



HEXAGON TRANSPORTATION CONSULTANTS, INC.



Atherton Housing Element Update

Transportation Analysis

Prepared for:

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Table of Contents

Executive Summary.....	i
1. Introduction.....	1
2. Existing Transportation Conditions.....	9
3. Trip Generation Estimates.....	15
4. CEQA Transportation Analysis.....	17
5. Local Transportation Analysis.....	22

Appendices

Appendix A VMT Analysis
Appendix B Traffic Counts
Appendix C Traffic Volumes
Appendix D Level of Service Calculations
Appendix E Signal Warrants

List of Tables

Table 1 HEU Site Inventory.....	1
Table 2 Signalized Intersection Level of Service Definitions Based on Control Delay.....	7
Table 3 Unsignalized Intersection Level of Service Definitions Based on Control Delay.....	7
Table 4 Existing Transit Facilities.....	13
Table 5 Project Trip Generation Estimates.....	16
Table 6 Intersection Level of Service Summary.....	34

List of Figures

Figure 1 Location of Proposed Multifamily Housing Sites.....	3
Figure 2 Study Intersections.....	5
Figure 3 Roadway Classifications.....	10
Figure 4 Existing Bicycle Facilities.....	12
Figure 5 Existing Transit Services.....	14
Figure 6 Multifamily Housing Trip Distribution.....	23
Figure 7 Multifamily Housing Trip Assignment.....	24
Figure 8 Existing Lane Configurations.....	26
Figure 9 Existing Traffic Volumes.....	27
Figure 10 Existing Plus Project Traffic Volumes.....	28
Figure 11 Cumulative Traffic Volumes.....	29
Figure 12 Cumulative Plus Project Traffic Volumes.....	30

Executive Summary

This report presents the results of the transportation analysis (TA) conducted for the proposed Atherton Housing Element Update (HEU) project. The HEU would result in an increase in 629 residential units within the Town of Atherton. This includes 126 multifamily units at 1000 El Camino Real, 45 multifamily units at 50 Valparaiso Avenue, 20 multifamily units at 150 Valparaiso Avenue, 16 multifamily units at 23 Oakwood Boulevard, 85 multi-family units at opportunity sites, 280 accessory dwelling units, 48 projected Senate Bill (SB 9) lot splits, and 9 vacant sites.

The potential impacts of the HEU were evaluated in accordance with the standards and methodologies set forth by the Town of Atherton.

Project Trip Generation

It is estimated that the proposed HEU would generate 4,594 new daily trips, including 319 net new trips (79 net new inbound and 270 net new outbound) during the AM peak hour and 424 net new trips (266 net new inbound and 158 net new outbound) during the PM peak hour.

CEQA Transportation Analysis

Vehicle Miles Traveled (VMT) Impact

Screened Projects

Per the OPR VMT screening criteria, the following projects can be screened from further VMT analysis:

Small Projects

The following projects are individually small and are expected to generate less than 110 daily trips (see Table 5). Therefore, their VMT impact would be less than significant as defined by OPR:

- ADUs, SB 9 units, Vacant Sites – 337 units
- 23 Oakwood Boulevard – 16 units
- 150 Valparaiso Avenue – 20 units
- Gilmore House – 9 units
- Circus Club – 5 units
- CA Water Service – 3 units

Projects Near Transit

The proposed multifamily developments at 1000 El Camino Real and 50 Valparaiso Avenue are located adjacent to El Camino Real, which is considered to be a high-quality transit corridor. In the vicinity of the project sites, SamTrans bus route ECR provides fixed route bus service with 15-minute headways during peak commute hours. Per OPR guidelines, project sites located within ½ mile walkshed of a high-quality transit corridor can be assumed to have a less than significant VMT impact.

Projects in Low VMT Areas

Per the C/CAG VMT Estimation Tool, the proposed project at 175, 185, and 197 Ravenswood Avenue is located in a low VMT area i.e. the VMT per resident for those parcels is 7.7 VMT per resident and 10.4 VMT per resident, which is less than the Bay Area regional threshold of 12.4 daily VMT per resident (see Appendix A). Therefore, this project can be assumed to have a less than significant VMT impact.

Projects Not Screened

The project proposed at 999 Ringwood Avenue, 352, 318, and 296 Bay Road is located in an area where the existing VMT is 13.0 daily VMT per resident, which is above the established threshold of 12.4 daily VMT per resident and is referred to as being in a “high-VMT area” (see Appendix A).

VMT Mitigation

Projects in high-VMT areas are required to include a set of VMT reduction measures that would reduce the project VMT to the greatest extent possible. The C/CAG VMT Estimation Tool evaluates a list of selected VMT reduction measures that can be applied to a project to reduce the project VMT. There are four strategy tiers whose effects on VMT can be calculated with the VMT estimation tool:

1. Tier 1: Project characteristics (e.g. density, diversity of uses, design, and affordability of housing) that encourage walking, biking and transit uses;
2. Tier 2: Multimodal infrastructure improvements that increase accessibility for transit users, bicyclists, and pedestrians. These improvements include:
 - Increase bike access
 - Improve connectivity by increasing intersection density
 - Increase transit accessibility
 - Traffic calming measures beyond the project frontage
 - Pedestrian network improvements beyond the project frontage
3. Tier 3: Parking measures that discourage personal motorized vehicle-trips. These improvements include:
 - Limit parking supply
 - Provide bike facilities
4. Tier 4: Transportation demand management (TDM) measures that provide incentives and services to encourage alternatives to personal motorized vehicle-trips. These measures for residential developments include:
 - School pool programs
 - Bike share programs
 - Car share programs
 - Subsidized transit program
 - Unbundle parking costs from property costs
 - Voluntary travel behavior change program

The first three strategies – land use characteristics, multimodal network improvements, and parking – are physical design strategies that can be incorporated into the project design. TDM includes

programmatic measures that aim to reduce VMT by decreasing personal motorized vehicle mode share and by encouraging more walking, biking, and riding transit. TDM measures should be enforced through annual trip monitoring to assess the project's status in meeting the VMT reduction goals. The project could implement Tier 1-4 mitigation measures and reduce its impact to less than significant.

Local Transportation Analysis

Intersection Traffic Operations

Intersection levels of service were evaluated against the standards of the Town of Atherton. The results of the analysis show that all signalized study intersections are operating at acceptable levels of service during the AM and PM peak hours of traffic under existing conditions. Under cumulative conditions, most study intersections would continue to operate at an acceptable level of service. The intersection of Ravenswood Avenue and Middlefield Road would operate at an unacceptable LOS E during both peak hours under cumulative conditions.

The results of the analysis show that the added project trips would not cause an adverse operational effect, as defined by Atherton, at any of the signalized study intersections.

Proposed improvements at the four unsignalized study intersections are described below:

El Camino Real & Selby Lane Intersection

Selby Lane at El Camino Real is estimated to experience long delays equivalent to LOS F under all study scenarios. The peak-hour volume signal warrant analysis indicates that peak-hour volumes at the intersection would meet the peak-hour volume warrant under all scenarios, both with and without the project traffic.

Improvement:

It is recommended that a traffic signal be installed at the intersection. With the addition of a traffic signal, the intersection would be expected to operate at an acceptable LOS B under all scenarios.

Alameda de las Pulgas & Atherton Avenue Intersection

The Alameda de las Pulgas & Atherton Avenue intersection would operate with high delays equivalent to LOS E during the PM peak hour under cumulative plus project conditions.

The peak-hour volume signal warrant analysis indicates that peak-hour volumes at the intersection would not meet the peak-hour volume warrant during the PM peak hour under the cumulative plus project scenario, with or without the project traffic. Therefore, signalization is not recommended at this intersection.

Improvement:

A single lane roundabout is recommended at this intersection. The intersection appears big enough to accommodate a roundabout within the right of way, but the feasibility of the roundabout would require further design work. With the addition of a roundabout, the intersection would operate at an acceptable LOS B or better during both peak hours.

El Camino Real & Alejandra Avenue Intersection

During the AM peak hour, Alejandra Avenue at El Camino Real is estimated to experience long delays equivalent to LOS E under all study scenarios. The added project trips would increase the delay for this approach. The peak-hour volume signal warrant analysis indicates that peak-hour volumes at the intersection would not meet the peak-hour volume warrant under any scenario, with or without the

project traffic, therefore signalization is not recommended. There are no other feasible improvements at this intersection.

Bay Road & Ringwood Avenue/Sonoma Avenue Intersection

The Bay Road & Ringwood Avenue/Sonoma Avenue intersection would operate with high delays equivalent to LOS E during the AM peak hour under cumulative and cumulative plus project conditions.

The peak-hour volume signal warrant analysis indicates that peak-hour volumes at the intersection would meet the peak-hour volume warrant under all scenarios, both with and without the project traffic, during the AM peak hour.

Menlo Park's Traffic Impact Fee (TIF) lists the following improvements for this intersection:

- Convert the east legs of Sonoma Avenue and Ringwood Avenue to one-way couplets with Ringwood Avenue serving eastbound traffic and Sonoma Avenue serving westbound traffic.
- Add left-turn lanes, as deemed necessary during the design phase, on eastbound Ringwood Avenue and northbound Bay Road. This would require full use of public right-of-way and the removal of existing landscaping and the relocation of existing utilities.
- Install a traffic signal.

Improvement:

With the addition of a traffic signal, the intersection would be expected to operate at an acceptable LOS A during the AM peak hour. Installation of improvements as identified in Menlo Park's TIF is recommended.

1. Introduction

This report presents the results of the transportation analysis (TA) conducted for the proposed CEQA clearance document analyzing the Housing Element Update (HEU) for the Town of Atherton, California. The HEU would result in an increase in 629 residential units within the Town of Atherton. Figure 1 shows the location of the proposed multifamily housing sites in the Town. Table 1 shows the breakdown of the projected increase in units.

Table 1
HEU Site Inventory

Site Inventory	Projected Units
1000 El Camino Real	126
50 Valparaiso Ave	45
150 Valparaiso Ave	20
23 Oakwood Blvd	16
Multi-Family Residential Opportunity Sites	
999 Ringwood Ave, 352, 318, and 296 Bay Rd	36
175, 185, and 197 Ravenswood Ave	32
Gilmore House	9
Circus Club	5
CA Water Service	3
Accessory Dwelling Units (ADUs)	280
Projected Senate Bill (SB) 9 Lot Splits	48
Vacant Sites	9
Total Projected Units	629

Scope of Study

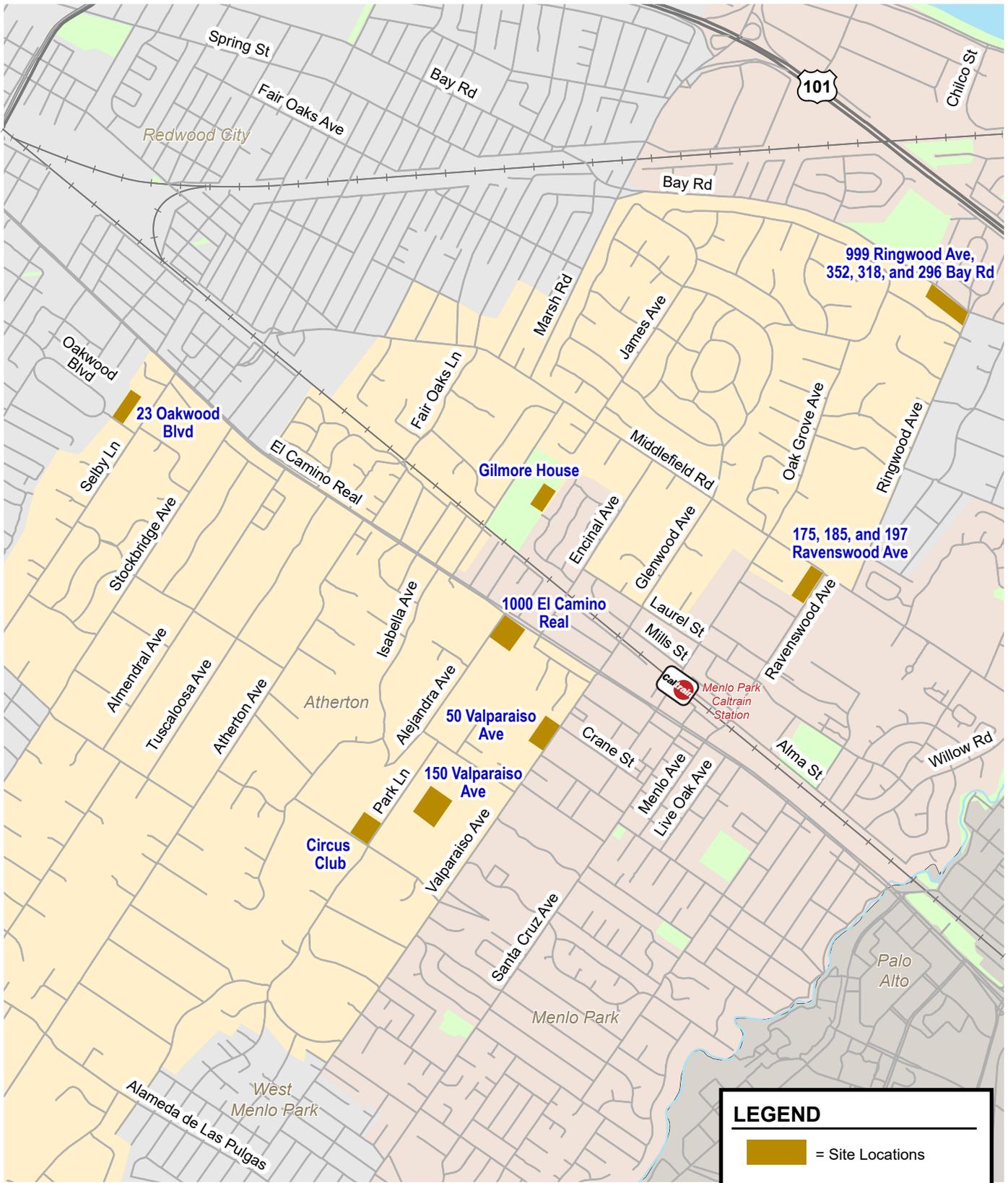
The purpose of the study is to identify potential transportation impacts related to the proposed HEU. Per California Senate Bill 743 (SB 743) and CEQA Guidelines, the study includes a vehicle miles traveled (VMT) analysis. The study also includes a local transportation analysis that evaluates potential

transportation effects of the HEU in accordance with the standards and methodologies set forth by the Town of Atherton.

CEQA VMT Analysis

In accordance with Senate Bill (SB) 743, an analysis of the proposed increase in housing's potential impacts on VMT was conducted as part of the environmental analysis for the project. The Town of Atherton has not formally adopted a VMT policy, therefore, the VMT thresholds for this project were based on the Governor's Office of Planning and Research (OPR)'s recommendations.

Consistent with OPR guidelines, 85 percent of the existing regional average daily VMT per resident was assumed as the VMT threshold of significance. Average VMT per resident for the project parcels was reported from the City/County Association of Governments (C/CAG) of San Mateo County VMT Estimation Tool, and the project average VMT per resident was compared to the Bay Area regional average.



NOTE: California Water Services, ADU, SB 9, and vacant sites are not shown on the map.

Figure 1
Location of Proposed Multifamily Housing Sites

Local Transportation Analysis (LTA)

The LTA supplements the VMT analysis by identifying potential adverse traffic operational effects of the proposed housing sites that may arise due to the new development. This includes operations at key intersections providing access to and through the study area.

The intersection operations analysis is based on the AM (7:00 AM and 9:00 AM) and PM (4:00 PM and 6:00 PM) peak-hour level of service for five signalized intersections and four unsignalized intersections in the vicinity of the HEU sites as illustrated in Figure 2. The following intersections were identified for analysis:

1. El Camino Real and Selby Lane (unsignalized)
2. Alameda de las Pulgas and Atherton Avenue (unsignalized)
3. El Camino Real and Atherton Avenue/Fair Oaks Lane
4. Middlefield Road and Marsh Road
5. El Camino Real and Alejandra Avenue (unsignalized)
6. El Camino Real and Encinal Avenue
7. El Camino Real and Valparaiso Avenue/Glenwood Avenue
8. Middlefield Road and Ravenswood Avenue
9. Bay Road and Ringwood Avenue/Sonoma Avenue (unsignalized)

Traffic conditions were evaluated for the following scenarios:

- **Existing Conditions.** Existing traffic volumes at the study intersections were based on new traffic counts conducted in 2023 and counts collected in 2022 for other traffic studies in the area (see Appendix B).
- **Existing Plus Project Conditions.** Existing plus project traffic volumes were estimated by adding to existing traffic volumes the additional traffic generated by the proposed new development. Existing plus project conditions were evaluated relative to existing conditions to determine potential adverse project effects.
- **Cumulative Conditions.** The cumulative scenario assumed a year 2031 horizon, which represents the Regional Housing Needs Assessment (RHNA) planning cycle. The cumulative conditions traffic volumes were determined using forecasts from the Countywide transportation demand model.
- **Cumulative Plus Project Conditions.** Cumulative plus project traffic volumes were estimated by adding to cumulative traffic volumes the additional traffic generated by the project. Cumulative plus project conditions were evaluated relative to cumulative conditions to determine potential adverse project effects.

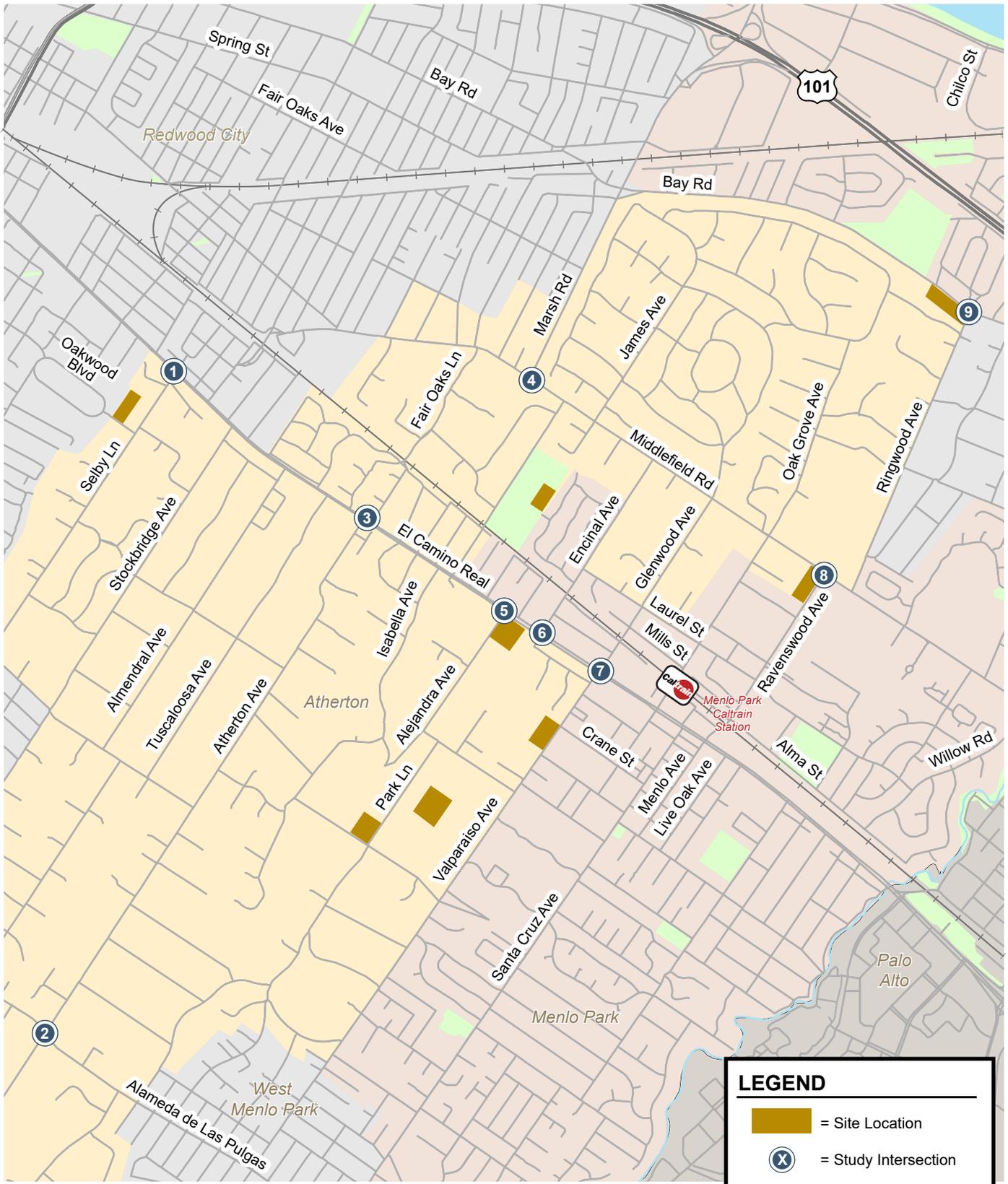


Figure 2
Study Intersections

Intersection Operations Analysis Methodology

This section presents the methods used to determine the traffic conditions at the study intersections and the potential adverse operational effects due to the project. It includes descriptions of the data requirements, the analysis methodologies, the applicable intersection level of service standards, and the criteria used to determine adverse effects on intersection operations.

Data Requirements

The data required for the analysis were obtained from previous traffic studies, new traffic counts, the Town of Atherton, the City of Menlo Park, and Google Earth. The following data were collected from these sources:

- Existing traffic volumes
- Lane configurations
- Signal timing and phasing

Level of Service Analysis Methodology and Standards

Traffic conditions at the study intersections were evaluated using level of service (LOS). *Level of Service* is a qualitative description of operating conditions ranging from LOS A, or free-flow conditions with little or no delay, to LOS F, or jammed conditions with excessive delays. The analysis methods are described below.

Signalized Intersections

The Town of Atherton utilizes SYNCHRO software and the *Highway Capacity Manual (HCM), 2000 Edition* methodology to evaluate intersection operations. The HCM method evaluates signalized intersection operations on the basis of average control delay time for all vehicles at the intersection. Control delay is the amount of delay that is attributed to the particular traffic control device at the intersection, and includes initial deceleration delay, queue move-up time, stopped delay, and final acceleration delay. The correlation between average delay and level of service is shown in Table 2.

There are four study intersections shared between Atherton and Menlo Park. Menlo Park utilizes Vistro software and *Highway Capacity Manual (HCM), 7th Edition*. In order to be consistent with traffic studies conducted in Menlo Park, these four study intersections were analyzed using Menlo Park's methodology.

Level of Service Standard

In the Town of Atherton, the level of service standard for highways is LOS E, for minor arterials and collectors is LOS D, and for local streets is LOS C.

