

TRAFFIC STUDY

Carwash and
Drive-Thru Coffee Shop

23820 Avalon Boulevard

Carson, CA 90745

July 2023

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EXECUTIVE SUMMARY

- This traffic study was prepared for Sticks Holdings, LLC by KOA for the proposed project. The following summarizes the traffic study results, conclusions, and recommendations:
- The proposed project site is located at 23820 Avalon Boulevard on the northeast corner of Sepulveda and Avalon Boulevards in the City of Carson. The project site is located on a parcel with current access on Avalon Boulevard on the west and Sepulveda Boulevard on the south.
- The proposed project land use is a 3,600 sq.ft. car wash and a 2,140 sq. ft. Starbucks coffee shop with a drive-thru facility. The analyzed project opening year is 2023.
- The traffic impact analysis methodology was defined by City policy on traffic study review, and the *Los Angeles County Public Works Transportation Impact Analysis Guidelines* of July 2020, which are accepted by the City.

CEQA and VMT Analysis

- The project (California Environmental Quality Act) CEQA transportation impacts were determined to be less than significant, based on screening criteria.
- A project that contains a local serving retail use is assumed to have less than significant VMT impacts for the retail portion of the project. If a commercial project does not have more than 50,000 square feet of floor area, a less than significant VMT impact determination can be made.
- The total project commercial floor area is 5,740 square feet, and therefore as the answer to this question would be no, the proposed project can be screened from further VMT analysis based on this criterion.

Local Area Circulation Effects

- The proposed project land uses are a 3,600 sq. ft. car wash and a 2,140 sq.ft. coffee shop with a drive-thru facility.
- The total estimated net weekday daily project vehicle trip total is 1,922, including 184 AM peak hour trips and 161 PM peak hour trips.
- The two intersections of Avalon Boulevard and Sepulveda Boulevard and Wilmington Ave and Sepulveda Boulevard are expected to operate at LOS E during the AM peak hour period and LOS E during the PM peak hour in the future, with or without the project.
- The intersection of Dolores Street and Sepulveda Boulevard is expected to operate at LOS B during the AM peak hour period and LOS C during the PM peak hour period in the future, with or without the project.
- The proposed Project is not expected to adversely affect traffic for vehicles making left turns at movements at the Avalon and Sepulveda Boulevard intersection, as adequate storage capacity would remain at most locations to accommodate the additional vehicle trips generated by the Project. Queuing would exceed the eastbound left-turn movement queuing capacity of the intersection in both pre-project and post-project periods.

Drive-Thru Analysis

- Based on the existing Starbucks site surveys, 9.6 vehicles is the high AM peak 95th percentile average queue number from the site survey data, and 7.0 vehicles is the PM high average queue number. Neither of these numbers exceeds the total drive-thru lane capacity of 12 vehicles, and the provided queuing area would be adequate.
- The available queue length for the carwash entrance lanes would be 135 feet, or five to six vehicles for each of the two lanes. The queuing analysis indicated that the typical peak queuing lengths for the car wash would be five to six vehicles per lane, using the 95th percentile average value. The average peak queue would not exceed the capacity provided in the entrance queue for the car wash, and the provided queuing area would be adequate.

1. INTRODUCTION

1.1 LEAD AND LOCAL AGENCY REVIEW

The analysis summarized in this report was completed based on the methodologies and procedures outlined in the City of Carson policies on traffic study review and the County of Los Angeles County Public Works *Transportation Impact Analysis Guidelines* of July 2020. The guidelines define impact standards for the analysis of California Environmental Quality Act (CEQA) project compliance, and non-CEQA circulation review standards. The methodology for the study area circulation analysis and the definitions for effects and impacts standards were defined by a scoping document provided to the City.

This report presents the conclusions of the evaluation of the California Environmental Quality Act (CEQA) and non-CEQA transportation impacts of the project. The study intersections for the non-CEQA local circulation analysis are located within the City of Carson.

1.2 PROJECT DESCRIPTION

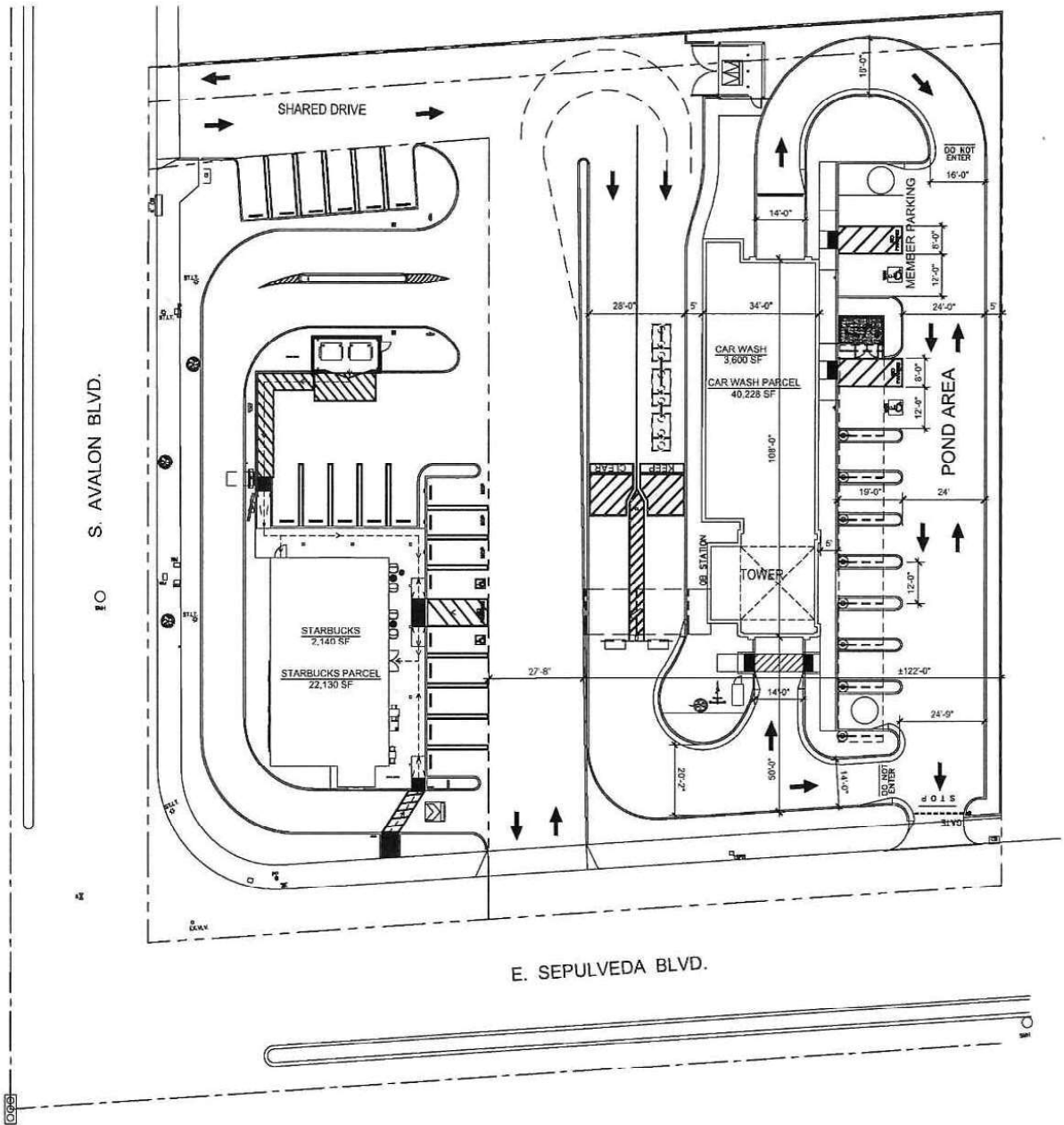
The project is proposed at 23820 Avalon Boulevard in the City of Carson. The project site is located on a parcel on the northeast corner of the intersection of Avalon Boulevard and Sepulveda Boulevard.

The proposed project land uses are a 3,600 sq. ft. car wash and a 2,140 sq.ft. coffee shop with a drive-thru facility. The analyzed project opening year is 2023.

Access to the site would be provided via three driveways, one on Avalon Boulevard and two on Sepulveda Boulevard. Two of these driveways would allow primary ingress and egress into and out of the Project site. Movements at the driveways will be restricted to right turns only. Left turns into the project are restricted and are prevented by raised medians on both Avalon Boulevard and Sepulveda Boulevard. A third proposed driveway will also be provided on Sepulveda Boulevard and will serve as an exit from the carwash facility.

The proposed project site plan is provided on Figure 1.

Figure 1 - Project Site Plan



NEC AVALON BOULEVARD and SEPULVEDA BOULEVARD

SITE PLAN

23820 AVALON BLVD
CARSON, CA 90745

SCALE: 1/16"=1'-0"



2. CEQA TRANSPORTATION IMPACT ANALYSIS

The City of Carson applies by policy the traffic study guidelines of the County of Los Angeles Department of Public Works. The guidelines define impact standards for the analysis of California Environmental Quality Act (CEQA) project compliance. VMT screening and analysis methodologies were applied to the project and discussed here for the VMT review.

2.1 VMT ANALYSIS GUIDELINES

County guidelines for project VMT impacts are based on consistency with State CEQA guidelines. Development projects are analyzed to determine if and how much each project would affect total VMT, unless they can be screened out from analysis requirements under specific categories.

Screening Criteria Review

The following screening criteria were evaluated for the project, as they were deemed appropriate based on the project characteristics. The CEQA Guidelines Appendix G checklist question that defines a vehicle miles traveled (VMT) analysis is as follows:

For a development project, would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)(1)?

This question targets the adequate reduction of total project VMT. The screening guidance of the County guidelines was applied below, and impact criteria were also applied after the screening analysis, to address this question.

Non-Retail Project Trip Generation Screening Criteria

This criterion applies to projects with land uses other than retail. Therefore, this screening criterion does not apply to the project.

Retail Project Site Plan Screening Criteria

A project that contains a local serving retail use is assumed to have less than significant VMT impacts for the retail portion of the project. This criterion applies to the project as it is proposed to include retail use.

A project that contains a local serving retail use is assumed to have less than significant VMT impacts for the retail portion of the project. If the answer to the following question is no, a less than significant determination can be made for the portion of the project that contains retail uses.

Does the project contain retail uses that exceed 50,000 square feet of gross floor area?

The total project commercial floor area is 5,740 square feet, and therefore as the answer to this question would be no, the proposed project can be screened from further VMT analysis based on this criterion.

Proximity to Transit Based Screening Criteria

The criterion applies to projects located near a major transit stop or high-quality transit corridor, with specific requirements for transit service type and frequency. The project is not located within a half-mile of a major transit stop nor is it within a half-mile of an existing stop along a high-quality transit corridor. Therefore this criterion does not apply.

Another screening category defined by the guidelines, the Residential Land Use Based Screening Criteria, was reviewed and does not apply to the project land uses.

3. SITE ACCESS STUDY – OPERATIONAL ANALYSIS

In addition to the analysis of potential CEQA impacts, a review of potential project local circulation impacts was conducted. The determinations for this area of analysis are not tied to CEQA, and are focused on the City review of local effects of development projects. This section provides a summary of the local circulation review conducted for the proposed project. A project completion year of 2023 has been applied.

A project traffic scoping document was provided to the City, and revised based on comments received. The finalized document is provided in Appendix A.

3.1 STUDY METHODOLOGY

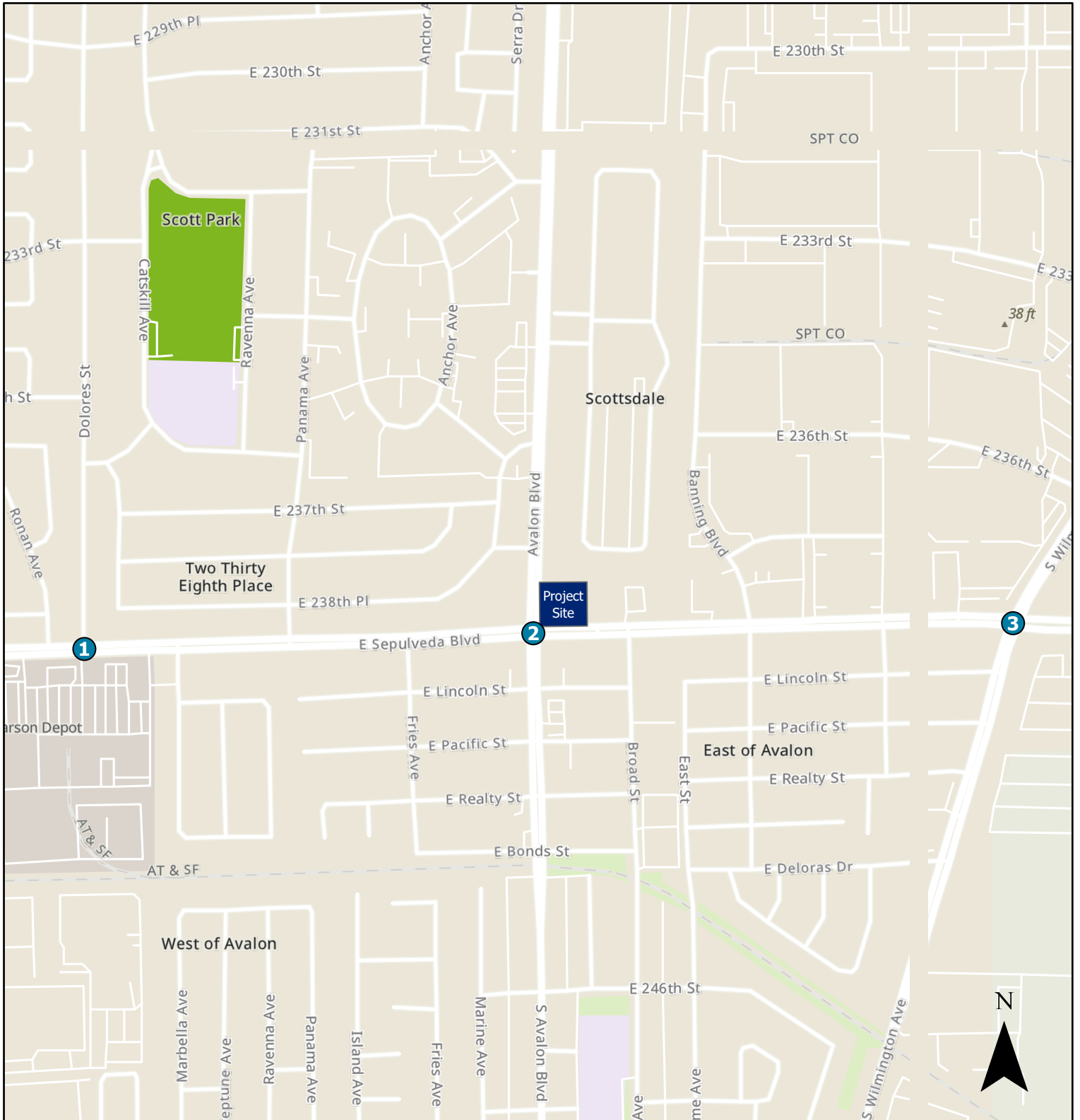
To determine the effects of the project on the operation of vehicular travel within the immediate project vicinity, an evaluation was made of the project contribution to delay and queuing at the study intersections under existing and future conditions.

The project study area includes the following three study intersections along the primary access routes to and from the site:

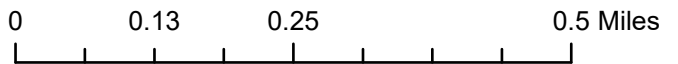
1. Dolores St. and Sepulveda Bl.
2. Avalon Bl. and Sepulveda Bl.
3. Wilmington Av. and Sepulveda Bl.

Figure 2 illustrates the locations of the study intersections.

Figure 2 - Project Study Area



- Study Intersections
- Project Site



Analysis Scenarios

The study included the analysis of the following traffic scenarios:

- Existing
- Future without-Project
- Future with-Project

Project trip generation was based on land use intensities and trip rates defined by *Trip Generation, 11th edition*, published by the Institute of Transportation Engineers (ITE). Project trip distribution percentages were defined based on the expected local travel routes to and from the project site.

In order to account for traffic growth in the study area through the project opening year, an ambient/background traffic growth rate of one percent per year for one year (between the existing year of 2022 and future project opening year of 2023) was applied to the traffic counts.

Traffic from related projects (approved and pending developments) was also requested from planning staff at the City of Carson. No projects were within a half-mile radius from the project site.

The future with-project traffic volume conditions were determined and analyzed based on the future without-project volumes plus traffic from the proposed project.

Level of Service Methodology

For analysis of the Level of Service (LOS) at signalized intersections, the City of Carson has designated the Highway Capacity Manual 6th Edition (HCM 6) methodology as the desired tool. A facility is “at capacity” (delay of 80 seconds or greater) when extreme congestion occurs. This total vehicle approach delay output of the HCM is a function of hourly volumes, signal phasing, and approach lane configuration, and green time for each leg of the intersection.

Level of service values range from LOS A to LOS F. LOS A indicates excellent operating conditions with little delay to motorists, whereas LOS F represents congested conditions with excessive vehicle delay. LOS E is typically defined as the operating “capacity” of a roadway. Signalized intersection LOS is based on overall approach vehicle delay, and unsignalized intersection delay is based on the worst-case controlled (stop sign) approach delay. Table 1 defines the level of service criteria applied to the study intersections.

Table 1 – Intersection Level of Service Definitions

LEVEL OF SERVICE	SIGNALIZED INTERSECTION	STOP-CONTROLLED INTERSECTION	General Description
	Average Control Delay (seconds/vehicle)	Worst Approach Delay (seconds/vehicle)	
A	≤ 10	≤ 10	Free flow
B	≥ 10-20	≥ 10-15	Stable flow (slight delays)
C	> 20-35	> 15-25	Stable flow (acceptable delays)
D	> 35-55	> 25-35	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	> 55-80	> 35-50	Unstable flow (intolerable delay)
F ¹	> 80	> 50	Forced flow (congested and queues fail to clear)

Source: Highway Capacity Manual, 11th Edition

3.2 EXISTING MOBILITY SYSTEM

This section describes the existing conditions within the study area in terms of roadway facilities, transit service, and traffic operating conditions.

All the roadway classifications are based on the City’s Circulation Element. The key roadways within the study area are described here. The discussion is limited to specific roadways that traverse the study intersections and serve the project site.

[Avalon Boulevard](#) is classified as a Major Highway in the General Plan. This north-south roadway provides two travel lanes in each direction as well as a raised median. On-street parking is generally permitted on both sides of the street with the exception of Wednesdays from 5 AM to 8 AM for street sweeping. The posted speed limit is 40 mph.

[Dolores Street](#) is classified as a collector street. This north-south roadway provides two travel lanes in each direction. On-street parking is generally permitted on both sides of the roadway with the exception of Tuesdays from 10AM to 1PM.

[Sepulveda Boulevard](#) is classified as a Major Highway. This east-west roadway in the project vicinity provides two travel lanes in each direction as well as a center raised median. On-street parking is generally permitted on both sides of the roadway with the exception of Tuesdays from 8AM to 11AM on the south side of the street and Fridays from 5AM to 8 AM on the north side of the street. The posted speed limit is 40 miles per hour.

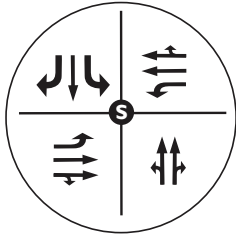
[Wilmington Avenue](#) is classified as a Major Highway. This east-west roadway in the project vicinity provides two travel lanes in each direction as well as a center raised median. On-street parking is generally prohibited on both sides of the roadway. The posted speed limit is 45 miles per hour.

Figure 3 illustrates the existing traffic controls and approach lane configurations at the study intersections.

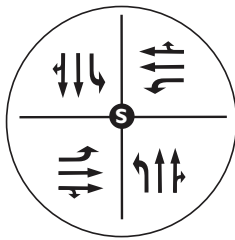
Transit service is provided within a one-quarter mile radius of the proposed project site, which is operated by Torrance Transit, Long Beach Transit, and the Los Angeles Metropolitan Transportation Authority (LA Metro). Table 2 summarizes the project study area transit service.

Figure 3 - Existing Study Intersection Lane and Control Configurations

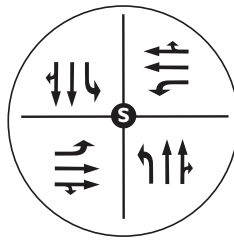
#1) Dolores St & Sepulveda Bl




#2) Avalon Bl & Sepulveda Bl



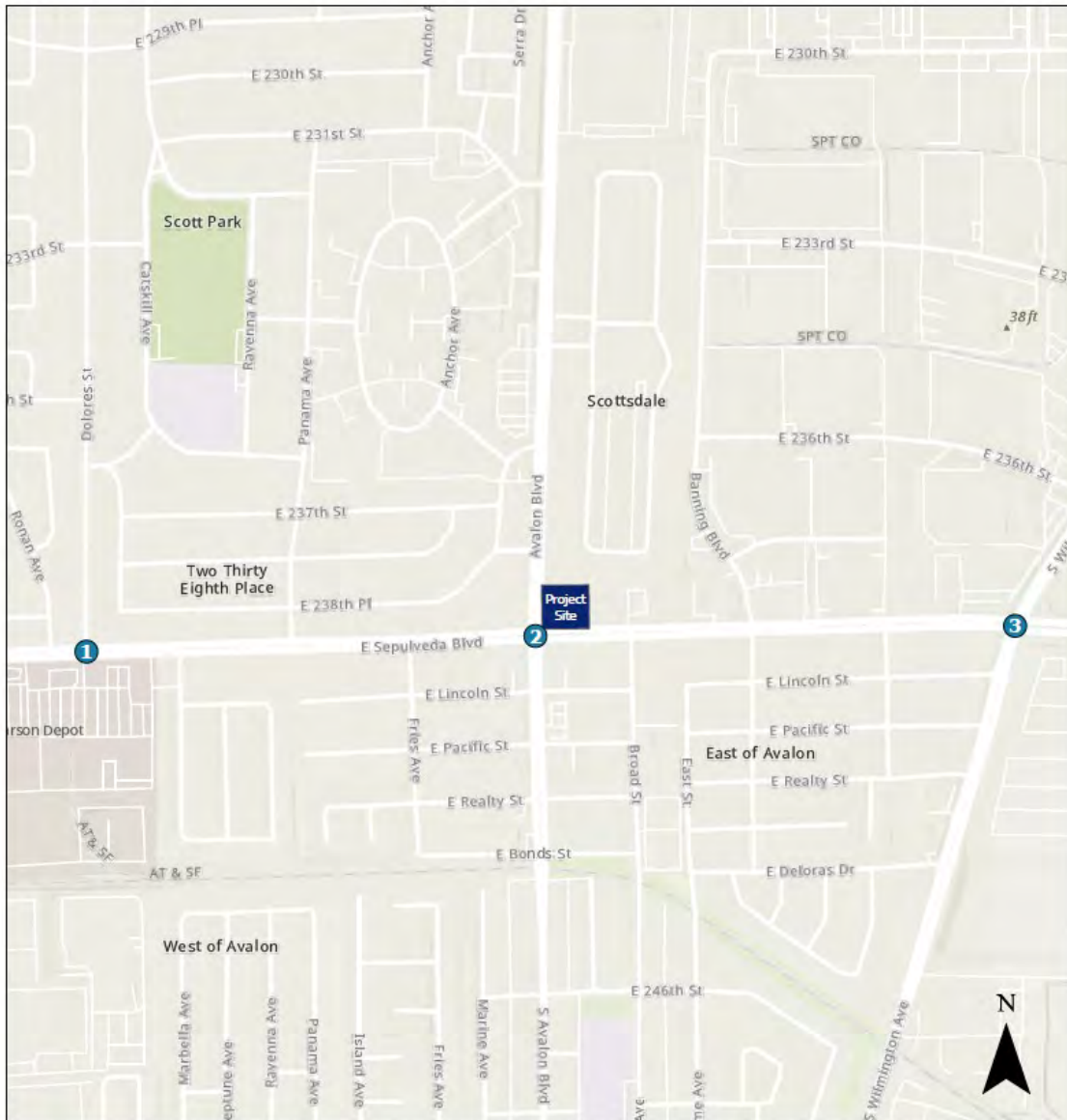
#3) Wilmington Ave & Sepulveda Bl





LANE CONFIGURATION

 Signalized Intersection

 Intersection Lane Geometry



 Study Intersections
 Project Site

0 0.13 0.25 0.5 Miles

Table 2 – Existing Transit Service

Agency	Line	From	To	Via	Peak Frequency (Minutes)
LA Metro	246	Harbor Gateway Transit Center	San Pedro (21St and Pacific Av)	Avalon Bl	40
Torrance Transit	7	Sepulveda/Avalon	Rendondo Beach Pier	Sepulveda Bl	50

Source: transit.torranceca.gov, metro.net

3.3 EXISTING CIRCULATION CONDITIONS

Traffic data was defined by year-2022 counts collected in the field by Counts Unlimited for this project study. The traffic counts were conducted at the study intersections on Tuesday, November 15, 2022, during the peak timeframes of 7:00 AM to 9:00 AM and 4:00 PM to 6:00 PM. The day was considered appropriate for counts, as no known atypical traffic conditions existed in the area and local schools were in session.

Traffic controls and approach lane configurations at each study intersection were identified as inputs to the analysis. Based on the intersection lane configurations and the existing traffic volumes, average vehicle approach delay values and corresponding levels of service (LOS) were determined for each of the study intersections during the weekday a.m. and p.m. peak hours.

Table 3 provides the operations analysis results for the existing conditions scenario, with delay and LOS values for each study intersection.

