

Appendix K

Traffic Analysis

California Northstate University

Draft Transportation Analysis Report

Prepared for:
Ascent Environmental

July 14, 2020

RS19-3789

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1. Introduction

This study addresses the potential transportation impacts associated with the proposed California Northstate University in the City of Elk Grove. This impact analysis examines the transportation system surrounding the Project under the following scenarios:

- Existing Conditions
- Existing Plus Project Conditions
- Cumulative Conditions
- Cumulative Plus Project Conditions

Additionally, the project site access and on-site circulation, bicycle and pedestrian facilities and access, transit, and construction.

1.1 Project Description

The proposed Project includes expanding the existing CNU campus, which consists of one 109,800 square foot building, to include a hospital, outpatient building, medical office building, dormitories, administrative offices, restaurant, and retail space, and three parking garages. An existing 76,000 square foot office building and seven commercial buildings totaling approximately 68,500 square feet will be demolished with phased construction of the Project ("Project").

The Project is located southwest of the Elk Grove Boulevard/West Taron Drive intersection. Access is proposed via one existing driveway on Elk Grove Boulevard, four existing driveways on West Taron Drive, and three existing driveways on Riparian Drive. Figure 1 shows the location of the proposed Project.

Consistent with the requirements of the City of Elk Grove Climate Action Plan: 2019 Update, the Project will also include a Transportation Demand Management (TDM) Plan. The Climate Action Plan (CAP), CAP measure TACM-3 (Intercity Transportation Demand Management) focuses on implementing TDM strategies to reduce the use of single-occupancy vehicle trips, with a target of achieving a 15 percent reduction in project vehicle trips and associated vehicle miles of travel (VMT).

To aid the development of TDM plans, the City of Elk Grove developed the City of Elk Grove Transportation Demand Management Plan Guidelines. The guidelines identify TDM measure by category that include marketing and promotion, bike facilities, transit benefits, commuter benefits, and parking facilities. The guidelines outline the requirements for each TDM plan and identifies the following for each TDM measure:

- **Measure Requirements** – describes the transportation amenity being provided, the amount/frequency of the amenity, and the property owner’s responsibilities. Each TDM measure is assigned a point value between one and five. The higher the value the more effective the measure is a reducing vehicle travel
- **Compliance Requirements** – identifies the required actions and obligations of the applicant or property owner’s for compliance with the TDM measure during the development review phase of the project
- **TDM Plan Annual Progress Report** – identifies the annual reporting requirement for the property owners of TDM coordinator, which include the number of employees participating in the plan (i.e., by measure) and the commute mode share of employees, along with other performance measures that demonstrate performance

The TDM Plan is required to include all required measures and a set of optional TDM measures that total to a minimum of 10 points. **Table 1** summarizes measures that may be included in the proposed Project’s TDM Plan. A detailed description of the TDM measures is provided in **Attachment A**.

Table 1: Potential TDM Measures

TDM Category	TDM Measure	Required	Optional	Measure Points
Marketing and Promotion	Transportation Marketing Services	X	-	-
Bike Facilities	Short-Term Bicycle Parking	-	X	1
	Long-Term Bicycle Parking			2
	Improved Access to Bike Network			1
	Showers and Locker Rooms			3
On Site Amenities	On-Site Cafe			3
Transit	Subsidized Transit Passes			3
Commuter Benefits	Shuttle Bus Service			5
	Carpooling Program			3
	Guaranteed Ride Home			4
Parking	Parking Cash Out Program			3
Total				28

Source: Fehr & Peers, 2020.

An Excel-based tool, TDM+, which estimates a percent reduction in VMT due to a single TDM strategy as well as a combination of multiple TDM strategies, was use to evaluate the potential for achieving a 15 percent reduction in project vehicle trips and associated VMT, consistent the City of Elk Grove

Transportation Demand Management Plan Guidelines. The VMT calculations applied in TDM+ are based on strategies identified in the California Air Resources Board's Zero Carbon Buildings Study, which in turn draws from the 2010 CAPCOA manual Quantifying Greenhouse Gas Mitigation Measures. These reductions are exclusive of built environment variables like land use mix and density, which are accounted for in the estimation of the Project's internal trip capture. The TDM strategy reductions have been limited in effectiveness to only land uses where there is supporting research or case studies to support the reductions. The reductions reflect the suburban (single-family) environment of the Project location.

A range of overall reduction for the entire Project between 4% and 31% is possible. Therefore, based on this evaluation, a 15% reduction is achievable. The results of the TDM+ evaluation is provided in Attachment A.

1.2 Study Area

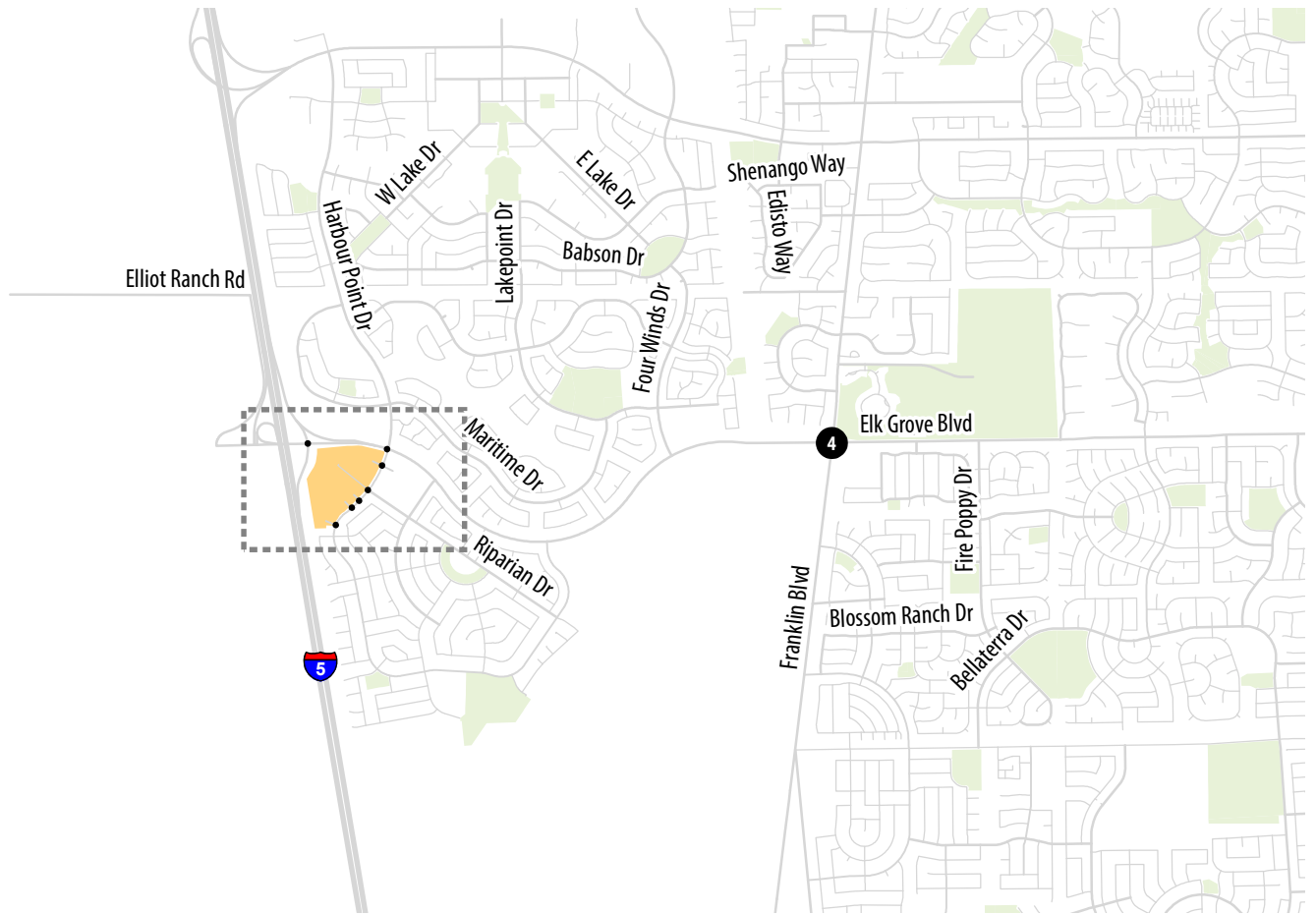
This report considers the Project and its immediate location, along with a larger study area. The study area was selected based on the Project's location, site access, expected trip generation, and comments received during the NOP comment period. The analysis considers traffic operations at the following intersections that are shown on **Figure 1**.

1. Elk Grove Boulevard/I-5 NB Ramps
2. Elk Grove Boulevard/W Taron Drive/Harbour Point Drive
3. W Taron Drive/Riparian Drive
4. Elk Grove Boulevard/Franklin Boulevard
5. W Taron Drive/Shell Driveway/Chevron Driveway
6. W Taron Drive/Alldata Driveway
7. W Taron Drive/CA Northstate University North Driveway
8. W Taron Drive/CA Northstate University South Driveway

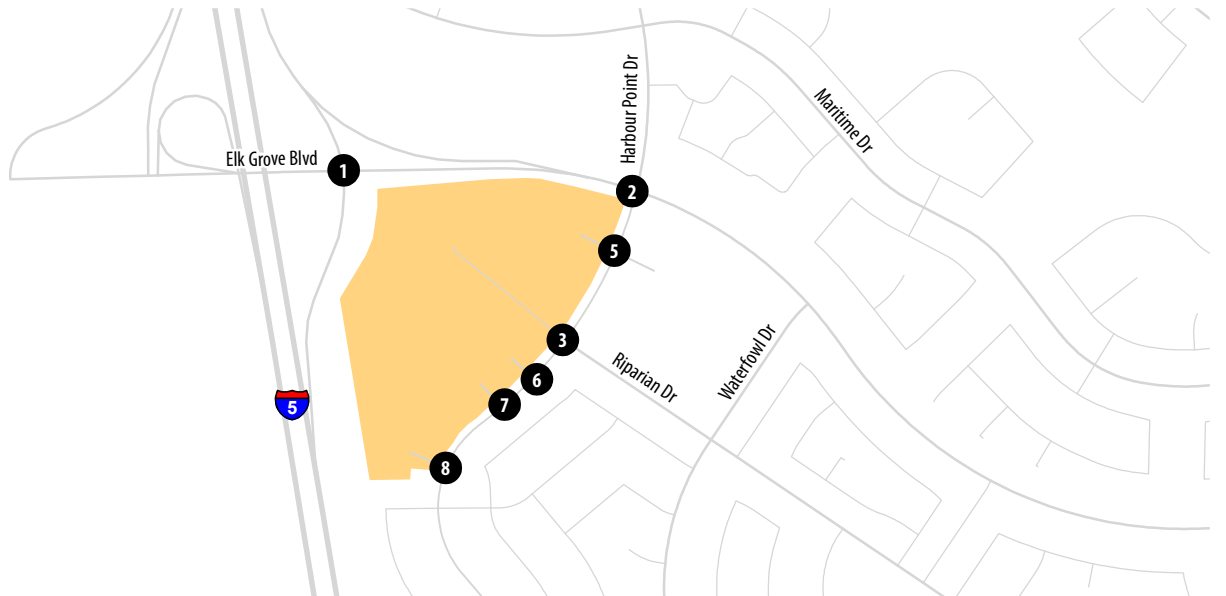
1.3 Data Collection

To provide a baseline for the transportation analysis, traffic counts were collected at the study intersections shown in **Figure 1** the week of August 19, 2019. The intersection turning movements counts were conducted during the AM (6:00 to 9:00) and PM (4:00 to 7:00) peak periods. During the counts, weather conditions were clear, no unusual traffic patterns were observed, and the Elk Grove Unified School District was in full session. Pedestrians, bicyclists, and heavy vehicles were also counted at the study intersections.

The peak hour within the peak period was used for the analysis. The counts indicated that the AM peak hour along Elk Grove Boulevard at W Taron Drive is between 7:15 and 8:15 and the PM peak hour is between 5:00 and 6:00 with measured peak hour factor is 0.97 in the AM peak hour and 0.95 in the PM peak hour.



INSET



- 1 Study Intersection
- Project Site



Figure 1
Study Area

1.4 Analysis Methodology

Project analysis includes both Vehicle Miles of Travel (VMT) and intersection Delay.

VMT

The City uses total daily VMT and VMT per service population as the basis for VMT analysis. The following describes these two VMT metrics and their intended use:

- VMT per Service Population – Includes the sum of all vehicle miles of travel produced by individual land uses in a project, divide by the sum of total employees working within the project, residents living in the land uses, students attending classes, patients receiving care, or visitors in the project. The VMT per service population metric is used to assess a Project against specific land use VMT limits. The Project includes hospital, medical office, outpatient, administration, classroom, dormitory, and commercial/retail land use.
- Total Daily VMT – Includes the sum of all daily vehicle miles of travel produced by all uses within the City of applicable Study Area. Since the Project is located in the City limits, the Citywide cumulative VMT limit that is outlined in Policy MOB-1-1(a)(ii) is used to assess the Project.

Using the modified version of SACOG's SACSIM regional travel demand forecasting model, developed for the City of Elk Grove General Plan Update, origin-destination/tour-based transportation analysis VMT forecasts VMT based on all trips that have one end in a project location and includes the following:

- Trip Types – Includes internal-to-internal (II), internal-to-external (IX), and external-to-internal (XI) trips. External-to-external (XX) trips are excluded.
- Trip Length – Fully accounts for entire length of each trip.
- Trip Tours – Includes trip tours without an origin or destination at the home.

Details of the VMT calculation process are included in Appendix E of the City of Elk Grove Transportation Analysis Guidelines.

We estimated VMT using a modified version of SACOG's SACSIM regional travel demand forecasting model, developed for the analysis of the City of Elk Grove General Plan Update in conjunction with mobile-sourced data from StreetLight Data to obtain average trip lengths for the for the existing CNU school building, the existing office building (ALLDATA), the existing shopping center, as well as seven comparable hospitals and medical centers within the Sacramento region. Attachment B includes the VMT analysis and findings for the proposed Project.

Intersections

The study intersections were analyzed using procedures and methodologies contained in the *Highway Capacity Manual, 6th Edition* (Transportation Research Board, 2017), using the Synchro/SimTraffic software.

Detailed Assumptions and Methodologies

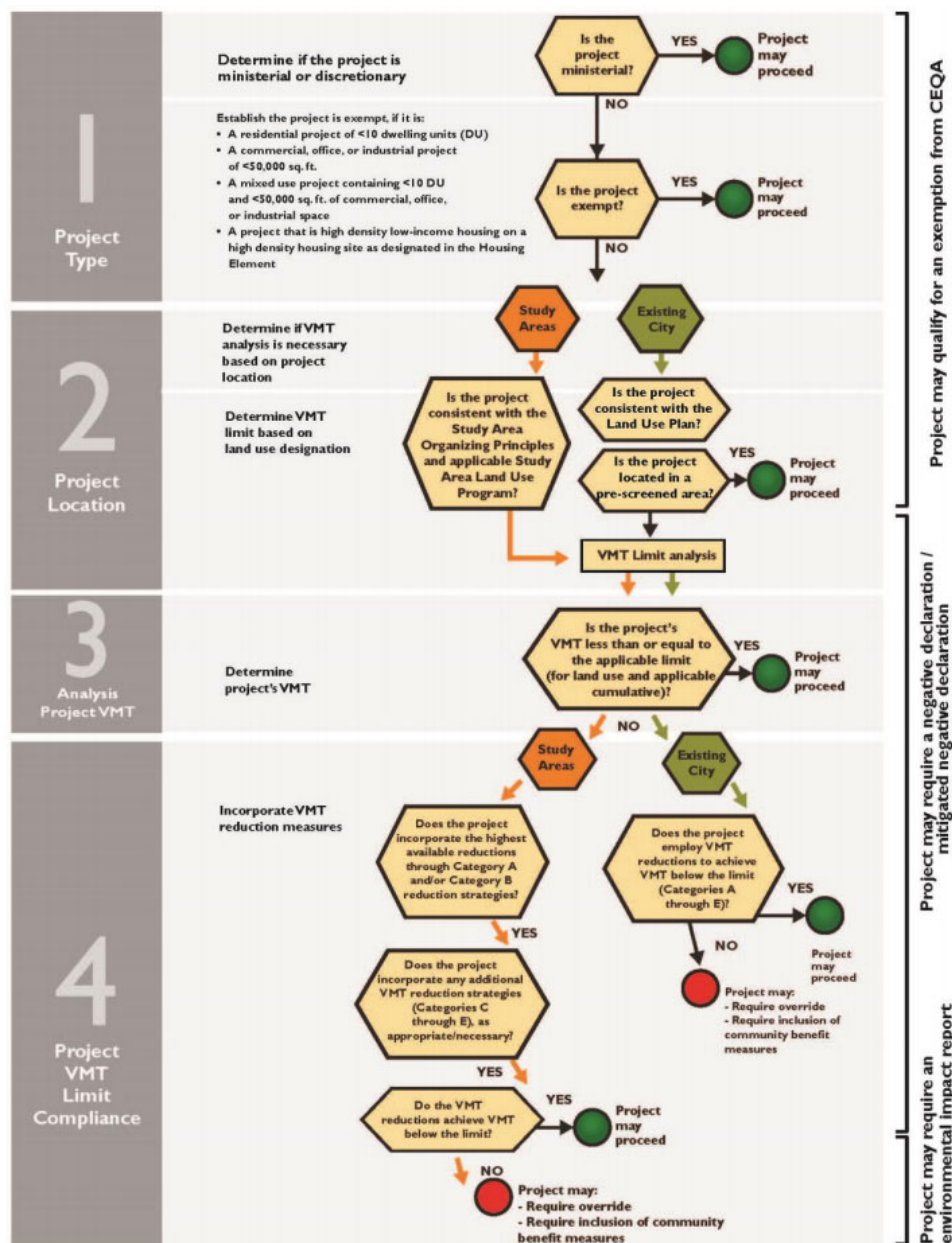
- The measured peak hour factors were applied to the study intersections based on the August 2019 traffic counts
- Measured heavy vehicle percentage were applied to the study intersections based on the August 2019 traffic counts
- Measured pedestrian and bicycle flows were applied to the study intersections based on the August 2019 traffic counts

1.5 Analysis Evaluation Criteria

The following evaluation criteria was used to determine if the addition of the proposed Project would result in an impact in the City of Elk Grove.

VMT

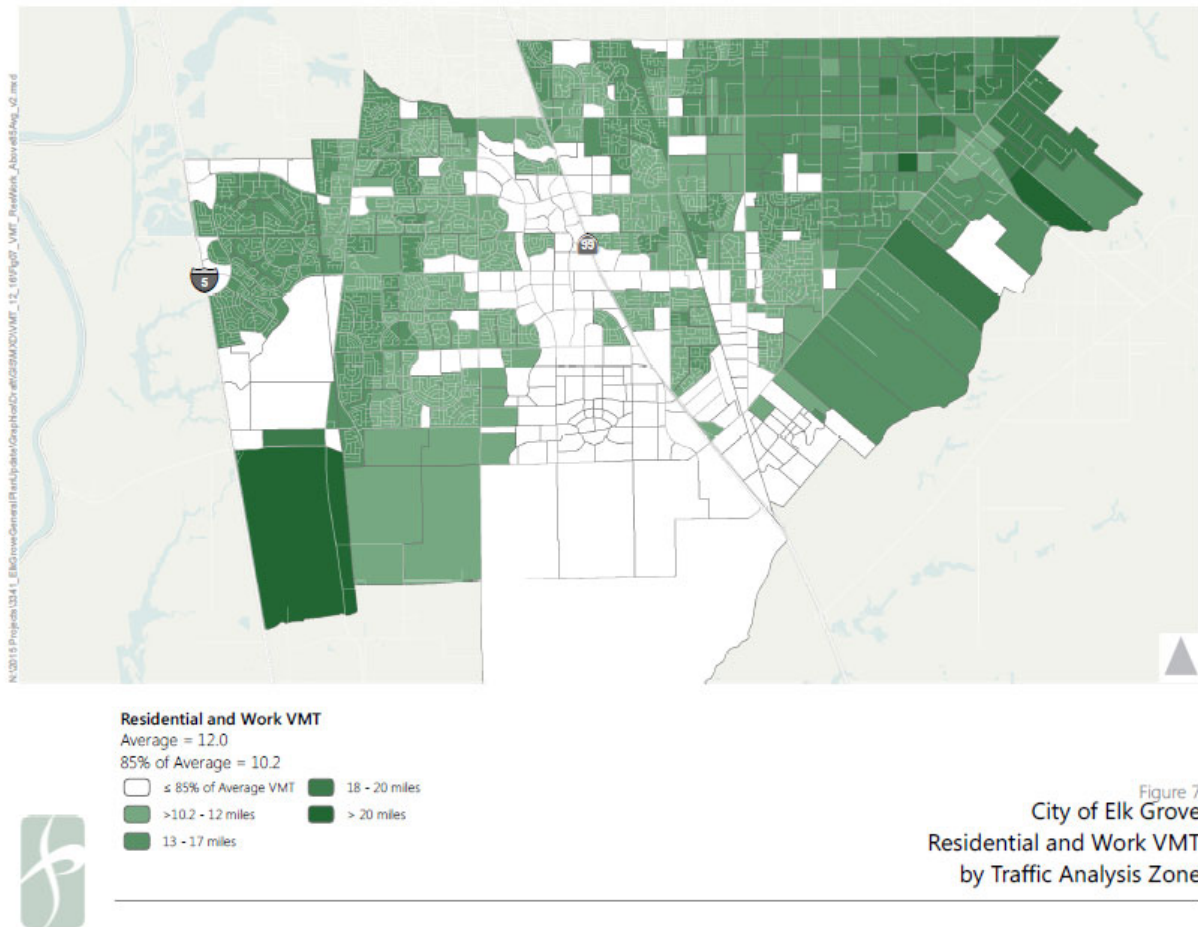
The City desires to achieve a reduction in VMT. Reductions in VMT can be accomplished through a combination of land use and mobility actions. To reduce VMT, the City has established the following metrics and limits depicted in the following graphic.



The VMT analysis process for land use projects outlined above includes the following four steps:

- **Step 1 (Project Type)** – Determine if the project is ministerial or discretionary or if the project is exempt from VMT analysis.
- **Step 2 (Project Location)** – Determine if VMT analysis is necessary based on project location and determine the project's VMT limit by land use designation.
- **Step 3 (Analyze Project VMT)** – Determine the project's VMT and compare to the VMT limit by land use designation (from Step 2) to determine if VMT mitigation is necessary.
- **Step 4 (Project VMT Limit Compliance)** – Identify VMT reduction mitigation measures and significance of VMT impacts with mitigation.

The following VMT Screening Map identifies areas in the City that are exempt from VMT analysis. These include sites that have been pre-screened through Citywide VMT analysis. Pre-screened areas are shown in white and have been determined to result in 15 percent or below the average service population VMT established for that land use designation if built to the specifications of the Land Use Plan. With an average VMT per service population of 12.0, the City's target VMT per service population threshold is 10.2.



For projects that have not been pre-screened and that do not achieve the limits outlined below shall be subject to all feasible mitigation measures necessary to reduce the VMT for, or induced by, the project to the applicable limits. If the VMT for or induced by the Project cannot be reduced consistent with the performance metrics outlined below, the City may consider approval of the Project, subject to a finding of overriding consideration and mitigation of transportation impacts to the extent feasible, provided some other form of community benefit is achieved by the Project.

- **New Development** – Any new land use plans, amendments to such plans, and other discretionary development proposals (referred to as “development projects”) are required to demonstrate a 15 percent reduction in VMT from existing (2015) conditions. To demonstrate this reduction, conformance with following land use and cumulative VMT limits is required:
 1. **Land Use** – Development projects shall demonstrate that the VMT produced by the project at buildout is equal to or less than the VMT limit of the project’s General Plan land use designation, as shown in the following table, which incorporates the 15 percent reduction from 2015 conditions:

Vehicle Miles Traveled Limits by Land Use Designation

Land Use Designation	VTM Limit (daily per service population)
Commercial and Employment Land Use Designations	
Community Commercial	41.6
Regional Commercial	44.3
Employment Center	47.1
Light Industrial/Flex	24.5
Light Industrial	24.5
Heavy Industrial	39.5
Mixed Use Land Use Designations	
Village Center Mixed Use	41.6
Residential Mixed Use	21.2
Public/Quasi Public and Open Space Land Use Designations	
Parks and Open Space ¹	0.0
Resource Management and Conservation ¹	0.0
Public Services	53.1
Residential Land Use Designations	
Rural Residential	34.7
Estate Residential	49.2
Low Density Residential	21.2
Medium Density Residential	20.9
High Density Residential	20.6
Other Land Use Designations	
Agriculture	34.7

Notes:

1. These land use designations are not anticipated to produce substantial VMT, as they have no residents and few to no employees. These land use designations therefore have no limit and are exempt from analysis.

2. **Cumulative for Development Projects within the Existing City** – Development projects located within the existing (2017) City limits shall demonstrate that cumulative VMT within the City including the project would be equal to or less than the established Citywide limit of 6,367,833 VMT (total daily VMT).
3. **Cumulative for Development Projects within Growth Areas** – Development projects located in Study Areas shall demonstrate that cumulative VMT within the applicable

Study Area would be equal to or less than the established limit shown in the following table.

Study Area Total Vehicle Miles Traveled Limits

Study Area	VMT Limit (total VMT at buildout)
North Study Area	37,622
East Study Area	420,612
South Study Area	1,311,107
West Study Area	705,243

The Project is located within the City limits. The Project and remainder of the City will meet the buildout VMT Limit 6,367,833.

Consistent with the City of Elk Grove Transportation Analysis Guidelines (Updated December 2019), and the General Plan, the performance targets shown in **Table 2 and Table 3** were used to evaluate intersection and roadway performance, respectively. A project may be inconsistent with the General Plan if it causes an intersection to operate in excess of the performance target for that intersection type; however, the City may allow deviations from these metrics when accounting for both roadway operations and the effectiveness of the improvements with the character of the surrounding area, the cost to complete the improvement, and ongoing maintenance obligations (General Plan policy MOB-1-3).

Intersections

Table 2: Intersection Performance Targets

Intersection Control	Delay (Seconds)
Stop (Side-Street & All-Way)	< 35.1
Signal	< 55.1
Roundabout	< 35.1

Notes:

Source: *Highway Capacity Manual 2016*, Transportation Research Board, 2016.

Roadways**Table 3: Roadway Segment Performance Targets**

Facility Type	Number of Lanes	Median	Speed (mph)	Average Daily Traffic Design Target (Number of Vehicles)
Arterial or Arterial\Collector	2	No	25	13,600
			30	14,600
			35	15,700
			40	16,600
			45	17,700
			55	18,600
		Yes	25	14,300
			30	15,600
			35	16,500
			40	17,500
			45	18,600
			55	19,600
	4	No	30	29,800
			35	31,600
			40	33,500
			45	35,300
	4	Yes	30	31,400
			35	33,300
			40	35,300
			45	37,200
	5	Yes	45	45,600
	6	Yes	30	46,400
			35	48,900
			40	51,500
			45	54,000
	7	Yes	45	59,400
	8	Yes	45	64,800
			55	72,000
Expressway	4	Yes	55	64,800
	6	Yes	55	97,200
Freeway	4	Yes	55+	74,400
	6	Yes	55+	111,600
	8	Yes	55+	148,800

Source: City of Elk Grove Transportation Analysis Guidelines (Adopted February 2019/Updated December 2019)

Bicycle/Pedestrian Facilities

An impact is considered significant if implementation of the project will degrade the Bicycle Streetscore LTS or the Pedestrian Streetscore LTS.

Transit

An impact is considered significant if the project creates demand for public transit services above the crush load capacity that is provided or planned.

On-Site Circulation

An impact is considered significant if the project designs for on-site circulation and parking areas fail to meet City or industry design guidelines or if the project fails to provide adequate accessibility for service and delivery trucks on-site, including access to truck loading areas.

1.6 Report Organization

The remainder of this report consists of the following sections:

- **Section 2** – Intersection and Roadway Performance
- **Section 3** – Site Access and On-site Circulation
- **Section 4** – Construction Traffic
- **Section 5** – Parking
- **Section 6** – VMT
- **Section 7** – Bicycle/Pedestrian/Transit Facilities and Services

2. Intersection and Roadway Performance

This section discusses intersection and roadway performance under existing and cumulative conditions.

2.1 Existing Transportation System

Regional access to the Project site is provided primarily by Interstate 5, which is adjacent to the Project, by way of the I-5/Elk Grove Boulevard interchange. To a lesser extent Interstate 5, which is located about 5.1 miles east of the Project site also provides regional access. Key local roadway facilities near the Project site are described below:

2.2 Roadway System

- **Elk Grove Boulevard** is an east-west roadway that extends from I-5 to Grant Line Road. Elk Grove Boulevard is six lanes from I-5 through the Franklin Boulevard intersection. Elk Grove Boulevard is improved to its general plan designation as a six-lane arterial. Elk Grove Boulevard has Class II bike lanes beginning at W Taron Drive
- **West Taron Drive** is a north-south roadway extending from Elk Grove Boulevard and provides direct access to the Project site. West Taron Drive has two travel lanes and with Class II bike lanes.
- **Riparian Drive** is an east-west roadway extending from the Project site to E Taron Drive. West Taron Drive will provide primary access to the Project site, is two lanes with Class II bike lanes.
- **Harbour Pointe Drive** is a north-south roadway extending from Elk Grove Boulevard to Laguna Boulevard. Harbour Pointe is four lanes and is improved to its general plan designation as a four-lane arterial and provides the north leg of the Elk Grove Boulevard/W Taron Drive/Harbour Point Drive. Harbour Pointe Drive has Class II bike lanes.
- **Franklin Boulevard** is a north-south roadway extending north of Sacramento County (south of the City) to the City of Sacramento (north of the City). Franklin Boulevard is six lanes north of Elk Grove Boulevard and transitions to four lanes to the south. Franklin Boulevard is designated as a four-lane arterial in the general plan. Franklin Boulevard has Class II bike lanes north of Elk Grove Boulevard.

2.3 Bicycle and Pedestrian Facilities

Class II bike lanes (on-street with signage and striping) are provided in both directions on W Taron Drive, Riparian Drive, Harbour Point Drive and Elk Grove Boulevard.

Pedestrian facilities are provided on all roadway frontages. Except for Elk Grove Boulevard, all sidewalks are adjacent to the roadway. On Elk Grove Boulevard (east of W Taron Drive/Harbour Point Drive) sidewalks are buffered from the roadway by landscaping. The W Taron Drive/Riparian Drive and Elk Grove Boulevard/W Taron Drive/Harbour Point Drive intersections include pedestrian crosswalks on all legs. The Elk Grove Boulevard/Franklin Boulevard intersection has pedestrian crosswalks on the north, south, and east legs.

2.4 Transit Service

Transit service within the study area is provided by e-Tran, which operates seven local routes within Elk Grove and ten commuter routes with service to Downtown Sacramento and Rancho Cordova. Routes that travel near the Project are described briefly below:

- **Route 111** is a local route that provides service between the area near Cosumnes Oaks High School and Laguna Town Hall. This route runs Monday through Friday from approximately 6:00 AM to 8:00 PM. Generally, the route runs about every hour. Near the Project, Route 111 travels on Elk Grove Boulevard and Harbour Point Drive with a stop on Harbour Point Drive north of Elk Grove Boulevard.
- **Route 11** is a commuter route that travels from the area near Franklin High to Downtown Sacramento. With the study area, the route travels on Elk Grove Boulevard. This route provides four inbound buses in the morning and four outbound buses in the evening, Monday through Friday.

The nearest bus stops to the Project are located on Elk Grove Boulevard (east of Harbour Point Drive) and on Harbour Point Drive (north of Elk Grove Boulevard). The stops on eastbound Elk Grove Boulevard and northbound Harbour Point Drive have shelters.

2.5 Traffic Operations Analysis

This section describes study intersection and roadway operations under existing and cumulative conditions.

Intersection turning movement volumes, traffic control, and lane configurations under existing and cumulative conditions are shown on the following figures:

- **Figure 2** – Existing Conditions
- **Figure 3** – Existing Plus Phase 1 Conditions
- **Figure 4** – Cumulative No Project Conditions
- **Figure 5** – Cumulative Plus Project Buildout Conditions

Figure 6 and Figure 7 shows the trip distribution for Phase 1 and Buildout, respectively, used to assign Project trips to the study intersections and roadway under existing and cumulative conditions.

Intersections

Table 4 summarizes intersection performance under existing conditions and existing conditions with the addition of Phase 1 of the proposed Project and **Table 5** summarizes intersection performance under cumulative conditions and cumulative conditions with buildout of the proposed Project. Both **Tables 4 and 5** exclude recommended intersection modifications that may be necessary to provide consistency with the City's General Plan targets for roadway performance.

Table 6 summarizes intersection performance under existing and cumulative conditions with recommended intersection modifications needed to reduce delay to levels consistent with General Plan targets for intersection performance. As shown, with the recommended improvements, delay would be reduced to below conditions without the proposed Project. **Figure 8** shows recommended intersection modifications summarized in **Table 6**. However, the Elk Grove Boulevard/Franklin Boulevard would still exceed the performance target. For this intersection, it is recommended that the City consider allowing a deviation to the intersection performance target, as provided in Policy MOB-1-3 of the General Plan for the following reasons:

- **Recommended Improvement** – The recommended improvement in **Table 6** will accommodate added traffic from the proposed Project. Exceedance of intersection performance target is due to background growth.
- **Available Right-of-Way** – Elk Grove Boulevard is built to its General Plan designation as a 6-Lane arterial and there is limited available right-of-way for adding additional travel lanes.
- **Impact to Preserve** – Adding travel lanes would impact the Stone Lakes National Wildlife Refuge.

Table 4: Peak Hour Intersection Operations – Existing Plus Phase 1 Conditions

Intersection	Traffic Control	Performance Delay Target	Peak Hour	Delay		Exceed Performance Delay Target
				Existing	Existing Plus Phase 1	
1. Elk Grove Boulevard/I-5 NB Ramps	SSSC	< 35.1	AM	2 (11)	2 (11)	
			PM	2 (17)	3 (18)	
2. Elk Grove Boulevard/W Taron Drive/Harbour Point Drive	Signal	< 55.1	AM	28	33	
			PM	30	32	
3. W Taron Drive/Riparian Drive	AWSC	< 35.1	AM	11	16	
			PM	12	40	Yes
4. Elk Grove Boulevard/Franklin Boulevard	Signal	< 55.1	AM	41	43	
			PM	39	40	
5. W Taron Drive/Shell Driveway/Chevron Driveway	SSSC	< 35.1	AM	1 (10)	1 (12)	
			PM	1 (10)	1 (12)	
6. W Taron Drive/Alldata Driveway	SSSC	< 35.1	AM	0 (0)	0 (12)	
			PM	0 (10)	0 (10)	
7. W Taron Drive/CA Northstate University North Driveway	SSSC	< 35.1	AM	0 (13)	1 (14)	
			PM	3 (14)	4 (16)	
8. W Taron Drive/CA Northstate University South Driveway	SSSC	< 35.1	AM	0 (11)	0 (11)	
			PM	2 (11)	2 (11)	

Notes:

Bold text indicates delay greater than performance delay target

Source: Fehr & Peers.

Table 5: Peak Hour Intersection Operations – Cumulative Plus Buildout Conditions

Intersection	Traffic Control	Performance Delay Target	Peak Hour	Delay		Exceed Performance Delay Target
				Cumulative	Cumulative Plus Buildout	
1. Elk Grove Boulevard/I-5 NB Ramps	SSSC	< 35.1	AM	5 (14)	12 (83)	Yes
			PM	5 (78)	9 (162)	Yes
2. Elk Grove Boulevard/W Taron Drive/Harbour Point Drive	Signal	< 55.1	AM	34	50	
			PM	42	59	Yes
3. W Taron Drive/Riparian Drive	AWSC	< 35.1	AM	11	85	Yes
			PM	12	193	Yes
4. Elk Grove Boulevard/Franklin Boulevard	Signal	< 55.1	AM	80	130	Yes
			PM	48	60	Yes
5. W Taron Drive/Shell Driveway/Chevron Driveway	SSSC	< 35.1	AM	1 (10)	2 (25)	
			PM	1 (11)	30 (171)	Yes
6. W Taron Drive/Alldata Driveway	SSSC	< 35.1	AM	0 (0)	Intersection is eliminated with Project Buildout	
			PM	0 (10)		
7. W Taron Drive/CA Northstate University North Driveway	SSSC	< 35.1	AM	0 (13)	2 (27)	
			PM	3 (14)	5 (28)	
8. W Taron Drive/CA Northstate University South Driveway	SSSC	< 35.1	AM	0 (11)	1 (12)	
			PM	2 (11)	3 (13)	

Notes:

Bold text indicates delay greater than performance delay target

Source: Fehr & Peers.

Table 6: Peak Hour Intersection Operations – With Recommended Improvements

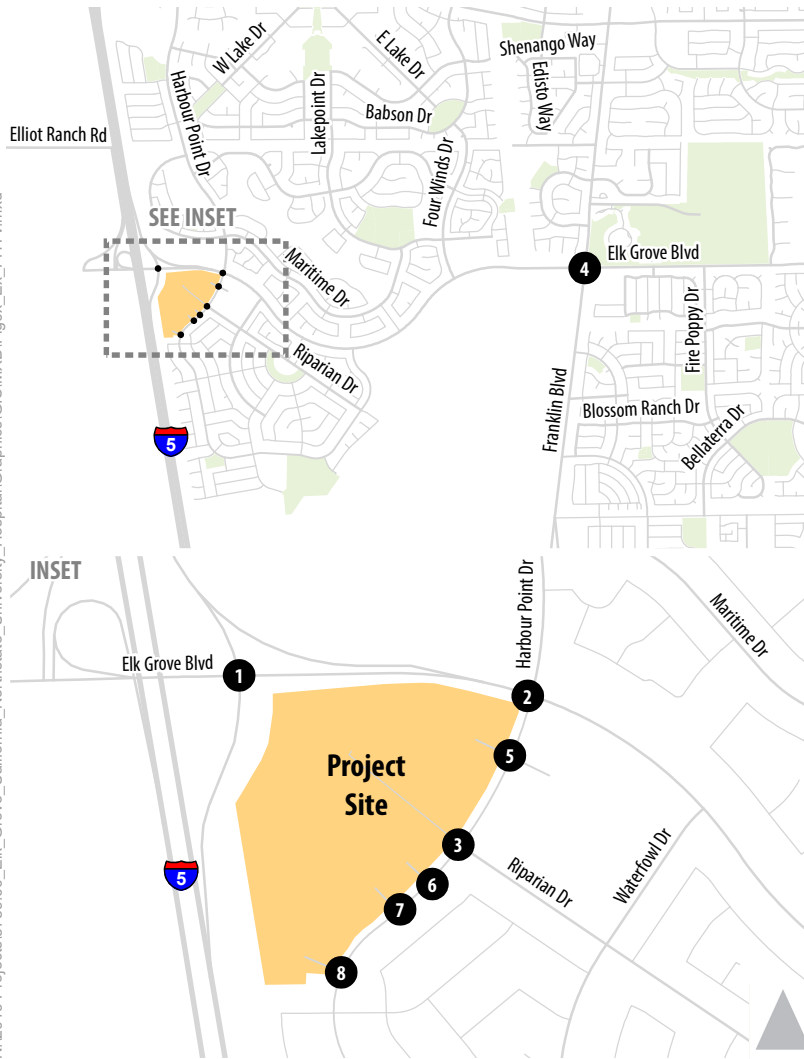
Scenario	Intersection	Traffic Control	Performance Delay Target	Peak Hour	With Recommended Improvements		
					Traffic Control	Description	Delay
Existing Plus Phase 1 Conditions	W Taron Drive/Riparian Drive	AWSC	< 35.1	AM	Signal	Install traffic signal	17
				PM			31
Cumulative Plus Buildout Conditions	Elk Grove Boulevard/I-5 NB Ramps	SSSC	< 35.1	AM	Signal	Install traffic signal	17
				PM			9
	Elk Grove Boulevard/W Taron Drive/Harbour Point Drive	Signal	< 55.1	AM	Signal	Increase PM peak hour traffic signal cycle length to 120 seconds	50
				PM			53
	W Taron Drive/Riparian Drive	AWSC	< 35.1	AM	Signal	Install traffic and add two eastbound left-turn lanes	46
				PM			23
	Elk Grove Boulevard/Franklin Boulevard	Signal	< 55.1	AM	Signal	Provide three northbound left-turn lanes ¹	66
				PM			53
	W Taron Drive/Shell Driveway/Chevron Driveway	SSSC	< 35.1	AM	SSSC	Parking Structure 2 – Limit access to inbound movements only on north side of structure	2(25)
				PM			2(26)

Notes:

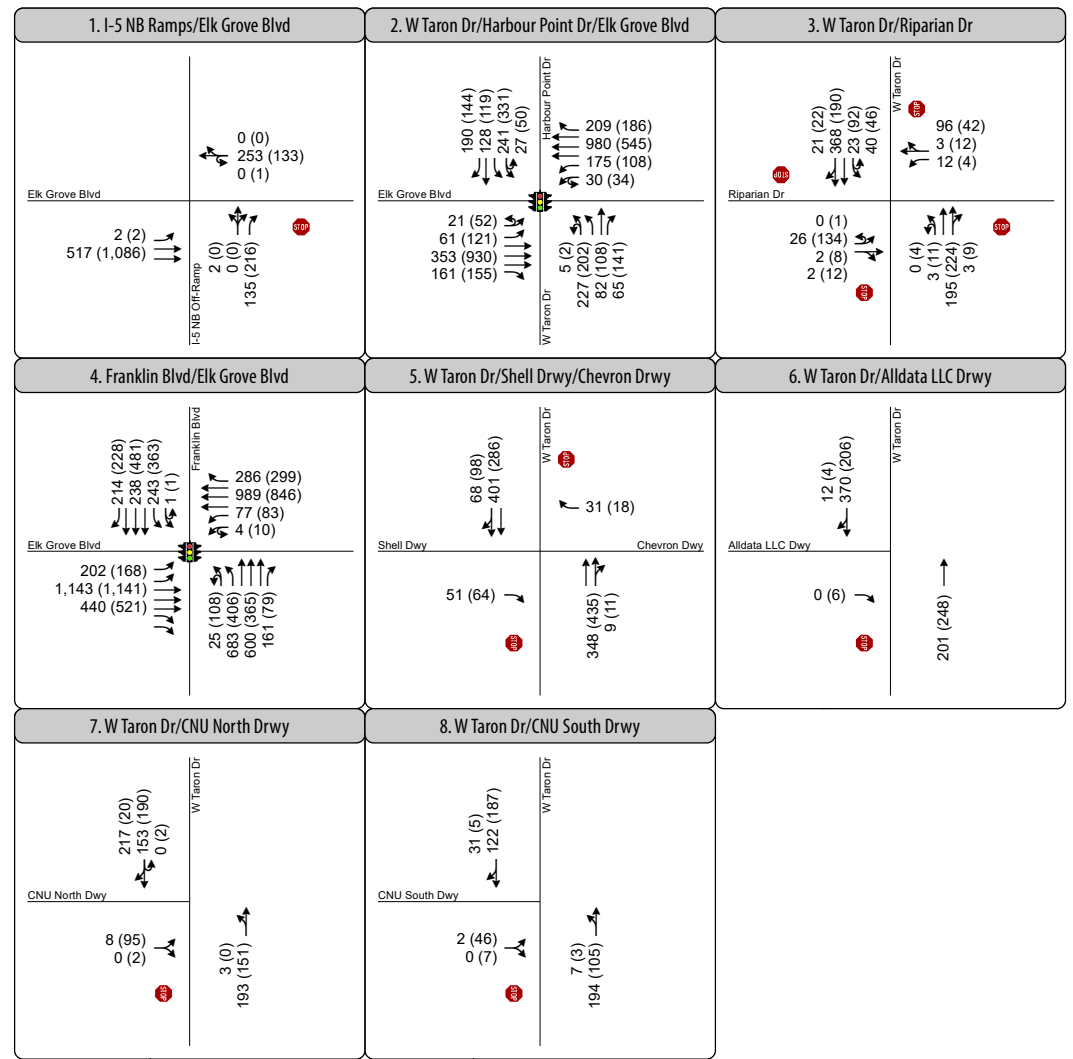
Bold text indicates delay greater than performance delay target

¹Provide three NB left-turn lanes by converting inside SB travel lane to develop third NB left-turn lane, which will require restriping the southbound travel lanes (north of Elk Grove Boulevard through the intersection). General Plan includes the reduction in through travel lanes on Franklin Boulevard from 6 to 4 lanes. Will require striping adjustment on EB approach to accommodate third NB left-turn lane to minimize potential conflicts.

Source: Fehr & Peers.