Unsignalized Intersections

The study includes the analysis of four unsignalized intersections. Level of service analysis at unsignalized intersections is generally used to determine the need for modification in the type of intersection control (i.e., all-way stop or signalization). Atherton does not have an adopted level of service standard for unsignalized intersections. As part of the evaluation, traffic volumes, delays and traffic signal warrants are evaluated to determine if the existing intersection control is appropriate. The unsignalized study intersections were analyzed on the basis of the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B) described in the California Manual on Uniform Traffic Control Devices (MUTCD), 2014 Edition.

For unsignalized intersections, level of service depends on the average delay experienced by vehicles on the stop-controlled approaches. Thus, for all-way stop controlled intersections, level of service is determined by the average delay for all movements through the intersection. For side street stop-controlled intersections (two-way or T-intersections), operations are defined by the average control delay experienced by vehicles entering the intersection from the stop-controlled approaches on minor streets or from left-turn approaches on major streets. For two-way or T-intersections, the level of service is reported based on the delay for the worst movement. The level of service definitions for unsignalized intersections is shown in Table 3.

Table 2
Signalized Intersection Level of Service Definitions Based on Control Delay

Level of Service	Description	Average Control Delay Per Vehicle (sec.)
A	Operations with very low delay occurring with favorable progression and/or short cycle lengths.	up to 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	10.1 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or high V/C ratios. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high V/C ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, poor progression, or very long cycle lengths.	Greater than 80.0

Source: Transportation Research Board, *2000 Highway Capacity Manual*, (Washington, D.C., 2000).

Table 3
Unsignalized Intersection Level of Service Definitions Based on Control Delay

Level of Service	Level of Service	Average Delay Per Vehicle (Sec.)
A	Little or no traffic delay	10.0 or less
B	Short traffic delays	10.1 to 15.0
C	Average traffic delays	15.1 to 25.0
D	Long traffic delays	25.1 to 35.0
E	Very long traffic delays	35.1 to 50.0
F	Extreme traffic delays	greater than 50.0

Source: Transportation Research Board, *2000 Highway Capacity Manual* (Washington, D.C., 2000) p17-2.

Adverse Operational Effects on Intersections

For this analysis, the criteria used to determine an adverse effect on signalized intersections are based on the Town of Atherton's Level of Service standards. The Town's General Plan specifies that a project is considered to have a potentially adverse traffic impact if the addition of project traffic causes:

- Threshold "I" – An intersection on minor arterial streets or local approaches to State-controlled signalized intersections operating at LOS A through D to operate at an unacceptable level (LOS E or F) or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first.
- Threshold "II" - An increase of more than 4 seconds to average delay to vehicles on all critical movements for intersections on minor arterial streets operating at LOS E or F.
- Threshold "III" - An increase of more than 4 seconds to average delay to vehicles on the most critical movements for intersections on local approaches to State-controlled intersections operating at LOS E or F.
- Threshold "IV" - An intersection on collector streets operating at LOS A through C to operate at an unacceptable level (LOS D, E or F) or have an increase of 23 seconds or greater in average vehicle delay, whichever comes first.
- Threshold "V" - An increase of more than 4 seconds to average delay to vehicles on all critical movements for intersections on collector streets operating at LOS D, E or F.

Atherton has not adopted an adverse effect criterion for unsignalized intersections. For the purpose of this analysis, potential improvements are discussed at an unsignalized intersection if it operates at LOS E or LOS F and meets the signal warrant under project conditions.

Report Organization

This report has a total of five chapters. Chapter 2 describes existing transportation conditions including the existing roadway network, transit service, and bicycle and pedestrian facilities. Chapter 3 describes the methods used to estimate project-generated traffic. Chapter 4 describes the CEQA transportation analysis, including the project VMT impact analysis. Chapter 5 describes the local transportation analysis including operations of study intersections and the project's effects on the study intersections.

2. Existing Transportation Conditions

This chapter describes the existing conditions of the transportation system within Atherton. It describes the roadway network, transit service, and pedestrian and bicycle facilities. The analysis of existing intersection operations is included as part of the local transportation analysis (see Chapter 4).

Existing Roadway Network

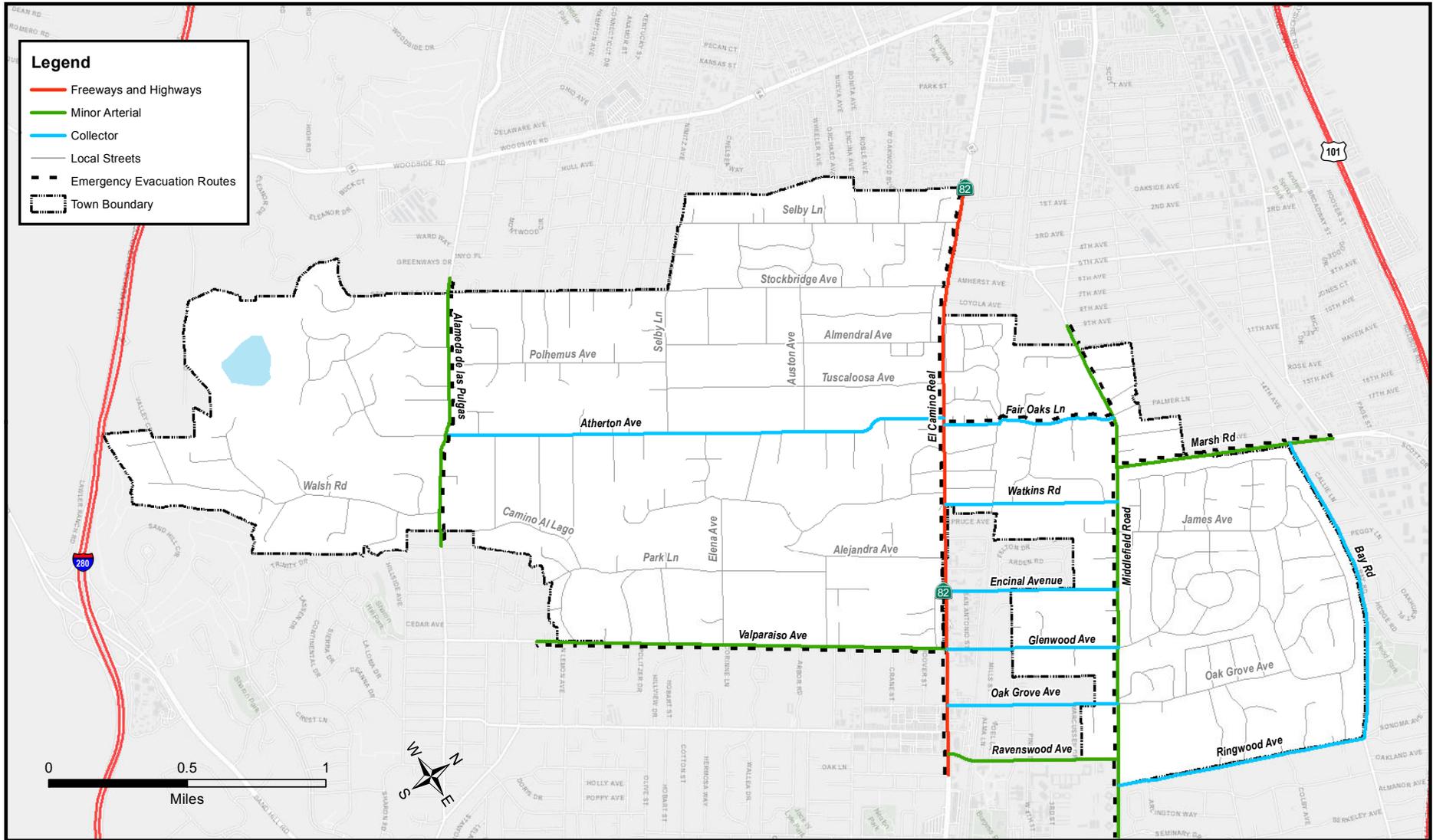
Regional and local roadways serving the Town of Atherton where housing is proposed in the HEU are described below.

Regional Access

The Town of Atherton contains no freeways; however, the Junipero Serra Freeway (Interstate 280) abuts the western edge of the incorporated Town limits. The single highway through the Town is El Camino Real (State Route 82) which provides for through traffic.

Local Access

Local access in the Town is provided by minor arterials and collectors. These streets provide access to the HEU sites. The roadway network serving Atherton, including classifications from the General Plan, is shown in Figure 3.



Source: Atherton General Plan Update - Circulation Element, December 2018

Figure 3
Roadway Classification

Existing Pedestrian and Bicycle Facilities

Bicycle Facilities

Bicycle facilities in Atherton include bike lanes and bike routes. Bike lanes (Class II facilities) are lanes on roadways designated for use by bicycles with special lane markings, pavement legends, and signage. Bike routes (Class III facilities) are roadways shared between bicycles and vehicles. Bike routes are often designated for use by bicycles with “sharrow” pavement markings and signage. The existing bicycle facilities within the study area are described below and are shown on Figure 4.

Striped bike lanes (Class II bikeway) are present along the following roadways in the Town:

- Selby Lane between Oakwood Boulevard and El Camino Real
- Alameda de las Pulgas between City Limits
- Valparaiso Avenue between City Limits
- Middlefield Road between City Limits
- Encinal Avenue between Garwood Way and Middlefield Road
- Laurel Street between City Limits
- Ringwood Avenue between City Limits
- Bay Road between City Limits

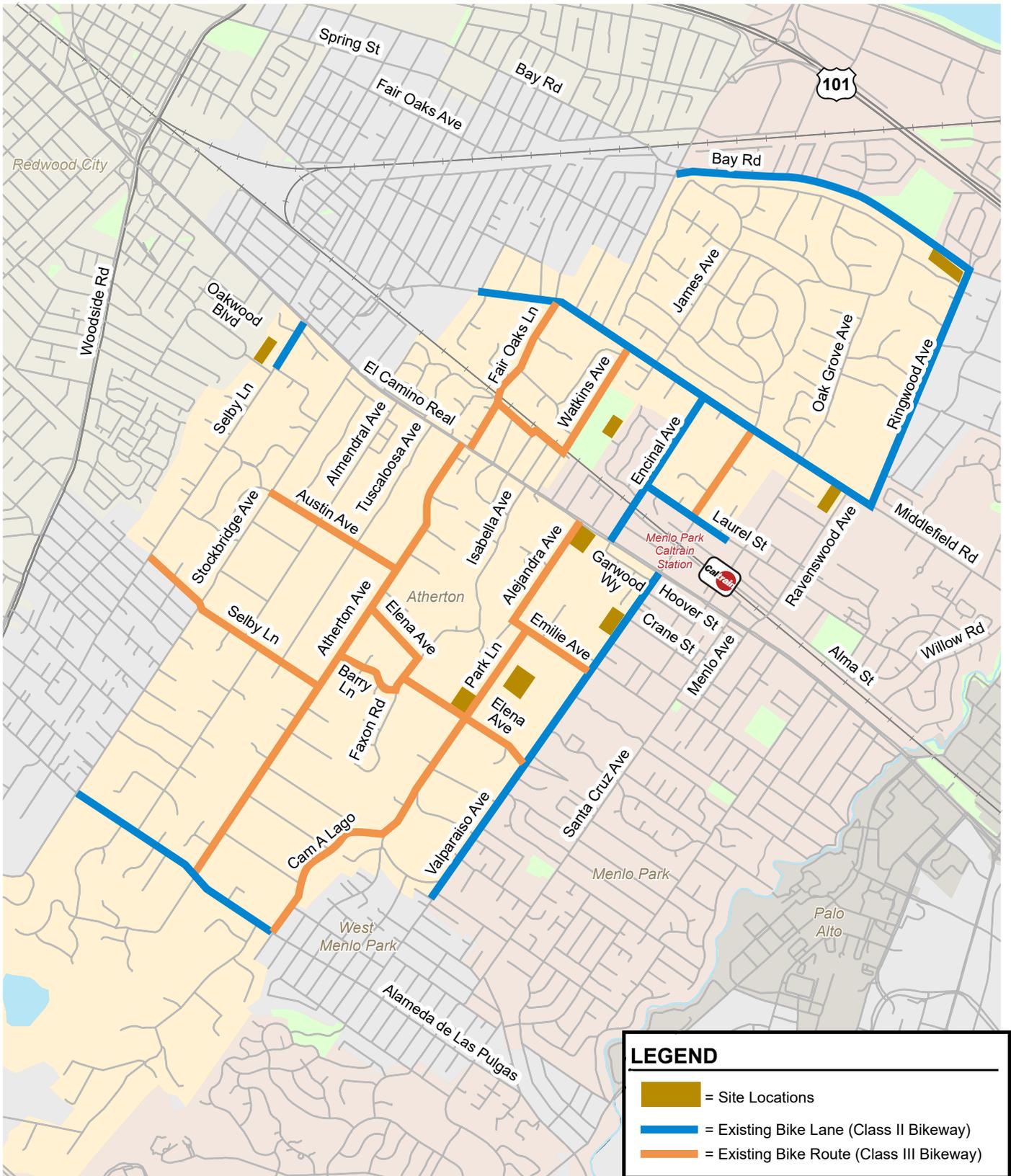
Bike routes (Class III bikeway) are present along the following roadways in the Town:

- Selby Lane between Selby Lane and Atherton Avenue
- Austin Avenue between Selby Lane and Atherton Avenue
- Atherton Avenue between Alameda de las Pulgas and El Camino Real
- Fair Oaks Lane between Alameda de las Pulgas and Middlefield Road
- Dinkelspiel Station Lane between Fair Oaks Lane and Watkins Avenue
- Watkins Avenue between El Camino Real and Middlefield Road
- Alejandra Avenue between Emilie Avenue and El Camino Real
- Park Lane between Cam Al Lago and Emilie Avenue
- Cam Al Lago between Alameda de las Pulgas and Park Lane
- Barry Lane between Atherton Avenue and Faxon Lane
- Faxon Lane between Barry Lane and Elena Avenue
- Elena Avenue between Atherton Avenue and Valparaiso Avenue
- Emilie Avenue between Alejandra Avenue and Valparaiso Avenue
- Glenwood Avenue between Laurel Street and Middlefield Road

Pedestrian Facilities

Pedestrian sidewalks and crosswalks are generally lacking on local streets in Atherton as well as on minor arterials like Middlefield Road, Alameda de las Pulgas, Bay Road, and Marsh Road.

Crosswalks are present at signalized intersections along El Camino Real. The intersections of El Camino Real at Selby Lane and El Camino Real at Stockbridge Avenue have ladder crosswalks with pedestrian yield signs across El Camino Real. The intersections of El Camino Real at Almendral Avenue, El Camino Real at Isabella Avenue, and El Camino Real at Alejandra Avenue have pedestrian hybrid beacons. Continuous sidewalks are absent on the west side of El Camino Real. The multifamily housing sites are proposed near El Camino Real. Continuous sidewalks are absent between the housing sites and El Camino Real.



Note: Only bike facilities within the City of Atherton are shown.

Figure 4
Existing Bicycle Facilities

Existing Transit Services

Existing transit service in Atherton is provided by SamTrans (see Figure 5 and Table 4). Three SamTrans regular bus routes (ECR, 296, 397) and five SamTrans school-oriented bus routes (72, 82, 83, 87, 88) serve the City. The regular SamTrans bus routes are described below:

**Table 4
Existing Transit Facilities**

Bus Route	Description	Operating Hours	Peak Hour Headway	Nearby Bus Stops
ECR	Between Daly City BART Station and Palo Alto Transit Center via El Camino Real	4:00 AM to 2:00 AM (next day)	15 min	El Camino Real & Amherst-5th Avenue, El Camino Real & Almendral Ave, El Camino Real & Isabella Ave, El Camino Real & Encinal Ave, El Camino Real & Valparaiso Ave
296	Between Redwood City Transit Center and Bayshore/Donohoe via Middlefield Road	5:15 AM - 10:45 PM	20 min	Middlefield Road & Fair Oaks Lane, Middlefield Road & James Ave
397	Between San Francisco and Palo Alto Transit Ctr via Middlefield Road	1:00 AM - 6:00 AM	45 min - 60 min	Middlefield Road & Fair Oaks Lane, Middlefield Road & James Ave

Note: Approximate weekday operation hours and headways during peak commute periods in the project area, as of June 2023.

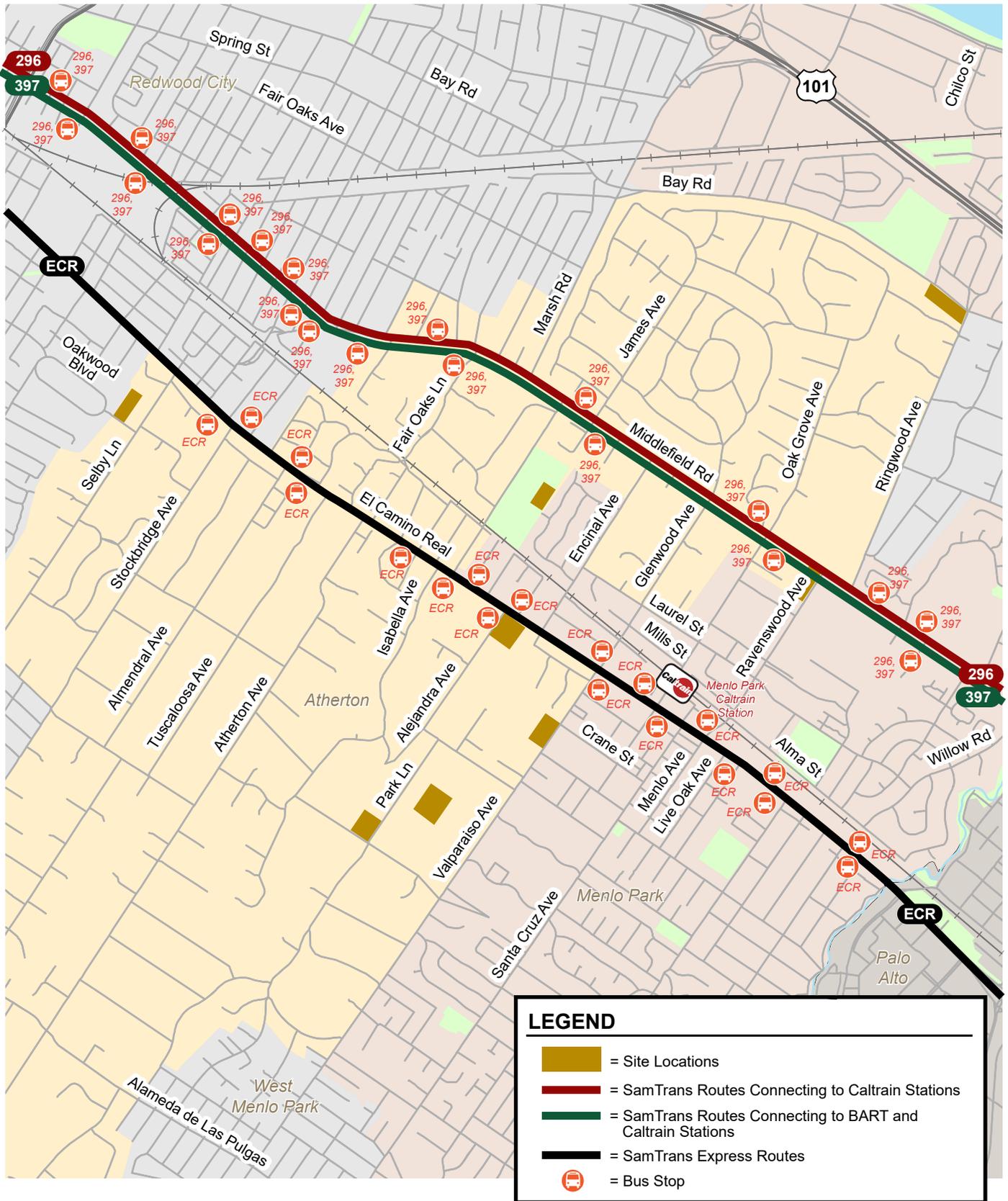


Figure 5
Existing Transit Services

3. Trip Generation Estimates

This chapter describes the method by which project traffic is estimated. The magnitude of traffic produced by a new development and the locations where that traffic would appear are estimated using a three-step process: (1) trip generation, (2) trip distribution, and (3) trip assignment. In determining project trip generation, the magnitude of traffic entering and exiting the project sites is estimated for the AM and PM peak hours. The trip distribution and trip assignment processes are described in Chapter 5.

Trip Generation

AM and PM peak hour trip generation rates resulting from new development are typically estimated using trip rates published in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 11th Edition. Trips that would be generated by the proposed multifamily housing were estimated using the ITE trip rates for "Low-Rise Multifamily Housing" (Land use 220). The trip generation is shown per housing development group in Table 5.

Since the locations of all vacant and ADU sites and SB 9 units are not yet known, the baseline intersection volumes were increased by a factor of 1.0% to represent these uses under project conditions. The factor was developed from the Countywide transportation demand model using the proportion of homes assumed to have ADUs and the percentage of home-based trips.

Internal Capture

The 1000 El Camino Real project site is located on the Menlo College property, the 50 Valparaiso Avenue site is located on the Menlo School property, and the 150 Valparaiso Avenue site is located on the Sacred Heart School property. It is anticipated that the housing proposed on the Menlo College property would be primarily for college faculty. Therefore, an internal capture rate of 50 percent was assumed for this development, i.e., a portion of the trips generated by the project will both begin and end within the development. The housing proposed on the Menlo School property may be occupied by school faculty at Menlo School or other schools in Atherton. Therefore, an internal capture of 20 percent was assumed for this development. The housing proposed on the Sacred Heart property would be occupied by faculty, and therefore, an internal capture of 50 percent was assumed for this development.

Net Project Trips

It is estimated that the proposed HEU would generate 4,594 new daily trips, including 319 net new trips (79 net new inbound and 240 net new outbound) during the AM peak hour and 424 net new trips (266 net new inbound and 158 net new outbound) during the PM peak hour (see Table 5).

**Table 5
Project Trip Generation Estimates**

Land Use	Size	Daily Rate ¹	Daily Trips	AM Peak Hour			PM Peak Hour				
				Rate ¹	In	Out	Total	Rate ¹	In	Out	Total
Proposed											
1000 ECR (Menlo College)¹	126 d.u.	6.74	849	0.40	12	38	50	0.51	40	24	64
<i>Internal Capture (50%)</i>			(425)		(6)	(19)	(25)		(20)	(12)	(32)
Net Project Trips			425		6	19	25		20	12	32
50 Valparaiso (Menlo School)¹	45 d.u.	6.74	303	0.40	4	14	18	0.51	14	9	23
<i>Internal Capture (20%)</i>			(61)		(1)	(3)	(4)		(3)	(2)	(5)
Net Project Trips			242		3	11	14		11	7	18
150 Valparaiso (Sacred Heart)¹	20 d.u.	6.74	135	0.40	2	6	8	0.51	6	4	10
<i>Internal Capture (50%)</i>			(68)		(1)	(3)	(4)		(3)	(2)	(5)
Net Project Trips			68		1	3	4		3	2	5
Multi-Family Opportunity Sites¹											
999 Ringwood Ave, 352, 318, and 296 Bay Rd	36 d.u.	6.74	243	0.40	3	11	14	0.51	11	7	18
175, 185, and 197 Ravenswood Ave	32 d.u.	6.74	216	0.40	3	10	13	0.51	10	6	16
Gilmore House	9 d.u.	6.74	61	0.40	1	3	4	0.51	3	2	5
Circus Club	5 d.u.	6.74	34	0.40	0	2	2	0.51	2	1	3
CA Water Service	3 d.u.	6.74	20	0.40	0	1	1	0.51	1	1	2
Multi-Family Opportunity Sites Subtotal	85 d.u.		574		7	27	34		27	17	44
23 Oakwood¹	16 d.u.	6.74	108	0.40	1	5	6	0.51	5	3	8
ADUs, SB 9 units, Vacant Sites²	337 d.u.	9.43	3,178	0.70	61	175	236	0.94	200	117	317
Proposed Total	629 d.u.		4,594		79	240	319		266	158	424

Notes

d.u. = dwelling units

¹ Trip generations rate for the proposed Apartments and Condominiums are based on the ITE's *Trip Generation Manual, 11th Edition* rates for Land Use Code 220 "Multifamily Housing (Low-Rise) - Not Close to Rail Transit in General Urban/Suburban."