Table 3 – Existing Intersection Operations

Study Intersections		AM Peak		PM Peak	
		Delay	LOS	Delay	LOS
1	Dolores St/ Sepulveda Bl	18.8	B	24.1	C
2	Avalon Bl/ Sepulveda Bl	44.2	D	59.7	E
3	Wilmington Av/ Sepulveda Bl	47.4	D	63.5	E

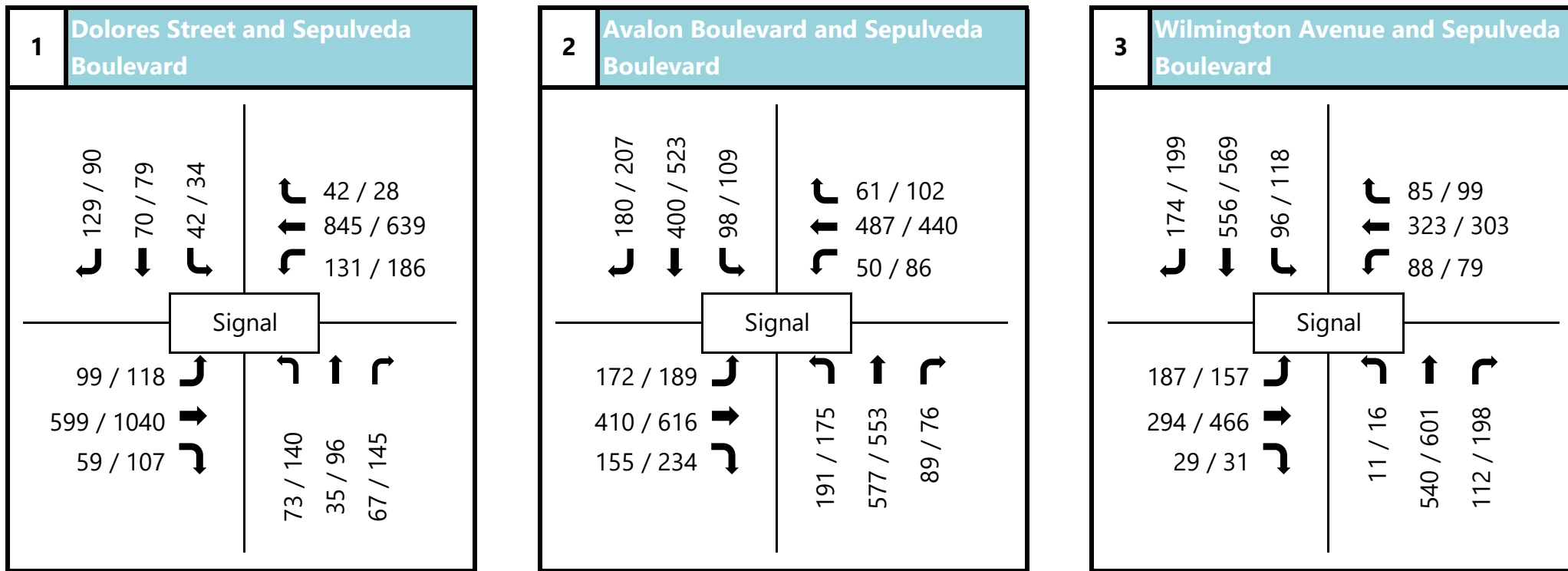
LOS = Level of Service

VIC = Volume-to-Capacity Ratio

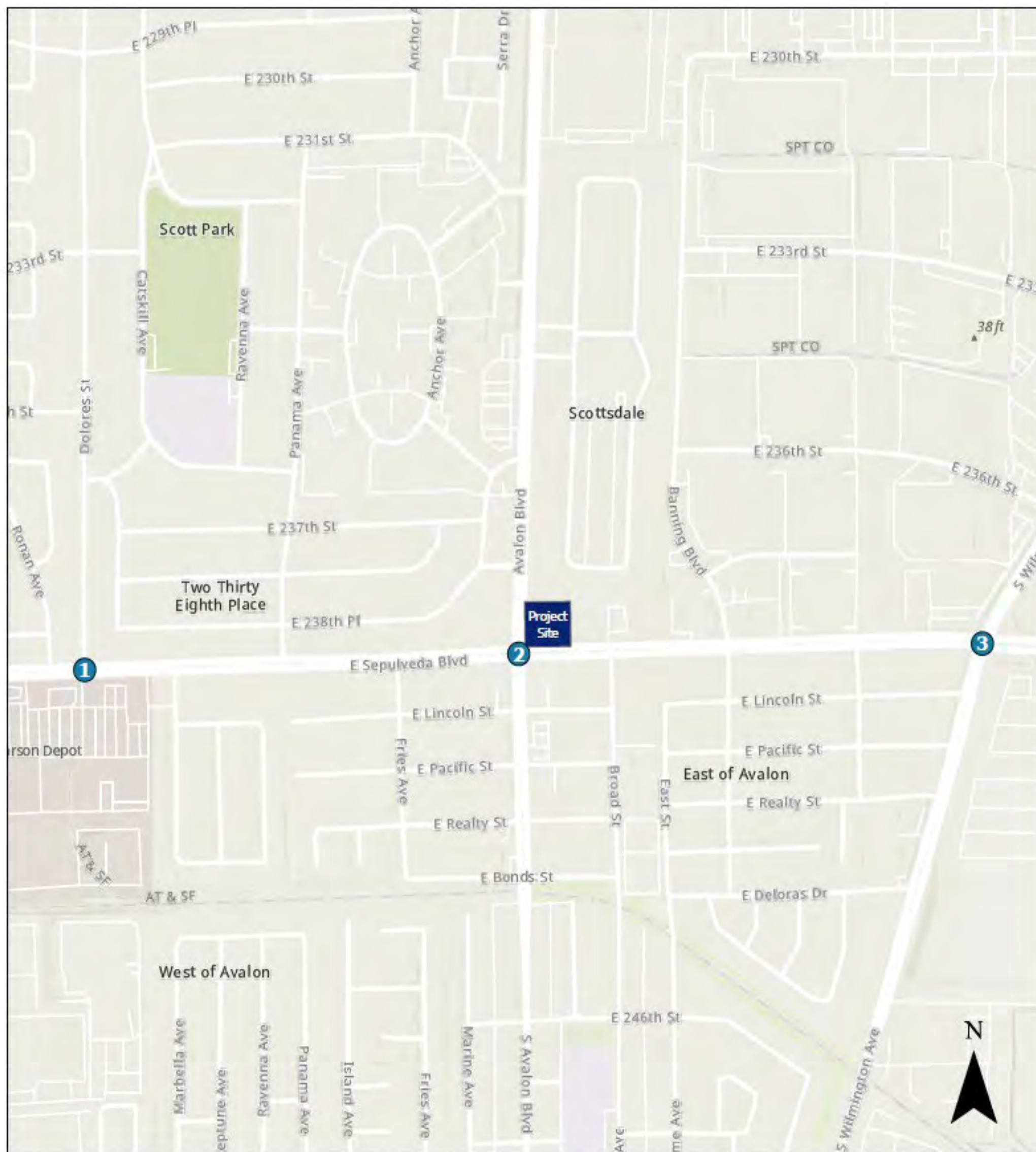
Two of the three study intersections currently operate at Level of Service (LOS) D during the AM peak hour period and LOS E during the PM peak hour period, while the intersection of Dolores St and Sepulveda Boulevard operates at LOS B during the AM peak hour and LOS C during the PM peak hour.

The existing weekday a.m. peak-hour and p.m. peak-hour traffic turning movement volumes are illustrated on Figure 4. The traffic count data sheets are provided in Appendix B, and the existing traffic analysis scenario worksheets are provided in Appendix C.

Figure 4 - Existing AM/PM Peak Hour Traffic Volumes



XX/XX AM /PM Peak Hour Traffic Volumes



3.4 PROJECT TRAFFIC

This section defines the traffic generated by the proposed project in a three-step process, including trip generation, trip distribution, and trip assignment.

The analyzed project land use categories included a car wash and a coffee shop with a drive-thru facility. Trip generation rates for each land use were applied from *Trip Generation, 11th edition*, published by the Institute of Transportation Engineers (ITE). The total estimated net weekday daily project vehicle trip total is 1,922, as calculated in Table 4. This includes 184 AM peak hour trips and 161 PM peak hour trips.

Table 4 – Project Trip Generation

PROJECT TRIP GENERATION				DAILY	AM PEAK HOUR			PM PEAK HOUR		
ITE	LAND USE	UNITS	INTENSITY	TOTAL	TOTAL	IN	OUT	TOTAL	IN	OUT
RATES										
948	Car Wash	Tunnels	-		0	0	0	77.5	0.5	0.5
937	Coffee Shop W/ Drive Thru	KSF	-	533.57	85.88	0.51	0.49	38.99	0.5	0.5
TRIPS										
948	Car Wash	Tunnels	1	780 *	0	0	0	78	39	39
937	Coffee Shop W/ Drive Thru	KSF	2.14	1142	184	94	90	84	42	42
Total				1922	184	94	90	162	81	81

Rates source: ITE Trip Generation Manual, 11th Edition

* Daily trips for car wash use were estimated by multiplying PM peak hour trips by a factor of 10

Project Trip Distribution

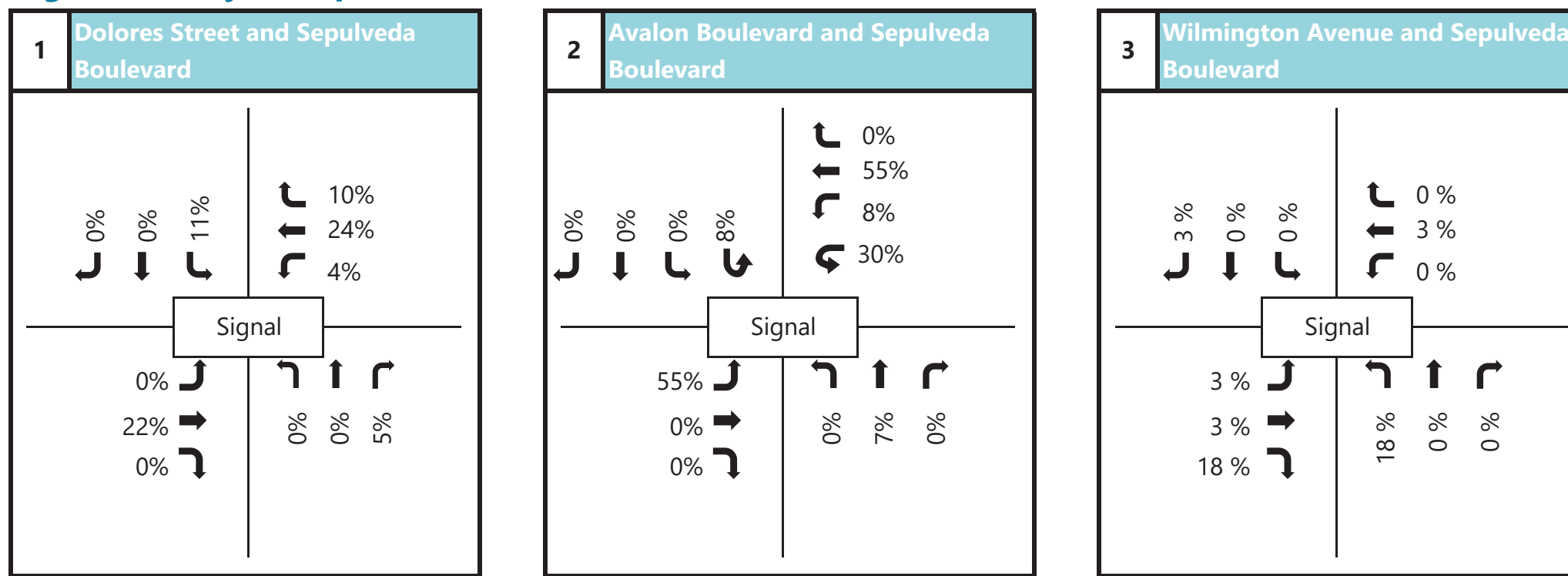
Trip distribution is the process of assigning the directions from which traffic will access the project site. Trip distribution is dependent upon the land use characteristics of the project, the local roadway network, and the general locations of other land uses to which project trips would originate or terminate.

Figure 5 illustrates the trip distribution percentages that were utilized for the project traffic.

Project Trip Assignment

Based on the trip generation and distribution assumptions described above, project traffic was assigned to the roadway system. The peak-hour project trip assignment is illustrated on Figure 6.

Figure 5 - Project Trip Distribution



XX% Project Trip Distribution

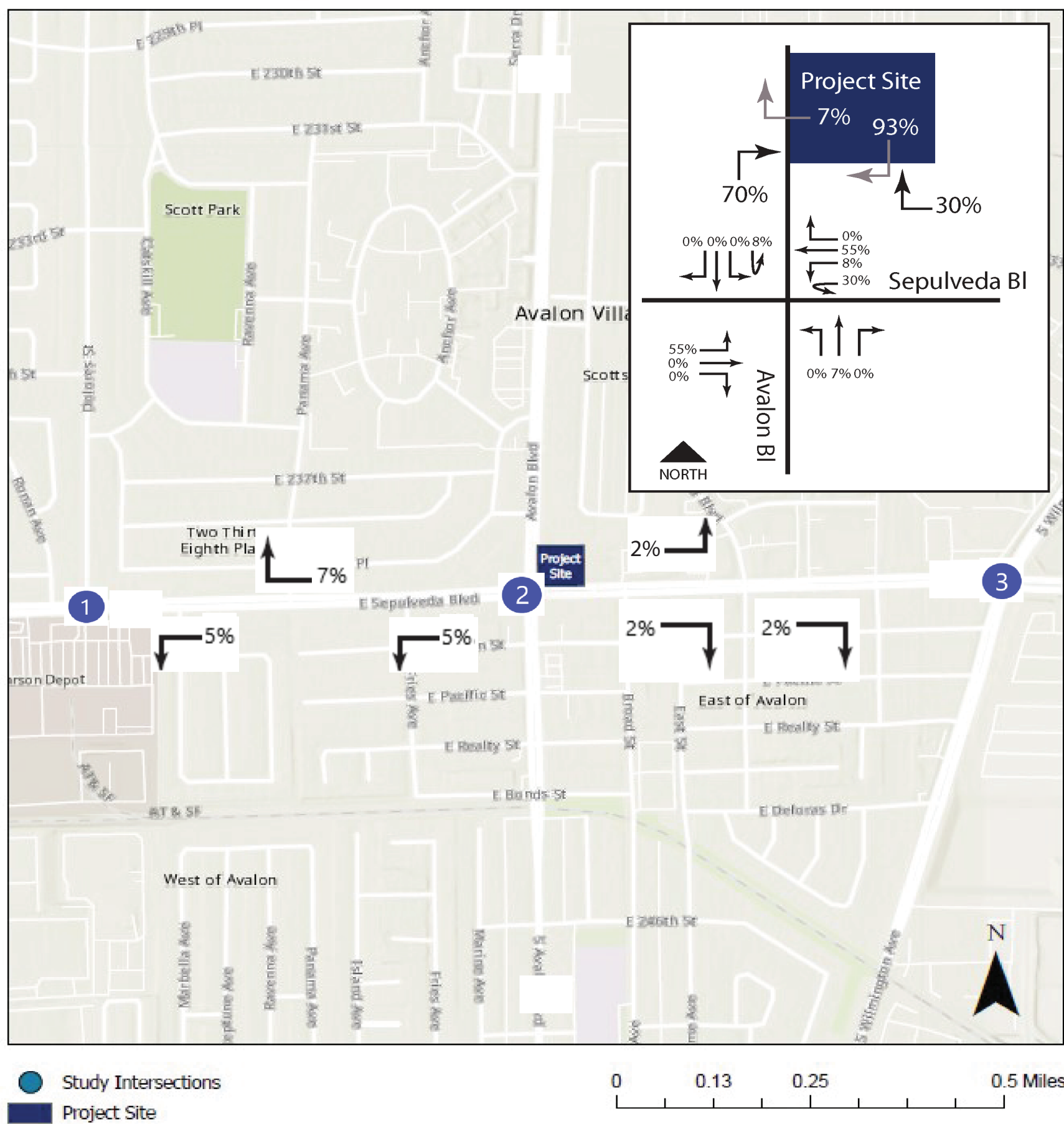
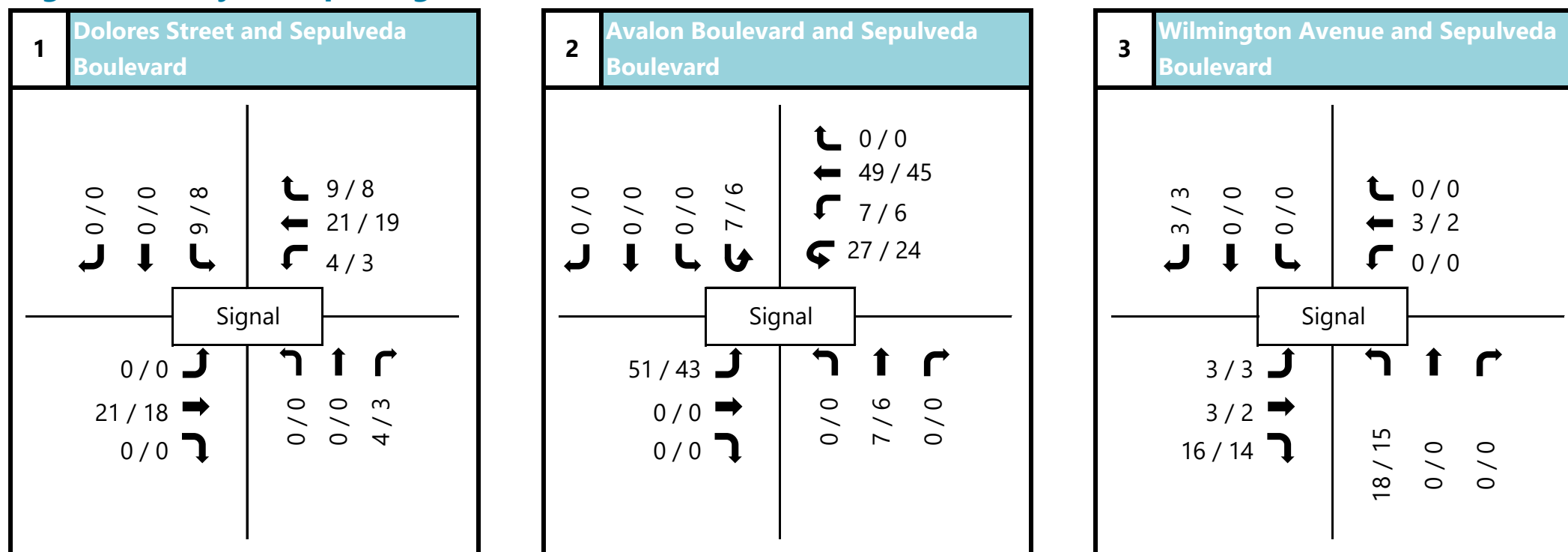
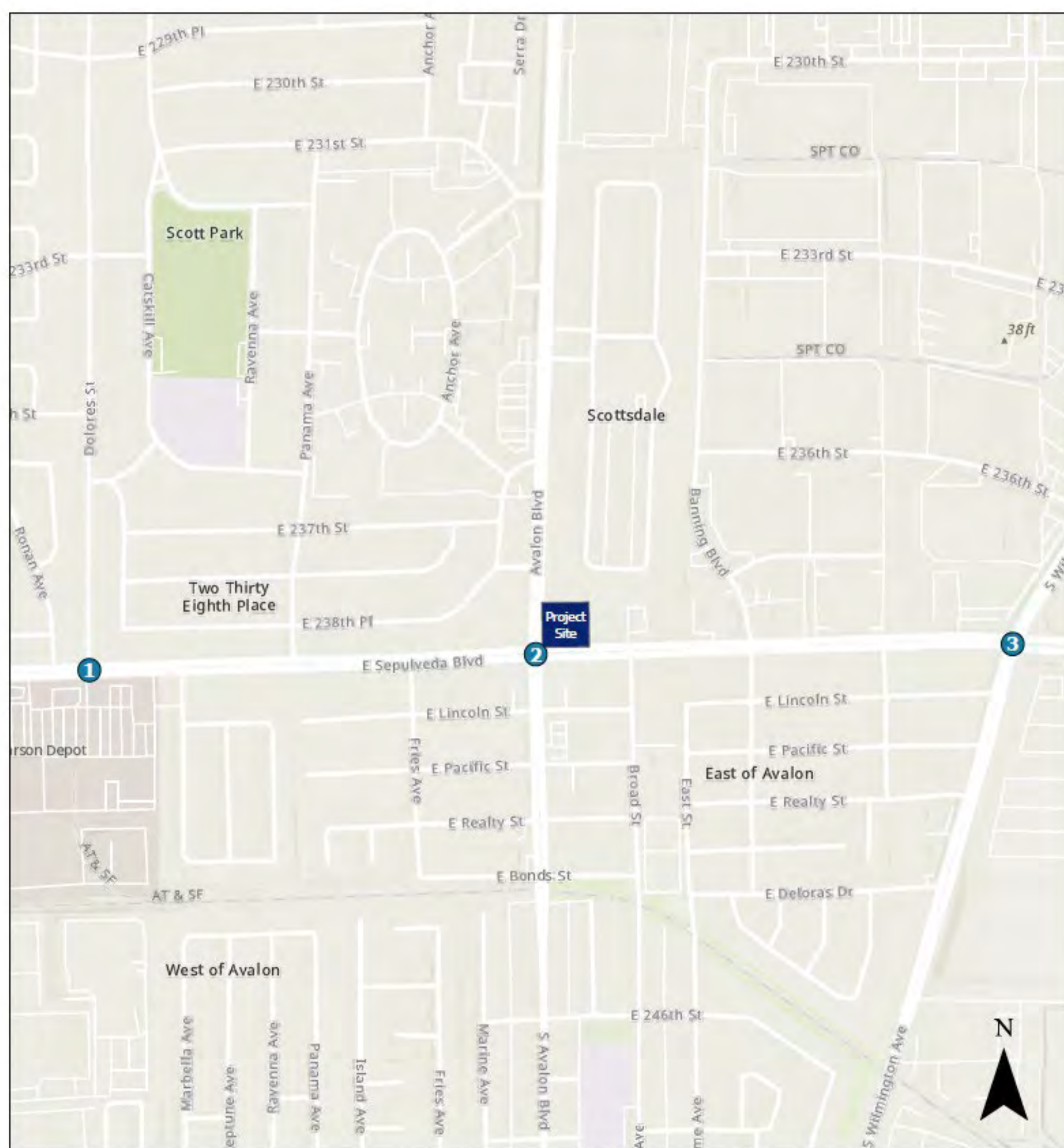


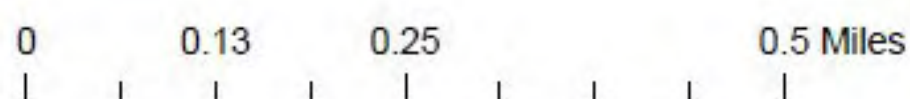
Figure 6 - Project Trip Assignment - AM/PM Peak Hour Traffic Volumes



XX/XX AM /PM Peak Hour Traffic Volumes



- Study Intersections
- Project Site



3.5 FUTURE CONDITIONS

This section provides an analysis of future traffic conditions in the study area with and without project traffic. The proposed project is anticipated to be completed within the year 2023, and therefore this defined the future analysis year.

Ambient Growth

In order to acknowledge regional population and employment growth outside of the study area, an annual ambient traffic growth rate of one percent was applied to the existing scenario traffic volumes.

Area Projects

Traffic from related projects (approved and pending developments) was requested from the City of Carson. The City of Carson provided a list of development projects that have been recently approved or under construction, but none are within a half-mile area of the project site. Therefore, no area projects were included as part of the future scenarios.

Future Conditions without and with Project Traffic

Future baseline traffic volumes for the without-project condition were determined by applying ambient traffic growth and area project traffic volumes to the existing traffic volumes. Under the future with-project scenario, the traffic volumes were derived by adding project trips to the future baseline traffic volumes.

Table 5 provides the delay and LOS values at the study intersections for future without-project and future with-project conditions.

Table 5 – Future Study Intersection Performance

Study Intersections		Peak Hour	Future 2023 pre-Project		Future 2023 post-Project		Change in Delay
			Delay	LOS	Delay	LOS	
1	Dolores St/ Sepulveda Bl	AM	18.9	B	19.2	B	0.30
		PM	24.4	C	24.8	C	0.40
2	Avalon Bl/ Sepulveda Bl	AM	44.7	D	46.7	D	2.00
		PM	65.0	E	66.0	E	1.00
3	Wilmington Av/ Sepulveda Bl	AM	48.2	D	48.3	D	0.10
		PM	61.2	E	61.4	E	0.20

LOS = Level of Service

VIC = Volume-to-Capacity Ratio

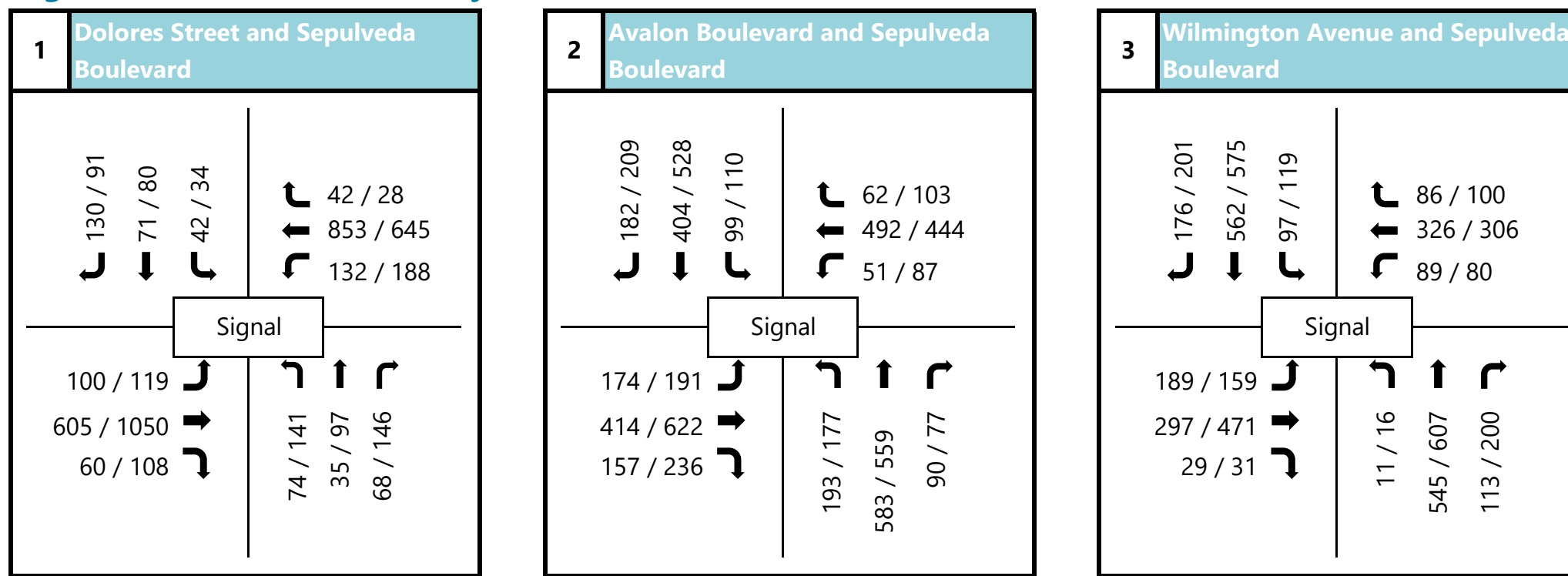
The two intersections of Avalon Boulevard and Sepulveda Boulevard and Wilmington Ave and Sepulveda Boulevard are expected to operate at LOS E during the AM peak hour period and LOS E during the PM peak hour in both future project scenarios. The intersection of Dolores Street and Sepulveda Boulevard is expected to operate at LOS B during the AM peak hour period and LOS C during the PM peak hour period for both future project scenarios.

The future without-project traffic volumes for the weekday a.m. and p.m. peak hours are illustrated on Figure

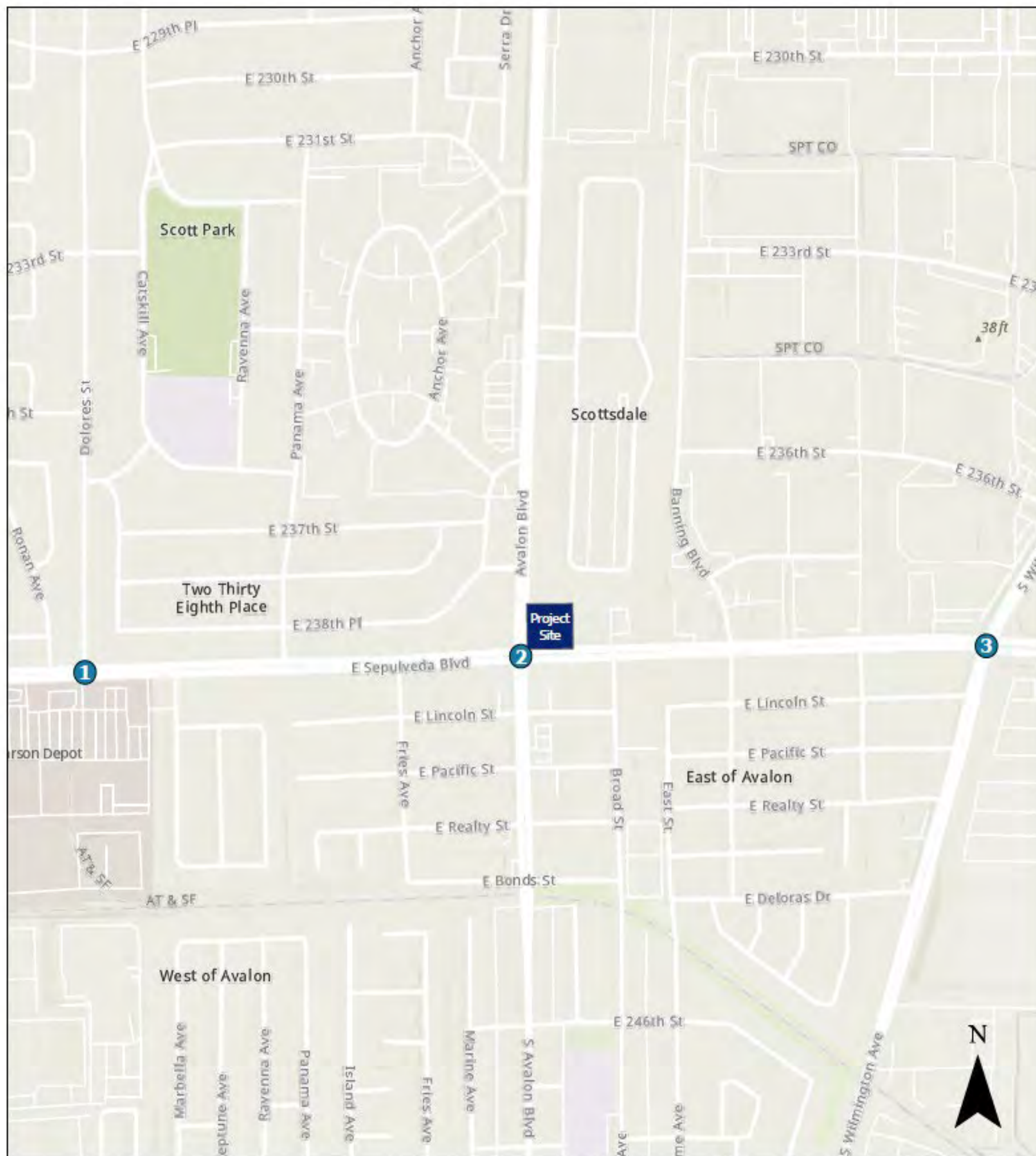
7. The analysis worksheets for this scenario are provided in Appendix D.