- 1** Study Intersection
- Orange** Project Site

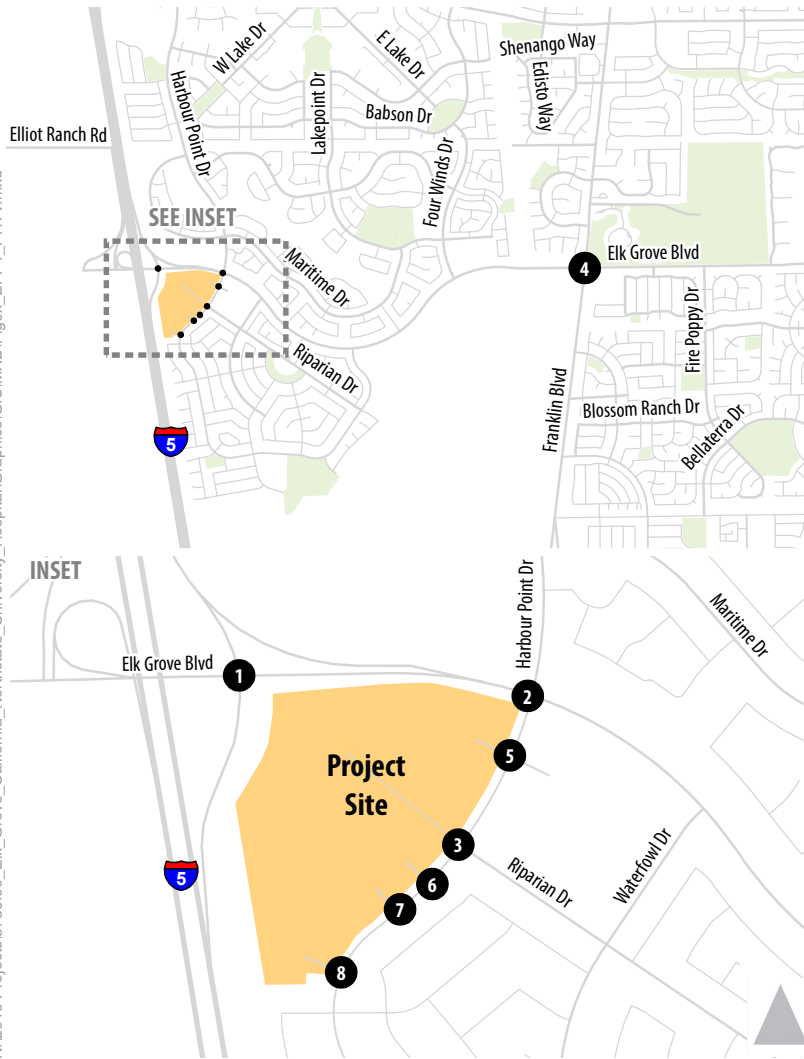


- Turn Lane
- Traffic Signal
- Stop Sign
- AM (PM)** Peak Hour Traffic Volume

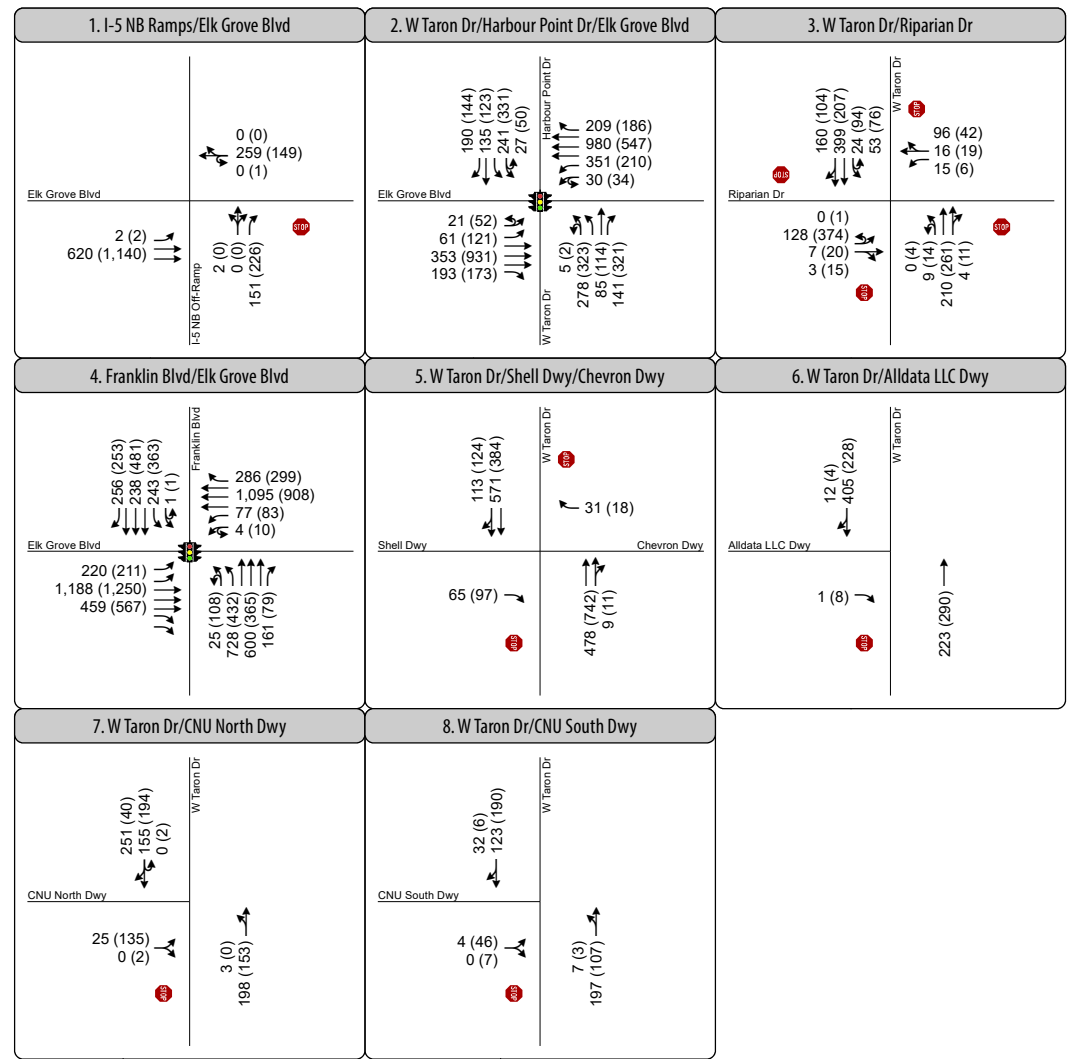
Figure 2

Peak Hour Traffic Volumes
and Lane Configurations -
Existing Conditions





- 1** Study Intersection
- Project Site

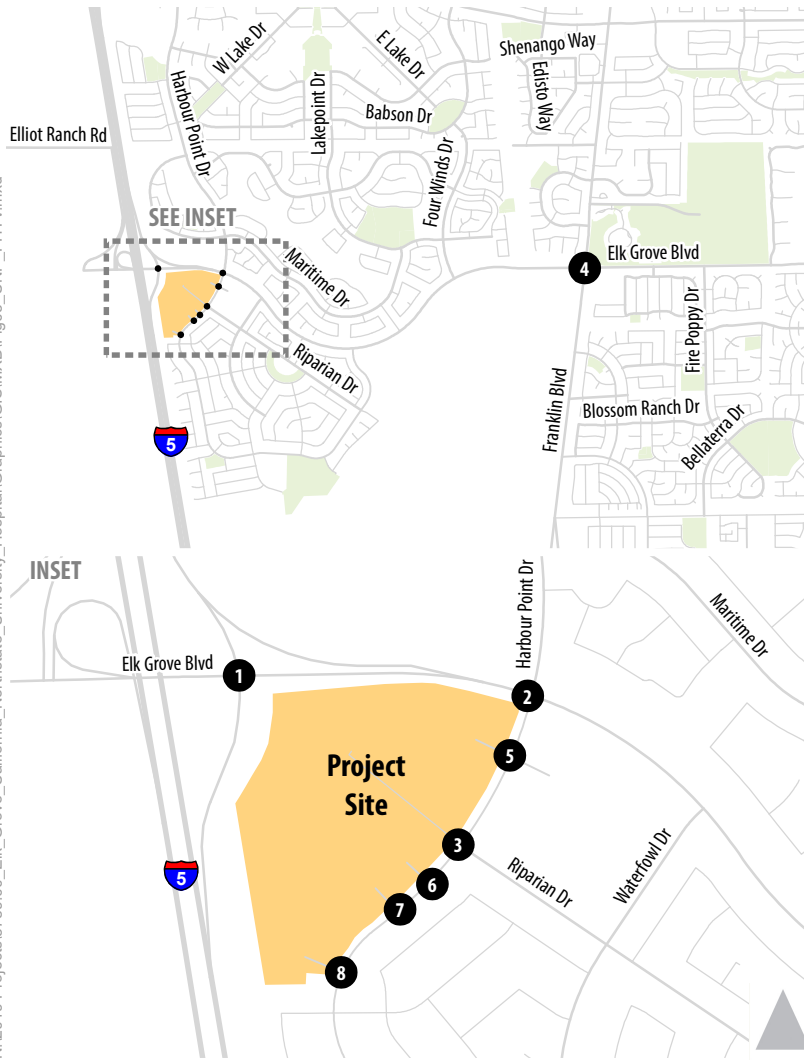


- Turn Lane
- Traffic Signal
- Stop Sign
- AM (PM) Peak Hour Traffic Volume

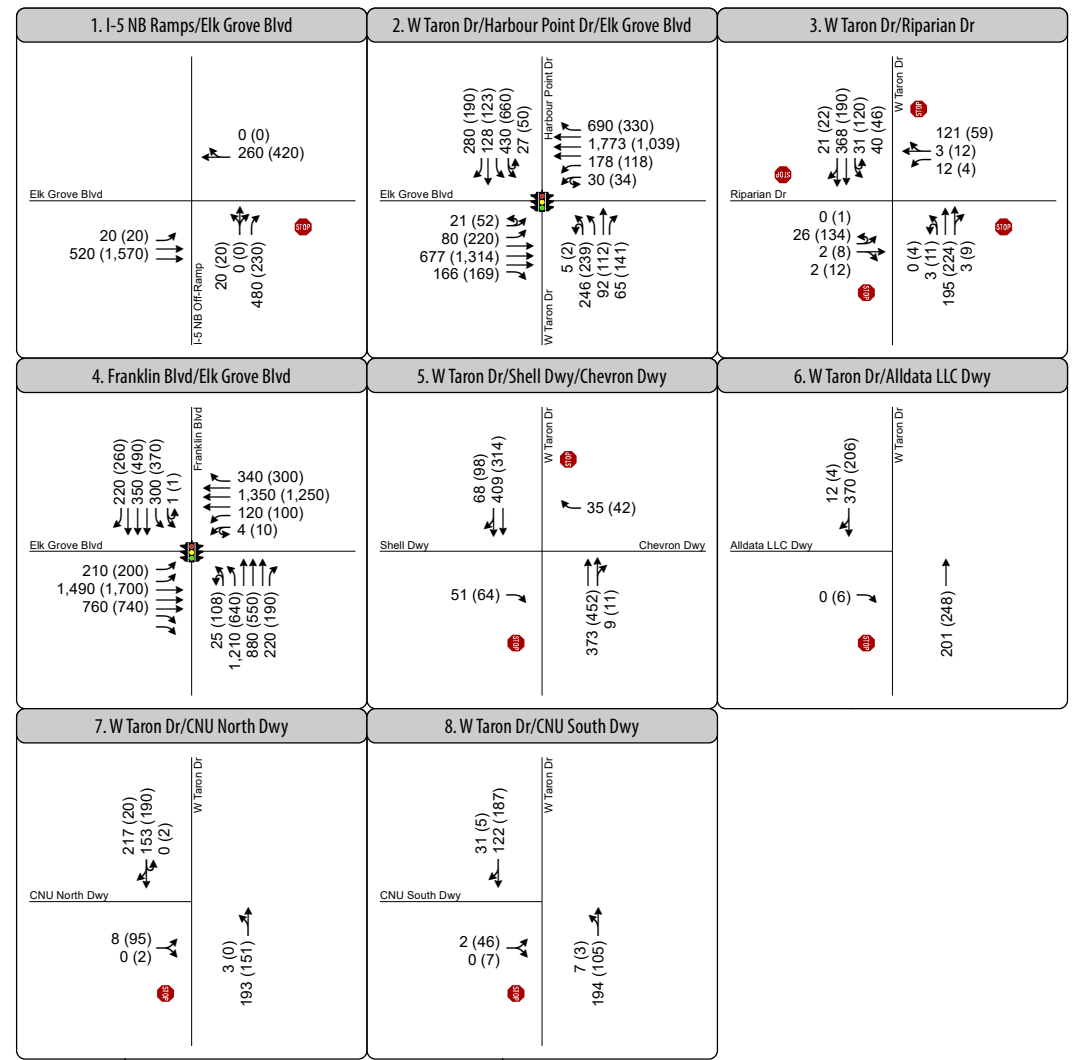
Figure 3

Peak Hour Traffic Volumes
and Lane Configurations -
Existing Plus Phase 1 Conditions





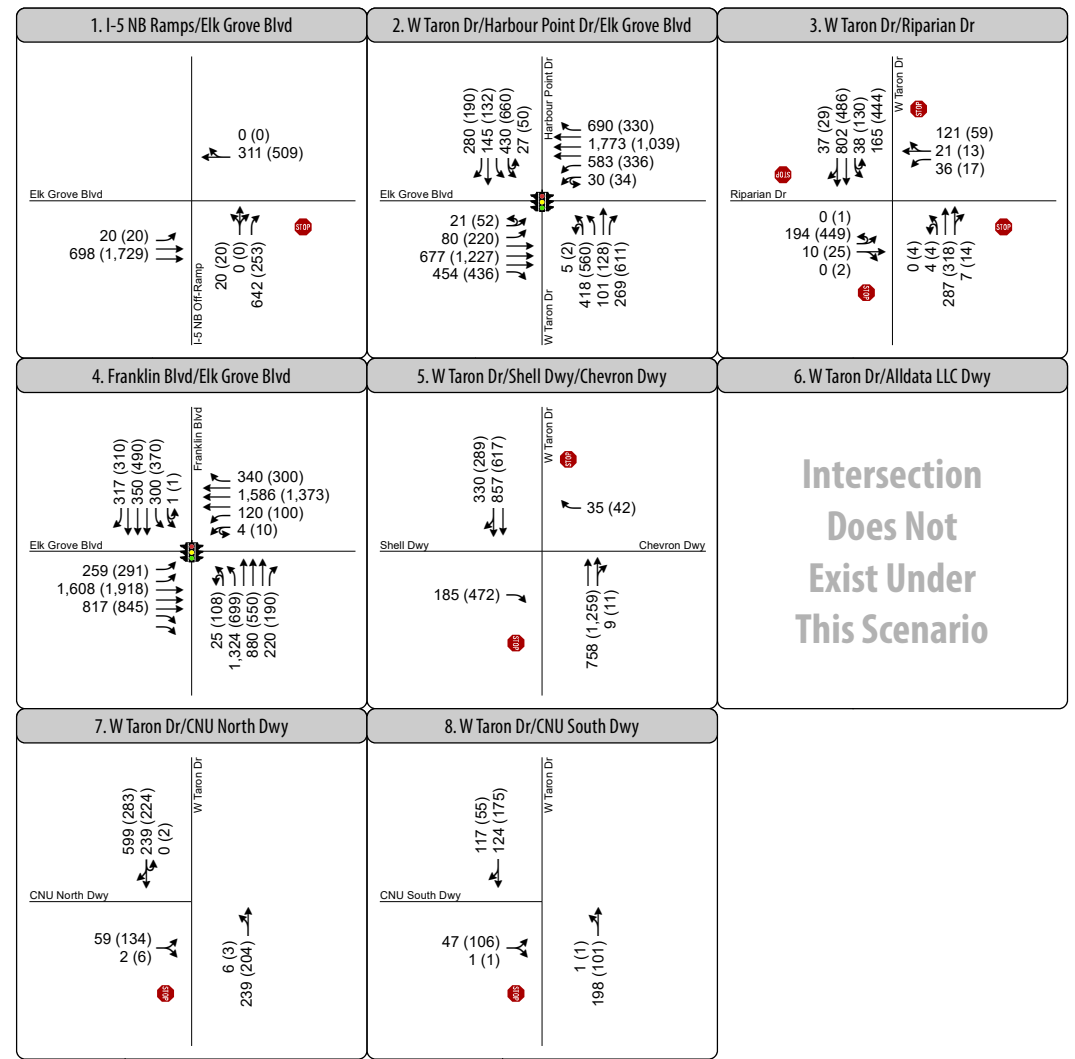
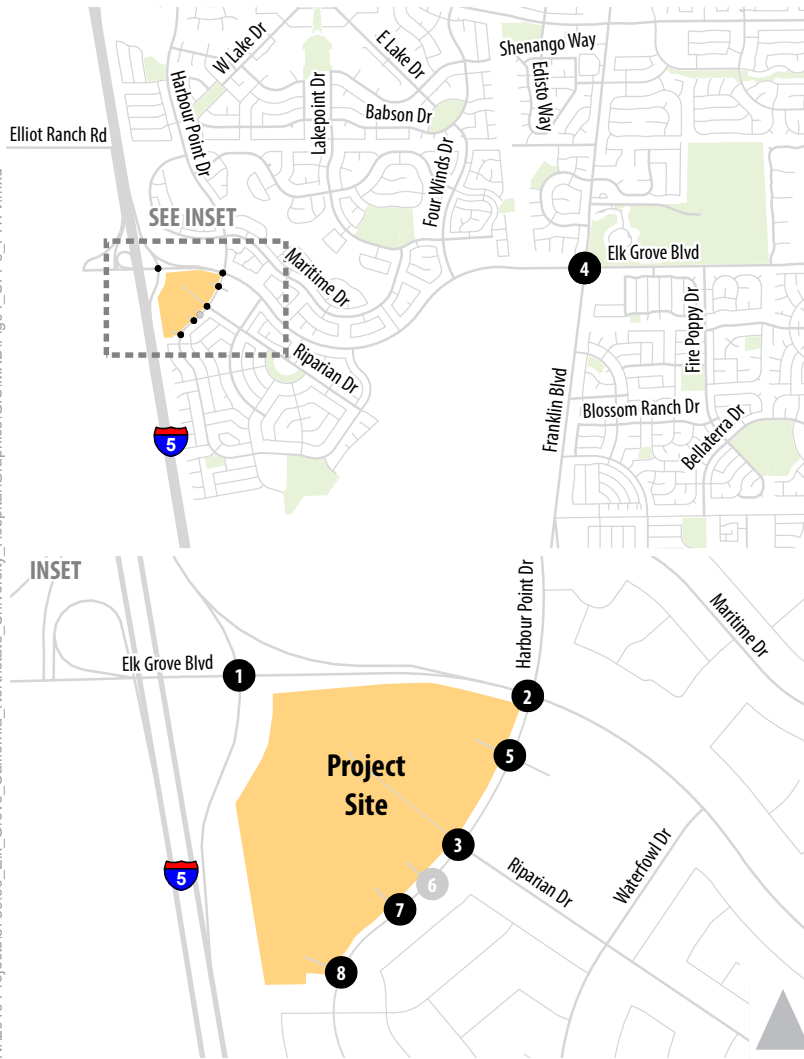
- 1** Study Intersection
- Project Site



- Turn Lane
- Traffic Signal
- Stop Sign
- AM (PM) Peak Hour Traffic Volume

Figure 4
Peak Hour Traffic Volumes
and Lane Configurations -
Cumulative No Project Conditions





Turn Lane
 Traffic Signal
 Stop Sign
 AM (PM) Peak Hour Traffic Volume

Figure 5

Peak Hour Traffic Volumes
and Lane Configurations -
Cumulative Plus Phase 3 Conditions

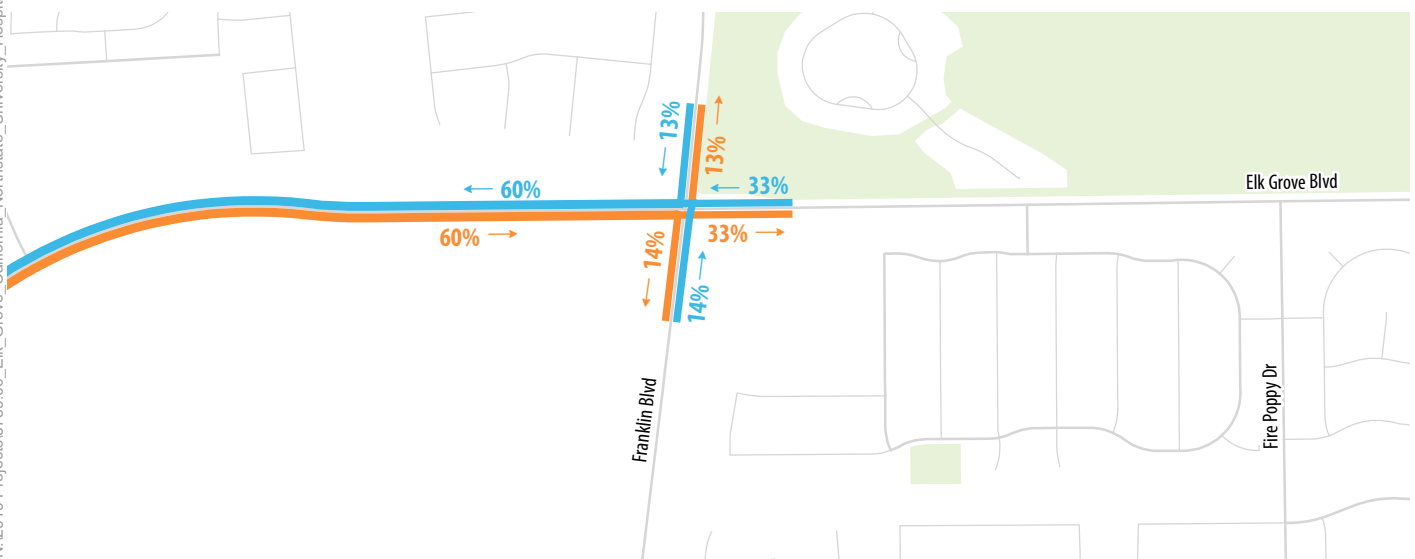


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See Inset
(Franklin Blvd/Elk Grove Blvd) →

INSET (Franklin Blvd/Elk Grove Blvd)



- **x%** Phase 1 Inbound Trip Distribution Percentage
- **x%** Phase 1 Outbound Trip Distribution Percentage
- Project Site



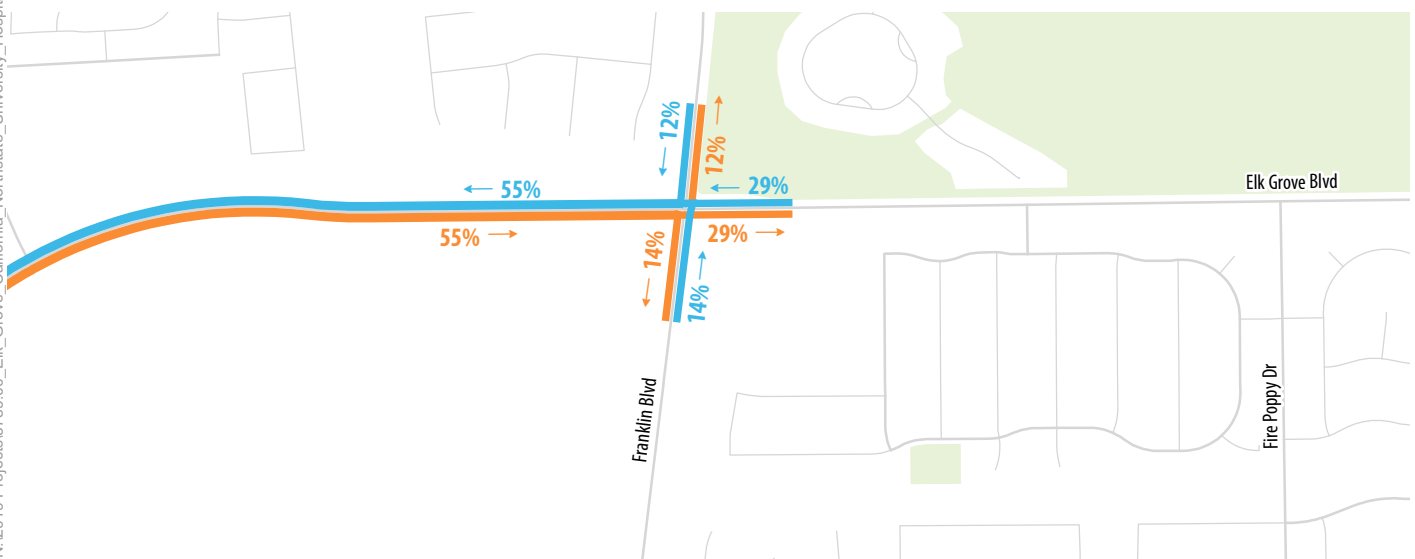
Figure 6
Phase 1 Inbound & Outbound Trip Distribution

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See Inset
(Franklin Blvd/Elk Grove Blvd) →

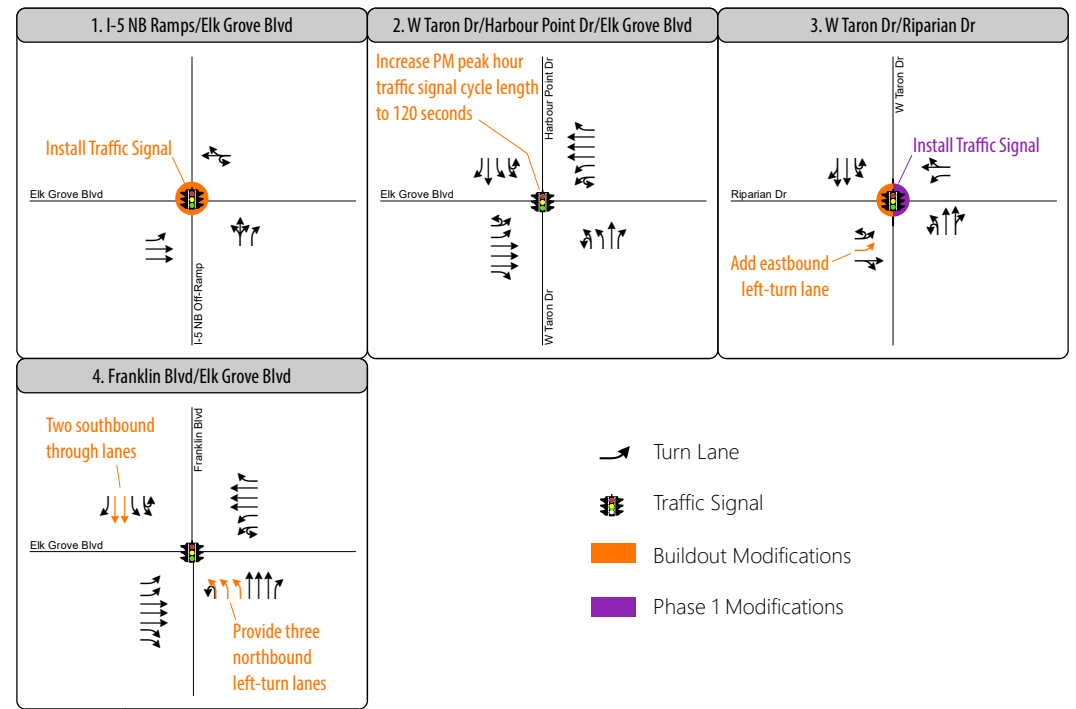
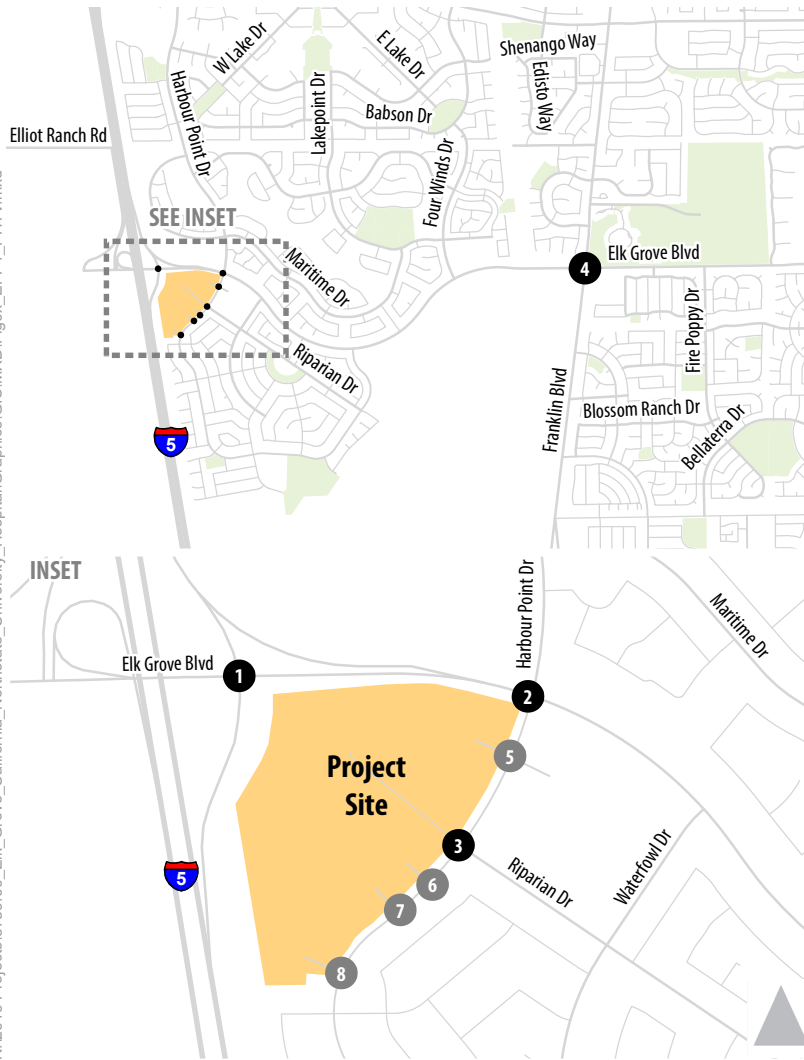
INSET (Franklin Blvd/Elk Grove Blvd)



- x% Phase 3 Inbound Trip Distribution Percentage
- x% Phase 3 Outbound Trip Distribution Percentage
- Project Site



Figure 7
Phase 3 Inbound & Outbound Trip Distribution



- Turn Lane
- Traffic Signal
- Buildout Modifications
- Phase 1 Modifications



Figure 8
Recommended Intersection Modifications

Roadways

Table 7 summarizes the analysis of roadway design targets under existing conditions with and without the addition of Phase 1 of the proposed Project and under cumulative conditions with and without buildout of the proposed Project.

As shown, the addition of traffic from Phase 1 of the proposed Project would not cause daily traffic volumes to exceed the designated General Plan roadway design targets under existing conditions. However, under cumulative conditions the addition of traffic from buildout of the proposed Project would cause the segment of Elk Grove Boulevard between W. Taron Drive/Harbour Point Drive and Franklin Boulevard to exceed the General Plan roadway design target.

For this segment, it is recommended that the City consider allowing a deviation to the roadway design target, as provided in Policy MOB-1-3 of the General Plan for the following reasons:

- **Intersection Operations** – Intersections are the locations on a transportation system where drivers experience delay and reduced travel speeds. Under cumulative conditions with buildout of the proposed Project, the Elk Grove Boulevard/W Taron Drive/Harbour Point Drive and Elk Grove Boulevard/Franklin Boulevard intersections (i.e., with recommended improvements in **Table 6**) will operate with lower delay than under cumulative conditions without buildout of the proposed Project.
- **Traffic Loading Along Segment** – This segment of Elk Grove Boulevard is only loaded on one side of the roadway with access to the north east of E. Taron Drive and access to the south west of E. Taron Drive.
- **Available Right-of-Way** – Elk Grove Boulevard is built to its General Plan designation as a 6-Lane arterial and there is limited available right-of-way for adding additional travel lanes.
- **Impact to Preserve** – Adding travel lanes would impact the Stone Lakes National Wildlife Refuge.

Attachment B includes intersection performance technical calculations.

Table 7: Daily Roadway Performance – Existing Plus Phase 1 and Cumulative Plus Buildout Conditions

Roadway	Segment		Lanes	Average Daily Design Target (Vehicles)	Existing Conditions			Cumulative Conditions		
	From	To			Existing	Existing Plus Phase 1	Design Target Exceeded?	Cumulative	Cumulative Plus Buildout	Design Target Exceeded?
Elk Grove Boulevard	I-5	W. Taron Drive / Harbour Point Drive	6	54,000	26,400	28,500	No	35,400	38,700	No
	W. Taron Drive / Harbour Point Drive	Franklin Boulevard	6	54,000	40,900	46,100	No	49,200	57,600	Yes
	Franklin Boulevard	Bruceville Road	6	54,000	35,200	38,100	No	42,400	46,800	No
Harbour Point Drive	Elk Grove Boulevard	Laguna Boulevard	4	37,200	13,300	13,500	No	17,900	18,200	No
W. Taron Drive	Riparian Drive	Elk Grove Boulevard	4	33,300	7,300	14,300	No	9,800	24,300	No
	Ruddy Duck Way	Riparian Drive	2	15,700	4,000	5,100	No	4,000	13,100	No
Riparian Drive	W. Taron Drive	Waterfowl Drive	2	15,700	1,700	2,100	No	2,300	3,100	No
Franklin Boulevard	Elk Grove Boulevard	Laguna Boulevard	6	54,000	20,900	22,000	No	31,900	33,700	No
	Laguna Boulevard	Whitelock Parkway	4	37,200	22,100	23,300	No	34,200	36,300	No

Bold text indicates volume greater than design target

Source: Fehr & Peers, 2020

3. Site Access and On-Site Circulation

This section summarizes the evaluation of site access and on-site circulation, including recommendations to proposed parking structures, evaluation of the proposed emergency vehicle access from westbound Elk Grove Boulevard, and truck circulation.

Site Access and On-site Circulation Recommendations

Based on the operations analysis discussed in Section 2, access modifications are needed to improve vehicle circulation, on-site circulation, to minimize southbound U-turn movements and vehicle delay at the W Taron Drive/Riparian Drive intersection. **Table 8** summarizes site access and on-site circulation recommendations, which are shown on **Figure 9**

Table 8: Site Access and On-site Circulation Recommendations

ID	Location	Recommendation
1	Parking Structure 1	Relocate Riparian Drive access to location of proposed EVA. Allow inbound/outbound movements. This will allow left-turn movements from Riparian Drive.
2		Begin EVA access south of relocated access (ID #1).
3		Eliminate proposed access and relocate to the west.
4		Provide third access to Parking Structure 1 to accommodate inbound/outbound movements, located at the existing driveway cut on W Taron Drive that serves the ALLDATA building.
5	W Taron Drive	Restripe W Taron Drive from Ruddy Duck Way to Riparian Drive to include a center two-way left-turn lane. Cross-section would include Class II Bike Lanes, two travel lanes, and a center two-way left-turn lane.
6	Parking Structure 2	Restrict access to proposed access (north side of structure) to inbound movements only.
7		Provide second access to parking structure to accommodate inbound/outbound movements.
8		Provide cross access to prevent vehicles from exiting Parking Structure #2 from becoming trapped in parking aisle.
9	W Taron Drive/Riparian Drive Intersection	Install traffic signal and provide two left-turn lanes and a shared through/right-turn lanes on the eastbound approach.

Source: Fehr & Peers, 2020

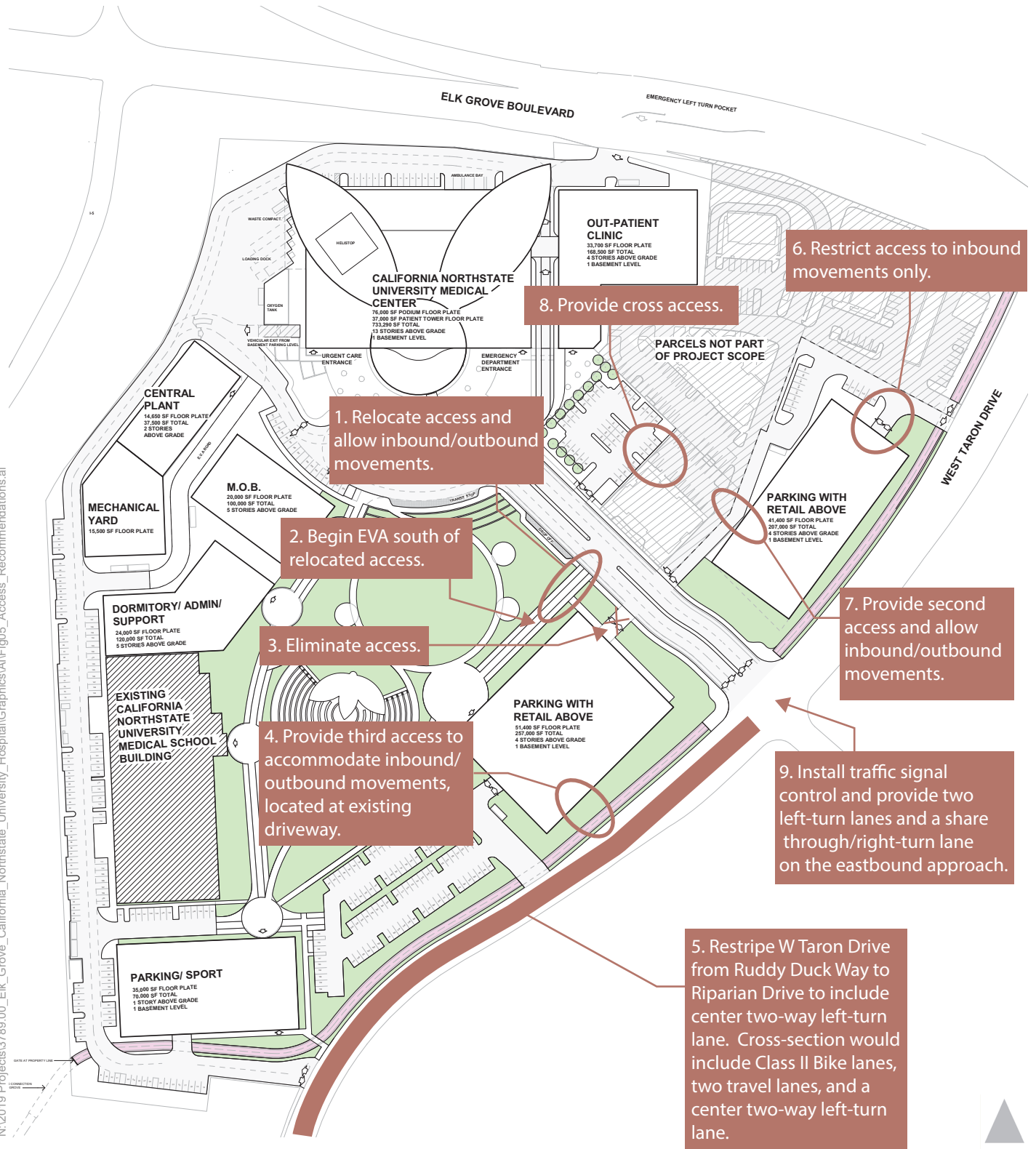
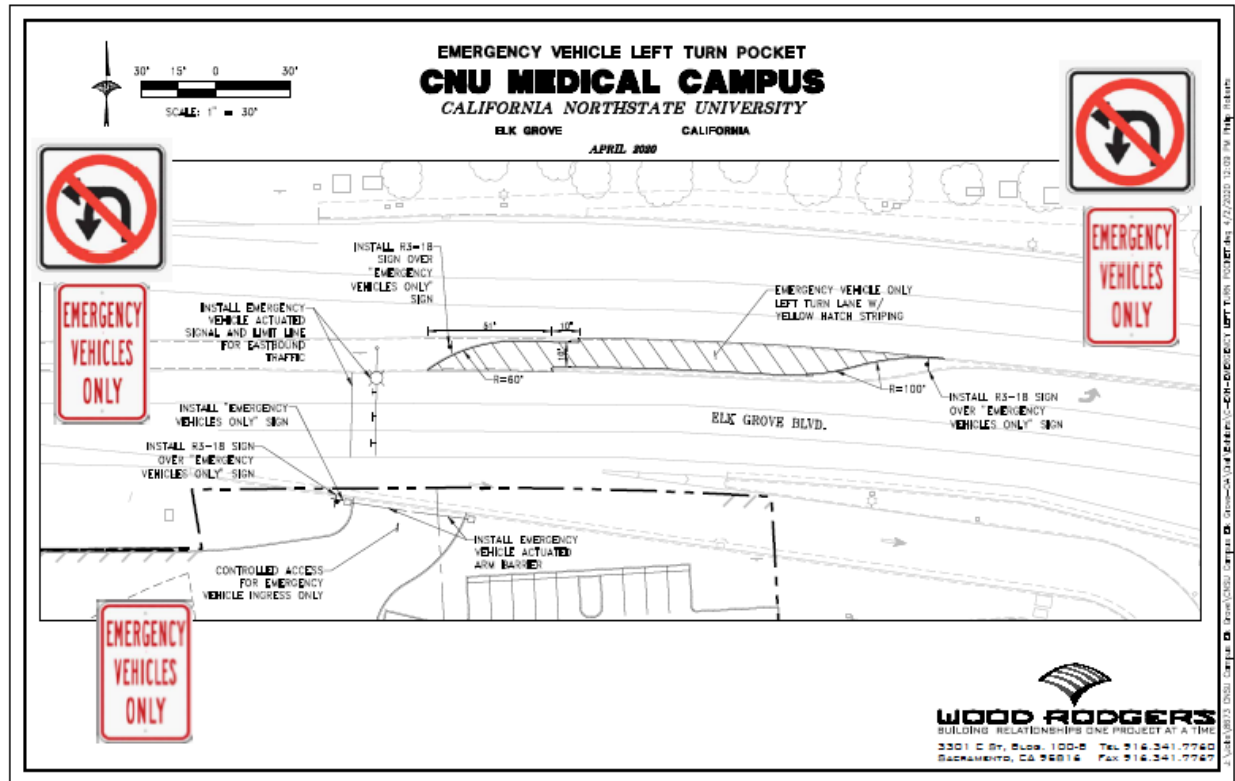


Figure 9
Access Recommendations

Emergency Left-turn Access (Westbound Elk Grove Boulevard)

The proposed Project includes the provision for an emergency vehicle access from westbound Elk Grove Boulevard that will provide a more direct access into the Emergency Department. The proposed emergency vehicle access is shown on the image below.



As shown, the emergency vehicle access includes signing and pavement striping to clearly identify the turn pocket for use by emergency vehicles. At the entrance into the Project site, the access includes an actuated arm barrier that will be remotely operated by entering emergency vehicles.

The left-turn pocket would provide approximately 120 feet of storage. Based on forecasted demand on eastbound Elk Grove Boulevard, the proposed turn pocket has sufficient storage to accommodate three emergency vehicles at one time, without consideration of the features incorporated into the design to minimize delay for emergency vehicles.

As proposed, the access will operate without significant impact to EB Elk Grove Boulevard. Delay experienced by EB Elk Grove Boulevard vehicles will be brief since emergency vehicles would only be crossing two opposing travel lanes and will only occur when an emergency vehicle needs to access the emergency department. So, there would be adequate gaps in traffic to accommodate left-turn movements.

The analysis of queuing in the left-turn pocket did not adjust for vehicle code regulations that require drivers to yield to emergency vehicles, so the analysis is conservative (i.e., on the high side).

Truck and Emergency Vehicle Circulation

As proposed, the truck bays for deliveries are located on the west side of the proposed hospital. To access the loading bays, trucks would circulation the Project site entering/exiting by way of the southern driveway. The application includes swept path analysis using a California Legal design vehicle and emergency vehicle turning radius (preferred by Cosumnes CSD). **Attachment C** includes the detailed swept path analysis and the emergency vehicle turn radius layouts. As proposed, the Project site will adequately accommodate truck and emergency vehicle circulation.

4. Construction Traffic

This section summarizes proposed phased Project construction, the expected construction peak-day truck and worker commute trips and evaluates the potential for construction traffic to effect operations of roadways adjacent to the Project site.

As proposed, construction of the entire Project (i.e., all phases) is assumed to be completed in 10 years. During peak construction periods, construction would occur 5 days per week (Monday through Friday), 8 hours per shift, and 1 shift per day. The sixth and seventh days of the week (Saturday and Sunday) would be used if and as necessary to maintain the Project construction schedule, as would addition of selected second-shift activities. Some construction activities, like concrete work, will have to occur through the night.

Construction staging will occur on unused parking lots adjacent to existing buildings and would be located to not impact on-site circulation for employees and patrons of existing land uses.

Table 9 summarizes peak-day construction traffic anticipated by development phase. As shown, Phase 1 will result in the largest number of trips with 575 trips.

Table 9: Peak-Day Truck and Worker Trips by Development Phase

Phase	Construction Duration (Months)	Peak-Day Trips (Trips/Day)		
		Trucks	Worker	Total
1	31	125	450	575
2	56	80	100	180
3	36	30	60	90

Source: Fehr & Peers, 2020

Table 10 summarizes the analysis of roadway design targets with phased construction. Currently, the distribution of construction traffic is unknown. Therefore, the total peak-day trips from construction activities, summarized in **Table 9**, were added to each study roadway segment to determine if construction traffic added to existing conditions (i.e., for Phase 1), Phase 1 conditions (i.e., for Phase 2), and cumulative conditions (i.e., for Phase 3) would cause forecast volumes to exceed the City of Elk Grove roadway design targets. A passenger car equivalent of 2.0 was applied to trucks. As shown, traffic volume forecasts would be below identified design target for all phases of construction.

Table 10: Roadway Design Target with Phased Construction

Roadway	Segment		Lanes	Average Daily Design Target (Vehicles)	Phase 1					Phase 2					Phase 3				
					Existing	Trucks ¹	Workers	Existing Plus Phase 1	Design Target Exceeded?	Phase 1	Trucks ¹	Workers	Existing Plus Phase 2	Design Target Exceeded?	Cumulative	Trucks ¹	Workers	Cumulative Plus Phase 3	Design Target Exceeded?
	From	To																	
Elk Grove Boulevard	I-5	W. Taron Drive / Harbour Point Drive	6	54,000	26,400	250	575	27,225	No	28,200	160	180	28,540	No	35,400	60	90	35,550	No
	W. Taron Drive / Harbour Point Drive	Franklin Boulevard	6	54,000	40,900	250	575	41,725	No	46,100	160	180	46,440	No	49,200	60	90	49,350	No
	Franklin Boulevard	Bruceville Road	6	54,000	35,200	250	575	36,025	No	38,100	160	180	38,440	No	42,400	60	90	42,550	No
Harbour Point Drive	Elk Grove Boulevard	Laguna Boulevard	4	37,200	13,300	250	575	14,125	No	13,500	160	180	13,840	No	17,900	60	90	18,050	No
W. Taron Drive	Riparian Drive	Elk Grove Boulevard	4	33,300	7,300	250	575	8,125	No	14,300	160	180	14,640	No	9,800	60	90	9,950	No
	Ruddy Duck Way	Riparian Drive	2	15,700	4,000	250	575	4,825	No	4,100	160	180	4,440	No	4,000	60	90	4,150	No
Riparian Drive	W. Taron Drive	Waterfowl Drive	2	15,700	1,700	250	575	2,525	No	2,300	160	180	2,640	No	2,300	60	90	2,450	No
Franklin Boulevard	Elk Grove Boulevard	Laguna Boulevard	6	54,000	20,900	250	575	21,725	No	22,000	160	180	22,340	No	31,900	60	90	32,050	No
	Laguna Boulevard	Whitelock Parkway	4	37,200	22,100	250	575	22,925	No	23,300	160	180	23,640	No	34,200	60	90	34,350	No

1PCE - 2.0 for Trucks
Source: Fehr & Peers, 2020

5. Parking

This section evaluates required parking levels for the proposed Project by development phase. The following summarizes proposed parking, calculates required parking, and identifies if additional parking is needed beyond proposed parking levels.

Proposed Parking

As proposed, the Project would provide the following parking spaces by phase:

- **Phase 1** – A total of 1,427 spaces consisting of 1,118 surface spaces, 230 parking spaces on the lower level of the hospital, and 79 spaces (stacked) on the base level of the central plan building.
- **Phase 2** – A total of 2,699 parking spaces consisting of 590 surface parking spaces, 309 parking spaces on the lower levels of the hospital and central plant building, 100 spaces in the outpatient clinic, and 1,700 parking spaces in the parking structure.
- **Phase 3 (Buildout)** – A total of 3,404 parking spaces consisting of 363 surface parking spaces, 41 parking spaces on the lower level of the central plant (hospital and central plant basements would be used for support services in Phase 3 would have reduced parking), 100 spaces in the outpatient clinic, 2,700 parking spaces in the parking structures, and 200 parking spaces in the student parking structure.

Required Parking

Table 11 compare the parking required by phase, based on the City of Elk Grove Municipal Code (Chapter 23.58 - Parking to proposed parking levels. As shown in **Table 11**, the proposed Project will provide more parking than required at each development phase.

Table 11: Required Parking

Land Use	Parking Rate	Quantity by Phase			Required Parking by Phase		
		1	2	Buildout	1	2	Buildout
Hospital	2.0 Spaces/Bed	218	400	400	436	800	800
Ambulatory Care	4.0 Spaces/1,000 SF ¹	-	134,800		-	540	540
Administration/ Medical Office		-	100,000		-	400	400
Administration		-	-	24,000	-	-	96
Alldata Building	4.5 Spaces/1,000 SF	76,000	-	-	342	-	-
College Students	1.0 Space/2 Students	670	700	430	335	350	215
College Employees	1 Space/Employee	130	200	230	130	200	230
Student Housing	1 Space/Unit	-	-	150	-	-	150
Retail	4.5 Spaces/1,000 SF	-	51,400	92,800	-	232	418
Existing Retail		21,747	14,546	-	98	66	-
Total Required Spaces					1,341	2,588	2,849
Proposed Parking					1,427	2,699	3,404
Difference					86	111	555

Source: City of Elk Grove Municipal Code Chapter 23.58 (Parking)

¹SF – Square Feet

Source: Fehr & Peers, 2020

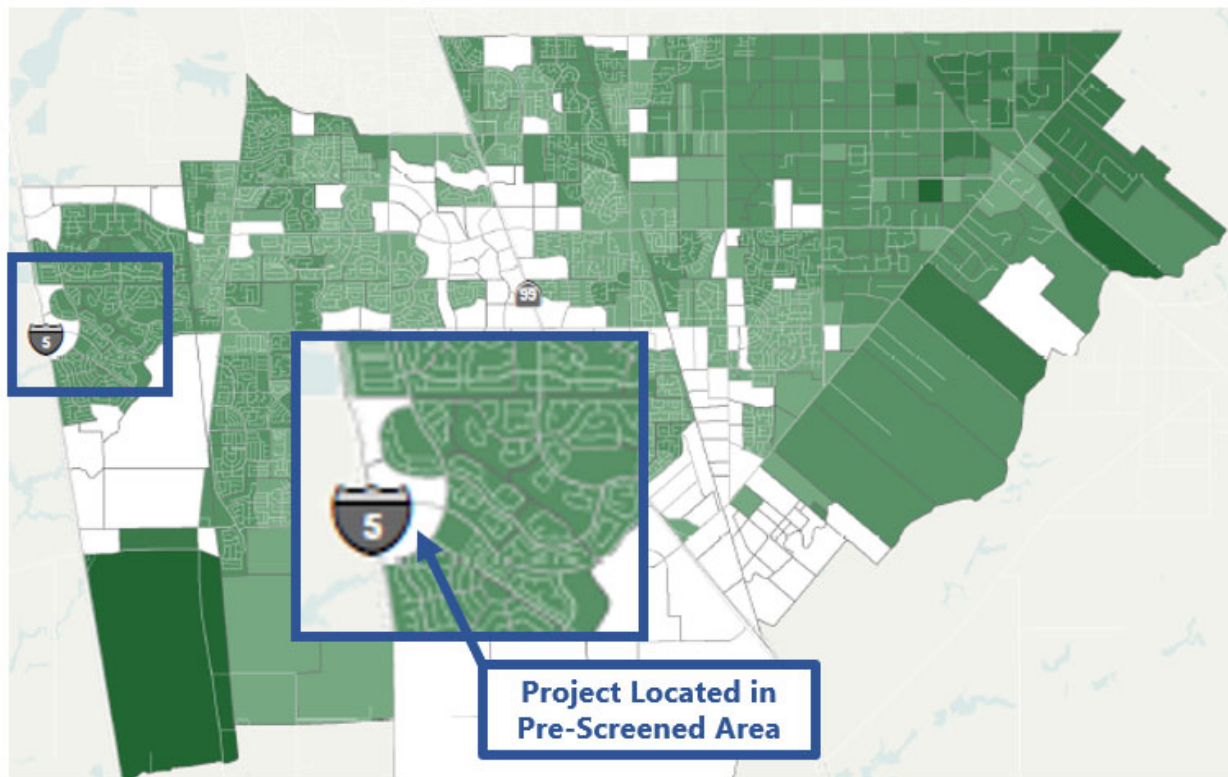
6. Vehicle Miles of Travel

This section presents analysis of Project vehicle miles traveled (VMT) under cumulative conditions, relative to the threshold of significance presented in Section 1. The VMT analysis includes all of the roadway improvements included as part of the General Plan VMT analysis.

6.1 VMT Screening

The VMT Screening Map identifies areas in the City that are exempt from VMT analysis. These include sites that have been pre-screened through Citywide VMT analysis. Pre-screened areas are shown in white and have been determined to result in 15 percent or below the average service population VMT established for the land use designations for the study area if built to the specifications of the Land Use Plan.