² Trip generations rate for the proposed ADUs, SB 9 units, and vacant sites are based on the ITE's *Trip Generation Manual, 11th Edition* rates for Land Use Code 210 "Single-Family Detached Housing in General Urban/Suburban."

4. CEQA Transportation Analysis

This section describes the California Environmental Quality Act (CEQA) transportation analysis for the proposed project. The following describes the significance criteria used to identify impacts on the transportation system for the proposed HEU. A significant impact would occur if implementation of the HEU would:

1. Conflict with a program, plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.
2. Conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b).
3. Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).
4. Result in inadequate emergency access.

(1) Consistency With Program, Plan, Ordinance or Policy Addressing the Safety or Performance of the Circulation System (Criterion 1).

Implementation of the HEU would be subject to and implement General Plan policies applicable to transit, bicycle, and pedestrian facilities. Additionally, development projects under the HEU would be subject to all applicable Town guidelines, standards, and specifications related to transit, bicycle, or pedestrian facilities.

Specifically, any modifications or new transit, bicycle, and pedestrian facilities would be subject to and designed in accordance with all applicable General Plan policies. In particular, Circulation Element Policy CIR-3.1 supports the study and evaluation of providing dedicated bicycle and pedestrian facilities, and transit access improvements, along the length of El Camino Real within Atherton by repurposing a vehicle travel lane in one or both directions; Policy CIR-4.1 commits to creating and maintaining Complete Streets serving all users; Policy CIR-4.4 considers incorporating Complete Streets infrastructure in all appropriate projects and phases; Policy CIR-4.6 encourages the development and maintenance of bikeways in accordance with the adopted bicycle and pedestrian master plan; Policy CIR-4.7 encourages separating bicycles from vehicular traffic; Policy CIR-6.2 supports the continued operation and upgrading of passenger rail service operated over the Joint Powers Board right-of-way between Gilroy and San Francisco, and Policy CIR-8.1 requires implementing the Greenhouse Gas programs in the Atherton Climate Action Plan related to reduction of vehicle miles traveled and alternative modes of transportation.

The Town has also adopted a Bicycle/Pedestrian Plan (adopted July 2014) that establishes the Town's vision for a network of bicycle and pedestrian facilities to encourage bicycling and walking as viable modes of travel around the Town. The Plan identifies specific improvement projects around the Town to

improve the walking and bicycling environment. The plan proposes new or upgraded bicycle facilities and intersection improvements along major roads in the Town including El Camino Real, Alejandra Avenue, Watkins Avenue, Valparaiso Avenue, Middlefield Road, Alameda de las Pulgas, and Marsh Road. Furthermore, the plan recommends converting the westernmost southbound travel lane along El Camino Real to a Class I trail with landscaping and pedestrian crossing improvements, including prioritizing improvements to the Selby Lane/Fifth Avenue and Isabella/Watkins Avenue intersections, called the Grand Boulevard Greenway. The multifamily housing sites are proposed near El Camino Real.

The Town is served by three SamTrans bus routes (ECR, 296, 397). The multifamily housing sites are proposed near the bus route ECR.

Because implementation of the HEU would be subject to all applicable Town guidelines, standards, and specifications, the proposed HEU would not conflict with adopted policies, plans, or programs for transit, bicycle, or pedestrian facilities. Therefore, the HEU would result in a less-than-significant impact to transit, bicycle, and pedestrian facilities.

Mitigation Measure: None required.

(2) Vehicle Miles Traveled (Criterion 2)

Pursuant to SB 743, the California Natural Resources Agency finalized updates to the CEQA Guidelines in late 2018. The guidelines state that level of service will no longer be considered to be an environmental impact under CEQA and consider vehicle-miles-traveled (VMT) the most appropriate measure of transportation impact. VMT is defined as the total distance traveled by vehicles traveling to and from a land use over a typical day. Since the Town of Atherton has not formally adopted a VMT policy, the VMT analysis is based on the Governor's Office of Planning and Research (OPR)'s guidelines.

Per OPR, a project's VMT is compared to the appropriate thresholds of significance based on the project location and type of development. When assessing a residential project, the project's VMT is divided by the number of residents expected to occupy the project to determine the VMT per capita.

VMT Thresholds of Significance

OPR's VMT guidelines include screening criteria for evaluating a project's VMT impact. Based on the guidelines, the following types of projects may be presumed to have a less than significant VMT impact:

- Small projects (i.e., fewer than 110 trips per day)
- Projects in low VMT areas*
- Projects near transit (i.e., within ½ mile walkshed of a major transit stop or along a high-quality transit corridor that has a fixed route bus service with service intervals no longer than 15 minutes during peak commute hours)
- 100 percent affordable residential development

*Note: To determine whether a project is located in a low VMT area, the C/CAG VMT Estimation Tool was used. This tool is based on model forecasts and has been developed by C/CAG to streamline the analysis for development projects located within the County.

For projects that cannot be screened out from the analysis based on the above criteria, consistent with OPR guidelines, 85 percent of the existing regional average daily VMT per resident was assumed as the VMT threshold of significance. Average VMT per resident for the project parcels was reported from C/CAG VMT Estimation Tool, and the project average VMT per resident was compared to the Bay Area

regional average. As estimated by the C/CAG VMT Estimation Tool, the existing (2015) Bay Area average residential VMT is estimated at 14.6 daily VMT per resident. Therefore, the VMT threshold for this project is 12.4 daily VMT per resident.

VMT Analysis

Screened Projects

Per the OPR VMT screening criteria, the following projects can be screened from further VMT analysis:

Small Projects

The following projects are individually small and are expected to generate less than 110 daily trips (see Table 5). Therefore, their VMT impact would be less than significant as defined by OPR:

- ADUs, SB 9 units, Vacant Sites – 337 units
- 23 Oakwood Boulevard – 16 units
- 150 Valparaiso Avenue – 20 units
- Gilmore House – 9 units
- Circus Club – 5 units
- CA Water Service – 3 units

Projects Near Transit

The proposed multifamily developments at 1000 El Camino Real and 50 Valparaiso Avenue are located adjacent to El Camino Real, which is considered to be a high-quality transit corridor. In the vicinity of the project sites, SamTrans bus route ECR provides fixed route bus service with 15-minute headways during peak commute hours. Per OPR guidelines, project sites located within ½ mile walkshed of a high-quality transit corridor can be assumed to have a less than significant VMT impact.

It is important to note that if the project is designed to have a Floor Area Ratio (FAR) of less than 0.75, includes more parking for use by residents than required by the jurisdiction, is inconsistent with the applicable Sustainable Communities Strategy, or replaces affordable residential units with a smaller number of moderate- or high-income residential units, it would require further VMT analysis.

Projects in Low VMT Areas

Per the C/CAG VMT Estimation Tool, the proposed project at 175, 185, and 197 Ravenswood Avenue is located in a low VMT area i.e. the VMT per resident for those parcels is 7.7 VMT per resident and 10.4 VMT per resident, which is less than the Bay Area regional threshold of 12.4 daily VMT per resident (see Appendix A). Therefore, this project can be assumed to have a less than significant VMT impact.

Projects Not Screened

The project proposed at 999 Ringwood Avenue, 352, 318, and 296 Bay Road is located in an area where the existing VMT is 13.0 daily VMT per resident, which is above the established threshold of 12.4 daily VMT per resident and is referred to as being in a “high-VMT area” (see Appendix A).

VMT Mitigation

Projects in high-VMT areas are required to include a set of VMT reduction measures that would reduce the project VMT to the greatest extent possible. The C/CAG VMT Estimation Tool evaluates a list of selected VMT reduction measures that can be applied to a project to reduce the project VMT. There are four strategy tiers whose effects on VMT can be calculated with the VMT estimation tool:

5. Tier 1: Project characteristics (e.g. density, diversity of uses, design, and affordability of housing) that encourage walking, biking and transit uses;
6. Tier 2: Multimodal infrastructure improvements that increase accessibility for transit users, bicyclists, and pedestrians. These improvements include:
 - Increase bike access
 - Improve connectivity by increasing intersection density
 - Increase transit accessibility
 - Traffic calming measures beyond the project frontage
 - Pedestrian network improvements beyond the project frontage
7. Tier 3: Parking measures that discourage personal motorized vehicle-trips. These improvements include:
 - Limit parking supply
 - Provide bike facilities
8. Tier 4: Transportation demand management (TDM) measures that provide incentives and services to encourage alternatives to personal motorized vehicle-trips. These measures for residential developments include:
 - School pool programs
 - Bike share programs
 - Car share programs
 - Subsidized transit program
 - Unbundle parking costs from property costs
 - Voluntary travel behavior change program

The first three strategies – land use characteristics, multimodal network improvements, and parking – are physical design strategies that can be incorporated into the project design. TDM includes programmatic measures that aim to reduce VMT by decreasing personal motorized vehicle mode share and by encouraging more walking, biking, and riding transit. TDM measures should be enforced through annual trip monitoring to assess the project’s status in meeting the VMT reduction goals. The project could implement Tier 1-4 mitigation measures and reduce its impact to less than significant.

(3) Substantially Increase Hazards Due to a Geometric Design Feature or Incompatible Uses (Criterion 3)

Subsequent new residential development, and other future projects under the project, including any new roadway, bicycle, pedestrian, and transit infrastructure improvements would be designed according to the Town’s General Plan and other Town standards. Future projects would be subject to existing regulations that are aimed at reducing hazardous conditions with respect to circulation. Additionally, future development resulting from the project would be concentrated on sites that are already developed where impacts related to incompatible traffic related land uses would not likely occur. Therefore, the project would result in a less-than-significant impact with respect to transportation hazards.

(4) Inadequate Emergency Access (Criterion 4)

Based on the proposed locations of new residential development in the Town, adequate emergency access exists; and when specific development projects occur, emergency access within the site must be evaluated. Furthermore, the Town maintains the roadway network that provides access to new development sites in accordance with industry design standards, which ensures that the physical network would be free of obstructions to emergency responders. The Town’s General Plan and other Town standards and regulations include policies that would ensure efficient circulation and adequate access in the Town, which would help facilitate emergency response. Emergency access to new development sites would be subject to review by the Town and responsible emergency service

agencies, thus ensuring the projects would be designed to meet all emergency access and design standards. The Town also requires the preparation of construction management plans that minimize temporary obstruction of traffic during site construction.

Additional vehicles associated with new development sites could increase delays for emergency response vehicles during peak commute hours. However, emergency responders maintain response plans that include use of alternate routes, sirens, and other methods to bypass congestion and minimize response times. In addition, California law requires drivers to yield the right-of-way to emergency vehicles and remain stopped until the emergency vehicle passes to ensure the safe and timely passage of emergency vehicles.

Based on the above considerations, adequate emergency access would be provided to new development sites, and the impact would be less-than-significant.

5. Local Transportation Analysis

This chapter describes the local transportation analysis (LTA) including intersection operations analysis for existing, existing plus project, cumulative, and cumulative plus project scenarios, and any adverse effects to intersection level of service caused by the project.

Intersection Operations Analysis

The intersection operations analysis is intended to quantify the operations of Atherton's intersections and to identify potential negative effects due to the addition of project traffic. Information required for the intersection operations analysis related to project trip distribution, and trip assignment are presented in this section. The study intersections are evaluated based on the Town of Atherton's intersection analysis methodology and standards in determining potential adverse operational effects due to the HEU, as described in Chapter 1.

Trip Distribution

As part of the project trip distribution, the directions to and from which the project trips would travel are estimated. The trip distribution patterns for the proposed multifamily units were estimated based on existing travel patterns on the surrounding roadway network that reflect typical weekday AM and PM peak commute patterns for each land use, the locations of complementary land uses, and freeway access points. The trip distribution patterns are shown on Figure 6. Although not shown on the figure, the proposed sites along Bay Road and Ringwood Avenue are assumed to be mostly accessed by US 101.

Trip Assignment

In the project trip assignment, the project trips are assigned to specific streets and intersections. The peak-hour vehicle trips generated by the proposed multifamily units were assigned to the roadway network in accordance with the trip distribution patterns and the locations of project sites (see Figure 7).

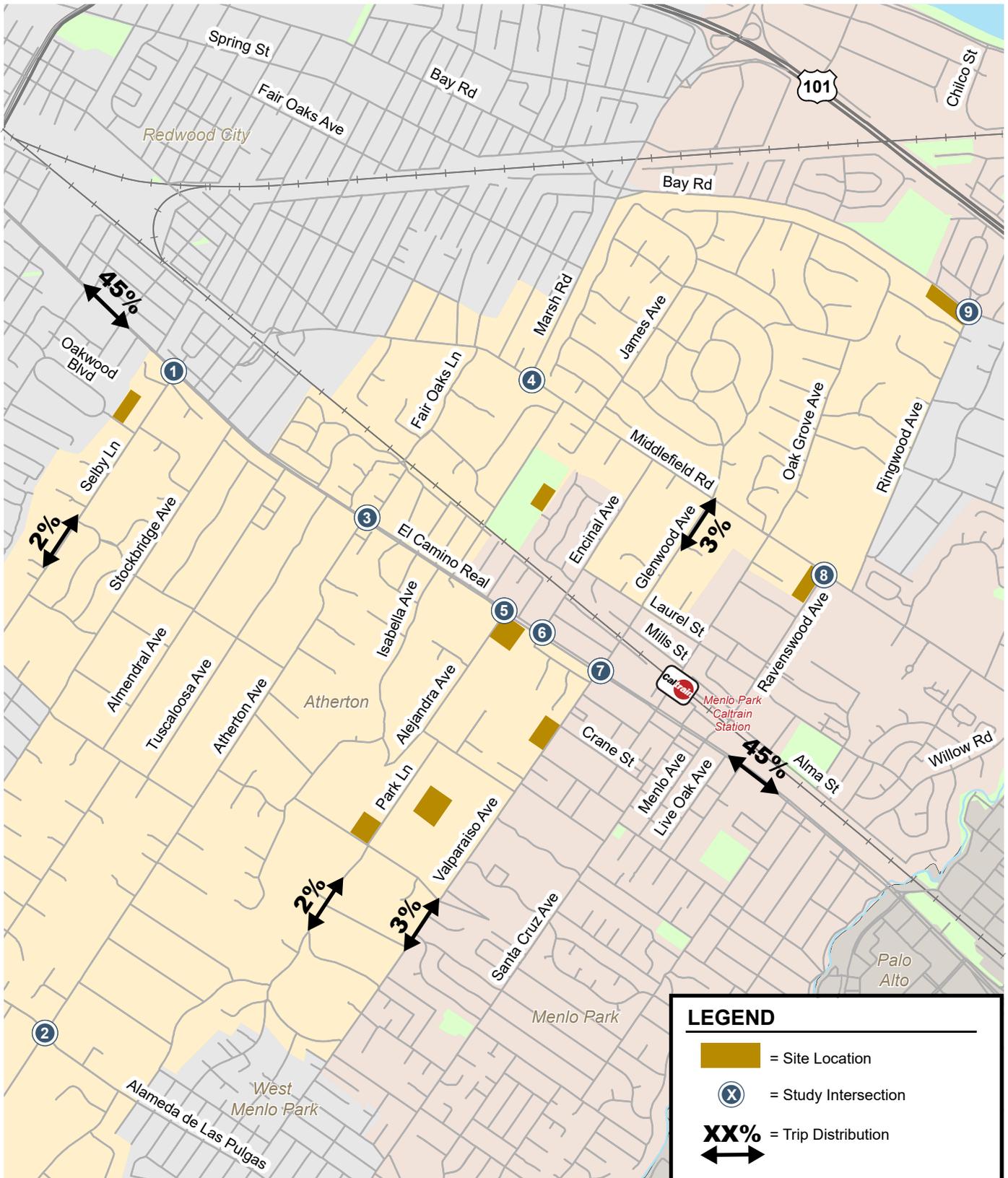
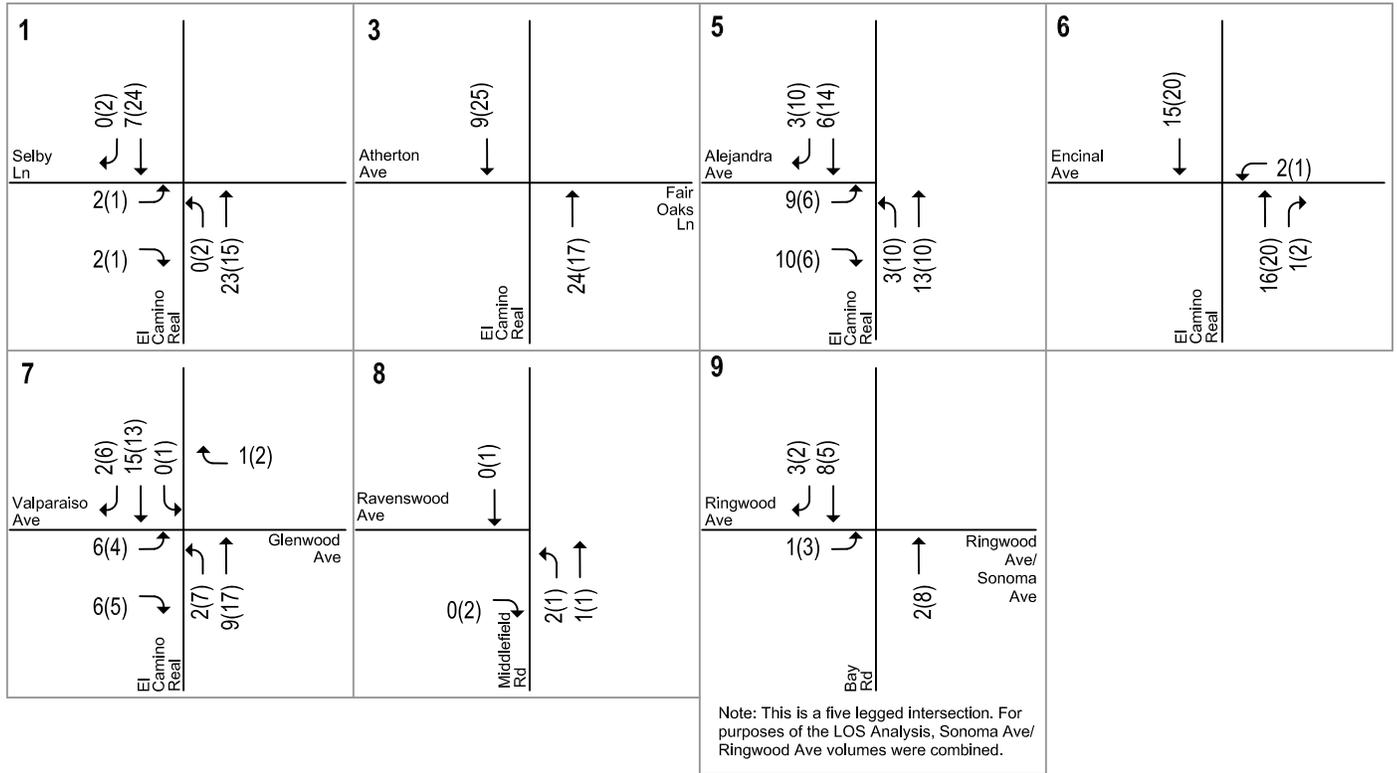


Figure 6
Multifamily Housing Trip Distribution

Atherton HEU Transportation Analysis



LEGEND

XX(X) = AM(PM) Peak-Hour Trips

Note: Intersections in the proximity of the proposed multifamily housing sites where trips from these projects would be added are shown on the figure.

Figure 7
Multifamily Housing Trip Assignment

Intersection Lane Configurations and Traffic Volumes Under All Scenarios

Existing Lane Configurations and Traffic Volumes

The existing lane configurations at the study intersections are shown on Figure 8.

Existing AM and PM traffic volumes at the study intersections were based on new traffic counts conducted in 2023 and new counts collected in 2022 as part of other transportation studies in the area (see Figure 9).

Intersection turning-movement counts used for this analysis are presented in Appendix B. The volume summary sheets with the existing counts are presented in Appendix C.

Existing Plus Project Lane Configurations and Traffic Volumes

The intersection lane configurations under existing plus project conditions for all intersections are assumed to be the same as under existing conditions.

Project trips were added to existing traffic volumes to obtain existing plus project traffic volumes (see Figure 10).

Cumulative Lane Configurations and Traffic Volumes

The intersection lane configurations under cumulative conditions for all intersections are assumed to be the same as under existing conditions.

The Town's adopted bicycle and pedestrian plan envisions a safer El Camino Real, including locations for crosswalk upgrades and the potential for a "Grand Boulevard Greenway" trail that can be implemented in phases over time. It recommends converting the westernmost southbound travel lane along El Camino Real to a Class I trail with landscaping and pedestrian crossing improvements. However, since there is not an approved project or design for this corridor, these improvements were not assumed in the analysis.