The future with-project traffic volumes for the weekday a.m. and p.m. peak-hour volumes are illustrated on Figure 8. The analysis worksheets for this scenario are provided in Appendix E.

Figure 7 - Future Without Project - AM/PM Peak Hour Traffic Volumes



XX/XX AM /PM Peak Hour Traffic Volumes



● Study Intersections
 ■ Project Site

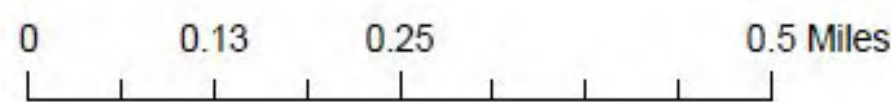
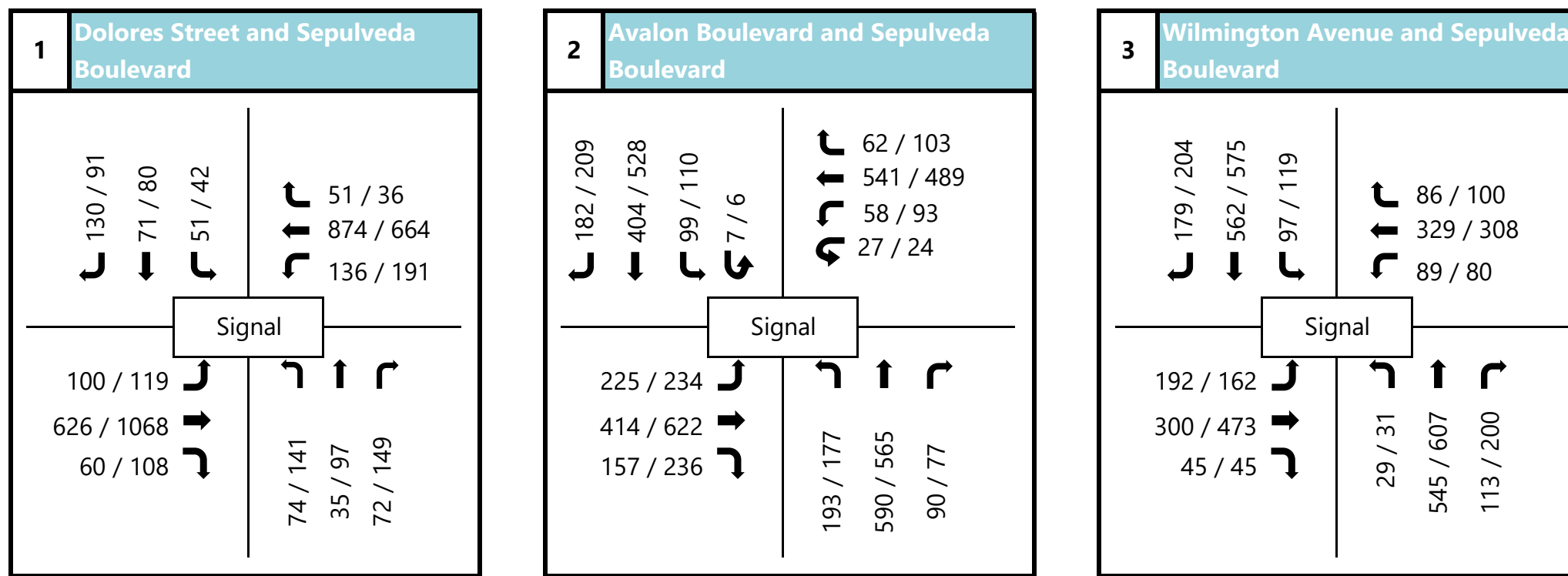
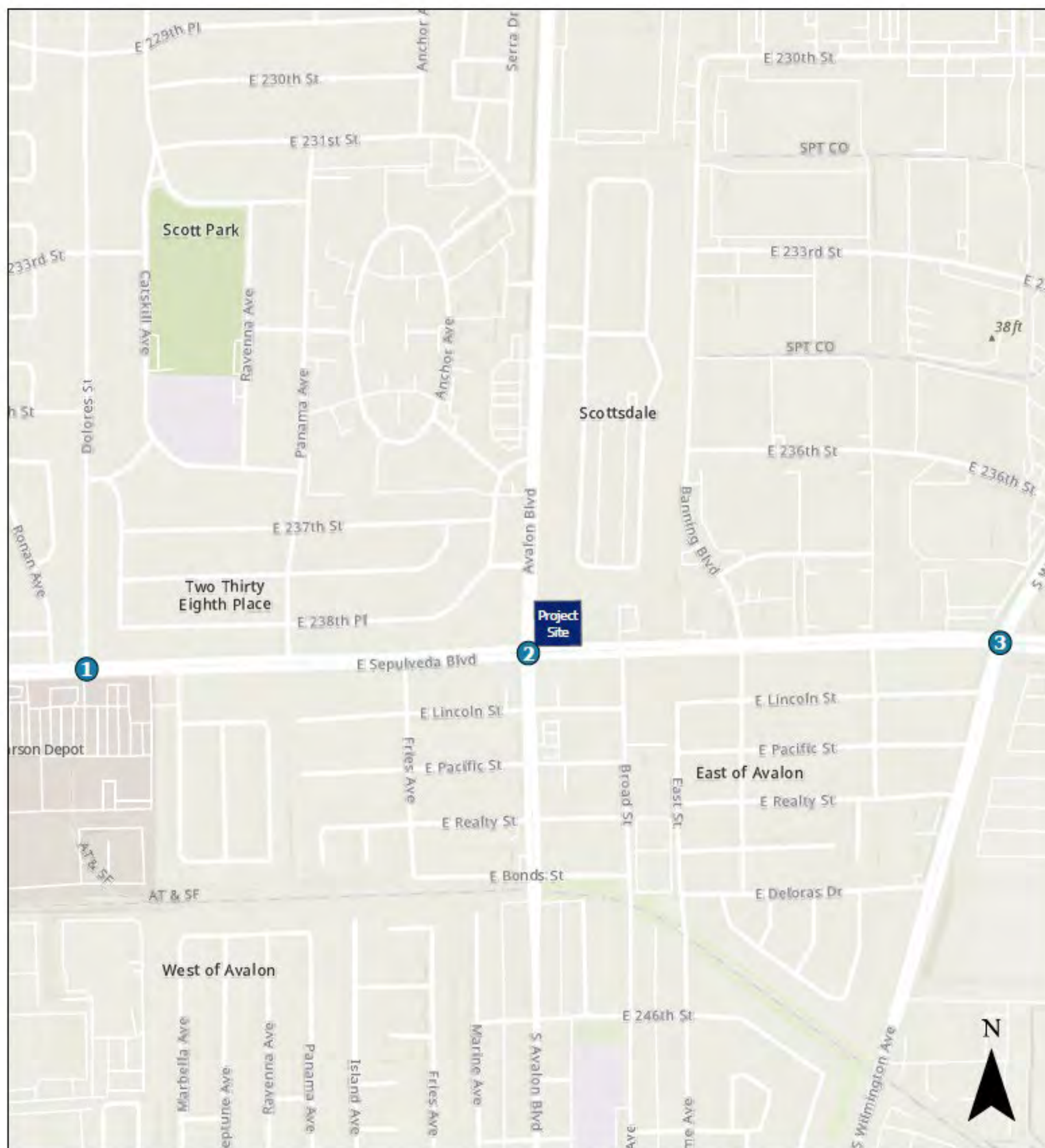


Figure 8 – Future With-Project - AM/PM Peak Hour Traffic Volumes



XX/XX AM /PM Peak Hour Traffic Volumes



● Study Intersections
 ■ Project Site

0 0.13 0.25 0.5 Miles

3.6 DRIVE-THRU QUEUING – STARBUCKS

The proposed Starbucks drive-thru facility was evaluated for adequate capacity under the expected queues during operation.

Drive-thru surveys were conducted at three existing area Starbucks sites over a two day period, during the 6:00 AM to 10:00 AM and 3:00 PM to 7:00 PM periods, to cover the AM and PM peak activity periods. The survey data included queuing lengths from the street to the drive-thru entrance, the drive-thru entrance to the order board, and from the order board to the pick-up window. The locations of the existing Starbucks surveys were the following:

- 20810 Avalon Boulevard, Carson
- 1832 East Carson Street, Carson
- 898 Sepulveda Boulevard, Harbor City 90710

The average queue values during the AM period for the two-day surveys at the three sites, from the 95th percentile values, is 4.0 vehicles from the order board to the pick-up-window, 2.7 vehicles from the drive-thru entrance to the order board, 1.1 vehicles from the street to the drive-thru entrance, and 6.9 vehicles as a combined value for each of the three individual queues.

During the PM period, the average queue values for the surveys at the three sites are 3.5 vehicles from the order board to the pick-up-window, 2.5 vehicles from the drive-thru entrance to the order board, 0.7 vehicles from the street to the drive-thru entrance, and 6.2 vehicles as a combined value for each of the three individual queues.

None of the surveys identified any queuing beyond the designed capacity of any of the three included facilities. The peak queuing levels for each of the surveyed sites for both days were as follows:

- 20810 Avalon Blvd, Carson – 8 vehicles in the AM, 8 vehicles in the PM
- 1832 East Carson St, Carson - 11 vehicles in the AM, 8 vehicles in the PM
- 898 Sepulveda Blvd, Harbor City 90710 - 10 vehicles in the AM, 7 vehicles in the PM

The total queuing capacity of the proposed Starbucks drive-thru facility would be twelve vehicles, calculated in the text below. The distance from the order boards to the pick-up window would be as follows:

- The proposed Starbucks drive-thru facility has an approximate queuing length of 180 feet from the southern order board location to the pick-up window. Applying a 25-foot on-center distance for queued vehicles, this distance provides a queuing area for approximately seven vehicles.
- Within the second order aisle on the north, there would be approximately 30 feet of queuing space past the order board, and one additional vehicle can queue there.
- With these two distances combined, there would be an approximate eight-vehicle queuing capacity from the ordering boards to the pick-up window.

The distance from the order boards to the entrance of the drive-thru facility would be as follows:

- From the drive-thru entrance to the order boards, there would be a 50-foot queuing length for each of the two ordering lanes.
- There is a 100-foot total queuing capacity at the order boards across the two lanes, and approximately four vehicles can queue in this area.

The total drive-thru facility capacity is, therefore, 12 vehicles. Based on the surveyed results, 9.6 vehicles is the high AM peak 95th percentile average queue number from the site survey data, and 7.0 vehicles is the PM high average queue. Neither of these numbers exceeds the total drive-thru lane capacity of 12 vehicles. A typical AM period queue is 2.7 vehicles, and the typical PM period queue is 2.5 vehicles.

The total twelve-vehicle capacity of the proposed drive-Starbucks thru facility would be adequate for the expected high average 95th percentile of 9.6 or 10 vehicles from the survey data. This expected peak queuing level is less than the proposed storage capacity of 12 vehicles.

The area drive-thru survey data summaries are provided in Appendix F.

3.7 DRIVE-THRU QUEUING – CAR WASH

The proposed project car wash drive-thru facility was evaluated for adequate capacity under the expected queues during operation. The proposed operator Quick Quack Car Wash, provided data on activity at an existing facility that is similar to the proposed facility, at 17945 Hesperian Boulevard in San Lorenzo, CA. The existing site survey was conducted from 7:00 AM to 8:00 PM over a seven-day period.

The peak hourly arrival of vehicles occurred during the survey period, at 111 vehicles in the 11:00 AM hour on Sunday. This maximum inbound vehicle flow was applied to a random-arrivals queuing analysis, using the Q.xls spreadsheet created by the University of Missouri at Kansas City. The applied vehicle processing rate was 155 per hour, per the data provided by the operator.

The car wash entrance lanes would have a queuing area before the vacuuming and check-in area. The queuing length within the entrance queuing area would be 85 feet of queuing capacity, or three to four vehicles. Including the vacuuming and check-in area, the total available queue length would be 135 feet, or five to six vehicles per lane.

The queuing analysis indicated that the typical peak queuing lengths for the car wash would be five to six vehicles per lane, using the 95th percentile average value. The average peak queue would not exceed the capacity provided in the entrance queue for the car wash, and the provided queuing area would be adequate.

The survey data for the San Lorenzo car wash site, and the documentation of the vehicle processing time of the proposed car wash system, is provided in Attachment G.

3.8 LEFT-TURN QUEUING AND STORAGE

Queuing analysis was conducted at the intersection of Avalon Boulevard and Sepulveda Boulevard to assess the Projects contribution of vehicles making a left turn and U-turns and the capacity available for storage at the turning pocket. As part of the analysis, vehicles are only expected to make U-turns at the southbound left and westbound right turn movements due to the proposed Project driveway configuration with right-in/right-out turn restrictions. Left turn movements into the site are restricted by existing raised medians on both Avalon Boulevard and Sepulveda Boulevard.

Queuing at specific intersection movements is reviewed in the text below.

Westbound Left-Turn Pocket

The available queuing storage is 260 feet at this left turn pocket. Under pre-project conditions, 95th percentile queuing during the AM peak hour period would be 47 feet and during the PM peak would be 84 feet.

During the post-project period, queuing would be 83 feet in the AM peak hour and 119 feet in PM peak hour. These lengths would not exceed the turn pocket length of 260 feet.

Southbound Left-Turn Pocket

The available queuing storage is 245 feet at this left turn pocket. Under pre-project conditions, 95th percentile queuing during the AM peak hour would be 97 feet and during the PM peak hour would be 110 feet.

During the post-project period, queuing during the AM peak hour would be 106 feet and during the PM peak hour would be 118 feet. These lengths would not exceed the turn pocket length.

Eastbound Left-Turn Pocket

The available queuing storage is 185 feet at this left turn pocket. Under pre-project conditions, 95th percentile queuing during the AM peak hour would be 195 feet and during the PM peak hour would be 217 feet.

During the post-project period, queuing during the AM peak hour would be 272 feet and during the PM peak hour would be 290 feet. These lengths would exceed the turn pocket length in both the pre-project and post-project periods, but expansion of the turn pocket to the west is not possible due to the presence of a turn pocket for a driveway. The project-related queue increase would be 73 feet in the AM peak and 77 feet in the PM peak hour, an increase in both periods of approximately three vehicles.

The proposed Project is therefore not expected to adversely affect traffic for vehicles making left turns at these movements, as adequate storage capacity would remain at most locations to accommodate the additional vehicle trips generated by the Project. Queuing would exceed the eastbound left-turn movement of the intersection in both pre-project and post-project periods.

APPENDIX A
Study Scoping Document

TRAFFIC STUDY – Scoping Summary Document
23820 Avalon Blvd. Commercial Project, Carson
November 15, 2022

This traffic scoping document acknowledges that the traffic study for the following project will be prepared in accordance with current traffic study guidelines and policies of the City of Carson.

Project Name: 23820 Avalon Blvd. Commercial Project

Project Description and Scope of Work:

The proposed project is a 3,600 sq.ft. car wash and a 2,140 sq.ft. Starbucks with a drive-thru facility. The proposed site plan is provided in Attachment A.

The CEQA analysis will be a screening of the project based on its local serving nature, and a quantified vehicle miles traveled (VMT) analysis will not be necessary.

The scope of work includes a circulation effects analysis at three Carson intersections in the vicinity of the project site as detailed below.

Geographic Distribution

The trip distribution to the study area is estimated to be as follows:

- 25 percent of trips to the north
- 25 percent of trips to the south
- 20 percent of trips to the east
- 30 percent of trips to the west

Trip Generation

The proposed project land uses will consist of a car wash and a coffee shop with a drive-thru facility. Rates are based on the number of units and rates defined by ITE *Trip Generation (11th Edition)*. The car wash use is assumed to not generate substantial trips during the AM peak hour. The total trip generation would be 1,922 daily trips, including 184 AM peak-hour trips and 161 PM peak-hour trips.

TABLE 1 – ESTIMATED TRIP GENERATION

PROJECT TRIP GENERATION				DAILY		AM PEAK HOUR		PM PEAK HOUR		
ITE	LAND USE	UNITS	INTENSITY	TOTAL	TOTAL	IN	OUT	TOTAL	IN	OUT
RATES										
948	Car Wash	Tunnels	-		0	0	0	77.5	0.5	0.5
937	Coffee Shop W/ Drive Thru	KSF	-	533.57	85.88	0.51	0.49	38.99	0.5	0.5
TRIPS										
948	Car Wash	Tunnels	1	780 *	0	0	0	78	39	39
937	Coffee Shop W/ Drive Thru	KSF	2.14	1142	184	94	90	83	42	42
Total				1922	184	94	90	161	81	81

Rates source: ITE Trip Generation Manual, 11th Edition

* Daily trips for car wash use were estimated by multiplying PM peak hour trips by a factor of 10

Project Buildout Year: 2023

Ambient Growth Rate: 1% per year

Area projects: A cumulative/area project list will be obtained from the City of Carson, to include known pending/under-construction projects in the City.

Study Intersections

The locations of these proposed study intersections are illustrated in Attachment B.

1. Main Street/Sepulveda Boulevard
2. Avalon Boulevard/Sepulveda Boulevard
3. Wilmington Avenue/ Sepulveda Boulevard
4. Dolores Street/Sepulveda Boulevard

Figures are provided for project trip distribution in Attachment B and for trip assignment in Attachments C1 (AM peak) and C2 (PM peak).

Drive-Thru Queuing Analysis

A queuing analysis would be conducted for the coffee use drive-thru. The data will be based on drive-thru processing times from Starbucks, averaged from data compiled for nine area locations.

The queuing analysis inputs will include peak-hour incoming volumes and the total order processing times for a random arrivals and queuing output. The estimated peak queuing vehicle length will be analyzed against the planned physical length of the project drive-thru facility.



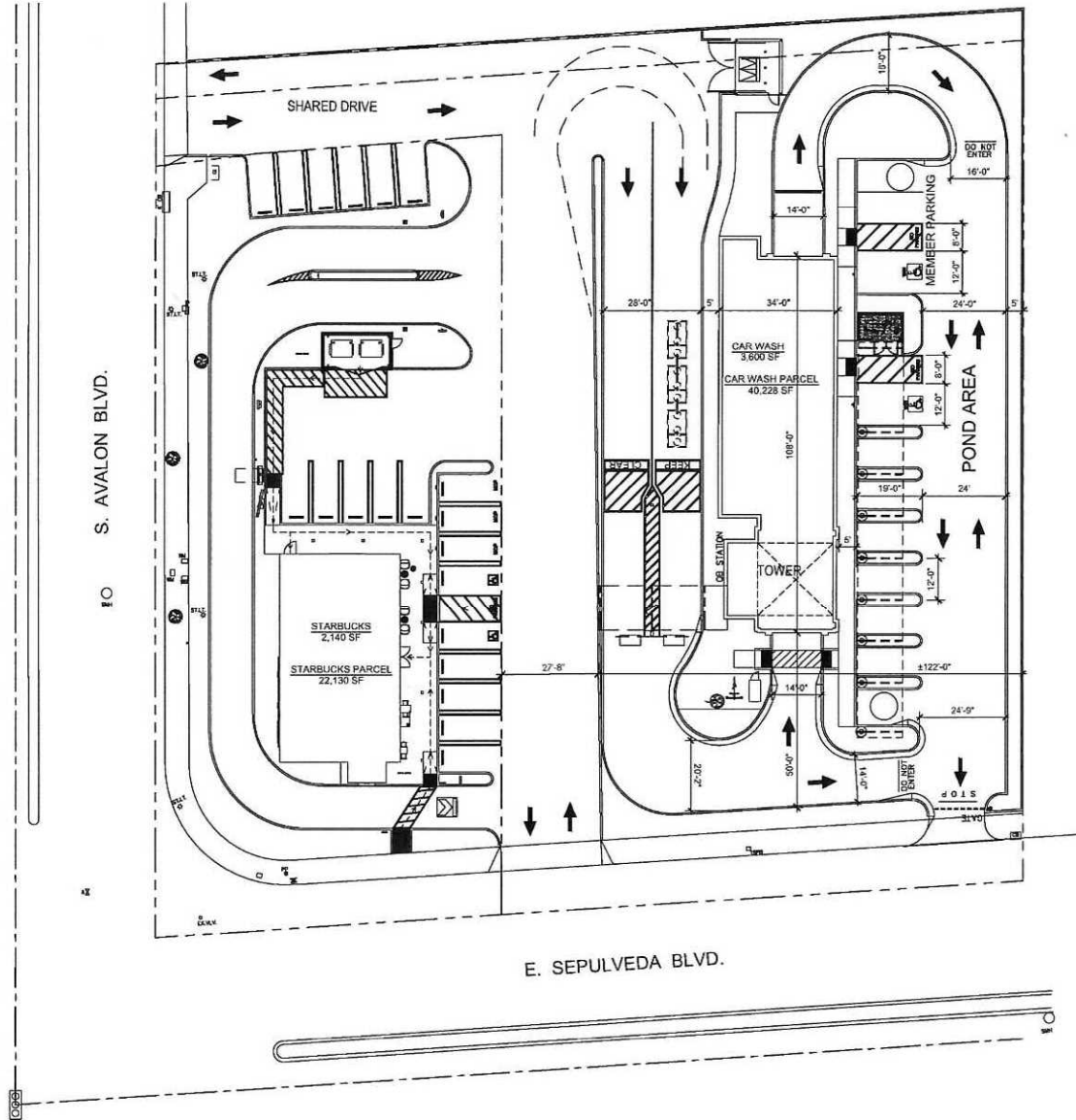
Vehicle Miles Traveled

The project VMT analysis will be conducted for CEQA, and will be summarized in a separate technical memo. The project can likely be screened from further analysis based on CEQA guidelines and City policies, due to the local-serving nature of the use and the low overall amount of project commercial floor area.

Study Contact

Name: Brian Marchetti, KOA Corporation
Address 1100 Corporate Center Drive, Suite. 201, Monterey Park, CA 91754
Phone No. (323) 260-4703
E-Mail bmarchetti@koacorp.com

ATTACHMENT A - SITE PLAN



NEC AVALON BOULEVARD and SEPULVEDA BOULEVARD

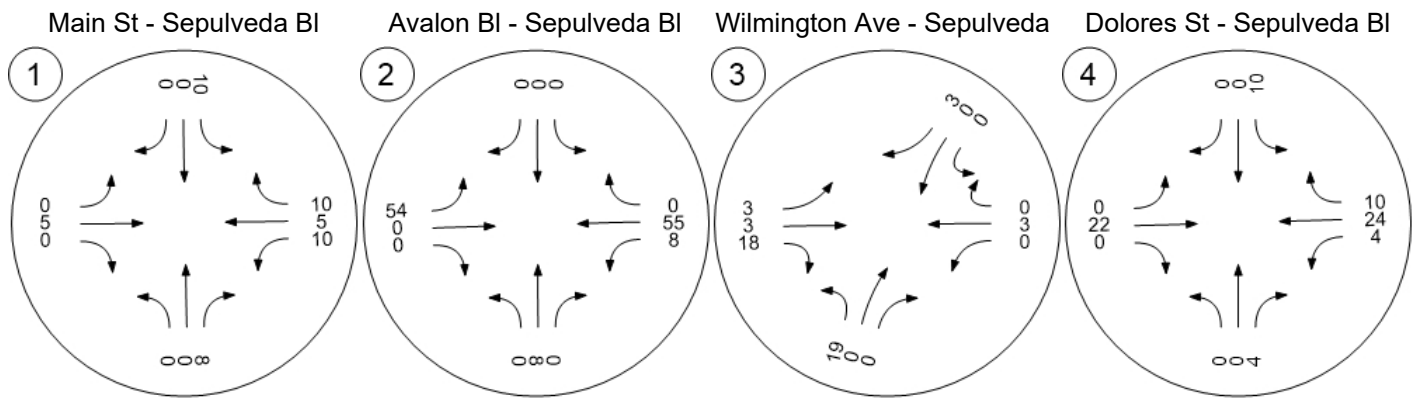
SITE PLAN

23820 AVALON BLVD
CARSON, CA 90745

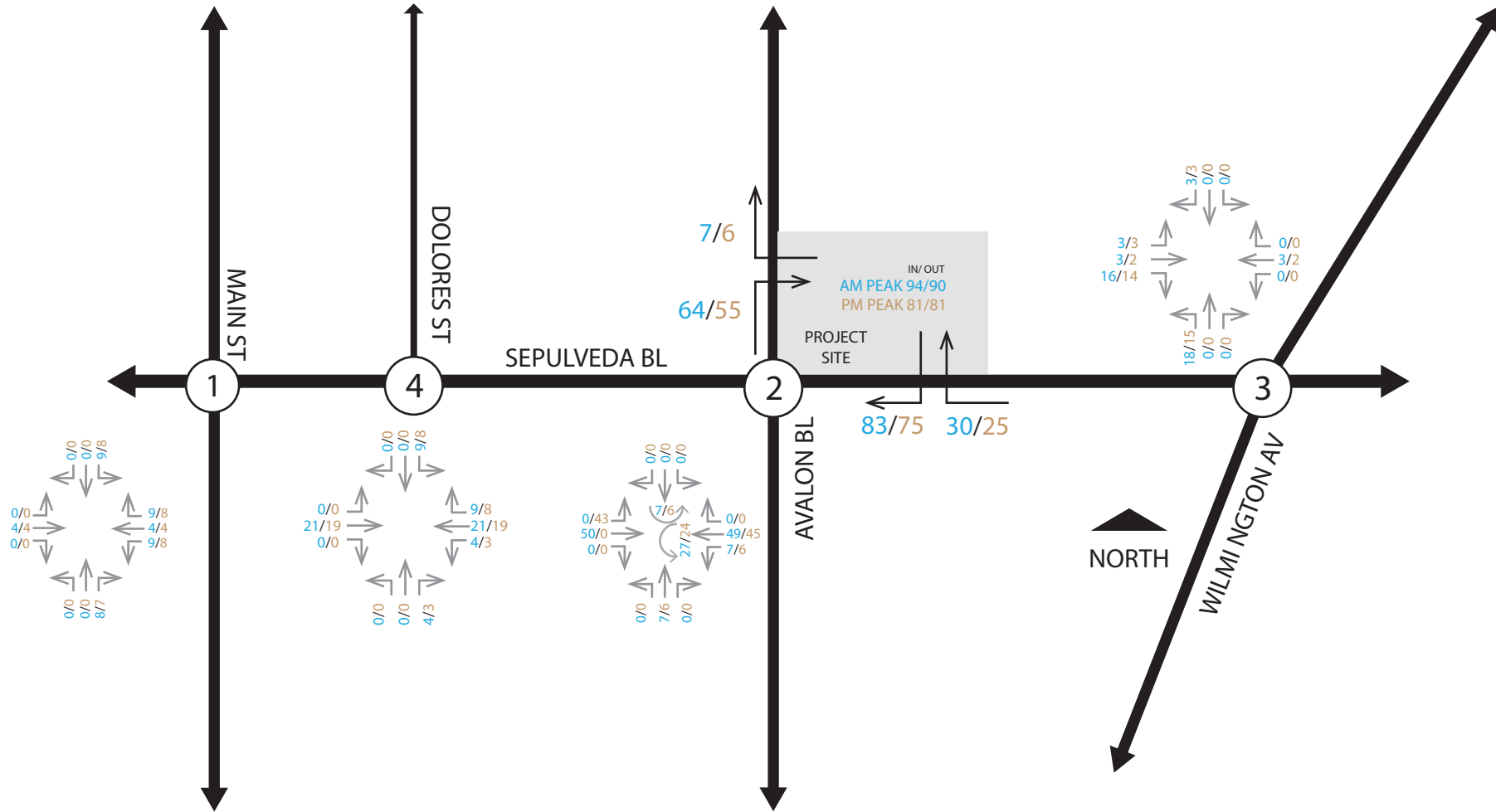
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Traffic Volume - Project Trip Distribution