The Project area is identified on the VMT Screening Map shown below. As shown, the Project is located in a pre-screened area. However, the Project requires a general plan amendment to change some land use designations (i.e., representing most of the Project area) from Community Commercial and Light Industrial to Employment Center, so the Project is not eligible for pre-screening.



6.2 VMT Limits by Land Use Designation

As outlined above, the Project must demonstrate that the VMT produced by the Project at buildout is equal to or less than the VMT limit of the underlying land use designation. The Project will have a General Plan land use designation of Employment Center after the required general plan amendment outlined above.

Table 12 compares the Project's VMT per service population (i.e., employees, students, patients, and visitors) to the City's VMT limit for that land use (which incorporates a 15% reduction in total VMT from the 2015 baseline). As shown in **Table 12**, the Project as analyzed will not exceed the City's VMT limits for the Employment Center land use designation. Technical calculations are included in **Attachment D**.

Table 12: VMT by Land Use Designation Limits – Project Buildout Conditions

Project	Land Use Designation	VMT Per Service Population		Limit Exceeded?
		Limit	Project ¹	
Buildout	Employment Center	47.1	13.67	No
Buildout With 15% TDM Reduction			11.62	No

Source: Fehr & Peers, 2020.

6.3 Citywide VMT Limits

As outlined above, land use development projects located within the existing (2017) City limits shall demonstrate that cumulative VMT within the City, including the Project, would be equal to or less than the City's established total VMT limit. This VMT limit incorporates a 15% reduction in total VMT from the 2015 baseline. **Table 13** compares the citywide total VMT limit to the City's total VMT limit with buildout of the proposed Project. As shown in **Table 13**, the addition of the Project would not cause cumulative VMT to exceed the established citywide limit.

Table 13: Citywide VMT Limit – Project Buildout Conditions

Development Projects in Existing City	Total VMT		Limit Exceeded?
	Limit	Project	
Citywide	6,367,833	6,342,176	No

Source: Fehr & Peers, 2020.

7. Bicycle/Pedestrian/Transit Facilities and Services

This section discusses the conditions of bicycle and pedestrian facilities and transit service with the addition of the proposed Project.

7.1 Bicycle Facilities

Bicycle LTS refers to the comfort associated with roadways, or the mental ease people experience riding on them. Metrics for bicycling LTS were developed at the Mineta Transportation Institute (MTI) and published in the report “Low-Stress Bicycling and Network Connectivity.”¹ The criteria establish a “weakest link” approach, as roadways are classified based on their segments with the highest level of traffic stress, assuming that only those that are comfortable riding under the higher stress would travel on that road. Factors influencing LTS include:

- Number of travel lanes
- Speed of traffic
- Number of vehicles
- Presence of bike lanes
- Width of bike lanes
- Presence of physical barrier

Bicycle riders vary in experience, skill, ability, and confidence. As such, they rely on the bikeway system to cater to their specific needs and abilities. Some cyclists are more comfortable riding in traffic and value bikeways and routes that are direct and limit unnecessary delay. They more comfortably utilize facilities that share the roadway with automobiles or have limited bicycle infrastructure. People with limited bicycling confidence and lower or developing skill levels such as children and older adult riders may desire more separation from traffic to feel comfortable enough to ride. Different bicycle types also require more space in bicycle facilities, such as trailers for children or cargo or adult tricycles. For these reasons, facilities should be designed to accommodate the lowest skill levels, especially in heavily traveled areas.

Recent research has correlated these different bicycle riders with the level of “traffic stress” they are willing to experience while cycling. Bicycle LTS criteria span from 1 to 4, with 1 being the least stressful and 4 being the most stressful:

¹ Mekuria, Maaza C., Peter G. Furth, and Hilary Nixon, (2012). *Low-Stress Bicycling and Network Connectivity*. San Jose, California: Mineta Transportation Institute.

- **LTS 1:** Most children and elderly riders can tolerate this level of stress and feel safe and comfortable. LTS 1 roadways typically require more separation from traffic.
- **LTS 2:** This is the highest level of stress that the mainstream adult population will tolerate while still feeling safe.
- **LTS 3:** Bicyclists who are considered “enthused and confident” but still prefer having their own dedicated space for riding will tolerate this level of stress and feel safe while bicycling.
- **LTS 4:** For bicyclists, this is tolerated only by those characterized as “strong and fearless,” which comprises a small percentage of the population. These roadways have high speed limits, multiple travel lanes, limited or non-existent bike lanes and signage, and large distances to cross at intersections.

The Fehr & Peers Streetscore+ tool was used to analyze the level of traffic stress for bicyclists.

As discussed in Section 2, Class II bike lanes (on-street with signage and striping) are provided in both directions on W Taron Drive, Riparian Drive, Harbour Point Drive and Elk Grove Boulevard. **Table 14** summarize bicycle LTS with the addition of the proposed Project on W Taron Drive, which will be modified with the addition of the proposed Project. As shown in **Table 14**, the addition of the proposed Project will not degrade the Bicycle Streetscore LTS. The proposed Project includes the phased implementation of an off-street multi-use path that will be buffered from W Taron Drive with landscaping. This will improve the bicycle environment and will provide an off-street alternative for some users. However, this modification will not lower the LTS, due to the travel speed on W Taron Drive.

Table 14: Bicycle Streetscore LTS

Roadway Segment/Intersection		LTS	
		Current Conditions	With Project ¹
W Taron Drive	Elk Grove Boulevard to Riparian Drive	3	3
	Riparian Drive to Ruddy Duck Way	3	3
W Taron Drive/Riparian Drive		1	1

¹The proposed Project includes the phased implementation of an off-street multi-use path that will be buffered from W Taron Drive with landscaping. This will improve the bicycle environment and will provide an off-street alternative for some users.

Source: Fehr & Peers, 2020

7.2 Pedestrian Facilities

The Pedestrian Streetscore+ Level of Traffic Stress (LTS) refers to the pedestrian comfort associated with a roadway or intersection.

The Pedestrian LTS methodology builds on Mekuria, Furth, and Nixon's 2012 *Low Stress Bicycling and Network Connectivity* report and LTS methodology with a corresponding index for pedestrian comfort. A tool to evaluate Pedestrian and Bicycle LTS called Streetscore+ was developed by Fehr & Peers and includes recommended parameters for the pedestrian environment provided by the NACTO Urban Streets Design Guide (USDG) and additional considerations of comfort informed by practitioner and best practice experience. Roadway segments and intersection approaches receive individual scores based on different considerations. The following factors are considered in developing the Pedestrian Streetscore+ for roadways and intersections:

<u>Roadways</u>	<u>Intersections</u>
Usable sidewalk space	Crossing distance
Driveways	Accessibility
Pedestrian-scale lighting	Channelized right-turns
Street trees and landscaping	Leading pedestrian intervals (LPIs) and pedestrian scrambles
Speed	
Sidewalk quality	
Number of travel lanes	
Heavy vehicle volumes	
Crosswalk frequency	

The Pedestrian Streetscore+ uses a scale that ranges from 1 to 4:

- **Streetscore+ 1:** Highly comfortable, pedestrian-friendly, and easily navigable for pedestrians of all ages and abilities, including seniors or school-aged children walking unaccompanied to school. These streets provide an ideal “pedestrian-friendly” environment.
- **Streetscore+ 2:** Generally comfortable for many pedestrians, but parents may not feel comfortable with children walking alone. Seniors may have concerns about the walking environment and take more caution. These streets may be part of a “pedestrian-friendly” environment where it intersects with a more auto-oriented roadway or other environmental constraints.
- **Streetscore+ 3:** Walking is uncomfortable but possible. Minimum sidewalk and crossing facilities may be present, but barriers are also present that make the walking experience uninviting and uncomfortable.

- **Streetscore+ 4:** Walking is a barrier and is very uncomfortable or even impossible. Streets have limited or no accommodation for pedestrians and are inhospitable and possibly unsafe environment for pedestrians.

As discussed in Section 3, pedestrian facilities are provided on all roadway frontages. Except for Elk Grove Boulevard, all sidewalks are adjacent to the roadway. On Elk Grove Boulevard (east of W Taron Drive/Harbour Point Drive) sidewalks are buffered from the roadway by landscaping. **Table 15** summarize pedestrian LTS with the addition of the proposed Project on W Taron Drive, which will be modified with the addition of the proposed Project. As shown in **Table 15**, the addition of the proposed Project will not degrade the Pedestrian Streetscore LTS. The proposed Project includes the phased implementation of an off-street multi-use path that will be buffered from W Taron Drive with landscaping. This will improve the pedestrian environment compared to the current sidewalk that lacks a landscape buffer. However, this modification will not lower the LTS, due to the travel speed on W Taron Drive.

Table 15: Pedestrian Streetscore LTS

Roadway Segment/Intersection		LTS	
		Current Conditions	With Project ¹
W Taron Drive	Elk Grove Boulevard to Riparian Drive	3	3
	Riparian Drive to Ruddy Duck Way	3	3
W Taron Drive/Riparian Drive		2	2

¹The proposed Project includes the phased implementation of an off-street multi-use path that will be buffered from W Taron Drive with landscaping. This will improve the pedestrian environment compared to the current sidewalk that lacks a landscape buffer.

Source: Fehr & Peers, 2020

7.3 Transit Service

As discussed in Section 3 Transit service within the study area is provided by e-Tran, which operates seven local routes within Elk Grove and ten commuter routes with service to Downtown Sacramento and Rancho Cordova. Routes that travel near the Project are described briefly below:

- **Route 111** is a local route that provides service between the area near Cosumnes Oaks High School and Laguna Town Hall. This route runs Monday through Friday from approximately 6:00 AM to 8:00 PM. Generally, the route runs about every hour with 30-minute headways during the AM peak hour. Near the Project, Route 111 travels on Elk Grove Boulevard and Harbour Point Drive with a stop on Harbour Point Drive north of Elk Grove Boulevard.

- **Route 11** is a commuter route that travels from the area near Franklin High to Downtown Sacramento. With the study area, the route travels on Elk Grove Boulevard. This route provides four inbound buses in the morning and four outbound buses in the evening, Monday through Friday.

The nearest bus stops to the Project are located on Elk Grove Boulevard (east of Harbour Point Drive) and on Harbour Point Drive (north of Elk Grove Boulevard). The stops on eastbound Elk Grove Boulevard and northbound Harbour Point Drive have shelters.

The Project's TDM Plan may include measures that are intended to incentivize the use of alternatives to the private automobile, including subsidized transit passes, a shuttle bus service, a carpooling program and associated guaranteed ride home program. While subsidized transit passes will increase transit ridership, the shuttle bus service increase seat capacity (although privately operated).

The Federal Transit Administration maintains a database of transit system performance. The City of Elk Grove 2018 Annual Agency Profile² identifies that local bus service had unlinked trips per vehicle revenue hour of 10.1, or about 10 passengers per hour. Generally, this level of performance is indicative of low demand and productivity. Routes performing at this level would have excess seated and standing capacity. Consequently, the proposed Project would not create demand for public transit services above the crush load capacity of the transit system.

While the demand for public transit services will not result in an increase in ridership above the crush load capacity of the transit system, the Project will increase transit ridership and demand for transit stops near the project. Consequently, the Project should coordinate with the City of Elk Grove e-tran to fund and implement necessary improvements to transit stops amenities (i.e., shelters) near the project to ensure that they are adequate to accommodate new transit riders generated by the Project.

² https://cms7.fta.dot.gov/sites/fta.dot.gov/files/transit_agency_profile_doc/2018/90205.pdf

Attachment A
TDM

1. MARKETING AND PROMOTION

This measure category focuses on ensuring that employees are informed of the TDM Plan being implemented and understand all the available transportation amenities, services, and/or incentives.

TDM MEASURE	MEASURE REQUIREMENTS	COMPLIANCE REQUIREMENTS	MEASURE POINTS
Transportation Marketing Services	The building owner, in coordination with the building tenants, shall administer a comprehensive marketing and communication campaign which provides all tenants and employees at the project site with information about available transportation amenities, services, and/or incentives. Marketing services shall be provided by a TDM coordinator or a communications professional. Marketing services shall include, at a minimum, the following activities: 1. Promotions. The TDM coordinator or communications professional shall develop and deploy promotions to encourage the use of sustainable transportation modes. Marketing materials may include targeted messaging, communications campaigns, incentives (e.g., subsidized transit passes, employee parking cash out options), contests, and other creative strategies for existing and new employees. 2. Welcome Packets. New employees at the project site shall be provided with marketing information about the available transportation amenities, services, and/or incentives. For employees, the packet shall reflect options for major commute origins and offer one-on-one consultations.	The applicant or property owner shall provide the contact information for the provider of TDM marketing services, a description of qualifications, and a sample TDM Plan. City staff shall contact the designated provider and/or review the plan to verify that the applicant or property owner is prepared to offer marketing services in the time frame specified for project approval.	Required Measure

2. BIKE FACILITIES

This measure category encourages employees to use active modes of transportation to commute to and from work by providing convenient on-site amenities tailored to bike commuters.

TDM MEASURE	MEASURE REQUIREMENTS	COMPLIANCE REQUIREMENTS	MEASURE POINTS
Short-Term Bicycle Parking	For new office buildings, provide secure bicycle parking for five percent of the vehicular parking spaces being added, with a minimum of one space. Acceptable parking facilities shall be conveniently located near the building entrance and meet the requirements in 23.58.090 (D)(1) of the Elk Grove Municipal Code.	The applicant or property owner shall submit plans during the development review stage that identify the location and number of short-term bicycle parking spaces.	1
Long-Term Bicycle Parking	For new office buildings, provide secure bicycle parking for five percent of the vehicular parking spaces being added, with a minimum of one space. Acceptable parking facilities shall be conveniently located near the building entrance and shall meet one of the following: 1. Covered, lockable enclosures with permanently anchored racks for bicycles; 2. Lockable bicycle rooms with permanently anchored racks; or 3. Lockable, permanently anchored bicycle lockers.	The applicant or property owner shall submit plans during the development review stage that identify the location and number of long-term bicycle parking spaces.	2
Improved Access to Bike Network	The project shall design features which improve pedestrian and bicycle connectivity consistent with the City's Bicycle, Pedestrian, and Trails Master Plan and related planning efforts. The applicant shall provide pathways that are a minimum of 10 feet in width that allow pedestrians and cyclists to connect from adjacent roadways, bike lanes and sidewalks to the main entrance of a building(s). Applicants shall demonstrate, as part of the site design plans, that the proposed project includes pedestrian and bicycle infrastructure and connections to existing facilities.	The applicant or property owner shall submit plans during the development review stage that identify improved access to the City's bike network in the site designs.	1
Showers and Locker Rooms	For new office buildings, projects shall provide at least one shower and six clothes lockers for every 30 Bicycle Parking spaces, but no fewer than one shower and six clothes lockers.	The applicant or property owner shall submit plans during the development review stage that identify the location and number of showers and clothes lockers. City staff shall review the proposed plan to ensure that the included showers and clothes lockers meet the measure requirements.	3

3. ON-SITE AMENITIES

This measure category provides a set of on-site design features and amenities that assist employees in reducing single-occupancy vehicle trips during the workday.

TDM MEASURE	MEASURE REQUIREMENTS	COMPLIANCE REQUIREMENTS	MEASURE POINTS
On-Site Cafe	For new office buildings, projects shall provide an on-site café with full coffee and lunch menu services to help reduce coffee break and lunchtime vehicle trips.	The applicant or property owner shall submit information about the potential providers for the on-site cafe and a description of the services that would be offered at the project site. Information shall be submitted during the development review stage.	3

4. TRANSIT MEASURES

This measure category incentivizes employees that use transit as their primary commute mode. Transit measures shall only be included in the TDM Plan if the project site is located within 1/2 miles from a transit stop.

TDM MEASURE	MEASURE REQUIREMENTS		MEASURE POINTS
Subsidized Transit Passes	Provide free or subsidized monthly transit passes for on-site employees. Transit pass subsidies shall provide a minimum of \$50 of monthly transit costs per employee. Publicize the availability of free or subsidized transit passes to employees through the new employee welcome package.	The applicant or property owner shall provide information on the method in which employees would be reimbursed or compensated for monthly transit costs and how this process would be managed for building tenants. This information will be verified by City staff before certificate of occupancy issuance.	3

5. COMMUTER BENEFITS

This measure category provides a set of commuter services and incentives that encourage employees to commute using modes other than single-occupancy vehicles.

TDM MEASURE	MEASURE REQUIREMENTS		MEASURE POINTS
Vanpool Program	The property owner shall implement an employer or building manager-sponsored vanpool program. The vanpool program would provide service between the project site and general locations where vanpool users live. The property owner shall purchase or lease vans for employee use and pay for mileage and maintenance of the vehicles. See Sac Region 511 website for vanpool incentives.	The applicant or property owner shall provide information on the method in which employees would be reimbursed or compensated for monthly vanpool costs and how this process would be managed for building tenants. This information will be verified by City staff before certificate of occupancy issuance.	4
Carpooling Program	Promote and provide discounts for employees who use rideshare services such as Waze Carpool, UberPOOL, and LyftLine	The applicant or property owner shall provide information on the method in which employees would be reimbursed or compensated for discounts when using rideshare services and how this process would be managed for building tenants. This information will be verified by City staff before certificate of occupancy issuance.	3
Bikeshare Program	Promote and provide discounts for employees who use bike or scooter share services, such as Gotcha, JUMP, SPIN, Lime, or other such services. Provide docks or other designated parking/storage area for the service on-site.	The applicant or property owner shall provide information on the method in which employees would be reimbursed or compensated for discounts when using these services and how this process would be managed for building tenants. This information will be verified by City staff before certificate of occupancy issuance.	1

TDM MEASURE	MEASURE REQUIREMENTS		MEASURE POINTS
Shuttle Bus Service	The applicant shall provide a service plan describing the hours of operation, stop location(s), routes, and headways for the shuttle service. The applicant or property owner shall also submit plans that identify the location and dimensions of potential shuttle stops at the project site and the proposed destination(s) stops. The plans shall identify any other relevant information that may be helpful in understanding potential conflicts at the proposed shuttle stop locations (e.g., proximity to transit stops, crosswalks).	The applicant or property owner shall submit a detailed service plan for the shuttle bus service which must be finalized and approved by the City before certificate of occupancy issuance.	5
Guaranteed Ride Home	The applicant shall submit a service plan describing the services provided by a Guaranteed Ride Home program. See Sacramento TMA for opportunity to participate in an existing program. Participants must pre-register in the program at no additional cost to the employee or employer and are eligible to use the Guaranteed Ride Home program as long as they have used a qualified commute alternative on the day they need assistance. 1. Qualified commute alternatives include carpool, vanpool, shuttles, transit, bicycling, and walking, and commute apps that are specifically for carpooling (such as Scoop and Waze Carpool). 2. Non-qualified commute alternatives include driving alone, motorcycles, and Transportation Network Companies/ride-hailing apps (such as Uber or Lyft) 3. Emergency-related side trips – such as picking up a sick child from school or getting a prescription filled at a pharmacy – are permitted. 4. Participants can be reimbursed a maximum of six times per calendar year (January-December).	The applicant or property owner shall submit a detailed service plan for the Guaranteed Ride Home program which must be finalized and approved by the City before certificate of occupancy issuance.	4

6. PARKING FACILITIES

This measure category focuses on discouraging trips made by private vehicles (particularly single occupancy vehicles) by controlling the supply of accessory parking spaces. Parking Facility measures shall only be included in the TDM Plan if the project site is located within 1/2 miles from a transit stop.

TDM MEASURE	MEASURE REQUIREMENTS		MEASURE POINTS
Parking Cash Out Program	Any tenant employer that subsidizes parking for its employees shall provide all employees with a choice of forgoing any subsidized/free parking for a cash payment equivalent to the cost of the parking space to the employer. Employers shall promote the program to all employees eligible to receive parking at a subsidized level.	The applicant, property owner, or TDM coordinator shall provide City staff with a signed letter agreeing to distribute the TDM Plan, including provisions for the Parking Cash Out Program, via new employee packets, tenant lease documents, and/or deeds. This information shall be submitted during the development review stage.	3
Unbundled Parking Requirement	50 percent of project parking spaces shall be leased or sold separately as part of the tenant or lease agreement rental so that tenants have the option of renting or buying a parking space at an additional cost, and would, thus, experience cost savings if they opt not to rent or purchase parking.	The applicant, property owner, or TDM coordinator shall submit a signed letter agreeing to distribute the TDM Plan, including provisions for the unbundled parking requirements as part of tenant lease documents, and/or deeds. This information shall be submitted during the development review stage.	3

TDM Reduction Summary Report: CNU Elk Grove Hospital

Overall VMT Reduction: 4% to 31%

VMT % Reduction by Land Use

Parking



Parking1A: Increased Off-Street Fees
Parking1B: Increased On-Street Fees
Parking1D: Unbundled Parking
Parking1E: Pay-as-you-Go Parking Rates
Parking 2: Parking Supply

Transit



Transit 1: Subsidies	up to 2%	-	-	-
Transit 2A: Transit Frequency				
Transit 2B: Transit Coverage				
Transit 3A: Private Point-to-Point Shuttles	1% to 9%	up to 9%	up to 9%	up to 9%
Transit 3B: Last Mile Shuttle	up to 5%	up to 5%	up to 5%	up to 5%

Commute Programs



Commute 1A: Commuter Incentives				
Commute 2: Commute Marketing Program	3% to 13%	3% to 13%	3% to 13%	3% to 13%
Commute 3: ERH	up to 1%	-	-	-
Commute 4: TNC Partnerships	up to 1%	-	-	-

Bike and Walk



BikeWalk1: Secure Parking	up to 1%	up to 1%	up to 1%	up to 1%
BikeWalk2: Showers & Lockers	up to 1%	up to 1%	up to 1%	up to 1%
BikeWalk3: End of Trip Repair Stations	up to 1%	up to 1%	up to 1%	up to 1%
BikeWalk 4: Pedestrian-Oriented Design	up to 2%	up to 2%	up to 2%	up to 2%
BikeWalk 5: Bikeshare System & Subsidies				

Rideshare



Rideshare 1: Carpool/Vanpool Incentives				
Rideshare 2: Ridematch Program	up to 6%	up to 6%	up to 6%	up to 6%
Rideshare 3: Carshare	up to 1%	up to 1%	up to 1%	up to 1%
Rideshare 4: Carshare Subsidy				

Total



Total of all Measures	6% to 35%	3% to 29%	3% to 29%	3% to 31%
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Attachment B
Traffic Counts
Intersection Operations

National Data & Surveying Services

Intersection Turning Movement Count

Location: I-5 NB Off Ramp & Elk Grove Blvd

City: Elk Grove

Control: 1-Way Stop(NB)

Project ID: 19-07272-001

Date: 8/20/2019

Total

NS/EW Streets:	I-5 NB Off Ramp				I-5 NB Off Ramp				Elk Grove Blvd				Elk Grove Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	0.3	1.3	0	0	0	0	0	1	2	0	0	0	1	3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	0	36	0	0	0	0	0	0	101	0	0	0	75	308	0	520
7:15 AM	0	0	30	0	0	0	0	0	0	129	0	0	0	60	307	0	526
7:30 AM	0	0	30	0	0	0	0	0	1	125	0	0	0	66	242	0	464
7:45 AM	2	0	29	0	0	0	0	0	1	124	0	0	0	52	276	0	484
8:00 AM	0	0	37	0	0	0	0	0	0	93	0	0	0	49	238	0	417
8:15 AM	0	0	26	0	0	0	0	0	1	104	0	0	0	47	262	0	440
8:30 AM	0	1	22	0	0	0	0	0	1	95	0	0	0	34	241	0	394
8:45 AM	1	1	36	0	0	0	0	0	1	133	0	0	0	34	185	0	391
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	3	2	246	0	0	0	0	0	5	904	0	0	0	417	2059	0	3636
PEAK HR :	1.20%	0.80%	98.01%	0.00%					0.55%	99.45%	0.00%	0.00%	0.00%	16.84%	83.16%	0.00%	
PEAK HR VOL :	07:00 AM - 08:00 AM				0	0	0	0	2	479	0	0	0	253	1133	0	TOTAL
PEAK HR FACTOR :	0.250	0.000	0.868	0.000	0.000	0.000	0.000	0.000	0.500	0.928	0.000	0.000	0.000	0.843	0.920	0.000	1994
	0.882								0.932				0.905				0.948

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	0.3	1.3	0	0	0	0	0	1	2	0	0	0	1	3	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	1	0	60	0	0	0	0	0	1	222	0	0	0	28	192	0	504
4:15 PM	0	0	41	0	0	0	0	0	2	259	0	0	0	28	174	0	504
4:30 PM	0	0	41	0	0	0	0	0	0	247	0	0	0	36	156	0	480
4:45 PM	0	0	51	0	0	0	0	0	0	228	0	0	0	25	172	0	476
5:00 PM	0	0	62	0	0	0	0	0	1	230	0	0	0	42	172	0	507
5:15 PM	0	0	53	0	0	0	0	0	1	252	0	0	0	35	178	0	519
5:30 PM	0	0	50	0	0	0	0	0	0	306	0	0	0	27	179	1	563
5:45 PM	0	0	51	0	0	0	0	0	0	298	0	0	0	29	158	0	536
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	1	0	409	0	0	0	0	0	5	2042	0	0	0	250	1381	1	4089
PEAK HR :	0.24%	0.00%	99.76%	0.00%					0.24%	99.76%	0.00%	0.00%	0.00%	15.32%	84.62%	0.06%	
PEAK HR VOL :	05:00 PM - 06:00 PM				0	0	0	0	2	1086	0	0	0	133	687	1	TOTAL
PEAK HR FACTOR :	0.000	0.000	0.871	0.000	0.000	0.000	0.000	0.000	0.500	0.887	0.000	0.000	0.000	0.792	0.959	0.250	2125
	0.871								0.889				0.959				0.944

National Data & Surveying Services

Intersection Turning Movement Count

Location: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

City: Elk Grove

Control: Signalized

Project ID: 19-07272-002

Date: 8/20/2019

Total

NS/EW Streets:	W Taron Dr/Harbour Point Dr				W Taron Dr/Harbour Point Dr				Elk Grove Blvd				Elk Grove Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	2	1	1	0	2	1	1	0	2	3	1	0	2	3	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	82	15	8	0	34	7	62	10	13	92	17	5	12	252	33	4	646
7:15 AM	69	20	22	0	73	15	45	5	11	109	13	7	13	274	33	5	714
7:30 AM	53	17	17	0	74	14	52	4	15	90	33	6	21	236	38	7	677
7:45 AM	43	13	14	2	51	27	51	11	20	84	29	2	33	252	57	10	699
8:00 AM	62	32	12	1	43	24	42	7	15	70	26	6	43	218	81	8	690
8:15 AM	57	14	14	0	34	11	44	10	14	61	29	6	46	229	41	8	618
8:30 AM	42	15	11	0	45	31	39	7	17	59	36	4	60	230	35	4	635
8:45 AM	40	15	4	1	40	44	33	11	21	80	51	7	65	167	36	3	618
TOTAL VOLUMES :	NL 448	NT 141	NR 102	NU 4	SL 394	ST 173	SR 368	SU 65	EL 126	ET 645	ER 234	EU 43	WL 293	WT 1858	WR 354	WU 49	TOTAL 5297
APPROACH %'s :	64.46%	20.29%	14.68%	0.58%	39.40%	17.30%	36.80%	6.50%	12.02%	61.55%	22.33%	4.10%	11.47%	72.75%	13.86%	1.92%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	227	82	65	3	241	80	190	27	61	353	101	21	110	980	209	30	2780
PEAK HR FACTOR :	0.822	0.641	0.739	0.375	0.814	0.741	0.913	0.614	0.763	0.810	0.765	0.750	0.640	0.894	0.645	0.750	0.973
	0.849				0.934				0.931				0.944				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	2	1	1	0	2	1	1	0	2	3	1	0	2	3	1	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	59	37	63	1	74	28	35	5	19	207	36	8	23	142	38	11	786
4:15 PM	66	14	34	0	70	24	45	11	24	216	42	10	27	132	45	9	769
4:30 PM	47	12	25	0	94	29	34	6	20	227	27	6	19	146	47	10	749
4:45 PM	52	17	28	1	80	30	35	9	19	192	42	12	23	124	42	10	716
5:00 PM	59	16	31	0	88	30	42	13	29	210	33	14	19	138	41	7	770
5:15 PM	51	41	41	0	77	35	42	12	32	208	48	8	31	151	49	12	838
5:30 PM	45	32	44	1	80	31	30	14	24	267	26	18	33	129	46	8	828
5:45 PM	39	14	19	1	86	23	30	11	34	227	45	11	25	127	50	7	749
TOTAL VOLUMES :	NL 418	NT 183	NR 285	NU 4	SL 649	ST 230	SR 293	SU 81	EL 201	ET 1754	ER 299	EU 87	WL 200	WT 1089	WR 358	WU 74	TOTAL 6205
APPROACH %'s :	46.97%	20.56%	32.02%	0.45%	51.80%	18.36%	23.38%	6.46%	8.59%	74.93%	12.77%	3.72%	11.62%	63.28%	20.80%	4.30%	
PEAK HR :	05:00 PM - 06:00 PM																TOTAL
PEAK HR VOL :	194	103	135	2	331	119	144	50	119	912	152	51	108	545	186	34	3185
PEAK HR FACTOR :	0.822	0.628	0.767	0.500	0.940	0.850	0.857	0.893	0.875	0.854	0.792	0.708	0.818	0.902	0.930	0.708	0.950
	0.816				0.931				0.921				0.898				

National Data & Surveying Services

Intersection Turning Movement Count

Location: W Taron Dr & Riparian Dr

City: Elk Grove

Control: 4-Way Stop

Project ID: 19-07272-003

Date: 8/20/2019

Total

NS/EW Streets:	W Taron Dr				W Taron Dr				Riparian Dr				Riparian Dr				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	1 NL	2 NT	0 NR	0 NU	1 SL	2 ST	0 SR	0 SU	1 EL	1 ET	0 ER	0 EU	1 WL	1 WT	0 WR	0 WU	
7:00 AM	2	54	0	0	3	19	7	7	5	0	0	0	0	2	40	0	139
7:15 AM	1	64	0	0	5	25	3	8	5	1	1	0	0	0	35	0	148
7:30 AM	0	46	0	0	6	49	3	6	4	1	2	0	0	1	24	0	142
7:45 AM	2	37	0	1	6	67	6	6	11	0	1	0	8	2	23	0	170
8:00 AM	2	43	0	0	8	64	5	16	9	0	0	0	2	0	32	0	181
8:15 AM	0	34	0	0	7	60	4	10	8	1	1	0	2	2	20	0	149
8:30 AM	0	31	2	0	3	103	6	11	6	1	0	0	4	0	21	0	188
8:45 AM	0	30	0	0	5	139	6	2	3	0	1	0	4	1	23	0	214
TOTAL VOLUMES :	NL 7	NT 339	NR 2	NU 1	SL 43	ST 526	SR 40	SU 66	EL 51	ET 4	ER 6	EU 0	WL 20	WT 8	WR 218	WU 0	TOTAL 1331
APPROACH %'s :	2.01%	97.13%	0.57%	0.29%	6.37%	77.93%	5.93%	9.78%	83.61%	6.56%	9.84%	0.00%	8.13%	3.25%	88.62%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	2	138	2	0	23	366	21	39	26	2	2	0	12	3	96	0	732
PEAK HR FACTOR :	0.250	0.802	0.250	0.000	0.719	0.658	0.875	0.609	0.722	0.500	0.500	0.000	0.750	0.375	0.750	0.000	0.855
	0.789				0.738				0.750				0.816				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	1 NL	2 NT	0 NR	0 NU	1 SL	2 ST	0 SR	0 SU	1 EL	1 ET	0 ER	0 EU	1 WL	1 WT	0 WR	0 WU	
4:00 PM	4	96	4	0	22	45	6	15	36	0	1	0	0	1	10	0	240
4:15 PM	3	50	3	1	22	54	6	10	32	4	4	0	1	7	8	0	205
4:30 PM	1	26	1	2	19	42	5	10	31	1	7	0	0	1	16	0	162
4:45 PM	2	38	0	1	28	47	5	11	35	3	0	1	3	3	8	0	185
5:00 PM	3	43	2	0	28	35	2	15	28	3	5	0	0	1	11	0	176
5:15 PM	5	53	0	0	18	52	2	8	47	3	1	0	3	1	21	0	214
5:30 PM	1	65	4	0	25	43	5	11	36	4	3	0	0	3	11	0	211
5:45 PM	2	43	0	0	24	37	4	12	19	2	3	0	0	3	7	0	156
TOTAL VOLUMES :	NL 21	NT 414	NR 14	NU 4	SL 186	ST 355	SR 35	SU 92	EL 264	ET 20	ER 24	EU 1	WL 7	WT 20	WR 92	WU 0	TOTAL 1549
APPROACH %'s :	4.64%	91.39%	3.09%	0.88%	27.84%	53.14%	5.24%	13.77%	85.44%	6.47%	7.77%	0.32%	5.88%	16.81%	77.31%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	10	210	8	4	91	188	22	46	134	8	12	1	4	12	42	0	792
PEAK HR FACTOR :	0.625	0.547	0.500	0.500	0.813	0.870	0.917	0.767	0.931	0.500	0.429	0.250	0.333	0.429	0.656	0.000	0.825
	0.558				0.943				0.969				0.853				

National Data & Surveying Services

Intersection Turning Movement Count

Location: Franklin Blvd/J8 & Elk Grove Blvd

City: Elk Grove

Control: Signalized

Project ID: 19-07272-004

Date: 8/20/2019

Total

NS/EW Streets:	Franklin Blvd/J8				Franklin Blvd/J8				Elk Grove Blvd				Elk Grove Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2 NL	3 NT	1 NR	0 NU	2 SL	3 ST	1 SR	0 SU	2 EL	3 ET	2 ER	0 EU	2 WL	3 WT	1 WR	0 WU	TOTAL
7:00 AM	115	116	18	4	42	42	36	0	42	158	66	0	18	157	50	1	865
7:15 AM	148	138	27	4	57	89	39	0	36	265	196	0	14	184	48	0	1245
7:30 AM	150	137	50	8	79	53	41	1	53	456	108	0	15	223	72	0	1446
7:45 AM	204	174	61	4	74	56	92	0	50	225	87	0	28	285	83	4	1427
8:00 AM	181	151	23	9	33	40	42	0	63	197	49	0	20	297	83	0	1188
8:15 AM	138	101	19	7	50	31	36	2	48	159	43	0	23	220	57	0	934
8:30 AM	107	80	22	6	47	39	36	0	28	146	20	0	11	190	78	0	810
8:45 AM	98	93	18	7	56	44	45	0	22	159	24	0	9	166	53	0	794
TOTAL VOLUMES :	NL 1141	NT 990	NR 238	NU 49	SL 438	ST 394	SR 367	SU 3	EL 342	ET 1765	ER 593	EU 0	WL 138	WT 1722	WR 524	WU 5	TOTAL 8709
APPROACH %'s :	47.19%	40.94%	9.84%	2.03%	36.44%	32.78%	30.53%	0.25%	12.67%	65.37%	21.96%	0.00%	5.78%	72.08%	21.93%	0.21%	
PEAK HR :	07:15 AM - 08:15 AM																TOTAL
PEAK HR VOL :	683	600	161	25	243	238	214	1	202	1143	440	0	77	989	286	4	5306
PEAK HR FACTOR :	0.837	0.862	0.660	0.694	0.769	0.669	0.582	0.250	0.802	0.627	0.561	0.000	0.688	0.832	0.861	0.250	0.917
	0.829				0.784				0.723				0.848				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	2 NL	3 NT	1 NR	0 NU	2 SL	3 ST	1 SR	0 SU	2 EL	3 ET	2 ER	0 EU	2 WL	3 WT	1 WR	0 WU	TOTAL
4:00 PM	75	69	18	16	76	94	46	0	36	262	94	0	24	187	70	3	1070
4:15 PM	96	80	22	26	94	92	48	0	30	254	113	0	17	178	78	1	1129
4:30 PM	98	75	18	30	75	85	44	2	33	264	100	1	24	198	75	1	1123
4:45 PM	99	96	21	24	75	128	74	0	48	287	131	0	26	224	71	2	1306
5:00 PM	105	98	19	30	97	111	60	0	54	258	124	0	19	192	64	0	1231
5:15 PM	92	89	21	30	84	139	51	0	39	286	149	0	20	223	83	4	1310
5:30 PM	110	82	18	24	107	103	43	1	27	310	117	0	18	207	81	4	1252
5:45 PM	102	80	30	15	83	108	70	0	43	299	147	1	18	198	68	0	1262
TOTAL VOLUMES :	NL 777	NT 669	NR 167	NU 195	SL 691	ST 860	SR 436	SU 3	EL 310	ET 2220	ER 975	EU 2	WL 166	WT 1607	WR 590	WU 15	TOTAL 9683
APPROACH %'s :	42.98%	37.00%	9.24%	10.79%	34.72%	43.22%	21.91%	0.15%	8.84%	63.30%	27.80%	0.06%	6.98%	67.58%	24.81%	0.63%	
PEAK HR :	04:45 PM - 05:45 PM																TOTAL
PEAK HR VOL :	406	365	79	108	363	481	228	1	168	1141	521	0	83	846	299	10	5099
PEAK HR FACTOR :	0.923	0.931	0.940	0.900	0.848	0.865	0.770	0.250	0.778	0.920	0.874	0.000	0.798	0.944	0.901	0.625	0.973
	0.950				0.968				0.965				0.938				

National Data & Surveying Services

Intersection Turning Movement Count

Location: W Taron Dr & Dwy 1/Chevron Dwy

City: Elk Grove

Control: 1-Way Stop(EB)

Project ID: 19-07272-005

Date: 8/20/2019

Total

NS/EW Streets:	W Taron Dr				W Taron Dr				Dwy 1/Chevron Dwy				Dwy 1/Chevron Dwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	2	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	110	2	0	0	27	7	0	0	0	8	0	0	0	1	0	155
7:15 AM	0	107	2	0	0	31	9	0	0	0	9	0	0	0	4	0	162
7:30 AM	0	74	3	0	0	63	6	0	0	0	7	0	0	0	4	0	157
7:45 AM	0	80	1	0	0	70	16	0	0	0	10	0	0	0	6	0	183
8:00 AM	0	91	2	0	0	73	20	0	0	0	18	0	0	0	8	0	212
8:15 AM	0	79	1	0	0	72	15	0	0	0	15	0	0	0	8	0	190
8:30 AM	0	59	3	0	0	108	11	0	0	0	13	0	0	0	3	0	197
8:45 AM	0	63	2	0	0	148	22	0	0	0	5	0	0	0	7	0	247
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	663	16	0	0	592	106	0	0	0	85	0	0	0	41	0	1503
	0.00%	97.64%	2.36%	0.00%	0.00%	84.81%	15.19%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	0	292	8	0	0	401	68	0	0	0	51	0	0	0	26	0	846
PEAK HR FACTOR :	0.000	0.802	0.667	0.000	0.000	0.677	0.773	0.000	0.000	0.000	0.708	0.000	0.000	0.000	0.813	0.000	0.856
	0.806				0.690				0.708				0.813				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	2	0	0	0	2	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	0	158	2	0	0	66	29	0	0	0	20	0	0	0	7	0	282
4:15 PM	0	98	4	0	0	76	28	0	0	0	15	0	0	0	6	0	227
4:30 PM	0	86	3	0	0	57	17	0	0	0	16	0	0	0	3	0	182
4:45 PM	0	88	2	0	0	78	21	0	0	0	13	0	0	0	2	0	204
5:00 PM	0	86	4	0	0	59	24	0	0	0	20	0	0	0	7	0	200
5:15 PM	0	134	2	0	0	71	37	0	0	0	11	0	0	0	3	0	258
5:30 PM	0	114	4	0	0	71	22	0	0	0	11	0	0	0	5	0	227
5:45 PM	0	80	2	0	0	54	26	0	0	0	21	0	0	0	6	0	189
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	844	23	0	0	532	204	0	0	0	127	0	0	0	39	0	1769
	0.00%	97.35%	2.65%	0.00%	0.00%	72.28%	27.72%	0.00%	0.00%	0.00%	100.00%	0.00%	0.00%	0.00%	100.00%	0.00%	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	430	11	0	0	277	95	0	0	0	64	0	0	0	18	0	895
PEAK HR FACTOR :	0.000	0.680	0.688	0.000	0.000	0.888	0.819	0.000	0.000	0.000	0.800	0.000	0.000	0.000	0.643	0.000	0.793
	0.689				0.894				0.800				0.643				

National Data & Surveying Services

Intersection Turning Movement Count

Location: W Taron Dr & Dwy 2/Alldata LLC Dwy

City: Elk Grove

Control: 1-Way Stop(EB)

Project ID: 19-07272-006

Date: 8/20/2019

Total

NS/EW Streets:	W Taron Dr				W Taron Dr				Dwy 2/Alldata LLC Dwy				Dwy 2/Alldata LLC Dwy				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	56	0	0	0	16	3	0	0	0	0	0	0	0	0	0	75
7:15 AM	0	64	0	0	0	22	3	0	0	0	0	0	0	0	0	0	89
7:30 AM	0	46	0	0	0	43	5	0	0	0	0	0	0	0	0	0	94
7:45 AM	0	42	0	0	0	72	8	0	0	0	0	0	0	0	0	0	122
8:00 AM	0	43	0	0	0	61	6	0	0	0	0	0	0	0	0	0	110
8:15 AM	0	35	0	0	0	56	0	0	0	0	0	0	0	0	0	0	91
8:30 AM	0	33	0	0	0	100	3	0	0	0	0	0	0	0	0	0	136
8:45 AM	0	25	0	0	0	145	3	0	0	0	0	0	0	0	0	0	173
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	344	0	0	0	515	31	0	0	0	0	0	0	0	0	0	890
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	0	136	0	0	0	362	12	0	0	0	0	0	0	0	0	0	510
PEAK HR FACTOR :	0.000	0.791	0.000	0.000	0.000	0.624	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.737
	0.791				0.632												

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	1	0	0	0	2	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	0	113	0	0	0	48	0	0	0	0	3	0	0	0	0	0	164
4:15 PM	0	52	0	0	0	55	1	0	0	0	2	0	0	0	0	0	110
4:30 PM	0	32	0	0	0	51	2	0	0	0	0	0	0	0	0	0	85
4:45 PM	0	41	0	0	0	48	1	0	0	0	1	0	0	0	0	0	91
5:00 PM	0	43	0	0	0	41	1	0	0	0	1	0	0	0	0	0	86
5:15 PM	0	57	0	0	0	58	1	0	0	0	0	0	0	0	0	0	116
5:30 PM	0	70	0	0	0	43	0	0	0	0	0	0	0	0	0	0	113
5:45 PM	0	50	0	0	0	39	0	0	0	0	1	0	0	0	0	0	90
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	458	0	0	0	383	6	0	0	0	8	0	0	0	0	0	855
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	238	0	0	0	202	4	0	0	0	6	0	0	0	0	0	450
PEAK HR FACTOR :	0.000	0.527	0.000	0.000	0.000	0.918	0.500	0.000	0.000	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.686
	0.527				0.920				0.500								

National Data & Surveying Services

Intersection Turning Movement Count

Location: W Taron Dr & California North State University Hwy/EB

City: Elk Grove

Control: 1-Way Stop(EB)

Project ID: 19-07272-007

Date: 8/20/2019

Total

NS/EW Streets:	W Taron Dr				W Taron Dr				California North State University N Dwy/Dwy 3				California North State University N Dwy/Dwy 3				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	55	0	0	0	10	3	0	1	0	1	0	0	0	0	0	70
7:15 AM	0	65	0	0	0	21	2	0	0	0	0	0	0	0	0	0	88
7:30 AM	0	45	0	0	0	26	22	0	1	0	0	0	0	0	0	0	94
7:45 AM	0	39	0	0	0	34	37	0	1	0	0	0	0	0	0	0	111
8:00 AM	0	47	0	0	0	26	32	0	0	0	0	0	0	0	0	0	105
8:15 AM	1	28	0	0	0	35	22	0	3	0	0	0	0	0	0	0	89
8:30 AM	0	31	0	0	0	42	65	0	2	0	0	0	0	0	0	0	140
8:45 AM	1	27	0	0	0	46	92	0	3	0	0	0	0	0	0	0	169
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	2	337	0	0	0	240	275	0	11	0	1	0	0	0	0	0	866
	0.59%	99.41%	0.00%	0.00%	0.00%	46.60%	53.40%	0.00%	91.67%	0.00%	8.33%	0.00%	0	0	0	0	
PEAK HR :	08:00 AM - 09:00 AM																TOTAL
PEAK HR VOL :	2	133	0	0	0	149	211	0	8	0	0	0	0	0	0	0	503
PEAK HR FACTOR :	0.500	0.707	0.000	0.000	0.000	0.810	0.573	0.000	0.667	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.744
	0.718				0.652				0.667								
PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	0	57	0	0	0	41	8	0	47	0	1	0	0	0	0	0	154
4:15 PM	0	29	0	0	0	53	4	2	25	0	0	0	0	0	0	0	113
4:30 PM	0	20	0	0	0	46	3	0	10	0	1	0	0	0	0	0	80
4:45 PM	0	29	0	0	0	46	5	0	13	0	0	0	0	0	0	0	93
5:00 PM	0	29	0	0	0	39	1	1	15	0	0	0	0	0	0	0	85
5:15 PM	0	49	0	0	0	53	5	0	12	0	0	0	0	0	0	0	119
5:30 PM	0	42	0	0	0	42	2	0	31	0	0	0	0	0	0	0	117
5:45 PM	0	35	0	0	0	38	1	0	9	0	0	0	0	0	0	0	83
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	290	0	0	0	358	29	3	162	0	2	0	0	0	0	0	844
	0.00%	100.00%	0.00%	0.00%	0.00%	91.79%	7.44%	0.77%	98.78%	0.00%	1.22%	0.00%	0	0	0	0	
PEAK HR :	04:00 PM - 05:00 PM																TOTAL
PEAK HR VOL :	0	135	0	0	0	186	20	2	95	0	2	0	0	0	0	0	440
PEAK HR FACTOR :	0.000	0.592	0.000	0.000	0.000	0.877	0.625	0.250	0.505	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.714
	0.592				0.881				0.505								

National Data & Surveying Services

Intersection Turning Movement Count

Location: W Taron Dr & California North State University S

City: Elk Grove

Control: 1-Way Stop(EB)

Project ID: 19-07272-008

Date: 8/20/2019

Total

NS/EW Streets:	W Taron Dr				W Taron Dr				California North State University S Dwy/Dwy 4				California North State University S Dwy/Dwy 4				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	1	55	0	0	0	10	4	0	0	0	0	0	0	0	0	0	70
7:15 AM	0	65	0	0	0	16	4	0	0	0	0	0	0	0	0	0	85
7:30 AM	1	44	0	0	0	20	7	0	1	0	0	0	0	0	0	0	73
7:45 AM	5	39	0	0	0	28	5	0	0	0	0	0	0	0	0	0	77
8:00 AM	1	46	0	0	0	26	7	0	1	0	0	0	0	0	0	0	81
8:15 AM	0	28	0	0	0	20	15	0	1	0	0	0	0	0	0	0	64
8:30 AM	8	30	0	0	0	13	28	0	1	0	1	0	0	0	0	0	81
8:45 AM	11	28	0	0	0	7	40	0	0	0	0	0	0	0	0	0	86
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	27	335	0	0	0	140	110	0	4	0	1	0	0	0	0	0	617
PEAK HR :	7.46%	92.54%	0.00%	0.00%	0.00%	56.00%	44.00%	0.00%	80.00%	0.00%	20.00%	0.00%	0	0	0	0	
PEAK HR VOL :	07:15 AM - 08:15 AM				0	90	23	0	2	0	0	0	0	0	0	0	TOTAL
PEAK HR FACTOR :	0.350	0.746	0.000	0.000	0.000	0.804	0.821	0.000	0.500	0.000	0.000	0.000	0.000	0.000	0.000	0.000	316
	0.773				0.856				0.500								0.929

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	1	16	0	0	0	40	0	0	41	0	4	0	0	0	0	0	102
4:15 PM	0	15	0	0	0	54	1	0	13	0	2	0	0	0	0	0	85
4:30 PM	1	16	0	0	0	46	1	0	6	0	2	0	0	0	0	0	72
4:45 PM	0	20	0	0	0	43	3	0	7	0	1	0	0	0	0	0	74
5:00 PM	0	21	0	0	0	39	0	0	9	0	1	0	0	0	0	0	70
5:15 PM	3	36	0	0	0	51	1	0	13	0	3	0	0	0	0	0	107
5:30 PM	0	28	0	0	0	41	1	0	17	0	2	0	0	0	0	0	89
5:45 PM	1	24	0	0	0	39	1	0	8	0	1	0	0	0	0	0	74
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	6	176	0	0	0	353	8	0	114	0	16	0	0	0	0	0	673
PEAK HR :	3.30%	96.70%	0.00%	0.00%	0.00%	97.78%	2.22%	0.00%	87.69%	0.00%	12.31%	0.00%	0	0	0	0	
PEAK HR VOL :	04:45 PM - 05:45 PM				0	174	5	0	46	0	7	0	0	0	0	0	TOTAL
PEAK HR FACTOR :	0.250	0.729	0.000	0.000	0.000	0.853	0.417	0.000	0.676	0.000	0.583	0.000	0.000	0.000	0.000	0.000	340
	0.692				0.861				0.697								0.794