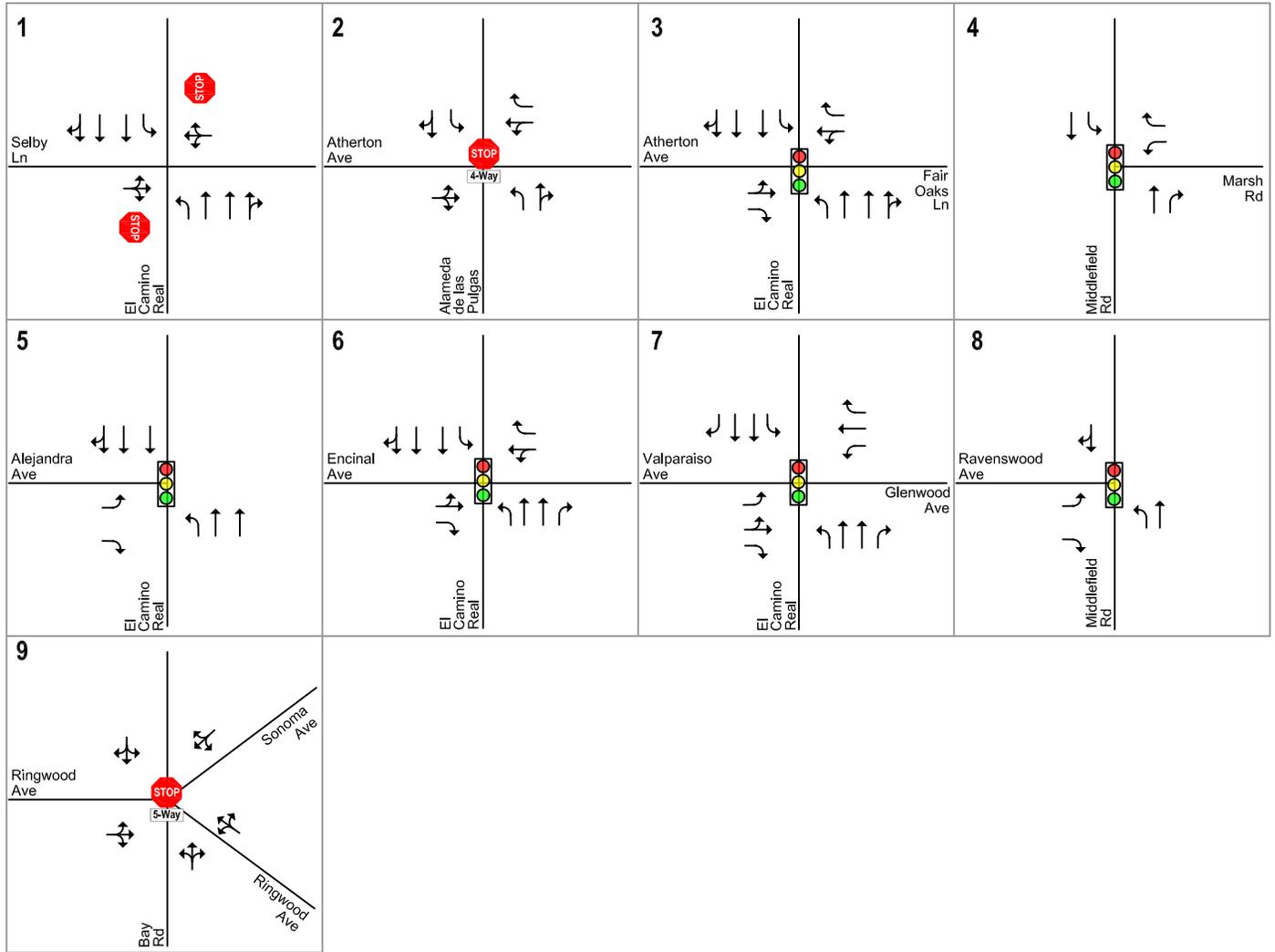
The 2031 cumulative conditions traffic volumes were determined by interpolating 2015 forecasts and 2040 forecasts from the Countywide transportation demand model. The cumulative peak-hour intersection volumes are shown on Figure 11.

Cumulative Plus Project Lane Configurations and Traffic Volumes

The intersection lane configurations under cumulative plus project conditions are assumed to be the same as under cumulative conditions.

Project trips were added to cumulative traffic volumes to obtain cumulative plus project traffic volumes (see Figure 12).

Atherton HEU Transportation Analysis

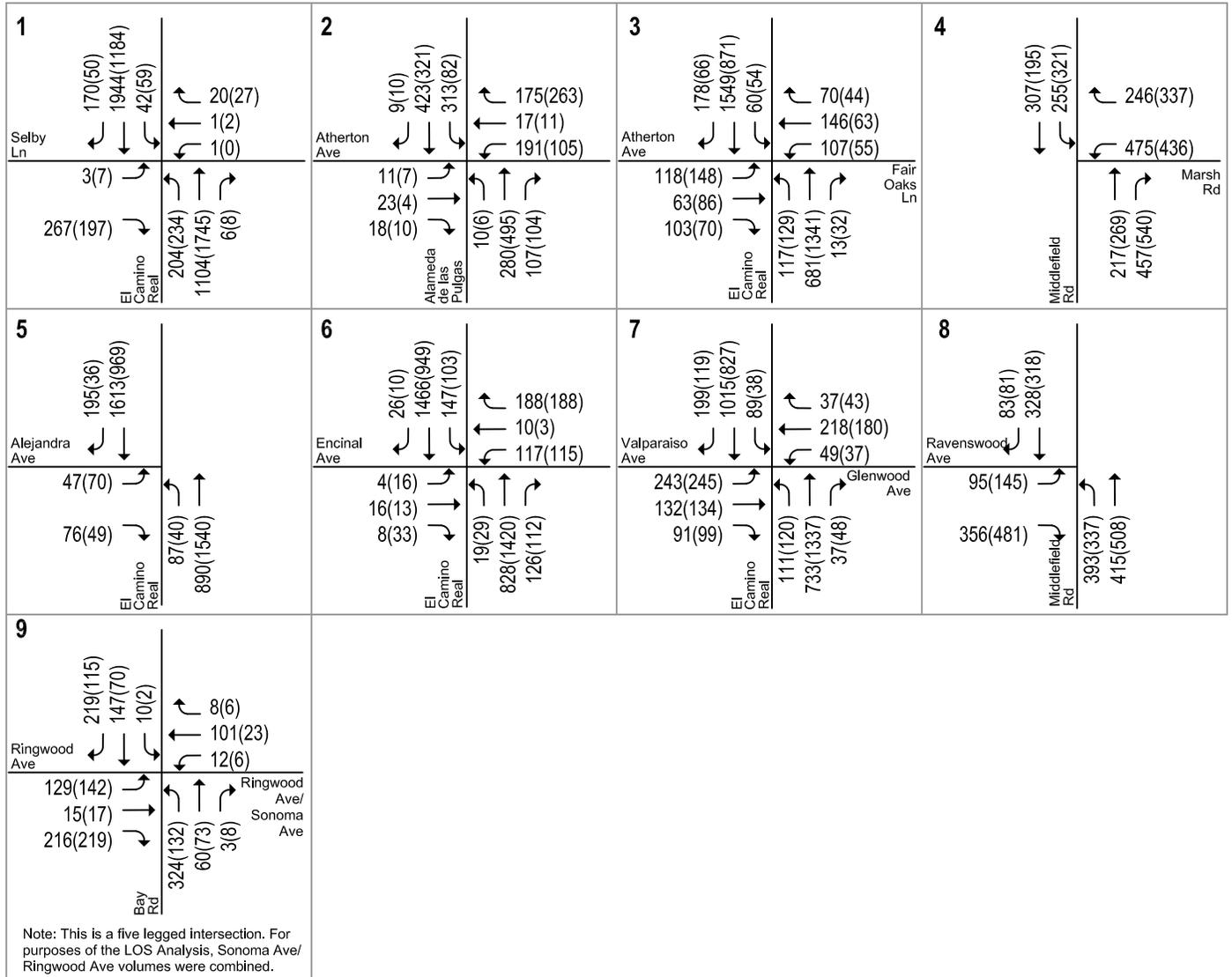


LEGEND

-  = Stop Controlled Approach
-  = Stop Controlled Intersection
-  = Signalized Intersection

Figure 8
Existing Lane Configurations

Atherton HEU Transportation Analysis

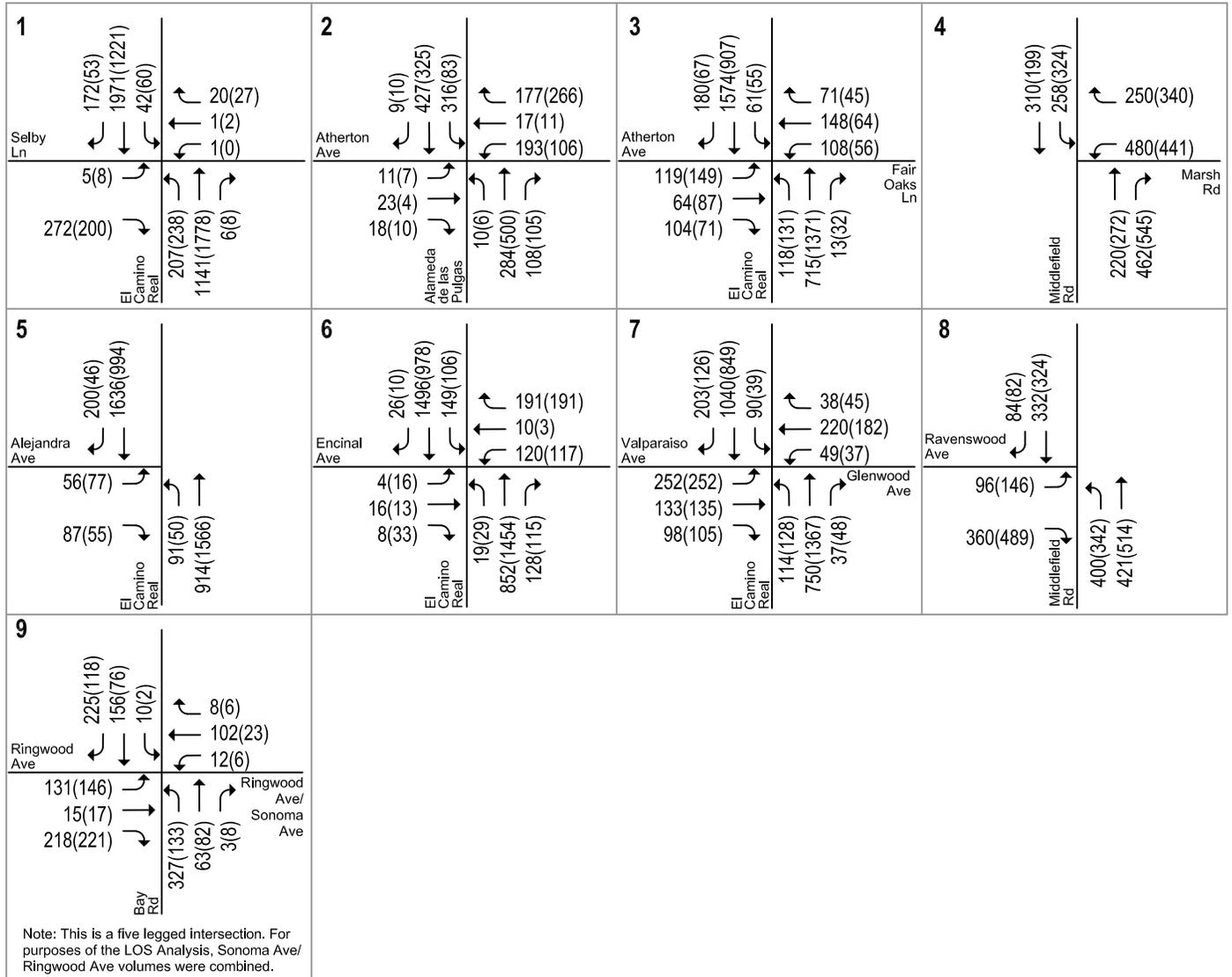


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 9
Existing Traffic Volumes

Atherton HEU Transportation Analysis

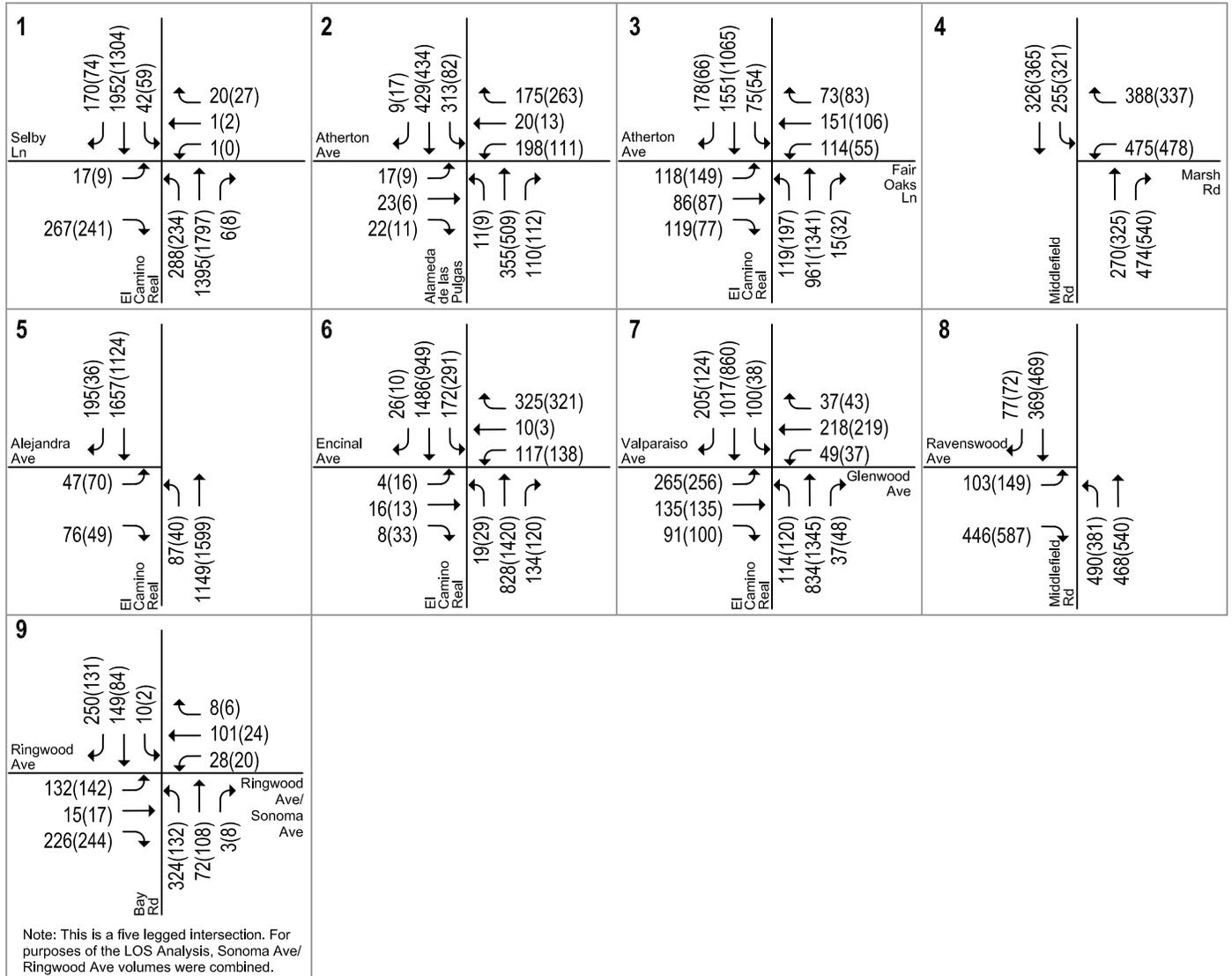


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 10
Existing Plus Project Traffic Volumes

Atherton HEU Transportation Analysis

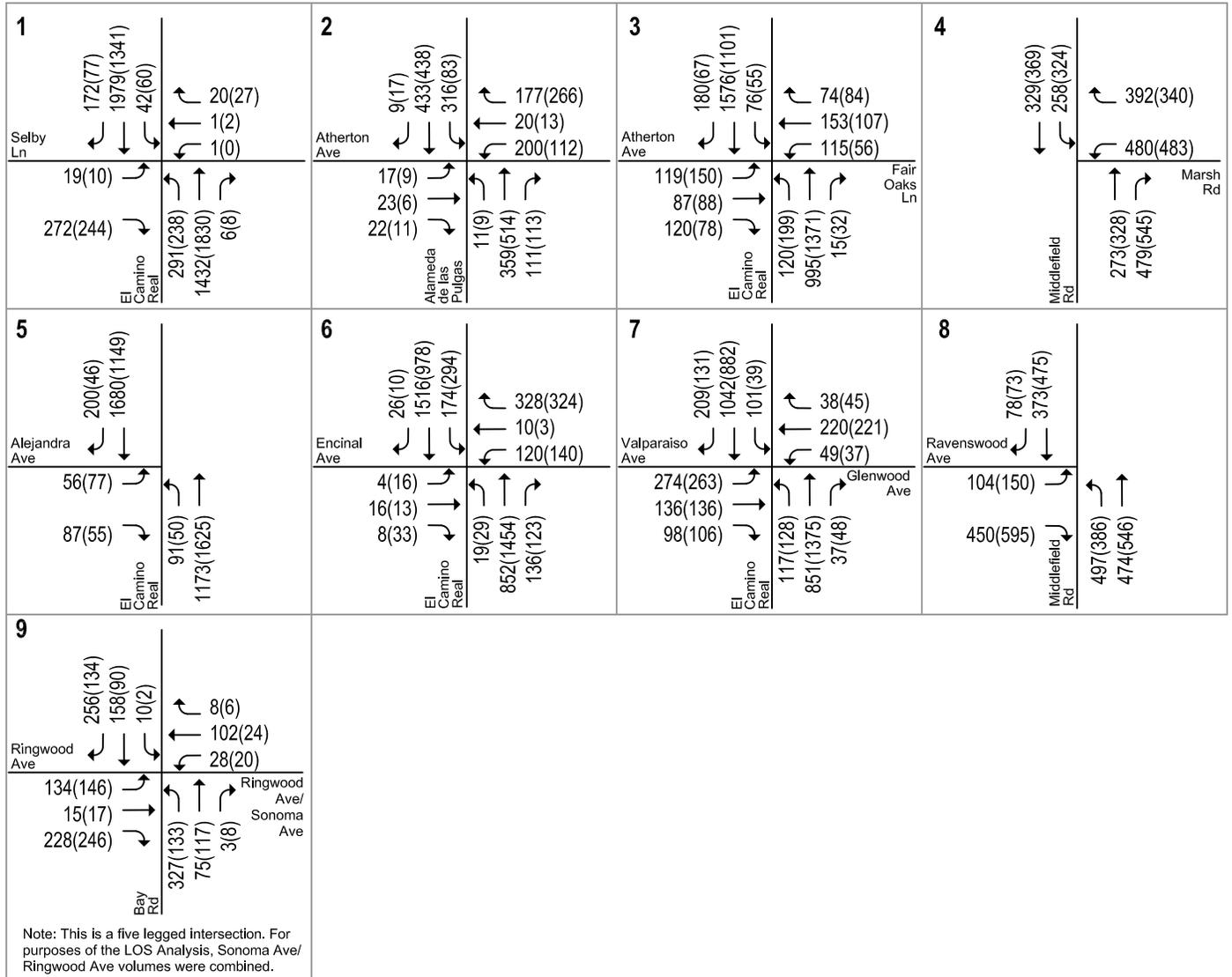


LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 11
Cumulative Traffic Volumes

Atherton HEU Transportation Analysis



LEGEND

XX(XX) = AM(PM) Peak-Hour Traffic Volumes

Figure 12
Cumulative Plus Project Traffic Volumes

Traffic Operations at Signalized Intersections

The results of the intersection level of service analysis are shown in Table 6. The detailed intersection level of service calculation sheets for all study scenarios are included in Appendix D.

Existing and Cumulative Conditions

Intersection levels of service were evaluated against the standards of the Town of Atherton. The results of the analysis show that all signalized study intersections are operating at acceptable levels of service during the AM and PM peak hours of traffic under existing conditions. Under cumulative conditions, most study intersections would continue to operate at an acceptable level of service. The intersection of Ravenswood Avenue and Middlefield Road would operate at an unacceptable LOS E during both peak hours under cumulative conditions.

Project Conditions

The results of the analysis show that the added project trips would not cause an adverse operational effect, as defined by Atherton, at any of the signalized study intersections.

Traffic Operations at Unsignalized Intersections

The study also evaluated four unsignalized intersections. The operation of each intersection is described below:

EI Camino Real & Selby Lane Intersection

The EI Camino Real and Selby Lane intersection is a two way stop controlled intersection with the stop control on the east and west approaches. During both peak hours, under existing, existing plus project, cumulative, and cumulative plus project scenarios, Selby Lane is estimated to experience long delays equivalent to LOS F. The peak-hour volume signal warrant analysis described below indicates that peak-hour volumes at the intersection would meet the peak-hour volume warrant under all scenarios, both with and without the project traffic.

Improvement:

It is recommended that a traffic signal be installed at the intersection. With the addition of a traffic signal, the intersection would be expected to operate at an acceptable LOS B under all scenarios.

Alameda de las Pulgas & Atherton Avenue Intersection

The Alameda de las Pulgas & Atherton Avenue intersection has four approaches and is stop controlled on all legs. Under existing, existing plus project, and cumulative conditions, during both peak hours, the intersection operates at an acceptable LOS D or better. Under cumulative plus project conditions, the intersection would operate with high delays equivalent to LOS E during the PM peak hour.

The peak-hour volume signal warrant analysis described below indicates that peak-hour volumes at the intersection would not meet the peak-hour volume warrant during the PM peak hour under the cumulative plus project scenario. Therefore, signalization is not recommended at this intersection.

Improvement:

A single lane roundabout is recommended at this intersection. The intersection appears big enough to accommodate a roundabout within the right of way, but the feasibility of the roundabout would require further design work. With the addition of a roundabout, the intersection would operate at an acceptable LOS B or better during both peak hours.

El Camino Real & Alejandra Avenue Intersection

The El Camino Real & Alejandra Avenue intersection has three approaches and is stop controlled on the Alejandra Avenue approach. In addition, there is storage for two vehicles to queue within the center median. During the AM peak hour, Alejandra Avenue is estimated to experience long delays equivalent to LOS E under all study scenarios. The added project trips would increase the delay for this approach. The peak-hour volume signal warrant analysis described below indicates that peak-hour volumes at the intersection would not meet the peak-hour volume warrant under any scenario, with or without the project traffic, therefore signalization is not recommended. There are no other feasible improvements at this intersection.

Bay Road & Ringwood Avenue/Sonoma Avenue Intersection

The Bay Road & Ringwood Avenue/Sonoma Avenue intersection has five approaches and is stop controlled on all legs. Under the existing and existing plus project scenarios during both peak hours, the intersection operates at an acceptable LOS D or better. Under cumulative and cumulative plus project conditions, the intersection would operate with high delays equivalent to LOS E during the AM peak hour.

The peak-hour volume signal warrant analysis described below indicates that peak-hour volumes at the intersection would meet the peak-hour volume warrant under all scenarios, both with and without the project traffic, during the AM peak hour.

Menlo Park's Traffic Impact Fee (TIF) lists the following improvements for this intersection:

- Convert the east legs of Sonoma Avenue and Ringwood Avenue to one-way couplets with Ringwood Avenue serving eastbound traffic and Sonoma Avenue serving westbound traffic.
- Add left-turn lanes, as deemed necessary during the design phase, on eastbound Ringwood Avenue and northbound Bay Road. This would require full use of public right-of-way and the removal of existing landscaping and the relocation of existing utilities.
- Install a traffic signal.