TRIP ASSIGNMENT



APPENDIX B
Traffic Count Summaries

City of Carson
 N/S: Avalon Boulevard
 E/W: Sepulveda Boulevard
 Weather: Clear

File Name : 02_CRS_Ava_Sep AM
 Site Code : 221018
 Start Date : 11/15/2022
 Page No : 1

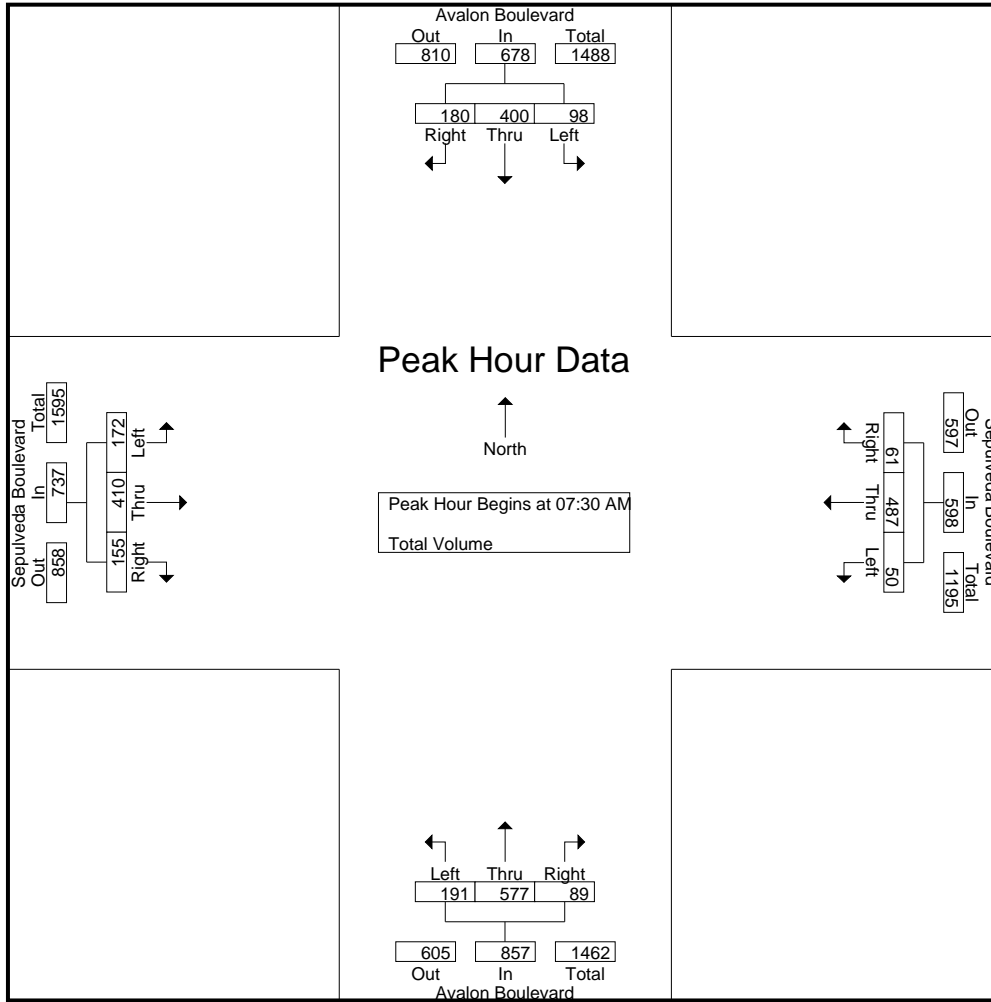
Groups Printed- Total Volume

Start Time	Avalon Boulevard Southbound				Sepulveda Boulevard Westbound				Avalon Boulevard Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	9	60	40	109	8	102	12	122	20	65	9	94	29	84	15	128	453
07:15 AM	21	88	33	142	9	95	11	115	35	80	21	136	21	95	27	143	536
07:30 AM	25	102	46	173	8	131	15	154	45	157	22	224	39	117	31	187	738
07:45 AM	18	99	36	153	10	106	11	127	42	132	20	194	43	94	39	176	650
Total	73	349	155	577	35	434	49	518	142	434	72	648	132	390	112	634	2377
08:00 AM	20	106	48	174	17	144	19	180	46	143	21	210	45	107	47	199	763
08:15 AM	35	93	50	178	15	106	16	137	58	145	26	229	45	92	38	175	719
08:30 AM	19	68	45	132	15	99	20	134	43	106	13	162	38	79	35	152	580
08:45 AM	18	93	41	152	12	92	13	117	34	95	11	140	46	91	36	173	582
Total	92	360	184	636	59	441	68	568	181	489	71	741	174	369	156	699	2644
Grand Total	165	709	339	1213	94	875	117	1086	323	923	143	1389	306	759	268	1333	5021
Apprch %	13.6	58.5	27.9		8.7	80.6	10.8		23.3	66.5	10.3		23	56.9	20.1		
Total %	3.3	14.1	6.8	24.2	1.9	17.4	2.3	21.6	6.4	18.4	2.8	27.7	6.1	15.1	5.3	26.5	

Start Time	Avalon Boulevard Southbound				Sepulveda Boulevard Westbound				Avalon Boulevard Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	25	102	46	173	8	131	15	154	45	157	22	224	39	117	31	187	738
07:45 AM	18	99	36	153	10	106	11	127	42	132	20	194	43	94	39	176	650
08:00 AM	20	106	48	174	17	144	19	180	46	143	21	210	45	107	47	199	763
08:15 AM	35	93	50	178	15	106	16	137	58	145	26	229	45	92	38	175	719
Total Volume	98	400	180	678	50	487	61	598	191	577	89	857	172	410	155	737	2870
% App. Total	14.5	59	26.5		8.4	81.4	10.2		22.3	67.3	10.4		23.3	55.6	21		
PHF	.700	.943	.900	.952	.735	.845	.803	.831	.823	.919	.856	.936	.956	.876	.824	.926	.940

City of Carson
 N/S: Avalon Boulevard
 E/W: Sepulveda Boulevard
 Weather: Clear

File Name : 02_CRS_Ava_Sep AM
 Site Code : 221018
 Start Date : 11/15/2022
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:30 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	25	102	46	173	8	131	15	154	45	157	22	224	39	117	31	187
+15 mins.	18	99	36	153	10	106	11	127	42	132	20	194	43	94	39	176
+30 mins.	20	106	48	174	17	144	19	180	46	143	21	210	45	107	47	199
+45 mins.	35	93	50	178	15	106	16	137	58	145	26	229	45	92	38	175
Total Volume	98	400	180	678	50	487	61	598	191	577	89	857	172	410	155	737
% App. Total	14.5	59	26.5		8.4	81.4	10.2		22.3	67.3	10.4		23.3	55.6	21	
PHF	.700	.943	.900	.952	.735	.845	.803	.831	.823	.919	.856	.936	.956	.876	.824	.926

City of Carson
 N/S: Avalon Boulevard
 E/W: Sepulveda Boulevard
 Weather: Clear

File Name : 02_CRS_Ava_Sep PM
 Site Code : 221018
 Start Date : 11/15/2022
 Page No : 1

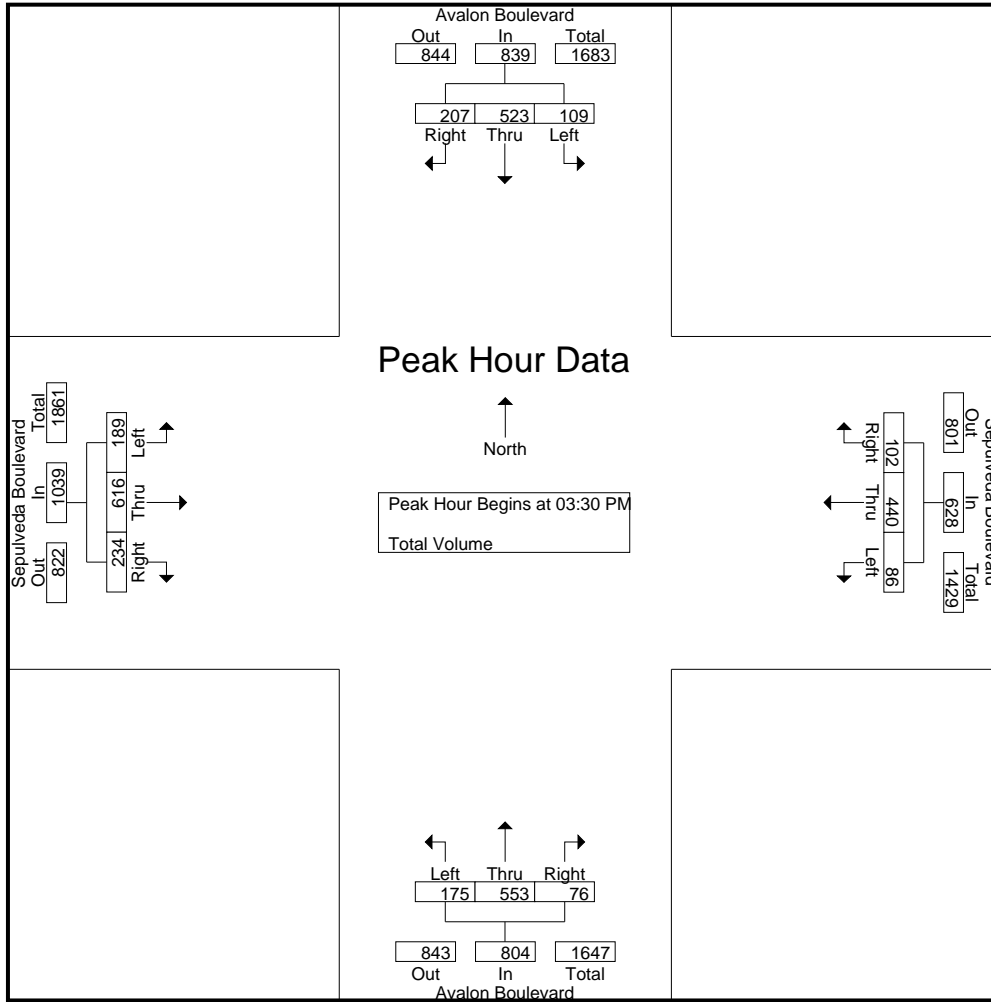
Groups Printed- Total Volume

Start Time	Avalon Boulevard Southbound				Sepulveda Boulevard Westbound				Avalon Boulevard Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
03:00 PM	29	85	47	161	19	84	23	126	45	127	18	190	45	116	51	212	689
03:15 PM	27	114	44	185	21	91	19	131	34	142	24	200	36	119	51	206	722
03:30 PM	27	119	52	198	26	121	25	172	40	114	17	171	59	176	58	293	834
03:45 PM	32	138	56	226	20	93	28	141	51	164	17	232	40	150	66	256	855
Total	115	456	199	770	86	389	95	570	170	547	76	793	180	561	226	967	3100
04:00 PM	18	114	52	184	27	116	22	165	38	144	26	208	53	154	55	262	819
04:15 PM	32	152	47	231	13	110	27	150	46	131	16	193	37	136	55	228	802
04:30 PM	25	97	53	175	26	141	26	193	25	127	15	167	44	161	57	262	797
04:45 PM	37	147	52	236	20	100	24	144	31	124	14	169	40	129	41	210	759
Total	112	510	204	826	86	467	99	652	140	526	71	737	174	580	208	962	3177
05:00 PM	22	115	52	189	27	142	37	206	34	122	19	175	50	158	61	269	839
05:15 PM	31	149	58	238	20	102	24	146	34	134	14	182	47	107	64	218	784
05:30 PM	36	132	53	221	27	125	12	164	39	97	17	153	51	173	77	301	839
05:45 PM	30	101	51	182	19	85	18	122	39	114	15	168	43	120	59	222	694
Total	119	497	214	830	93	454	91	638	146	467	65	678	191	558	261	1010	3156
Grand Total	346	1463	617	2426	265	1310	285	1860	456	1540	212	2208	545	1699	695	2939	9433
Apprch %	14.3	60.3	25.4		14.2	70.4	15.3		20.7	69.7	9.6		18.5	57.8	23.6		
Total %	3.7	15.5	6.5	25.7	2.8	13.9	3	19.7	4.8	16.3	2.2	23.4	5.8	18	7.4	31.2	

Start Time	Avalon Boulevard Southbound				Sepulveda Boulevard Westbound				Avalon Boulevard Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	27	119	52	198	26	121	25	172	40	114	17	171	59	176	58	293	834
03:45 PM	32	138	56	226	20	93	28	141	51	164	17	232	40	150	66	256	855
04:00 PM	18	114	52	184	27	116	22	165	38	144	26	208	53	154	55	262	819
04:15 PM	32	152	47	231	13	110	27	150	46	131	16	193	37	136	55	228	802
Total Volume	109	523	207	839	86	440	102	628	175	553	76	804	189	616	234	1039	3310
% App. Total	13	62.3	24.7		13.7	70.1	16.2		21.8	68.8	9.5		18.2	59.3	22.5		
PHF	.852	.860	.924	.908	.796	.909	.911	.913	.858	.843	.731	.866	.801	.875	.886	.887	.968

City of Carson
 N/S: Avalon Boulevard
 E/W: Sepulveda Boulevard
 Weather: Clear

File Name : 02_CRS_Ava_Sep PM
 Site Code : 221018
 Start Date : 11/15/2022
 Page No : 2



Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	04:45 PM				04:15 PM				03:15 PM				03:30 PM			
+0 mins.	37	147	52	236	13	110	27	150	34	142	24	200	59	176	58	293
+15 mins.	22	115	52	189	26	141	26	193	40	114	17	171	40	150	66	256
+30 mins.	31	149	58	238	20	100	24	144	51	164	17	232	53	154	55	262
+45 mins.	36	132	53	221	27	142	37	206	38	144	26	208	37	136	55	228
Total Volume	126	543	215	884	86	493	114	693	163	564	84	811	189	616	234	1039
% App. Total	14.3	61.4	24.3		12.4	71.1	16.5		20.1	69.5	10.4		18.2	59.3	22.5	
PHF	.851	.911	.927	.929	.796	.868	.770	.841	.799	.860	.808	.874	.801	.875	.886	.887

City of Carson
 N/S: Wilmington Avenue
 E/W: Sepulveda Boulevard
 Weather: Clear

File Name : 03_CRS_Wil_Sep AM
 Site Code : 221018
 Start Date : 11/15/2022
 Page No : 1

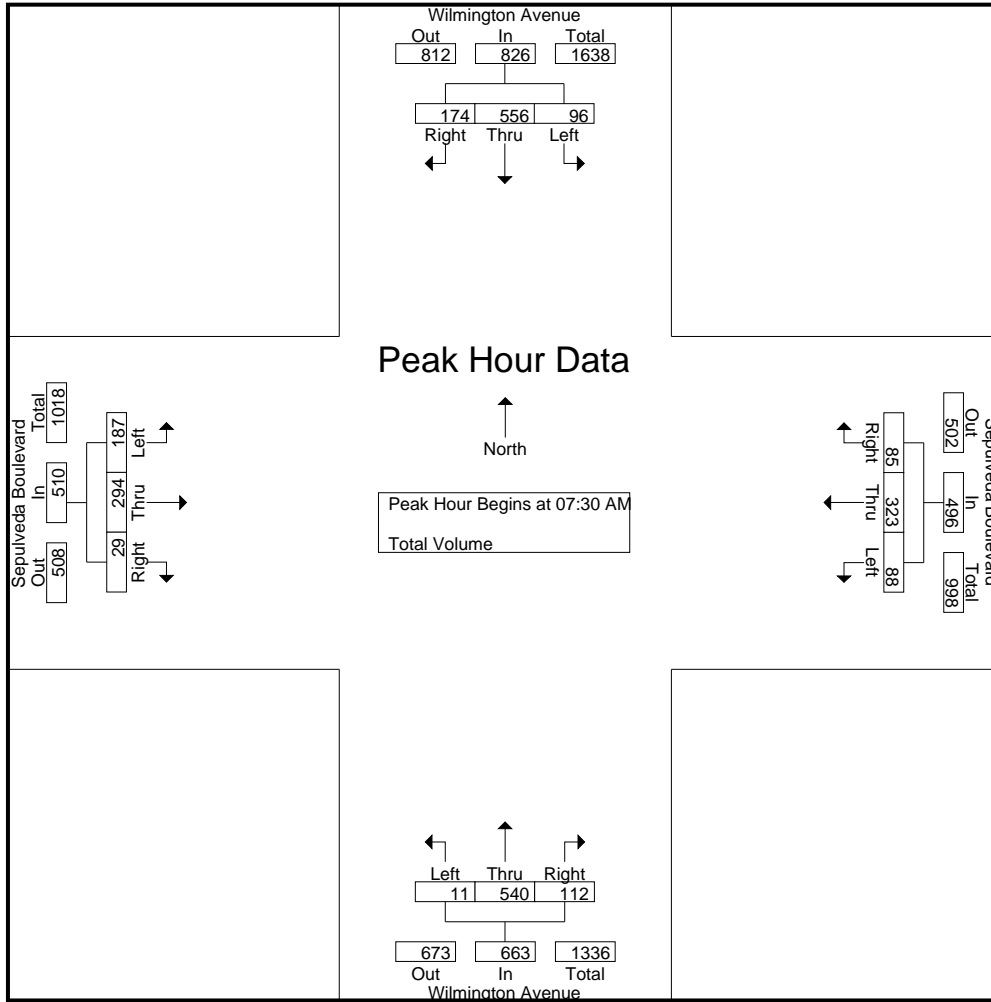
Groups Printed- Total Volume

Start Time	Wilmington Avenue Southbound				Sepulveda Boulevard Westbound				Wilmington Avenue Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	22	106	31	159	15	70	9	94	3	78	16	97	35	52	3	90	440
07:15 AM	26	128	39	193	17	74	8	99	1	102	16	119	53	63	8	124	535
07:30 AM	20	120	41	181	25	84	11	120	3	154	34	191	49	68	11	128	620
07:45 AM	26	155	44	225	24	88	26	138	2	125	33	160	40	80	7	127	650
Total	94	509	155	758	81	316	54	451	9	459	99	567	177	263	29	469	2245
08:00 AM	24	166	42	232	17	80	23	120	5	157	25	187	47	53	8	108	647
08:15 AM	26	115	47	188	22	71	25	118	1	104	20	125	51	93	3	147	578
08:30 AM	25	126	47	198	20	58	14	92	1	90	24	115	28	56	6	90	495
08:45 AM	33	114	32	179	10	52	15	77	10	107	29	146	39	54	3	96	498
Total	108	521	168	797	69	261	77	407	17	458	98	573	165	256	20	441	2218
Grand Total	202	1030	323	1555	150	577	131	858	26	917	197	1140	342	519	49	910	4463
Apprch %	13	66.2	20.8		17.5	67.2	15.3		2.3	80.4	17.3		37.6	57	5.4		
Total %	4.5	23.1	7.2	34.8	3.4	12.9	2.9	19.2	0.6	20.5	4.4	25.5	7.7	11.6	1.1	20.4	

Start Time	Wilmington Avenue Southbound				Sepulveda Boulevard Westbound				Wilmington Avenue Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	20	120	41	181	25	84	11	120	3	154	34	191	49	68	11	128	620
07:45 AM	26	155	44	225	24	88	26	138	2	125	33	160	40	80	7	127	650
08:00 AM	24	166	42	232	17	80	23	120	5	157	25	187	47	53	8	108	647
08:15 AM	26	115	47	188	22	71	25	118	1	104	20	125	51	93	3	147	578
Total Volume	96	556	174	826	88	323	85	496	11	540	112	663	187	294	29	510	2495
% App. Total	11.6	67.3	21.1		17.7	65.1	17.1		1.7	81.4	16.9		36.7	57.6	5.7		
PHF	.923	.837	.926	.890	.880	.918	.817	.899	.550	.860	.824	.868	.917	.790	.659	.867	.960

City of Carson
 N/S: Wilmington Avenue
 E/W: Sepulveda Boulevard
 Weather: Clear

File Name : 03_CRS_Wil_Sep AM
 Site Code : 221018
 Start Date : 11/15/2022
 Page No : 2



Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:30 AM				07:30 AM				07:30 AM			
+0 mins.	26	155	44	225	25	84	11	120	3	154	34	191	49	68	11	128
+15 mins.	24	166	42	232	24	88	26	138	2	125	33	160	40	80	7	127
+30 mins.	26	115	47	188	17	80	23	120	5	157	25	187	47	53	8	108
+45 mins.	25	126	47	198	22	71	25	118	1	104	20	125	51	93	3	147
Total Volume	101	562	180	843	88	323	85	496	11	540	112	663	187	294	29	510
% App. Total	12	66.7	21.4		17.7	65.1	17.1		1.7	81.4	16.9		36.7	57.6	5.7	
PHF	.971	.846	.957	.908	.880	.918	.817	.899	.550	.860	.824	.868	.917	.790	.659	.867

City of Carson
 N/S: Wilmington Avenue
 E/W: Sepulveda Boulevard
 Weather: Clear

File Name : 03_CRS_Wil_Sep PM
 Site Code : 221018
 Start Date : 11/15/2022
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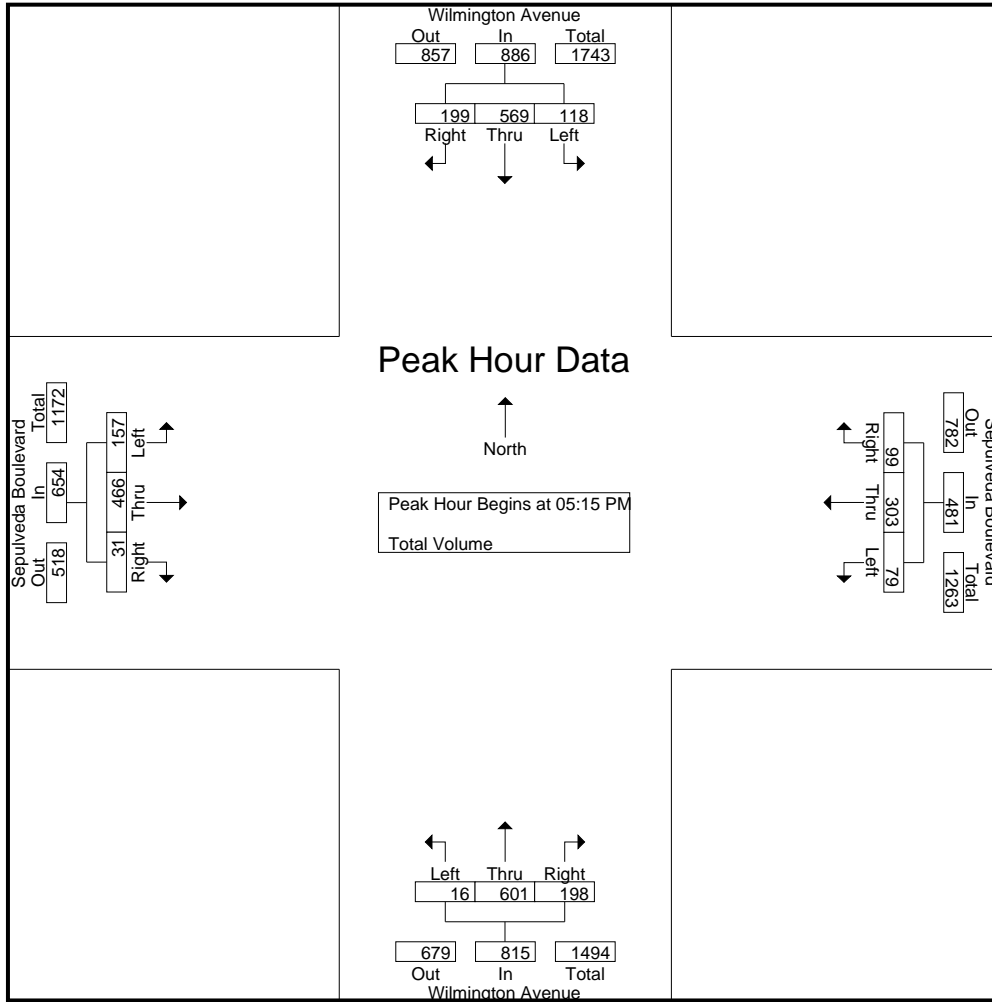
Groups Printed- Total Volume

Start Time	Wilmington Avenue Southbound				Sepulveda Boulevard Westbound				Wilmington Avenue Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
04:00 PM	23	89	44	156	25	57	17	99	5	137	37	179	38	81	12	131	565
04:15 PM	19	105	52	176	19	53	28	100	6	148	40	194	30	97	5	132	602
04:30 PM	22	96	48	166	30	74	38	142	2	172	51	225	66	109	9	184	717
04:45 PM	22	110	38	170	12	69	27	108	4	207	42	253	53	96	3	152	683
Total	86	400	182	668	86	253	110	449	17	664	170	851	187	383	29	599	2567
05:00 PM	28	117	42	187	15	63	23	101	4	163	40	207	49	109	4	162	657
05:15 PM	30	133	40	203	22	71	30	123	8	155	44	207	43	117	6	166	699
05:30 PM	33	137	63	233	16	81	29	126	2	156	59	217	33	121	9	163	739
05:45 PM	24	152	45	221	15	74	25	114	1	140	49	190	33	107	12	152	677
Total	115	539	190	844	68	289	107	464	15	614	192	821	158	454	31	643	2772
06:00 PM	31	147	51	229	26	77	15	118	5	150	46	201	48	121	4	173	721
06:15 PM	19	130	64	213	15	71	15	101	2	147	37	186	35	89	7	131	631
06:30 PM	14	129	39	182	21	66	26	113	2	158	37	197	45	118	9	172	664
06:45 PM	28	125	53	206	20	51	11	82	3	114	28	145	42	98	7	147	580
Total	92	531	207	830	82	265	67	414	12	569	148	729	170	426	27	623	2596
Grand Total	293	1470	579	2342	236	807	284	1327	44	1847	510	2401	515	1263	87	1865	7935
Apprch %	12.5	62.8	24.7		17.8	60.8	21.4		1.8	76.9	21.2		27.6	67.7	4.7		
Total %	3.7	18.5	7.3	29.5	3	10.2	3.6	16.7	0.6	23.3	6.4	30.3	6.5	15.9	1.1	23.5	

Start Time	Wilmington Avenue Southbound				Sepulveda Boulevard Westbound				Wilmington Avenue Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:15 PM																	
05:15 PM	30	133	40	203	22	71	30	123	8	155	44	207	43	117	6	166	699
05:30 PM	33	137	63	233	16	81	29	126	2	156	59	217	33	121	9	163	739
05:45 PM	24	152	45	221	15	74	25	114	1	140	49	190	33	107	12	152	677
06:00 PM	31	147	51	229	26	77	15	118	5	150	46	201	48	121	4	173	721
Total Volume	118	569	199	886	79	303	99	481	16	601	198	815	157	466	31	654	2836
% App. Total	13.3	64.2	22.5		16.4	63	20.6		2	73.7	24.3		24	71.3	4.7		
PHF	.894	.936	.790	.951	.760	.935	.825	.954	.500	.963	.839	.939	.818	.963	.646	.945	.959