National Data & Surveying Services

Intersection Turning Movement Count

Location: Dwy 5/Carl's Jr. Dwy & Elk Grove Blvd

City: Elk Grove

Control: No Control

Project ID: 19-07272-009

Date: 8/20/2019

Total

NS/EW Streets:	Dwy 5/Carl's Jr. Dwy				Dwy 5/Carl's Jr. Dwy				Elk Grove Blvd				Elk Grove Blvd				
AM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	0	0	0	0	0	0	0	0	3	1	0	0	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
7:00 AM	0	0	0	0	0	0	0	0	0	129	15	0	0	379	0	0	523
7:15 AM	0	0	0	0	0	0	0	0	0	148	13	0	0	367	0	0	528
7:30 AM	0	0	0	0	0	0	0	0	0	141	14	0	0	307	0	0	462
7:45 AM	0	0	0	0	0	0	0	0	0	136	14	0	0	327	0	0	477
8:00 AM	0	0	0	0	0	0	0	0	0	125	10	0	0	297	0	0	432
8:15 AM	0	0	0	0	0	0	0	0	0	112	17	0	0	306	0	0	435
8:30 AM	0	0	0	0	0	0	0	0	0	109	7	0	0	284	0	0	400
8:45 AM	0	0	0	0	0	0	0	0	0	155	12	0	0	219	0	0	386
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	0	0	0	0	0	0	0	0	1055	102	0	0	2486	0	0	3643
PEAK HR :	07:00 AM - 08:00 AM								0.00% 91.18% 8.82% 0.00%				0.00% 100.00% 0.00% 0.00%				
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	554	56	0	0	1380	0	0	1990
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.936	0.933	0.000	0.000	0.910	0.000	0.000	0.942
									0.947				0.910				

PM	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				TOTAL
	0	0	0	0	0	0	0	0	0	3	1	0	0	3	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	
4:00 PM	0	0	0	0	0	0	0	0	0	269	15	0	0	221	0	0	505
4:15 PM	0	0	0	0	0	0	0	0	0	284	10	0	0	196	0	0	490
4:30 PM	0	0	0	0	0	0	0	0	0	280	9	0	0	205	0	0	494
4:45 PM	0	0	0	0	0	0	0	0	0	262	20	0	0	202	0	0	484
5:00 PM	0	0	0	0	0	0	0	0	0	291	7	0	0	206	0	0	504
5:15 PM	0	0	0	0	0	0	0	0	0	290	12	0	0	214	0	0	516
5:30 PM	0	0	0	0	0	0	0	0	0	341	12	0	0	207	0	0	560
5:45 PM	0	0	0	0	0	0	0	0	0	330	14	0	0	183	0	0	527
TOTAL VOLUMES :	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
APPROACH %'s :	0	0	0	0	0	0	0	0	0	2347	99	0	0	1634	0	0	4080
PEAK HR :	05:00 PM - 06:00 PM								0.00% 95.95% 4.05% 0.00%				0.00% 100.00% 0.00% 0.00%				
PEAK HR VOL :	0	0	0	0	0	0	0	0	0	1252	45	0	0	810	0	0	2107
PEAK HR FACTOR :	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.918	0.804	0.000	0.000	0.946	0.000	0.000	0.941
									0.919				0.946				



Major Street	W. Taron Drive
Minor Street	Riparian Drive

Project	Elk Grove California Northstate Univ.
Scenario	Existing Plus Phase 1 Conditions
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	-	77	128	15
Through	210	399	7	16
Right	4	160	3	96
Total	214	636	138	127

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	15.1
Approach with Worst Case Delay	EB
Total Vehicles on Approach	138

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Existing Plus Phase 1 Conditions	0.6	138	1,115
Limiting Value	5	150	800
Condition Satisfied?	Not Met	Not Met	Met
Warrant Met	NO		

Major Street	W. Taron Drive
Minor Street	Riparian Drive

Project	Elk Grove California Northstate Univ.
Scenario	Existing Plus Phase 1 Conditions
Peak Hour	AM

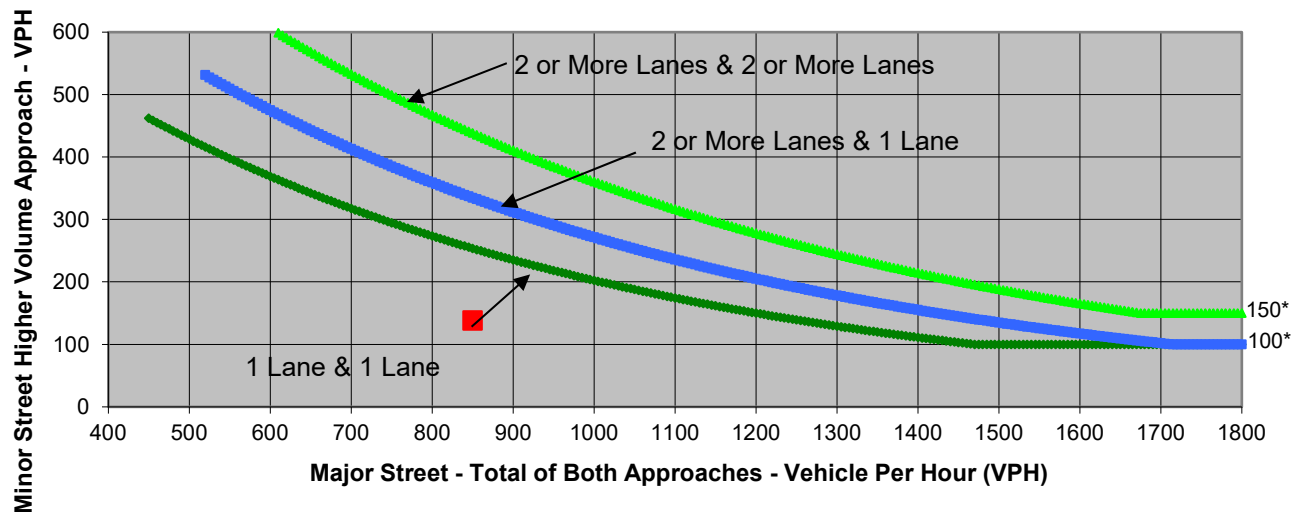
Turn Movement Volumes

	NB	SB	EB	WB
Left	-	77	128	15
Through	210	399	7	16
Right	4	160	3	96
Total	214	636	138	127

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: California Manual on Uniform Traffic Control Devices, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	W. Taron Drive	Riparian Drive	
Number of Approach Lanes	2	2	<u>NO</u>
Traffic Volume (VPH) *	850	138	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	W. Taron Drive
Minor Street	Riparian Drive

Project	Elk Grove California Northstate Univ.
Scenario	Existing Plus Phase 1 Conditions
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	18	170	375	6
Through	261	207	20	19
Right	11	104	15	42
Total	290	481	410	67

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	87.3
Approach with Worst Case Delay	EB
Total Vehicles on Approach	410

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Existing Plus Phase 1 Conditions	9.9	410	1,248
Limiting Value	5	150	800
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street **W. Taron Drive**
 Minor Street **Riparian Drive**

Project **Elk Grove California Northstate Univ.**
 Scenario **Existing Plus Phase 1 Conditions**
 Peak Hour **PM**

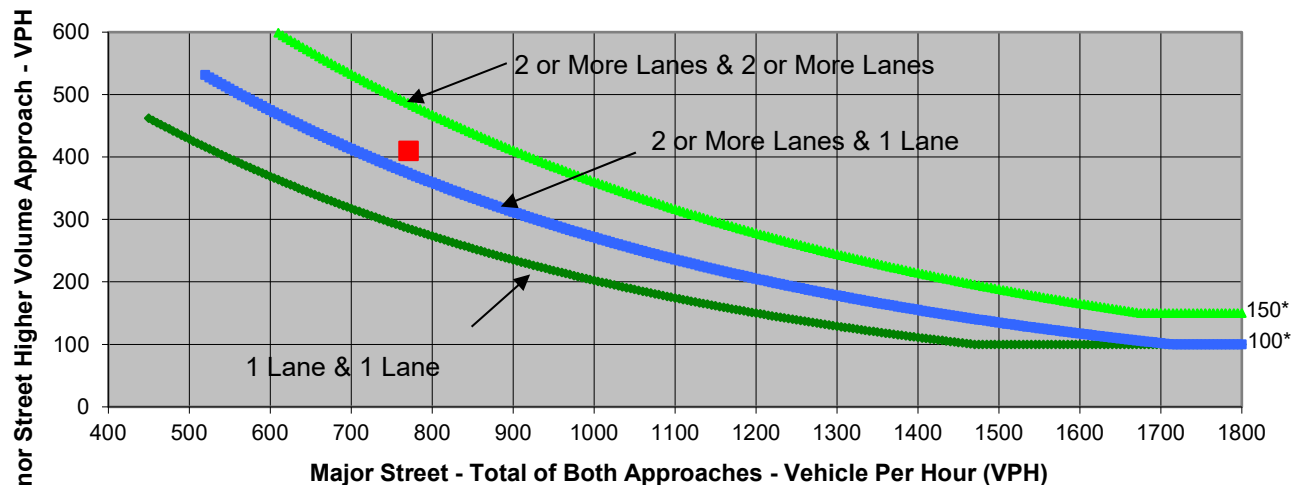
Turn Movement Volumes

	NB	SB	EB	WB
Left	18	170	375	6
Through	261	207	20	19
Right	11	104	15	42
Total	290	481	410	67

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	W. Taron Drive	Riparian Drive	
Number of Approach Lanes	2	2	<u>NO</u>
Traffic Volume (VPH) *	771	410	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

HCM 6th TWSC
1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Existing Conditions
Timing Plan: AM Peak Hour

Intersection												
Int Delay, s/veh	1.6											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	517	0	0	253	0	2	0	135	0	0	0
Future Vol, veh/h	2	517	0	0	253	0	2	0	135	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	210	-	-	-	-	-	-	-	400	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	544	0	0	266	0	2	0	142	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	266	0	-	-	-	0	814	814	272
Stage 1	-	-	-	-	-	-	548	548	-
Stage 2	-	-	-	-	-	-	266	266	-
Critical Hdwy	4.115	-	-	-	-	-	6.615	6.515	6.915
Critical Hdwy Stg 1	-	-	-	-	-	-	5.815	5.515	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.415	5.515	-
Follow-up Hdwy	2.2095	-	-	-	-	-	3.5095	4.0095	3.3095
Pot Cap-1 Maneuver	1303	-	0	0	-	-	333	313	729
Stage 1	-	-	0	0	-	-	546	518	-
Stage 2	-	-	0	0	-	-	781	690	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1303	-	-	-	-	-	332	0	729
Mov Cap-2 Maneuver	-	-	-	-	-	-	332	0	-
Stage 1	-	-	-	-	-	-	545	0	-
Stage 2	-	-	-	-	-	-	781	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	10.7
HCM LOS			B

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	694	729	1303	-	-	-
HCM Lane V/C Ratio	0.071	0.13	0.002	-	-	-
HCM Control Delay (s)	10.6	10.7	7.8	-	-	-
HCM Lane LOS	B	B	A	-	-	-
HCM 95th %tile Q(veh)	0.2	0.4	0	-	-	-

HCM 6th Signalized Intersection Summary

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Existing Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	82	353	161	205	980	209	232	82	65	268	128	190
Future Volume (veh/h)	82	353	161	205	980	209	232	82	65	268	128	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
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	85	364	68	211	1010	96	239	85	7	276	132	29
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	250	2470	767	278	2511	779	311	194	163	346	226	189
Arrive On Green	0.07	0.48	0.48	0.08	0.49	0.49	0.09	0.10	0.10	0.10	0.12	0.12
Sat Flow, veh/h	3456	5106	1585	3456	5106	1584	3456	1870	1576	3456	1870	1563
Grp Volume(v), veh/h	85	364	68	211	1010	96	239	85	7	276	132	29
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1584	1728	1870	1576	1728	1870	1563
Q Serve(g_s), s	2.3	4.0	2.3	6.0	12.5	3.3	6.8	4.3	0.4	7.8	6.7	1.7
Cycle Q Clear(g_c), s	2.3	4.0	2.3	6.0	12.5	3.3	6.8	4.3	0.4	7.8	6.7	1.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	250	2470	767	278	2511	779	311	194	163	346	226	189
V/C Ratio(X)	0.34	0.15	0.09	0.76	0.40	0.12	0.77	0.44	0.04	0.80	0.58	0.15
Avail Cap(c_a), veh/h	594	2470	767	422	2511	779	619	335	282	594	322	269
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	14.3	13.9	45.0	16.1	13.7	44.5	42.1	40.4	44.0	41.6	39.4
Incr Delay (d2), s/veh	0.3	0.1	0.2	1.6	0.5	0.3	1.5	1.2	0.1	1.6	1.8	0.3
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	1.4	0.8	2.5	4.5	1.2	2.9	2.0	0.2	3.3	3.1	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.4	14.5	14.2	46.6	16.6	14.1	46.0	43.2	40.4	45.6	43.4	39.7
LnGrp LOS	D	B	B	D	B	B	D	D	D	D	D	D
Approach Vol, veh/h	517				1317				331			
Approach Delay, s/veh	19.4				21.2				45.2			
Approach LOS	B				C				D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	55.0	14.1	17.9	13.9	54.2	15.8	16.2				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	17.2	25.2	17.9	17.2	12.2	30.2	17.2	* 18				
Max Q Clear Time (g_c+I1), s	4.3	14.5	8.8	8.7	8.0	6.0	9.8	6.3				
Green Ext Time (p_c), s	0.1	4.9	0.2	0.3	0.1	2.4	0.2	0.2				

Intersection Summary

HCM 6th Ctrl Delay	27.8
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

HCM 6th AWSC
3: W Taron Dr & Riparian Dr

Existing Conditions
Timing Plan: AM Peak Hour

Intersection

Intersection Delay, s/veh 11.2

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	26	2	2	12	3	96	3	195	3	40	23	368	21
Future Vol, veh/h	26	2	2	12	3	96	3	195	3	40	23	368	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	30	2	2	14	3	112	3	227	3	47	27	428	24
Number of Lanes	1	1	0	1	1	0	1	2	0	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	10.4	10.1	10.7	11.7
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	96%	0%	50%	0%	3%	0%	100%	85%
Vol Right, %	0%	0%	4%	0%	50%	0%	97%	0%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	130	68	26	4	12	99	63	245	144
LT Vol	3	0	0	26	0	12	0	63	0	0
Through Vol	0	130	65	0	2	0	3	0	245	123
RT Vol	0	0	3	0	2	0	96	0	0	21
Lane Flow Rate	3	151	79	30	5	14	115	73	285	167
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.006	0.26	0.135	0.062	0.008	0.028	0.191	0.126	0.449	0.258
Departure Headway (Hd)	6.702	6.198	6.167	7.382	6.53	7.148	5.968	6.175	5.672	5.569
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	534	579	581	485	548	501	601	582	636	645
Service Time	4.439	3.935	3.904	5.129	4.276	4.887	3.708	3.904	3.401	3.298
HCM Lane V/C Ratio	0.006	0.261	0.136	0.062	0.009	0.028	0.191	0.125	0.448	0.259
HCM Control Delay	9.5	11.1	9.9	10.6	9.3	10.1	10.1	9.8	13	10.2
HCM Lane LOS	A	B	A	B	A	B	B	A	B	B
HCM 95th-tile Q	0	1	0.5	0.2	0	0.1	0.7	0.4	2.3	1

HCM 6th Signalized Intersection Summary

4: Franklin Blvd & Elk Grove Blvd

Existing Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	202	1143	440	81	989	286	708	600	161	244	238	214
Future Volume (veh/h)	202	1143	440	81	989	286	708	600	161	244	238	214
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	220	1242	174	88	1075	154	770	652	45	265	259	29
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, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	319	1938	1046	330	1954	607	820	1246	378	325	515	155
Arrive On Green	0.09	0.38	0.38	0.09	0.38	0.38	0.24	0.24	0.24	0.09	0.10	0.10
Sat Flow, veh/h	3483	5147	2776	3483	5147	1598	3483	5147	1563	3483	5147	1554
Grp Volume(v), veh/h	220	1242	174	88	1075	154	770	652	45	265	259	29
Grp Sat Flow(s),veh/h/ln	1742	1716	1388	1742	1716	1598	1742	1716	1563	1742	1716	1554
Q Serve(g_s), s	7.3	23.8	5.0	2.8	19.7	7.9	26.0	13.2	2.7	9.0	5.7	2.1
Cycle Q Clear(g_c), s	7.3	23.8	5.0	2.8	19.7	7.9	26.0	13.2	2.7	9.0	5.7	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	1938	1046	330	1954	607	820	1246	378	325	515	155
V/C Ratio(X)	0.69	0.64	0.17	0.27	0.55	0.25	0.94	0.52	0.12	0.81	0.50	0.19
Avail Cap(c_a), veh/h	470	1938	1046	470	1954	607	848	1246	378	702	995	300
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	30.7	24.9	50.5	29.2	25.6	45.0	39.5	35.5	53.4	51.2	49.5
Incr Delay (d2), s/veh	2.7	1.6	0.3	0.2	1.1	1.0	17.3	0.4	0.1	1.9	0.8	0.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.3	9.7	1.6	1.2	7.9	3.1	12.8	5.4	1.0	3.9	2.4	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.5	32.4	25.2	50.6	30.3	26.6	62.3	39.9	35.6	55.3	51.9	50.1
LnGrp LOS	E	C	C	D	C	C	E	D	D	E	D	D
Approach Vol, veh/h	1636					1317		1467		553		
Approach Delay, s/veh	34.7					31.2		51.5		53.4		
Approach LOS	C					C		D		D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.8	51.4	34.0	17.8	17.2	51.0	17.0	34.8				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	16.2	28.2	29.2	23.2	16.2	28.2	24.2	28.2				
Max Q Clear Time (g_c+I), s	19.3	21.7	28.0	7.7	4.8	25.8	11.0	15.2				
Green Ext Time (p_c), s	0.4	3.7	0.2	1.4	0.1	1.8	0.2	3.4				

Intersection Summary

HCM 6th Ctrl Delay 40.8
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM 6th TWSC
5: W Taron Dr & Shell Dwy/Chevron Dwy

Existing Conditions
Timing Plan: AM Peak Hour

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	51	0	0	31	0	348	9	0	401	68
Future Vol, veh/h	0	0	51	0	0	31	0	348	9	0	401	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	59	0	0	36	0	405	10	0	466	79
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	273	-	-	208	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.92	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.31	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	728	0	0	801	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	728	-	-	801	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.4		9.7		0		0					
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBT		NBR EBLn1WBLn1		SBT		SBR					
Capacity (veh/h)	-		728 801		-		-					
HCM Lane V/C Ratio	-		0.081 0.045		-		-					
HCM Control Delay (s)	-		10.4 9.7		-		-					
HCM Lane LOS	-		B A		-		-					
HCM 95th %tile Q(veh)	-		0.3 0.1		-		-					

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	0	0	201	370	12
Future Vol, veh/h	0	0	0	201	370	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	0	0	272	500	16
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	508	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.21	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.309	-	-	-	-
Pot Cap-1 Maneuver	0	567	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	567	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Control Delay (s)	-	0	-	-		
HCM Lane LOS	-	A	-	-		
HCM 95th %tile Q(veh)	-	-	-	-		

HCM 6th TWSC
7: W Taron Dr & CA NSU North Dwy

Existing Conditions
Timing Plan: AM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	0	3	193	153	217
Future Vol, veh/h	8	0	3	193	153	217
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	11	0	4	261	207	293
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	623	354	500	0	-	0
Stage 1	354	-	-	-	-	-
Stage 2	269	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	451	692	1069	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	449	692	1069	-	-	-
Mov Cap-2 Maneuver	449	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.2	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1069	-	449	-	-	
HCM Lane V/C Ratio	0.004	-	0.024	-	-	
HCM Control Delay (s)	8.4	0	13.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC
8: W Taron Dr & CA NSU South Dwy

Existing Conditions
Timing Plan: AM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	7	194	122	31
Future Vol, veh/h	2	0	7	194	122	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	2	0	8	209	131	33
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	373	148	164	0	-	0
Stage 1	148	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	630	901	1421	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	815	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	626	901	1421	-	-	-
Mov Cap-2 Maneuver	626	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	815	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1421	-	626	-	-	
HCM Lane V/C Ratio	0.005	-	0.003	-	-	
HCM Control Delay (s)	7.5	0	10.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Existing Conditions
Timing Plan: PM Peak Hour

Intersection													
Int Delay, s/veh	2.4												
Movement	EBL	EBT	EBR	WBU	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	2	1086	0	1	0	133	0	0	0	216	0	0	0
Future Vol, veh/h	2	1086	0	1	0	133	0	0	0	216	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	-	None	-	-	None	-	-	None
Storage Length	210	-	-	-	-	-	-	-	-	400	-	-	-
Veh in Median Storage, #	-	0	-	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	1155	0	1	0	141	0	0	0	230	0	0	0

Major/Minor	Major1			Major2			Minor1			
Conflicting Flow All	141	0	-	1155	-	-	0	1300	1302	578
Stage 1	-	-	-	-	-	-	-	1159	1159	-
Stage 2	-	-	-	-	-	-	-	141	143	-
Critical Hdwy	4.1	-	-	6.9	-	-	-	6.6	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	3.1	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1455	-	0	200	0	-	-	167	162	464
Stage 1	-	-	0	-	0	-	-	265	272	-
Stage 2	-	-	0	-	0	-	-	891	782	-
Platoon blocked, %		-				-	-			
Mov Cap-1 Maneuver	1455	-	-	107	-	-	-	165	0	464
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	165	0	-
Stage 1	-	-	-	-	-	-	-	265	0	-
Stage 2	-	-	-	-	-	-	-	882	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0.3	15.8
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	464	464	1455	-	-	-
HCM Lane V/C Ratio	0.165	0.33	0.001	-	-	-
HCM Control Delay (s)	14.3	16.5	7.5	-	-	-
HCM Lane LOS	B	C	A	-	-	-
HCM 95th %tile Q(veh)	0.6	1.4	0	-	-	-

HCM 6th Signalized Intersection Summary

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Existing Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	173	930	155	142	545	186	204	108	141	381	119	144
Future Volume (veh/h)	173	930	155	142	545	186	204	108	141	381	119	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	182	979	68	149	574	76	215	114	20	401	125	29
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	277	2274	705	274	2270	705	313	211	174	472	311	258
Arrive On Green	0.08	0.44	0.44	0.08	0.44	0.44	0.09	0.11	0.11	0.14	0.16	0.16
Sat Flow, veh/h	3483	5147	1595	3483	5147	1598	3483	1885	1559	3483	1885	1568
Grp Volume(v), veh/h	182	979	68	149	574	76	215	114	20	401	125	29
Grp Sat Flow(s),veh/h/ln	1742	1716	1595	1742	1716	1598	1742	1885	1559	1742	1885	1568
Q Serve(g_s), s	5.1	13.1	2.5	4.1	7.0	2.8	6.0	5.7	1.2	11.2	5.9	1.6
Cycle Q Clear(g_c), s	5.1	13.1	2.5	4.1	7.0	2.8	6.0	5.7	1.2	11.2	5.9	1.6
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	277	2274	705	274	2270	705	313	211	174	472	311	258
V/C Ratio(X)	0.66	0.43	0.10	0.54	0.25	0.11	0.69	0.54	0.11	0.85	0.40	0.11
Avail Cap(c_a), veh/h	495	2274	705	495	2270	705	728	356	295	704	343	285
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	19.2	16.3	44.3	17.6	16.4	44.2	42.0	40.0	42.2	37.4	35.5
Incr Delay (d2), s/veh	1.0	0.6	0.3	0.6	0.3	0.3	1.0	1.6	0.2	4.2	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	2.2	4.9	0.9	1.7	2.6	1.0	2.6	2.7	0.4	4.9	2.7	0.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.7	19.8	16.5	45.0	17.9	16.7	45.2	43.6	40.2	46.4	38.0	35.7
LnGrp LOS	D	B	B	D	B	B	D	D	D	D	D	D
Approach Vol, veh/h		1229			799			349			555	
Approach Delay, s/veh		23.5			22.8			44.4			44.0	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.7	49.9	14.1	22.3	13.7	50.0	19.4	17.0				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	14.2	24.2	20.9	18.2	14.2	24.2	20.2	* 19				
Max Q Clear Time (g_c+I1), s	7.1	9.0	8.0	7.9	6.1	15.1	13.2	7.7				
Green Ext Time (p_c), s	0.1	3.3	0.2	0.3	0.1	4.2	0.3	0.3				

Intersection Summary

HCM 6th Ctrl Delay 29.7
HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

HCM 6th AWSC
3: W Taron Dr & Riparian Dr

Existing Conditions
Timing Plan: PM Peak Hour

Intersection

Intersection Delay, s/veh 11.8

Intersection LOS B

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations															
Traffic Vol, veh/h	1	134	8	12	4	12	42	4	11	224	9	46	92	190	22
Future Vol, veh/h	1	134	8	12	4	12	42	4	11	224	9	46	92	190	22
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	1	161	10	14	5	14	51	5	13	270	11	55	111	229	27
Number of Lanes	0	1	1	0	1	1	0	0	1	2	0	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	13.1	10.3	11.6	11.5
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	89%	0%	40%	0%	22%	0%	100%	74%
Vol Right, %	0%	0%	11%	0%	60%	0%	78%	0%	0%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	149	84	135	20	4	54	138	127	85
LT Vol	15	0	0	135	0	4	0	138	0	0
Through Vol	0	149	75	0	8	0	12	0	127	63
RT Vol	0	0	9	0	12	0	42	0	0	22
Lane Flow Rate	18	180	101	163	24	5	65	166	153	103
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.035	0.325	0.18	0.33	0.043	0.01	0.12	0.313	0.266	0.174
Departure Headway (Hd)	7.014	6.508	6.431	7.3	6.378	7.68	6.63	6.769	6.264	6.081
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	509	551	555	491	559	464	537	530	572	588
Service Time	4.78	4.274	4.198	5.068	4.146	5.463	4.412	4.53	4.024	3.841
HCM Lane V/C Ratio	0.035	0.327	0.182	0.332	0.043	0.011	0.121	0.313	0.267	0.175
HCM Control Delay	10	12.4	10.6	13.7	9.4	10.5	10.3	12.6	11.3	10.1
HCM Lane LOS	A	B	B	B	A	B	B	B	B	B
HCM 95th-tile Q	0.1	1.4	0.7	1.4	0.1	0	0.4	1.3	1.1	0.6

HCM 6th Signalized Intersection Summary

4: Franklin Blvd & Elk Grove Blvd

Existing Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	168	1141	521	93	846	299	514	365	79	364	481	228
Future Volume (veh/h)	168	1141	521	93	846	299	514	365	79	364	481	228
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	173	1176	205	96	872	117	530	376	15	375	496	34
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	318	2157	1163	334	2180	676	586	858	265	435	635	194
Arrive On Green	0.09	0.42	0.42	0.10	0.42	0.42	0.17	0.17	0.17	0.12	0.12	0.12
Sat Flow, veh/h	3483	5147	2775	3483	5147	1596	3483	5147	1589	3483	5147	1570
Grp Volume(v), veh/h	173	1176	205	96	872	117	530	376	15	375	496	34
Grp Sat Flow(s),veh/h/ln	1742	1716	1387	1742	1716	1596	1742	1716	1589	1742	1716	1570
Q Serve(g_s), s	5.7	20.6	5.6	3.1	14.1	5.5	17.9	7.9	1.0	12.7	11.2	2.3
Cycle Q Clear(g_c), s	5.7	20.6	5.6	3.1	14.1	5.5	17.9	7.9	1.0	12.7	11.2	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	318	2157	1163	334	2180	676	586	858	265	435	635	194
V/C Ratio(X)	0.54	0.55	0.18	0.29	0.40	0.17	0.90	0.44	0.06	0.86	0.78	0.18
Avail Cap(c_a), veh/h	586	2157	1163	528	2180	676	673	858	265	673	823	251
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.1	26.2	21.9	50.4	24.0	21.5	48.9	44.9	42.1	51.5	51.0	47.1
Incr Delay (d2), s/veh	1.4	1.0	0.3	0.2	0.5	0.6	13.4	0.4	0.1	4.4	3.7	0.4
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	2.5	8.2	1.8	1.3	5.6	2.1	8.6	3.3	0.4	5.7	4.9	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	53.6	27.2	22.2	50.6	24.6	22.1	62.3	45.3	42.1	55.9	54.7	47.6
LnGrp LOS	D	C	C	D	C	C	E	D	D	E	D	D
Approach Vol, veh/h	1554		1085				921			905		
Approach Delay, s/veh	29.5		26.6				55.1			54.9		
Approach LOS	C		C				E			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.8	56.6	26.0	20.6	17.3	56.1	20.8	25.8				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	20.2	34.2	23.2	19.2	18.2	36.2	23.2	19.2				
Max Q Clear Time (g_c+I1), s	17.5	16.1	19.9	13.2	5.1	22.6	14.7	9.9				
Green Ext Time (p_c), s	0.4	5.7	0.3	1.6	0.1	7.0	0.3	1.5				

Intersection Summary

HCM 6th Ctrl Delay 39.2
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM 6th TWSC
5: W Taron Dr & Shell Dwy/Chevron Dwy

Existing Conditions
Timing Plan: PM Peak Hour

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	64	0	0	18	0	435	11	0	286	98
Future Vol, veh/h	0	0	64	0	0	18	0	435	11	0	286	98
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	81	0	0	23	0	551	14	0	362	124
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	244	-	-	283	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.92	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.31	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	760	0	0	717	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	759	-	-	717	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.3		10.2		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT		NBR EBLn1WBLn1		SBT SBR							
Capacity (veh/h)	-		759 717		-							
HCM Lane V/C Ratio	-		0.107 0.032		-							
HCM Control Delay (s)	-		10.3 10.2		-							
HCM Lane LOS	-		B B		-							
HCM 95th %tile Q(veh)	-		0.4 0.1		-							

HCM 6th TWSC
6: W Taron Dr & Alldata LLC Dwy

Existing Conditions
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	0.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	6	0	248	206	4
Future Vol, veh/h	0	6	0	248	206	4
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	9	0	359	299	6
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	305	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	735	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	733	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	10	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	733	-	-		
HCM Lane V/C Ratio	-	0.012	-	-		
HCM Control Delay (s)	-	10	-	-		
HCM Lane LOS	-	B	-	-		
HCM 95th %tile Q(veh)	-	0	-	-		

HCM 6th TWSC
7: W Taron Dr & CA NSU North Dwy

Existing Conditions
Timing Plan: PM Peak Hour

Intersection							
Int Delay, s/veh	3						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	95	2	0	151	2	190	20
Future Vol, veh/h	95	2	0	151	2	190	20
Conflicting Peds, #/hr	2	0	3	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	134	3	0	213	3	268	28
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	500	285	299	0	-	-	0
Stage 1	285	-	-	-	-	-	-
Stage 2	215	-	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-	-
Pot Cap-1 Maneuver	530	754	1262	-	-	-	-
Stage 1	763	-	-	-	-	-	-
Stage 2	821	-	-	-	-	-	-
Platoon blocked, %				-	-	-	-
Mov Cap-1 Maneuver	527	752	1258	-	-	-	-
Mov Cap-2 Maneuver	527	-	-	-	-	-	-
Stage 1	761	-	-	-	-	-	-
Stage 2	819	-	-	-	-	-	-
Approach	EB	NB		SB			
HCM Control Delay, s	14.1	0					
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	1258	-	530	-	-		
HCM Lane V/C Ratio	-	-	0.258	-	-		
HCM Control Delay (s)	0	-	14.1	-	-		
HCM Lane LOS	A	-	B	-	-		
HCM 95th %tile Q(veh)	0	-	1	-	-		

HCM 6th TWSC
8: W Taron Dr & CA NSU South Dwy

Existing Conditions
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	46	7	3	105	187	5
Future Vol, veh/h	46	7	3	105	187	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	58	9	4	133	237	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	382	241	244	0	-	0
Stage 1	241	-	-	-	-	-
Stage 2	141	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	622	800	1328	-	-	-
Stage 1	801	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	619	799	1327	-	-	-
Mov Cap-2 Maneuver	619	-	-	-	-	-
Stage 1	798	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.3	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1327	-	638	-	-	
HCM Lane V/C Ratio	0.003	-	0.105	-	-	
HCM Control Delay (s)	7.7	0	11.3	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

HCM 6th TWSC
1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Existing Plus Phase 1 Conditions
Timing Plan: AM Peak Hour

Intersection												
Int Delay, s/veh	1.7											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	620	0	0	259	0	2	0	151	0	0	0
Future Vol, veh/h	2	620	0	0	259	0	2	0	151	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	210	-	-	-	-	-	-	-	400	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	2	653	0	0	273	0	2	0	159	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	273	0	-	-	-	0	930	930	327
Stage 1	-	-	-	-	-	-	657	657	-
Stage 2	-	-	-	-	-	-	273	273	-
Critical Hdwy	4.115	-	-	-	-	-	6.615	6.515	6.915
Critical Hdwy Stg 1	-	-	-	-	-	-	5.815	5.515	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.415	5.515	-
Follow-up Hdwy	2.2095	-	-	-	-	-	3.5095	4.0095	3.3095
Pot Cap-1 Maneuver	1295	-	0	0	-	-	282	268	672
Stage 1	-	-	0	0	-	-	481	463	-
Stage 2	-	-	0	0	-	-	775	685	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1295	-	-	-	-	-	281	0	672
Mov Cap-2 Maneuver	-	-	-	-	-	-	281	0	-
Stage 1	-	-	-	-	-	-	480	0	-
Stage 2	-	-	-	-	-	-	775	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0	0	11.3
HCM LOS			B

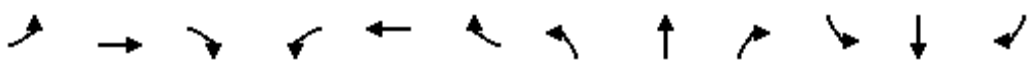
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	638	672	1295	-	-	-
HCM Lane V/C Ratio	0.086	0.158	0.002	-	-	-
HCM Control Delay (s)	11.2	11.4	7.8	-	-	-
HCM Lane LOS	B	B	A	-	-	-
HCM 95th %tile Q(veh)	0.3	0.6	0	-	-	-

HCM 6th Signalized Intersection Summary

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Existing Plus Phase 1 Conditions

Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑	↗	↔↔	↑	↗
Traffic Volume (veh/h)	82	353	193	381	980	209	283	85	141	268	135	190
Future Volume (veh/h)	82	353	193	381	980	209	283	85	141	268	135	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	1.00		0.99
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	85	364	65	393	1010	92	292	88	16	276	139	21
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	250	2243	696	422	2496	774	363	199	168	346	203	170
Arrive On Green	0.07	0.44	0.44	0.12	0.49	0.49	0.10	0.11	0.11	0.10	0.11	0.11
Sat Flow, veh/h	3456	5106	1585	3456	5106	1584	3456	1870	1576	3456	1870	1563
Grp Volume(v), veh/h	85	364	65	393	1010	92	292	88	16	276	139	21
Grp Sat Flow(s),veh/h/ln	1728	1702	1585	1728	1702	1584	1728	1870	1576	1728	1870	1563
Q Serve(g_s), s	2.3	4.3	2.4	11.3	12.6	3.2	8.3	4.4	0.9	7.8	7.2	1.2
Cycle Q Clear(g_c), s	2.3	4.3	2.4	11.3	12.6	3.2	8.3	4.4	0.9	7.8	7.2	1.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	250	2243	696	422	2496	774	363	199	168	346	203	170
V/C Ratio(X)	0.34	0.16	0.09	0.93	0.40	0.12	0.81	0.44	0.10	0.80	0.68	0.12
Avail Cap(c_a), veh/h	594	2243	696	422	2496	774	619	335	282	594	322	269
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	16.9	16.4	43.5	16.3	13.9	43.8	41.9	40.3	44.0	42.9	40.3
Incr Delay (d2), s/veh	0.3	0.2	0.3	27.2	0.5	0.3	1.6	1.1	0.2	1.6	3.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.0	1.6	0.9	6.2	4.6	1.1	3.6	2.1	0.4	3.3	3.4	0.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.4	17.1	16.7	70.7	16.8	14.2	45.4	43.0	40.5	45.6	45.9	40.5
LnGrp LOS	D	B	B	E	B	B	D	D	D	D	D	D
Approach Vol, veh/h		514			1495			396			436	
Approach Delay, s/veh		21.5			30.8			44.6			45.5	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.0	54.7	15.6	16.7	18.0	49.7	15.8	16.5				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	17.2	25.2	17.9	17.2	12.2	30.2	17.2	* 18				
Max Q Clear Time (g_c+I1), s	4.3	14.6	10.3	9.2	13.3	6.3	9.8	6.4				
Green Ext Time (p_c), s	0.1	4.9	0.2	0.3	0.0	2.4	0.2	0.2				

Intersection Summary

HCM 6th Ctrl Delay	33.3
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

HCM 6th AWSC
3: W Taron Dr & Riparian Dr

Existing Plus Phase 1 Conditions
Timing Plan: AM Peak Hour

Intersection

Intersection Delay, s/veh 15.6

Intersection LOS C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	128	7	3	15	16	96	9	210	4	0	77	399	160
Future Vol, veh/h	128	7	3	15	16	96	9	210	4	0	77	399	160
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	149	8	3	17	19	112	10	244	5	0	90	464	186
Number of Lanes	1	1	0	1	1	0	1	2	0	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	15.1	12.7	13.3	17.1
HCM LOS	C	B	B	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	95%	0%	70%	0%	14%	0%	100%	45%
Vol Right, %	0%	0%	5%	0%	30%	0%	86%	0%	0%	55%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	9	140	74	128	10	15	112	77	266	293
LT Vol	9	0	0	128	0	15	0	77	0	0
Through Vol	0	140	70	0	7	0	16	0	266	133
RT Vol	0	0	4	0	3	0	96	0	0	160
Lane Flow Rate	10	163	86	149	12	17	130	90	309	341
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.023	0.341	0.179	0.345	0.025	0.041	0.266	0.179	0.574	0.596
Departure Headway (Hd)	8.058	7.548	7.509	8.348	7.633	8.461	7.352	7.19	6.682	6.294
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	444	475	478	430	468	423	488	502	544	576
Service Time	5.811	5.301	5.262	6.102	5.387	6.216	5.106	4.89	4.382	3.994
HCM Lane V/C Ratio	0.023	0.343	0.18	0.347	0.026	0.04	0.266	0.179	0.568	0.592
HCM Control Delay	11	14.2	11.9	15.5	10.6	11.6	12.8	11.5	18	17.8
HCM Lane LOS	B	B	B	C	B	B	B	B	C	C
HCM 95th-tile Q	0.1	1.5	0.6	1.5	0.1	0.1	1.1	0.6	3.6	3.9

HCM 6th Signalized Intersection Summary

4: Franklin Blvd & Elk Grove Blvd

Existing Plus Phase 1 Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	220	1188	459	81	1095	286	753	600	161	244	238	256
Future Volume (veh/h)	220	1188	459	81	1095	286	753	600	161	244	238	256
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	239	1291	153	88	1190	156	818	652	33	265	259	28
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, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	319	1897	1024	330	1913	594	848	1286	391	325	515	155
Arrive On Green	0.09	0.37	0.37	0.09	0.37	0.37	0.24	0.25	0.25	0.09	0.10	0.10
Sat Flow, veh/h	3483	5147	2776	3483	5147	1598	3483	5147	1563	3483	5147	1554
Grp Volume(v), veh/h	239	1291	153	88	1190	156	818	652	33	265	259	28
Grp Sat Flow(s),veh/h/ln	1742	1716	1388	1742	1716	1598	1742	1716	1563	1742	1716	1554
Q Serve(g_s), s	8.0	25.4	4.4	2.8	22.7	8.2	27.9	13.1	1.9	9.0	5.7	2.0
Cycle Q Clear(g_c), s	8.0	25.4	4.4	2.8	22.7	8.2	27.9	13.1	1.9	9.0	5.7	2.0
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	1897	1024	330	1913	594	848	1286	391	325	515	155
V/C Ratio(X)	0.75	0.68	0.15	0.27	0.62	0.26	0.97	0.51	0.08	0.81	0.50	0.18
Avail Cap(c_a), veh/h	470	1897	1024	470	1913	594	848	1286	391	702	995	300
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	31.9	25.3	50.5	30.8	26.2	44.9	38.7	34.5	53.4	51.2	49.5
Incr Delay (d2), s/veh	3.7	2.0	0.3	0.2	1.5	1.1	22.6	0.3	0.1	1.9	0.8	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.6	10.4	1.5	1.2	9.2	3.2	14.2	5.4	0.7	3.9	2.4	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.9	33.9	25.6	50.6	32.3	27.3	67.5	39.0	34.6	55.3	51.9	50.0
LnGrp LOS	E	C	C	D	C	C	E	D	C	E	D	D
Approach Vol, veh/h	1683			1434			1503			552		
Approach Delay, s/veh	36.4			32.9			54.4			53.4		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.8	50.4	35.0	17.8	17.2	50.0	17.0	35.8				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	16.8	28.2	29.2	23.2	16.2	28.2	24.2	28.2				
Max Q Clear Time (g_c+110), s	110.0	24.7	29.9	7.7	4.8	27.4	11.0	15.1				
Green Ext Time (p_c), s	0.4	2.4	0.0	1.4	0.1	0.6	0.2	3.4				

Intersection Summary

HCM 6th Ctrl Delay 42.5
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM 6th TWSC
5: W Taron Dr & Shell Dwy/Chevron Dwy

Existing Plus Phase 1 Conditions
Timing Plan: AM Peak Hour

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	65	0	0	31	0	478	9	0	571	113
Future Vol, veh/h	0	0	65	0	0	31	0	478	9	0	571	113
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	76	0	0	36	0	556	10	0	664	131
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	398	-	-	283	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.92	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.31	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	604	0	0	717	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	604	-	-	717	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.8		10.3		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT		NBR EBLn1WBLn1		SBT SBR							
Capacity (veh/h)	-		604 717		-							
HCM Lane V/C Ratio	-		0.125 0.05		-							
HCM Control Delay (s)	-		11.8 10.3		-							
HCM Lane LOS	-		B B		-							
HCM 95th %tile Q(veh)	-		0.4 0.2		-							

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	1	0	223	405	12
Future Vol, veh/h	0	1	0	223	405	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	1	0	301	547	16
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	555	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.21	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.309	-	-	-	-
Pot Cap-1 Maneuver	0	533	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	533	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	11.8	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	533	-	-		
HCM Lane V/C Ratio	-	0.003	-	-		
HCM Control Delay (s)	-	11.8	-	-		
HCM Lane LOS	-	B	-	-		
HCM 95th %tile Q(veh)	-	0	-	-		

HCM 6th TWSC
7: W Taron Dr & CA NSU North Dwy

Existing Plus Phase 1 Conditions
Timing Plan: AM Peak Hour

Intersection						
Int Delay, s/veh	0.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	25	0	3	198	155	251
Future Vol, veh/h	25	0	3	198	155	251
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	34	0	4	268	209	339
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	655	379	548	0	-	0
Stage 1	379	-	-	-	-	-
Stage 2	276	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	432	670	1027	-	-	-
Stage 1	694	-	-	-	-	-
Stage 2	773	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	430	670	1027	-	-	-
Mov Cap-2 Maneuver	430	-	-	-	-	-
Stage 1	691	-	-	-	-	-
Stage 2	773	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	14.1	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1027	-	430	-	-	
HCM Lane V/C Ratio	0.004	-	0.079	-	-	
HCM Control Delay (s)	8.5	0	14.1	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.3	-	-	

HCM 6th TWSC
8: W Taron Dr & CA NSU South Dwy

Existing Plus Phase 1 Conditions
Timing Plan: AM Peak Hour

Intersection						
Int Delay, s/veh	0.3					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	4	0	7	197	123	32
Future Vol, veh/h	4	0	7	197	123	32
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	4	0	8	212	132	34
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	377	149	166	0	-	0
Stage 1	149	-	-	-	-	-
Stage 2	228	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	627	900	1418	-	-	-
Stage 1	881	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	623	900	1418	-	-	-
Mov Cap-2 Maneuver	623	-	-	-	-	-
Stage 1	876	-	-	-	-	-
Stage 2	812	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1418	-	623	-	-	
HCM Lane V/C Ratio	0.005	-	0.007	-	-	
HCM Control Delay (s)	7.6	0	10.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Existing Plus Phase 1 Conditions
Timing Plan: PM Peak Hour

Intersection												
Int Delay, s/veh	2.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	1140	0	0	150	0	0	0	226	0	0	0
Future Vol, veh/h	2	1140	0	0	150	0	0	0	226	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	210	-	-	-	-	-	-	-	400	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	2	1213	0	0	160	0	0	0	240	0	0	0

Major/Minor	Major1		Major2		Minor1		
Conflicting Flow All	160	0	-	-	-	0	1377
Stage 1	-	-	-	-	-	-	1217
Stage 2	-	-	-	-	-	-	160
Critical Hdwy	4.1	-	-	-	-	-	6.6
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4
Follow-up Hdwy	2.2	-	-	-	-	-	3.5
Pot Cap-1 Maneuver	1432	-	0	0	-	-	149
Stage 1	-	-	0	0	-	-	247
Stage 2	-	-	0	0	-	-	874
Platoon blocked, %	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1432	-	-	-	-	-	149
Mov Cap-2 Maneuver	-	-	-	-	-	-	149
Stage 1	-	-	-	-	-	-	247
Stage 2	-	-	-	-	-	-	874

Approach	EB	WB	NB
HCM Control Delay, s	0	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	444	444	1432	-	-	-
HCM Lane V/C Ratio	0.18	0.361	0.001	-	-	-
HCM Control Delay (s)	14.9	17.6	7.5	-	-	-
HCM Lane LOS	B	C	A	-	-	-
HCM 95th %tile Q(veh)	0.7	1.6	0	-	-	-

HCM 6th Signalized Intersection Summary

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Existing Plus Phase 1 Conditions

Timing Plan: PM Peak Hour

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↑↑↑	↱	↰↱	↑↑↑	↱	↰↱	↑	↱	↰↱	↑	↱
Traffic Volume (veh/h)	173	931	173	244	547	186	325	114	321	381	123	144
Future Volume (veh/h)	173	931	173	244	547	186	325	114	321	381	123	144
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	182	980	67	257	576	70	342	120	70	401	129	15
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	277	2187	678	326	2260	701	415	215	177	472	259	215
Arrive On Green	0.08	0.42	0.42	0.09	0.44	0.44	0.12	0.11	0.11	0.14	0.14	0.14
Sat Flow, veh/h	3483	5147	1595	3483	5147	1598	3483	1885	1559	3483	1885	1566
Grp Volume(v), veh/h	182	980	67	257	576	70	342	120	70	401	129	15
Grp Sat Flow(s),veh/h/ln	1742	1716	1595	1742	1716	1598	1742	1885	1559	1742	1885	1566
Q Serve(g_s), s	5.1	13.5	2.5	7.2	7.1	2.6	9.6	6.0	4.2	11.2	6.3	0.8
Cycle Q Clear(g_c), s	5.1	13.5	2.5	7.2	7.1	2.6	9.6	6.0	4.2	11.2	6.3	0.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	277	2187	678	326	2260	701	415	215	177	472	259	215
V/C Ratio(X)	0.66	0.45	0.10	0.79	0.25	0.10	0.82	0.56	0.39	0.85	0.50	0.07
Avail Cap(c_a), veh/h	495	2187	678	495	2260	701	728	356	295	704	343	285
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.7	20.4	17.3	44.4	17.7	16.5	43.0	41.9	41.1	42.2	39.9	37.6
Incr Delay (d2), s/veh	1.0	0.7	0.3	2.3	0.3	0.3	1.6	1.7	1.1	4.2	1.1	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	2.2	5.2	1.0	3.1	2.7	1.0	4.1	2.9	1.6	4.9	2.9	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	45.7	21.1	17.5	46.7	18.0	16.7	44.6	43.6	42.2	46.4	41.0	37.7
LnGrp LOS	D	C	B	D	B	B	D	D	D	D	D	D
Approach Vol, veh/h		1229			903			532			545	
Approach Delay, s/veh		24.5			26.1			44.1			44.9	
Approach LOS		C			C			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.7	49.7	17.0	19.5	15.2	48.3	19.4	17.2				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	14.2	24.2	20.9	18.2	14.2	24.2	20.2	* 19				
Max Q Clear Time (g_c+I1), s	7.1	9.1	11.6	8.3	9.2	15.5	13.2	8.0				
Green Ext Time (p_c), s	0.1	3.3	0.3	0.3	0.1	4.1	0.3	0.5				

Intersection Summary

HCM 6th Ctrl Delay	31.7
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

HCM 6th AWSC
3: W Taron Dr & Riparian Dr

Existing Plus Phase 1 Conditions
Timing Plan: PM Peak Hour

Intersection

Intersection Delay, s/veh40.4

Intersection LOS E

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations															
Traffic Vol, veh/h	0	375	20	15	6	19	42	0	18	261	11	0	170	207	104
Future Vol, veh/h	0	375	20	15	6	19	42	0	18	261	11	0	170	207	104
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	452	24	18	7	23	51	0	22	314	13	0	205	249	125
Number of Lanes	0	1	1	0	1	1	0	0	1	2	0	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	87.3	13.9	17.9	17.7
HCM LOS	F	B	C	C