Improvement:

With the addition of a traffic signal, the intersection would be expected to operate at an acceptable LOS A during the AM peak hour. Installation of improvements as identified in Menlo Park's TIF is recommended.

Peak-Hour Signal Warrant Analysis

In conjunction with the traffic operations analysis, a signal warrant analysis was performed to determine if the unsignalized intersections of El Camino Real & Selby Lane, Alameda de las Pulgas & Atherton Avenue, El Camino Real & Alejandra Avenue, and Bay Road & Ringwood Avenue/Sonoma Avenue would warrant traffic signals. These unsignalized study intersections were analyzed on the basis of the Peak-Hour Volume Signal Warrant, (Warrant #3 – Part B) described in the *California Manual on Uniform Traffic Control Devices (MUTCD)*, 2014 Edition. This method provides an indication of whether peak-hour traffic volumes are, or would be, sufficient to justify installation of a traffic signal. Intersections that meet the peak hour warrant are subject to further analysis before determining that a traffic signal is necessary. Additional analysis may include unsignalized intersection level of service analysis and/or operational analysis such as evaluating vehicle queuing and delay. The results of the peak-hour signal warrant checks indicate the following:

- All peak-hour volumes at El Camino Real & Selby Lane would warrant signalization under all scenarios.

- AM peak-hour volumes at Alameda de las Pulgas & Atherton Avenue would meet the signal warrant under cumulative and cumulative plus project scenarios.
- All peak-hour volumes at El Camino Real & Alejandra Avenue would not meet the signal warrant under all scenarios.
- AM peak-hour volumes at Bay Road & Ringwood Avenue/Sonoma Avenue would meet the signal warrant under all scenarios.

The peak-hour signal warrant sheets are contained in Appendix E.

**Table 6
Intersection Level of Service Summary**

#	Intersection	Control	Peak Hour	Count Date	Existing Conditions					Cumulative Conditions				
					No Project		Existing Plus Project			No Project		Cumulative Plus Project		
					avg. delay (sec/veh) ¹	LOS	avg. delay (sec/veh)	LOS	increase in avg. delay	avg. delay	LOS	avg. delay	LOS	increase in avg. delay
1	El Camino Real & Selby Lane ^{1,3}	TWSC	AM	5/16/2023	>50	F	>50	F	--	>50	F	>50	F	--
			PM	5/16/2023	>50	F	>50	F	--	>50	F	>50	F	--
2	Alameda de las Pulgas & Atherton Ave ¹	AWSC	AM	5/16/2023	20.5	C	21.1	C	0.6	29.3	D	30.7	D	1.4
			PM	5/16/2023	24.5	C	25.6	D	1.1	34.5	D	36.1	E	1.6
3	El Camino Real & Fair Oaks Lane ¹	Signal	AM	5/16/2023	40.0	D	40.1	D	0.1	41.8	D	42.5	D	0.7
			PM	5/16/2023	28.6	C	29.0	C	0.4	33.4	C	34.1	C	0.7
4	Middlefield Road & Marsh Road ¹	Signal	AM	5/16/2023	14.2	B	14.3	B	0.1	14.8	B	15.0	B	0.2
			PM	5/16/2023	16.7	B	16.9	B	0.2	19.2	B	19.5	B	0.3
5	El Camino Real & Alejandra Ave ¹	TWSC	AM	5/16/2023	41.2	E	50.5	F	9.3	46.0	E	57.6	F	11.6
			PM	5/16/2023	18.4	C	19.7	C	1.3	22.0	C	23.9	C	1.9
6	El Camino Real & Encinal Ave ²	Signal	AM	3/2/2023	47.0	D	49.0	D	2.0	44.8	D	47.0	D	2.2
			PM	3/2/2023	26.9	C	27.5	C	0.6	42.2	D	44.4	D	2.2
7	El Camino Real & Valparaiso Ave/Glenwood Ave ²	Signal	AM	3/2/2023	31.6	C	32.1	C	0.5	32.3	C	32.8	C	0.5
			PM	3/2/2023	28.3	C	28.8	C	0.5	30.5	C	31.1	C	0.6
8	Middlefield Road & Ravenswood Ave ²	Signal	AM	5/24/2023	43.7	D	44.7	D	1.0	77.5	E	79.4	E	1.9
			PM	5/24/2023	33.0	C	34.2	C	1.2	61.4	E	64.1	E	2.7
9	Bay Road & Ringwood Ave/Sonoma Ave ²	AWSC	AM	12/8/2022	29.6	D	31.5	D	1.9	39.3	E	44.9	E	5.6
			PM	12/8/2022	12.0	B	12.4	B	0.4	13.6	B	14.2	B	0.6

* For signalized and allway stop controlled intersections, level of service (LOS) is based on average delay. For the side-street stop controlled intersections, LOS is based on the average delay experienced by the worst movement.

Bold indicates a substandard level of service

¹ For intersections wholly within Atherton, Synchro software and HCM 2000 methodology was used to calculate average delay and LOS.

² For intersections shared with Atherton and Menlo Park, Vistro software and HCM 7th Edition methodology was used to calculate average delay and LOS.

³ The stop-controlled movements face very high delays. Synchro software is unable to compute delay.

Atherton Housing Element Update Transportation Analysis

Technical Appendices

February 13, 2024

Appendix A

VMT Analysis

Project Details

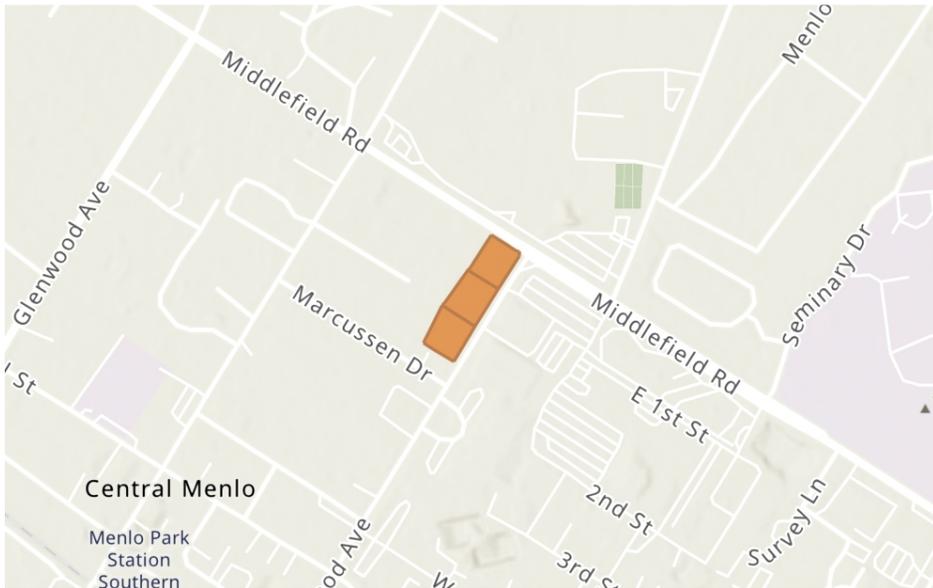
Timestamp of Analysis: February 12, 2024, 03:57:46 PM

Project Name: Atherton HEU - 175, 185, 195 Ravenswood Ave

Project Description: Atherton HEU

Project Location

jurisdiction:	apn	TAZ
Atherton	061281060	1633
	061281150	1633
Inside a TPA? Yes (Pass)	061281050	1585



Analysis Details

Data Version: C/CAG Travel Model

Analysis Methodology: TAZ

Baseline Year: 2015

Project Land Use

Residential:

Single Family DU:

Multifamily DU: 32

Total DUs: 32

Non-Residential:

Office KSF:

Local Serving Retail KSF:

Industrial KSF:

Residential Affordability (percent of all units):

Extremely Low Income: 0 %

Very Low Income: 20 %

Low Income: 0 %

Parking:

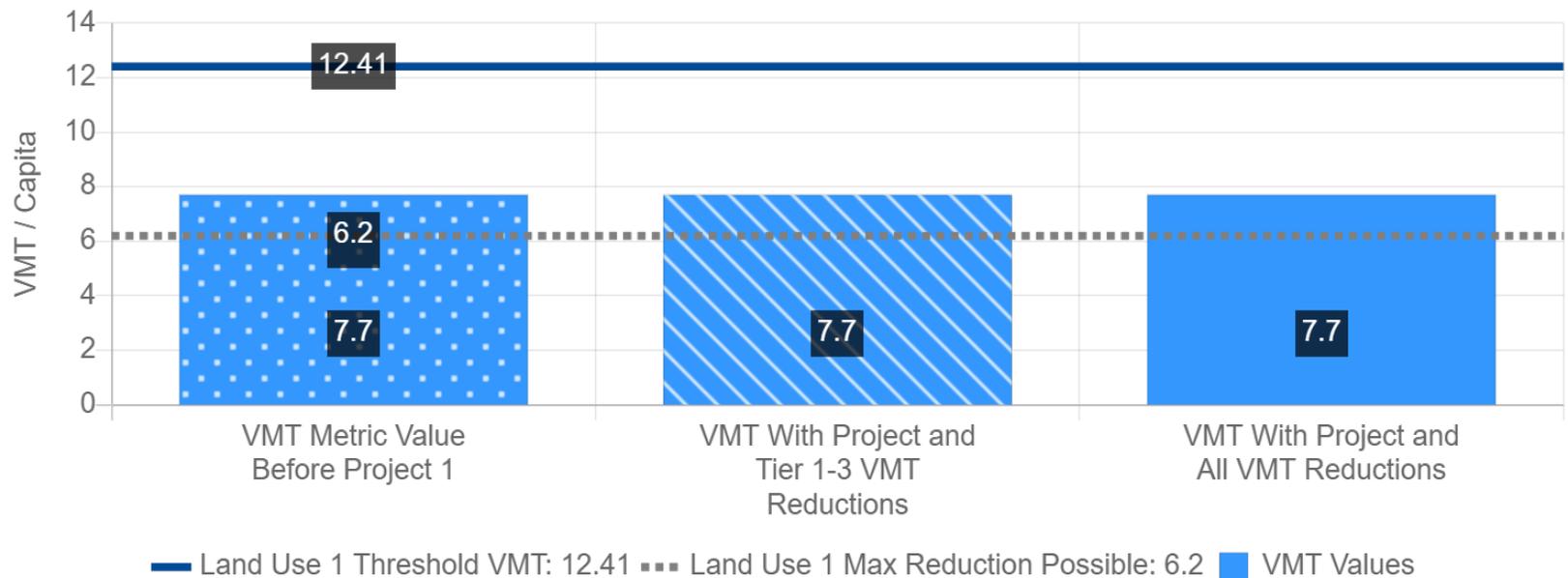
Motor Vehicle Parking:

Bicycle Parking:

Residential Vehicle Miles Traveled (VMT) Screening Results

Land Use Type 1:	Residential
VMT Without Project 1:	Home-Based VMT per Resident
VMT Baseline Description 1:	Bay Area Regional Average
VMT Baseline Value 1:	14.6
TAZ:	1585
VMT Threshold Description 1:	-15%
Land Use 1 has been Pre-Screened by the Local Jurisdiction:	N/A

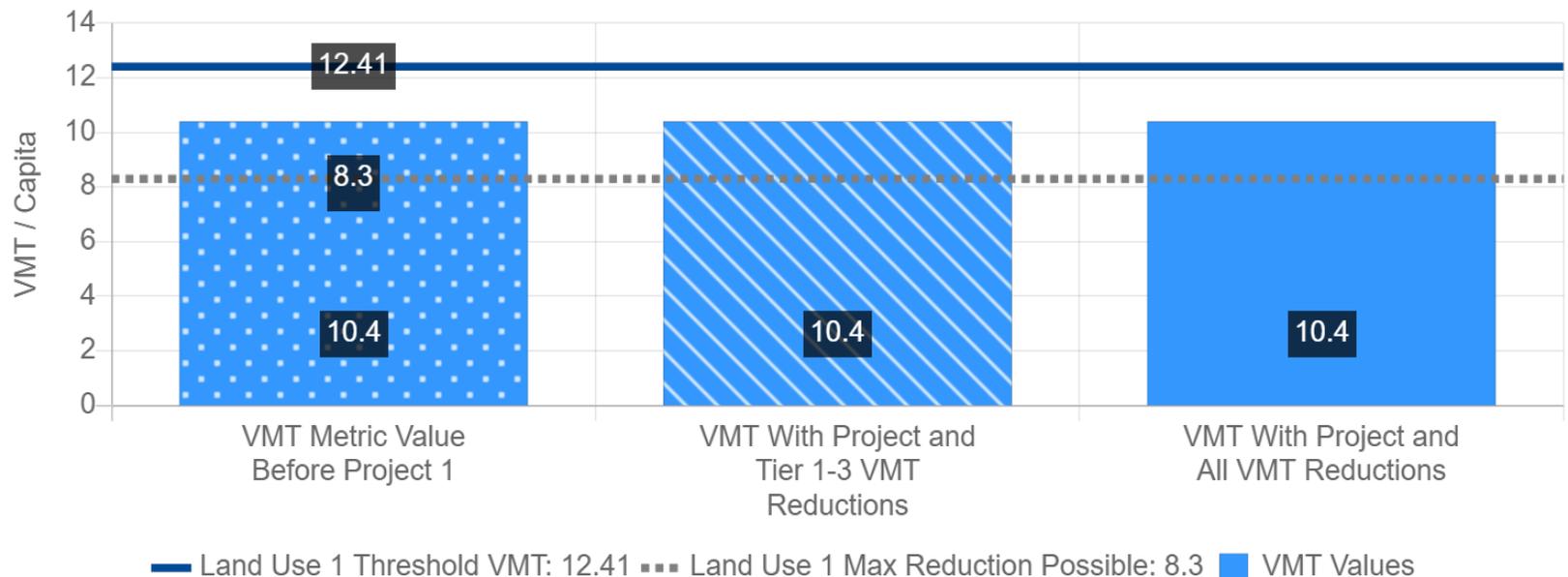
	Without Project	With Project & Tier 1-3 VMT Reductions	With Project & All VMT Reductions
Project Generated Vehicle Miles Traveled (VMT) Rate	7.7	7.7	7.7
Low VMT Screening Analysis	Yes (Pass)	Yes (Pass)	Yes (Pass)



Residential Vehicle Miles Traveled (VMT) Screening Results

Land Use Type 1:	Residential
VMT Without Project 1:	Home-Based VMT per Resident
VMT Baseline Description 1:	Bay Area Regional Average
VMT Baseline Value 1:	14.6
TAZ:	1633
VMT Threshold Description 1:	-15%
Land Use 1 has been Pre-Screened by the Local Jurisdiction:	N/A

	Without Project	With Project & Tier 1-3 VMT Reductions	With Project & All VMT Reductions
Project Generated Vehicle Miles Traveled (VMT) Rate	10.4	10.4	10.4
Low VMT Screening Analysis	Yes (Pass)	Yes (Pass)	Yes (Pass)



Project Details

Timestamp of Analysis: February 12, 2024, 03:44:18 PM

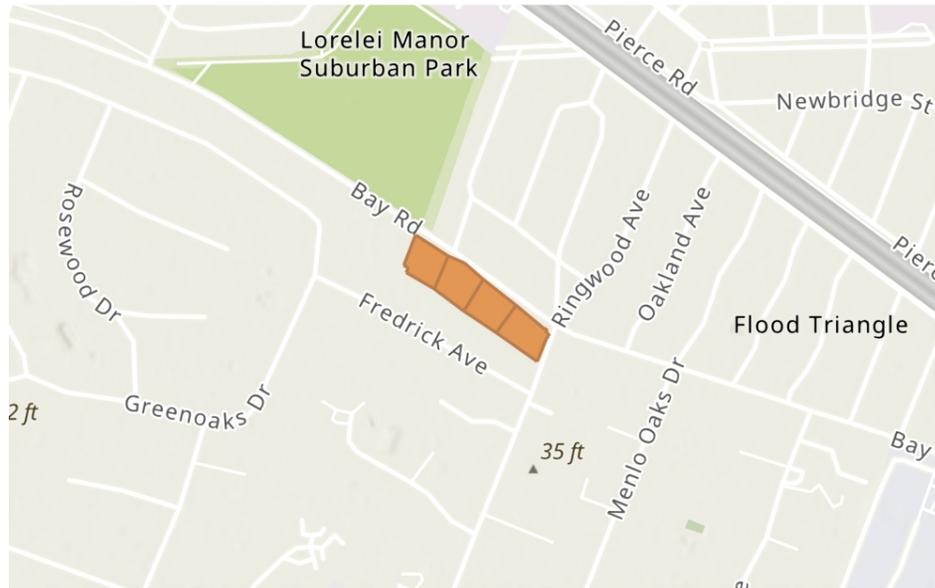
Project Name: Atherton HEU - 999 Ringwood Ave, 352, 318, and 296 Bay Road

Project Description: Atherton HEU

Project Location

jurisdiction:	apn	TAZ	061091060	2039	061091070	2039
Atherton	061091050	2039	061091080	2039		

Inside a TPA?
No (Fail)



Analysis Details

Data Version: C/CAG Travel Model

Analysis Methodology: TAZ

Baseline Year: 2015

Project Land Use

Residential:

Single Family DU:

Multifamily DU: 36

Total DUs: 36

Non-Residential:

Office KSF:

Local Serving Retail KSF:

Industrial KSF:

Residential Affordability (percent of all units):

Extremely Low Income: 0 %

Very Low Income: 20 %

Low Income: 0 %

Parking:

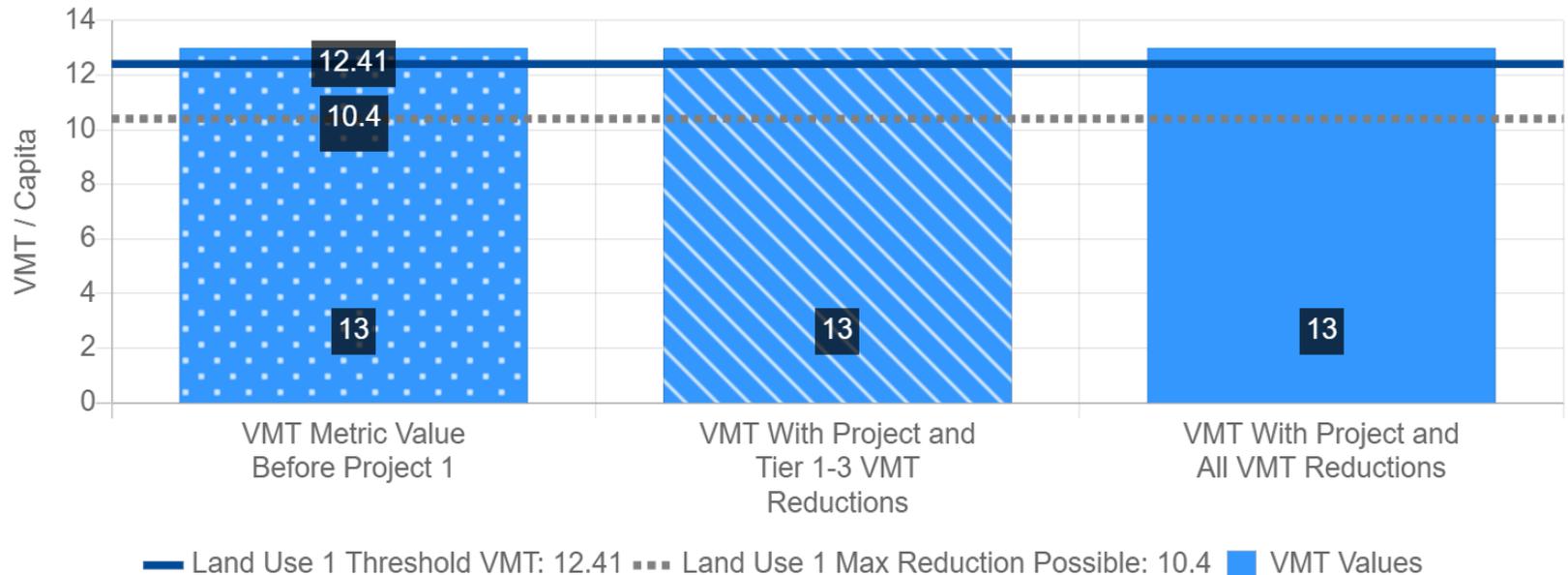
Motor Vehicle Parking:

Bicycle Parking:

Residential Vehicle Miles Traveled (VMT) Screening Results

Land Use Type 1:	Residential
VMT Without Project 1:	Home-Based VMT per Resident
VMT Baseline Description 1:	Bay Area Regional Average
VMT Baseline Value 1:	14.6
VMT Threshold Description 1:	-15%
Land Use 1 has been Pre-Screened by the Local Jurisdiction:	N/A

	Without Project	With Project & Tier 1-3 VMT Reductions	With Project & All VMT Reductions
Project Generated Vehicle Miles Traveled (VMT) Rate	13	13	13
Low VMT Screening Analysis	No (Fail)	No (Fail)	No (Fail)



Appendix B

Traffic Counts

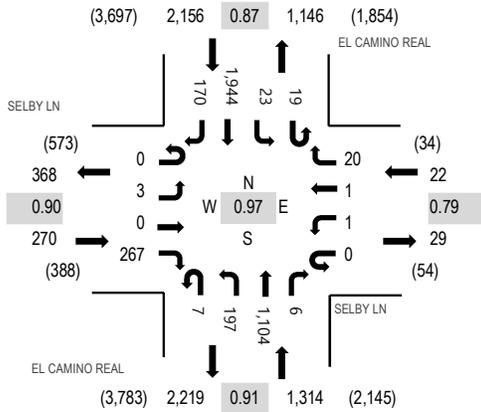
Location: 1 EL CAMINO REAL & SELBY LN AM

Date: Tuesday, May 16, 2023

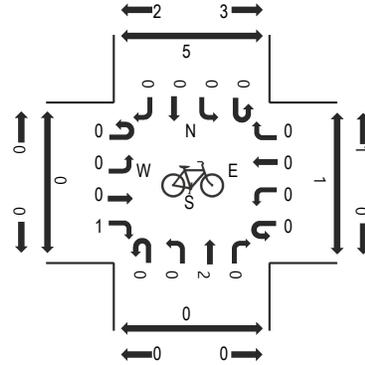
Peak Hour: 07:45 AM - 08:45 AM

Peak 15-Minutes: 07:45 AM - 08:00 AM

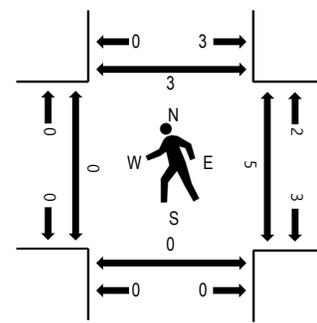
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