City of Carson
 N/S: Wilmington Avenue
 E/W: Sepulveda Boulevard
 Weather: Clear

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Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	05:30 PM				05:15 PM				04:30 PM				04:00 PM			
+0 mins.	33	137	63	233	22	71	30	123	2	172	51	225	66	109	9	184
+15 mins.	24	152	45	221	16	81	29	126	4	207	42	253	53	96	3	152
+30 mins.	31	147	51	229	15	74	25	114	4	163	40	207	49	109	4	162
+45 mins.	19	130	64	213	26	77	15	118	8	155	44	207	43	117	6	166
Total Volume	107	566	223	896	79	303	99	481	18	697	177	892	211	431	22	664
% App. Total	11.9	63.2	24.9		16.4	63	20.6		2	78.1	19.8		31.8	64.9	3.3	
PHF	.811	.931	.871	.961	.760	.935	.825	.954	.563	.842	.868	.881	.799	.921	.611	.902

City of Carson
 N/S: Dolores Street
 E/W: Sepulveda Boulevard
 Weather: Clear

File Name : 04_CRS_Dolores_Sep AM
 Site Code : 221018
 Start Date : 11/30/2022
 Page No : 1

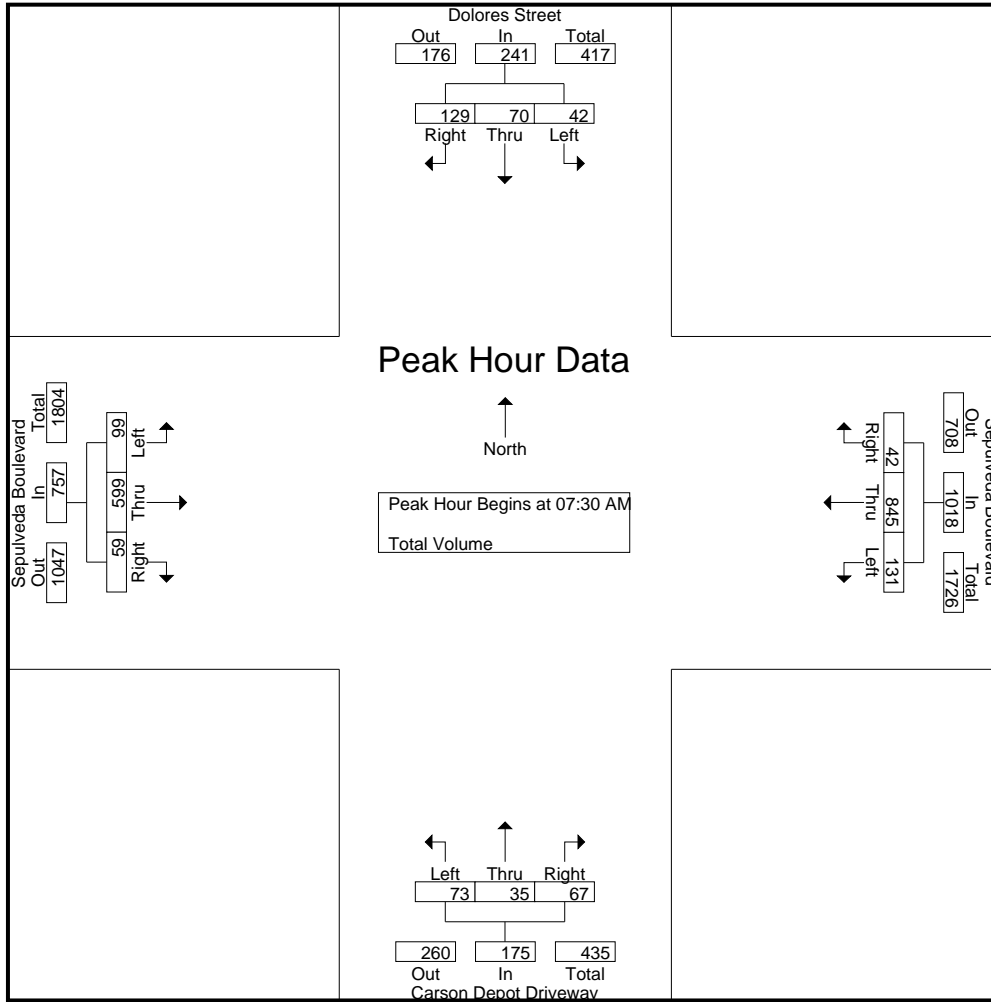
Groups Printed- Total Volume

Start Time	Dolores Street Southbound				Sepulveda Boulevard Westbound				Carson Depot Driveway Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
07:00 AM	6	9	19	34	18	175	6	199	8	3	16	27	10	99	17	126	386
07:15 AM	4	12	35	51	40	222	2	264	19	6	12	37	9	120	15	144	496
07:30 AM	5	16	26	47	24	242	11	277	13	6	16	35	14	150	12	176	535
07:45 AM	8	9	26	43	34	217	9	260	16	9	10	35	28	148	14	190	528
Total	23	46	106	175	116	856	28	1000	56	24	54	134	61	517	58	636	1945
08:00 AM	17	29	42	88	33	212	12	257	23	10	20	53	40	168	20	228	626
08:15 AM	12	16	35	63	40	174	10	224	21	10	21	52	17	133	13	163	502
08:30 AM	12	19	18	49	41	156	2	199	18	8	21	47	27	133	13	173	468
08:45 AM	1	13	18	32	41	130	7	178	24	8	27	59	17	113	7	137	406
Total	42	77	113	232	155	672	31	858	86	36	89	211	101	547	53	701	2002
Grand Total	65	123	219	407	271	1528	59	1858	142	60	143	345	162	1064	111	1337	3947
Apprch %	16	30.2	53.8		14.6	82.2	3.2		41.2	17.4	41.4		12.1	79.6	8.3		
Total %	1.6	3.1	5.5	10.3	6.9	38.7	1.5	47.1	3.6	1.5	3.6	8.7	4.1	27	2.8	33.9	

Start Time	Dolores Street Southbound				Sepulveda Boulevard Westbound				Carson Depot Driveway Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:30 AM																	
07:30 AM	5	16	26	47	24	242	11	277	13	6	16	35	14	150	12	176	535
07:45 AM	8	9	26	43	34	217	9	260	16	9	10	35	28	148	14	190	528
08:00 AM	17	29	42	88	33	212	12	257	23	10	20	53	40	168	20	228	626
08:15 AM	12	16	35	63	40	174	10	224	21	10	21	52	17	133	13	163	502
Total Volume	42	70	129	241	131	845	42	1018	73	35	67	175	99	599	59	757	2191
% App. Total	17.4	29	53.5		12.9	83	4.1		41.7	20	38.3		13.1	79.1	7.8		
PHF	.618	.603	.768	.685	.819	.873	.875	.919	.793	.875	.798	.825	.619	.891	.738	.830	.875

City of Carson
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 E/W: Sepulveda Boulevard
 Weather: Clear

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Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	07:45 AM				07:15 AM				08:00 AM				07:30 AM			
+0 mins.	8	9	26	43	40	222	2	264	23	10	20	53	14	150	12	176
+15 mins.	17	29	42	88	24	242	11	277	21	10	21	52	28	148	14	190
+30 mins.	12	16	35	63	34	217	9	260	18	8	21	47	40	168	20	228
+45 mins.	12	19	18	49	33	212	12	257	24	8	27	59	17	133	13	163
Total Volume	49	73	121	243	131	893	34	1058	86	36	89	211	99	599	59	757
% App. Total	20.2	30	49.8		12.4	84.4	3.2		40.8	17.1	42.2		13.1	79.1	7.8	
PHF	.721	.629	.720	.690	.819	.923	.708	.955	.896	.900	.824	.894	.619	.891	.738	.830

City of Carson
 N/S: Dolores Street
 E/W: Sepulveda Boulevard
 Weather: Clear

File Name : 04_CRS_Dolores_Sep PM
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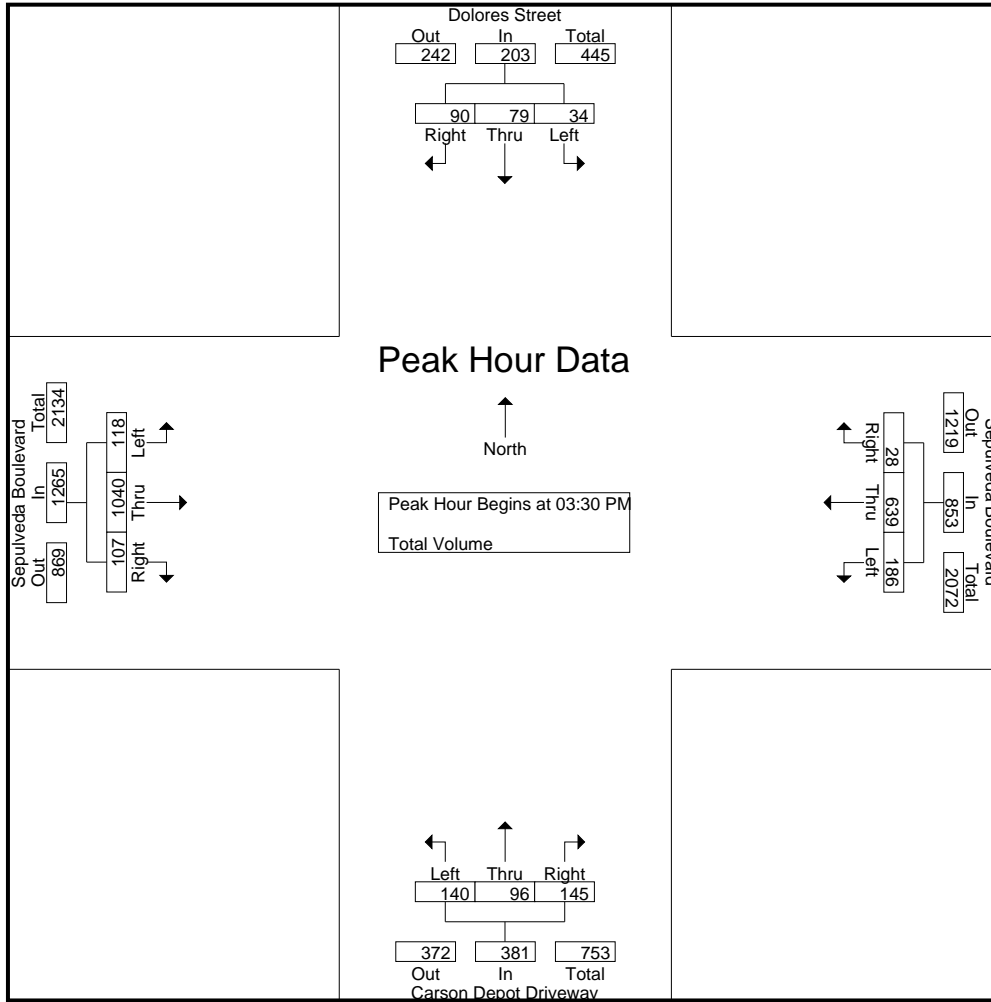
Groups Printed- Total Volume

Start Time	Dolores Street Southbound				Sepulveda Boulevard Westbound				Carson Depot Driveway Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
03:00 PM	8	13	16	37	60	149	6	215	39	17	33	89	34	211	12	257	598
03:15 PM	4	22	16	42	44	136	10	190	41	22	36	99	21	221	24	266	597
03:30 PM	9	20	29	58	48	174	7	229	38	16	34	88	37	244	18	299	674
03:45 PM	10	16	25	51	58	155	9	222	35	23	38	96	31	279	27	337	706
Total	31	71	86	188	210	614	32	856	153	78	141	372	123	955	81	1159	2575
04:00 PM	7	17	21	45	45	143	5	193	34	30	37	101	31	273	32	336	675
04:15 PM	8	26	15	49	35	167	7	209	33	27	36	96	19	244	30	293	647
04:30 PM	2	20	15	37	43	159	4	206	30	21	43	94	33	273	27	333	670
04:45 PM	6	23	14	43	58	154	8	220	38	35	35	108	28	219	25	272	643
Total	23	86	65	174	181	623	24	828	135	113	151	399	111	1009	114	1234	2635
05:00 PM	4	15	23	42	40	170	17	227	36	21	47	104	36	210	24	270	643
05:15 PM	6	23	18	47	53	188	5	246	35	13	41	89	28	233	35	296	678
05:30 PM	7	29	14	50	50	166	8	224	36	24	28	88	27	232	24	283	645
05:45 PM	7	14	14	35	45	104	9	158	30	22	44	96	26	202	24	252	541
Total	24	81	69	174	188	628	39	855	137	80	160	377	117	877	107	1101	2507
Grand Total	78	238	220	536	579	1865	95	2539	425	271	452	1148	351	2841	302	3494	7717
Apprch %	14.6	44.4	41		22.8	73.5	3.7		37	23.6	39.4		10	81.3	8.6		
Total %	1	3.1	2.9	6.9	7.5	24.2	1.2	32.9	5.5	3.5	5.9	14.9	4.5	36.8	3.9	45.3	

Start Time	Dolores Street Southbound				Sepulveda Boulevard Westbound				Carson Depot Driveway Northbound				Sepulveda Boulevard Eastbound				Int. Total
	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	Left	Thru	Right	App. Total	
Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 03:30 PM																	
03:30 PM	9	20	29	58	48	174	7	229	38	16	34	88	37	244	18	299	674
03:45 PM	10	16	25	51	58	155	9	222	35	23	38	96	31	279	27	337	706
04:00 PM	7	17	21	45	45	143	5	193	34	30	37	101	31	273	32	336	675
04:15 PM	8	26	15	49	35	167	7	209	33	27	36	96	19	244	30	293	647
Total Volume	34	79	90	203	186	639	28	853	140	96	145	381	118	1040	107	1265	2702
% App. Total	16.7	38.9	44.3		21.8	74.9	3.3		36.7	25.2	38.1		9.3	82.2	8.5		
PHF	.850	.760	.776	.875	.802	.918	.778	.931	.921	.800	.954	.943	.797	.932	.836	.938	.957

City of Carson
 N/S: Dolores Street
 E/W: Sepulveda Boulevard
 Weather: Clear

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Peak Hour Analysis From 03:00 PM to 05:45 PM - Peak 1 of 1
 Peak Hour for Each Approach Begins at:

	03:30 PM				04:45 PM				04:15 PM				03:45 PM			
+0 mins.	9	20	29	58	58	154	8	220	33	27	36	96	31	279	27	337
+15 mins.	10	16	25	51	40	170	17	227	30	21	43	94	31	273	32	336
+30 mins.	7	17	21	45	53	188	5	246	38	35	35	108	19	244	30	293
+45 mins.	8	26	15	49	50	166	8	224	36	21	47	104	33	273	27	333
Total Volume	34	79	90	203	201	678	38	917	137	104	161	402	114	1069	116	1299
% App. Total	16.7	38.9	44.3		21.9	73.9	4.1		34.1	25.9	40		8.8	82.3	8.9	
PHF	.850	.760	.776	.875	.866	.902	.559	.932	.901	.743	.856	.931	.864	.958	.906	.964

APPENDIX C
Existing LOS Worksheets

Carson_Car_Wsh

Vistro File: J:\...\Carson_Car_Wash_TIS_v3.vistro

Scenario 1 EXAM

Report File: J:\...\EXAM.pdf

6/16/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Dolores St - Sepulveda Bl	Signalized	HCM 6th Edition	SB Left	0.385	18.8	B
2	Avalon Bl - Sepulveda Bl	Signalized	HCM 6th Edition	NB Left	0.576	44.2	D
3	Wilmington Ave - Sepulveda Bl	Signalized	HCM 6th Edition	SB Right	0.503	47.4	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Dolores St - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	18.8
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.385

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐			⇐⇐			⇐⇐			⇐⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	210.00	100.00	100.00	200.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	35	67	42	70	129	99	599	59	131	845	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	73	35	67	42	70	129	99	599	59	131	845	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	18	9	17	11	18	32	25	150	15	33	211	11
Total Analysis Volume [veh/h]	73	35	67	42	70	129	99	599	59	131	845	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	6	0	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	9	44	0	14	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	7	0	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	28	28	28	28	28	54	40	40	54	45	45
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.31	0.60	0.44	0.44	0.60	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.09	0.07	0.04	0.04	0.09	0.14	0.20	0.20	0.15	0.27	0.27
s, saturation flow rate [veh/h]	962	1351	1163	1683	1431	698	1683	1631	899	1683	1655
c, Capacity [veh/h]	373	420	360	524	445	433	748	725	559	841	828
d1, Uniform Delay [s]	25.98	22.85	26.93	22.28	23.47	9.46	17.33	17.33	8.89	15.32	15.32
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.45	1.14	0.66	0.53	1.64	1.23	1.93	1.99	0.98	2.40	2.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.23	0.21	0.12	0.13	0.29	0.23	0.45	0.45	0.23	0.53	0.53
d, Delay for Lane Group [s/veh]	27.43	24.00	27.59	22.81	25.11	10.69	19.25	19.33	9.88	17.72	17.76
Lane Group LOS	C	C	C	C	C	B	B	B	A	B	B
Critical Lane Group	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.60	1.49	0.77	1.12	2.24	0.90	4.98	4.85	1.17	6.42	6.32
50th-Percentile Queue Length [ft/ln]	39.96	37.33	19.19	28.11	55.90	22.47	124.62	121.29	29.19	160.42	158.00
95th-Percentile Queue Length [veh/ln]	2.88	2.69	1.38	2.02	4.02	1.62	8.65	8.46	2.10	10.57	10.44
95th-Percentile Queue Length [ft/ln]	71.93	67.20	34.54	50.59	100.62	40.44	216.16	211.60	52.55	264.29	261.08

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.43	25.31	24.00	27.59	22.81	25.11	10.69	19.29	19.33	9.88	17.74	17.76
Movement LOS	C	C	C	C	C	C	B	B	B	A	B	B
d_A, Approach Delay [s/veh]	25.69			24.88			18.16			16.73		
Approach LOS	C			C			B			B		
d_I, Intersection Delay [s/veh]	18.84											
Intersection LOS	B											
Intersection V/C	0.385											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.170	2.456	2.757	2.698
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	622	622	889	1000
d_b, Bicycle Delay [s]	21.36	21.36	13.89	11.25
I_b,int, Bicycle LOS Score for Intersection	1.704	1.957	2.184	2.399
Bicycle LOS	A	A	B	B

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Avalon BI - Sepulveda BI

Control Type:	Signalized	Delay (sec / veh):	44.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.576

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	290.00	100.00	100.00	185.00	100.00	100.00	285.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	191	577	89	98	400	180	172	410	155	50	487	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	191	577	89	98	400	180	172	410	155	50	487	61
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	144	22	25	100	45	43	103	39	13	122	15
Total Analysis Volume [veh/h]	191	577	89	98	400	180	172	410	155	50	487	61
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.12	0.20	0.20	0.06	0.18	0.18	0.11	0.18	0.18	0.03	0.17	0.17
s, saturation flow rate [veh/h]	1603	1683	1605	1603	1683	1509	1603	1683	1528	1603	1683	1618
c, Capacity [veh/h]	267	411	392	267	411	369	267	411	374	267	411	396
d1, Uniform Delay [s]	35.48	32.21	32.22	33.29	31.36	31.43	35.01	31.16	31.19	32.26	30.78	30.82
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	15.12	17.25	18.00	3.85	11.35	12.94	11.37	10.30	11.46	1.55	8.66	9.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.71	0.83	0.83	0.37	0.74	0.75	0.64	0.72	0.72	0.19	0.68	0.68
d, Delay for Lane Group [s/veh]	50.60	49.46	50.21	37.14	42.71	44.37	46.38	41.46	42.65	33.80	39.45	39.95
Lane Group LOS	D	D	D	D	D	D	D	D	D	C	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.01	8.81	8.49	2.16	7.25	6.72	4.30	6.91	6.43	1.04	6.33	6.18
50th-Percentile Queue Length [ft/ln]	125.35	220.23	212.26	53.99	181.13	168.05	107.56	172.77	160.72	26.03	158.32	154.42
95th-Percentile Queue Length [veh/ln]	8.69	13.68	13.27	3.89	11.66	10.97	7.70	11.22	10.59	1.87	10.46	10.25
95th-Percentile Queue Length [ft/ln]	217.16	341.92	331.73	97.17	291.49	274.35	192.60	280.56	264.68	46.85	261.50	256.32

Movement, Approach, & Intersection Results

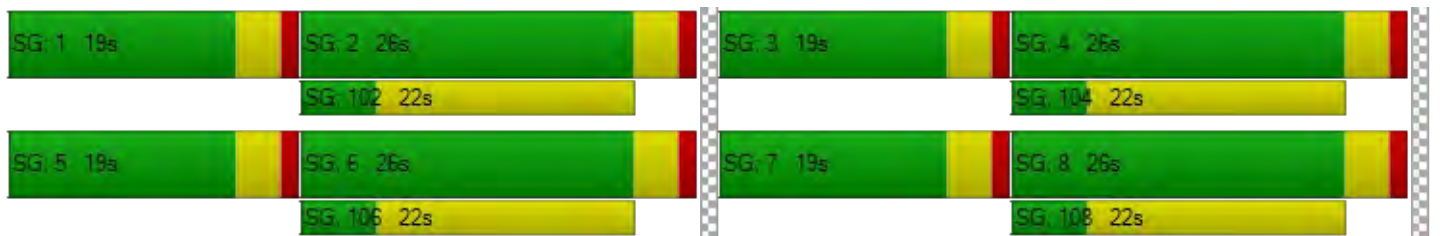
d_M, Delay for Movement [s/veh]	50.60	49.77	50.21	37.14	43.11	44.37	46.38	41.79	42.65	33.80	39.66	39.95
Movement LOS	D	D	D	D	D	D	D	D	D	C	D	D
d_A, Approach Delay [s/veh]	50.00			42.58			43.04			39.20		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	44.21											
Intersection LOS	D											
Intersection V/C	0.576											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.586	2.592	2.612	2.534
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	489	489	489
d_b, Bicycle Delay [s]	25.69	25.69	25.69	25.69
I_b,int, Bicycle LOS Score for Intersection	2.267	2.119	2.168	2.053
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Wilmington Ave - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	47.4
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.503

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	200.00	100.00	100.00	240.00	100.00	100.00	410.00	100.00	100.00	280.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	11	540	112	96	556	174	187	294	29	88	323	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	540	112	96	556	174	187	294	29	88	323	85
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	135	28	24	139	44	47	74	7	22	81	21
Total Analysis Volume [veh/h]	11	540	112	96	556	174	187	294	29	88	323	85
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing in		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.01	0.20	0.20	0.06	0.23	0.23	0.12	0.10	0.10	0.05	0.12	0.13
s, saturation flow rate [veh/h]	1603	1683	1584	1603	1683	1547	1603	1683	1631	1603	1683	1565
c, Capacity [veh/h]	267	411	387	267	411	378	267	411	399	267	411	382
d1, Uniform Delay [s]	31.47	32.07	32.12	33.24	33.18	33.20	35.38	28.45	28.47	33.07	29.35	29.42
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.29	16.07	17.33	3.73	28.80	30.79	14.22	2.86	2.98	3.27	4.46	4.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.81	0.82	0.36	0.92	0.93	0.70	0.40	0.40	0.33	0.51	0.52
d, Delay for Lane Group [s/veh]	31.76	48.14	49.45	36.97	61.98	63.99	49.60	31.31	31.45	36.34	33.80	34.37
Lane Group LOS	C	D	D	D	E	E	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.22	8.53	8.21	2.11	11.15	10.47	4.86	3.22	3.16	1.91	4.34	4.16
50th-Percentile Queue Length [ft/ln]	5.51	213.17	205.25	52.74	278.68	261.85	121.38	80.61	79.00	47.86	108.58	104.02
95th-Percentile Queue Length [veh/ln]	0.40	13.32	12.91	3.80	16.62	15.78	8.47	5.80	5.69	3.45	7.76	7.49
95th-Percentile Queue Length [ft/ln]	9.91	332.90	322.72	94.94	415.56	394.54	211.72	145.09	142.19	86.14	194.03	187.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.76	48.63	49.45	36.97	62.62	63.99	49.60	31.37	31.45	36.34	34.00	34.37
Movement LOS	C	D	D	D	E	E	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	48.49			59.93			38.06			34.48		
Approach LOS	D			E			D			C		
d_I, Intersection Delay [s/veh]	47.36											
Intersection LOS	D											
Intersection V/C	0.503											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0			9.0			9.0		
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00			0.00			0.00		
d_p, Pedestrian Delay [s]	36.45			36.45			36.45			36.45		
I_p,int, Pedestrian LOS Score for Intersection	2.562			2.621			2.500			2.496		
Crosswalk LOS	B			B			B			B		
s_b, Saturation Flow Rate of the bicycle lane	2000			2000			2000			2000		
c_b, Capacity of the bicycle lane [bicycles/h]	489			489			489			489		
d_b, Bicycle Delay [s]	25.69			25.69			25.69			25.69		
I_b,int, Bicycle LOS Score for Intersection	2.107			2.241			1.980			1.969		
Bicycle LOS	B			B			A			A		

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Carson_Car_Wsh

Vistro File: J:\...\Carson_Car_Wash_TIS_v3.vistro

Scenario 2 EXPM

Report File: J:\...\EXPM.pdf

6/16/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Dolores St - Sepulveda Bl	Signalized	HCM 6th Edition	SB Left	0.589	24.1	C
2	Avalon Bl - Sepulveda Bl	Signalized	HCM 6th Edition	EB Right	0.656	63.5	E
3	Wilmington Ave - Sepulveda Bl	Signalized	HCM 6th Edition	NB Right	0.546	59.7	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Dolores St - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	24.1
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.589

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐			⇐⇐			⇐⇐			⇐⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	210.00	100.00	100.00	200.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	140	96	145	34	79	90	118	1040	107	186	639	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	140	96	145	34	79	90	118	1040	107	186	639	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	24	36	9	20	23	30	260	27	47	160	7
Total Analysis Volume [veh/h]	140	96	145	34	79	90	118	1040	107	186	639	28
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	6	0	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	9	44	0	14	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	7	0	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	28	28	28	28	28	54	40	40	54	45	45
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.31	0.60	0.44	0.44	0.60	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.03	0.05	0.06	0.15	0.35	0.35	0.27	0.20	0.20
s, saturation flow rate [veh/h]	1014	1356	1025	1683	1431	810	1683	1629	699	1683	1658
c, Capacity [veh/h]	386	422	255	524	445	515	748	724	405	841	829
d1, Uniform Delay [s]	28.48	25.01	31.99	22.41	22.79	8.62	21.23	21.27	14.80	14.06	14.06
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.12	3.72	1.08	0.61	1.02	1.03	7.83	8.17	3.72	1.41	1.44
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.47	0.47	0.13	0.15	0.20	0.23	0.78	0.78	0.46	0.40	0.40
d, Delay for Lane Group [s/veh]	32.60	28.73	33.07	23.02	23.81	9.65	29.06	29.43	18.52	15.47	15.49
Lane Group LOS	C	C	C	C	C	A	C	C	B	B	B
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.79	3.77	0.70	1.28	1.50	1.05	11.42	11.16	1.92	4.37	4.31
50th-Percentile Queue Length [ft/ln]	94.71	94.13	17.60	31.93	37.59	26.36	285.49	279.01	47.89	109.16	107.71
95th-Percentile Queue Length [veh/ln]	6.82	6.78	1.27	2.30	2.71	1.90	16.96	16.64	3.45	7.79	7.71
95th-Percentile Queue Length [ft/ln]	170.47	169.43	31.68	57.47	67.65	47.45	424.04	415.98	86.20	194.83	192.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.60	30.46	28.73	33.07	23.02	23.81	9.65	29.22	29.43	18.52	15.48	15.49
Movement LOS	C	C	C	C	C	C	A	C	C	B	B	B
d_A, Approach Delay [s/veh]	30.59			25.05			27.42			16.14		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	24.13											
Intersection LOS	C											
Intersection V/C	0.589											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.310	2.476	2.917	2.754
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	622	622	889	1000
d_b, Bicycle Delay [s]	21.36	21.36	13.89	11.25
I_b,int, Bicycle LOS Score for Intersection	1.874	1.895	2.603	2.263
Bicycle LOS	A	A	B	B