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	89%	0%	57%	0%	31%	0%	100%	40%
Vol Right, %	0%	0%	11%	0%	43%	0%	69%	0%	0%	60%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	18	174	98	375	35	6	61	170	138	173
LT Vol	18	0	0	375	0	6	0	170	0	0
Through Vol	0	174	87	0	20	0	19	0	138	69
RT Vol	0	0	11	0	15	0	42	0	0	104
Lane Flow Rate	22	210	118	452	42	7	73	205	166	208
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.055	0.499	0.278	1.074	0.091	0.02	0.184	0.49	0.374	0.443
Departure Headway (Hd)	9.444	8.925	8.844	8.561	7.755	10.245	9.238	8.933	8.416	7.98
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	381	407	409	425	464	351	391	406	431	454
Service Time	7.144	6.625	6.544	6.268	5.462	7.945	6.938	6.633	6.116	5.68
HCM Lane V/C Ratio	0.058	0.516	0.289	1.064	0.091	0.02	0.187	0.505	0.385	0.458
HCM Control Delay	12.7	20.2	14.9	94.4	11.2	13.2	14	19.9	16.1	16.9
HCM Lane LOS	B	C	B	F	B	B	B	C	C	C
HCM 95th-tile Q	0.2	2.7	1.1	15.1	0.3	0.1	0.7	2.6	1.7	2.2

HCM 6th Signalized Intersection Summary

4: Franklin Blvd & Elk Grove Blvd

Existing Plus Phase 1 Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↖↗	↑↑↑	↖↗	↖↗	↑↑↑	↖	↖↗	↑↑↑	↖	↖↗	↑↑↑	↖
Traffic Volume (veh/h)	211	1250	567	93	908	299	540	365	79	364	481	253
Future Volume (veh/h)	211	1250	567	93	908	299	540	365	79	364	481	253
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.99	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	218	1289	208	96	936	119	557	376	13	375	496	31
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	319	2119	1143	334	2142	664	612	895	277	435	635	194
Arrive On Green	0.09	0.41	0.41	0.10	0.42	0.42	0.18	0.17	0.17	0.12	0.12	0.12
Sat Flow, veh/h	3483	5147	2775	3483	5147	1596	3483	5147	1589	3483	5147	1570
Grp Volume(v), veh/h	218	1289	208	96	936	119	557	376	13	375	496	31
Grp Sat Flow(s),veh/h/ln	1742	1716	1387	1742	1716	1596	1742	1716	1589	1742	1716	1570
Q Serve(g_s), s	7.3	23.6	5.7	3.1	15.6	5.6	18.8	7.8	0.8	12.7	11.2	2.1
Cycle Q Clear(g_c), s	7.3	23.6	5.7	3.1	15.6	5.6	18.8	7.8	0.8	12.7	11.2	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	2119	1143	334	2142	664	612	895	277	435	635	194
V/C Ratio(X)	0.68	0.61	0.18	0.29	0.44	0.18	0.91	0.42	0.05	0.86	0.78	0.16
Avail Cap(c_a), veh/h	586	2119	1143	528	2142	664	673	895	277	673	823	251
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.8	27.7	22.4	50.4	25.0	22.1	48.5	44.2	41.3	51.5	51.0	47.0
Incr Delay (d2), s/veh	2.6	1.3	0.4	0.2	0.7	0.6	14.9	0.3	0.1	4.4	3.7	0.4
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	8.2	9.5	1.9	1.3	6.2	2.2	9.2	3.3	0.3	5.7	4.9	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	55.4	29.0	22.8	50.6	25.7	22.7	63.4	44.5	41.3	55.9	54.7	47.4
LnGrp LOS	E	C	C	D	C	C	E	D	D	E	D	D
Approach Vol, veh/h		1715			1151			946			902	
Approach Delay, s/veh		31.6			27.4			55.6			55.0	
Approach LOS		C			C			E			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.8	55.7	26.9	20.6	17.3	55.2	20.8	26.7				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	20.2	34.2	23.2	19.2	18.2	36.2	23.2	19.2				
Max Q Clear Time (g_c+I), s	19.3	17.6	20.8	13.2	5.1	25.6	14.7	9.8				
Green Ext Time (p_c), s	0.5	5.9	0.2	1.6	0.1	6.4	0.3	1.5				

Intersection Summary

HCM 6th Ctrl Delay 39.9
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM 6th TWSC
5: W Taron Dr & Shell Dwy/Chevron Dwy

Existing Plus Phase 1 Conditions
Timing Plan: PM Peak Hour

Intersection												
Int Delay, s/veh	1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	97	0	0	18	0	742	11	0	384	124
Future Vol, veh/h	0	0	97	0	0	18	0	742	11	0	384	124
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	123	0	0	23	0	939	14	0	486	157
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	323	-	-	477	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.92	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.31	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	676	0	0	537	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	675	-	-	537	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	11.5		12		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT		NBR EBLn1WBLn1		SBT		SBR					
Capacity (veh/h)	-		675 537		-		-					
HCM Lane V/C Ratio	-		0.182 0.042		-		-					
HCM Control Delay (s)	-		11.5 12		-		-					
HCM Lane LOS	-		B B		-		-					
HCM 95th %tile Q(veh)	-		0.7 0.1		-		-					

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	8	0	290	228	4
Future Vol, veh/h	0	8	0	290	228	4
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	12	0	420	330	6
Major/Minor	Minor2	Major1	Major2			
Conflicting Flow All	-	336	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.22	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.318	-	-	-	-
Pot Cap-1 Maneuver	0	706	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	704	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB	SB			
HCM Control Delay, s	10.2	0	0			
HCM LOS	B					
Minor Lane/Major Mvmt	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	-	704	-	-		
HCM Lane V/C Ratio	-	0.016	-	-		
HCM Control Delay (s)	-	10.2	-	-		
HCM Lane LOS	-	B	-	-		
HCM 95th %tile Q(veh)	-	0.1	-	-		

HCM 6th TWSC
7: W Taron Dr & CA NSU North Dwy

Existing Plus Phase 1 Conditions
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	4.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	135	2	0	153	196	40
Future Vol, veh/h	135	2	0	153	196	40
Conflicting Peds, #/hr	2	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	190	3	0	215	276	56
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	524	307	335	0	-	0
Stage 1	307	-	-	-	-	-
Stage 2	217	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	514	733	1224	-	-	-
Stage 1	746	-	-	-	-	-
Stage 2	819	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	511	731	1221	-	-	-
Mov Cap-2 Maneuver	511	-	-	-	-	-
Stage 1	744	-	-	-	-	-
Stage 2	817	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	16.2	0		0		
HCM LOS	C					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1221	-	513	-	-	
HCM Lane V/C Ratio	-	-	0.376	-	-	
HCM Control Delay (s)	0	-	16.2	-	-	
HCM Lane LOS	A	-	C	-	-	
HCM 95th %tile Q(veh)	0	-	1.7	-	-	

HCM 6th TWSC
8: W Taron Dr & CA NSU South Dwy

Existing Plus Phase 1 Conditions
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	1.7					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	46	7	3	107	190	6
Future Vol, veh/h	46	7	3	107	190	6
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	58	9	4	135	241	8
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	389	246	250	0	-	0
Stage 1	246	-	-	-	-	-
Stage 2	143	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	617	795	1321	-	-	-
Stage 1	797	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	614	794	1320	-	-	-
Mov Cap-2 Maneuver	614	-	-	-	-	-
Stage 1	794	-	-	-	-	-
Stage 2	886	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.4	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1320	-	633	-	-	
HCM Lane V/C Ratio	0.003	-	0.106	-	-	
HCM Control Delay (s)	7.7	0	11.4	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

HCM 6th Signalized Intersection Summary Existing Plus Phase 1 Conditions (w/ Improvements)

3: W Taron Dr & Riparian Dr

Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	128	7	3	15	16	96	9	210	4	77	399	160
Future Volume (veh/h)	128	7	3	15	16	96	9	210	4	77	399	160
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		0.99	1.00		0.99	1.00		0.99
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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	149	8	2	17	19	17	10	244	5	90	464	152
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	277	314	79	68	91	82	42	796	16	228	862	280
Arrive On Green	0.15	0.22	0.22	0.04	0.10	0.10	0.02	0.22	0.22	0.13	0.33	0.33
Sat Flow, veh/h	1795	1453	363	1795	914	818	1795	3589	73	1795	2651	862
Grp Volume(v), veh/h	149	0	10	17	0	36	10	122	127	90	312	304
Grp Sat Flow(s),veh/h/ln	1795	0	1816	1795	0	1732	1795	1791	1871	1795	1791	1722
Q Serve(g_s), s	3.9	0.0	0.2	0.5	0.0	1.0	0.3	2.9	2.9	2.4	7.3	7.4
Cycle Q Clear(g_c), s	3.9	0.0	0.2	0.5	0.0	1.0	0.3	2.9	2.9	2.4	7.3	7.4
Prop In Lane	1.00		0.20	1.00		0.47	1.00		0.04	1.00		0.50
Lane Grp Cap(c), veh/h	277	0	393	68	0	173	42	397	415	228	583	560
V/C Ratio(X)	0.54	0.00	0.03	0.25	0.00	0.21	0.24	0.31	0.31	0.40	0.54	0.54
Avail Cap(c_a), veh/h	521	0	1234	315	0	978	315	865	904	381	931	896
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	20.0	0.0	15.9	24.0	0.0	21.2	24.6	16.7	16.7	20.6	14.2	14.2
Incr Delay (d2), s/veh	1.6	0.0	0.0	1.9	0.0	0.6	2.9	0.4	0.4	1.1	0.8	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	0.1	0.2	0.0	0.4	0.1	1.1	1.1	1.0	2.6	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	21.6	0.0	15.9	25.9	0.0	21.8	27.5	17.1	17.1	21.7	14.9	15.0
LnGrp LOS	C	A	B	C	A	C	C	B	B	C	B	B
Approach Vol, veh/h	159			53			259			706		
Approach Delay, s/veh	21.3			23.1			17.5			15.8		
Approach LOS	C			C			B			B		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	11.6	16.5	7.0	16.2	6.3	21.8	13.0	10.2				
Change Period (Y+Rc), s	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1				
Max Green Setting (Gmax), s	10.9	24.8	9.0	34.9	9.0	26.7	14.9	29.0				
Max Q Clear Time (g_c+I1), s	4.4	4.9	2.5	2.2	2.3	9.4	5.9	3.0				
Green Ext Time (p_c), s	0.1	1.2	0.0	0.0	0.0	3.5	0.2	0.1				
Intersection Summary												
HCM 6th Ctrl Delay	17.3											
HCM 6th LOS	B											

HCM 6th Signalized Intersection Summary

3: W Taron Dr & Riparian Dr

Existing Plus Phase 1 (w/ Improvements)

Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	375	20	15	6	19	42	18	261	11	170	207	104
Future Volume (veh/h)	375	20	15	6	19	42	18	261	11	170	207	104
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	452	24	7	7	23	6	22	314	11	205	249	73
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	492	459	134	30	101	26	82	650	23	254	764	218
Arrive On Green	0.27	0.33	0.33	0.02	0.07	0.07	0.05	0.18	0.18	0.14	0.28	0.28
Sat Flow, veh/h	1795	1402	409	1795	1441	376	1795	3526	123	1795	2730	779
Grp Volume(v), veh/h	452	0	31	7	0	29	22	159	166	205	161	161
Grp Sat Flow(s),veh/h/ln	1795	0	1812	1795	0	1817	1795	1791	1858	1795	1791	1718
Q Serve(g_s), s	15.1	0.0	0.7	0.2	0.0	0.9	0.7	4.9	4.9	6.8	4.4	4.6
Cycle Q Clear(g_c), s	15.1	0.0	0.7	0.2	0.0	0.9	0.7	4.9	4.9	6.8	4.4	4.6
Prop In Lane	1.00		0.23	1.00		0.21	1.00		0.07	1.00		0.45
Lane Grp Cap(c), veh/h	492	0	593	30	0	127	82	330	342	254	501	481
V/C Ratio(X)	0.92	0.00	0.05	0.24	0.00	0.23	0.27	0.48	0.48	0.81	0.32	0.33
Avail Cap(c_a), veh/h	492	0	1083	262	0	854	262	691	716	288	717	688
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	21.7	0.0	14.2	30.0	0.0	27.1	28.4	22.5	22.5	25.7	17.6	17.7
Incr Delay (d2), s/veh	22.5	0.0	0.0	4.0	0.0	0.9	1.7	1.1	1.1	14.0	0.4	0.4
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	8.9	0.0	0.3	0.1	0.0	0.4	0.3	2.0	2.1	3.7	1.7	1.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.3	0.0	14.3	34.0	0.0	28.0	30.2	23.6	23.6	39.7	17.9	18.1
LnGrp LOS	D	A	B	C	A	C	C	C	C	D	B	B
Approach Vol, veh/h		483			36			347			527	
Approach Delay, s/veh		42.3			29.2			24.0			26.4	
Approach LOS		D			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.8	16.5	6.1	25.3	7.9	22.4	22.0	9.4				
Change Period (Y+Rc), s	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1				
Max Green Setting (Gmax), s	9.9	23.8	9.0	36.9	9.0	24.7	16.9	29.0				
Max Q Clear Time (g_c+I1), s	8.8	6.9	2.2	2.7	2.7	6.6	17.1	2.9				
Green Ext Time (p_c), s	0.1	1.6	0.0	0.1	0.0	1.7	0.0	0.1				
Intersection Summary												
HCM 6th Ctrl Delay			31.4									
HCM 6th LOS			C									
Notes												
User approved ignoring U-Turning movement.												



Major Street	Elk Grove Boulevard
Minor Street	I-5 NB Ramps

Project	Elk Grove California Northstate Univ.
Scenario	Cumulative Conditions
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	0	-	0
Through	0	0	520	260
Right	480	0	0	0
Total	500	0	520	260

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	16.4
Approach with Worst Case Delay	NB
Total Vehicles on Approach	500

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Conditions	2.3	500	1,280
Limiting Value	5	150	650
Condition Satisfied?	Not Met	Met	Met
Warrant Met	NO		

Major Street **Elk Grove Boulevard**
 Minor Street **I-5 NB Ramps**

Project **Elk Grove California Northstate Univ.**
 Scenario **Cumulative Conditions**
 Peak Hour **AM**

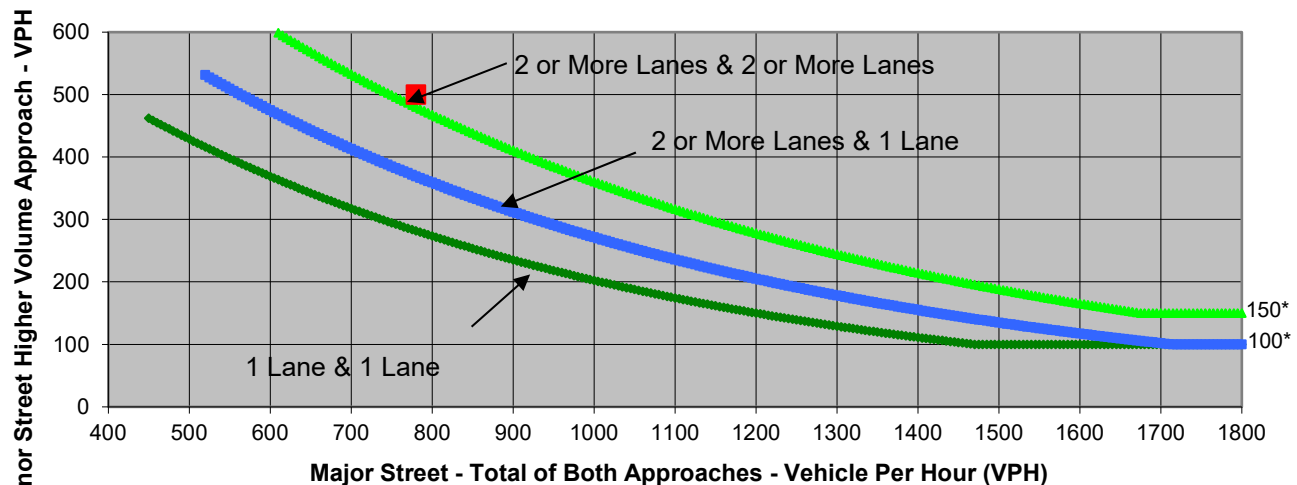
Turn Movement Volumes

	NB	SB	EB	WB
Left	20		-	
Through	0		520	260
Right	480			0
Total	500	0	520	260

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Elk Grove Boulevard	I-5 NB Ramps	
Number of Approach Lanes	2	2	<u>YES</u>
Traffic Volume (VPH) *	780	500	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	Elk Grove Boulevard
Minor Street	I-5 Ramps

Project	Elk Grove California Northstate Univ.
Scenario	Cumulative Conditions
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	0	0	0
Through	0	0	1,570	420
Right	230	0	-	0
Total	250	0	1,570	420

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	42.3
Approach with Worst Case Delay	NB
Total Vehicles on Approach	250

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative Conditions	2.9	250	2,240
Limiting Value	5	150	650
Condition Satisfied?	Not Met	Met	Met
Warrant Met	NO		

Major Street **Elk Grove Boulevard**
 Minor Street **I-5 Ramps**

Project **Elk Grove California Northstate Univ.**
 Scenario **Cumulative Conditions**
 Peak Hour **PM**

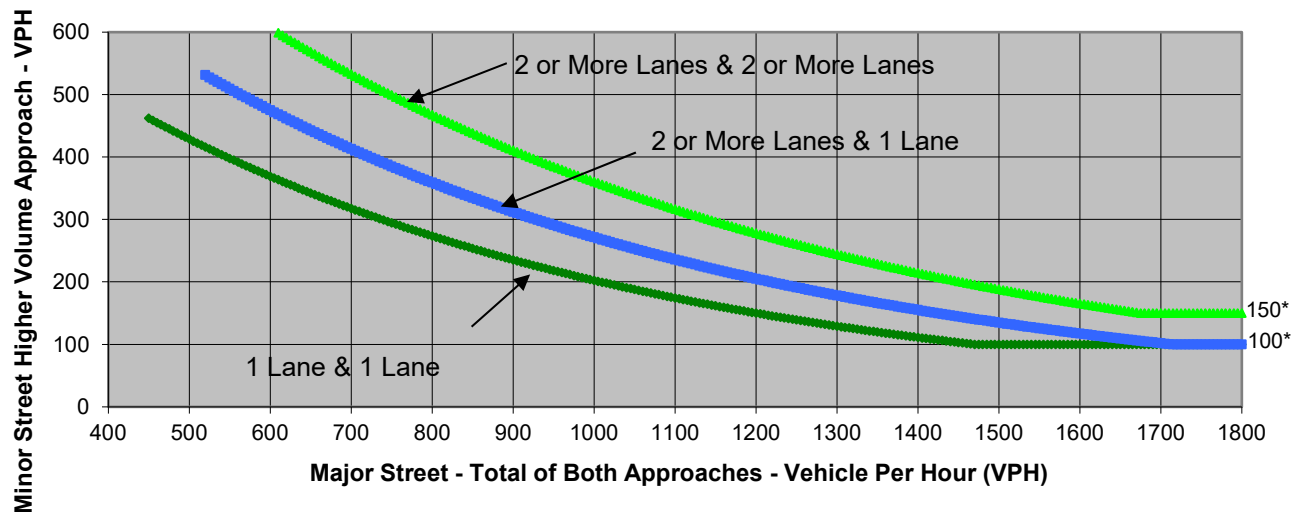
Turn Movement Volumes

	NB	SB	EB	WB
Left	20			
Through	0		1,570	420
Right	230		-	0
Total	250	0	1,570	420

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Elk Grove Boulevard	I-5 Ramps	
Number of Approach Lanes	2	2	<u>YES</u>
Traffic Volume (VPH) *	1,990	250	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	Elk Grove Boulevard
Minor Street	I-5 NB Ramps

Project	Elk Grove California Northstate Univ.
Scenario	Cumulative + Phase 3 Conditions
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	0	-	0
Through	0	0	698	311
Right	642	0	0	0
Total	662	0	698	311

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	30.9
Approach with Worst Case Delay	NB
Total Vehicles on Approach	662

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative + Phase 3 Conditions	5.7	662	1,671
Limiting Value	5	150	650
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street **Elk Grove Boulevard**
 Minor Street **I-5 NB Ramps**

Project **Elk Grove California Northstate Univ.**
 Scenario **Cumulative + Phase 3 Conditions**
 Peak Hour **AM**

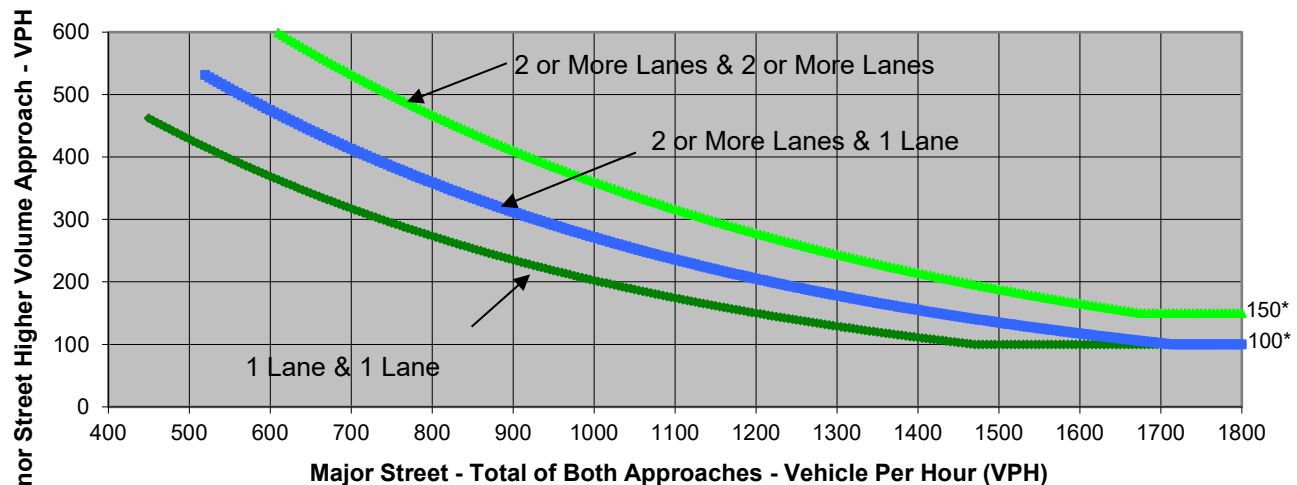
Turn Movement Volumes

	NB	SB	EB	WB
Left	20		-	
Through	0		698	311
Right	642			0
Total	662	0	698	311

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Elk Grove Boulevard	I-5 NB Ramps	
Number of Approach Lanes	2	2	<u>YES</u>
Traffic Volume (VPH) *	1,009	662	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	Elk Grove Boulevard
Minor Street	I-5 Ramps

Project	Elk Grove California Northstate Univ.
Scenario	Cumulative + Phase 3 Conditions
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	20	0	0	0
Through	0	0	1,729	509
Right	253	0	-	0
Total	273	0	1,729	509

Major Street Direction

	North/South
x	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	3

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	65
Approach with Worst Case Delay	NB
Total Vehicles on Approach	273

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative + Phase 3 Conditions	4.9	273	2,511
Limiting Value	5	150	650
Condition Satisfied?	Not Met	Met	Met
Warrant Met	NO		

Major Street **Elk Grove Boulevard**
 Minor Street **I-5 Ramps**

Project **Elk Grove California Northstate Univ.**
 Scenario **Cumulative + Phase 3 Conditions**
 Peak Hour **PM**

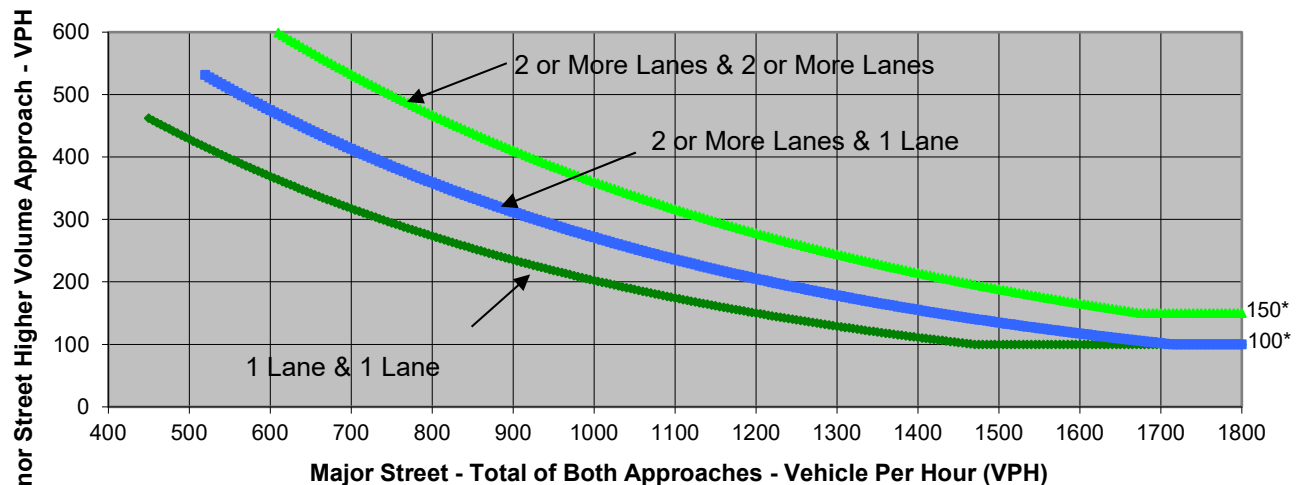
Turn Movement Volumes

	NB	SB	EB	WB
Left	20			
Through	0		1,729	509
Right	253		-	0
Total	273	0	1,729	509

Major Street Direction

	North/South
x	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	Elk Grove Boulevard	I-5 Ramps	
Number of Approach Lanes	2	2	YES
Traffic Volume (VPH) *	2,238	273	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	W Taron Drive
Minor Street	Riparian Drive

Project	Elk Grove California Northstate Univ.
Scenario	Cumulative + Phase 3 Conditions
Peak Hour	AM

Turn Movement Volumes

	NB	SB	EB	WB
Left	-	203	194	36
Through	287	802	10	21
Right	7	37	0	121
Total	294	1,042	204	178

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	29.5
Approach with Worst Case Delay	EB
Total Vehicles on Approach	204

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative + Phase 3 Conditions	1.7	204	1,718
Limiting Value	5	150	800
Condition Satisfied?	Not Met	Met	Met
Warrant Met	NO		

Major Street **W Taron Drive**
 Minor Street **Riparian Drive**

Project **Elk Grove California Northstate Univ.**
 Scenario **Cumulative + Phase 3 Conditions**
 Peak Hour **AM**

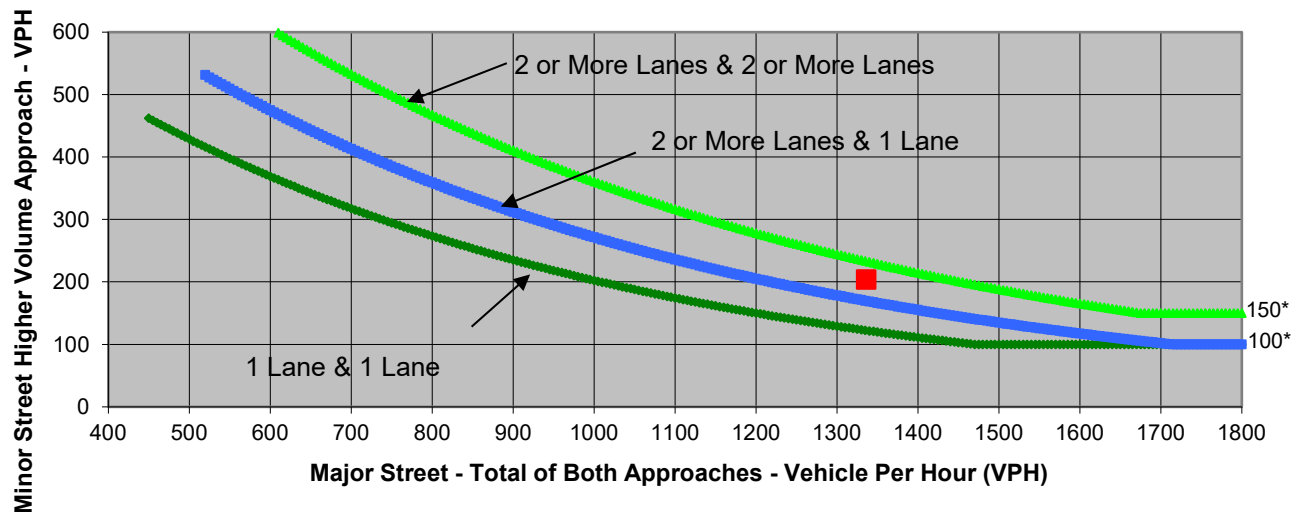
Turn Movement Volumes

	NB	SB	EB	WB
Left	-	203	194	36
Through	287	802	10	21
Right	7	37	0	121
Total	294	1,042	204	178

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	W Taron Drive	Riparian Drive	
Number of Approach Lanes	2	2	<u>NO</u>
Traffic Volume (VPH) *	1,336	204	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.



Major Street	W Taron Drive
Minor Street	Riparian Drive

Project	Elk Grove California Northstate Univ.
Scenario	Cumulative + Phase 3 Conditions
Peak Hour	PM

Turn Movement Volumes

	NB	SB	EB	WB
Left	-	574	450	17
Through	318	486	25	13
Right	14	29	2	59
Total	332	1,089	477	89

Major Street Direction

x	North/South
	East/West

Intersection Geometry

Number of Approach Lanes for Minor Street	2
Total Approaches	4

Worst Case Delay for Minor Street

Stopped Delay (seconds per vehicle)	272.9
Approach with Worst Case Delay	EB
Total Vehicles on Approach	477

Warrant 3A, Peak Hour			
	Peak Hour Delay on Minor Approach (vehicle-hours)	Peak Hour Volume on Minor Approach (vph)	Peak Hour Entering Volume Served (vph)
Cumulative + Phase 3 Conditions	36.2	477	1,987
Limiting Value	5	150	800
Condition Satisfied?	Met	Met	Met
Warrant Met	YES		

Major Street **W Taron Drive**
 Minor Street **Riparian Drive**

Project **Elk Grove California Northstate Univ.**
 Scenario **Cumulative + Phase 3 Conditions**
 Peak Hour **PM**

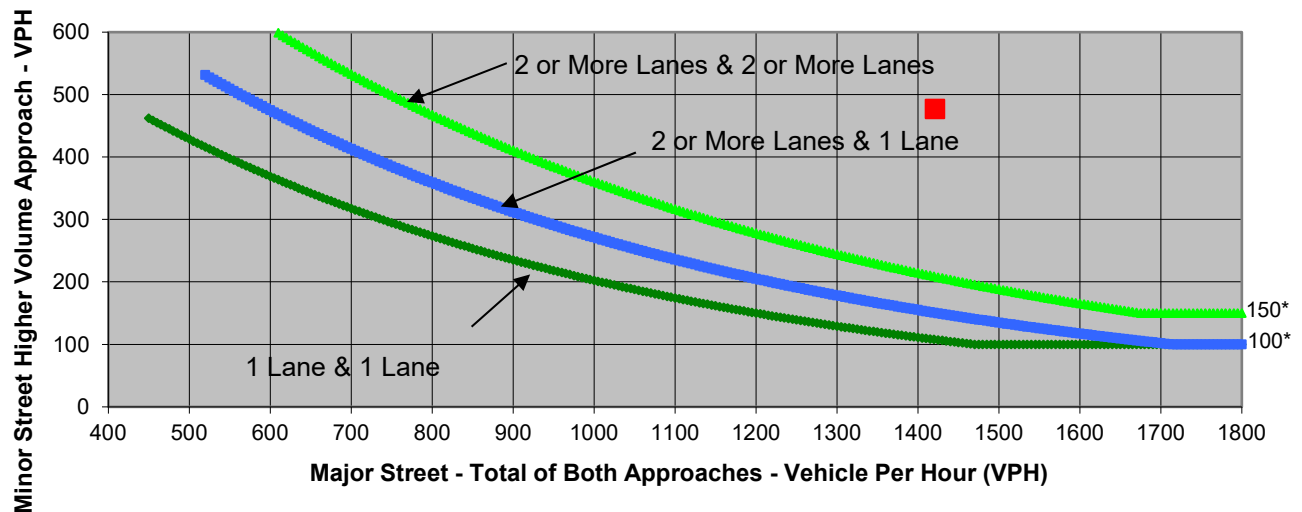
Turn Movement Volumes

	NB	SB	EB	WB
Left	-	574	450	17
Through	318	486	25	13
Right	14	29	2	59
Total	332	1,089	477	89

Major Street Direction

x	North/South
	East/West

Warrant 3B, Peak Hour



* Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: *California Manual on Uniform Traffic Control Devices*, Caltrans, 2014

	Major Street	Minor Street	Warrant Met
	W Taron Drive	Riparian Drive	
Number of Approach Lanes	2	2	<u>YES</u>
Traffic Volume (VPH) *	1,421	477	

* Note: Traffic Volume for Major Street is Total Volume of Both Approaches.
 Traffic Volume for Minor Street is the Volume of High Volume Approach.

HCM 6th TWSC
1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Cumulative No Project Conditions
Timing Plan: AM Peak Hour

Intersection												
Int Delay, s/veh	5.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	520	0	0	260	0	20	0	480	0	0	0
Future Vol, veh/h	20	520	0	0	260	0	20	0	480	0	0	0
Conflicting Peds, #/hr	0	0	2	0	0	2	0	0	2	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	210	-	-	-	-	-	-	-	400	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	21	547	0	0	274	0	21	0	505	0	0	0
Major/Minor	Major1			Major2			Minor1					
Conflicting Flow All	276	0	-	-	-	0	863	865	276			
Stage 1	-	-	-	-	-	-	589	589	-			
Stage 2	-	-	-	-	-	-	274	276	-			
Critical Hdwy	4.115	-	-	-	-	-	6.615	6.515	6.915			
Critical Hdwy Stg 1	-	-	-	-	-	-	5.815	5.515	-			
Critical Hdwy Stg 2	-	-	-	-	-	-	5.415	5.515	-			
Follow-up Hdwy	2.2095	-	-	-	-	-	3.5095	4.0095	3.3095			
Pot Cap-1 Maneuver	1292	-	0	0	-	-	311	292	725			
Stage 1	-	-	0	0	-	-	521	497	-			
Stage 2	-	-	0	0	-	-	774	683	-			
Platoon blocked, %		-			-	-						
Mov Cap-1 Maneuver	1292	-	-	-	-	-	306	0	724			
Mov Cap-2 Maneuver	-	-	-	-	-	-	306	0	-			
Stage 1	-	-	-	-	-	-	513	0	-			
Stage 2	-	-	-	-	-	-	774	0	-			
Approach	EB			WB			NB					
HCM Control Delay, s	0.3			0			13.8					
HCM LOS							B					
Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR						
Capacity (veh/h)	629	724	1292	-	-	-						
HCM Lane V/C Ratio	0.301	0.465	0.016	-	-	-						
HCM Control Delay (s)	13.2	14.2	7.8	-	-	-						
HCM Lane LOS	B	B	A	-	-	-						
HCM 95th %tile Q(veh)	1.3	2.5	0.1	-	-	-						

HCM 6th Signalized Intersection Summary

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Cumulative No Project Conditions
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	101	677	166	208	1773	690	251	92	65	457	128	280
Future Volume (veh/h)	101	677	166	208	1773	690	251	92	65	457	128	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	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	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	104	698	66	214	1828	462	259	95	7	471	132	50
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	2175	674	281	2205	684	330	198	167	535	322	268
Arrive On Green	0.08	0.43	0.43	0.08	0.43	0.43	0.10	0.11	0.11	0.15	0.17	0.17
Sat Flow, veh/h	3456	5106	1583	3456	5106	1583	3456	1870	1576	3456	1870	1559
Grp Volume(v), veh/h	104	698	66	214	1828	462	259	95	7	471	132	50
Grp Sat Flow(s),veh/h/ln	1728	1702	1583	1728	1702	1583	1728	1870	1576	1728	1870	1559
Q Serve(g_s), s	2.9	9.1	2.5	6.1	31.7	23.4	7.3	4.8	0.4	13.3	6.3	2.7
Cycle Q Clear(g_c), s	2.9	9.1	2.5	6.1	31.7	23.4	7.3	4.8	0.4	13.3	6.3	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	2175	674	281	2205	684	330	198	167	535	322	268
V/C Ratio(X)	0.40	0.32	0.10	0.76	0.83	0.68	0.79	0.48	0.04	0.88	0.41	0.19
Avail Cap(c_a), veh/h	594	2175	674	422	2205	684	619	335	282	594	322	268
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	19.1	17.2	45.0	25.1	22.8	44.2	42.1	40.2	41.3	36.9	35.4
Incr Delay (d2), s/veh	0.4	0.4	0.3	1.9	3.8	5.3	1.6	1.3	0.1	12.4	0.6	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.4	0.9	2.6	12.4	9.3	3.2	2.2	0.2	6.4	2.8	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.4	19.5	17.5	46.9	28.9	28.1	45.8	43.5	40.2	53.7	37.5	35.6
LnGrp LOS	D	B	B	D	C	C	D	D	D	D	D	D
Approach Vol, veh/h	868		2504				361		653			
Approach Delay, s/veh	22.3		30.3				45.1		49.0			
Approach LOS	C		C				D		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	49.0	14.6	23.0	13.9	48.4	21.3	16.4				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	17.2	25.2	17.9	17.2	12.2	30.2	17.2	* 18				
Max Q Clear Time (g_c+I1), s	4.9	33.7	9.3	8.3	8.1	11.1	15.3	6.8				
Green Ext Time (p_c), s	0.1	0.0	0.2	0.4	0.1	4.4	0.2	0.2				

Intersection Summary

HCM 6th Ctrl Delay 32.7
HCM 6th LOS C

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

Intersection

Intersection Delay, s/veh 11.4

Intersection LOS B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	26	2	2	12	3	121	3	195	3	0	71	368	21
Future Vol, veh/h	26	2	2	12	3	121	3	195	3	0	71	368	21
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	30	2	2	14	3	141	3	227	3	0	83	428	24
Number of Lanes	1	1	0	1	1	0	1	2	0	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	10.6	10.7	10.9	11.9
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	96%	0%	50%	0%	2%	0%	100%	85%
Vol Right, %	0%	0%	4%	0%	50%	0%	98%	0%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	3	130	68	26	4	12	124	71	245	144
LT Vol	3	0	0	26	0	12	0	71	0	0
Through Vol	0	130	65	0	2	0	3	0	245	123
RT Vol	0	0	3	0	2	0	121	0	0	21
Lane Flow Rate	3	151	79	30	5	14	144	83	285	167
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.007	0.266	0.138	0.063	0.009	0.028	0.241	0.144	0.458	0.264
Departure Headway (Hd)	6.84	6.336	6.304	7.51	6.657	7.199	6.015	6.29	5.786	5.683
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	523	567	568	476	536	497	595	570	622	631
Service Time	4.586	4.082	4.05	5.267	4.414	4.947	3.762	4.028	3.524	3.421
HCM Lane V/C Ratio	0.006	0.266	0.139	0.063	0.009	0.028	0.242	0.146	0.458	0.265
HCM Control Delay	9.6	11.4	10.1	10.8	9.5	10.2	10.7	10.1	13.3	10.5
HCM Lane LOS	A	B	B	B	A	B	B	B	B	B
HCM 95th-tile Q	0	1.1	0.5	0.2	0	0.1	0.9	0.5	2.4	1.1

HCM 6th Signalized Intersection Summary

4: Franklin Blvd & Elk Grove Blvd

Cumulative No Project Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	210	1490	760	124	1350	340	1235	880	220	301	350	220
Future Volume (veh/h)	210	1490	760	124	1350	340	1235	880	220	301	350	220
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	228	1620	221	135	1467	218	1342	957	106	327	380	48
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, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	319	1425	769	344	1463	454	1152	1644	501	388	515	155
Arrive On Green	0.09	0.28	0.28	0.10	0.28	0.28	0.33	0.32	0.32	0.11	0.10	0.10
Sat Flow, veh/h	3483	5147	2776	3483	5147	1598	3483	5147	1567	3483	5147	1554
Grp Volume(v), veh/h	228	1620	221	135	1467	218	1342	957	106	327	380	48
Grp Sat Flow(s),veh/h/ln	1742	1716	1388	1742	1716	1598	1742	1716	1567	1742	1716	1554
Q Serve(g_s), s	7.6	33.2	7.5	4.4	34.1	13.6	39.7	18.7	5.9	11.0	8.6	3.4
Cycle Q Clear(g_c), s	7.6	33.2	7.5	4.4	34.1	13.6	39.7	18.7	5.9	11.0	8.6	3.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	1425	769	344	1463	454	1152	1644	501	388	515	155
V/C Ratio(X)	0.71	1.14	0.29	0.39	1.00	0.48	1.16	0.58	0.21	0.84	0.74	0.31
Avail Cap(c_a), veh/h	441	1425	769	441	1463	454	1152	1644	501	731	588	177
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.0	43.4	34.1	50.7	42.9	35.6	40.1	34.1	29.8	52.3	52.5	50.1
Incr Delay (d2), s/veh	3.3	70.6	0.9	0.3	24.2	3.6	83.8	0.5	0.2	1.9	4.2	1.1
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	8.4	22.8	2.6	1.9	17.1	5.6	29.6	7.6	2.2	4.8	3.8	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	56.3	114.0	35.0	51.0	67.2	39.2	124.0	34.7	30.0	54.2	56.7	51.3
LnGrp LOS	E	F	D	D	F	D	F	C	C	D	E	D
Approach Vol, veh/h	2069			1820			2405			755		
Approach Delay, s/veh	99.2			62.6			84.3			55.3		
Approach LOS	F			E			F			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	16.8	39.9	45.5	17.8	17.7	39.0	19.2	44.1				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	15.2	28.2	39.7	13.7	15.2	28.2	25.2	28.2				
Max Q Clear Time (g_c+I), s	19.6	36.1	41.7	10.6	6.4	35.2	13.0	20.7				
Green Ext Time (p_c), s	0.3	0.0	0.0	0.7	0.1	0.0	0.3	3.7				

Intersection Summary

HCM 6th Ctrl Delay 80.0
HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM 6th TWSC
5: W Taron Dr & Shell Dwy/Chevron Dwy

Cumulative No Project Conditions
Timing Plan: AM Peak Hour

Intersection												
Int Delay, s/veh	0.9											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	51	0	0	35	0	373	9	0	409	68
Future Vol, veh/h	0	0	51	0	0	35	0	373	9	0	409	68
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	59	0	0	41	0	434	10	0	476	79
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	278	-	-	222	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.92	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.31	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	722	0	0	785	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	722	-	-	785	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.4		9.8		0		0					
HCM LOS	B		A									
Minor Lane/Major Mvmt	NBT		NBR EBLn1WBLn1		SBT		SBR					
Capacity (veh/h)	-		722 785		-		-					
HCM Lane V/C Ratio	-		0.082 0.052		-		-					
HCM Control Delay (s)	-		10.4 9.8		-		-					
HCM Lane LOS	-		B A		-		-					
HCM 95th %tile Q(veh)	-		0.3 0.2		-		-					

HCM 6th TWSC
6: W Taron Dr & Alldata LLC Dwy

Cumulative No Project Conditions
Timing Plan: AM Peak Hour

Intersection						
Int Delay, s/veh	0					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations		↗		↑	↘	
Traffic Vol, veh/h	0	0	0	201	370	12
Future Vol, veh/h	0	0	0	201	370	12
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	0	0	0	272	500	16
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	-	508	-	0	-	0
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Critical Hdwy	-	6.21	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-
Follow-up Hdwy	-	3.309	-	-	-	-
Pot Cap-1 Maneuver	0	567	0	-	-	-
Stage 1	0	-	0	-	-	-
Stage 2	0	-	0	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	-	567	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	0	0		0		
HCM LOS	A					
Minor Lane/Major Mvmt	NBT EBLn1		SBT	SBR		
Capacity (veh/h)	-	-	-	-		
HCM Lane V/C Ratio	-	-	-	-		
HCM Control Delay (s)	-	0	-	-		
HCM Lane LOS	-	A	-	-		
HCM 95th %tile Q(veh)	-	-	-	-		

HCM 6th TWSC
7: W Taron Dr & CA NSU North Dwy

Cumulative No Project Conditions
Timing Plan: AM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	8	0	3	193	153	217
Future Vol, veh/h	8	0	3	193	153	217
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	11	0	4	261	207	293
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	623	354	500	0	-	0
Stage 1	354	-	-	-	-	-
Stage 2	269	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	451	692	1069	-	-	-
Stage 1	713	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	449	692	1069	-	-	-
Mov Cap-2 Maneuver	449	-	-	-	-	-
Stage 1	710	-	-	-	-	-
Stage 2	778	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	13.2	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1069	-	449	-	-	
HCM Lane V/C Ratio	0.004	-	0.024	-	-	
HCM Control Delay (s)	8.4	0	13.2	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.1	-	-	

HCM 6th TWSC
8: W Taron Dr & CA NSU South Dwy

Cumulative No Project Conditions
Timing Plan: AM Peak Hour

Intersection						
Int Delay, s/veh	0.2					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	2	0	7	194	122	31
Future Vol, veh/h	2	0	7	194	122	31
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	93	93	93	93	93	93
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	2	0	8	209	131	33
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	373	148	164	0	-	0
Stage 1	148	-	-	-	-	-
Stage 2	225	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	630	901	1421	-	-	-
Stage 1	882	-	-	-	-	-
Stage 2	815	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	626	901	1421	-	-	-
Mov Cap-2 Maneuver	626	-	-	-	-	-
Stage 1	877	-	-	-	-	-
Stage 2	815	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	10.8	0.3		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1421	-	626	-	-	
HCM Lane V/C Ratio	0.005	-	0.003	-	-	
HCM Control Delay (s)	7.5	0	10.8	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0	-	-	

HCM 6th TWSC
1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Cumulative No Project Conditions
Timing Plan: PM Peak Hour

Intersection												
Int Delay, s/veh	5.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	1570	0	0	420	0	20	0	230	0	0	0
Future Vol, veh/h	20	1570	0	0	420	0	20	0	230	0	0	0
Conflicting Peds, #/hr	0	0	2	0	0	2	0	0	2	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	210	-	-	-	-	-	-	-	400	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	21	1670	0	0	447	0	21	0	245	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	449	0	- - - 0 2159 2161 837
Stage 1	-	-	- - - 1712 1712 -
Stage 2	-	-	- - - 447 449 -
Critical Hdwy	4.1	-	- - - 6.6 6.5 6.9
Critical Hdwy Stg 1	-	-	- - - 5.8 5.5 -
Critical Hdwy Stg 2	-	-	- - - 5.4 5.5 -
Follow-up Hdwy	2.2	-	- - - 3.5 4 3.3
Pot Cap-1 Maneuver	1122	- 0 0	- - 47 48 314
Stage 1	-	- 0 0	- - 134 147 -
Stage 2	-	- 0 0	- - 649 576 -
Platoon blocked, %	-	-	-
Mov Cap-1 Maneuver	1122	- - -	- 46 0 313
Mov Cap-2 Maneuver	-	- - -	- 46 0 -
Stage 1	-	- - -	- 131 0 -
Stage 2	-	- - -	- 649 0 -

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0	47.7
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	142	313	1122	-	-	-
HCM Lane V/C Ratio	0.724	0.521	0.019	-	-	-
HCM Control Delay (s)	78.4	28.4	8.3	-	-	-
HCM Lane LOS	F	D	A	-	-	-
HCM 95th %tile Q(veh)	4.2	2.8	0.1	-	-	-

HCM 6th Signalized Intersection Summary

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Cumulative No Project Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	272	1314	169	152	1039	330	241	112	141	710	123	190
Future Volume (veh/h)	272	1314	169	152	1039	330	241	112	141	710	123	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	286	1383	72	160	1094	105	254	118	20	747	129	48
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	351	1783	552	275	1670	518	327	211	175	803	482	402
Arrive On Green	0.10	0.35	0.35	0.08	0.32	0.32	0.09	0.11	0.11	0.23	0.26	0.26
Sat Flow, veh/h	3483	5147	1595	3483	5147	1595	3483	1885	1559	3483	1885	1572
Grp Volume(v), veh/h	286	1383	72	160	1094	105	254	118	20	747	129	48
Grp Sat Flow(s),veh/h/ln	1742	1716	1595	1742	1716	1595	1742	1885	1559	1742	1885	1572
Q Serve(g_s), s	8.0	24.0	3.1	4.4	18.2	4.8	7.1	5.9	1.2	21.0	5.5	2.3
Cycle Q Clear(g_c), s	8.0	24.0	3.1	4.4	18.2	4.8	7.1	5.9	1.2	21.0	5.5	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	351	1783	552	275	1670	518	327	211	175	803	482	402
V/C Ratio(X)	0.81	0.78	0.13	0.58	0.65	0.20	0.78	0.56	0.11	0.93	0.27	0.12
Avail Cap(c_a), veh/h	390	1783	552	390	1670	518	832	356	295	808	482	402
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.0	29.2	22.4	44.4	29.0	24.4	44.3	42.1	39.9	37.7	29.7	28.6
Incr Delay (d2), s/veh	10.2	3.4	0.5	0.7	2.0	0.9	1.5	1.7	0.2	16.8	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	3.8	9.8	1.2	1.9	7.3	1.9	3.1	2.8	0.4	10.4	2.4	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	32.6	22.9	45.2	31.0	25.3	45.8	43.8	40.1	54.5	29.9	28.7
LnGrp LOS	D	C	C	D	C	C	D	D	D	D	C	C
Approach Vol, veh/h	1741			1359			392			924		
Approach Delay, s/veh	35.7			32.2			44.9			49.7		
Approach LOS	D			C			D			D		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.9	38.3	14.5	31.4	13.7	40.4	28.8	17.0				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	11.2	24.2	23.9	18.2	11.2	24.2	23.2	* 19				
Max Q Clear Time (g_c+I1), s	10.0	20.2	9.1	7.5	6.4	26.0	23.0	7.9				
Green Ext Time (p_c), s	0.1	2.5	0.3	0.4	0.1	0.0	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay 38.4
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