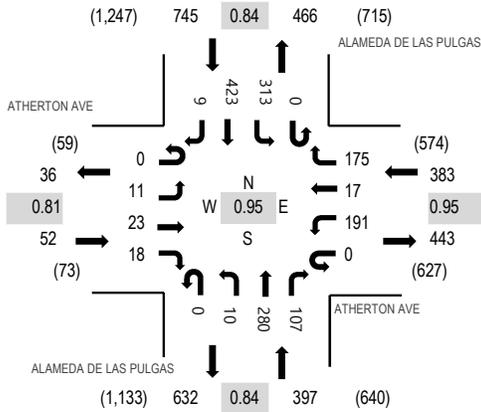
Traffic Counts - Motorized Vehicles

Interval Start Time	SELBY LN Eastbound				SELBY LN Westbound				EL CAMINO REAL Northbound				EL CAMINO REAL Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	1	16	0	0	0	3	2	31	109	0	0	6	187	8	364	2,658	0	3	0	1
7:15 AM	0	3	1	13	0	1	0	2	2	31	132	2	6	4	330	11	538	3,250	2	6	0	1
7:30 AM	0	2	0	39	0	0	0	4	1	39	187	1	3	5	480	24	785	3,673	3	1	0	1
7:45 AM	0	0	0	63	0	0	0	6	2	42	223	2	6	7	564	56	971	3,762	0	0	0	2
8:00 AM	0	0	0	60	0	0	0	7	1	69	270	1	1	6	470	71	956	3,606	0	4	0	0
8:15 AM	0	1	0	74	0	0	1	2	1	54	311	2	5	3	476	31	961		0	0	0	1
8:30 AM	0	2	0	70	0	1	0	5	3	32	300	1	7	7	434	12	874		0	1	0	0
8:45 AM	0	2	0	40	0	0	0	2	6	47	240	1	12	4	447	14	815		0	2	0	0

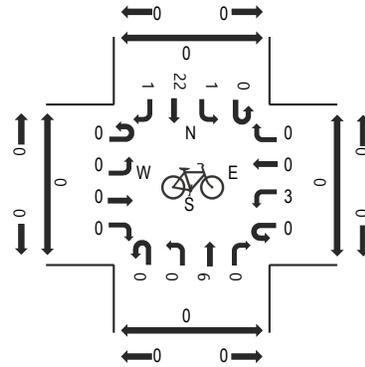
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	4	0	0	0	5	0	9
Lights	0	2	0	267	0	1	1	19	7	196	1,074	5	19	21	1,896	169	3,677
Mediums	0	1	0	0	0	0	0	1	0	1	26	1	0	2	43	1	76
Total	0	3	0	267	0	1	1	20	7	197	1,104	6	19	23	1,944	170	3,762

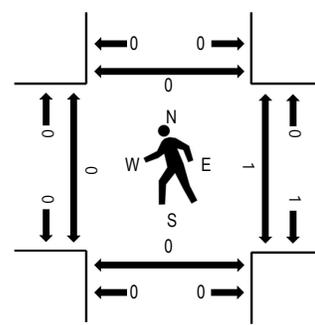
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

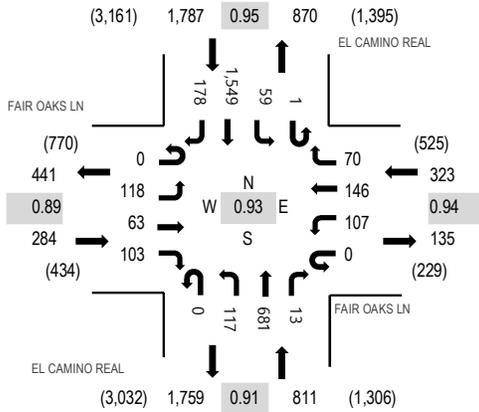
Traffic Counts - Motorized Vehicles

Interval Start Time	ATHERTON AVE Eastbound				ATHERTON AVE Westbound				ALAMEDA DE LAS PULGAS Northbound				ALAMEDA DE LAS PULGAS Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
	7:00 AM	0	1	1	1	0	15	3	10	0	0	31	13	0	23	62			0	160	1,027	0
7:15 AM	0	1	1	2	0	29	2	13	0	2	25	14	0	25	80	2	196	1,282	0	0	1	0
7:30 AM	0	3	3	2	0	45	3	18	0	1	47	18	0	33	115	4	292	1,453	1	0	0	0
7:45 AM	0	3	1	4	0	58	4	31	0	0	60	20	0	75	120	3	379	1,577	0	0	0	0
8:00 AM	0	1	9	6	0	43	5	40	0	1	61	28	0	115	105	1	415	1,507	0	1	0	0
8:15 AM	0	2	10	1	0	49	3	49	0	3	71	31	0	69	75	4	367		0	0	0	0
8:30 AM	0	5	3	7	0	41	5	55	0	6	88	28	0	54	123	1	416		0	0	0	0
8:45 AM	0	0	3	3	0	23	2	28	0	2	72	18	0	32	124	2	309		0	2	1	0

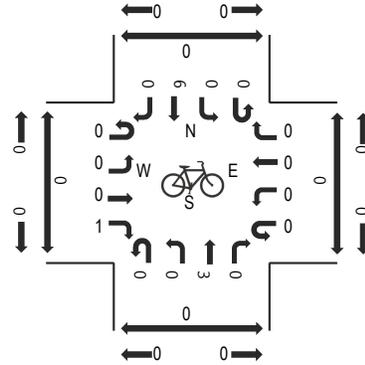
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1
Lights	0	10	22	17	0	189	16	174	0	10	274	106	0	308	415	7	1,548
Mediums	0	1	1	1	0	2	1	1	0	0	6	1	0	4	8	2	28
Total	0	11	23	18	0	191	17	175	0	10	280	107	0	313	423	9	1,577

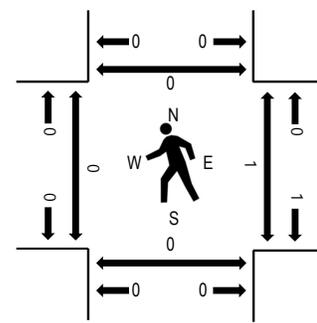
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	FAIR OAKS LN Eastbound				FAIR OAKS LN Westbound				EL CAMINO REAL Northbound				EL CAMINO REAL Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	8	11	8	0	7	9	14	0	8	69	3	0	4	146	21	308	2,252	0	0	0	0
7:15 AM	0	8	8	6	0	8	32	9	0	6	95	6	0	5	268	45	496	2,756	0	0	0	0
7:30 AM	0	10	7	18	0	8	44	15	0	19	111	2	0	13	389	53	689	3,125	0	1	0	0
7:45 AM	0	22	10	23	0	24	49	13	0	18	117	1	0	9	416	57	759	3,205	0	0	0	0
8:00 AM	0	23	21	39	0	31	37	18	0	35	179	2	1	14	371	41	812	3,174	0	1	0	0
8:15 AM	0	39	8	21	0	30	33	16	0	39	190	4	0	23	417	45	865		0	0	0	0
8:30 AM	0	34	24	20	0	22	27	23	0	25	195	6	0	13	345	35	769		0	0	0	0
8:45 AM	0	22	18	26	0	9	30	17	0	27	147	2	0	15	380	35	728		0	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	1	0	0	0	0	0	0	2	0	0	0	3	0	6
Lights	0	116	63	102	0	107	144	67	0	115	657	12	1	59	1,517	172	3,132
Mediums	0	2	0	0	0	0	2	3	0	2	22	1	0	0	29	6	67
Total	0	118	63	103	0	107	146	70	0	117	681	13	1	59	1,549	178	3,205

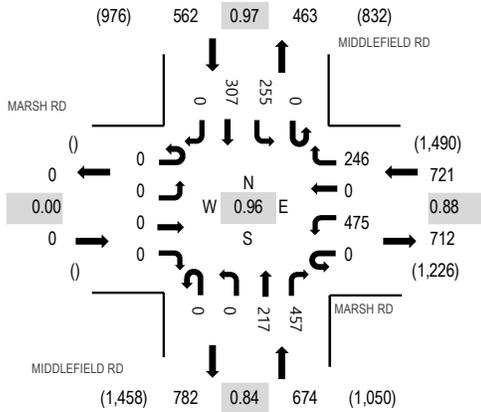
Location: 4 MIDDLEFIELD RD & MARSH RD AM

Date: Tuesday, May 16, 2023

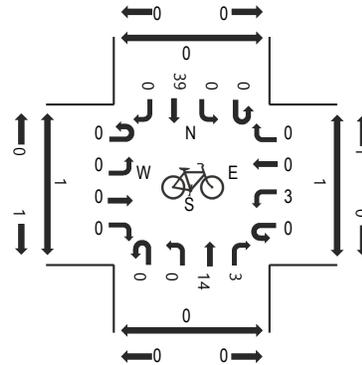
Peak Hour: 07:45 AM - 08:45 AM

Peak 15-Minutes: 08:30 AM - 08:45 AM

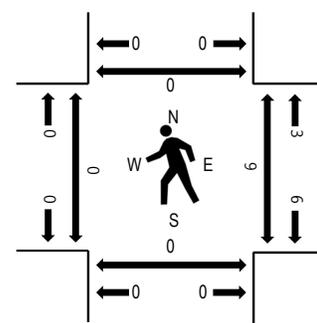
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

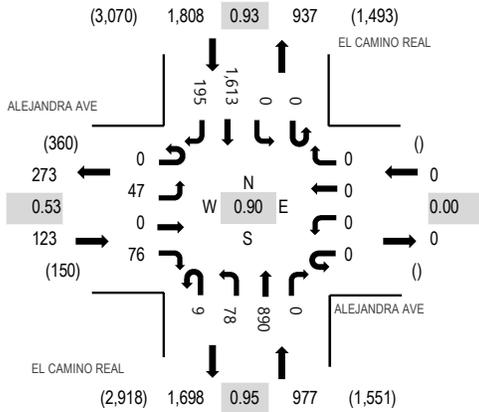
Traffic Counts - Motorized Vehicles

Interval Start Time	MARSH RD Eastbound				MARSH RD Westbound				MIDDLEFIELD RD Northbound				MIDDLEFIELD RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	0	0	0	0	105	0	59	0	0	8	61	0	53	24	0	310	1,559	0	0	0	0
7:15 AM	0	0	0	0	0	108	0	82	0	0	16	53	0	52	38	0	349	1,720	0	0	0	0
7:30 AM	0	0	0	0	0	147	0	75	0	0	22	74	0	60	53	0	431	1,876	0	0	0	0
7:45 AM	0	0	0	0	0	140	0	65	0	0	38	102	0	44	80	0	469	1,957	0	1	0	0
8:00 AM	0	0	0	0	0	97	0	56	0	0	63	109	0	63	83	0	471	1,957	0	1	0	0
8:15 AM	0	0	0	0	0	135	0	64	0	0	51	110	0	67	78	0	505		0	3	0	0
8:30 AM	0	0	0	0	0	103	0	61	0	0	65	136	0	81	66	0	512		0	4	0	0
8:45 AM	0	0	0	0	0	136	0	57	0	0	50	92	0	69	65	0	469		0	2	0	0

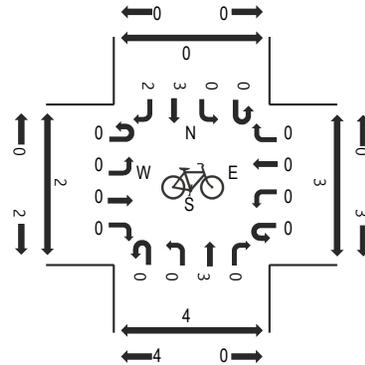
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	2
Lights	0	0	0	0	0	455	0	235	0	0	213	447	0	252	301	0	1,903
Mediums	0	0	0	0	0	19	0	11	0	0	4	9	0	3	6	0	52
Total	0	0	0	0	0	475	0	246	0	0	217	457	0	255	307	0	1,957

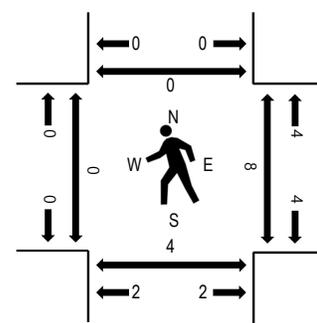
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ALEJANDRA AVE Eastbound				ALEJANDRA AVE Westbound				EL CAMINO REAL Northbound				EL CAMINO REAL Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
7:00 AM	0	1	0	1	0	0	0	0	1	5	88	0	0	0	158	14	268	1,880	0	5	1	0
7:15 AM	0	2	0	1	0	0	0	0	5	2	118	0	0	0	255	12	395	2,395	1	1	2	0
7:30 AM	0	5	0	6	0	0	0	0	2	7	132	0	0	0	371	23	546	2,810	1	2	0	0
7:45 AM	0	3	0	5	0	0	0	0	3	7	173	0	0	0	436	44	671	2,908	0	2	1	0
8:00 AM	0	6	0	14	0	0	0	0	2	21	242	0	0	0	440	58	783	2,891	0	2	2	0
8:15 AM	0	20	0	39	0	0	0	0	0	39	224	0	0	0	410	78	810		0	2	0	0
8:30 AM	0	18	0	18	0	0	0	0	4	11	251	0	0	0	327	15	644		0	2	1	0
8:45 AM	0	6	0	5	0	0	0	0	4	6	204	0	0	0	411	18	654		0	5	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	2	0	0	0	5	0	7
Lights	0	46	0	75	0	0	0	0	9	78	864	0	0	0	1,579	194	2,845
Mediums	0	1	0	1	0	0	0	0	0	0	24	0	0	0	29	1	56
Total	0	47	0	76	0	0	0	0	9	78	890	0	0	0	1,613	195	2,908

Traffic Data Service

San Jose, CA
 (408) 622-4787
 tdsbay@cs.com

File Name : 24AM FINAL
 Site Code : 00000024
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Vehicles

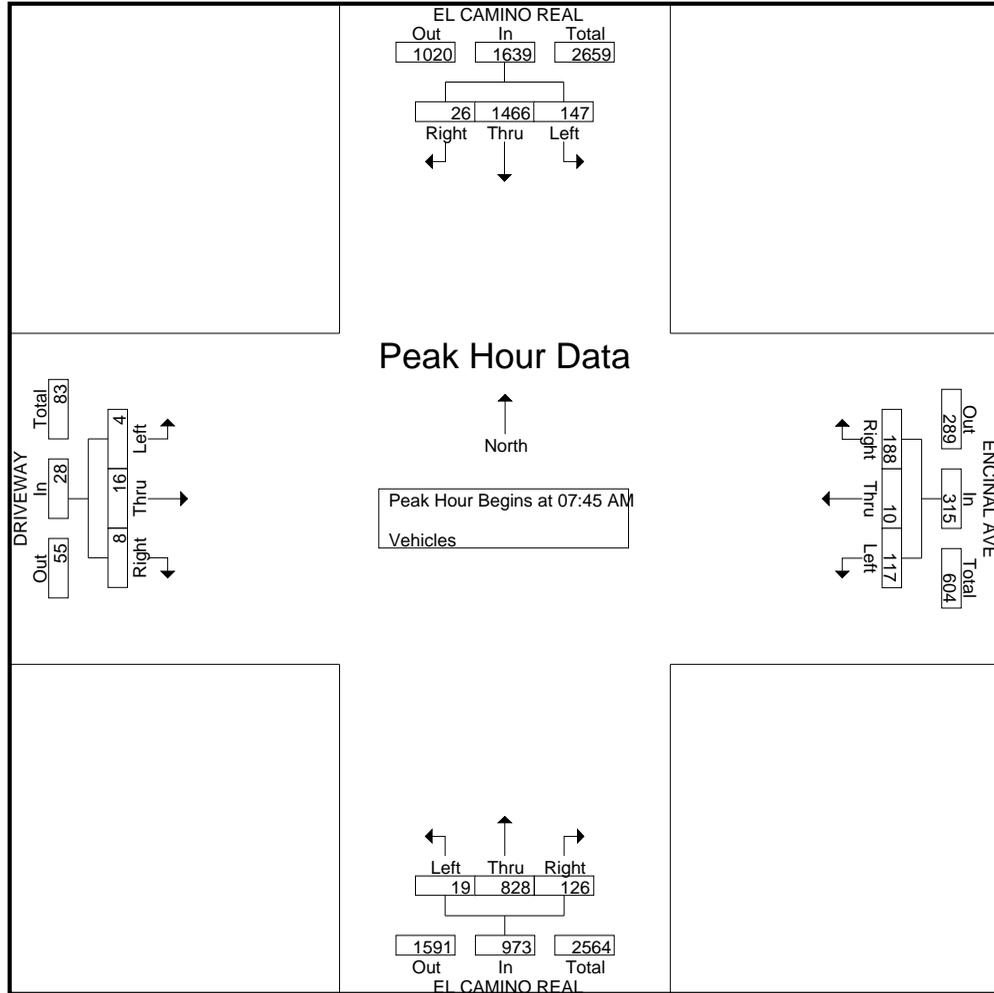
Start Time	EL CAMINO REAL Southbound					ENCINAL AVE Westbound					EL CAMINO REAL Northbound					DRIVEWAY Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	3	170	5	0	178	8	1	12	4	25	7	89	4	0	100	0	2	0	0	2	305
07:15 AM	2	242	12	4	260	17	0	12	0	29	12	103	2	0	117	0	1	1	0	2	408
07:30 AM	4	300	25	0	329	19	0	20	0	39	26	150	4	0	180	1	2	0	0	3	551
07:45 AM	12	373	44	1	430	41	1	27	0	69	30	162	2	0	194	0	10	0	1	11	704
Total	21	1085	86	5	1197	85	2	71	4	162	75	504	12	0	591	1	15	1	1	18	1968
08:00 AM	7	362	37	2	408	71	3	44	1	119	31	205	6	0	242	5	2	0	0	7	776
08:15 AM	3	377	31	2	413	49	3	28	0	80	24	249	5	0	278	0	2	2	1	5	776
08:30 AM	4	354	35	2	395	27	3	18	1	49	41	212	6	0	259	3	2	2	1	8	711
08:45 AM	6	357	36	3	402	21	2	21	1	45	30	215	9	0	254	1	1	0	0	2	703
Total	20	1450	139	9	1618	168	11	111	3	293	126	881	26	0	1033	9	7	4	2	22	2966
09:00 AM	4	274	21	2	301	26	4	16	2	48	24	184	11	0	219	0	1	2	0	3	571
09:15 AM	9	267	15	1	292	27	12	19	0	58	22	191	13	0	226	1	2	2	0	5	581
09:30 AM	16	243	15	0	274	15	7	24	4	50	14	193	14	0	221	1	1	4	0	6	551
09:45 AM	1	260	17	0	278	21	4	24	1	50	9	199	5	0	213	4	0	2	1	7	548
Total	30	1044	68	3	1145	89	27	83	7	206	69	767	43	0	879	6	4	10	1	21	2251
Grand Total	71	3579	293	17	3960	342	40	265	14	661	270	2152	81	0	2503	16	26	15	4	61	7185
Apprch %	1.8	90.4	7.4	0.4		51.7	6.1	40.1	2.1		10.8	86	3.2	0		26.2	42.6	24.6	6.6		
Total %	1	49.8	4.1	0.2	55.1	4.8	0.6	3.7	0.2	9.2	3.8	30	1.1	0	34.8	0.2	0.4	0.2	0.1	0.8	

Start Time	EL CAMINO REAL Southbound				ENCINAL AVE Westbound				EL CAMINO REAL Northbound				DRIVEWAY Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	12	373	44	429	41	1	27	69	30	162	2	194	0	10	0	10	702
08:00 AM	7	362	37	406	71	3	44	118	31	205	6	242	5	2	0	7	773
08:15 AM	3	377	31	411	49	3	28	80	24	249	5	278	0	2	2	4	773
08:30 AM	4	354	35	393	27	3	18	48	41	212	6	259	3	2	2	7	707
Total Volume	26	1466	147	1639	188	10	117	315	126	828	19	973	8	16	4	28	2955
% App. Total	1.6	89.4	9		59.7	3.2	37.1		12.9	85.1	2		28.6	57.1	14.3		
PHF	.542	.972	.835	.955	.662	.833	.665	.667	.768	.831	.792	.875	.400	.400	.500	.700	.956

Traffic Data Service

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File Name : 24AM FINAL
 Site Code : 0000024
 Start Date : 3/2/2023
 Page No : 2



Traffic Data Service

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 tdsbay@cs.com

File Name : 25AM FINAL
 Site Code : 00000025
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Vehicles