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Avalon BI - Sepulveda BI

Control Type:	Signalized	Delay (sec / veh):	63.5
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	290.00	100.00	100.00	185.00	100.00	100.00	285.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	175	553	76	109	523	207	189	616	234	86	440	102
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	175	553	76	109	523	207	189	616	234	86	440	102
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	138	19	27	131	52	47	154	59	22	110	26
Total Analysis Volume [veh/h]	175	553	76	109	523	207	189	616	234	86	440	102
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing in		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.11	0.19	0.19	0.07	0.23	0.23	0.12	0.26	0.26	0.05	0.17	0.17
s, saturation flow rate [veh/h]	1603	1683	1613	1603	1683	1523	1603	1683	1527	1603	1683	1575
c, Capacity [veh/h]	267	411	394	267	411	372	267	411	373	267	411	385
d1, Uniform Delay [s]	35.08	31.74	31.75	33.53	33.26	33.27	35.43	34.00	34.00	33.02	30.79	30.84
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	11.89	13.65	14.25	4.57	29.98	32.34	14.66	68.49	70.78	3.17	8.69	9.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.66	0.78	0.78	0.41	0.93	0.93	0.71	1.08	1.08	0.32	0.68	0.68
d, Delay for Lane Group [s/veh]	46.97	45.40	46.00	38.10	63.23	65.62	50.09	102.49	104.78	36.19	39.48	40.30
Lane Group LOS	D	D	D	D	E	E	D	F	F	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.41	7.91	7.65	2.44	11.36	10.54	4.93	16.54	15.25	1.87	6.34	6.07
50th-Percentile Queue Length [ft/ln]	110.20	197.72	191.33	60.95	283.99	263.48	123.35	413.54	381.17	46.65	158.56	151.69
95th-Percentile Queue Length [veh/ln]	7.85	12.52	12.19	4.39	16.89	15.86	8.58	24.29	22.65	3.36	10.47	10.11
95th-Percentile Queue Length [ft/ln]	196.29	313.02	304.75	109.71	422.17	396.58	214.42	607.15	566.14	83.97	261.81	252.69

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.97	45.65	46.00	38.10	63.87	65.62	50.09	103.13	104.78	36.19	39.78	40.30
Movement LOS	D	D	D	D	E	E	D	F	F	D	D	D
d_A, Approach Delay [s/veh]	45.97			60.95			93.85			39.37		
Approach LOS	D			E			F			D		
d_I, Intersection Delay [s/veh]	63.55											
Intersection LOS	E											
Intersection V/C	0.656											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.623	2.630	2.664	2.580
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	489	489	489
d_b, Bicycle Delay [s]	25.69	25.69	25.69	25.69
I_b,int, Bicycle LOS Score for Intersection	2.223	2.252	2.417	2.078
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Wilmington Ave - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	59.7
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.546

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	200.00	100.00	100.00	240.00	100.00	100.00	410.00	100.00	100.00	280.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	16	601	198	118	569	199	157	466	31	79	303	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	601	198	118	569	199	157	466	31	79	303	99
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	150	50	30	142	50	39	117	8	20	76	25
Total Analysis Volume [veh/h]	16	601	198	118	569	199	157	466	31	79	303	99
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0		0			0			0			
v_di, Inbound Pedestrian Volume crossing in	0		0			0			0			
v_co, Outbound Pedestrian Volume crossing	0		0			0			0			
v_ci, Inbound Pedestrian Volume crossing mi	0		0			0			0			
v_ab, Corner Pedestrian Volume [ped/h]	0		0			0			0			
Bicycle Volume [bicycles/h]	0		0			0			0			

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.01	0.25	0.25	0.07	0.24	0.24	0.10	0.15	0.15	0.05	0.12	0.13
s, saturation flow rate [veh/h]	1603	1683	1542	1603	1683	1536	1603	1683	1646	1603	1683	1544
c, Capacity [veh/h]	267	411	377	267	411	375	267	411	402	267	411	377
d1, Uniform Delay [s]	31.57	34.00	34.00	33.73	33.74	33.74	34.64	30.19	30.20	32.87	29.30	29.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.43	47.53	50.11	5.22	38.71	40.90	9.15	6.59	6.77	2.80	4.37	4.96
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	1.01	1.01	0.44	0.98	0.98	0.59	0.61	0.61	0.30	0.50	0.52
d, Delay for Lane Group [s/veh]	31.99	81.53	84.11	38.96	72.45	74.64	43.80	36.79	36.98	35.67	33.67	34.35
Lane Group LOS	C	F	F	D	E	E	D	D	D	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.32	14.15	13.23	2.67	12.86	11.97	3.80	5.47	5.39	1.70	4.29	4.08
50th-Percentile Queue Length [ft/ln]	8.05	353.66	330.81	66.85	321.52	299.29	95.08	136.84	134.69	42.49	107.18	102.03
95th-Percentile Queue Length [veh/ln]	0.58	20.46	19.36	4.81	18.74	17.65	6.85	9.31	9.19	3.06	7.68	7.35
95th-Percentile Queue Length [ft/ln]	14.49	511.55	484.01	120.32	468.56	441.16	171.15	232.76	229.85	76.48	192.07	183.65

Movement, Approach, & Intersection Results

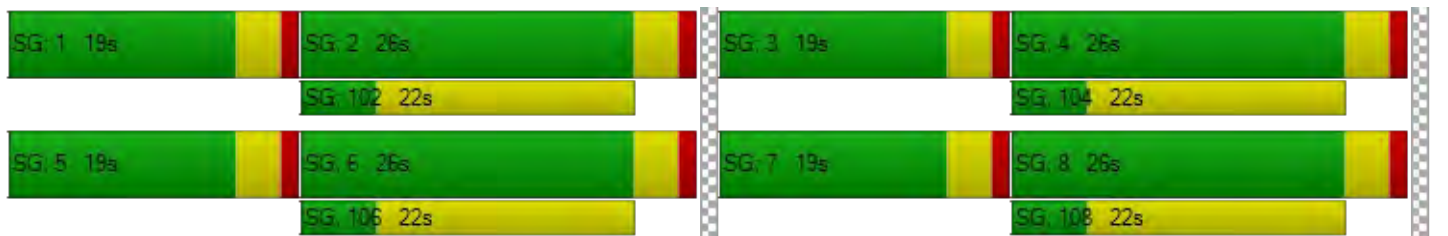
d_M, Delay for Movement [s/veh]	31.99	82.32	84.11	38.96	73.09	74.64	43.80	36.87	36.98	35.67	33.88	34.35
Movement LOS	C	F	F	D	E	E	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	81.77			68.90			38.54			34.27		
Approach LOS	F			E			D			C		
d_I, Intersection Delay [s/veh]	59.72											
Intersection LOS	E											
Intersection V/C	0.546											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.593	2.641	2.530	2.548
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	489	489	489
d_b, Bicycle Delay [s]	25.69	25.69	25.69	25.69
I_b,int, Bicycle LOS Score for Intersection	2.232	2.291	2.099	1.956
Bicycle LOS	B	B	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX D
Future Pre-Project LOS Worksheets

Carson_Car_Wsh

Vistro File: J:\...\Carson_Car_Wash_TIS_v3.vistro

Scenario 5 Future_No_Project_AM

Report File: J:\...\Future_No_AM.pdf

6/16/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Dolores St - Sepulveda Bl	Signalized	HCM 6th Edition	SB Left	0.389	18.9	B
2	Avalon Bl - Sepulveda Bl	Signalized	HCM 6th Edition	NB Left	0.582	44.7	D
3	Wilmington Ave - Sepulveda Bl	Signalized	HCM 6th Edition	SB Right	0.508	48.2	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Dolores St - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	18.9
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.389

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐			⇐⇐			⇐⇐			⇐⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	210.00	100.00	100.00	200.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	35	67	42	70	129	99	599	59	131	845	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	35	68	42	71	130	100	605	60	132	853	42
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	9	17	11	18	33	25	151	15	33	213	11
Total Analysis Volume [veh/h]	74	35	68	42	71	130	100	605	60	132	853	42
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing in		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	6	0	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	9	44	0	14	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	7	0	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	28	28	28	28	28	54	40	40	54	45	45
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.31	0.60	0.44	0.44	0.60	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.09	0.07	0.04	0.04	0.09	0.14	0.20	0.20	0.15	0.27	0.27
s, saturation flow rate [veh/h]	957	1351	1162	1683	1431	695	1683	1630	896	1683	1655
c, Capacity [veh/h]	372	420	359	524	445	430	748	725	556	841	828
d1, Uniform Delay [s]	26.06	22.88	26.98	22.30	23.49	9.52	17.37	17.38	8.93	15.37	15.37
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.48	1.16	0.66	0.54	1.66	1.26	1.96	2.03	1.00	2.44	2.48
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.23	0.21	0.12	0.14	0.29	0.23	0.45	0.45	0.24	0.54	0.54
d, Delay for Lane Group [s/veh]	27.54	24.04	27.64	22.83	25.15	10.78	19.34	19.41	9.93	17.81	17.86
Lane Group LOS	C	C	C	C	C	B	B	B	A	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.62	1.51	0.77	1.14	2.26	0.91	5.05	4.92	1.18	6.50	6.40
50th-Percentile Queue Length [ft/ln]	40.46	37.85	19.22	28.53	56.39	22.75	126.36	122.95	29.47	162.48	160.05
95th-Percentile Queue Length [veh/ln]	2.91	2.73	1.38	2.05	4.06	1.64	8.74	8.56	2.12	10.68	10.55
95th-Percentile Queue Length [ft/ln]	72.83	68.14	34.59	51.35	101.50	40.95	218.54	213.88	53.04	267.00	263.79

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.54	25.36	24.04	27.64	22.83	25.15	10.78	19.37	19.41	9.93	17.83	17.86
Movement LOS	C	C	C	C	C	C	B	B	B	A	B	B
d_A, Approach Delay [s/veh]	25.76			24.90			18.25			16.82		
Approach LOS	C			C			B			B		
d_I, Intersection Delay [s/veh]	18.92											
Intersection LOS	B											
Intersection V/C	0.389											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.172	2.458	2.762	2.701
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	622	622	889	1000
d_b, Bicycle Delay [s]	21.36	21.36	13.89	11.25
I_b,int, Bicycle LOS Score for Intersection	1.706	1.961	2.191	2.407
Bicycle LOS	A	A	B	B

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Avalon BI - Sepulveda BI

Control Type:	Signalized	Delay (sec / veh):	44.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.582

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	290.00	100.00	100.00	185.00	100.00	100.00	285.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	191	577	89	98	400	180	172	410	155	50	487	61
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	193	583	90	99	404	182	174	414	157	51	492	62
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	48	146	23	25	101	46	44	104	39	13	123	16
Total Analysis Volume [veh/h]	193	583	90	99	404	182	174	414	157	51	492	62
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.12	0.20	0.20	0.06	0.18	0.18	0.11	0.18	0.18	0.03	0.17	0.17
s, saturation flow rate [veh/h]	1603	1683	1605	1603	1683	1509	1603	1683	1528	1603	1683	1618
c, Capacity [veh/h]	267	411	392	267	411	369	267	411	373	267	411	396
d1, Uniform Delay [s]	35.53	32.30	32.30	33.31	31.44	31.50	35.06	31.23	31.26	32.28	30.85	30.89
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	15.59	18.04	18.80	3.91	11.76	13.39	11.71	10.66	11.85	1.58	8.94	9.43
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.84	0.84	0.37	0.75	0.75	0.65	0.73	0.73	0.19	0.68	0.69
d, Delay for Lane Group [s/veh]	51.12	50.33	51.10	37.22	43.19	44.89	46.77	41.89	43.11	33.86	39.79	40.31
Lane Group LOS	D	D	D	D	D	D	D	D	D	C	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.10	8.99	8.66	2.18	7.37	6.83	4.37	7.03	6.53	1.06	6.44	6.28
50th-Percentile Queue Length [ft/ln]	127.39	224.75	216.59	54.61	184.22	170.86	109.32	175.70	163.37	26.57	160.90	156.90
95th-Percentile Queue Length [veh/ln]	8.80	13.91	13.49	3.93	11.82	11.12	7.80	11.38	10.73	1.91	10.60	10.38
95th-Percentile Queue Length [ft/ln]	219.94	347.68	337.27	98.29	295.52	278.04	195.05	284.39	268.18	47.83	264.92	259.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.12	50.65	51.10	37.22	43.60	44.89	46.77	42.23	43.11	33.86	40.01	40.31
Movement LOS	D	D	D	D	D	D	D	D	D	C	D	D
d_A, Approach Delay [s/veh]	50.80			43.02			43.48			39.53		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	44.73											
Intersection LOS	D											
Intersection V/C	0.582											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.590	2.595	2.616	2.537
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	489	489	489
d_b, Bicycle Delay [s]	25.69	25.69	25.69	25.69
I_b,int, Bicycle LOS Score for Intersection	2.274	2.125	2.174	2.059
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Wilmington Ave - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	48.2
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.508

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	200.00	100.00	100.00	240.00	100.00	100.00	410.00	100.00	100.00	280.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	11	540	112	96	556	174	187	294	29	88	323	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	11	545	113	97	562	176	189	297	29	89	326	86
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	3	136	28	24	141	44	47	74	7	22	82	22
Total Analysis Volume [veh/h]	11	545	113	97	562	176	189	297	29	89	326	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.01	0.20	0.20	0.06	0.23	0.23	0.12	0.10	0.10	0.06	0.13	0.13
s, saturation flow rate [veh/h]	1603	1683	1584	1603	1683	1547	1603	1683	1631	1603	1683	1564
c, Capacity [veh/h]	267	411	387	267	411	378	267	411	399	267	411	382
d1, Uniform Delay [s]	31.47	32.14	32.19	33.26	33.29	33.30	35.43	28.48	28.50	33.09	29.39	29.46
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.29	16.68	17.98	3.79	30.52	32.53	14.66	2.90	3.02	3.33	4.55	5.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.04	0.82	0.83	0.36	0.93	0.94	0.71	0.40	0.40	0.33	0.51	0.52
d, Delay for Lane Group [s/veh]	31.76	48.83	50.17	37.05	63.81	65.84	50.09	31.38	31.53	36.42	33.94	34.51
Lane Group LOS	C	D	D	D	E	E	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.22	8.68	8.35	2.13	11.46	10.76	4.93	3.26	3.19	1.94	4.40	4.21
50th-Percentile Queue Length [ft/ln]	5.51	216.88	208.80	53.36	286.41	268.97	123.35	81.47	79.85	48.46	109.94	105.28
95th-Percentile Queue Length [veh/ln]	0.40	13.51	13.09	3.84	17.01	16.14	8.58	5.87	5.75	3.49	7.84	7.58
95th-Percentile Queue Length [ft/ln]	9.91	337.65	327.28	96.06	425.18	403.45	214.42	146.65	143.73	87.23	195.92	189.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.76	49.34	50.17	37.05	64.45	65.84	50.09	31.44	31.53	36.42	34.14	34.51
Movement LOS	C	D	D	D	E	E	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	49.19			61.56			38.29			34.61		
Approach LOS	D			E			D			C		
d_I, Intersection Delay [s/veh]	48.16											
Intersection LOS	D											
Intersection V/C	0.508											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.564	2.624	2.502	2.498
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	489	489	489
d_b, Bicycle Delay [s]	25.69	25.69	25.69	25.69
I_b,int, Bicycle LOS Score for Intersection	2.112	2.248	1.984	1.973
Bicycle LOS	B	B	A	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Carson_Car_Wsh

Vistro File: J:\...\Carson_Car_Wash_TIS_v3.vistro

Scenario 6 Future_No_Project_PM

Report File: J:\...\Future_No_PM.pdf

6/16/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Dolores St - Sepulveda Bl	Signalized	HCM 6th Edition	SB Left	0.595	24.4	C
2	Avalon Bl - Sepulveda Bl	Signalized	HCM 6th Edition	EB Right	0.662	65.0	E
3	Wilmington Ave - Sepulveda Bl	Signalized	HCM 6th Edition	NB Right	0.551	61.2	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Dolores St - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	24.4
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.595

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐			⇐⇐			⇐⇐			⇐⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	210.00	100.00	100.00	200.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	140	96	145	34	79	90	118	1040	107	186	639	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	97	146	34	80	91	119	1050	108	188	645	28
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	24	37	9	20	23	30	263	27	47	161	7
Total Analysis Volume [veh/h]	141	97	146	34	80	91	119	1050	108	188	645	28
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	6	0	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	9	44	0	14	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	7	0	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	28	28	28	28	28	54	40	40	54	45	45
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.31	0.60	0.44	0.44	0.60	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.03	0.05	0.06	0.15	0.35	0.35	0.27	0.20	0.20
s, saturation flow rate [veh/h]	1010	1357	1023	1683	1431	807	1683	1629	696	1683	1658
c, Capacity [veh/h]	385	422	254	524	445	513	748	724	402	841	829
d1, Uniform Delay [s]	28.56	25.05	32.09	22.42	22.81	8.64	21.34	21.38	15.04	14.09	14.09
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.20	3.78	1.10	0.62	1.04	1.06	8.13	8.49	3.86	1.43	1.46
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.47	0.13	0.15	0.20	0.23	0.79	0.79	0.47	0.40	0.40
d, Delay for Lane Group [s/veh]	32.76	28.83	33.18	23.04	23.84	9.70	29.47	29.87	18.90	15.52	15.54
Lane Group LOS	C	C	C	C	C	A	C	C	B	B	B
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.82	3.81	0.71	1.29	1.52	1.07	11.62	11.37	1.95	4.42	4.36
50th-Percentile Queue Length [ft/ln]	95.59	95.23	17.64	32.36	38.04	26.63	290.61	284.20	48.68	110.41	108.95
95th-Percentile Queue Length [veh/ln]	6.88	6.86	1.27	2.33	2.74	1.92	17.22	16.90	3.50	7.86	7.78
95th-Percentile Queue Length [ft/ln]	172.07	171.42	31.76	58.24	68.47	47.94	430.40	422.43	87.62	196.58	194.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.76	30.57	28.83	33.18	23.04	23.84	9.70	29.64	29.87	18.90	15.53	15.54
Movement LOS	C	C	C	C	C	C	A	C	C	B	B	B
d_A, Approach Delay [s/veh]	30.71			25.08			27.80			16.27		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	24.37											
Intersection LOS	C											
Intersection V/C	0.595											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.314	2.477	2.922	2.757
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	622	622	889	1000
d_b, Bicycle Delay [s]	21.36	21.36	13.89	11.25
I_b,int, Bicycle LOS Score for Intersection	1.876	1.898	2.613	2.270
Bicycle LOS	A	A	B	B

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Avalon BI - Sepulveda BI

Control Type:	Signalized	Delay (sec / veh):	65.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.662

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	290.00	100.00	100.00	185.00	100.00	100.00	285.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	175	553	76	109	523	207	189	616	234	86	440	102
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	177	559	77	110	528	209	191	622	236	87	444	103
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	140	19	28	132	52	48	156	59	22	111	26
Total Analysis Volume [veh/h]	177	559	77	110	528	209	191	622	236	87	444	103
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing in		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.11	0.19	0.19	0.07	0.23	0.23	0.12	0.27	0.27	0.05	0.17	0.17
s, saturation flow rate [veh/h]	1603	1683	1613	1603	1683	1523	1603	1683	1527	1603	1683	1575
c, Capacity [veh/h]	267	411	394	267	411	372	267	411	373	267	411	385
d1, Uniform Delay [s]	35.13	31.83	31.84	33.55	33.35	33.37	35.48	34.00	34.00	33.04	30.85	30.90
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.24	14.23	14.84	4.64	31.55	33.94	15.12	71.85	74.17	3.22	8.92	9.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.66	0.79	0.79	0.41	0.94	0.94	0.71	1.09	1.09	0.33	0.68	0.69
d, Delay for Lane Group [s/veh]	47.37	46.06	46.68	38.19	64.90	67.31	50.60	105.85	108.17	36.26	39.77	40.61
Lane Group LOS	D	D	D	D	E	E	D	F	F	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.48	8.06	7.80	2.46	11.64	10.79	5.01	16.93	15.60	1.89	6.43	6.15
50th-Percentile Queue Length [ft/ln]	112.00	201.58	195.04	61.60	290.98	269.82	125.35	423.13	389.98	47.25	160.73	153.74
95th-Percentile Queue Length [veh/ln]	7.95	12.72	12.38	4.43	17.23	16.18	8.69	24.89	23.21	3.40	10.59	10.22
95th-Percentile Queue Length [ft/ln]	198.78	318.00	309.55	110.87	430.86	404.51	217.16	622.31	580.20	85.06	264.69	255.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.37	46.32	46.68	38.19	65.55	67.31	50.60	106.49	108.17	36.26	40.08	40.61
Movement LOS	D	D	D	D	E	E	D	F	F	D	D	D
d_A, Approach Delay [s/veh]	46.58			62.43			96.69			39.64		
Approach LOS	D			E			F			D		
d_I, Intersection Delay [s/veh]	65.00											
Intersection LOS	E											
Intersection V/C	0.662											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.626	2.633	2.668	2.583
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	489	489	489
d_b, Bicycle Delay [s]	25.69	25.69	25.69	25.69
I_b,int, Bicycle LOS Score for Intersection	2.230	2.258	2.425	2.083
Bicycle LOS	B	B	B	B

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Wilmington Ave - Sepulveda BI

Control Type:	Signalized	Delay (sec / veh):	61.2
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.551

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	200.00	100.00	100.00	240.00	100.00	100.00	410.00	100.00	100.00	280.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	16	601	198	118	569	199	157	466	31	79	303	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	16	607	200	119	575	201	159	471	31	80	306	100
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	4	152	50	30	144	50	40	118	8	20	77	25
Total Analysis Volume [veh/h]	16	607	200	119	575	201	159	471	31	80	306	100
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.01	0.25	0.25	0.07	0.24	0.24	0.10	0.15	0.15	0.05	0.12	0.13
s, saturation flow rate [veh/h]	1603	1683	1542	1603	1683	1536	1603	1683	1647	1603	1683	1544
c, Capacity [veh/h]	267	411	377	267	411	375	267	411	403	267	411	377
d1, Uniform Delay [s]	31.57	34.00	34.00	33.76	33.85	33.85	34.69	30.24	30.26	32.89	29.34	29.43
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.43	50.27	52.82	5.30	41.01	43.20	9.42	6.76	6.94	2.85	4.46	5.05
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.06	1.02	1.02	0.45	0.99	0.99	0.60	0.62	0.62	0.30	0.51	0.52
d, Delay for Lane Group [s/veh]	31.99	84.27	86.82	39.06	74.86	77.05	44.11	37.00	37.19	35.75	33.80	34.48
Lane Group LOS	C	F	F	D	E	E	D	D	D	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.32	14.46	13.52	2.70	13.24	12.32	3.87	5.55	5.46	1.72	4.34	4.13
50th-Percentile Queue Length [ft/ln]	8.05	361.47	337.88	67.51	331.01	307.92	96.68	138.70	136.52	43.08	108.53	103.27
95th-Percentile Queue Length [veh/ln]	0.58	20.97	19.82	4.86	19.21	18.07	6.96	9.41	9.29	3.10	7.76	7.44
95th-Percentile Queue Length [ft/ln]	14.49	524.17	495.53	121.52	480.20	451.81	174.02	235.27	232.33	77.54	193.96	185.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.99	85.05	86.82	39.06	75.51	77.05	44.11	37.09	37.19	35.75	34.01	34.48
Movement LOS	C	F	F	D	E	E	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	84.45			71.01			38.78			34.40		
Approach LOS	F			E			D			C		
d_I, Intersection Delay [s/veh]	61.22											
Intersection LOS	E											
Intersection V/C	0.551											

Other Modes

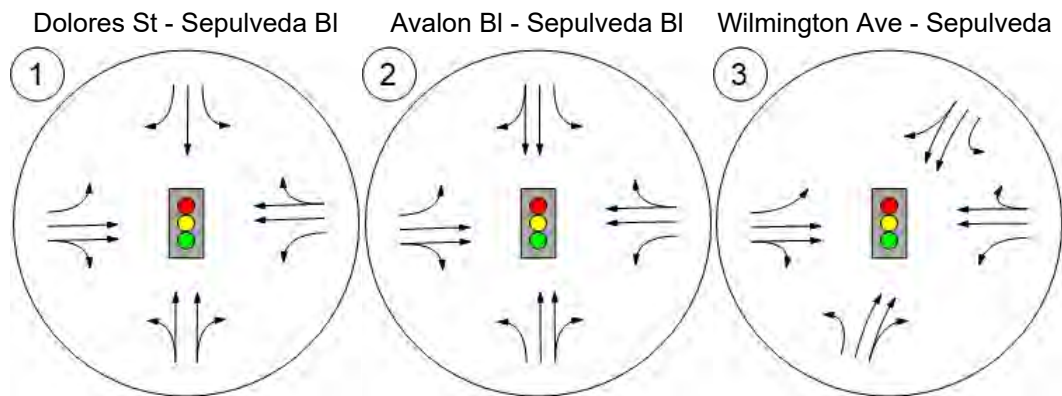
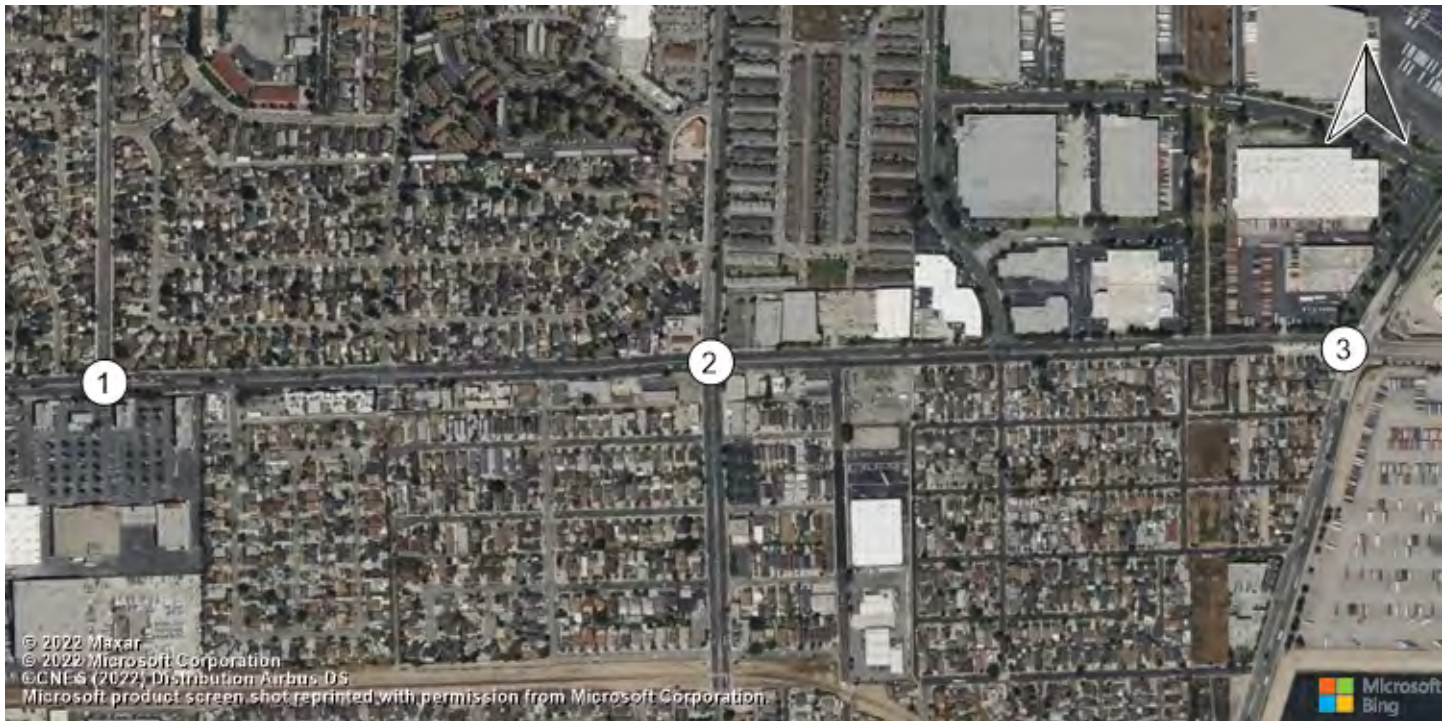
g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.596	2.645	2.532	2.550
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	489	489	489
d_b, Bicycle Delay [s]	25.69	25.69	25.69	25.69
I_b,int, Bicycle LOS Score for Intersection	2.239	2.298	2.105	1.961
Bicycle LOS	B	B	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Lane Configuration and Traffic Control