HCM 6th AWSC
3: W Taron Dr & Riparian Dr

Cumulative No Project Conditions
Timing Plan: PM Peak Hour

Intersection

Intersection Delay, s/veh 12.3

Intersection LOS B

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations															
Traffic Vol, veh/h	1	134	8	12	4	12	59	4	11	224	9	46	120	190	22
Future Vol, veh/h	1	134	8	12	4	12	59	4	11	224	9	46	120	190	22
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	1	161	10	14	5	14	71	5	13	270	11	55	145	229	27
Number of Lanes	0	1	1	0	1	1	0	0	1	2	0	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	13.5	10.8	12	12.3
HCM LOS	B	B	B	B

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	89%	0%	40%	0%	17%	0%	100%	74%
Vol Right, %	0%	0%	11%	0%	60%	0%	83%	0%	0%	26%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	15	149	84	135	20	4	71	166	127	85
LT Vol	15	0	0	135	0	4	0	166	0	0
Through Vol	0	149	75	0	8	0	12	0	127	63
RT Vol	0	0	9	0	12	0	59	0	0	22
Lane Flow Rate	18	180	101	163	24	5	86	200	153	103
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.036	0.334	0.185	0.338	0.044	0.01	0.16	0.382	0.27	0.177
Departure Headway (Hd)	7.196	6.689	6.613	7.48	6.558	7.814	6.725	6.881	6.374	6.192
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	495	534	539	478	543	455	530	520	562	577
Service Time	4.975	4.467	4.391	5.261	4.338	5.607	4.518	4.65	4.143	3.96
HCM Lane V/C Ratio	0.036	0.337	0.187	0.341	0.044	0.011	0.162	0.385	0.272	0.179
HCM Control Delay	10.2	12.8	10.9	14.1	9.6	10.7	10.8	13.9	11.5	10.3
HCM Lane LOS	B	B	B	B	A	B	B	B	B	B
HCM 95th-tile Q	0.1	1.5	0.7	1.5	0.1	0	0.6	1.8	1.1	0.6

HCM 6th Signalized Intersection Summary

4: Franklin Blvd & Elk Grove Blvd

Cumulative No Project Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	200	1700	740	110	1250	300	748	550	190	371	490	260
Future Volume (veh/h)	200	1700	740	110	1250	300	748	550	190	371	490	260
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	206	1753	257	113	1289	169	771	567	43	382	505	90
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	319	1835	989	340	1866	579	790	1159	358	443	648	198
Arrive On Green	0.09	0.36	0.36	0.10	0.36	0.36	0.23	0.23	0.23	0.13	0.13	0.13
Sat Flow, veh/h	3483	5147	2774	3483	5147	1596	3483	5147	1591	3483	5147	1570
Grp Volume(v), veh/h	206	1753	257	113	1289	169	771	567	43	382	505	90
Grp Sat Flow(s),veh/h/ln	1742	1716	1387	1742	1716	1596	1742	1716	1591	1742	1716	1570
Q Serve(g_s), s	6.9	39.9	7.9	3.6	25.6	9.1	26.4	11.5	2.6	12.9	11.4	6.4
Cycle Q Clear(g_c), s	6.9	39.9	7.9	3.6	25.6	9.1	26.4	11.5	2.6	12.9	11.4	6.4
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	319	1835	989	340	1866	579	790	1159	358	443	648	198
V/C Ratio(X)	0.65	0.96	0.26	0.33	0.69	0.29	0.98	0.49	0.12	0.86	0.78	0.46
Avail Cap(c_a), veh/h	470	1835	989	412	1866	579	790	1159	358	790	823	251
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.6	37.7	27.4	50.5	32.5	27.3	46.1	40.5	37.0	51.3	50.8	48.6
Incr Delay (d2), s/veh	2.2	12.8	0.6	0.2	2.1	1.3	26.1	0.3	0.1	2.0	3.7	1.6
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	8.0	18.1	2.6	1.6	10.5	3.5	13.9	4.8	1.0	5.6	5.0	2.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.8	50.5	28.0	50.7	34.6	28.5	72.2	40.8	37.2	53.3	54.6	50.3
LnGrp LOS	D	D	C	D	C	C	E	D	D	D	D	D
Approach Vol, veh/h	2216						1381		977			
Approach Delay, s/veh	48.3						58.2		53.7			
Approach LOS	D		D				E		D			
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	46.8	49.3	33.0	20.9	17.5	48.6	21.1	32.8				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	16.2	34.2	27.2	19.2	14.2	36.2	27.2	19.2				
Max Q Clear Time (g_c+I), s	19.9	27.6	28.4	13.4	5.6	41.9	14.9	13.5				
Green Ext Time (p_c), s	0.4	4.4	0.0	1.7	0.1	0.0	0.4	1.8				

Intersection Summary

HCM 6th Ctrl Delay 48.0
HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM 6th TWSC
5: W Taron Dr & Shell Dwy/Chevron Dwy

Cumulative No Project Conditions
Timing Plan: PM Peak Hour

Intersection												
Int Delay, s/veh	1.1											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	0	64	0	0	42	0	452	11	0	314	98
Future Vol, veh/h	0	0	64	0	0	42	0	452	11	0	314	98
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	81	0	0	53	0	572	14	0	397	124
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	262	-	-	293	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.92	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.31	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	740	0	0	706	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	739	-	-	706	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	10.5		10.5		0		0					
HCM LOS	B		B									
Minor Lane/Major Mvmt	NBT		NBR		EBLn1WBLn1		SBT		SBR			
Capacity (veh/h)	-		-		739 706		-		-			
HCM Lane V/C Ratio	-		-		0.11 0.075		-		-			
HCM Control Delay (s)	-		-		10.5 10.5		-		-			
HCM Lane LOS	-		-		B B		-		-			
HCM 95th %tile Q(veh)	-		-		0.4 0.2		-		-			

HCM 6th TWSC
6: W Taron Dr & Alldata LLC Dwy

Cumulative No Project Conditions
Timing Plan: PM Peak Hour

Intersection

Int Delay, s/veh 0.1

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	0	6	0	248	206	4
Future Vol, veh/h	0	6	0	248	206	4
Conflicting Peds, #/hr	0	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	-	0	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	69	69	69	69	69	69
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	0	9	0	359	299	6

Major/Minor	Minor2	Major1	Major2
Conflicting Flow All	- 305	- 0	- 0
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -
Critical Hdwy	- 6.22	- -	- -
Critical Hdwy Stg 1	- -	- -	- -
Critical Hdwy Stg 2	- -	- -	- -
Follow-up Hdwy	- 3.318	- -	- -
Pot Cap-1 Maneuver	0 735	0 -	- -
Stage 1	0 -	0 -	- -
Stage 2	0 -	0 -	- -
Platoon blocked, %		- -	- -
Mov Cap-1 Maneuver	- 733	- -	- -
Mov Cap-2 Maneuver	- -	- -	- -
Stage 1	- -	- -	- -
Stage 2	- -	- -	- -

Approach	EB	NB	SB
HCM Control Delay, s	10	0	0
HCM LOS	B		

Minor Lane/Major Mvmt	NBT EBLn1	SBT	SBR
Capacity (veh/h)	- 733	- -	- -
HCM Lane V/C Ratio	- 0.012	- -	- -
HCM Control Delay (s)	- 10	- -	- -
HCM Lane LOS	- B	- -	- -
HCM 95th %tile Q(veh)	- 0	- -	- -

HCM 6th TWSC
7: W Taron Dr & CA NSU North Dwy

Cumulative No Project Conditions
Timing Plan: PM Peak Hour

Intersection							
Int Delay, s/veh	3						
Movement	EBL	EBR	NBL	NBT	SBU	SBT	SBR
Lane Configurations							
Traffic Vol, veh/h	95	2	0	151	2	190	20
Future Vol, veh/h	95	2	0	151	2	190	20
Conflicting Peds, #/hr	2	0	3	0	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	-	None
Storage Length	0	-	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	-	0	-
Grade, %	0	-	-	0	-	0	-
Peak Hour Factor	71	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2	2
Mvmt Flow	134	3	0	213	3	268	28
Major/Minor	Minor2	Major1		Major2			
Conflicting Flow All	500	285	299	0	-	-	0
Stage 1	285	-	-	-	-	-	-
Stage 2	215	-	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-	-
Pot Cap-1 Maneuver	530	754	1262	-	-	-	-
Stage 1	763	-	-	-	-	-	-
Stage 2	821	-	-	-	-	-	-
Platoon blocked, %				-	-	-	-
Mov Cap-1 Maneuver	527	752	1258	-	-	-	-
Mov Cap-2 Maneuver	527	-	-	-	-	-	-
Stage 1	761	-	-	-	-	-	-
Stage 2	819	-	-	-	-	-	-
Approach	EB	NB		SB			
HCM Control Delay, s	14.1	0					
HCM LOS	B						
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR		
Capacity (veh/h)	1258	-	530	-	-		
HCM Lane V/C Ratio	-	-	0.258	-	-		
HCM Control Delay (s)	0	-	14.1	-	-		
HCM Lane LOS	A	-	B	-	-		
HCM 95th %tile Q(veh)	0	-	1	-	-		

HCM 6th TWSC
8: W Taron Dr & CA NSU South Dwy

Cumulative No Project Conditions
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	1.8					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	46	7	3	105	187	5
Future Vol, veh/h	46	7	3	105	187	5
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	58	9	4	133	237	6
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	382	241	244	0	-	0
Stage 1	241	-	-	-	-	-
Stage 2	141	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	622	800	1328	-	-	-
Stage 1	801	-	-	-	-	-
Stage 2	888	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	619	799	1327	-	-	-
Mov Cap-2 Maneuver	619	-	-	-	-	-
Stage 1	798	-	-	-	-	-
Stage 2	887	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	11.3	0.2		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1327	-	638	-	-	
HCM Lane V/C Ratio	0.003	-	0.105	-	-	
HCM Control Delay (s)	7.7	0	11.3	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.4	-	-	

HCM 6th TWSC
1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Cumulative Plus Phase 3 Conditions
Timing Plan: AM Peak Hour

Intersection												
Int Delay, s/veh	8.5											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	698	0	0	311	0	20	0	642	0	0	0
Future Vol, veh/h	20	698	0	0	311	0	20	0	642	0	0	0
Conflicting Peds, #/hr	0	0	2	0	0	2	0	0	2	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	210	-	-	-	-	-	-	-	400	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	95	95	95	95	95	95	95	95	95	95	95	95
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	21	735	0	0	327	0	21	0	676	0	0	0

Major/Minor	Major1	Major2	Minor1
Conflicting Flow All	329	0	- - - 0 1104 1106 370
Stage 1	-	-	- - - 777 777 -
Stage 2	-	-	- - - 327 329 -
Critical Hdwy	4.115	-	- - - 6.615 6.515 6.915
Critical Hdwy Stg 1	-	-	- - - 5.815 5.515 -
Critical Hdwy Stg 2	-	-	- - - 5.415 5.515 -
Follow-up Hdwy	2.2095	-	- - - 3.5095 4.0095 3.3095
Pot Cap-1 Maneuver	1235	-	0 0 - - 220 211 ~ 630
Stage 1	-	-	0 0 - - 417 408 -
Stage 2	-	-	0 0 - - 733 648 -
Platoon blocked, %	-	-	- -
Mov Cap-1 Maneuver	1235	-	- - - 216 0 ~ 629
Mov Cap-2 Maneuver	-	-	- - - 216 0 -
Stage 1	-	-	- - - 410 0 -
Stage 2	-	-	- - - 733 0 -

Approach	EB	WB	NB
HCM Control Delay, s	0.2	0	21.4
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	541	629	1235	-	-	-
HCM Lane V/C Ratio	0.455	0.716	0.017	-	-	-
HCM Control Delay (s)	17.1	23.8	8	-	-	-
HCM Lane LOS	C	C	A	-	-	-
HCM 95th %tile Q(veh)	2.4	6	0.1	-	-	-

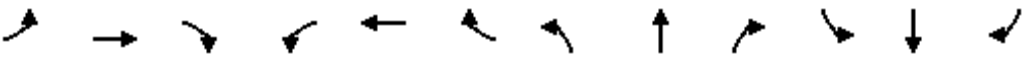
Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th Signalized Intersection Summary

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Cumulative Plus Phase 3 Conditions

Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↔↔	↑↑↑	↗	↔↔	↑↑↑	↗	↔↔	↑	↗	↔↔	↑	↗
Traffic Volume (veh/h)	101	677	454	613	1773	690	423	101	269	457	145	280
Future Volume (veh/h)	101	677	454	613	1773	690	423	101	269	457	145	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	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	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	104	698	163	632	1828	466	436	104	40	471	149	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	1853	574	560	2294	711	480	208	175	456	208	173
Arrive On Green	0.08	0.36	0.36	0.16	0.45	0.45	0.14	0.11	0.11	0.13	0.11	0.11
Sat Flow, veh/h	3456	5106	1582	3456	5106	1583	3456	1870	1576	3456	1870	1555
Grp Volume(v), veh/h	104	698	163	632	1828	466	436	104	40	471	149	40
Grp Sat Flow(s),veh/h/ln	1728	1702	1582	1728	1702	1583	1728	1870	1576	1728	1870	1555
Q Serve(g_s), s	2.9	10.1	7.3	16.2	30.7	23.0	12.4	5.2	2.3	13.2	7.7	2.3
Cycle Q Clear(g_c), s	2.9	10.1	7.3	16.2	30.7	23.0	12.4	5.2	2.3	13.2	7.7	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	1853	574	560	2294	711	480	208	175	456	208	173
V/C Ratio(X)	0.40	0.38	0.28	1.13	0.80	0.66	0.91	0.50	0.23	1.03	0.72	0.23
Avail Cap(c_a), veh/h	698	1853	574	560	2294	711	480	335	282	456	322	267
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.1	23.5	22.6	41.9	23.6	21.5	42.4	41.8	40.5	43.4	42.9	40.5
Incr Delay (d2), s/veh	0.4	0.6	1.2	78.8	3.0	4.7	20.5	1.4	0.5	50.8	3.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	3.9	2.8	12.7	11.8	9.0	6.6	2.5	0.9	8.6	3.6	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	44.4	24.1	23.9	120.7	26.6	26.2	62.9	43.2	41.0	94.2	46.3	41.0
LnGrp LOS	D	C	C	F	C	C	E	D	D	F	D	D
Approach Vol, veh/h		965			2926			580			660	
Approach Delay, s/veh		26.3			46.8			57.9			80.1	
Approach LOS		C			D			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	50.7	19.0	16.9	22.0	42.1	19.0	16.9				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	20.2	26.2	13.9	17.2	16.2	30.2	13.2	* 18				
Max Q Clear Time (g_c+I1), s	4.9	32.7	14.4	9.7	18.2	12.1	15.2	7.2				
Green Ext Time (p_c), s	0.1	0.0	0.0	0.4	0.0	4.7	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay 48.5

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

HCM 6th AWSC
3: W Taron Dr & Riparian Dr

Cumulative Plus Phase 3 Conditions
Timing Plan: AM Peak Hour

Intersection

Intersection Delay, s/veh85.2

Intersection LOS F

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations													
Traffic Vol, veh/h	194	10	0	36	21	121	4	287	7	0	203	802	37
Future Vol, veh/h	194	10	0	36	21	121	4	287	7	0	203	802	37
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	226	12	0	42	24	141	5	334	8	0	236	933	43
Number of Lanes	1	1	0	1	1	0	1	2	0	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left SB		NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right NB		SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	29.5	18.7	22.3	125.4
HCM LOS	D	C	C	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	93%	0%	100%	0%	15%	0%	100%	88%
Vol Right, %	0%	0%	7%	0%	0%	0%	85%	0%	0%	12%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	4	191	103	194	10	36	142	203	535	304
LT Vol	4	0	0	194	0	36	0	203	0	0
Through Vol	0	191	96	0	10	0	21	0	535	267
RT Vol	0	0	7	0	0	0	121	0	0	37
Lane Flow Rate	5	222	119	226	12	42	165	236	622	354
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.013	0.578	0.309	0.635	0.031	0.12	0.425	0.565	1.4	0.788
Departure Headway (Hd)	10.452	9.933	9.883	10.711	10.202	10.95	9.83	8.623	8.108	8.02
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	345	365	366	338	353	329	368	415	448	449
Service Time	8.152	7.633	7.583	8.411	7.902	8.65	7.53	6.415	5.899	5.811
HCM Lane V/C Ratio	0.014	0.608	0.325	0.669	0.034	0.128	0.448	0.569	1.388	0.788
HCM Control Delay	13.3	25.4	16.9	30.3	13.2	15.1	19.6	22.1	216.1	34.9
HCM Lane LOS	B	D	C	D	B	C	C	C	F	D
HCM 95th-tile Q	0	3.5	1.3	4.1	0.1	0.4	2.1	3.4	29.7	7

HCM 6th Signalized Intersection Summary

4: Franklin Blvd & Elk Grove Blvd

Cumulative Plus Phase 3 Conditions
Timing Plan: AM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	259	1608	817	124	1586	340	1349	880	220	301	350	317
Future Volume (veh/h)	259	1608	817	124	1586	340	1349	880	220	301	350	317
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	282	1748	233	135	1724	233	1466	957	107	327	380	180
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, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	340	1352	729	344	1359	422	1138	1717	523	388	609	184
Arrive On Green	0.10	0.26	0.26	0.10	0.26	0.26	0.33	0.33	0.33	0.11	0.12	0.12
Sat Flow, veh/h	3483	5147	2776	3483	5147	1598	3483	5147	1567	3483	5147	1557
Grp Volume(v), veh/h	282	1748	233	135	1724	233	1466	957	107	327	380	180
Grp Sat Flow(s),veh/h/ln	1742	1716	1388	1742	1716	1598	1742	1716	1567	1742	1716	1557
Q Serve(g_s), s	9.5	31.5	8.1	4.4	31.7	15.1	39.2	18.3	5.9	11.0	8.4	13.8
Cycle Q Clear(g_c), s	9.5	31.5	8.1	4.4	31.7	15.1	39.2	18.3	5.9	11.0	8.4	13.8
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	340	1352	729	344	1359	422	1138	1717	523	388	609	184
V/C Ratio(X)	0.83	1.29	0.32	0.39	1.27	0.55	1.29	0.56	0.20	0.84	0.62	0.98
Avail Cap(c_a), veh/h	383	1352	729	383	1359	422	1138	1717	523	731	609	184
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	44.2	35.6	50.7	44.2	38.0	40.4	32.7	28.6	52.3	50.4	52.7
Incr Delay (d2), s/veh	13.0	137.3	1.2	0.3	126.7	5.1	136.5	0.4	0.2	1.9	2.0	59.3
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	4.7	30.0	2.8	1.9	28.9	6.3	37.5	7.4	2.2	4.8	3.6	8.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	66.1	181.5	36.8	51.0	170.8	43.2	176.9	33.1	28.8	54.2	52.3	112.0
LnGrp LOS	E	F	D	D	F	D	F	C	C	D	D	F
Approach Vol, veh/h	2263			2092			2530			887		
Approach Delay, s/veh	152.2			148.9			116.3			65.2		
Approach LOS	F			F			F			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	7.5	37.5	45.0	20.0	17.7	37.3	19.2	45.8				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	13.2	30.2	39.2	14.2	13.2	30.2	25.2	28.2				
Max Q Clear Time (g_c+I1), s	11.5	33.7	41.2	15.8	6.4	33.5	13.0	20.3				
Green Ext Time (p_c), s	0.2	0.0	0.0	0.0	0.1	0.0	0.3	3.8				

Intersection Summary

HCM 6th Ctrl Delay 129.7
HCM 6th LOS F

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM 6th TWSC
5: W Taron Dr & Shell Dwy/Chevron Dwy

Cumulative Plus Phase 3 Conditions
Timing Plan: AM Peak Hour

Intersection												
Int Delay, s/veh	2.3											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	185	0	0	35	0	758	9	0	857	330
Future Vol, veh/h	0	0	185	0	0	35	0	758	9	0	857	330
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	86	86	86	86	86	86	86	86	86	86	86	86
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	215	0	0	41	0	881	10	0	997	384
Major/Minor	Minor2		Minor1		Major1		Major2					
Conflicting Flow All	-	-	691	-	-	446	-	0	0	-	-	0
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.92	-	-	6.92	-	-	-	-	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.31	-	-	3.31	-	-	-	-	-	-
Pot Cap-1 Maneuver	0	0	389	0	0	563	0	-	-	0	-	-
Stage 1	0	0	-	0	0	-	0	-	-	0	-	-
Stage 2	0	0	-	0	0	-	0	-	-	0	-	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	389	-	-	563	-	-	-	-	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-	-	-	-	-
Approach	EB		WB		NB		SB					
HCM Control Delay, s	25.1		11.9		0		0					
HCM LOS	D		B									
Minor Lane/Major Mvmt	NBT		NBR EBLn1WBLn1		SBT		SBR					
Capacity (veh/h)	-		389 563		-		-					
HCM Lane V/C Ratio	-		0.553 0.072		-		-					
HCM Control Delay (s)	-		25.1 11.9		-		-					
HCM Lane LOS	-		D B		-		-					
HCM 95th %tile Q(veh)	-		3.2 0.2		-		-					

HCM 6th TWSC
7: W Taron Dr & CA NSU North Dwy

Cumulative Plus Phase 3 Conditions
Timing Plan: AM Peak Hour

Intersection						
Int Delay, s/veh	1.5					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	59	2	6	239	239	599
Future Vol, veh/h	59	2	6	239	239	599
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	74	74	74	74	74	74
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	80	3	8	323	323	809
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	1067	728	1132	0	-	0
Stage 1	728	-	-	-	-	-
Stage 2	339	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	247	425	621	-	-	-
Stage 1	480	-	-	-	-	-
Stage 2	724	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	243	425	621	-	-	-
Mov Cap-2 Maneuver	243	-	-	-	-	-
Stage 1	472	-	-	-	-	-
Stage 2	724	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	26.8	0.3		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	621	-	246	-	-	
HCM Lane V/C Ratio	0.013	-	0.335	-	-	
HCM Control Delay (s)	10.9	0	26.8	-	-	
HCM Lane LOS	B	A	D	-	-	
HCM 95th %tile Q(veh)	0	-	1.4	-	-	

HCM 6th TWSC
8: W Taron Dr & CA NSU South Dwy

Cumulative Plus Phase 3 Conditions
Timing Plan: AM Peak Hour

Intersection

Int Delay, s/veh 1.1

Movement EBL EBR NBL NBT SBT SBR

Lane Configurations 

Traffic Vol, veh/h 47 1 1 198 124 117

Future Vol, veh/h 47 1 1 198 124 117

Conflicting Peds, #/hr 0 0 0 0 0 0

Sign Control Stop Stop Free Free Free Free

RT Channelized - None - None - None

Storage Length 0 - - - - -

Veh in Median Storage, # 0 - - 0 0 -

Grade, % 0 - - 0 0 -

Peak Hour Factor 93 93 93 93 93 93

Heavy Vehicles, % 1 1 1 1 1 1

Mvmt Flow 51 1 1 213 133 126

Major/Minor Minor2 Major1 Major2

Conflicting Flow All 411 196 259 0 - 0

Stage 1 196 - - - - -

Stage 2 215 - - - - -

Critical Hdwy 6.41 6.21 4.11 - - -

Critical Hdwy Stg 1 5.41 - - - - -

Critical Hdwy Stg 2 5.41 - - - - -

Follow-up Hdwy 3.509 3.309 2.209 - - -

Pot Cap-1 Maneuver 599 848 1311 - - -

Stage 1 840 - - - - -

Stage 2 823 - - - - -

Platoon blocked, % - - -

Mov Cap-1 Maneuver 598 848 1311 - - -

Mov Cap-2 Maneuver 598 - - - - -

Stage 1 839 - - - - -

Stage 2 823 - - - - -

Approach EB NB SB

HCM Control Delay, s 11.5 0 0

HCM LOS B

Minor Lane/Major Mvmt NBL NBT EBLn1 SBT SBR

Capacity (veh/h) 1311 - 602 - -

HCM Lane V/C Ratio 0.001 - 0.086 - -

HCM Control Delay (s) 7.7 0 11.5 - -

HCM Lane LOS A A B - -

HCM 95th %tile Q(veh) 0 - 0.3 - -

HCM 6th TWSC
1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Cumulative Plus Phase 3 Conditions
Timing Plan: PM Peak Hour

Intersection												
Int Delay, s/veh	9.4											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	20	1729	0	0	509	0	20	0	253	0	0	0
Future Vol, veh/h	20	1729	0	0	509	0	20	0	253	0	0	0
Conflicting Peds, #/hr	0	0	2	0	0	2	0	0	2	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	210	-	-	-	-	-	-	-	400	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	16965	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	0	0	0	0	0	0	0	0	0	0	0	0
Mvmt Flow	21	1839	0	0	541	0	21	0	269	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	543	0	-	-	-	0	2422	2424	922
Stage 1	-	-	-	-	-	-	1881	1881	-
Stage 2	-	-	-	-	-	-	541	543	-
Critical Hdwy	4.1	-	-	-	-	-	6.6	6.5	6.9
Critical Hdwy Stg 1	-	-	-	-	-	-	5.8	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.4	5.5	-
Follow-up Hdwy	2.2	-	-	-	-	-	3.5	4	3.3
Pot Cap-1 Maneuver	1036	-	0	0	-	-	32	33	276
Stage 1	-	-	0	0	-	-	108	121	-
Stage 2	-	-	0	0	-	-	588	523	-
Platoon blocked, %	-	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	1036	-	-	-	-	-	31	0	275
Mov Cap-2 Maneuver	-	-	-	-	-	-	31	0	-
Stage 1	-	-	-	-	-	-	106	0	-
Stage 2	-	-	-	-	-	-	588	0	-

Approach	EB	WB	NB
HCM Control Delay, s	0.1	0	86.3
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	110	275	1036	-	-	-
HCM Lane V/C Ratio	1.009	0.652	0.021	-	-	-
HCM Control Delay (s)	161.7	39.7	8.5	-	-	-
HCM Lane LOS	F	E	A	-	-	-
HCM 95th %tile Q(veh)	6.5	4.2	0.1	-	-	-

HCM 6th Signalized Intersection Summary

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Cumulative Plus Phase 3 Conditions
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	272	1227	436	370	1039	330	562	128	611	710	132	190
Future Volume (veh/h)	272	1227	436	370	1039	330	562	128	611	710	132	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	286	1292	207	389	1094	87	592	135	470	747	139	42
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	351	2434	755	390	2491	772	664	413	343	704	448	373
Arrive On Green	0.10	0.47	0.47	0.11	0.48	0.48	0.19	0.22	0.22	0.20	0.24	0.24
Sat Flow, veh/h	3483	5147	1596	3483	5147	1596	3483	1885	1568	3483	1885	1571
Grp Volume(v), veh/h	286	1292	207	389	1094	87	592	135	470	747	139	42
Grp Sat Flow(s),veh/h/ln	1742	1716	1596	1742	1716	1596	1742	1885	1568	1742	1885	1571
Q Serve(g_s), s	8.0	17.7	7.9	11.2	13.9	3.0	16.6	6.0	21.9	20.2	6.1	2.1
Cycle Q Clear(g_c), s	8.0	17.7	7.9	11.2	13.9	3.0	16.6	6.0	21.9	20.2	6.1	2.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	351	2434	755	390	2491	772	664	413	343	704	448	373
V/C Ratio(X)	0.81	0.53	0.27	1.00	0.44	0.11	0.89	0.33	1.37	1.06	0.31	0.11
Avail Cap(c_a), veh/h	390	2434	755	390	2491	772	832	413	343	704	448	373
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	44.0	18.5	16.0	44.4	16.9	14.1	39.5	32.9	39.0	39.9	31.4	29.9
Incr Delay (d2), s/veh	10.2	0.8	0.9	44.7	0.6	0.3	8.9	0.3	183.4	51.5	0.3	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	3.8	6.5	2.9	7.0	5.1	1.1	7.7	2.7	25.7	13.2	2.7	0.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	54.2	19.4	16.9	89.1	17.5	14.4	48.3	33.2	222.5	91.4	31.7	30.0
LnGrp LOS	D	B	B	F	B	B	D	C	F	F	C	C
Approach Vol, veh/h		1785			1570			1197			928	
Approach Delay, s/veh		24.7			35.1			115.0			79.7	
Approach LOS		C			D			F			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	15.9	54.9	24.2	29.5	17.0	53.8	26.0	27.7				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	11.2	24.2	23.9	18.2	11.2	24.2	20.2	* 22				
Max Q Clear Time (g_c+I1), s	10.0	15.9	18.6	8.1	13.2	19.7	22.2	23.9				
Green Ext Time (p_c), s	0.1	4.4	0.5	0.4	0.0	3.2	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay 56.7
HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

HCM 6th AWSC
3: W Taron Dr & Riparian Dr

Cumulative Plus Phase 3 Conditions
Timing Plan: PM Peak Hour

Intersection

Intersection Delay, s/veh 92.5

Intersection LOS F

Movement	EBU	EBL	EBT	EBR	WBL	WBT	WBR	NBU	NBL	NBT	NBR	SBU	SBL	SBT	SBR
Lane Configurations															
Traffic Vol, veh/h	0	450	25	2	17	13	59	0	8	318	14	0	574	486	29
Future Vol, veh/h	0	450	25	2	17	13	59	0	8	318	14	0	574	486	29
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	542	30	2	20	16	71	0	10	383	17	0	692	586	35
Number of Lanes	0	1	1	0	1	1	0	0	1	2	0	0	1	2	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	3	3
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	3	3	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	3	3	2	2
HCM Control Delay	272.9	18.7	32.1	221.5
HCM LOS	F	C	D	F

Lane	NBLn1	NBLn2	NBLn3	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1	SBLn2	SBLn3
Vol Left, %	100%	0%	0%	100%	0%	100%	0%	100%	0%	0%
Vol Thru, %	0%	100%	88%	0%	93%	0%	18%	0%	100%	85%
Vol Right, %	0%	0%	12%	0%	7%	0%	82%	0%	0%	15%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	8	212	120	450	27	17	72	574	324	191
LT Vol	8	0	0	450	0	17	0	574	0	0
Through Vol	0	212	106	0	25	0	13	0	324	162
RT Vol	0	0	14	0	2	0	59	0	0	29
Lane Flow Rate	10	255	145	542	33	20	87	692	390	230
Geometry Grp	8	8	8	8	8	8	8	8	8	8
Degree of Util (X)	0.028	0.701	0.393	1.547	0.088	0.066	0.254	1.755	0.937	0.546
Departure Headway (Hd)	12.483	11.953	11.867	11.172	10.611	13.377	12.256	10.486	9.959	9.847
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Cap	289	304	305	331	340	269	295	353	367	368
Service Time	10.183	9.653	9.567	8.872	8.311	11.077	9.956	8.186	7.659	7.547
HCM Lane V/C Ratio	0.035	0.839	0.475	1.637	0.097	0.074	0.295	1.96	1.063	0.625
HCM Control Delay	15.5	38.5	22	288.4	14.3	17	19.1	375.8	64.8	23.8
HCM Lane LOS	C	E	C	F	B	C	C	F	F	C
HCM 95th-tile Q	0.1	4.9	1.8	28.6	0.3	0.2	1	38.3	9.9	3.1

HCM 6th Signalized Intersection Summary

4: Franklin Blvd & Elk Grove Blvd

Cumulative Plus Phase 3 Conditions
Timing Plan: PM Peak Hour



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	291	1918	845	110	1373	300	807	550	190	371	490	310
Future Volume (veh/h)	291	1918	845	110	1373	300	807	550	190	371	490	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	300	1977	306	113	1415	179	832	567	40	382	505	102
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	368	1880	1013	340	1838	570	775	1115	345	443	624	190
Arrive On Green	0.11	0.37	0.37	0.10	0.36	0.36	0.22	0.22	0.22	0.13	0.12	0.12
Sat Flow, veh/h	3483	5147	2774	3483	5147	1596	3483	5147	1591	3483	5147	1570
Grp Volume(v), veh/h	300	1977	306	113	1415	179	832	567	40	382	505	102
Grp Sat Flow(s),veh/h/ln	1742	1716	1387	1742	1716	1596	1742	1716	1591	1742	1716	1570
Q Serve(g_s), s	10.1	43.8	9.4	3.6	29.3	9.7	26.7	11.6	2.4	12.9	11.5	7.3
Cycle Q Clear(g_c), s	10.1	43.8	9.4	3.6	29.3	9.7	26.7	11.6	2.4	12.9	11.5	7.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	368	1880	1013	340	1838	570	775	1115	345	443	624	190
V/C Ratio(X)	0.81	1.05	0.30	0.33	0.77	0.31	1.07	0.51	0.12	0.86	0.81	0.54
Avail Cap(c_a), veh/h	557	1880	1013	499	1838	570	775	1115	345	702	716	218
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	38.1	27.2	50.5	34.2	27.9	46.7	41.4	37.8	51.4	51.4	49.6
Incr Delay (d2), s/veh	5.6	35.9	0.8	0.2	3.2	1.4	53.9	0.4	0.1	3.9	6.1	2.3
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	4.6	23.6	3.1	1.6	12.2	3.8	16.9	4.8	0.9	5.7	5.2	0.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.1	74.0	27.9	50.7	37.4	29.4	100.6	41.8	37.9	55.2	57.5	51.9
LnGrp LOS	E	F	C	D	D	C	F	D	D	E	E	D
Approach Vol, veh/h	2583		1707				1439			989		
Approach Delay, s/veh	66.7		37.4				75.6			56.1		
Approach LOS	E		D				E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	48.5	48.7	32.5	20.4	17.5	49.6	21.0	31.8				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	19.2	34.2	26.7	16.7	17.2	36.2	24.2	19.2				
Max Q Clear Time (g_c+1/2), s	11.2	31.3	28.7	13.5	5.6	45.8	14.9	13.6				
Green Ext Time (p_c), s	0.6	2.3	0.0	1.1	0.1	0.0	0.3	1.7				

Intersection Summary

HCM 6th Ctrl Delay 59.6
HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM 6th TWSC
5: W Taron Dr & Shell Dwy/Chevron Dwy

Cumulative Plus Phase 3 Conditions
Timing Plan: PM Peak Hour

Intersection												
Int Delay, s/veh	30.2											
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations			↗			↗		↕			↕	
Traffic Vol, veh/h	0	0	472	0	0	42	0	1259	11	0	617	289
Future Vol, veh/h	0	0	472	0	0	42	0	1259	11	0	617	289
Conflicting Peds, #/hr	0	0	0	0	0	0	1	0	0	0	0	1
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	0	-	-	0	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1	1	1	1	1	1	1
Mvmt Flow	0	0	597	0	0	53	0	1594	14	0	781	366

Major/Minor	Minor2		Minor1		Major1		Major2	
Conflicting Flow All	-	-	575	-	-	804	-	0
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-
Critical Hdwy	-	-	6.92	-	-	6.92	-	-
Critical Hdwy Stg 1	-	-	-	-	-	-	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	-	-
Follow-up Hdwy	-	-	3.31	-	-	3.31	-	-
Pot Cap-1 Maneuver	0	0	~ 464	0	0	328	0	-
Stage 1	0	0	-	0	0	-	0	-
Stage 2	0	0	-	0	0	-	0	-
Platoon blocked, %	-	-	-	-	-	-	-	-
Mov Cap-1 Maneuver	-	-	~ 464	-	-	328	-	-
Mov Cap-2 Maneuver	-	-	-	-	-	-	-	-
Stage 1	-	-	-	-	-	-	-	-
Stage 2	-	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	170.7	18.1	0	0
HCM LOS	F	C		

Minor Lane/Major Mvmt	NBT	NBR	EBLn1WBLn1	SBT	SBR
Capacity (veh/h)	-	-	464 328	-	-
HCM Lane V/C Ratio	-	-	1.288 0.162	-	-
HCM Control Delay (s)	-	-	170.7 18.1	-	-
HCM Lane LOS	-	-	F C	-	-
HCM 95th %tile Q(veh)	-	-	25.5 0.6	-	-

Notes			
~: Volume exceeds capacity	\$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

HCM 6th TWSC
7: W Taron Dr & CA NSU North Dwy

Cumulative Plus Phase 3 Conditions
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	4.6					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	134	6	3	204	226	283
Future Vol, veh/h	134	6	3	204	226	283
Conflicting Peds, #/hr	2	0	3	0	0	3
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	71	71	71	71	71	71
Heavy Vehicles, %	2	2	2	2	2	2
Mvmt Flow	189	8	4	287	318	399
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	818	521	720	0	-	0
Stage 1	521	-	-	-	-	-
Stage 2	297	-	-	-	-	-
Critical Hdwy	6.42	6.22	4.12	-	-	-
Critical Hdwy Stg 1	5.42	-	-	-	-	-
Critical Hdwy Stg 2	5.42	-	-	-	-	-
Follow-up Hdwy	3.518	3.318	2.218	-	-	-
Pot Cap-1 Maneuver	346	555	882	-	-	-
Stage 1	596	-	-	-	-	-
Stage 2	754	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	342	553	879	-	-	-
Mov Cap-2 Maneuver	342	-	-	-	-	-
Stage 1	591	-	-	-	-	-
Stage 2	752	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	28	0.1		0		
HCM LOS	D					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	879	-	348	-	-	
HCM Lane V/C Ratio	0.005	-	0.567	-	-	
HCM Control Delay (s)	9.1	0	28	-	-	
HCM Lane LOS	A	A	D	-	-	
HCM 95th %tile Q(veh)	0	-	3.3	-	-	

HCM 6th TWSC
8: W Taron Dr & CA NSU South Dwy

Cumulative Plus Phase 3 Conditions
Timing Plan: PM Peak Hour

Intersection						
Int Delay, s/veh	3.1					
Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	106	1	1	101	175	55
Future Vol, veh/h	106	1	1	101	175	55
Conflicting Peds, #/hr	0	0	1	0	0	1
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	79	79	79	79	79	79
Heavy Vehicles, %	1	1	1	1	1	1
Mvmt Flow	134	1	1	128	222	70
Major/Minor	Minor2	Major1		Major2		
Conflicting Flow All	388	258	293	0	-	0
Stage 1	258	-	-	-	-	-
Stage 2	130	-	-	-	-	-
Critical Hdwy	6.41	6.21	4.11	-	-	-
Critical Hdwy Stg 1	5.41	-	-	-	-	-
Critical Hdwy Stg 2	5.41	-	-	-	-	-
Follow-up Hdwy	3.509	3.309	2.209	-	-	-
Pot Cap-1 Maneuver	617	783	1274	-	-	-
Stage 1	787	-	-	-	-	-
Stage 2	898	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	615	782	1273	-	-	-
Mov Cap-2 Maneuver	615	-	-	-	-	-
Stage 1	785	-	-	-	-	-
Stage 2	897	-	-	-	-	-
Approach	EB	NB		SB		
HCM Control Delay, s	12.5	0.1		0		
HCM LOS	B					
Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR	
Capacity (veh/h)	1273	-	616	-	-	
HCM Lane V/C Ratio	0.001	-	0.22	-	-	
HCM Control Delay (s)	7.8	0	12.5	-	-	
HCM Lane LOS	A	A	B	-	-	
HCM 95th %tile Q(veh)	0	-	0.8	-	-	

HCM 6th Signalized Intersection Summary

Cumulative Plus Phase 3 (w/ Improvements)

1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	698	0	0	311	0	20	0	642	0	0	0
Future Volume (veh/h)	20	698	0	0	311	0	20	0	642	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		1.00	1.00		0.99			
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	1885	1885	0	0	1885	1885	1885	1885	1885			
Adj Flow Rate, veh/h	21	735	0	0	327	0	0	0	437			
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95			
Percent Heavy Veh, %	1	1	0	0	1	1	1	1	1			
Cap, veh/h	63	2582	0	0	1183	0	0	321	541			
Arrive On Green	0.04	0.72	0.00	0.00	0.63	0.00	0.00	0.00	0.17			
Sat Flow, veh/h	1795	3676	0	0	1885	0	0	1885	3176			
Grp Volume(v), veh/h	21	735	0	0	327	0	0	0	437			
Grp Sat Flow(s),veh/h/ln	1795	1791	0	0	1885	0	0	1885	1588			
Q Serve(g_s), s	1.1	7.2	0.0	0.0	7.8	0.0	0.0	0.0	13.2			
Cycle Q Clear(g_c), s	1.1	7.2	0.0	0.0	7.8	0.0	0.0	0.0	13.2			
Prop In Lane	1.00		0.00	0.00		0.00	0.00		1.00			
Lane Grp Cap(c), veh/h	63	2582	0	0	1183	0	0	321	541			
V/C Ratio(X)	0.33	0.28	0.00	0.00	0.28	0.00	0.00	0.00	0.81			
Avail Cap(c_a), veh/h	183	2582	0	0	1183	0	0	714	1204			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00			
Uniform Delay (d), s/veh	47.1	4.9	0.0	0.0	8.4	0.0	0.0	0.0	39.9			
Incr Delay (d2), s/veh	1.1	0.3	0.0	0.0	0.6	0.0	0.0	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	0.5	2.0	0.0	0.0	2.9	0.0	0.0	0.0	5.2			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	5.2	0.0	0.0	9.0	0.0	0.0	0.0	42.1			
LnGrp LOS	D	A	A	A	A	A	A	A	D			
Approach Vol, veh/h	756			327			437					
Approach Delay, s/veh	6.4			9.0			42.1					
Approach LOS	A			A			D					
Timer - Assigned Phs	2			4			7			8		
Phs Duration (G+Y+Rc), s	22.1			77.9			9.3			68.5		
Change Period (Y+Rc), s	5.1			5.8			5.8			5.8		
Max Green Setting (Gmax), s	37.9			51.2			10.2			35.2		
Max Q Clear Time (g_c+I1), s	15.2			9.2			3.1			9.8		
Green Ext Time (p_c), s	1.3			5.2			0.0			1.7		

Intersection Summary

HCM 6th Ctrl Delay 17.2

HCM 6th LOS B

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

Cumulative Plus Phase 3 (w/ Improvements)

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  		 	  		 			 		
Traffic Volume (veh/h)	101	677	454	613	1773	690	423	101	269	457	145	280
Future Volume (veh/h)	101	677	454	613	1773	690	423	101	269	457	145	280
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.99	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	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	104	698	163	632	1828	466	436	104	40	471	149	40
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	261	1853	574	560	2294	711	480	208	175	456	208	173
Arrive On Green	0.15	0.73	0.73	0.16	0.45	0.45	0.14	0.11	0.11	0.13	0.11	0.11
Sat Flow, veh/h	3456	5106	1582	3456	5106	1583	3456	1870	1576	3456	1870	1555
Grp Volume(v), veh/h	104	698	163	632	1828	466	436	104	40	471	149	40
Grp Sat Flow(s),veh/h/ln	1728	1702	1582	1728	1702	1583	1728	1870	1576	1728	1870	1555
Q Serve(g_s), s	2.7	5.2	3.6	16.2	30.7	23.0	12.4	5.2	2.3	13.2	7.7	2.3
Cycle Q Clear(g_c), s	2.7	5.2	3.6	16.2	30.7	23.0	12.4	5.2	2.3	13.2	7.7	2.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	261	1853	574	560	2294	711	480	208	175	456	208	173
V/C Ratio(X)	0.40	0.38	0.28	1.13	0.80	0.66	0.91	0.50	0.23	1.03	0.72	0.23
Avail Cap(c_a), veh/h	698	1853	574	560	2294	711	480	335	282	456	322	267
HCM Platoon Ratio	2.00	2.00	2.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	40.4	9.4	9.2	41.9	23.6	21.5	42.4	41.8	40.5	43.4	42.9	40.5
Incr Delay (d2), s/veh	0.4	0.6	1.2	78.8	3.0	4.7	20.5	1.4	0.5	50.8	3.4	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.6	1.3	12.7	11.8	9.0	6.6	2.5	0.9	8.6	3.6	0.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	40.8	10.0	10.5	120.7	26.6	26.2	62.9	43.2	41.0	94.2	46.3	41.0
LnGrp LOS	D	B	B	F	C	C	E	D	D	F	D	D
Approach Vol, veh/h		965			2926			580			660	
Approach Delay, s/veh		13.4			46.8			57.9			80.1	
Approach LOS		B			D			E			F	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	13.4	50.7	19.0	16.9	22.0	42.1	19.0	16.9				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	20.2	26.2	13.9	17.2	16.2	30.2	13.2	* 18				
Max Q Clear Time (g_c+I1), s	4.7	32.7	14.4	9.7	18.2	7.2	15.2	7.2				
Green Ext Time (p_c), s	0.1	0.0	0.0	0.4	0.0	5.1	0.0	0.3				

Intersection Summary

HCM 6th Ctrl Delay 46.1

HCM 6th LOS D

Notes

User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

HCM 6th Signalized Intersection Summary

3: W Taron Dr & Riparian Dr

Cumulative Plus Phase 3 (w/ Improvements)

Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 			 	 		 	 		 	 	 
Traffic Volume (veh/h)	194	10	0	36	21	121	4	287	7	203	802	37
Future Volume (veh/h)	194	10	0	36	21	121	4	287	7	203	802	37
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		0.99	1.00		0.99	1.00		1.00
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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	226	12	0	42	24	27	5	334	8	236	933	41
Peak Hour Factor	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86	0.86
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	540	374	0	138	97	109	22	725	17	287	1224	54
Arrive On Green	0.16	0.20	0.00	0.08	0.12	0.12	0.01	0.20	0.20	0.16	0.35	0.35
Sat Flow, veh/h	3483	1885	0	1795	807	908	1795	3574	85	1795	3494	154
Grp Volume(v), veh/h	226	12	0	42	0	51	5	167	175	236	478	496
Grp Sat Flow(s),veh/h/ln	1742	1885	0	1795	0	1715	1795	1791	1869	1795	1791	1857
Q Serve(g_s), s	3.3	0.3	0.0	1.2	0.0	1.5	0.2	4.6	4.6	7.2	13.3	13.3
Cycle Q Clear(g_c), s	3.3	0.3	0.0	1.2	0.0	1.5	0.2	4.6	4.6	7.2	13.3	13.3
Prop In Lane	1.00		0.00	1.00		0.53	1.00		0.05	1.00		0.08
Lane Grp Cap(c), veh/h	540	374	0	138	0	206	22	363	379	287	627	650
V/C Ratio(X)	0.42	0.03	0.00	0.30	0.00	0.25	0.23	0.46	0.46	0.82	0.76	0.76
Avail Cap(c_a), veh/h	557	971	0	287	0	883	287	690	720	316	719	745
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(l)	1.00	1.00	0.00	1.00	0.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	21.5	18.2	0.0	24.6	0.0	22.5	27.6	19.7	19.7	22.9	16.2	16.2
Incr Delay (d2), s/veh	0.5	0.0	0.0	1.2	0.0	0.6	5.3	0.9	0.9	14.9	4.2	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	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.3	0.1	0.0	0.5	0.0	0.6	0.1	1.8	1.9	3.9	5.3	5.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	22.0	18.2	0.0	25.8	0.0	23.1	32.9	20.6	20.6	37.8	20.4	20.3
LnGrp LOS	C	B	A	C	A	C	C	C	C	D	C	C
Approach Vol, veh/h		238			93			347			1210	
Approach Delay, s/veh		21.8			24.3			20.8			23.8	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	14.1	16.5	9.4	16.3	5.8	24.8	13.8	11.9				
Change Period (Y+Rc), s	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1				
Max Green Setting (Gmax), s	9.9	21.7	9.0	29.0	9.0	22.6	9.0	29.0				
Max Q Clear Time (g_c+l1), s	9.2	6.6	3.2	2.3	2.2	15.3	5.3	3.5				
Green Ext Time (p_c), s	0.1	1.6	0.0	0.0	0.0	3.4	0.3	0.2				

Intersection Summary

HCM 6th Ctrl Delay	23.0
HCM 6th LOS	C

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary 4: Franklin Blvd & Elk Grove Blvd

Cumulative Plus Phase 3 (w/ Improvements)
Timing Plan: AM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	 	  	 	 	  		  	  		 	 	
Traffic Volume (veh/h)	259	1608	817	124	1586	340	1349	880	220	301	350	317
Future Volume (veh/h)	259	1608	817	124	1586	340	1349	880	220	301	350	317
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	1.00		0.98	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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	282	1748	292	135	1724	236	1466	957	96	327	380	242
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, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	325	1695	915	344	1724	535	1359	1383	420	382	394	320
Arrive On Green	0.09	0.33	0.33	0.10	0.34	0.34	0.27	0.27	0.27	0.11	0.11	0.11
Sat Flow, veh/h	3483	5147	2776	3483	5147	1598	5063	5147	1564	3483	3582	1556
Grp Volume(v), veh/h	282	1748	292	135	1724	236	1466	957	96	327	380	242
Grp Sat Flow(s),veh/h/ln	1742	1716	1388	1742	1716	1598	1688	1716	1564	1742	1791	1556
Q Serve(g_s), s	9.6	39.5	9.5	4.4	40.2	13.8	32.2	20.0	5.7	11.1	12.7	13.2
Cycle Q Clear(g_c), s	9.6	39.5	9.5	4.4	40.2	13.8	32.2	20.0	5.7	11.1	12.7	13.2
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	325	1695	915	344	1724	535	1359	1383	420	382	394	320
V/C Ratio(X)	0.87	1.03	0.32	0.39	1.00	0.44	1.08	0.69	0.23	0.86	0.96	0.76
Avail Cap(c_a), veh/h	325	1695	915	354	1724	535	1359	1383	420	424	394	320
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.7	40.2	30.1	50.7	39.9	31.1	43.9	39.4	34.2	52.5	53.2	45.1
Incr Delay (d2), s/veh	21.2	30.2	0.9	0.3	21.7	2.6	48.8	1.5	0.3	13.5	36.0	9.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.0	20.6	3.2	1.9	19.5	5.5	19.0	8.4	2.2	5.4	7.5	7.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	74.9	70.5	31.1	51.0	61.6	33.8	92.7	40.9	34.5	66.0	89.2	54.9
LnGrp LOS	E	F	C	D	E	C	F	D	C	E	F	D
Approach Vol, veh/h	2322			2095			2519			949		
Approach Delay, s/veh	66.0			57.7			70.8			72.5		
Approach LOS	E			E			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.0	46.0	38.0	19.0	17.7	45.3	19.0	38.0				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	11.2	40.2	32.2	13.2	12.2	39.2	14.6	30.8				
Max Q Clear Time (g_c+I1), s	11.6	42.2	34.2	15.2	6.4	41.5	13.1	22.0				
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0	0.1	0.0	0.1	4.1				

Intersection Summary

HCM 6th Ctrl Delay 66.1
HCM 6th LOS E

Notes

User approved pedestrian interval to be less than phase max green.
User approved ignoring U-Turning movement.