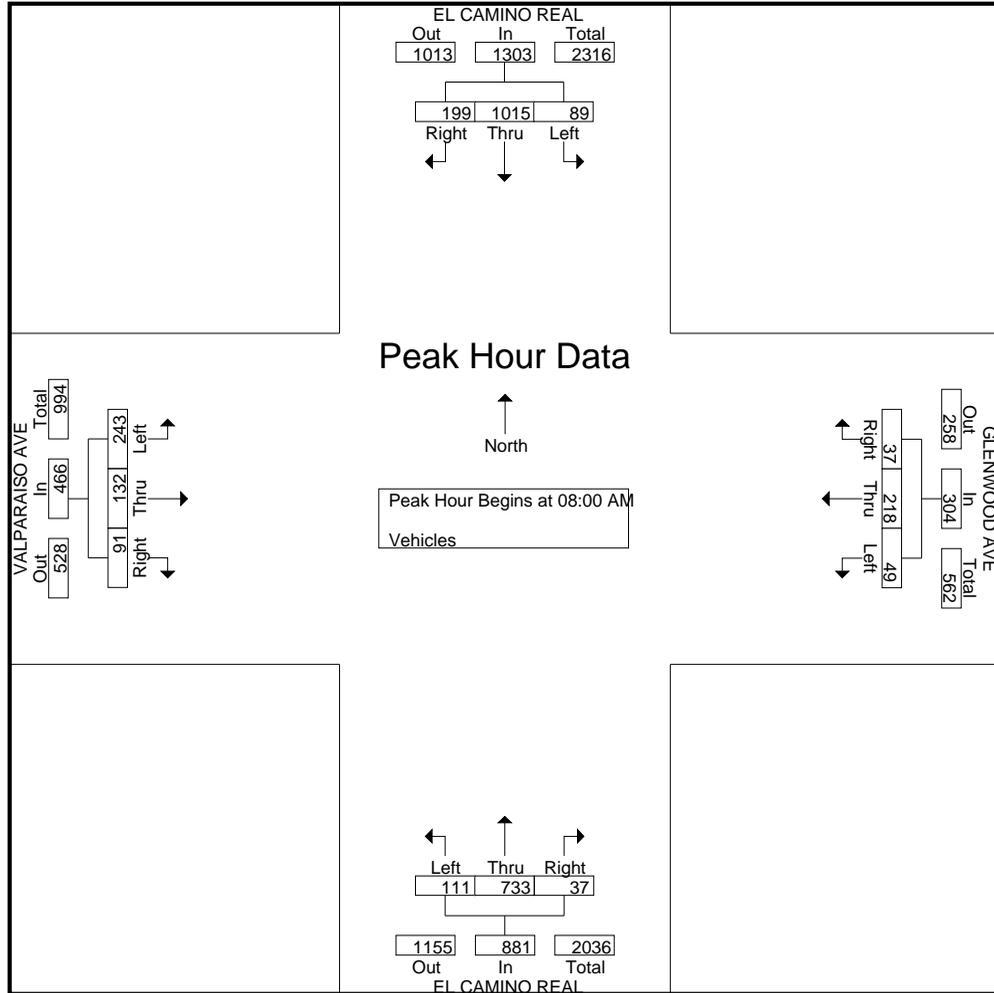
Start Time	EL CAMINO REAL Southbound					GLENWOOD AVE Westbound					EL CAMINO REAL Northbound					VALPARAISO AVE Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	21	135	2	2	160	1	16	4	2	23	4	68	8	1	81	4	9	26	0	39	303
07:15 AM	36	192	8	0	236	2	25	7	3	37	6	100	16	3	125	24	16	30	0	70	468
07:30 AM	51	188	9	0	248	9	34	9	3	55	6	122	19	1	148	11	13	37	0	61	512
07:45 AM	55	256	24	1	336	10	61	7	2	80	8	138	21	5	172	14	24	50	0	88	676
Total	163	771	43	3	980	22	136	27	10	195	24	428	64	10	526	53	62	143	0	258	1959
08:00 AM	46	257	32	13	348	7	62	10	4	83	14	181	21	0	216	16	44	59	0	119	766
08:15 AM	49	278	13	1	341	10	62	22	3	97	6	197	44	5	252	23	42	48	1	114	804
08:30 AM	38	223	23	3	287	11	62	12	2	87	10	169	31	1	211	26	20	81	0	127	712
08:45 AM	66	257	21	0	344	9	32	5	2	48	7	186	15	0	208	26	26	55	0	107	707
Total	199	1015	89	17	1320	37	218	49	11	315	37	733	111	6	887	91	132	243	1	467	2989
09:00 AM	55	225	9	1	290	10	33	10	5	58	5	183	13	6	207	11	27	36	0	74	629
09:15 AM	43	216	10	3	272	7	32	5	4	48	17	185	20	3	225	15	15	44	0	74	619
09:30 AM	38	185	17	0	240	8	19	16	5	48	6	166	25	1	198	13	22	43	0	78	564
09:45 AM	47	202	10	0	259	10	28	8	0	46	11	170	16	2	199	18	21	42	0	81	585
Total	183	828	46	4	1061	35	112	39	14	200	39	704	74	12	829	57	85	165	0	307	2397
Grand Total	545	2614	178	24	3361	94	466	115	35	710	100	1865	249	28	2242	201	279	551	1	1032	7345
Apprch %	16.2	77.8	5.3	0.7		13.2	65.6	16.2	4.9		4.5	83.2	11.1	1.2		19.5	27	53.4	0.1		
Total %	7.4	35.6	2.4	0.3	45.8	1.3	6.3	1.6	0.5	9.7	1.4	25.4	3.4	0.4	30.5	2.7	3.8	7.5	0	14.1	

Start Time	EL CAMINO REAL Southbound				GLENWOOD AVE Westbound				EL CAMINO REAL Northbound				VALPARAISO AVE Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 08:00 AM																	
08:00 AM	46	257	32	335	7	62	10	79	14	181	21	216	16	44	59	119	749
08:15 AM	49	278	13	340	10	62	22	94	6	197	44	247	23	42	48	113	794
08:30 AM	38	223	23	284	11	62	12	85	10	169	31	210	26	20	81	127	706
08:45 AM	66	257	21	344	9	32	5	46	7	186	15	208	26	26	55	107	705
Total Volume	199	1015	89	1303	37	218	49	304	37	733	111	881	91	132	243	466	2954
% App. Total	15.3	77.9	6.8		12.2	71.7	16.1		4.2	83.2	12.6		19.5	28.3	52.1		
PHF	.754	.913	.695	.947	.841	.879	.557	.809	.661	.930	.631	.892	.875	.750	.750	.917	.930

Traffic Data Service

San Jose, CA
 (408) 622-4787
 tdsbay@cs.com

File Name : 25AM FINAL
 Site Code : 00000025
 Start Date : 3/2/2023
 Page No : 2



TRAFFIC DATA SERVICE

6280 San Ignacio Ave Suite C
San Jose, CA 95119

tdsbay@cs.com

File Name : 14AM FINAL
Site Code : 00000014
Start Date : 12/8/2022
Page No : 1

Groups Printed- Vehicles

Start Time	MIDDLEFIELD RD Southbound					Westbound					MIDDLEFIELD RD Northbound					RAVENSWOOD AVE Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
07:00 AM	8	32	0	0	40	0	0	0	0	0	0	51	51	0	102	26	0	12	0	38	180
07:15 AM	13	34	0	0	47	0	0	0	0	0	0	61	76	0	137	29	0	4	1	34	218
07:30 AM	20	53	0	0	73	0	0	0	0	0	0	100	67	3	170	40	0	11	1	52	295
07:45 AM	11	70	0	0	81	0	0	0	0	0	0	128	97	6	231	74	0	25	3	102	414
Total	52	189	0	0	241	0	0	0	0	0	0	340	291	9	640	169	0	52	5	226	1107
08:00 AM	14	53	0	0	67	0	0	0	0	0	0	125	92	9	226	113	0	14	0	127	420
08:15 AM	23	57	0	0	80	0	0	0	0	0	0	84	81	32	197	124	0	44	3	171	448
08:30 AM	29	71	0	0	100	0	0	0	0	0	0	85	74	5	164	75	0	20	5	100	364
08:45 AM	6	39	0	0	45	0	0	0	0	0	0	48	62	5	115	36	0	16	5	57	217
Total	72	220	0	0	292	0	0	0	0	0	0	342	309	51	702	348	0	94	13	455	1449
09:00 AM	9	51	0	0	60	0	0	0	0	0	0	47	59	0	106	44	0	7	3	54	220
09:15 AM	18	67	0	0	85	0	0	0	0	0	0	45	52	1	98	71	0	12	0	83	266
09:30 AM	16	39	0	0	55	0	0	0	0	0	0	50	67	2	119	43	0	20	0	63	237
09:45 AM	11	40	0	0	51	0	0	0	0	0	0	62	91	1	154	26	0	12	1	39	244
Total	54	197	0	0	251	0	0	0	0	0	0	204	269	4	477	184	0	51	4	239	967
Grand Total	178	606	0	0	784	0	0	0	0	0	0	886	869	64	1819	701	0	197	22	920	3523
Apprch %	22.7	77.3	0	0		0	0	0	0		0	48.7	47.8	3.5		76.2	0	21.4	2.4		
Total %	5.1	17.2	0	0	22.3	0	0	0	0	0	0	25.1	24.7	1.8	51.6	19.9	0	5.6	0.6	26.1	

Start Time	MIDDLEFIELD RD Southbound				Westbound				MIDDLEFIELD RD Northbound				RAVENSWOOD AVE Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 07:45 AM																	
07:45 AM	11	70	0	81	0	0	0	0	0	128	97	225	74	0	25	99	405
08:00 AM	14	53	0	67	0	0	0	0	0	125	92	217	113	0	14	127	411
08:15 AM	23	57	0	80	0	0	0	0	0	84	81	165	124	0	44	168	413
08:30 AM	29	71	0	100	0	0	0	0	0	85	74	159	75	0	20	95	354
Total Volume	77	251	0	328	0	0	0	0	0	422	344	766	386	0	103	489	1583
% App. Total	23.5	76.5	0		0	0	0		0	55.1	44.9		78.9	0	21.1		
PHF	.664	.884	.000	.820	.000	.000	.000	.000	.000	.824	.887	.851	.778	.000	.585	.728	.958

TRAFFIC DATA SERVICE

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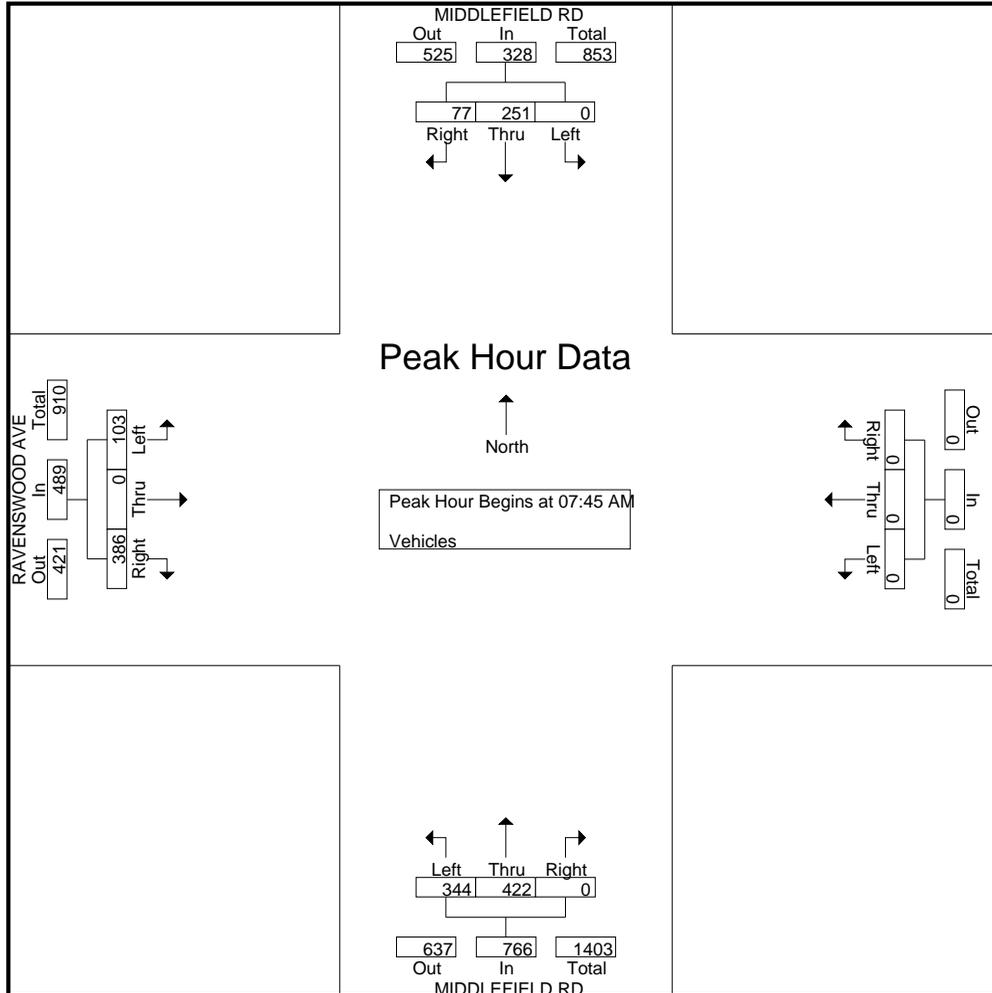
tdsbay@cs.com

File Name : 14AM FINAL

Site Code : 00000014

Start Date : 12/8/2022

Page No : 2



TRAFFIC DATA SERVICE

6280 San Ignacio Ave Suite C
San Jose, CA 95119

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File Name : 71AM FINAL
Site Code : 00000071
Start Date : 12/8/2022
Page No : 1

Groups Printed- Vehicles

Start Time	BAY RD Southbound						SONOMA AVE Southwestbound						RINGWOOD AVE Westbound						BAY RD Northbound						RINGWOOD AVE Eastbound						Int. Total
	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	
07:00 AM	22	12	1	0	7	42	0	1	2	0	3	6	0	1	0	0	3	4	0	0	10	32	0	42	2	0	2	7	0	11	105
07:15 AM	22	14	0	0	0	36	0	3	1	0	0	4	0	0	3	1	0	4	1	0	15	61	1	78	14	2	0	10	0	26	148
07:30 AM	42	23	1	0	9	75	0	3	0	0	5	8	0	0	5	0	6	11	0	0	7	91	0	98	19	0	0	8	0	27	219
07:45 AM	70	29	1	1	14	115	0	7	0	0	10	17	0	1	22	2	6	31	0	0	8	96	2	106	30	2	0	18	0	50	319
Total	156	78	3	1	30	268	0	14	3	0	18	35	0	2	30	3	15	50	1	0	40	280	3	324	65	4	2	43	0	114	791
08:00 AM	67	32	3	1	12	115	1	16	0	0	5	22	0	0	38	3	4	45	0	0	14	86	1	101	46	3	0	34	0	83	366
08:15 AM	47	41	0	2	8	98	3	5	6	0	5	19	0	1	6	0	1	8	2	0	16	80	2	100	70	7	5	33	0	115	340
08:30 AM	35	45	2	0	3	85	1	5	1	0	6	13	0	1	2	0	8	11	1	0	22	62	0	85	70	3	2	37	0	112	306
08:45 AM	33	57	1	0	3	94	1	4	3	0	4	12	0	0	0	0	4	4	0	0	12	55	3	70	24	0	6	21	0	51	231
Total	182	175	6	3	26	392	6	30	10	0	20	66	0	2	46	3	17	68	3	0	64	283	6	356	210	13	13	125	0	361	1243
09:00 AM	29	28	0	2	4	63	0	6	1	0	6	13	0	1	2	0	2	5	1	1	14	42	2	60	21	0	2	20	0	43	184
09:15 AM	20	28	0	0	2	50	0	2	3	0	2	7	0	0	0	1	1	2	1	0	14	31	0	46	15	4	1	18	0	38	143
09:30 AM	23	16	0	0	3	42	0	2	1	0	2	5	0	0	0	0	2	2	1	0	21	35	0	57	19	1	0	13	0	33	139
09:45 AM	14	9	0	0	0	23	0	3	1	0	3	7	0	1	0	0	2	3	1	0	15	29	0	45	17	1	3	12	0	33	111
Total	86	81	0	2	9	178	0	13	6	0	13	32	0	2	2	1	7	12	4	1	64	137	2	208	72	6	6	63	0	147	577
Grand Total	424	334	9	6	65	838	6	57	19	0	51	133	0	6	78	7	39	130	8	1	168	700	11	888	347	23	21	231	0	622	2611
Apprch %	50.6	39.9	1.1	0.7	7.8		4.5	42.9	14.3	0	38.3		0	4.6	60	5.4	30		0.9	0.1	18.9	78.8	1.2		55.8	3.7	3.4	37.1	0		
Total %	16.2	12.8	0.3	0.2	2.5	32.1	0.2	2.2	0.7	0	2	5.1	0	0.2	3	0.3	1.5	5	0.3	0	6.4	26.8	0.4	34	13.3	0.9	0.8	8.8	0	23.8	

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File Name : 71AM FINAL
Site Code : 00000071
Start Date : 12/8/2022
Page No : 2

Start Time	BAY RD Southbound					SONOMA AVE Southwestbound					RINGWOOD AVE Westbound					BAY RD Northbound					RINGWOOD AVE Eastbound					Int. Total
	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	
Peak Hour Analysis From 07:00 AM to 09:45 AM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 07:45 AM																										
07:45 AM	70	29	1	1	101	0	7	0	0	7	0	1	22	2	25	0	0	8	96	104	30	2	0	18	50	287
08:00 AM	67	32	3	1	103	1	16	0	0	17	0	0	38	3	41	0	0	14	86	100	46	3	0	34	83	344
08:15 AM	47	41	0	2	90	3	5	6	0	14	0	1	6	0	7	2	0	16	80	98	70	7	5	33	115	324
08:30 AM	35	45	2	0	82	1	5	1	0	7	0	1	2	0	3	1	0	22	62	85	70	3	2	37	112	289
Total Volume	219	147	6	4	376	5	33	7	0	45	0	3	68	5	76	3	0	60	324	387	216	15	7	122	360	1244
% App. Total	58.2	39.1	1.6	1.1		11.1	73.3	15.6	0		0	3.9	89.5	6.6		0.8	0	15.5	83.7		60	4.2	1.9	33.9		
PHF	.782	.817	.500	.500	.913	.417	.516	.292	.000	.662	.000	.750	.447	.417	.463	.375	.000	.682	.844	.930	.771	.536	.350	.824	.783	.904

TRAFFIC DATA SERVICE

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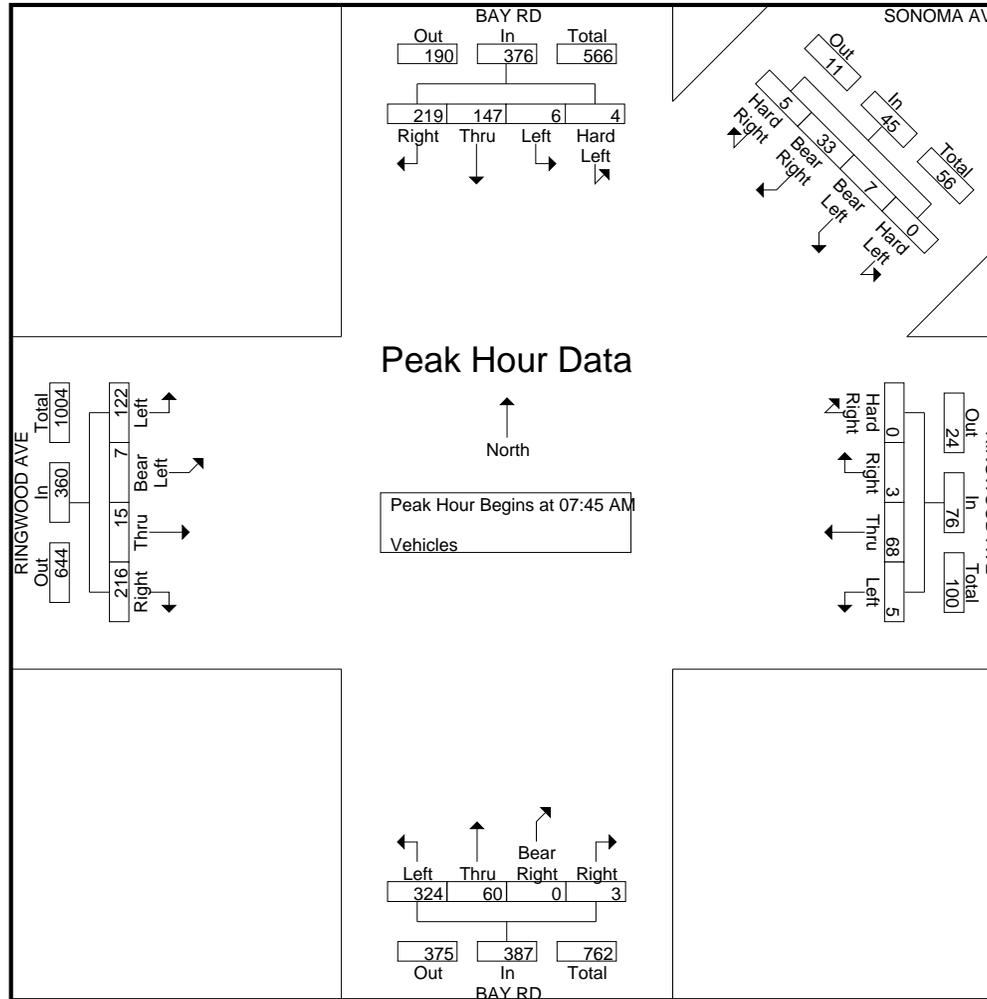
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File Name : 71AM FINAL

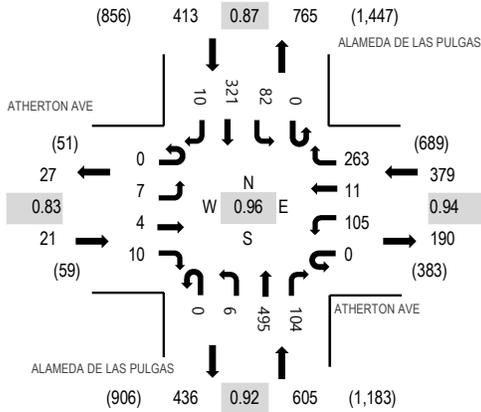
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Start Date : 12/8/2022

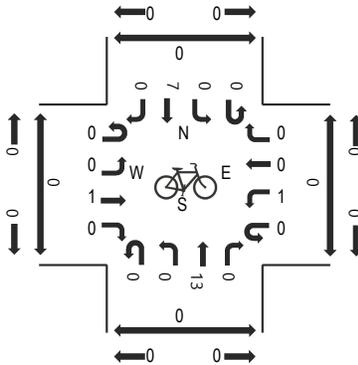
Page No : 3



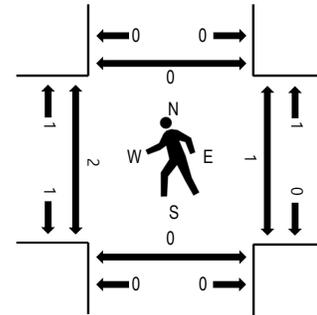
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ATHERTON AVE Eastbound				ATHERTON AVE Westbound				ALAMEDA DE LAS PULGAS Northbound				ALAMEDA DE LAS PULGAS Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	2	5	0	35	5	43	0	1	113	29	0	20	84	1	338	1,406	0	0	0	0
4:15 PM	0	3	5	5	0	27	2	61	0	3	130	21	0	22	84	1	364	1,417	2	0	1	0
4:30 PM	0	1	0	1	0	24	4	73	0	1	123	41	0	20	77	4	369	1,418	1	1	0	0
4:45 PM	0	2	1	1	0	25	2	49	0	3	113	22	0	26	87	4	335	1,396	0	0	0	0
5:00 PM	0	0	0	5	0	35	2	64	0	1	122	22	0	18	78	2	349	1,381	0	0	0	0
5:15 PM	0	4	3	3	0	21	3	77	0	1	137	19	0	18	79	0	365		1	0	0	0
5:30 PM	0	6	0	3	0	19	2	43	0	2	120	26	0	24	101	1	347		2	0	0	0
5:45 PM	0	4	0	5	0	21	1	51	0	3	108	22	0	22	81	2	320		1	0	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	7	4	10	0	105	11	260	0	6	494	102	0	82	320	10	1,411
Mediums	0	0	0	0	0	0	0	3	0	0	1	2	0	0	1	0	7
Total	0	7	4	10	0	105	11	263	0	6	495	104	0	82	321	10	1,418

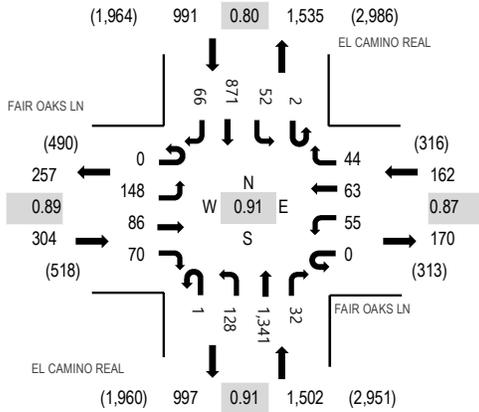
Location: 3 EL CAMINO REAL & FAIR OAKS LN PM