APPENDIX E
Future Post-Project LOS Worksheets

Carson_Car_Wsh

Vistro File: J:\...\Carson_Car_Wash_TIS_v3.vistro

Scenario 7 Future_With_Project_AM

Report File: J:\...\Future_W_AM_U_turns.pdf

6/16/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Dolores St - Sepulveda Bl	Signalized	HCM 6th Edition	SB Left	0.400	19.2	B
2	Avalon Bl - Sepulveda Bl	Signalized	HCM 6th Edition	EB Left	0.628	46.7	D
3	Wilmington Ave - Sepulveda Bl	Signalized	HCM 6th Edition	SB Right	0.511	48.3	D

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Dolores St - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	19.2
Analysis Method:	HCM 6th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.400

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐			⇐⇐			⇐⇐			⇐⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	210.00	100.00	100.00	200.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	73	35	67	42	70	129	99	599	59	131	845	42
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	4	9	0	0	0	21	0	4	21	9
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	74	35	72	51	71	130	100	626	60	136	874	51
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	19	9	18	13	18	33	25	157	15	34	219	13
Total Analysis Volume [veh/h]	74	35	72	51	71	130	100	626	60	136	874	51
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	6	0	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	9	44	0	14	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	7	0	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	28	28	28	28	28	54	40	40	54	45	45
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.31	0.60	0.44	0.44	0.60	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.09	0.07	0.04	0.04	0.09	0.15	0.21	0.21	0.15	0.28	0.28
s, saturation flow rate [veh/h]	967	1345	1158	1683	1431	681	1683	1632	885	1683	1651
c, Capacity [veh/h]	374	419	356	524	445	420	748	725	548	841	825
d1, Uniform Delay [s]	26.00	22.92	27.30	22.30	23.49	9.71	17.51	17.52	9.05	15.57	15.57
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.50	1.20	0.84	0.54	1.66	1.33	2.08	2.15	1.08	2.63	2.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.22	0.14	0.14	0.29	0.24	0.47	0.47	0.25	0.55	0.56
d, Delay for Lane Group [s/veh]	27.50	24.12	28.14	22.83	25.15	11.05	19.59	19.66	10.13	18.20	18.26
Lane Group LOS	C	C	C	C	C	B	B	B	B	B	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	1.66	1.55	0.95	1.14	2.26	0.91	5.26	5.12	1.22	6.83	6.71
50th-Percentile Queue Length [ft/ln]	41.38	38.81	23.63	28.53	56.39	22.87	131.53	128.05	30.55	170.75	167.79
95th-Percentile Queue Length [veh/ln]	2.98	2.79	1.70	2.05	4.06	1.65	9.02	8.83	2.20	11.12	10.96
95th-Percentile Queue Length [ft/ln]	74.48	69.86	42.54	51.35	101.50	41.16	225.57	220.84	54.99	277.90	274.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.50	25.59	24.12	28.14	22.83	25.15	11.05	19.62	19.66	10.13	18.23	18.26
Movement LOS	C	C	C	C	C	C	B	B	B	B	B	B
d_A, Approach Delay [s/veh]	25.79			25.10			18.53			17.19		
Approach LOS	C			C			B			B		
d_I, Intersection Delay [s/veh]	19.21											
Intersection LOS	B											
Intersection V/C	0.400											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.178	2.461	2.770	2.727
Crosswalk LOS	B	B	C	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	622	622	889	1000
d_b, Bicycle Delay [s]	21.36	21.36	13.89	11.25
I_b,int, Bicycle LOS Score for Intersection	1.709	1.975	2.208	2.435
Bicycle LOS	A	A	B	B

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Avalon BI - Sepulveda BI

Control Type:	Signalized	Delay (sec / veh):	46.7
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.628

Intersection Setup

Name	Northbound				Southbound				Eastbound			Westbound			
Approach	Northbound				Southbound				Eastbound			Westbound			
Lane Configuration	T T T				T T T				T T T			T T T			
Turning Movement	Left	Thru	Right	U-tu	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	1	0	0	1	0	0	0	
Entry Pocket Length [ft]	100.00	100.00	100.00	290.0	100.0	100.0	100.0	185.00	100.00	100.00	285.0	100.0	100.0	100.0	
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Speed [mph]	30.00				30.00				30.00			30.00			
Grade [%]	0.00				0.00				0.00			0.00			
Curb Present	No				No				No			No			
Crosswalk	Yes				Yes				Yes			Yes			

Volumes

Name															
Base Volume Input [veh/h]	191	577	89	0	98	400	180	172	410	155	0	50	487	61	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
Growth Factor	1.0100	1.0100	1.0100	1.000	1.010	1.010	1.010	1.0100	1.0100	1.0100	1.000	1.010	1.010	1.010	
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	7	0	7	0	0	0	51	0	0	27	7	49	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	193	590	90	7	99	404	182	225	414	157	27	58	541	62	
Peak Hour Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	
Total 15-Minute Volume [veh/h]	48	148	23	2	25	101	46	56	104	39	7	15	135	16	
Total Analysis Volume [veh/h]	193	590	90	7	99	404	182	225	414	157	27	58	541	62	
Presence of On-Street Parking	No		No	No			No	No		No	No			No	
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
v_do, Outbound Pedestrian Volume crossing	0			0				0			0				
v_di, Inbound Pedestrian Volume crossing in	0			0				0			0				
v_co, Outbound Pedestrian Volume crossing	0			0				0			0				
v_ci, Inbound Pedestrian Volume crossing mi	0			0				0			0				
v_ab, Corner Pedestrian Volume [ped/h]	0			0				0			0				
Bicycle Volume [bicycles/h]	0			0				0			0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permi	Prote	Permi	Permi	Protecte	Permiss	Permiss	Permi	Prote	Permi	Permi
Signal Group	1	6	0	0	5	2	0	3	8	0	0	7	4	0
Auxiliary Signal Groups														
Lead / Lag	Lead	-	-	-	Lead	-	-	Lead	-	-	-	Lead	-	-
Minimum Green [s]	5	10	0	0	5	10	0	5	10	0	0	5	10	0
Maximum Green [s]	30	30	0	0	30	30	0	30	30	0	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	0	19	26	0	19	26	0	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	0	5	0	0	5	0	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	0	17	0	0	17	0	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No			No				No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No	No		No	No			No	No	
Maximum Recall	No	No			No	No		No	No			No	No	
Pedestrian Recall	No	No			No	No		No	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.12	0.21	0.21	0.07	0.18	0.18	0.14	0.18	0.18	0.05	0.18	0.18
s, saturation flow rate [veh/h]	1603	1683	1606	1603	1683	1509	1603	1683	1527	1603	1683	1623
c, Capacity [veh/h]	267	411	393	267	411	369	267	411	373	267	411	397
d1, Uniform Delay [s]	35.53	32.38	32.39	33.46	31.44	31.50	36.35	31.24	31.26	33.00	31.41	31.43
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	15.59	18.84	19.62	4.36	11.77	13.38	26.26	10.70	11.81	3.11	11.61	12.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.85	0.85	0.40	0.75	0.75	0.84	0.73	0.73	0.32	0.75	0.75
d, Delay for Lane Group [s/veh]	51.12	51.23	52.01	37.83	43.20	44.88	62.61	41.93	43.07	36.11	43.02	43.55
Lane Group LOS	D	D	D	D	D	D	E	D	D	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	5.10	9.17	8.84	2.36	7.37	6.83	6.65	7.04	6.52	1.84	7.32	7.14
50th-Percentile Queue Length [ft/ln]	127.39	229.28	221.04	59.03	184.29	170.79	166.17	175.97	163.10	46.05	183.11	178.56
95th-Percentile Queue Length [veh/ln]	8.80	14.14	13.72	4.25	11.82	11.12	10.87	11.39	10.71	3.32	11.76	11.53
95th-Percentile Queue Length [ft/ln]	219.94	353.45	342.96	106.25	295.60	277.95	271.87	284.75	267.82	82.89	294.07	288.13

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	51.12	51.55	52.01	37.83	37.83	43.60	44.88	62.61	42.25	43.07	36.11	36.11	43.25	43.55
Movement LOS	D	D	D	D	D	D	D	E	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	51.50			43.05				48.17			42.40			
Approach LOS	D			D				D			D			
d_I, Intersection Delay [s/veh]	46.66													
Intersection LOS	D													
Intersection V/C	0.628													

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0				9.0			9.0			
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00				0.00			0.00			
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00				0.00			0.00			
d_p, Pedestrian Delay [s]	36.45			36.45				36.45			36.45			
I_p,int, Pedestrian LOS Score for Intersection	2.592			2.607				2.635			2.553			
Crosswalk LOS	B			B				B			B			
s_b, Saturation Flow Rate of the bicycle lane	2000			2000				2000			2000			
c_b, Capacity of the bicycle lane [bicycles/h]	489			489				489			489			
d_b, Bicycle Delay [s]	25.69			25.69				25.69			25.69			
I_b,int, Bicycle LOS Score for Intersection	2.280			2.049				2.216			2.079			
Bicycle LOS	B			B				B			B			

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Wilmington Ave - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	48.3
Analysis Method:	HCM 6th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.511

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	200.00	100.00	100.00	240.00	100.00	100.00	410.00	100.00	100.00	280.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	11	540	112	96	556	174	187	294	29	88	323	85
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	18	0	0	0	0	3	3	3	16	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	545	113	97	562	179	192	300	45	89	329	86
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	7	136	28	24	141	45	48	75	11	22	82	22
Total Analysis Volume [veh/h]	29	545	113	97	562	179	192	300	45	89	329	86
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.02	0.20	0.20	0.06	0.23	0.23	0.12	0.10	0.11	0.06	0.13	0.13
s, saturation flow rate [veh/h]	1603	1683	1584	1603	1683	1545	1603	1683	1608	1603	1683	1565
c, Capacity [veh/h]	267	411	387	267	411	378	267	411	393	267	411	383
d1, Uniform Delay [s]	31.83	32.15	32.19	33.26	33.33	33.35	35.50	28.68	28.71	33.09	29.42	29.49
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.82	16.70	17.95	3.79	31.28	33.33	15.35	3.22	3.42	3.33	4.61	5.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.11	0.82	0.83	0.36	0.94	0.94	0.72	0.43	0.43	0.33	0.52	0.53
d, Delay for Lane Group [s/veh]	32.64	48.85	50.14	37.05	64.61	66.68	50.86	31.90	32.14	36.42	34.03	34.61
Lane Group LOS	C	D	D	D	E	E	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.59	8.68	8.35	2.13	11.59	10.87	5.05	3.51	3.40	1.94	4.44	4.25
50th-Percentile Queue Length [ft/ln]	14.77	217.02	208.66	53.36	289.76	271.84	126.37	87.68	85.07	48.46	110.93	106.23
95th-Percentile Queue Length [veh/ln]	1.06	13.51	13.08	3.84	17.17	16.28	8.74	6.31	6.12	3.49	7.89	7.63
95th-Percentile Queue Length [ft/ln]	26.59	337.82	327.11	96.06	429.34	407.04	218.54	157.83	153.12	87.23	197.29	190.75

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.64	49.34	50.14	37.05	65.26	66.68	50.86	32.00	32.14	36.42	34.23	34.61
Movement LOS	C	D	D	D	E	E	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	48.77			62.30			38.75			34.68		
Approach LOS	D			E			D			C		
d_I, Intersection Delay [s/veh]	48.32											
Intersection LOS	D											
Intersection V/C	0.511											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.571	2.625	2.511	2.499
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	489	489	489
d_b, Bicycle Delay [s]	25.69	25.69	25.69	25.69
I_b,int, Bicycle LOS Score for Intersection	2.126	2.251	2.003	1.975
Bicycle LOS	B	B	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Carson_Car_Wsh

Vistro File: J:\...\Carson_Car_Wash_TIS_v3.vistro

Scenario 8 Future_With_Project_PM

Report File: J:\...\Future_W_PM_U_turns.pdf

6/16/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	Dolores St - Sepulveda Bl	Signalized	HCM 6th Edition	SB Left	0.602	24.8	C
2	Avalon Bl - Sepulveda Bl	Signalized	HCM 6th Edition	EB Right	0.681	66.0	E
3	Wilmington Ave - Sepulveda Bl	Signalized	HCM 6th Edition	NB Right	0.554	61.4	E

V/C, Delay, LOS: For two-way stop, these values are taken from the movement with the worst (highest) delay value. For all other control types, they are taken for the whole intersection.

Intersection Level Of Service Report
Intersection 1: Dolores St - Sepulveda Bl

Control Type:	Signalized	Delay (sec / veh):	24.8
Analysis Method:	HCM 6th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.602

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	⇐⇐⇐			⇐⇐⇐			⇐⇐⇐			⇐⇐⇐		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	210.00	100.00	100.00	200.00	100.00	100.00	180.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	140	96	145	34	79	90	118	1040	107	186	639	28
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	3	8	0	0	0	18	0	3	19	8
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	97	149	42	80	91	119	1068	108	191	664	36
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	24	37	11	20	23	30	267	27	48	166	9
Total Analysis Volume [veh/h]	141	97	149	42	80	91	119	1068	108	191	664	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	0			0			0			0		
v_di, Inbound Pedestrian Volume crossing in	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	0			0			0			0		
v_ci, Inbound Pedestrian Volume crossing mi	0			0			0			0		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	ProtPer	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	6	0	0	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	5	10	0	5	10	0
Maximum Green [s]	0	30	0	0	30	0	30	30	0	30	30	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	32	0	0	32	0	9	44	0	14	49	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	14	0	0	14	0	0	7	0	0	7	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	0.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	28	28	28	28	28	54	40	40	54	45	45
g / C, Green / Cycle	0.31	0.31	0.31	0.31	0.31	0.60	0.44	0.44	0.60	0.50	0.50
(v / s)_i Volume / Saturation Flow Rate	0.18	0.15	0.04	0.05	0.06	0.15	0.35	0.36	0.28	0.21	0.21
s, saturation flow rate [veh/h]	1014	1355	1020	1683	1431	792	1683	1629	690	1683	1653
c, Capacity [veh/h]	386	421	252	524	445	502	748	724	398	841	826
d1, Uniform Delay [s]	28.56	25.09	32.45	22.42	22.81	8.74	21.51	21.56	15.39	14.24	14.24
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.24	3.85	1.42	0.62	1.04	1.11	8.65	9.05	4.10	1.54	1.57
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.48	0.48	0.17	0.15	0.20	0.24	0.80	0.80	0.48	0.42	0.42
d, Delay for Lane Group [s/veh]	32.80	28.94	33.87	23.04	23.84	9.85	30.17	30.60	19.49	15.78	15.80
Lane Group LOS	C	C	C	C	C	A	C	C	B	B	B
Critical Lane Group	Yes	No	No	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	3.86	3.85	0.88	1.29	1.52	1.07	11.97	11.72	2.00	4.66	4.58
50th-Percentile Queue Length [ft/ln]	96.49	96.14	22.10	32.36	38.04	26.74	299.14	292.94	49.91	116.43	114.51
95th-Percentile Queue Length [veh/ln]	6.95	6.92	1.59	2.33	2.74	1.93	17.64	17.33	3.59	8.20	8.09
95th-Percentile Queue Length [ft/ln]	173.68	173.06	39.78	58.24	68.47	48.13	440.97	433.28	89.84	204.91	202.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.80	30.71	28.94	33.87	23.04	23.84	9.85	30.36	30.60	19.49	15.79	15.80
Movement LOS	C	C	C	C	C	C	A	C	C	B	B	B
d_A, Approach Delay [s/veh]	30.79			25.52			28.49			16.58		
Approach LOS	C			C			C			B		
d_I, Intersection Delay [s/veh]	24.78											
Intersection LOS	C											
Intersection V/C	0.602											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.317	2.480	2.929	2.780
Crosswalk LOS	B	B	C	C
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	622	622	889	1000
d_b, Bicycle Delay [s]	21.36	21.36	13.89	11.25
I_b,int, Bicycle LOS Score for Intersection	1.879	1.911	2.628	2.295
Bicycle LOS	A	A	B	B

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: Avalon BI - Sepulveda BI

Control Type:	Signalized	Delay (sec / veh):	66.0
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.681

Intersection Setup

Name	Northbound				Southbound				Eastbound			Westbound			
Approach	Northbound				Southbound				Eastbound			Westbound			
Lane Configuration	T T T				T T T				T T T			T T T			
Turning Movement	Left	Thru	Right	U-tu	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right	
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	
No. of Lanes in Entry Pocket	1	0	0	1	0	0	0	1	0	0	1	0	0	0	
Entry Pocket Length [ft]	100.00	100.00	100.00	290.0	100.0	100.0	100.0	185.00	100.00	100.00	285.0	100.0	100.0	100.0	
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Speed [mph]	30.00				30.00				30.00			30.00			
Grade [%]	0.00				0.00				0.00			0.00			
Curb Present	No				No				No			No			
Crosswalk	Yes				Yes				Yes			Yes			

Volumes

Name															
Base Volume Input [veh/h]	175	553	76	0	109	523	207	189	616	234	0	86	440	102	
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	
Growth Factor	1.0100	1.0100	1.0100	1.000	1.010	1.010	1.010	1.0100	1.0100	1.0100	1.000	1.010	1.010	1.010	
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Site-Generated Trips [veh/h]	0	6	0	6	0	0	0	43	0	0	24	6	45	0	
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Total Hourly Volume [veh/h]	177	565	77	6	110	528	209	234	622	236	24	93	489	103	
Peak Hour Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	
Other Adjustment Factor	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000	
Total 15-Minute Volume [veh/h]	44	141	19	2	28	132	52	59	156	59	6	23	122	26	
Total Analysis Volume [veh/h]	177	565	77	6	110	528	209	234	622	236	24	93	489	103	
Presence of On-Street Parking	No		No	No			No	No		No	No			No	
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
v_do, Outbound Pedestrian Volume crossing	0			0				0			0				
v_di, Inbound Pedestrian Volume crossing in	0			0				0			0				
v_co, Outbound Pedestrian Volume crossing	0			0				0			0				
v_ci, Inbound Pedestrian Volume crossing mi	0			0				0			0				
v_ab, Corner Pedestrian Volume [ped/h]	0			0				0			0				
Bicycle Volume [bicycles/h]	0			0				0			0				

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Permi	Prote	Permi	Permi	Protecte	Permiss	Permiss	Permi	Prote	Permi	Permi
Signal Group	1	6	0	0	5	2	0	3	8	0	0	7	4	0
Auxiliary Signal Groups														
Lead / Lag	Lead	-	-	-	Lead	-	-	Lead	-	-	-	Lead	-	-
Minimum Green [s]	5	10	0	0	5	10	0	5	10	0	0	5	10	0
Maximum Green [s]	30	30	0	0	30	30	0	30	30	0	0	30	30	0
Amber [s]	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	0	19	26	0	19	26	0	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	0	5	0	0	5	0	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	0	17	0	0	17	0	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No				No			No				No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No			No	No		No	No			No	No	
Maximum Recall	No	No			No	No		No	No			No	No	
Pedestrian Recall	No	No			No	No		No	No			No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.11	0.19	0.19	0.07	0.23	0.23	0.15	0.27	0.27	0.07	0.18	0.18
s, saturation flow rate [veh/h]	1603	1683	1613	1603	1683	1523	1603	1683	1527	1603	1683	1583
c, Capacity [veh/h]	267	411	394	267	411	372	267	411	373	267	411	387
d1, Uniform Delay [s]	35.13	31.90	31.91	33.69	33.35	33.37	36.59	34.00	34.00	33.71	31.36	31.39
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	12.24	14.74	15.36	5.07	31.57	33.93	30.70	71.70	74.32	5.15	11.35	12.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.66	0.80	0.80	0.43	0.94	0.94	0.88	1.09	1.09	0.44	0.74	0.74
d, Delay for Lane Group [s/veh]	47.37	46.64	47.26	38.76	64.92	67.29	67.29	105.70	108.32	38.86	42.71	43.57
Lane Group LOS	D	D	D	D	E	E	E	F	F	D	D	D
Critical Lane Group	Yes	No	No	No	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh/ln]	4.48	8.20	7.93	2.62	11.64	10.79	7.20	16.91	15.62	2.65	7.25	6.93
50th-Percentile Queue Length [ft/ln]	112.00	204.89	198.29	65.52	291.04	269.77	179.90	422.70	390.38	66.18	181.13	173.34
95th-Percentile Queue Length [veh/ln]	7.95	12.89	12.55	4.72	17.24	16.18	11.60	24.87	23.23	4.77	11.66	11.25
95th-Percentile Queue Length [ft/ln]	198.78	322.26	313.76	117.94	430.93	404.45	289.88	621.63	580.84	119.13	291.48	281.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.37	46.90	47.26	38.76	38.76	65.55	67.29	67.29	106.42	108.32	38.86	38.86	43.04	43.57
Movement LOS	D	D	D	D	D	E	E	E	F	F	D	D	D	D
d_A, Approach Delay [s/veh]	47.04			62.34				98.45			42.42			
Approach LOS	D			E				F			D			
d_I, Intersection Delay [s/veh]	66.02													
Intersection LOS	E													
Intersection V/C	0.681													

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0			9.0				9.0			9.0			
M_corner, Corner Circulation Area [ft ² /ped]	0.00			0.00				0.00			0.00			
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00			0.00				0.00			0.00			
d_p, Pedestrian Delay [s]	36.45			36.45				36.45			36.45			
I_p,int, Pedestrian LOS Score for Intersection	2.628			2.644				2.685			2.597			
Crosswalk LOS	B			B				B			B			
s_b, Saturation Flow Rate of the bicycle lane	2000			2000				2000			2000			
c_b, Capacity of the bicycle lane [bicycles/h]	489			489				489			489			
d_b, Bicycle Delay [s]	25.69			25.69				25.69			25.69			
I_b,int, Bicycle LOS Score for Intersection	2.235			2.173				2.461			2.068			
Bicycle LOS	B			B				B			B			

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 3: Wilmington Ave - Sepulveda BI

Control Type:	Signalized	Delay (sec / veh):	61.4
Analysis Method:	HCM 6th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.554

Intersection Setup

Name	Northbound			Southbound			Eastbound			Westbound		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration	T T T			T T T			T T T			T T T		
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	1	0	0	1	0	0	1	0	0	1	0	0
Entry Pocket Length [ft]	200.00	100.00	100.00	240.00	100.00	100.00	410.00	100.00	100.00	280.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name												
Base Volume Input [veh/h]	16	601	198	118	569	199	157	466	31	79	303	99
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Factor	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100	1.0100
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	0	0	0	0	3	3	2	14	0	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	31	607	200	119	575	204	162	473	45	80	308	100
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	8	152	50	30	144	51	41	118	11	20	77	25
Total Analysis Volume [veh/h]	31	607	200	119	575	204	162	473	45	80	308	100
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing		0			0			0			0	
v_di, Inbound Pedestrian Volume crossing in		0			0			0			0	
v_co, Outbound Pedestrian Volume crossing		0			0			0			0	
v_ci, Inbound Pedestrian Volume crossing mi		0			0			0			0	
v_ab, Corner Pedestrian Volume [ped/h]		0			0			0			0	
Bicycle Volume [bicycles/h]		0			0			0			0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	0.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	10	0	5	10	0	5	10	0	5	10	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	19	26	0	19	26	0	19	26	0	19	26	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	17	0	0	17	0	0	17	0	0	17	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk		No			No			No			No	
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

Pedestrian Signal Group	0
Pedestrian Walk [s]	0
Pedestrian Clearance [s]	0

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	C	L	C	C
C, Cycle Length [s]	90	90	90	90	90	90	90	90	90	90	90	90
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	22	22	15	22	22	15	22	22	15	22	22
g / C, Green / Cycle	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24	0.17	0.24	0.24
(v / s)_i Volume / Saturation Flow Rate	0.02	0.25	0.25	0.07	0.24	0.24	0.10	0.16	0.16	0.05	0.13	0.13
s, saturation flow rate [veh/h]	1603	1683	1542	1603	1683	1534	1603	1683	1632	1603	1683	1545
c, Capacity [veh/h]	267	411	377	267	411	375	267	411	399	267	411	378
d1, Uniform Delay [s]	31.87	34.00	34.00	33.76	33.89	33.90	34.76	30.44	30.45	32.89	29.36	29.45
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.88	50.32	52.76	5.30	42.02	44.23	9.84	7.39	7.66	2.85	4.50	5.10
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, 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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.12	1.02	1.02	0.45	0.99	0.99	0.61	0.64	0.64	0.30	0.51	0.52
d, Delay for Lane Group [s/veh]	32.75	84.32	86.76	39.06	75.91	78.13	44.60	37.83	38.11	35.75	33.86	34.55
Lane Group LOS	C	F	F	D	E	E	D	D	D	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.63	14.46	13.51	2.70	13.40	12.46	3.96	5.82	5.69	1.72	4.37	4.16
50th-Percentile Queue Length [ft/ln]	15.82	361.62	337.74	67.51	335.12	311.41	99.11	145.61	142.37	43.08	109.18	103.91
95th-Percentile Queue Length [veh/ln]	1.14	20.98	19.81	4.86	19.41	18.24	7.14	9.78	9.61	3.10	7.79	7.48
95th-Percentile Queue Length [ft/ln]	28.48	524.42	495.29	121.52	485.23	456.12	178.41	244.55	240.21	77.54	194.87	187.03

Movement, Approach, & Intersection Results

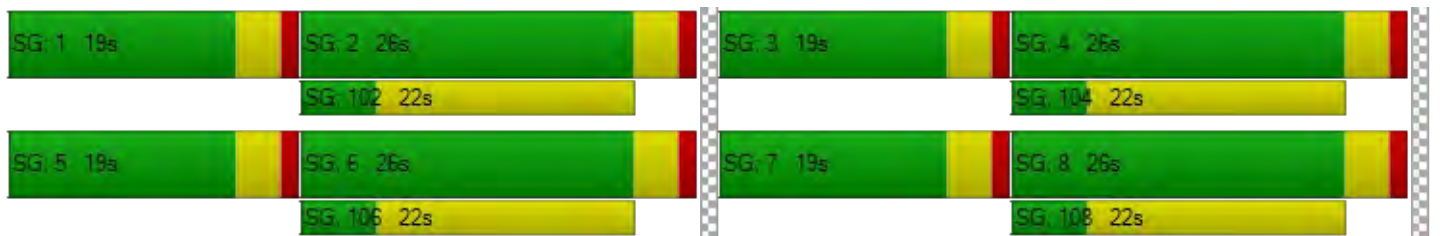
d_M, Delay for Movement [s/veh]	32.75	85.07	86.76	39.06	76.56	78.13	44.60	37.95	38.11	35.75	34.08	34.55
Movement LOS	C	F	F	D	E	E	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	83.54			71.95			39.55			34.45		
Approach LOS	F			E			D			C		
d_I, Intersection Delay [s/veh]	61.40											
Intersection LOS	E											
Intersection V/C	0.554											

Other Modes

g_Walk,mi, Effective Walk Time [s]	9.0	9.0	9.0	9.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	36.45	36.45	36.45	36.45
I_p,int, Pedestrian LOS Score for Intersection	2.601	2.646	2.540	2.551
Crosswalk LOS	B	B	B	B
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	489	489	489	489
d_b, Bicycle Delay [s]	25.69	25.69	25.69	25.69
I_b,int, Bicycle LOS Score for Intersection	2.251	2.300	2.121	1.962
Bicycle LOS	B	B	B	A

Sequence

Ring 1	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	5	6	7	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