HCM 6th Signalized Intersection Summary

Cumulative Plus Phase 3 (w/ Improvements)

1: I-5 NB Off-Ramp/I-5 NB On-Ramp & Elk Grove Blvd

Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	20	1729	0	0	509	0	20	0	253	0	0	0
Future Volume (veh/h)	20	1729	0	0	509	0	20	0	253	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		1.00	1.00		0.99			
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	1900	1900	0	0	1900	1900	1900	1900	1900			
Adj Flow Rate, veh/h	21	1839	0	0	541	0	0	0	132			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	0	0	0	0	0	0	0	0	0			
Cap, veh/h	64	2807	0	0	1300	0	0	215	362			
Arrive On Green	0.04	0.78	0.00	0.00	0.68	0.00	0.00	0.00	0.11			
Sat Flow, veh/h	1810	3705	0	0	1900	0	0	1900	3192			
Grp Volume(v), veh/h	21	1839	0	0	541	0	0	0	132			
Grp Sat Flow(s),veh/h/ln	1810	1805	0	0	1900	0	0	1900	1596			
Q Serve(g_s), s	1.1	23.1	0.0	0.0	12.6	0.0	0.0	0.0	3.8			
Cycle Q Clear(g_c), s	1.1	23.1	0.0	0.0	12.6	0.0	0.0	0.0	3.8			
Prop In Lane	1.00		0.00	0.00		0.00	0.00		1.00			
Lane Grp Cap(c), veh/h	64	2807	0	0	1300	0	0	215	362			
V/C Ratio(X)	0.33	0.66	0.00	0.00	0.42	0.00	0.00	0.00	0.36			
Avail Cap(c_a), veh/h	185	2807	0	0	1300	0	0	663	1114			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	0.00	0.00	0.00	1.00			
Uniform Delay (d), s/veh	47.1	5.0	0.0	0.0	7.0	0.0	0.0	0.0	41.0			
Incr Delay (d2), s/veh	1.1	1.2	0.0	0.0	1.0	0.0	0.0	0.0	0.5			
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	0.5	5.4	0.0	0.0	4.3	0.0	0.0	0.0	1.5			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	48.2	6.3	0.0	0.0	8.0	0.0	0.0	0.0	41.5			
LnGrp LOS	D	A	A	A	A	A	A	A	D			
Approach Vol, veh/h	1860			541			132					
Approach Delay, s/veh	6.7			8.0			41.5					
Approach LOS	A			A			D					
Timer - Assigned Phs	2			4			7			8		
Phs Duration (G+Y+Rc), s	16.4			83.6			9.3			74.2		
Change Period (Y+Rc), s	5.1			5.8			5.8			5.8		
Max Green Setting (Gmax), s	34.9			54.2			10.2			38.2		
Max Q Clear Time (g_c+I1), s	5.8			25.1			3.1			14.6		
Green Ext Time (p_c), s	0.4			17.1			0.0			3.2		

Intersection Summary

HCM 6th Ctrl Delay	8.8
HCM 6th LOS	A

Notes

User approved volume balancing among the lanes for turning movement.

HCM 6th Signalized Intersection Summary

2: W Taron Dr/Harbour Point Dr & Elk Grove Blvd

Cumulative Plus Phase 3 (w/ Improvements)

Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	272	1227	436	370	1039	330	562	128	611	710	132	190
Future Volume (veh/h)	272	1227	436	370	1039	330	562	128	611	710	132	190
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.98	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	1.00	1.00	1.00
Work Zone On Approach	No			No			No			No		
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	286	1292	250	389	1094	130	592	135	488	747	139	58
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	340	2029	629	383	2092	649	656	548	457	731	600	501
Arrive On Green	0.10	0.39	0.39	0.11	0.41	0.41	0.19	0.29	0.29	0.21	0.32	0.32
Sat Flow, veh/h	3483	5147	1595	3483	5147	1595	3483	1885	1571	3483	1885	1573
Grp Volume(v), veh/h	286	1292	250	389	1094	130	592	135	488	747	139	58
Grp Sat Flow(s),veh/h/ln	1742	1716	1595	1742	1716	1595	1742	1885	1571	1742	1885	1573
Q Serve(g_s), s	9.7	24.4	13.5	13.2	19.2	6.3	19.9	6.6	34.9	25.2	6.5	3.1
Cycle Q Clear(g_c), s	9.7	24.4	13.5	13.2	19.2	6.3	19.9	6.6	34.9	25.2	6.5	3.1
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	340	2029	629	383	2092	649	656	548	457	731	600	501
V/C Ratio(X)	0.84	0.64	0.40	1.02	0.52	0.20	0.90	0.25	1.07	1.02	0.23	0.12
Avail Cap(c_a), veh/h	354	2029	629	383	2092	649	984	548	457	731	600	501
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	53.2	29.4	26.1	53.4	26.8	23.0	47.6	32.5	42.5	47.4	30.1	29.0
Incr Delay (d2), s/veh	15.0	1.5	1.9	49.9	0.9	0.7	5.9	0.2	61.5	38.8	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	4.8	9.9	5.4	8.3	7.7	2.5	9.1	3.0	21.0	14.5	2.9	1.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	68.2	30.9	28.0	103.3	27.8	23.7	53.6	32.7	104.1	86.2	30.2	29.0
LnGrp LOS	E	C	C	F	C	C	D	C	F	F	C	C
Approach Vol, veh/h	1828			1613			1215			944		
Approach Delay, s/veh	36.4			45.7			71.5			74.4		
Approach LOS	D			D			E			E		
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	17.5	55.3	27.7	44.0	19.0	53.8	31.0	40.7				
Change Period (Y+Rc), s	5.8	5.8	5.1	5.8	5.8	5.8	5.8	* 5.8				
Max Green Setting (Gmax), s	12.2	25.2	33.9	26.2	13.2	24.2	25.2	* 35				
Max Q Clear Time (g_c+I1), s	11.7	21.2	21.9	8.5	15.2	26.4	27.2	36.9				
Green Ext Time (p_c), s	0.0	2.5	0.7	0.6	0.0	0.0	0.0	0.0				

Intersection Summary

HCM 6th Ctrl Delay 53.1
 HCM 6th LOS D

Notes

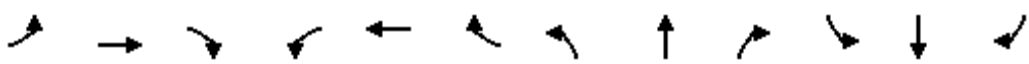
User approved pedestrian interval to be less than phase max green.

User approved ignoring U-Turning movement.

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

HCM 6th Signalized Intersection Summary 3: W Taron Dr & Riparian Dr

Cumulative Plus Phase 3 (w/ Improvements)
Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations	↰↱	↱		↰	↱		↰	↰↱		↰	↰↱	
Traffic Volume (veh/h)	450	25	2	17	13	59	8	318	14	574	486	29
Future Volume (veh/h)	450	25	2	17	13	59	8	318	14	574	486	29
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		0.96	1.00		0.99
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	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	542	30	1	20	16	8	10	383	15	692	586	31
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	632	363	12	73	70	35	40	498	19	640	1646	87
Arrive On Green	0.18	0.20	0.20	0.04	0.06	0.06	0.02	0.14	0.14	0.36	0.48	0.48
Sat Flow, veh/h	3483	1813	60	1795	1184	592	1795	3508	137	1795	3457	183
Grp Volume(v), veh/h	542	0	31	20	0	24	10	195	203	692	303	314
Grp Sat Flow(s),veh/h/ln	1742	0	1874	1795	0	1776	1795	1791	1854	1795	1791	1849
Q Serve(g_s), s	11.8	0.0	1.1	0.8	0.0	1.0	0.4	8.2	8.3	27.9	8.4	8.4
Cycle Q Clear(g_c), s	11.8	0.0	1.1	0.8	0.0	1.0	0.4	8.2	8.3	27.9	8.4	8.4
Prop In Lane	1.00		0.03	1.00		0.33	1.00		0.07	1.00		0.10
Lane Grp Cap(c), veh/h	632	0	375	73	0	106	40	254	263	640	852	880
V/C Ratio(X)	0.86	0.00	0.08	0.27	0.00	0.23	0.25	0.77	0.77	1.08	0.36	0.36
Avail Cap(c_a), veh/h	685	0	375	353	0	293	216	307	317	640	852	880
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	31.1	0.0	25.4	36.4	0.0	35.1	37.6	32.3	32.4	25.2	12.9	12.9
Incr Delay (d2), s/veh	10.0	0.0	0.1	2.0	0.0	1.1	3.1	9.2	9.2	59.5	0.3	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	5.7	0.0	0.5	0.4	0.0	0.5	0.2	4.1	4.2	21.4	3.1	3.2
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	41.0	0.0	25.5	38.4	0.0	36.2	40.7	41.5	41.6	84.7	13.2	13.2
LnGrp LOS	D	A	C	D	A	D	D	D	D	F	B	B
Approach Vol, veh/h		573			44			408			1309	
Approach Delay, s/veh		40.2			37.2			41.5			51.0	
Approach LOS		D			D			D			D	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	33.0	16.2	8.3	20.8	6.9	42.3	19.3	9.8				
Change Period (Y+Rc), s	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1				
Max Green Setting (Gmax), s	27.9	13.4	15.4	12.9	9.4	31.9	15.4	12.9				
Max Q Clear Time (g_c+I1), s	29.9	10.3	2.8	3.1	2.4	10.4	13.8	3.0				
Green Ext Time (p_c), s	0.0	0.7	0.0	0.0	0.0	3.6	0.4	0.0				

Intersection Summary

HCM 6th Ctrl Delay	46.4
HCM 6th LOS	D

Notes

User approved pedestrian interval to be less than phase max green.

HCM 6th Signalized Intersection Summary

4: Franklin Blvd & Elk Grove Blvd

Cumulative Plus Phase 3 (w/ Improvements)

Timing Plan: PM Peak Hour

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	291	1918	845	110	1373	300	807	550	190	371	490	310
Future Volume (veh/h)	291	1918	845	110	1373	300	807	550	190	371	490	310
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		0.99	1.00		1.00	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	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	300	1977	325	113	1415	180	832	567	37	382	505	98
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Percent Heavy Veh, %	1	1	1	1	1	1	1	1	1	1	1	1
Cap, veh/h	370	1932	1041	340	1889	586	894	1065	329	441	562	247
Arrive On Green	0.11	0.38	0.38	0.10	0.37	0.37	0.18	0.21	0.21	0.13	0.16	0.16
Sat Flow, veh/h	3483	5147	2774	3483	5147	1596	5063	5147	1591	3483	3582	1572
Grp Volume(v), veh/h	300	1977	325	113	1415	180	832	567	37	382	505	98
Grp Sat Flow(s),veh/h/ln	1742	1716	1387	1742	1716	1596	1688	1716	1591	1742	1791	1572
Q Serve(g_s), s	10.1	45.0	9.9	3.6	28.8	9.7	19.4	11.8	2.3	12.9	16.6	6.7
Cycle Q Clear(g_c), s	10.1	45.0	9.9	3.6	28.8	9.7	19.4	11.8	2.3	12.9	16.6	6.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Lane Grp Cap(c), veh/h	370	1932	1041	340	1889	586	894	1065	329	441	562	247
V/C Ratio(X)	0.81	1.02	0.31	0.33	0.75	0.31	0.93	0.53	0.11	0.87	0.90	0.40
Avail Cap(c_a), veh/h	586	1932	1041	528	1889	586	894	1065	329	615	573	251
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	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	52.5	37.5	26.5	50.5	33.2	27.1	48.7	42.4	38.6	51.4	49.6	45.5
Incr Delay (d2), s/veh	4.7	26.6	0.8	0.2	2.8	1.4	15.6	0.5	0.1	7.1	16.9	1.0
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	4.5	22.6	3.3	1.6	11.9	3.8	9.2	4.9	0.9	5.9	8.5	2.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	57.1	64.1	27.3	50.7	35.9	28.5	64.3	42.9	38.8	58.5	66.5	46.5
LnGrp LOS	E	F	C	D	D	C	E	D	D	E	E	D
Approach Vol, veh/h		2602			1708			1436			985	
Approach Delay, s/veh		58.7			36.1			55.2			61.4	
Approach LOS		E			D			E			E	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	18.5	49.8	27.0	24.6	17.5	50.8	21.0	30.6				
Change Period (Y+Rc), s	5.8	5.8	5.8	5.8	5.8	5.8	5.8	5.8				
Max Green Setting (Gmax), s	20.2	36.2	21.2	19.2	18.2	38.2	21.2	19.2				
Max Q Clear Time (g_c+I1), s	12.1	30.8	21.4	18.6	5.6	47.0	14.9	13.8				
Green Ext Time (p_c), s	0.6	3.9	0.0	0.2	0.1	0.0	0.3	1.7				

Intersection Summary

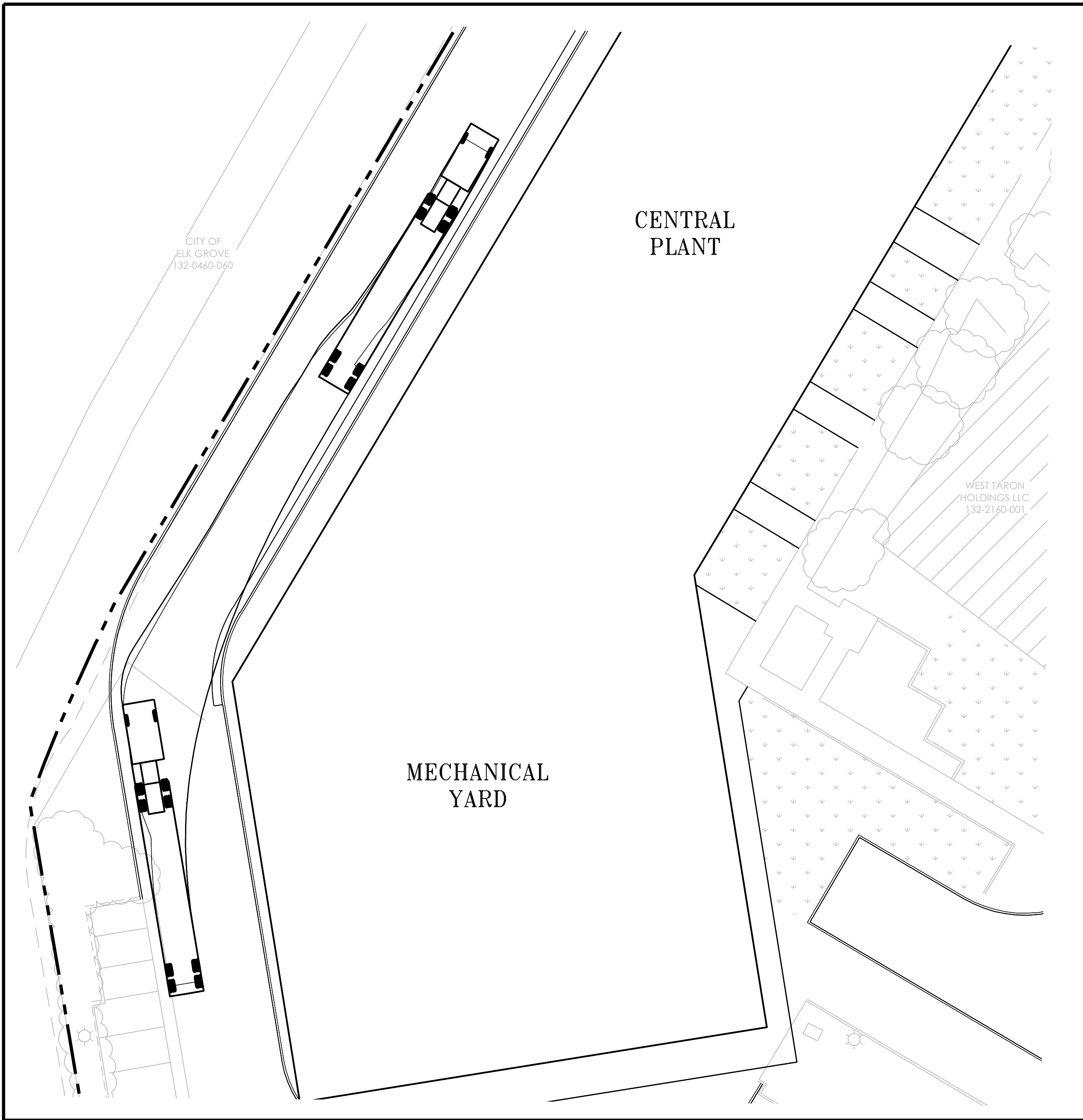
HCM 6th Ctrl Delay	52.6
HCM 6th LOS	D

Notes

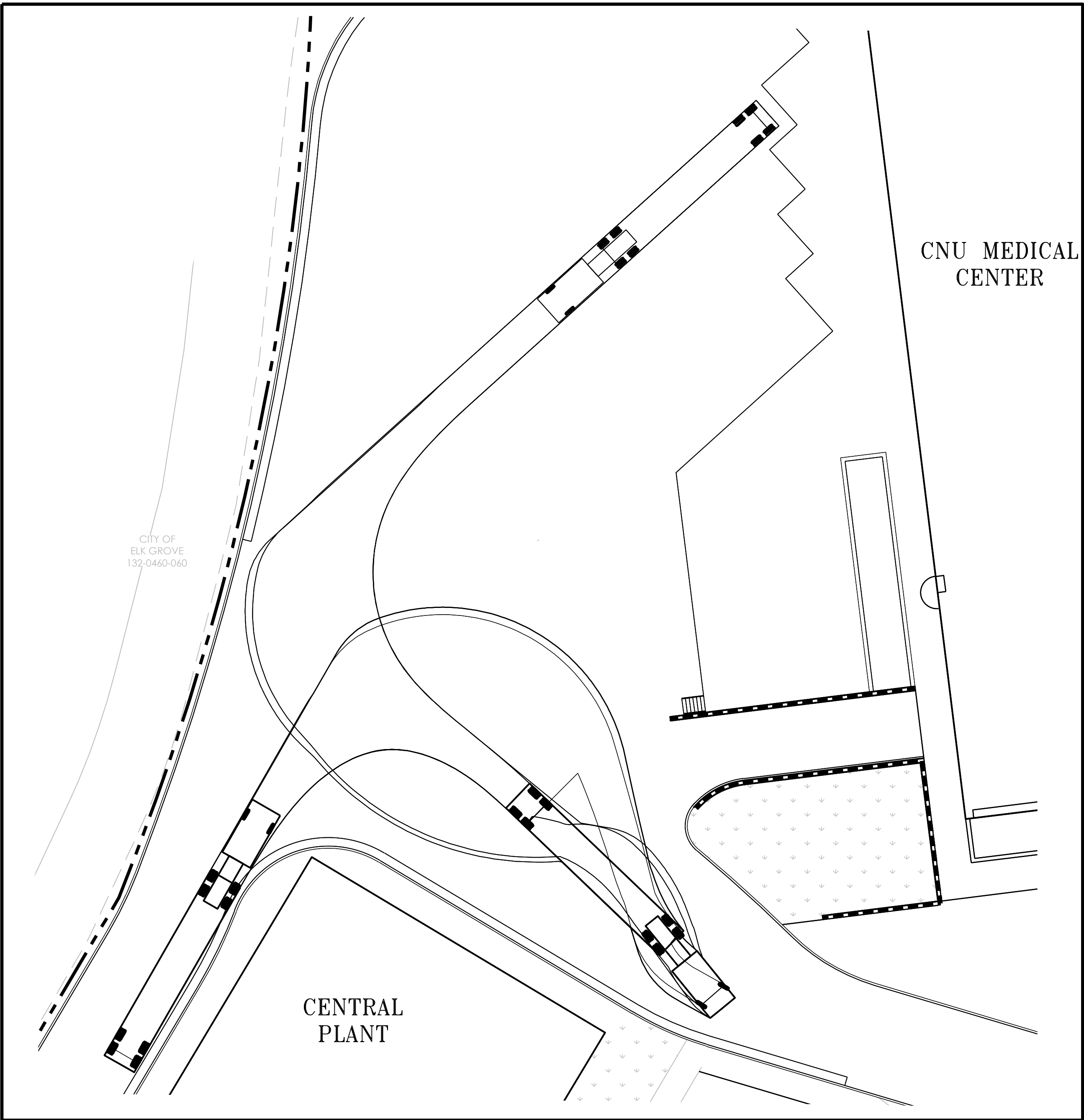
User approved pedestrian interval to be less than phase max green.
 User approved ignoring U-Turning movement.

Attachment C
Swept Path Analysis

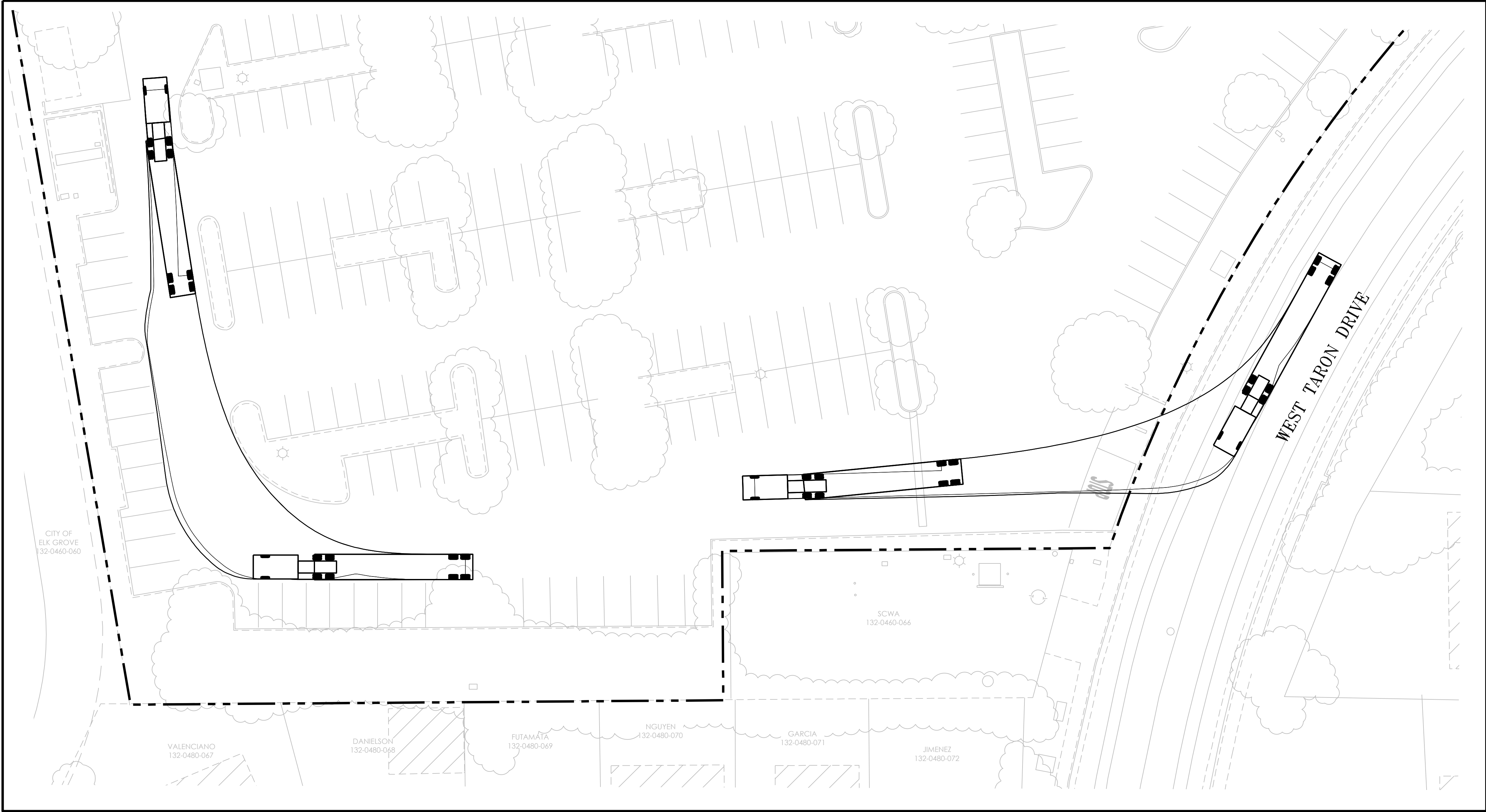
three inches = one foot
one and one half inches = one foot
one inch = one foot
three quarters inch = one foot
one half inch = one foot
one quarter inch = one foot
one eighth inch = one foot



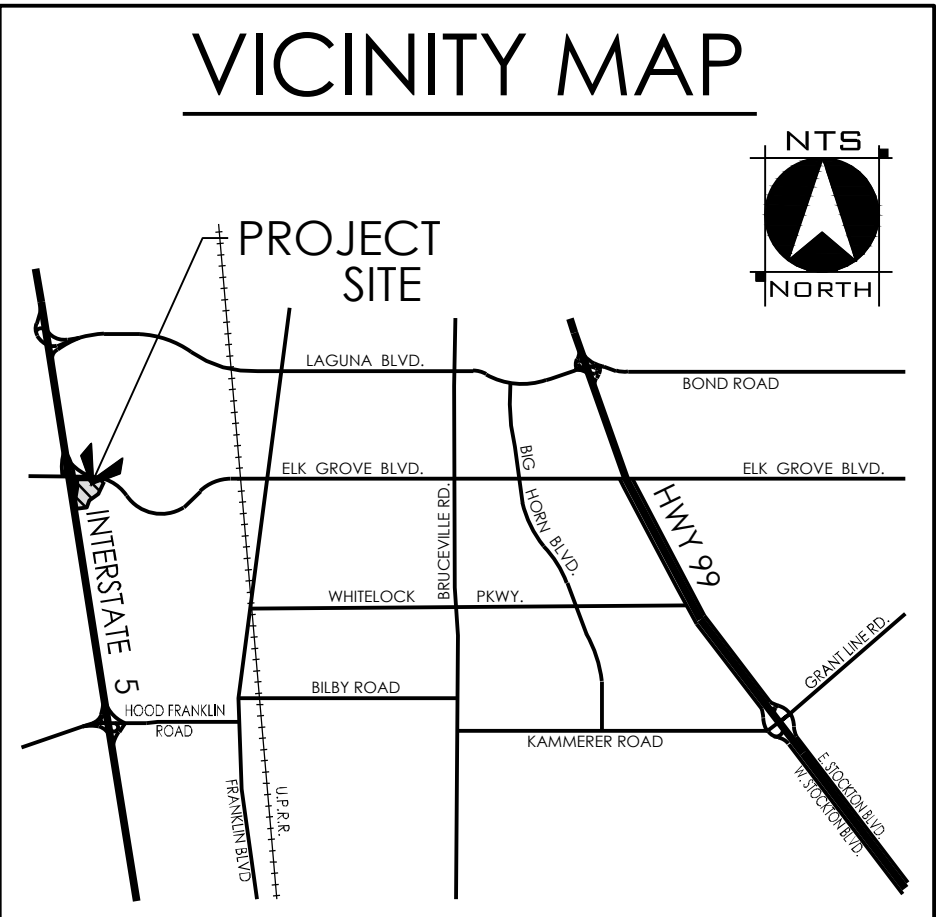
AT CENTRAL UTILITY PLANT



HOSPITAL TRUCK DOCK APPROACH



ENTRANCE AT WEST TARON DRIVE



PROJECT NOTES

OWNER
CALIFORNIA NORTHSTATE UNIVERSITY
9700 WEST TARON DRIVE
ELK GROVE, CA 95757
CONTACT: ALVIN CHEUNG
(916) 686-8883

APPLICANT
FONG & CHAN ARCHITECTS
1361 BUSH STREET
SAN FRANCISCO, CA 94109
CONTACT: PAOLO DIAZ
(415) 931-8600

SURVEYOR
DENNIS BARBER, PLS 8067
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SACRAMENTO, CA 95816
PHONE: (916) 341-7760

ASSESSOR'S PARCEL NO.
132-2480-001, -002, -003, -004, -005, -007, -008, -010, -011
132-2160-001, -002, 132-0460-076

AREA
24.6 ± ACRES GROSS

EXISTING USE
RETAIL/COMMERCIAL, OFFICE, PRIVATE SCHOOL

PROPOSED USE
PRIVATE SCHOOL, MEDICAL FACILITY

EXISTING/ PROPOSED GENERAL PLAN DESIGNATION
COMMERCIAL & EMPLOYMENT

EXISTING/ PROPOSED SPECIFIC PLAN DESIGNATION
N/A

EXISTING/ PROPOSED ZONING
GC - GENERAL COMMERCIAL
MP - INDUSTRIAL/OFFICE PARK,

PARK DISTRICT
COSUMNES CSD
9355 E. STOCKTON BLVD., #185
ELK GROVE, CA 95624
(916) 405-7150

FIRE PROTECTION
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SCHOOL DISTRICT
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SEWER
SACRAMENTO AREA SEWER DISTRICT
10060 GOETHE ROAD
SACRAMENTO, CA 95827
(916) 876-7526

STORM DRAINAGE
CITY OF ELK GROVE
8401 LAGUNA PALMS WAY
ELK GROVE, CA 95758
(916) 687-3005

WATER
SACRAMENTO COUNTY WATER AGENCY
827 7TH STREET, ROOM 301
SACRAMENTO, CA 95814
(916) 874-6851

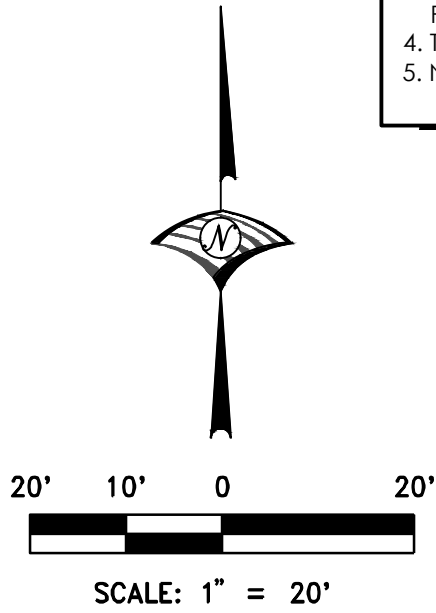
ELECTRICITY
SMUD
6301 S STREET
SACRAMENTO, CA 95817
(916) 742-7683

GAS
PG&E
5555 FLORIN PERKINS ROAD
SACRAMENTO, CA 95826
(916) 386-5453

TELEPHONE
FRONTIER COMMUNICATIONS
9257 LAGUNA SPRINGS WAY #160
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(916) 691-5615

NOTES

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4. THE AERIAL TOPOGRAPHY SHOWN HEREON WAS PROVIDED BY OTHERS.
5. NO DESIGN DEVIATIONS ARE PROPOSED WITH THIS SITE DESIGN.



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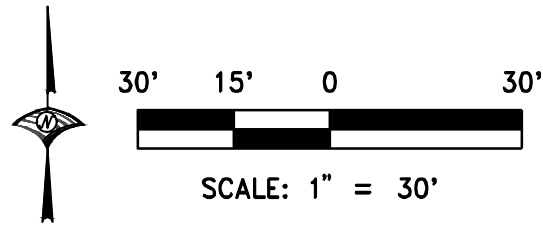
CALIFORNIA NORTHSTATE UNIVERSITY
CALIFORNIA NORTHSTATE UNIVERSITY MEDICAL CENTER
9700 W Taron Dr, Elk Grove, CA 95757

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST., BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

NO	DESCRIPTION	DATE
REVISIONS		

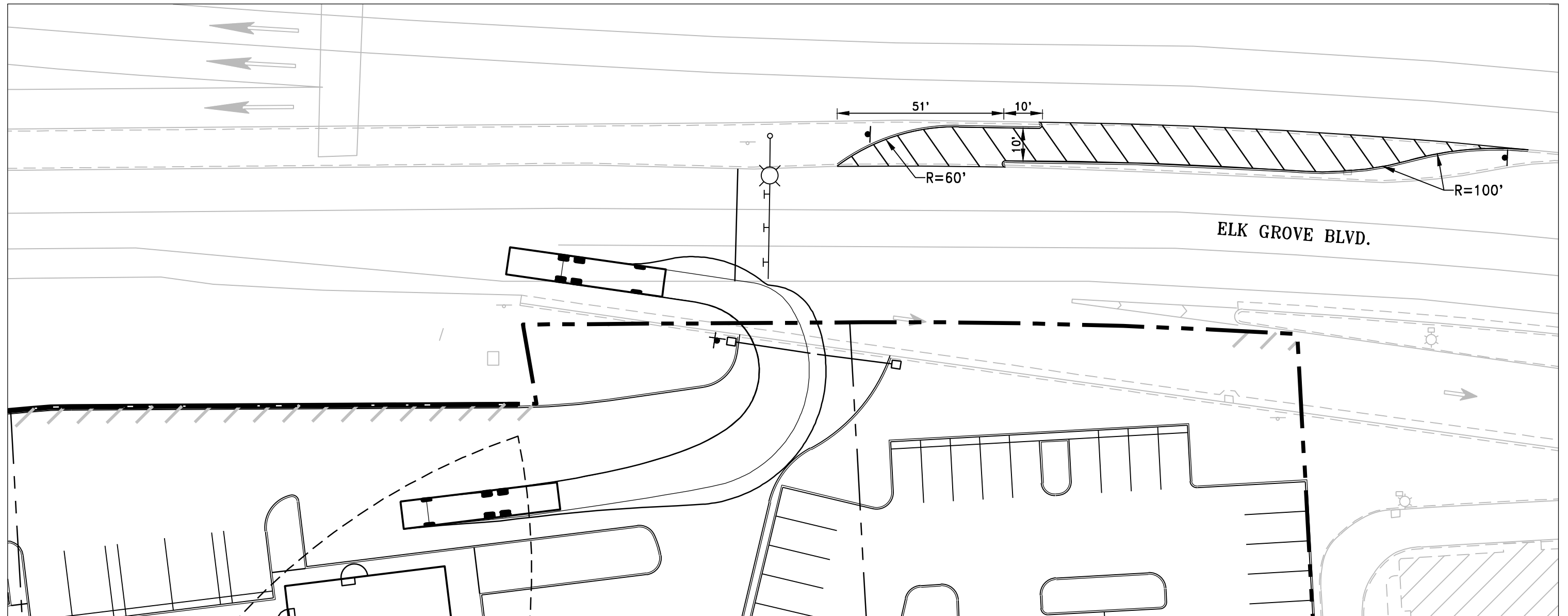
KEY PLAN
SHEET TITLE
PHASE 1 - TRUCK CIRCULATION PLAN

PROJECT NO. 467	SHEET NO. C4.0
DRAWN BY: P. ROBERTS	
CHECKED BY: M. SPOKELY	
SCALE:	
DATE: 02/18/2020	



EMERGENCY VEHICLE LEFT TURN POCKET
CNU MEDICAL CAMPUS
CALIFORNIA NORTHSTATE UNIVERSITY
ELK GROVE CALIFORNIA

APRIL 2020



VEHICLE ATTRIBUTES

E-ONE HP95 MIDMOUNT

OVERALL LENGTH: 47.75 FT
OVERALL WIDTH: 8.33 FT
BUMPER TO FRONT AXLE: 7.92 FT
AXLE TO AXLE: 18.42 FT

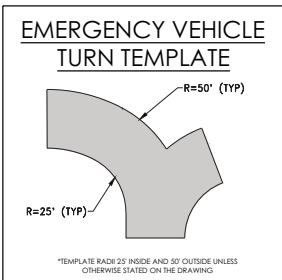
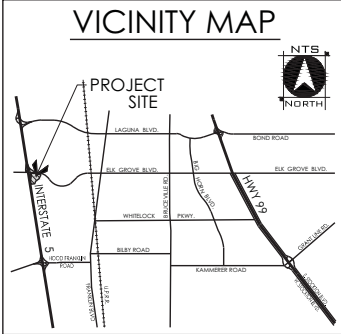
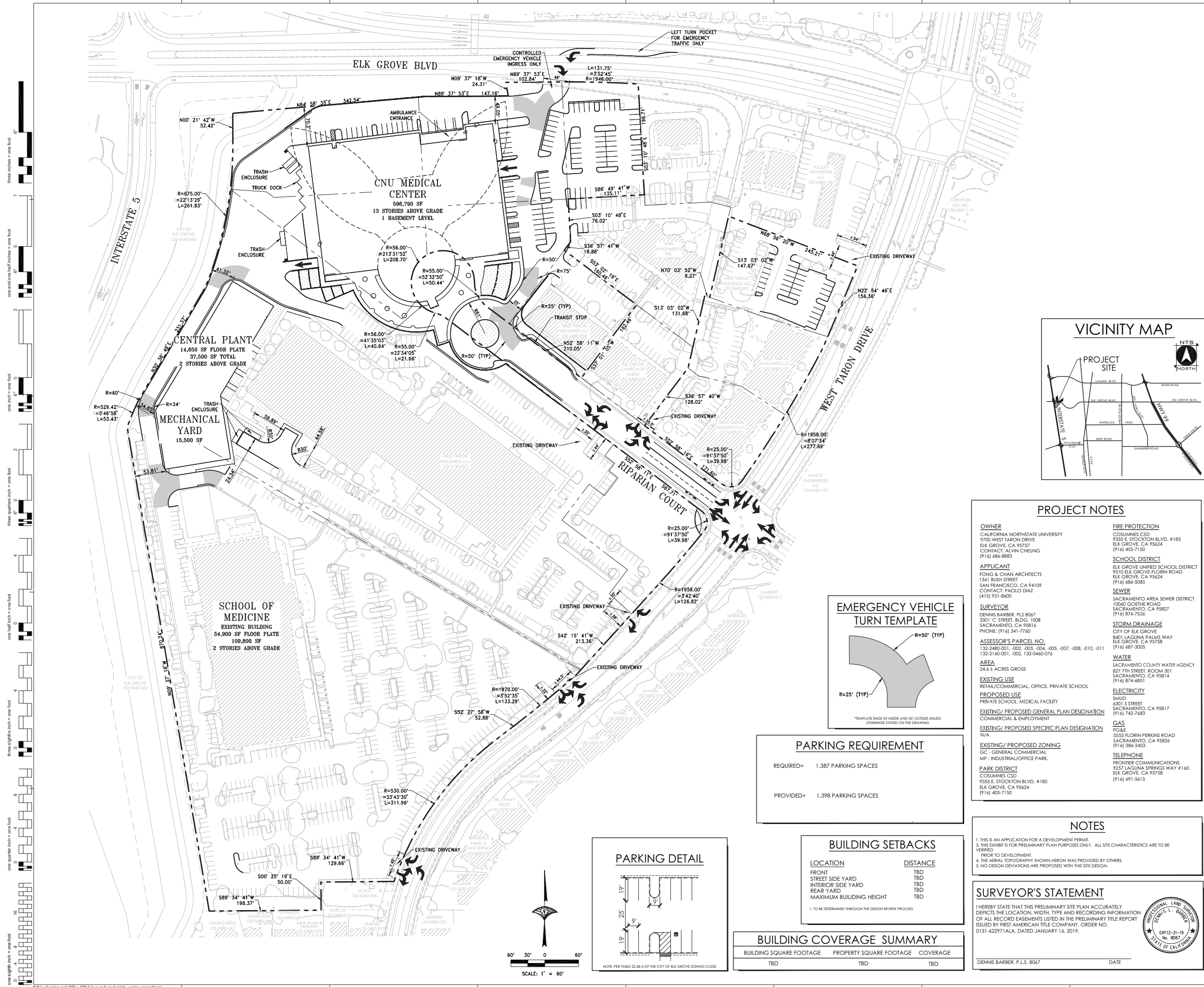


WOOD RODGERS

BUILDING RELATIONSHIPS ONE PROJECT AT A TIME

3301 C ST, BLDG. 100-B TEL 916.341.7760

SACRAMENTO, CA 95816 FAX 916.341.7767

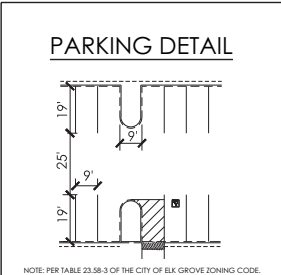


PARKING REQUIREMENT	
REQUIRED=	1,387 PARKING SPACES
PROVIDED=	1,398 PARKING SPACES

BUILDING SETBACKS	
LOCATION	DISTANCE
FRONT	TBD
STREET SIDE YARD	TBD
INTERIOR SIDE YARD	TBD
REAR YARD	TBD
MAXIMUM BUILDING HEIGHT	TBD

1. TO BE DETERMINED THROUGH THE DESIGN REVIEW PROCESS.

BUILDING COVERAGE SUMMARY		
BUILDING SQUARE FOOTAGE	PROPERTY SQUARE FOOTAGE	COVERAGE
TBD	TBD	TBD



PROJECT NOTES

OWNER
CALIFORNIA NORTHSTATE UNIVERSITY
9700 WEST TARON DRIVE
ELK GROVE, CA 95757
CONTACT: ALVIN CHEUNG
(916) 486-9883

APPLICANT
FONG & CHAN ARCHITECTS
1361 BUSH STREET
SAN FRANCISCO, CA 94109
CONTACT: PAOLO DIAZ
(415) 931-8600

SURVEYOR
DENNIS BARBER, PLS 8067
3301 C STREET, BLDG. 100B
SACRAMENTO, CA 95816
PHONE: (916) 341-7760

ASSESSOR'S PARCEL NO.
132-2480-001, -002, -003, -004, -005, -007, -008, -010, -011
132-2160-001, -002, 132-0460-076

AREA
24.4 ± ACRES GROSS

EXISTING USE
RETAIL/COMMERCIAL OFFICE, PRIVATE SCHOOL

PROPOSED USE
PRIVATE SCHOOL, MEDICAL FACILITY

EXISTING/ PROPOSED GENERAL PLAN DESIGNATION
COMMERCIAL & EMPLOYMENT

EXISTING/ PROPOSED SPECIFIC PLAN DESIGNATION
N/A

EXISTING/ PROPOSED ZONING
GC - GENERAL COMMERCIAL
MP - INDUSTRIAL/OFFICE PARK.

PARK DISTRICT
COSUMES CSD
9355 E. STOCKTON BLVD. #185
ELK GROVE, CA 95624
(916) 405-7150

FIRE PROTECTION
COSUMES CSD
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(916) 405-7150

SCHOOL DISTRICT
ELK GROVE UNIFIED SCHOOL DISTRICT
9510 ELK GROVE FLORIN ROAD
ELK GROVE, CA 95624
(916) 486-5085

SEWER
SACRAMENTO AREA SEWER DISTRICT
10060 GOETHE ROAD
SACRAMENTO, CA 95827
(916) 874-7526

STORM DRAINAGE
CITY OF ELK GROVE
8401 LAGUNA PALMS WAY
ELK GROVE, CA 95758
(916) 687-3005

WATER
SACRAMENTO COUNTY WATER AGENCY
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SACRAMENTO, CA 95814
(916) 874-6851

ELECTRICITY
SMUD
6301 S STREET
SACRAMENTO, CA 95817
(916) 742-7683

GAS
PG&E
5555 FLORIN PERKINS ROAD
SACRAMENTO, CA 95826
(916) 386-5453

TELEPHONE
FRONTIER COMMUNICATIONS
9257 LAGUNA SPRINGS WAY #160
ELK GROVE, CA 95758
(916) 691-5615

- NOTES**
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 - THE AERIAL TOPOGRAPHY SHOWN HEREON WAS PROVIDED BY OTHERS.
 - NO DESIGN DEVIATIONS ARE PROPOSED WITH THIS SITE DESIGN.

SURVEYOR'S STATEMENT

I HEREBY STATE THAT THIS PRELIMINARY SITE PLAN ACCURATELY DEPICTS THE LOCATION, WIDTH, TYPE AND RECORDING INFORMATION OF ALL RECORD EASEMENTS LISTED IN THE PRELIMINARY TITLE REPORT ISSUED BY FIRST AMERICAN TITLE COMPANY, ORDER NO. 0131-622971ALA, DATED JANUARY 16, 2019.

DENNIS BARBER, P.L.S. 8067 DATE

PROFESSIONAL LAND SURVEYOR
DENNIS L. BARBER
No. 8067
STATE OF CALIFORNIA
EXP-12-31-19

FONG & CHAN ARCHITECTS
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CALIFORNIA NORTHSTATE UNIVERSITY MEDICAL CENTER

9700 W Taron Dr, Elk Grove, CA 95757

CONSULTANTS:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C ST., BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95816 FAX 916.341.7767

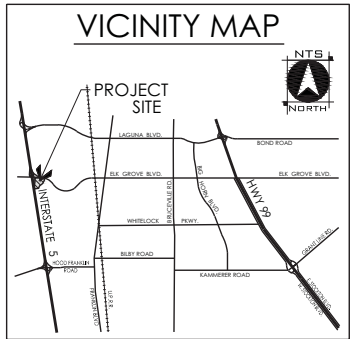
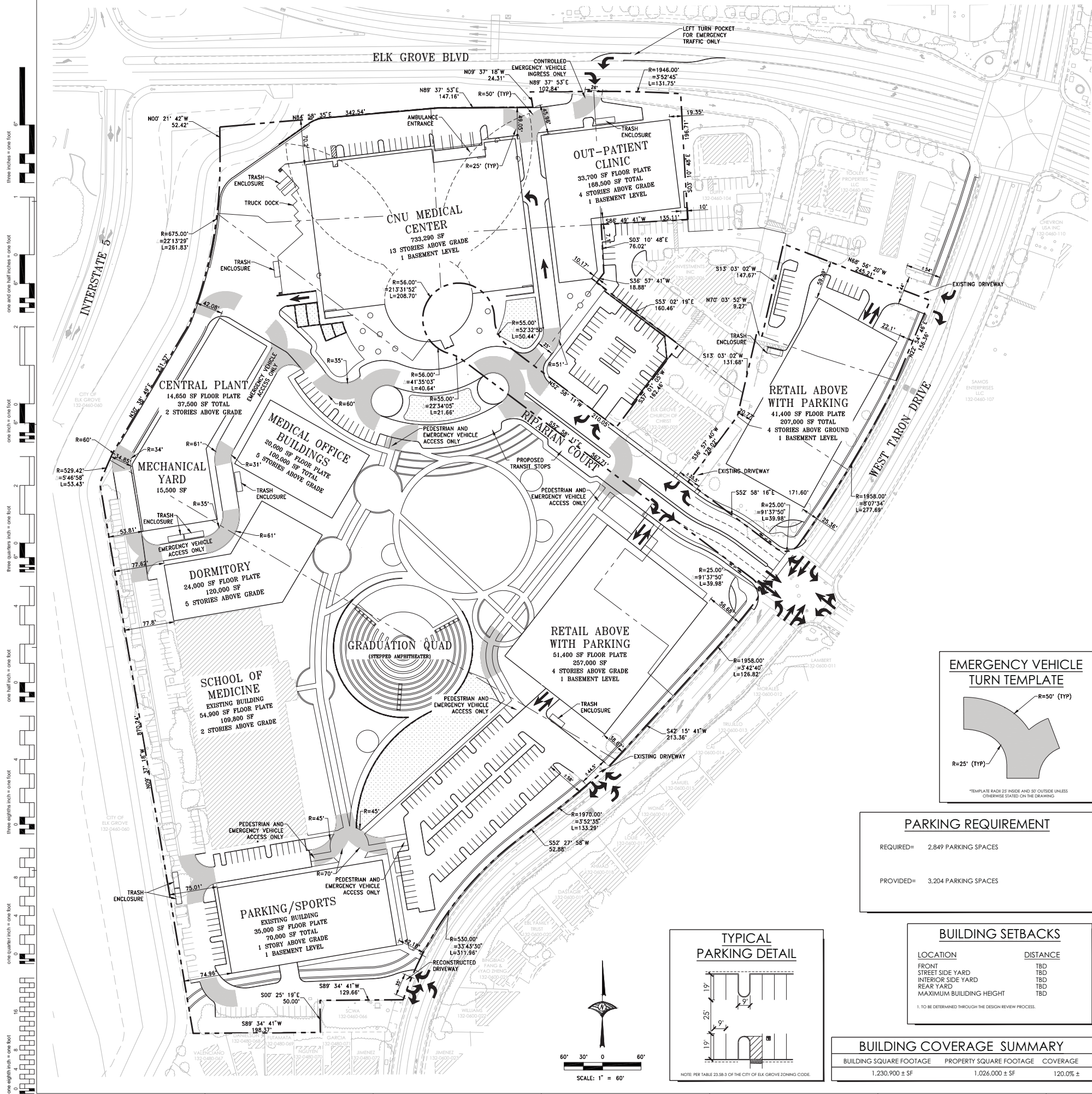
NO	DESCRIPTION	DATE
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REVISIONS

KEY PLAN
SHEET TITLE

PHASE 1 - PRELIMINARY SITE PLAN

PROJECT NO. 467	SHEET NO.
DRAWN BY: P. ROBERTS	C2.0
CHECKED BY: M. SPOKELY	
SCALE:	
DATE: 04/01/2020	



PROJECT NOTES

OWNER
CALIFORNIA NORTHSTATE UNIVERSITY
9700 WEST TARON DRIVE
ELK GROVE, CA 95757
CONTACT: ALVIN CHEUNG
(916) 456-8883

APPLICANT
FONG & CHAN ARCHITECTS
1361 BUSH STREET
SAN FRANCISCO, CA 94109
CONTACT: PAOLO DIAZ
(415) 931-8600

SURVEYOR
DENNIS BARBER, PLS 8067
3301 'C' STREET, BLDG. 100B
SACRAMENTO, CA 95814
PHONE: (916) 341-7740

ASSESSOR'S PARCEL NO.
132-2480-001, -002, -003, -004, -005, -007, -008, -010, -011
132-2140-001, -002, 132-0460-074

AREA
24.6 ± ACRES GROSS

EXISTING USE
RETAIL/COMMERCIAL OFFICE, PRIVATE SCHOOL

PROPOSED USE
PRIVATE SCHOOL, MEDICAL FACILITY

EXISTING/ PROPOSED GENERAL PLAN DESIGNATION
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EXISTING/ PROPOSED SPECIFIC PLAN DESIGNATION
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EXISTING/ PROPOSED ZONING
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SACRAMENTO AREA SEWER DISTRICT
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SACRAMENTO, CA 95827
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SACRAMENTO, CA 95814
(916) 874-8851

ELECTRICITY
SMUD
4301 'S' STREET
SACRAMENTO, CA 95817
(916) 742-7683

GAS
PG&E
5555 FLORIN PERKINS ROAD
SACRAMENTO, CA 95826
(916) 386-5453

TELEPHONE
FRONTIER COMMUNICATIONS
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ELK GROVE, CA 95758
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SURVEYOR'S STATEMENT

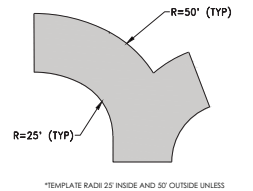
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DENNIS BARBER, P.L.S. 8067

DATE

EMERGENCY VEHICLE TURN TEMPLATE



PARKING REQUIREMENT

REQUIRED= 2,849 PARKING SPACES

PROVIDED= 3,204 PARKING SPACES

BUILDING SETBACKS

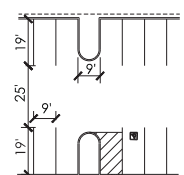
LOCATION	DISTANCE
FRONT STREET SIDE YARD	TBD
INTERIOR SIDE YARD	TBD
REAR YARD	TBD
MAXIMUM BUILDING HEIGHT	TBD

1. TO BE DETERMINED THROUGH THE DESIGN REVIEW PROCESS.

BUILDING COVERAGE SUMMARY

BUILDING SQUARE FOOTAGE	PROPERTY SQUARE FOOTAGE	COVERAGE
1,230,900 ± SF	1,026,000 ± SF	120.0% ±

TYPICAL PARKING DETAIL



NOTE: PER TABLE 23.56.3 OF THE CITY OF ELK GROVE ZONING CODE.

FONG & CHAN ARCHITECTS
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CONSULTANTS:

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BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 'C' ST, BLDG. 100-B TEL 916.341.7760
SACRAMENTO, CA 95814 FAX 916.341.7767

NO	DESCRIPTION	DATE

REVISIONS

KEY PLAN
SHEET TITLE

PHASE 3 FINAL BUILD OUT - PRELIMINARY SITE PLAN

PROJECT NO.
467

DRAWN BY:
P. ROBERTS

CHECKED BY:
M. SPOKELY

SCALE:

DATE:
04/01/2020

C2.1

Attachment D
VMT



TECHNICAL MEMORANDUM

Date: April 20, 2020
To: Pat Angell, Ascent Environmental
From: David B. Robinson, Fehr & Peers
Subject: California Northstate University – VMT Analysis

RS19-3789

Fehr & Peers completed a vehicle miles of travel (VMT) analysis for the proposed California Northstate University project, located in the City of Elk Grove. The purpose of the VMT analysis is to determine if the proposed project complies with City of Elk Grove General Plan Policy (Policy MOB-1-1) adopted to reduce VMT and achieve State-mandated reductions in VMT. This memorandum outlines SB 743, the proposed project, the analysis methodology, the evaluation criteria, and presents the analysis results.

SB 743

SB 743 (Stats. 2013, ch. 386) resulted in several statewide CEQA changes. It required the Governor's Office of Planning and Research (OPR) to establish new metrics for determining the significance of transportation impacts of projects within transit priority areas (TPAs) and allows OPR to extend use of the metrics beyond TPAs. OPR selected VMT as the preferred transportation impact metric and applied their discretion to require its use statewide. This legislation also established that aesthetic and parking effects of a residential, mixed-use residential, or employment center projects on an infill site within a TPA are not significant impacts on the environment. The revised CEQA Guidelines that implement this legislation became effective on December 28, 2018, and state that vehicle level of service (LOS) and similar measures related to delay shall not be used as the sole basis for determining the significance of transportation impacts, and that as of July 1, 2020, this requirement shall apply statewide, but that until that date, lead agencies may elect to rely on VMT rather than LOS to analyze transportation impacts.

Proposed Project

The proposed project includes expanding the existing CNU, which consists of one 109,800 square foot building, to include a hospital, outpatient building, medical office building, dormitories, administrative offices, restaurant and retail space, and three parking garages. An existing 76,000 square foot office building and seven commercial buildings totaling approximately 68,500 square feet will be demolished with phased construction of the project. The project will require a general plan amendment changing some land use designations from Community Commercial and Light Industrial to Employment Center.

The project is located southwest of the Elk Grove Boulevard/West Taron Drive intersection. Access is proposed via one existing driveway on Elk Grove Boulevard, four existing driveways on West Taron Drive, and three existing driveways on Riparian Drive.

Consistent with the requirements of the City of Elk Grove Climate Action Plan: 2019 Update, the project also includes a Transportation Demand Management (TDM) Plan. The Climate Action Plan (CAP), CAP measure

TACM-3 (Intercity Transportation Demand Management) focuses on implementing TDM strategies to reduce the use of single-occupancy vehicle trips, with a target of achieving a 15 percent reduction in project vehicle trips and associated vehicle miles of travel (VMT).

To aid the development of TDM plans, the City of Elk Grove developed the City of Elk Grove Transportation Demand Management Plan Guidelines. The guidelines identify TDM measure by category that include marketing and promotion, bike facilities, transit benefits, commuter benefits, and parking facilities. The guidelines outline the requirements for each TDM plan and identifies the following for each TDM measure:

- Measure Requirements – describes the transportation amenity being provided, the amount/frequency of the amenity, and the property owner's responsibilities. Each TDM measure is assigned a point value between one and five. The higher the value the more effective the measure is at reducing vehicle travel
- Compliance Requirements – identifies the required actions and obligations of the applicant or property owner's for compliance with the TDM measure during the development review phase of the project
- TDM Plan Annual Progress Report – identifies the annual reporting requirement for the property owners of TDM coordinator, which include the number of employees participating in the plan (i.e., by measure) and the commute mode share of employees, along with other performance measures that demonstrate performance

The TDM Plan is required to include all required measures and a set of optional TDM measures that total to a minimum of 10 points. Table 1 summarizes the measures included in the proposed project's TDM Plan. Consistent with the guidelines, the plan includes all required measures and 28 points of optional measures. A detailed description of the TDM measures is provided in Attachment A.

Table 1: Proposed Project TDM Plan

TDM Category	TDM Measure	Required	Optional	Measure Points
	Transportation Marketing Services	X	-	-
	Short-Term Bicycle Parking	-	X	1
	Long-Term Bicycle Parking			2
	Improved Access to Bike Network			1
	Showers and Locker Rooms			3
	On-Site Cafe			3
	Subsidized Transit Passes			3
	Shuttle Bus Service			5
	Carpooling Program			3
	Guaranteed Ride Home			4
	Parking Cash Out Program			3
Total				28

Source: Fehr & Peers, 2020.

TDM+ incorporates the effects of numerous land use strategies as well as various travel incentives/disincentives. The VMT calculations applied in TDM+ are based on strategies identified in the California Air Resources Board's Zero Carbon Buildings Study, which in turn draws from the 2010 CAPCOA manual Quantifying Greenhouse Gas Mitigation Measures. These reductions are exclusive of built environment variables like land use mix and density, which are accounted for in our internalization estimate, developed using MXD+. The TDM strategy reductions have been limited in effectiveness to only land uses where there is supporting research or case studies to support the reductions. The reductions reflect the suburban (single-family) environment of the project location.

TDM+ identified a range of overall reduction for the entire project between 4% and 31%. Based on this evaluation, the 15% reduction applied for the project analysis is achievable. The results of the TDM+ evaluation is provided in Attachment A.

Analysis Methodology

The City uses total daily VMT and VMT per service population as the basis for VMT analysis. The following describes these two VMT metrics and their intended use:

- VMT per Service Population – Includes the sum of all vehicle miles of travel produced by individual land uses in a project, divide by the sum of total employees working within the project, residents living in the land uses, students attending classes, patients receiving care, or visitors in the project. The VMT per service population metric is used to assess a project against specific land use VMT limits. The project includes hospital, medical office, outpatient, administration, classroom, dormitory, and commercial/retail land use.
- Total Daily VMT – Includes the sum of all daily vehicle miles of travel produced by all uses within the City of applicable Study Area. Since the project is located in the City limits, the Citywide cumulative VMT limit that is outlined in Policy MOB-1-1(a)(ii) is used to assess the project.

Using the modified version of SACOG's SACSIM regional travel demand forecasting model, developed for the City of Elk Grove General Plan Update, origin-destination/tour-based transportation analysis VMT forecasts VMT based on all trips that have one end in a project location and includes the following:

- Trip Types – Includes internal-to-internal (II), internal-to-external (IX), and external-to-internal (XI) trips. External-to-external (XX) trips are excluded.
- Trip Length – Fully accounts for entire length of each trip.
- Trip Tours – Includes trip tours without an origin or destination at the home.

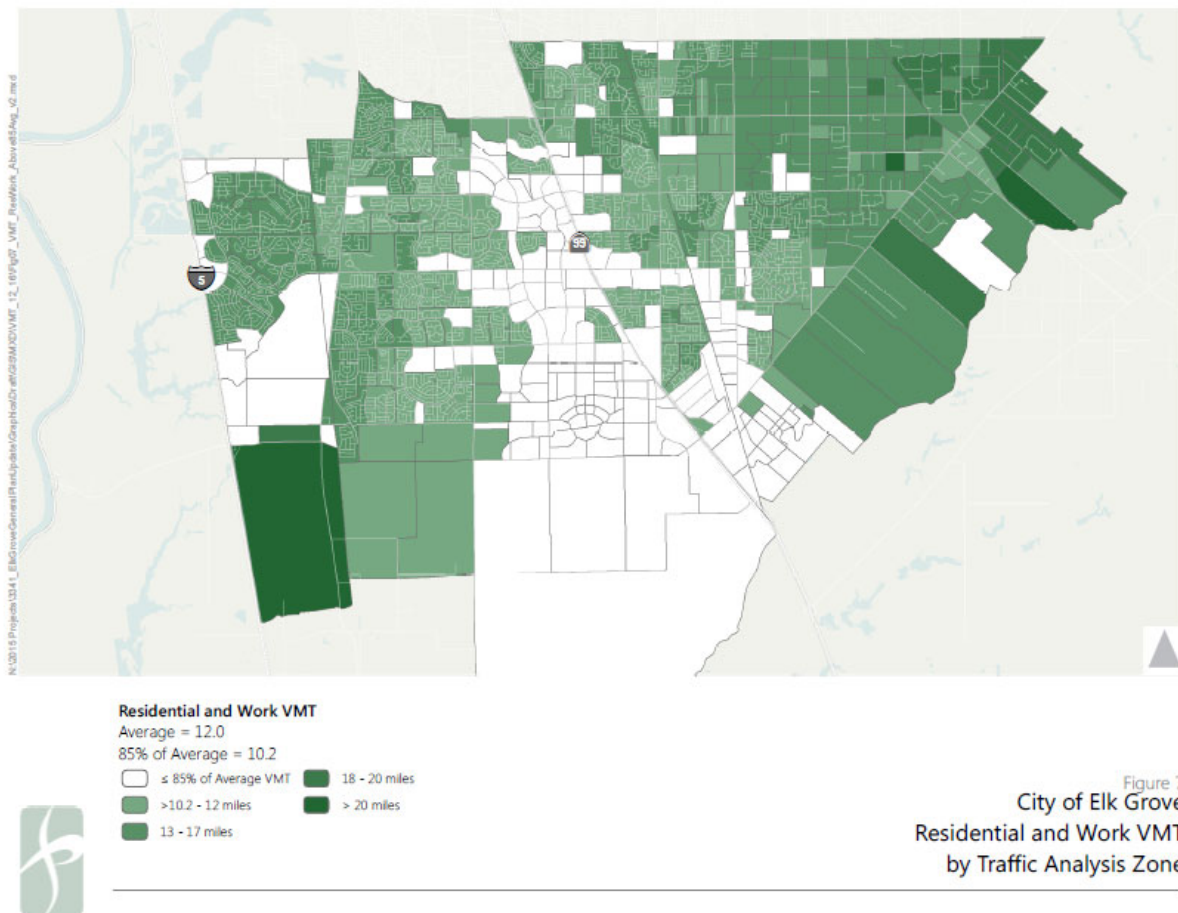
Details of the VMT calculation process are included in Appendix E of the City of Elk Grove Transportation Analysis Guidelines.

We estimated VMT using a modified version of SACOG's SACSIM regional travel demand forecasting model, developed for the analysis of the City of Elk Grove General Plan Update in conjunction with mobile-sourced data from StreetLight Data to obtain average trip lengths for the for the existing CNU school building, the existing office building (ALLDATA), the existing shopping center, as well as seven comparable hospitals and medical centers within the Sacramento region. Potential limitations to the model are outlined in Attachment C.

Analysis Evaluation Criteria

We used the following evaluation criteria from Policy MOB-1-1 of the City of Elk Grove General Plan to determine if the addition of the proposed project would result in an impact in the City of Elk Grove. The City desires to achieve a reduction in VMT. Reductions in VMT, which can be accomplished through a combination of land use and mobility actions. To reduce VMT, the City has established the following metrics and limits.

The following VMT Screening Map identifies areas in the City that are exempt from VMT analysis. These include sites that have been pre-screened through Citywide VMT analysis. Pre-screened areas are shown in white and have been determined to result in 15 percent or below the average service population VMT established for that land use designation if built to the specifications of the Land Use Plan. With an average VMT per service population of 12.0, the City's target VMT per service population threshold is 10.2.



For projects that have not been pre-screened and that do not achieve the limits outlined below shall be subject to all feasible mitigation measures necessary to reduce the VMT for, or induced by, the project to the applicable limits. If the VMT for or induced by the project cannot be reduced consistent with the performance metrics outlined below, the City may consider approval of the project, subject to a finding of overriding consideration and mitigation of transportation impacts to the extent feasible, provided some other form of community benefit is achieved by the project.

- **New Development** – Any new land use plans, amendments to such plans, and other discretionary development proposals (referred to as “development projects”) are required to demonstrate a 15 percent reduction in VMT from existing (2015) conditions. To demonstrate this reduction, conformance with following land use and cumulative VMT limits is required:
 1. **Land Use** – Development projects shall demonstrate that the VMT produced by the project at buildout is equal to or less than the VMT limit of the project’s General Plan land use designation, as shown in the following table, which incorporates the 15 percent reduction from 2015 conditions:

Vehicle Miles Traveled Limits by Land Use Designation

Land Use Designation	VMT Limit (daily per service population)
Commercial and Employment Land Use Designations	
Community Commercial	41.6
Regional Commercial	44.3
Employment Center	47.1
Light Industrial/Flex	24.5
Light Industrial	24.5
Heavy Industrial	39.5
Mixed Use Land Use Designations	
Village Center Mixed Use	41.6
Residential Mixed Use	21.2
Public/Quasi Public and Open Space Land Use Designations	
Parks and Open Space	0.0
Resource Management and Conservation	0.0
Public Services	53.1
Residential Land Use Designations	
Rural Residential	34.7
Estate Residential	49.2
Low Density Residential	21.2
Medium Density Residential	20.9
High Density Residential	20.6
Other Land Use Designations	
Agriculture	34.7

Notes:

1. *These land use designations are not anticipated to produce substantial VMT, as they have no residents and few to no employees. These land use designations therefore have no limit and are exempt from analysis.*

2. **Cumulative for Development Projects within the Existing City** – Development projects located within the existing (2017) City limits shall demonstrate that cumulative VMT within

the City including the project would be equal to or less than the established Citywide limit of 6,367,833 VMT (total daily VMT).

3. **Cumulative for Development Projects within Growth Areas** – Development projects located in Study Areas shall demonstrate that cumulative VMT within the applicable Study Area would be equal to or less than the established limit shown in the following table.

Study Area Total Vehicle Miles Traveled Limits

Study Area	VMT Limit (total VMT at buildout)
North Study Area	37,622
East Study Area	420,612
South Study Area	1,311,107
West Study Area	705,243

The project is located within the City limits. The project and remainder of the City shall meet the buildout VMT Limit of 6,367,833.

Analysis Results

The following presents the analysis of Project VMT under cumulative conditions, relative to the threshold of significance presented above. The VMT analysis includes all of the roadway improvement included as part of the General Plan VMT analysis.

Project-Type VMT Exemption

The City has identified the following project types that are exempt from VMT analysis:

- A residential project of < 10 dwelling units
- A commercial, office, or industrial project of < 50,000 square feet
- A mixed use project containing < 10 dwelling units and < 50,000 square feet of commercial, office, or industrial space
- A project that is high density low-income housing on a high density housing site as designated in the Housing Element

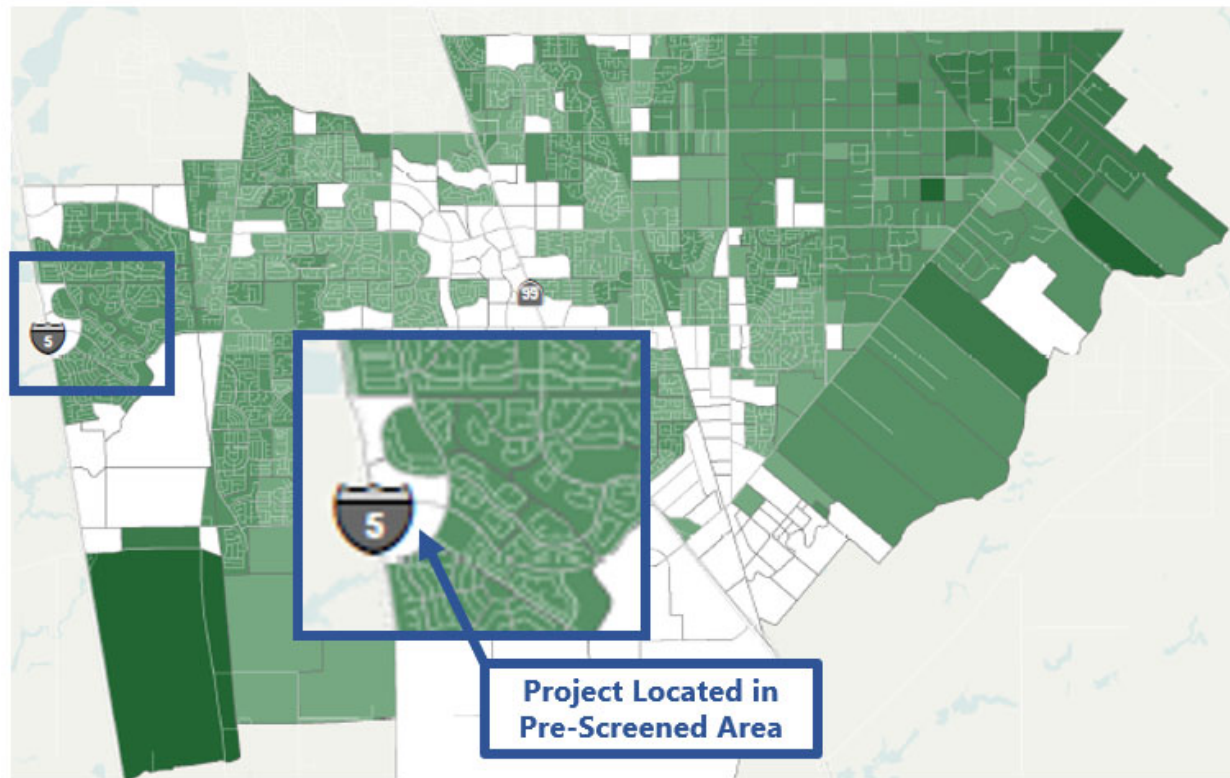
Based on these criteria, the project is not exempt from VMT analysis due to the size of the project

VMT Screening

The VMT Screening Map identifies areas in the City that are exempt from VMT analysis. These include sites that have been pre-screened through Citywide VMT analysis. Pre-screened areas are shown in white and have been determined to result in 15 percent or below the average service population VMT established for the land use designations for the study area if built to the specifications of the Land Use Plan.

The Project area is identified on the VMT Screening Map shown below. As shown, the Project is located in a pre-screened area. However, the project requires a general plan amendment to change some land use designations (i.e., representing most of the project area) from Community Commercial and Light Industrial to Employment Center, so the project is not eligible for pre-screening.

One parcel that will accommodate Parking Garage 2 will remain Community Commercial and will not require a general plan amendment. This parcel is pre-screened and is not subject to VMT analysis.



VMT Limits by Land Use Designation

As outlined above, the Project must demonstrate that the VMT produced by the Project at buildout is equal to or less than the VMT limit of the underlying land use designation. The project will have a General Plan land use designation of Employment Center after the required general plan amendment outlined above. Table 2 compares the Project's VMT per service population (i.e., employees, students, patients, and visitors) to the City's VMT limit for that land use. As shown in Table 2, the Project as analyzed will not exceed the City's VMT limits for the Employment Center land use designation. Technical calculations are included in Attachment B.

Table 2: VMT by Land Use Designation Limits – Project Buildout Conditions

Project	Land Use Designation	VMT Per Service Population		Limit Exceeded?
		Limit	Project ¹	
Buildout	Employment Center	47.1	13.67	No
Buildout With 15% TDM Reduction			11.62	No

Source: Fehr & Peers, 2020.

Citywide VMT Limits

As outlined above, land use development Projects located within the existing (2017) City limits shall demonstrate that cumulative VMT within the City, including the project, would be equal to or less than the City's established total VMT limit. Table 3 compares the citywide total VMT limit to the City's total VMT limit with buildout of the proposed project. As shown in Table 3, the addition of the project would not cause cumulative VMT to exceed the established citywide limit.

Table 3: Citywide VMT Limit – Project Buildout Conditions

Development Projects in Existing City	Total VMT		Limit Exceeded?
	Limit	Project	
Citywide	6,367,833	6,342,176	No

Source: Fehr & Peers, 2020.

Attachment A
TDM

1. MARKETING AND PROMOTION

This measure category focuses on ensuring that employees are informed of the TDM Plan being implemented and understand all the available transportation amenities, services, and/or incentives.

TDM MEASURE	MEASURE REQUIREMENTS	COMPLIANCE REQUIREMENTS	MEASURE POINTS
Transportation Marketing Services	The building owner, in coordination with the building tenants, shall administer a comprehensive marketing and communication campaign which provides all tenants and employees at the project site with information about available transportation amenities, services, and/or incentives. Marketing services shall be provided by a TDM coordinator or a communications professional. Marketing services shall include, at a minimum, the following activities: 1. Promotions. The TDM coordinator or communications professional shall develop and deploy promotions to encourage the use of sustainable transportation modes. Marketing materials may include targeted messaging, communications campaigns, incentives (e.g., subsidized transit passes, employee parking cash out options), contests, and other creative strategies for existing and new employees. 2. Welcome Packets. New employees at the project site shall be provided with marketing information about the available transportation amenities, services, and/or incentives. For employees, the packet shall reflect options for major commute origins and offer one-on-one consultations.	The applicant or property owner shall provide the contact information for the provider of TDM marketing services, a description of qualifications, and a sample TDM Plan. City staff shall contact the designated provider and/or review the plan to verify that the applicant or property owner is prepared to offer marketing services in the time frame specified for project approval.	Required Measure

2. BIKE FACILITIES

This measure category encourages employees to use active modes of transportation to commute to and from work by providing convenient on-site amenities tailored to bike commuters.

TDM MEASURE	MEASURE REQUIREMENTS	COMPLIANCE REQUIREMENTS	MEASURE POINTS
Short-Term Bicycle Parking	For new office buildings, provide secure bicycle parking for five percent of the vehicular parking spaces being added, with a minimum of one space. Acceptable parking facilities shall be conveniently located near the building entrance and meet the requirements in 23.58.090 (D)(1) of the Elk Grove Municipal Code.	The applicant or property owner shall submit plans during the development review stage that identify the location and number of short-term bicycle parking spaces.	1
Long-Term Bicycle Parking	For new office buildings, provide secure bicycle parking for five percent of the vehicular parking spaces being added, with a minimum of one space. Acceptable parking facilities shall be conveniently located near the building entrance and shall meet one of the following: 1. Covered, lockable enclosures with permanently anchored racks for bicycles; 2. Lockable bicycle rooms with permanently anchored racks; or 3. Lockable, permanently anchored bicycle lockers.	The applicant or property owner shall submit plans during the development review stage that identify the location and number of long-term bicycle parking spaces.	2
Improved Access to Bike Network	The project shall design features which improve pedestrian and bicycle connectivity consistent with the City's Bicycle, Pedestrian, and Trails Master Plan and related planning efforts. The applicant shall provide pathways that are a minimum of 10 feet in width that allow pedestrians and cyclists to connect from adjacent roadways, bike lanes and sidewalks to the main entrance of a building(s). Applicants shall demonstrate, as part of the site design plans, that the proposed project includes pedestrian and bicycle infrastructure and connections to existing facilities.	The applicant or property owner shall submit plans during the development review stage that identify improved access to the City's bike network in the site designs.	1
Showers and Locker Rooms	For new office buildings, projects shall provide at least one shower and six clothes lockers for every 30 Bicycle Parking spaces, but no fewer than one shower and six clothes lockers.	The applicant or property owner shall submit plans during the development review stage that identify the location and number of showers and clothes lockers. City staff shall review the proposed plan to ensure that the included showers and clothes lockers meet the measure requirements.	3

3. ON-SITE AMENITIES

This measure category provides a set of on-site design features and amenities that assist employees in reducing single-occupancy vehicle trips during the workday.

TDM MEASURE	MEASURE REQUIREMENTS	COMPLIANCE REQUIREMENTS	MEASURE POINTS
On-Site Cafe	For new office buildings, projects shall provide an on-site café with full coffee and lunch menu services to help reduce coffee break and lunchtime vehicle trips.	The applicant or property owner shall submit information about the potential providers for the on-site cafe and a description of the services that would be offered at the project site. Information shall be submitted during the development review stage.	3

4. TRANSIT MEASURES

This measure category incentivizes employees that use transit as their primary commute mode. Transit measures shall only be included in the TDM Plan if the project site is located within 1/2 miles from a transit stop.

TDM MEASURE	MEASURE REQUIREMENTS		MEASURE POINTS
Subsidized Transit Passes	Provide free or subsidized monthly transit passes for on-site employees. Transit pass subsidies shall provide a minimum of \$50 of monthly transit costs per employee. Publicize the availability of free or subsidized transit passes to employees through the new employee welcome package.	The applicant or property owner shall provide information on the method in which employees would be reimbursed or compensated for monthly transit costs and how this process would be managed for building tenants. This information will be verified by City staff before certificate of occupancy issuance.	3

5. COMMUTER BENEFITS

This measure category provides a set of commuter services and incentives that encourage employees to commute using modes other than single-occupancy vehicles.

TDM MEASURE	MEASURE REQUIREMENTS		MEASURE POINTS
Vanpool Program	The property owner shall implement an employer or building manager-sponsored vanpool program. The vanpool program would provide service between the project site and general locations where vanpool users live. The property owner shall purchase or lease vans for employee use and pay for mileage and maintenance of the vehicles. See Sac Region 511 website for vanpool incentives.	The applicant or property owner shall provide information on the method in which employees would be reimbursed or compensated for monthly vanpool costs and how this process would be managed for building tenants. This information will be verified by City staff before certificate of occupancy issuance.	4
Carpooling Program	Promote and provide discounts for employees who use rideshare services such as Waze Carpool, UberPOOL, and LyftLine	The applicant or property owner shall provide information on the method in which employees would be reimbursed or compensated for discounts when using rideshare services and how this process would be managed for building tenants. This information will be verified by City staff before certificate of occupancy issuance.	3
Bikeshare Program	Promote and provide discounts for employees who use bike or scooter share services, such as Gotcha, JUMP, SPIN, Lime, or other such services. Provide docks or other designated parking/storage area for the service on-site.	The applicant or property owner shall provide information on the method in which employees would be reimbursed or compensated for discounts when using these services and how this process would be managed for building tenants. This information will be verified by City staff before certificate of occupancy issuance.	1

TDM MEASURE	MEASURE REQUIREMENTS		MEASURE POINTS
Shuttle Bus Service	The applicant shall provide a service plan describing the hours of operation, stop location(s), routes, and headways for the shuttle service. The applicant or property owner shall also submit plans that identify the location and dimensions of potential shuttle stops at the project site and the proposed destination(s) stops. The plans shall identify any other relevant information that may be helpful in understanding potential conflicts at the proposed shuttle stop locations (e.g., proximity to transit stops, crosswalks).	The applicant or property owner shall submit a detailed service plan for the shuttle bus service which must be finalized and approved by the City before certificate of occupancy issuance.	5
Guaranteed Ride Home	The applicant shall submit a service plan describing the services provided by a Guaranteed Ride Home program. See Sacramento TMA for opportunity to participate in an existing program. Participants must pre-register in the program at no additional cost to the employee or employer and are eligible to use the Guaranteed Ride Home program as long as they have used a qualified commute alternative on the day they need assistance. 1. Qualified commute alternatives include carpool, vanpool, shuttles, transit, bicycling, and walking, and commute apps that are specifically for carpooling (such as Scoop and Waze Carpool). 2. Non-qualified commute alternatives include driving alone, motorcycles, and Transportation Network Companies/ride-hailing apps (such as Uber or Lyft) 3. Emergency-related side trips – such as picking up a sick child from school or getting a prescription filled at a pharmacy – are permitted. 4. Participants can be reimbursed a maximum of six times per calendar year (January-December).	The applicant or property owner shall submit a detailed service plan for the Guaranteed Ride Home program which must be finalized and approved by the City before certificate of occupancy issuance.	4

6. PARKING FACILITIES

This measure category focuses on discouraging trips made by private vehicles (particularly single occupancy vehicles) by controlling the supply of accessory parking spaces. Parking Facility measures shall only be included in the TDM Plan if the project site is located within 1/2 miles from a transit stop.

TDM MEASURE	MEASURE REQUIREMENTS		MEASURE POINTS
Parking Cash Out Program	Any tenant employer that subsidizes parking for its employees shall provide all employees with a choice of forgoing any subsidized/free parking for a cash payment equivalent to the cost of the parking space to the employer. Employers shall promote the program to all employees eligible to receive parking at a subsidized level.	The applicant, property owner, or TDM coordinator shall provide City staff with a signed letter agreeing to distribute the TDM Plan, including provisions for the Parking Cash Out Program, via new employee packets, tenant lease documents, and/or deeds. This information shall be submitted during the development review stage.	3
Unbundled Parking Requirement	50 percent of project parking spaces shall be leased or sold separately as part of the tenant or lease agreement rental so that tenants have the option of renting or buying a parking space at an additional cost, and would, thus, experience cost savings if they opt not to rent or purchase parking.	The applicant, property owner, or TDM coordinator shall submit a signed letter agreeing to distribute the TDM Plan, including provisions for the unbundled parking requirements as part of tenant lease documents, and/or deeds. This information shall be submitted during the development review stage.	3

TDM Reduction Summary Report: CNU Elk Grove Hospital

Overall VMT Reduction: 4% to 31%

VMT % Reduction by Land Use

Parking



Parking1A: Increased Off-Street Fees
Parking1B: Increased On-Street Fees
Parking1D: Unbundled Parking
Parking1E: Pay-as-you-Go Parking Rates
Parking 2: Parking Supply

Transit



Transit 1: Subsidies	up to 2%	-	-	-
Transit 2A: Transit Frequency				
Transit 2B: Transit Coverage				
Transit 3A: Private Point-to-Point Shuttles	1% to 9%	up to 9%	up to 9%	up to 9%
Transit 3B: Last Mile Shuttle	up to 5%	up to 5%	up to 5%	up to 5%

Commute Programs



Commute 1A: Commuter Incentives				
Commute 2: Commute Marketing Program	3% to 13%	3% to 13%	3% to 13%	3% to 13%
Commute 3: ERH	up to 1%	-	-	-
Commute 4: TNC Partnerships	up to 1%	-	-	-

Bike and Walk



BikeWalk1: Secure Parking	up to 1%	up to 1%	up to 1%	up to 1%
BikeWalk2: Showers & Lockers	up to 1%	up to 1%	up to 1%	up to 1%
BikeWalk3: End of Trip Repair Stations	up to 1%	up to 1%	up to 1%	up to 1%
BikeWalk 4: Pedestrian-Oriented Design	up to 2%	up to 2%	up to 2%	up to 2%
BikeWalk 5: Bikeshare System & Subsidies				

Rideshare



Rideshare 1: Carpool/Vanpool Incentives				
Rideshare 2: Ridematch Program	up to 6%	up to 6%	up to 6%	up to 6%
Rideshare 3: Carshare	up to 1%	up to 1%	up to 1%	up to 1%
Rideshare 4: Carshare Subsidy				

Total



Total of all Measures	6% to 35%	3% to 29%	3% to 29%	3% to 31%
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Attachment B
VMT Per Service Population

VMT - Proposed Project (Project Buildout)						
Land Use	Daily Trips	Daily (New External Project Trips)	Average Trip Length	VMT	Service Population	VMT Per Service Population
Hospital / Data Center / Outpatient Clinic / MOB / Admin	13,381	12,040	9.78	117,748		
CNU School	2,859	2,572	7.55	19,422		
Dorms*	633	570	9.78	5,570		
Retail/Restaurant	6,584	5,924	9.90	58,648		
Total	23,457	21,106		201,388	14,728	13.67

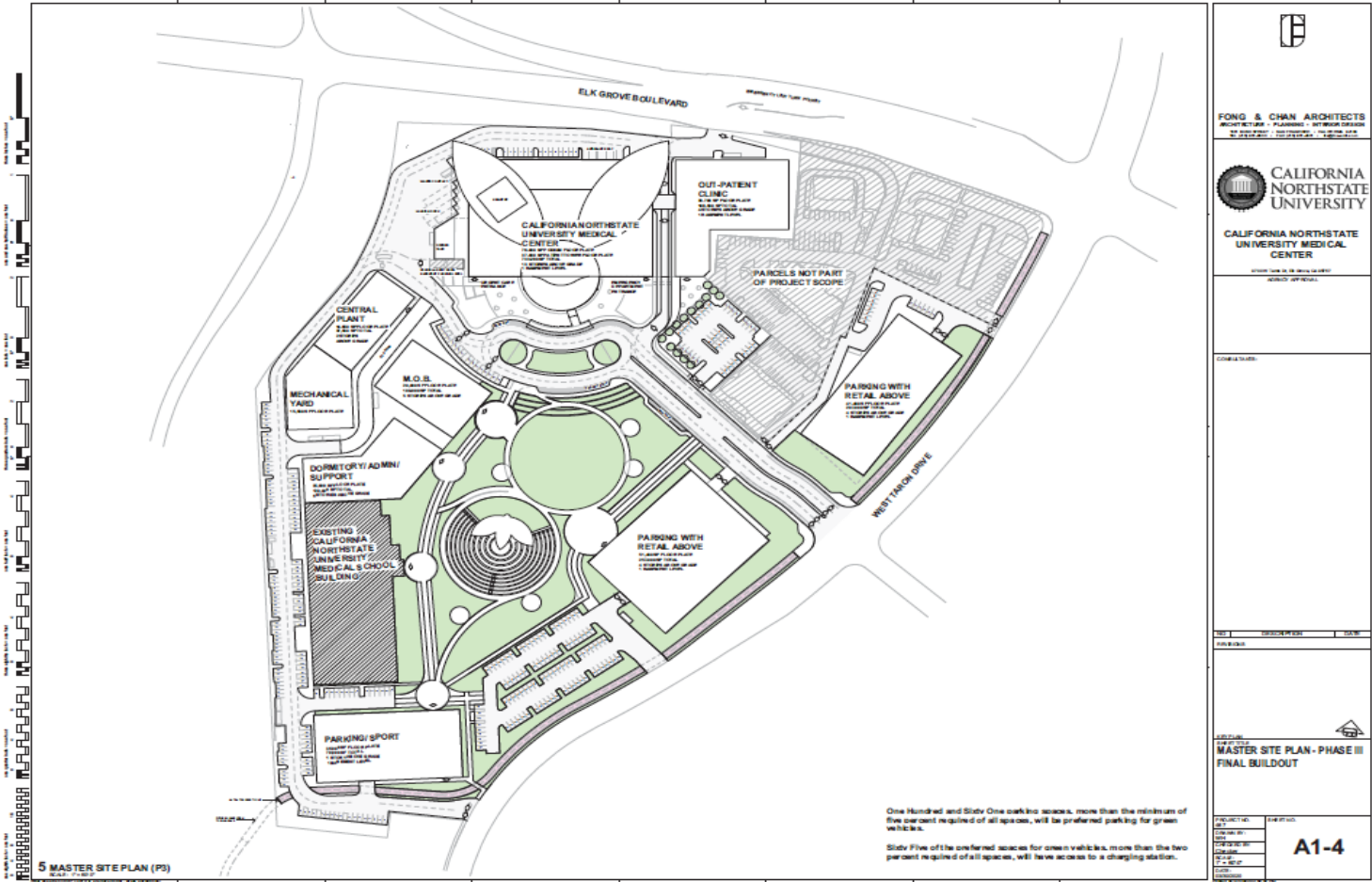
VMT - Proposed Project (Project Buildout With TDM Reductions)						
Land Use	Daily Trips	Daily (New External Project Trips)	Average Trip Length	VMT	Service Population	VMT Per Service Population
Hospital / Data Center / Outpatient Clinic / MOB / Admin	11,374	10,234	9.78	100,086		
CNU School	2,430	2,187	7.55	16,508		
Dorms*	538	484	9.78	4,735		
Retail/Restaurant	5,596	5,035	9.90	49,851		
Total	19,938	17,940		171,180	14,728	11.62

Trip Generation - Proposed Project (Project Buildout)																
Proposed Land Use	Land Use (ITE Code)	Quantity (ksf and beds for dorms)	Vehicle Trip Rate							Vehicle Trips						
			Daily	AM			PM			Daily	AM			PM		
	In	Out		Total	In	Out	Total	In	Out		Total					
	Hospital and Supporting Uses ¹ (610)	733.3	10.72	0.61	0.28	0.89	0.31	0.66	0.97	7,861	444	209	653	227	484	711
Outpatient Clinic (610)	168.5	10.72	0.61	0.28	0.89	0.31	0.66	0.97	1,806	102	48	150	52	111	163	
Medical Office Building (720)	100	34.80	2.17	0.61	2.78	0.97	2.49	3.46	3,480	217	61	278	97	249	346	
CNU School Building (550)	109.8	26.04	0.84	0.25	1.09	0.37	0.80	1.17	2,859	92	28	120	41	87	128	
Dormitory ²	300	2.11	0.03	0.04	0.07	0.08	0.08	0.16	633	10	11	21	24	24	48	
High-Turn Over Sit Down Restaurant (932)	41.4	112.18	5.47	4.47	9.94	6.06	3.71	9.77	4,644	227	185	412	250	154	404	
Retail (820)	51.4	37.75	0.58	0.36	0.94	1.83	1.98	3.81	1,940	30	18	48	94	102	196	
Admin (710)	24	9.74	1.00	0.16	1.16	0.18	0.97	1.15	234	24	4	28	4	24	28	
Proposed Project Trips									23,457	1,146	564	1,710	789	1,235	2,024	
Internal Trips									2,177	193	95	288	139	216	355	
Proposed Pass-By Trips ³									174				108	66	174	
Total New External Project Trips									21,106	953	469	1,422	542	953	1,495	

¹Includes 29 ksf data center

²Based on data collected at two local privately operated student housing apartment complexes. One was located on UC Davis and the other was within one mile of the UC Davis core campus

³43% of PM peak hour trips for proposed restaurant and 34% of PM peak hour trips for existing Shopping Center were removed from daily totals to account for pass-by trips during the PM peak hours. Daily pass-by percentages were not available. Shopping Center pass by was not applied to proposed retail as the proposed retail will be primarily geared towards students.



Observed Daily Trip Counts and Daily Average Trip Lengths		
Location	Number of Observations	Average Trip Length (Miles)
Existing Development		
Existing CNU School Building	1,162	7.55
Existing Office Building	980	24.35
Existing Shopping Center	1,992	9.90
Comparable Hospitals		
Kaiser Permanente Roseville Medical Center	20,839	10.25
Kaiser Permanente South Sacramento Medical Center	17,148	8.75
Mercy General Hospital	7,119	11.05
Mercy Hospital of Folsom	2,075	11.35
Mercy San Juan Medical Center	10,948	10.20
Methodist Hospital of Sacramento	8,408	8.45
Sutter Roseville Medical Center	16,817	9.90
Hospital Weighted Average Trip Length		9.78
Source: StreetLight Data and Fehr & Peers, 2020		

Service Population	
Land Use	Employees, Students, Patients, Visitors, and Customers
Existing Development	
CNU School Building	840
Office Building	400
Shopping Center	2,159
Total	3,399
Proposed Project Buildout	
Hospital Employees	1,080
Nurses	840
Doctors	360
Patients	2,400
Visitors	3,000
CNU Students	1,200
CNU Staff	350
Retail	5,498
Total	14,728
Source: Fehr & Peers, 2019	

Existing Conditions

CNU	840	Provided by Client
Office	400	Provided by Client
Retail Employees/Visitors	2,159	Daily Trips/2*Average Occupancy
Total	3,399	

Source

Proposed Project (Buildout)

Hospital Employees	1,080	Provided by Client
Nurses	840	Provided by Client
Doctors	360	Provided by Client
Patients	2,400	Provided by Client
Visitors	3,000	Provided by Client
CNU Students	1,200	Provided by Client
CNU Staff	350	Provided by Client
Retail Employees/Visitors	5,498	Daily Trips/2*Average Occupancy
Total	14,728	

Average Vehicle Occupancy 1.67

Federal Highway Administration (FHWA), 2017 NHTS Weighted Vehicle Occupancy Factors

<https://www.fhwa.dot.gov/policyinformation/nhstable.cfm>

Attachment C

Potential Limitations to Travel Demand Model

While the modified version of SACSIM used for the City of Elk Grove General Plan update represents ranges from state-of-practice to advanced-practice in travel modeling, travel behavior and the transportation systems are changing quickly in response to emerging trends, new technologies, and different preferences. Some of the new travel options and technologies emerging in the SACOG region are discussed below. Additionally, information about how technology is affecting travel is accumulating over time. Some of these emergent changes that could influence future travel forecasts include:

- Substitution of internet shopping and home delivery for some shopping or meal-related travel.
 - The 2018 SHTS showed that adults reported receiving a home delivery of a package on 17 percent of the travel days in the survey—and additional 4 percent received packages at work, food deliveries at home, etc. How these percentages compared to earlier years is not known.
 - NHTS showed the number of online purchases with home delivery doubling between 2009 and 2017, from about 2.5 to 4.9 per household per month (FHWA 2018).
 - Comparisons of 2017 to 2009 NHTS data show that nationally, non-work trips per household declined by 11 percent. Most of that decline is attributed to lower rates of shopping trips and other family-related errands (FHWA 2018).
- Substitution of telework for commute travel
 - The 2018 SHTS showed that 17 percent of the respondents reported working at home at least one day per week.
- New travel modes and choices
 - TNCs, car share, bike share, scooter share, and on-demand micro transit have increased the travel options available to travelers in the SACOG region and have contributed to changes in traditional travel demand relationships. As noted above, the current share of resident trips served by TNCs is less than one-quarter percent, and future growth depends on TNCs developing a sustainable business model.
- Automation of vehicles
 - Both passenger vehicles and commercial vehicles and trucks are evolving to include more automation. Research, development, and deployment testing is proceeding on fully AV, for which no human driver would be required, and the vehicle itself can navigate the roadways to take people or goods where they need to go. Forecasts of how quickly research, development, and deployment testing will transition to full deployment and marketing of fully AV vary widely both on the pace of the transition, and the market acceptance of fully autonomous

operation. More uncertainty exists for the behavioral response to AVs. In terms of impact on the transportation system and the environment, a scenario of concern would be one in which AVs are privately owned, like the present, but the automated function of the vehicles would entice users to travel more. Examples of this phenomenon could include:

- Vehicles are repositioned to serve different members of a household (e.g., have a car drop a worker at their workplace, then drive back home empty to serve another trip, such as a student going to school). The repositioning of driverless vehicles could add significantly to traffic volumes and VMT.
 - The time spent in a vehicle is reevaluated by travelers, resulting in an increase in the willingness to make longer trips. For example, if a person could read or do work in a vehicle instead of focusing on driving, they might be willing to commute longer to work. Conversely, a worker who prefers to live in a rural area, but is unwilling to drive far enough to act on that preference in a conventional vehicle, may be willing to do so in an AV.
 - There may be an increasing willingness to drive more to avoid parking costs or tolls. For example, a person going to a sporting event in an area that charges for parking may use an AV to be dropped off at the venue, with the AV repositioning to an area that does not charge for parking.
- Connected vehicles
 - Connected vehicles (CVs) can communicate wirelessly with its surroundings, including other vehicles, bicyclists, pedestrians, roadway infrastructure (i.e., traffic signals, toll facilities, traffic management facilities, etc.), and the internet. The influence that CVs may have is still speculative but includes the potential for reductions in collisions and congestion, and greater overall network performance optimization.

SACSIM does not explicitly capture the above-mentioned new modes of travel and emerging trends in travel behavior. Through validation of the model to 2016 conditions in Elk Grove, the cumulative effect of the new modes and changes are reflected to some degree in the resulting travel demand estimates, but the underlying behavioral impact of the modes are not modeled. Significant uncertainties exist at the present time that prevent explicit modeling of these new modes and emerging trends.

Additionally, future deployment levels for new modes of travel are unknown. For example, Uber and Lyft have both significantly increased trips, but both continue to run large operating losses and are reliant on investors to cover losses. A sustainable business model may require significant changes to services and/or fares, both of which could affect the trajectory of use and impact on travel behavior. Similar issues apply to bike share and other micro-mobility services.

The impact of new modes on individual and household travel behavior also is not fully understood and is the subject of ongoing research. Limitations on accessing utilization data directly from TNC vendors, in particular, constrains the ability to fully understand the impact

of those services. Regulatory and legislative efforts to address the limits on access are underway in California and elsewhere, but these efforts will take time. Only a few household travel surveys, including the 2018 SHTS, have surveyed TNC use in detail. Other major research studies focused on TNC use, and TNC driver behavior, are just being launched in California, and data collection and analysis has not yet started. Until this research is completed, there is no effective way to incorporate even the known new modes into travel demand models.