APPENDIX F
Area Starbucks Drive-Thru Survey Results

DRIVE THRU SURVEY

LOCATION: Starbucks, 898 Sepulevard Blvd
 CITY: Los Angeles

DAY: Wednesday
 DATE: 4/5/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
6:00	3	1	0	4	4.0
6:05	2	0	0	2	2.0
6:10	2	1	0	3	3.0
6:15	1	0	0	1	1.0
6:20	3	2	0	5	5.0
6:25	4	1	0	5	5.0
6:30	4	2	1	7	7.0
6:35	4	1	0	5	5.0
6:40	2	1	0	3	3.0
6:45	0	2	0	2	2.0
6:50	2	0	0	2	2.0
6:55	2	2	1	5	5.0
7:00	1	2	3	6	6.0
7:05	1	1	0	2	2.0
7:10	1	0	0	1	1.0
7:15	0	1	0	1	1.0
7:20	2	2	0	4	4.0
7:25	2	2	1	5	5.0
7:30	4	1	0	5	5.0
7:35	2	2	0	4	4.0
7:40	3	0	0	3	3.0
7:45	2	1	0	3	3.0
7:50	1	1	0	2	2.0
7:55	1	1	0	2	2.0
8:00	1	2	1	4	4.0
8:05	2	2	2	6	6.0
8:10	4	2	2	8	8.0
8:15	4	1	0	5	5.0
8:20	3	1	0	4	4.0
8:25	0	1	0	1	1.0
8:30	2	2	0	4	4.0
8:35	4	1	0	5	5.0
8:40	2	2	0	4	4.0
8:45	3	0	0	3	3.0
8:50	3	1	0	4	4.0
8:55	1	0	0	1	1.0
9:00	1	1	0	2	2.0
9:05	2	2	0	4	4.0
9:10	4	1	0	5	5.0
9:15	2	0	0	2	2.0
9:20	2	1	0	3	3.0
9:25	2	1	0	3	3.0
9:30	1	2	0	3	3.0
9:35	1	0	0	1	1.0
9:40	1	2	1	4	4.0
9:45	4	2	0	6	6.0
9:50	4	2	1	7	7.0
9:55	4	1	0	5	5.0

95th Perc Avg	4.0	2.0	2.0	7.0
Average	2.2	1.2	0.3	3.7
Peak	4.0	2.0	3.0	8.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 898 Sepulevard Blvd
 CITY: Los Angeles

DAY: Tuesday
 DATE: 4/4/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
6:00	4	2	1	7	7.0
6:05	4	2	0	6	6.0
6:10	4	2	0	6	6.0
6:15	3	0	0	3	3.0
6:20	2	1	0	3	3.0
6:25	1	1	0	2	2.0
6:30	0	0	0	0	0.0
6:35	0	2	0	2	2.0
6:40	2	0	0	2	2.0
6:45	3	1	0	4	4.0
6:50	3	0	0	3	3.0
6:55	3	2	0	5	5.0
7:00	3	0	0	3	3.0
7:05	1	0	0	1	1.0
7:10	0	0	0	0	0.0
7:15	1	0	0	1	1.0
7:20	1	0	0	1	1.0
7:25	1	2	0	3	3.0
7:30	2	1	0	3	3.0
7:35	0	0	0	0	0.0
7:40	1	0	0	1	1.0
7:45	4	0	0	4	4.0
7:50	0	0	0	0	0.0
7:55	1	2	0	3	3.0
8:00	1	0	0	1	1.0
8:05	0	2	1	3	3.0
8:10	2	2	0	4	4.0
8:15	1	2	0	3	3.0
8:20	2	1	0	3	3.0
8:25	2	2	1	5	5.0
8:30	1	1	0	2	2.0
8:35	0	1	0	1	1.0
8:40	2	0	0	2	2.0
8:45	4	0	0	4	4.0
8:50	3	2	0	5	5.0
8:55	2	1	0	3	3.0
9:00	1	0	0	1	1.0
9:05	1	1	0	2	2.0
9:10	1	1	0	2	2.0
9:15	1	1	0	2	2.0
9:20	2	2	0	4	4.0
9:25	4	0	0	4	4.0
9:30	0	2	1	3	3.0
9:35	3	2	0	5	5.0
9:40	3	1	0	4	4.0
9:45	4	2	0	6	6.0
9:50	4	2	0	6	6.0
9:55	4	2	4	10	10.0

95th Perc Avg	4.0	2.0	1.0	6.6
Average	1.9	1.0	0.2	3.1
Peak	4.0	2.0	4.0	10.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 898 Sepulevard Blvd
 CITY: Los Angeles

DAY: Wednesday
 DATE: 4/5/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
15:00	2	1	0	3	3.0
15:05	0	0	0	0	0.0
15:10	0	0	0	0	0.0
15:15	1	0	0	1	1.0
15:20	2	1	0	3	3.0
15:25	2	2	0	4	4.0
15:30	2	0	0	2	2.0
15:35	2	1	0	3	3.0
15:40	3	2	0	5	5.0
15:45	3	1	0	4	4.0
15:50	1	0	0	1	1.0
15:55	0	0	0	0	0.0
16:00	3	1	0	4	4.0
16:05	0	0	0	0	0.0
16:10	0	1	0	1	1.0
16:15	1	1	0	2	2.0
16:20	3	0	0	3	3.0
16:25	3	1	0	4	4.0
16:30	1	0	0	1	1.0
16:35	2	1	0	3	3.0
16:40	2	0	0	2	2.0
16:45	3	0	0	3	3.0
16:50	2	0	0	2	2.0
16:55	3	0	0	3	3.0
17:00	0	0	0	0	0.0
17:05	1	1	0	2	2.0
17:10	3	2	1	6	6.0
17:15	2	0	0	2	2.0
17:20	1	0	0	1	1.0
17:25	2	1	0	3	3.0
17:30	2	1	0	3	3.0
17:35	1	1	0	2	2.0
17:40	0	1	0	1	1.0
17:45	0	2	0	2	2.0
17:50	3	1	0	4	4.0
17:55	4	2	1	7	7.0
18:00	3	2	2	7	7.0
18:05	2	0	0	2	2.0
18:10	1	0	0	1	1.0
18:15	0	2	0	2	2.0
18:20	3	0	0	3	3.0
18:25	0	0	0	0	0.0
18:30	2	2	0	4	4.0
18:35	2	2	0	4	4.0
18:40	4	1	0	5	5.0
18:45	3	2	0	5	5.0
18:50	3	2	1	6	6.0
18:55	4	2	0	6	6.0

95th Perc Avg	4.0	2.0	1.0	6.6
Average	1.8	0.8	0.1	2.8
Peak	4.0	2.0	2.0	7.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 898 Sepulevard Blvd
 CITY: Los Angeles

DAY: Tuesday
 DATE: 4/4/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
15:00	3	2	0	5	5.0
15:05	4	0	0	4	4.0
15:10	4	2	0	6	6.0
15:15	3	2	2	7	7.0
15:20	3	2	2	7	7.0
15:25	4	1	0	5	5.0
15:30	1	0	0	1	1.0
15:35	1	1	0	2	2.0
15:40	0	0	0	0	0.0
15:45	0	2	1	3	3.0
15:50	1	1	0	2	2.0
15:55	1	0	0	1	1.0
16:00	1	0	0	1	1.0
16:05	1	2	3	6	6.0
16:10	3	2	2	7	7.0
16:15	4	1	0	5	5.0
16:20	4	2	0	6	6.0
16:25	4	1	0	5	5.0
16:30	2	2	2	6	6.0
16:35	2	2	0	4	4.0
16:40	1	2	0	3	3.0
16:45	2	0	0	2	2.0
16:50	0	2	0	2	2.0
16:55	1	0	0	1	1.0
17:00	1	2	0	3	3.0
17:05	3	2	1	6	6.0
17:10	3	1	0	4	4.0
17:15	2	0	0	2	2.0
17:20	0	0	0	0	0.0
17:25	2	2	1	5	5.0
17:30	1	0	0	1	1.0
17:35	0	0	0	0	0.0
17:40	3	2	0	5	5.0
17:45	2	0	0	2	2.0
17:50	0	1	0	1	1.0
17:55	2	1	0	3	3.0
18:00	0	0	0	0	0.0
18:05	0	0	0	0	0.0
18:10	1	0	0	1	1.0
18:15	1	1	0	2	2.0
18:20	3	1	0	4	4.0
18:25	0	1	0	1	1.0
18:30	0	1	0	1	1.0
18:35	1	2	0	3	3.0
18:40	2	1	0	3	3.0
18:45	0	0	0	0	0.0
18:50	0	0	0	0	0.0
18:55	1	0	0	1	1.0

95th Perc Avg	4.0	2.0	2.0	7.0
Average	1.6	1.0	0.3	2.9
Peak	4.0	2.0	3.0	7.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 1832 E Carson Ave
 CITY: Carson

DAY: Tuesday
 DATE: 4/4/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
6:00	0	0	0	0	0.0
6:05	4	0	0	4	4.0
6:10	2	1	0	3	3.0
6:15	2	0	0	2	2.0
6:20	2	3	0	5	5.0
6:25	5	2	0	7	7.0
6:30	5	2	0	7	7.0
6:35	4	0	0	4	4.0
6:40	1	0	0	1	1.0
6:45	3	1	0	4	4.0
6:50	5	2	0	7	7.0
6:55	2	1	0	3	3.0
7:00	2	0	0	2	2.0
7:05	4	1	0	5	5.0
7:10	1	3	0	4	4.0
7:15	4	1	0	5	5.0
7:20	2	2	0	4	4.0
7:25	2	2	0	4	4.0
7:30	3	1	0	4	4.0
7:35	3	3	0	6	6.0
7:40	4	1	0	5	5.0
7:45	2	3	0	5	5.0
7:50	2	2	0	4	4.0
7:55	4	0	0	4	4.0
8:00	0	0	0	0	0.0
8:05	0	2	0	2	2.0
8:10	3	3	1	7	7.0
8:15	4	2	0	6	6.0
8:20	4	2	0	6	6.0
8:25	2	0	0	2	2.0
8:30	4	3	0	7	7.0
8:35	3	2	0	5	5.0
8:40	4	1	0	5	5.0
8:45	2	2	0	4	4.0
8:50	5	0	0	5	5.0
8:55	2	0	0	2	2.0
9:00	0	1	0	1	1.0
9:05	2	0	0	2	2.0
9:10	4	1	0	5	5.0
9:15	3	0	0	3	3.0
9:20	3	1	0	4	4.0
9:25	3	0	0	3	3.0
9:30	3	4	0	7	7.0
9:35	4	0	0	4	4.0
9:40	2	1	0	3	3.0
9:45	0	0	0	0	0.0
9:50	4	3	0	7	7.0
9:55	3	2	0	5	5.0

95th Perc Avg	5.0	3.0	0.0	7.0
Average	2.8	1.3	0.0	4.0
Peak	5.0	4.0	1.0	7.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 1832 E Carson Ave
 CITY: Carson

DAY: Wednesday
 DATE: 4/5/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
6:00	2	0	0	2	2.0
6:05	4	2	0	6	6.0
6:10	4	2	0	6	6.0
6:15	4	3	0	7	7.0
6:20	4	1	0	5	5.0
6:25	0	1	0	1	1.0
6:30	4	2	0	6	6.0
6:35	1	0	0	1	1.0
6:40	1	0	0	1	1.0
6:45	1	2	0	3	3.0
6:50	3	2	0	5	5.0
6:55	0	1	0	1	1.0
7:00	3	1	0	4	4.0
7:05	2	0	0	2	2.0
7:10	3	4	0	7	7.0
7:15	3	2	0	5	5.0
7:20	4	1	0	5	5.0
7:25	2	2	0	4	4.0
7:30	4	4	0	8	8.0
7:35	3	2	0	5	5.0
7:40	4	3	0	7	7.0
7:45	2	3	0	5	5.0
7:50	5	4	1	10	10.0
7:55	2	4	0	6	6.0
8:00	4	3	0	7	7.0
8:05	4	3	0	7	7.0
8:10	4	2	0	6	6.0
8:15	4	1	0	5	5.0
8:20	2	1	0	3	3.0
8:25	5	2	0	7	7.0
8:30	4	4	0	8	8.0
8:35	4	4	3	11	11.0
8:40	4	4	1	9	9.0
8:45	4	4	0	8	8.0
8:50	2	4	3	9	9.0
8:55	5	3	0	8	8.0
9:00	5	3	0	8	8.0
9:05	4	4	1	9	9.0
9:10	4	3	0	7	7.0
9:15	3	3	0	6	6.0
9:20	5	1	0	6	6.0
9:25	2	3	0	5	5.0
9:30	4	2	0	6	6.0
9:35	1	0	0	1	1.0
9:40	2	2	0	4	4.0
9:45	4	3	0	7	7.0
9:50	5	0	0	5	5.0
9:55	3	3	0	6	6.0

95th Perc Avg	5.0	4.0	2.1	9.6
Average	3.2	2.3	0.2	5.6
Peak	5.0	4.0	3.0	11.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 1832 E Carson Ave
 CITY: Carson

DAY: Tuesday
 DATE: 4/4/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
15:00	1	1	0	2	2.0
15:05	1	1	0	2	2.0
15:10	2	1	0	3	3.0
15:15	2	0	0	2	2.0
15:20	0	0	0	0	0.0
15:25	0	0	0	0	0.0
15:30	2	1	0	3	3.0
15:35	1	3	0	4	4.0
15:40	4	2	0	6	6.0
15:45	4	1	0	5	5.0
15:50	3	0	0	3	3.0
15:55	1	1	0	2	2.0
16:00	4	4	0	8	8.0
16:05	3	4	0	7	7.0
16:10	3	4	0	7	7.0
16:15	1	0	0	1	1.0
16:20	1	1	0	2	2.0
16:25	3	0	0	3	3.0
16:30	1	0	0	1	1.0
16:35	2	0	0	2	2.0
16:40	3	0	0	3	3.0
16:45	0	0	0	0	0.0
16:50	0	1	0	1	1.0
16:55	0	1	0	1	1.0
17:00	3	1	0	4	4.0
17:05	5	1	0	6	6.0
17:10	4	1	0	5	5.0
17:15	1	3	0	4	4.0
17:20	3	1	0	4	4.0
17:25	2	2	0	4	4.0
17:30	4	0	0	4	4.0
17:35	0	0	0	0	0.0
17:40	2	1	0	3	3.0
17:45	2	1	0	3	3.0
17:50	2	0	0	2	2.0
17:55	1	0	0	1	1.0
18:00	1	1	0	2	2.0
18:05	0	0	0	0	0.0
18:10	0	0	0	0	0.0
18:15	0	0	0	0	0.0
18:20	2	1	0	3	3.0
18:25	3	0	0	3	3.0
18:30	1	0	0	1	1.0
18:35	2	1	0	3	3.0
18:40	0	1	0	1	1.0
18:45	1	0	0	1	1.0
18:50	0	0	0	0	0.0
18:55	1	1	0	2	2.0

95th Perc Avg	4.0	4.0	0.0	7.0
Average	1.7	0.9	0.0	2.6
Peak	5.0	4.0	0.0	8.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 1832 E Carson Ave
 CITY: Carson

DAY: Wednesday
 DATE: 4/5/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combine d Queues
15:00	3	2	0	5	5.0
15:05	1	0	0	1	1.0
15:10	2	2	0	4	4.0
15:15	3	0	0	3	3.0
15:20	2	0	0	2	2.0
15:25	3	1	0	4	4.0
15:30	2	2	0	4	4.0
15:35	2	0	0	2	2.0
15:40	1	1	0	2	2.0
15:45	1	2	0	3	3.0
15:50	2	0	0	2	2.0
15:55	1	1	0	2	2.0
16:00	2	1	0	3	3.0
16:05	1	2	0	3	3.0
16:10	5	2	0	7	7.0
16:15	1	1	0	2	2.0
16:20	1	1	0	2	2.0
16:25	1	0	0	1	1.0
16:30	2	1	0	3	3.0
16:35	1	0	0	1	1.0
16:40	1	0	0	1	1.0
16:45	1	2	0	3	3.0
16:50	0	0	0	0	0.0
16:55	1	0	0	1	1.0
17:00	1	1	0	2	2.0
17:05	0	0	0	0	0.0
17:10	0	0	0	0	0.0
17:15	1	1	0	2	2.0
17:20	3	0	0	3	3.0
17:25	0	0	0	0	0.0
17:30	1	0	0	1	1.0
17:35	3	1	0	4	4.0
17:40	0	0	0	0	0.0
17:45	2	0	0	2	2.0
17:50	0	1	0	1	1.0
17:55	1	0	0	1	1.0
18:00	2	1	0	3	3.0
18:05	2	1	0	3	3.0
18:10	2	2	0	4	4.0
18:15	2	1	0	3	3.0
18:20	1	0	0	1	1.0
18:25	2	2	0	4	4.0
18:30	3	1	0	4	4.0
18:35	1	1	0	2	2.0
18:40	2	1	0	3	3.0
18:45	1	2	0	3	3.0
18:50	2	0	0	2	2.0
18:55	1	1	0	2	2.0

95th Perc Avg	3.0	2.0	0.0	4.6
Average	1.5	0.8	0.0	2.3
Peak	5.0	2.0	0.0	7.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 20810 Avalon Blvd
 CITY: Carson

DAY: Tuesday
 DATE: 4/4/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
6:00	1	0	0	1	1.0
6:05	1	0	0	1	1.0
6:10	1	1	0	2	2.0
6:15	0	2	0	2	2.0
6:20	0	0	0	0	0.0
6:25	1	0	0	1	1.0
6:30	2	1	0	3	3.0
6:35	0	1	0	1	1.0
6:40	0	0	0	0	0.0
6:45	3	2	0	5	5.0
6:50	2	0	0	2	2.0
6:55	3	0	0	3	3.0
7:00	0	0	0	0	0.0
7:05	1	2	0	3	3.0
7:10	3	2	0	5	5.0
7:15	3	2	0	5	5.0
7:20	2	0	0	2	2.0
7:25	2	0	0	2	2.0
7:30	2	1	0	3	3.0
7:35	2	1	0	3	3.0
7:40	2	1	0	3	3.0
7:45	2	3	0	5	5.0
7:50	4	2	0	6	6.0
7:55	2	0	0	2	2.0
8:00	1	1	0	2	2.0
8:05	3	3	0	6	6.0
8:10	2	3	0	5	5.0
8:15	1	1	0	2	2.0
8:20	0	0	0	0	0.0
8:25	1	3	0	4	4.0
8:30	1	2	0	3	3.0
8:35	2	1	0	3	3.0
8:40	0	1	0	1	1.0
8:45	2	0	0	2	2.0
8:50	2	2	1	5	5.0
8:55	2	3	1	6	6.0
9:00	3	2	1	6	6.0
9:05	2	1	0	3	3.0
9:10	0	0	0	0	0.0
9:15	3	1	0	4	4.0
9:20	1	2	0	3	3.0
9:25	2	1	0	3	3.0
9:30	1	0	0	1	1.0
9:35	0	1	0	1	1.0
9:40	2	1	0	3	3.0
9:45	3	2	0	5	5.0
9:50	3	3	0	6	6.0
9:55	3	3	2	8	8.0

95th Perc Avg	3.0	3.0	1.0	6.0
Average	1.6	1.2	0.1	3.0
Peak	4.0	3.0	2.0	8.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 20810 Avalon Blvd
 CITY: Carson

DAY: Wednesday
 DATE: 4/5/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
6:00	1	0	0	1	1.0
6:05	1	0	0	1	1.0
6:10	0	0	0	0	0.0
6:15	1	0	0	1	1.0
6:20	2	0	0	2	2.0
6:25	3	2	0	5	5.0
6:30	3	0	0	3	3.0
6:35	0	0	0	0	0.0
6:40	0	0	0	0	0.0
6:45	0	0	0	0	0.0
6:50	1	1	0	2	2.0
6:55	0	2	0	2	2.0
7:00	0	1	0	1	1.0
7:05	0	2	0	2	2.0
7:10	1	2	0	3	3.0
7:15	0	1	0	1	1.0
7:20	2	1	0	3	3.0
7:25	1	0	0	1	1.0
7:30	1	2	0	3	3.0
7:35	3	2	0	5	5.0
7:40	1	0	0	1	1.0
7:45	1	1	0	2	2.0
7:50	1	1	0	2	2.0
7:55	0	2	0	2	2.0
8:00	2	0	1	3	3.0
8:05	3	1	0	4	4.0
8:10	2	1	0	3	3.0
8:15	1	2	0	3	3.0
8:20	2	2	1	5	5.0
8:25	2	1	0	3	3.0
8:30	1	1	0	2	2.0
8:35	1	1	0	2	2.0
8:40	1	0	0	1	1.0
8:45	0	0	0	0	0.0
8:50	1	1	0	2	2.0
8:55	0	1	0	1	1.0
9:00	0	1	0	1	1.0
9:05	3	1	0	4	4.0
9:10	1	0	0	1	1.0
9:15	3	0	0	3	3.0
9:20	2	1	0	3	3.0
9:25	2	1	0	3	3.0
9:30	0	0	0	0	0.0
9:35	2	2	0	4	4.0
9:40	3	0	0	3	3.0
9:45	2	0	0	2	2.0
9:50	0	0	0	0	0.0
9:55	0	0	0	0	0.0

95th Perc Avg	3.0	2.0	0.5	5.0
Average	1.2	0.8	0.0	2.0
Peak	3.0	2.0	1.0	5.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 20810 Avalon Blvd
 CITY: Carson

DAY: Tuesday
 DATE: 4/4/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
15:00	3	2	0	5	5.0
15:05	3	3	0	6	6.0
15:10	2	3	3	8	8.0
15:15	2	3	0	5	5.0
15:20	3	2	2	7	7.0
15:25	2	1	0	3	3.0
15:30	0	2	0	2	2.0
15:35	3	3	0	6	6.0
15:40	3	2	0	5	5.0
15:45	2	2	0	4	4.0
15:50	3	2	0	5	5.0
15:55	2	0	0	2	2.0
16:00	3	0	0	3	3.0
16:05	0	0	0	0	0.0
16:10	0	0	0	0	0.0
16:15	0	0	0	0	0.0
16:20	0	1	0	1	1.0
16:25	3	0	0	3	3.0
16:30	0	1	0	1	1.0
16:35	2	0	0	2	2.0
16:40	1	1	0	2	2.0
16:45	0	1	0	1	1.0
16:50	3	1	0	4	4.0
16:55	2	0	0	2	2.0
17:00	1	1	0	2	2.0
17:05	0	0	0	0	0.0
17:10	0	2	0	2	2.0
17:15	2	2	0	4	4.0
17:20	0	2	0	2	2.0
17:25	1	0	0	1	1.0
17:30	1	1	0	2	2.0
17:35	1	2	0	3	3.0
17:40	0	0	0	0	0.0
17:45	0	0	0	0	0.0
17:50	0	3	0	3	3.0
17:55	3	0	0	3	3.0
18:00	0	0	0	0	0.0
18:05	1	0	0	1	1.0
18:10	1	0	0	1	1.0
18:15	1	0	0	1	1.0
18:20	1	1	0	2	2.0
18:25	1	1	0	2	2.0
18:30	1	1	0	2	2.0
18:35	0	1	0	1	1.0
18:40	1	0	0	1	1.0
18:45	2	2	0	4	4.0
18:50	3	0	0	3	3.0
18:55	3	0	0	3	3.0

95th Perc Avg	3.0	3.0	1.1	6.6
Average	1.4	1.0	0.1	2.5
Peak	3.0	3.0	3.0	8.0

DRIVE THRU SURVEY

LOCATION: Starbucks, 20810 Avalon Blvd
 CITY: Carson

DAY: Wednesday
 DATE: 4/5/2023

TIME	PickUp Window To Order Board	Order Board to DT Entrance	DT Entrance into Street	TOTAL	Combined Queues
15:00	1	0	0	1	1.0
15:05	2	0	0	2	2.0
15:10	1	1	0	2	2.0
15:15	2	0	0	2	2.0
15:20	0	0	0	0	0.0
15:25	0	0	0	0	0.0
15:30	1	0	0	1	1.0
15:35	1	0	0	1	1.0
15:40	3	1	0	4	4.0
15:45	3	1	0	4	4.0
15:50	0	2	0	2	2.0
15:55	1	1	0	2	2.0
16:00	3	0	0	3	3.0
16:05	1	0	0	1	1.0
16:10	0	0	0	0	0.0
16:15	3	0	0	3	3.0
16:20	3	1	0	4	4.0
16:25	1	0	0	1	1.0
16:30	1	0	0	1	1.0
16:35	1	1	0	2	2.0
16:40	2	0	0	2	2.0
16:45	1	0	0	1	1.0
16:50	3	1	0	4	4.0
16:55	3	2	0	5	5.0
17:00	3	3	0	6	6.0
17:05	4	2	0	6	6.0
17:10	2	1	0	3	3.0
17:15	2	0	0	2	2.0
17:20	1	0	0	1	1.0
17:25	0	0	0	0	0.0
17:30	1	1	0	2	2.0
17:35	2	0	0	2	2.0
17:40	3	0	0	3	3.0
17:45	2	0	0	2	2.0
17:50	2	2	0	4	4.0
17:55	1	0	0	1	1.0
18:00	1	0	0	1	1.0
18:05	0	0	0	0	0.0
18:10	1	0	0	1	1.0
18:15	1	0	0	1	1.0
18:20	2	0	0	2	2.0
18:25	0	0	0	0	0.0
18:30	2	0	0	2	2.0
18:35	0	0	0	0	0.0
18:40	0	0	0	0	0.0
18:45	1	2	0	3	3.0
18:50	3	0	0	3	3.0
18:55	0	1	0	1	1.0

95th Perc Avg	3.0	2.0	0.0	5.6
Average	1.5	0.5	0.0	2.0
Peak	4.0	3.0	0.0	6.0

APPENDIX G
Car Wash Queuing Data



1380 Lead Hill Blvd. Suite 260
 Roseville, CA 95661
www.dontdrivedirty.com

April 4, 2023

Regarding: #46-276 Quick Quack Car Wash located at 23820 Avalon in Carson, CA.

To: Carson PLANNING

The information below is from two comparable locations:

Hours	SUN	MON	TUE	WED	THU	FRI	SAT	Highest Count in the hour
7 AM	41	37	48	34	35	40	45	48
8 AM	98	64	66	60	71	73	97	97
9 AM	77	64	87	64	53	105	95	77
10 AM	105	78	101	108	103	96	100	105
11 AM	111	82	106	99	102	75	94	111
12 PM	99	85	96	70	77	100	101	101
1 PM	94	101	106	98	84	92	105	92
2 PM	98	88	92	81	75	87	103	103
3 PM	99	80	95	103	75	105	103	105
4 PM	96	87	93	95	90	99	82	96
5 PM	95	86	99	84	95	97	86	97
6 PM	91	102	103	86	81	84	80	103
7 PM	60	95	74	82	71	83	68	95
8 PM	42	63	51	38	46	34	45	63
Total	111	88	103	103	95	105	103	105

Comparable Location to Avalon/Sepulveda - 2702 San Lorenzo
 Timeframe: November 2022 - Actual max hour for each hour of all 30 days

The speed of the conveyor is determined by the quality of the wash. The conveyor speed at all times allows 155 cars per hour, but there are some minor adjustments based on quality of wash factors. This means that if all conditions are perfect, there are no hold ups at the point of sale, the prepper is efficiently prepping and loading cars, and the stacking is such that we have enough people in line, that we could wash up to 155 cars in an hour.

If you have any further questions or concerns please reach out to me.

Sincerely,

Erika G. Hernandez
 Pre-Construction Manager
 Quick Quack Car Wash
 (c): 818.398.5179

erhernandez@dontdrivedirty.com
www.dontdrivedirty.com

MMs

M/M/s

Arrival rate	111
Service rate	150
Number of servers	1

Assumes Poisson process for arrivals and services.

U	Utilization	74.00%
	$P(0)$, probability that the system is empty	0.2600
li	L_q , expected queue length	2.1062
I	L , expected number in system	2.8462
Ti	W_q , expected time in queue	0.0190
T	W , expected total time in system	0.0256
	Probability that a customer waits	0.7400