Date: Tuesday, May 16, 2023

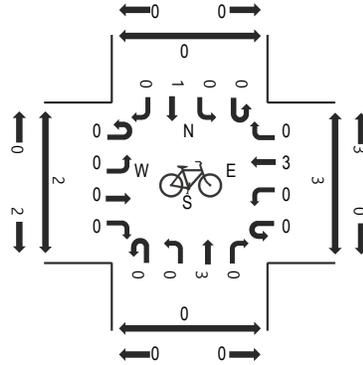
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:00 PM - 04:15 PM

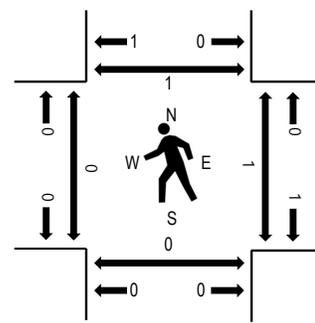
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	FAIR OAKS LN Eastbound				FAIR OAKS LN Westbound				EL CAMINO REAL Northbound				EL CAMINO REAL Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	34	23	22	0	17	12	13	0	30	345	10	0	18	265	26	815	2,959	0	1	0	0
4:15 PM	0	43	26	16	0	11	23	13	0	36	304	5	0	3	182	12	674	2,861	0	0	0	0
4:30 PM	0	33	24	17	0	9	11	13	0	31	374	9	0	16	230	15	782	2,870	0	0	0	0
4:45 PM	0	38	13	15	0	18	17	5	1	31	318	8	2	15	194	13	688	2,811	0	0	0	1
5:00 PM	0	23	20	11	0	13	14	16	0	38	318	12	0	17	213	22	717	2,790	0	0	0	0
5:15 PM	0	34	13	12	0	8	13	18	0	19	318	7	1	8	217	15	683		0	0	0	1
5:30 PM	0	23	13	14	0	12	20	9	0	22	338	12	0	9	234	17	723		0	0	0	0
5:45 PM	0	20	13	18	0	10	13	8	0	27	325	13	0	6	201	13	667		1	0	0	1

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Lights	0	144	85	70	0	55	63	43	1	127	1,329	30	2	52	864	65	2,930
Mediums	0	4	1	0	0	0	0	1	0	1	12	2	0	0	6	1	28
Total	0	148	86	70	0	55	63	44	1	128	1,341	32	2	52	871	66	2,959

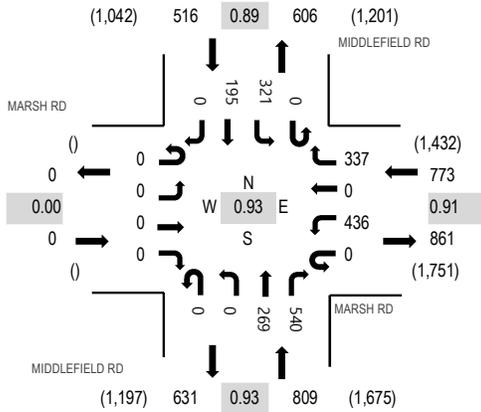
Location: 4 MIDDLEFIELD RD & MARSH RD PM

Date: Tuesday, May 16, 2023

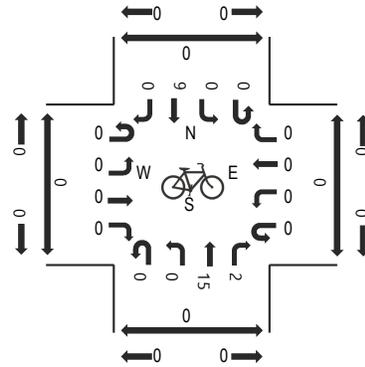
Peak Hour: 04:45 PM - 05:45 PM

Peak 15-Minutes: 05:15 PM - 05:30 PM

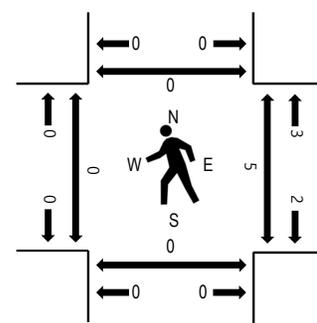
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	MARSH RD Eastbound				MARSH RD Westbound				MIDDLEFIELD RD Northbound				MIDDLEFIELD RD Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	0	0	0	0	101	0	72	0	0	85	146	0	91	60	0	555	2,093	0	4	0	0
4:15 PM	0	0	0	0	0	74	0	85	0	0	69	166	0	72	59	0	525	2,059	0	1	0	0
4:30 PM	0	0	0	0	0	82	0	69	0	0	74	130	0	95	39	0	489	2,097	0	1	0	0
4:45 PM	0	0	0	0	0	116	0	80	0	0	74	131	0	83	40	0	524	2,098	0	1	0	0
5:00 PM	0	0	0	0	0	104	0	72	0	0	63	155	0	87	40	0	521	2,056	0	0	0	0
5:15 PM	0	0	0	0	0	106	0	106	0	0	69	139	0	79	64	0	563		0	2	0	0
5:30 PM	0	0	0	0	0	110	0	79	0	0	63	115	0	72	51	0	490		0	2	0	0
5:45 PM	0	0	0	0	0	104	0	72	0	0	69	127	0	63	47	0	482		0	2	0	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	0	0	0	0	432	0	337	0	0	264	532	0	320	191	0	2,076
Mediums	0	0	0	0	0	4	0	0	0	0	5	8	0	1	4	0	22
Total	0	0	0	0	0	436	0	337	0	0	269	540	0	321	195	0	2,098

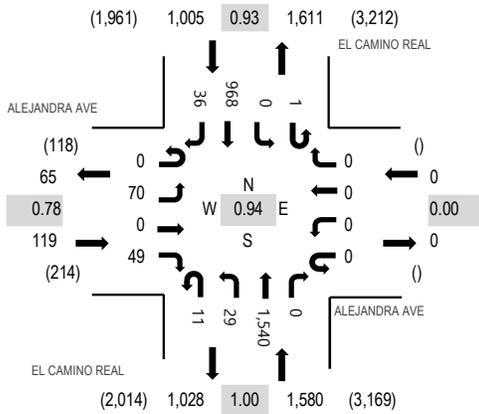
Location: 5 EL CAMINO REAL & ALEJANDRA AVE PM

Date: Tuesday, May 16, 2023

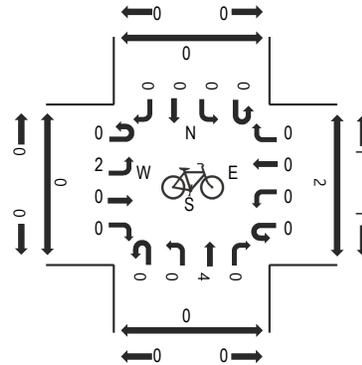
Peak Hour: 04:00 PM - 05:00 PM

Peak 15-Minutes: 04:00 PM - 04:15 PM

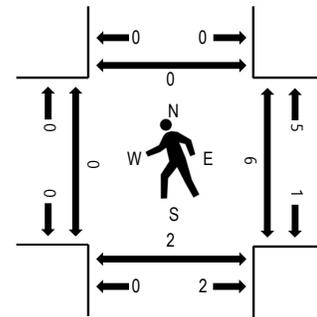
Peak Hour - Motorized Vehicles



Peak Hour - Bicycles



Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts - Motorized Vehicles

Interval Start Time	ALEJANDRA AVE Eastbound				ALEJANDRA AVE Westbound				EL CAMINO REAL Northbound				EL CAMINO REAL Southbound				Total	Rolling Hour	Pedestrian Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right			West	East	South	North
4:00 PM	0	23	0	12	0	0	0	0	2	7	408	0	0	0	254	16	722	2,704	0	1	0	0
4:15 PM	0	20	0	18	0	0	0	0	3	9	360	0	0	0	248	8	666	2,652	0	0	0	0
4:30 PM	0	8	0	13	0	0	0	0	1	6	386	0	0	0	223	9	646	2,638	0	5	0	0
4:45 PM	0	19	0	6	0	0	0	0	5	7	386	0	1	0	243	3	670	2,689	0	0	2	0
5:00 PM	0	18	0	14	0	0	0	0	4	9	388	0	1	0	226	10	670	2,640	0	2	0	0
5:15 PM	0	12	0	11	0	0	0	0	7	4	390	0	0	0	225	3	652		0	1	2	0
5:30 PM	0	9	0	8	0	0	0	0	4	4	389	0	0	0	271	12	697		0	1	1	0
5:45 PM	0	13	0	10	0	0	0	0	1	8	381	0	0	0	205	3	621		0	3	1	0

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total	
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right		
Articulated Trucks	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lights	0	70	0	49	0	0	0	0	11	29	1,523	0	1	0	961	36	2,680	
Mediums	0	0	0	0	0	0	0	0	0	0	17	0	0	0	7	0	24	
Total	0	70	0	49	0	0	0	0	11	29	1,540	0	1	0	968	36	2,704	

Traffic Data Service

San Jose, CA
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File Name : 24PM FINAL
 Site Code : 00000024
 Start Date : 3/2/2023
 Page No : 1

Groups Printed- Vehicles

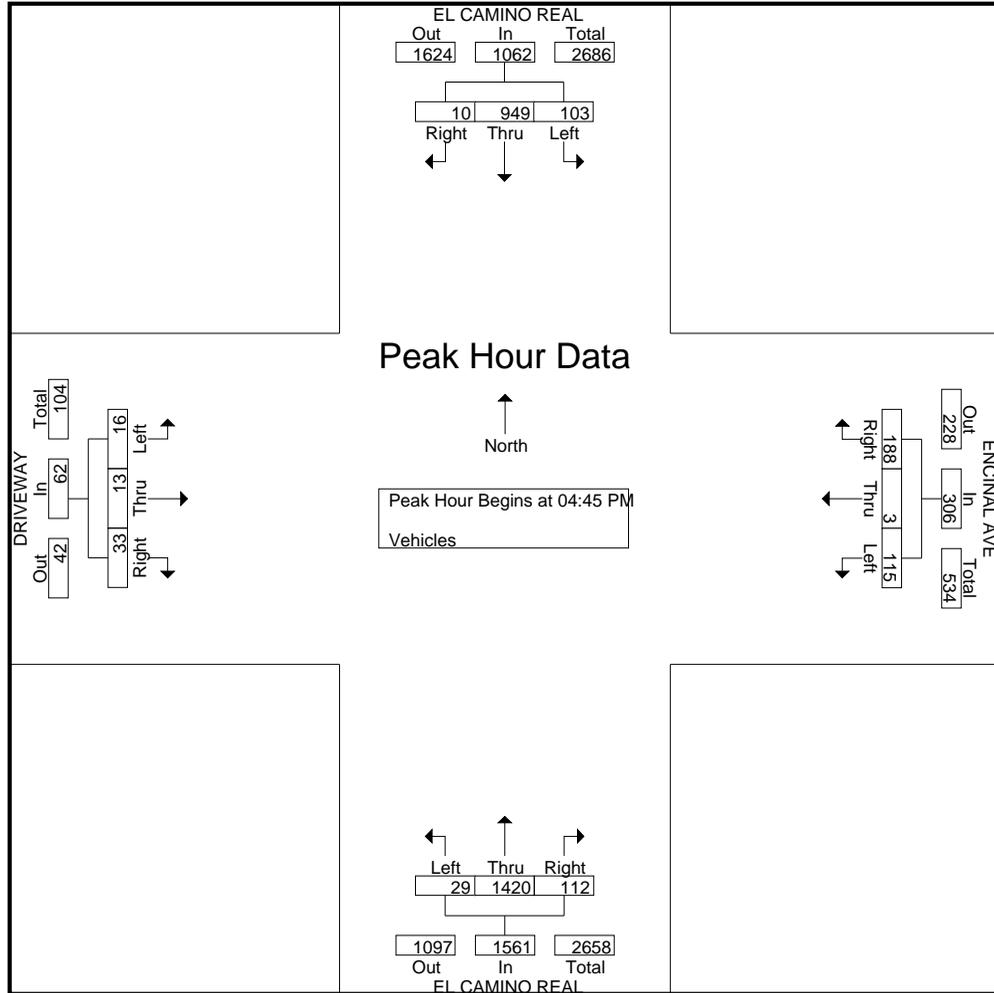
Start Time	EL CAMINO REAL Southbound					ENCINAL AVE Westbound					EL CAMINO REAL Northbound					DRIVEWAY Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	8	242	26	2	278	41	1	29	3	74	33	312	11	0	356	3	3	4	1	11	719
04:15 PM	2	215	19	1	237	27	1	27	5	60	31	341	6	0	378	3	2	6	1	12	687
04:30 PM	2	207	15	2	226	48	1	20	1	70	34	375	9	0	418	5	4	5	0	14	728
04:45 PM	4	244	22	3	273	39	2	28	6	75	27	387	12	0	426	11	3	5	1	20	794
Total	16	908	82	8	1014	155	5	104	15	279	125	1415	38	0	1578	22	12	20	3	57	2928
05:00 PM	2	223	26	4	255	44	0	29	2	75	26	334	7	0	367	16	7	5	0	28	725
05:15 PM	2	249	31	3	285	42	0	36	6	84	31	346	8	0	385	6	2	2	0	10	764
05:30 PM	2	233	24	0	259	63	1	22	2	88	28	353	2	0	383	0	1	4	0	5	735
05:45 PM	1	239	21	3	264	27	1	35	3	66	28	353	3	0	384	3	1	2	0	6	720
Total	7	944	102	10	1063	176	2	122	13	313	113	1386	20	0	1519	25	11	13	0	49	2944
06:00 PM	1	228	12	1	242	41	3	31	4	79	20	344	7	0	371	1	1	2	0	4	696
06:15 PM	2	224	11	3	240	28	0	21	0	49	15	321	3	0	339	1	1	3	0	5	633
06:30 PM	3	196	14	2	215	21	0	20	0	41	13	318	1	0	332	3	1	2	0	6	594
06:45 PM	2	185	10	4	201	19	1	20	3	43	14	262	4	0	280	2	1	4	0	7	531
Total	8	833	47	10	898	109	4	92	7	212	62	1245	15	0	1322	7	4	11	0	22	2454
Grand Total	31	2685	231	28	2975	440	11	318	35	804	300	4046	73	0	4419	54	27	44	3	128	8326
Apprch %	1	90.3	7.8	0.9		54.7	1.4	39.6	4.4		6.8	91.6	1.7	0		42.2	21.1	34.4	2.3		
Total %	0.4	32.2	2.8	0.3	35.7	5.3	0.1	3.8	0.4	9.7	3.6	48.6	0.9	0	53.1	0.6	0.3	0.5	0	1.5	

Start Time	EL CAMINO REAL Southbound				ENCINAL AVE Westbound				EL CAMINO REAL Northbound				DRIVEWAY Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	4	244	22	270	39	2	28	69	27	387	12	426	11	3	5	19	784
05:00 PM	2	223	26	251	44	0	29	73	26	334	7	367	16	7	5	28	719
05:15 PM	2	249	31	282	42	0	36	78	31	346	8	385	6	2	2	10	755
05:30 PM	2	233	24	259	63	1	22	86	28	353	2	383	0	1	4	5	733
Total Volume	10	949	103	1062	188	3	115	306	112	1420	29	1561	33	13	16	62	2991
% App. Total	0.9	89.4	9.7		61.4	1	37.6		7.2	91	1.9		53.2	21	25.8		
PHF	.625	.953	.831	.941	.746	.375	.799	.890	.903	.917	.604	.916	.516	.464	.800	.554	.954

Traffic Data Service

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File Name : 24PM FINAL
 Site Code : 0000024
 Start Date : 3/2/2023
 Page No : 2



Traffic Data Service

San Jose, CA
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File Name : 25PM FINAL
Site Code : 00000025
Start Date : 3/2/2023
Page No : 1

Groups Printed- Vehicles

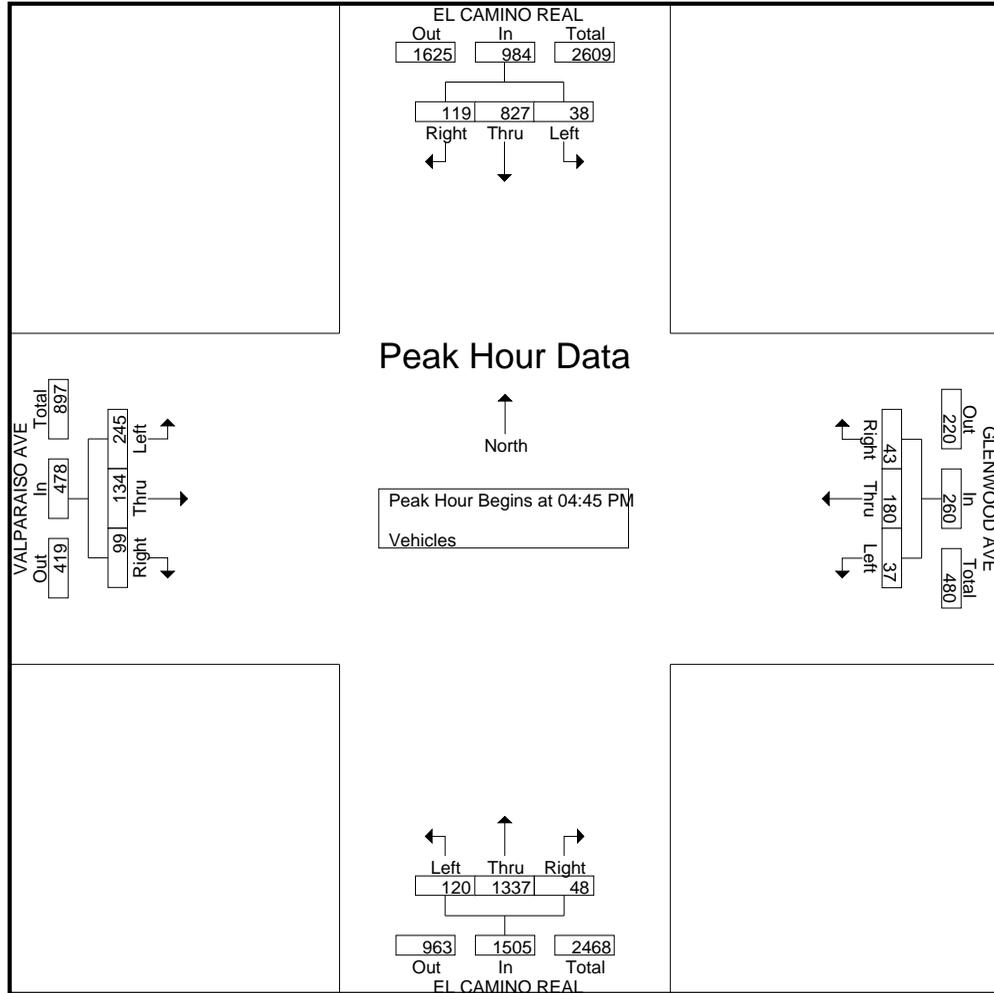
Start Time	EL CAMINO REAL Southbound					GLENWOOD AVE Westbound					EL CAMINO REAL Northbound					VALPARAISO AVE Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
04:00 PM	27	226	14	0	267	5	48	10	5	68	8	316	28	2	354	14	29	53	1	97	786
04:15 PM	22	195	12	3	232	12	37	8	5	62	14	311	23	4	352	20	43	60	1	124	770
04:30 PM	24	189	11	1	225	5	26	8	7	46	16	323	26	4	369	13	40	81	0	134	774
04:45 PM	43	210	9	2	264	8	55	7	6	76	12	353	34	1	400	29	29	61	2	121	861
Total	116	820	46	6	988	30	166	33	23	252	50	1303	111	11	1475	76	141	255	4	476	3191
05:00 PM	24	199	6	1	230	13	50	11	4	78	11	293	34	1	339	25	30	71	0	126	773
05:15 PM	26	218	15	1	260	15	28	7	5	55	11	345	17	0	373	20	40	63	0	123	811
05:30 PM	26	200	8	1	235	7	47	12	2	68	14	346	35	3	398	25	35	50	0	110	811
05:45 PM	25	210	15	1	251	10	47	11	6	74	16	322	28	0	366	25	40	53	0	118	809
Total	101	827	44	4	976	45	172	41	17	275	52	1306	114	4	1476	95	145	237	0	477	3204
06:00 PM	31	208	16	2	257	6	34	7	2	49	10	318	21	0	349	19	27	48	0	94	749
06:15 PM	43	186	5	3	237	8	36	5	4	53	12	293	19	2	326	20	25	46	0	91	707
06:30 PM	33	162	6	0	201	11	30	11	1	53	12	250	31	0	293	16	16	32	0	64	611
06:45 PM	36	164	5	1	206	11	26	6	5	48	11	255	18	0	284	16	21	21	0	58	596
Total	143	720	32	6	901	36	126	29	12	203	45	1116	89	2	1252	71	89	147	0	307	2663
Grand Total	360	2367	122	16	2865	111	464	103	52	730	147	3725	314	17	4203	242	375	639	4	1260	9058
Apprch %	12.6	82.6	4.3	0.6		15.2	63.6	14.1	7.1		3.5	88.6	7.5	0.4		19.2	29.8	50.7	0.3		
Total %	4	26.1	1.3	0.2	31.6	1.2	5.1	1.1	0.6	8.1	1.6	41.1	3.5	0.2	46.4	2.7	4.1	7.1	0	13.9	

Start Time	EL CAMINO REAL Southbound				GLENWOOD AVE Westbound				EL CAMINO REAL Northbound				VALPARAISO AVE Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 04:45 PM																	
04:45 PM	43	210	9	262	8	55	7	70	12	353	34	399	29	29	61	119	850
05:00 PM	24	199	6	229	13	50	11	74	11	293	34	338	25	30	71	126	767
05:15 PM	26	218	15	259	15	28	7	50	11	345	17	373	20	40	63	123	805
05:30 PM	26	200	8	234	7	47	12	66	14	346	35	395	25	35	50	110	805
Total Volume	119	827	38	984	43	180	37	260	48	1337	120	1505	99	134	245	478	3227
% App. Total	12.1	84	3.9		16.5	69.2	14.2		3.2	88.8	8		20.7	28	51.3		
PHF	.692	.948	.633	.939	.717	.818	.771	.878	.857	.947	.857	.943	.853	.838	.863	.948	.949

Traffic Data Service

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File Name : 25PM FINAL
 Site Code : 00000025
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TRAFFIC DATA SERVICE

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San Jose, CA 95119

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File Name : 14PM FINAL
Site Code : 00000014
Start Date : 12/8/2022
Page No : 1

Groups Printed- Vehicles

Start Time	MIDDLEFIELD RD Southbound					Westbound					MIDDLEFIELD RD Northbound					RAVENSWOOD AVE Eastbound					Int. Total
	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	
02:00 PM	9	50	0	0	59	0	0	0	0	0	0	51	52	2	105	84	0	25	0	109	273
02:15 PM	16	43	0	0	59	0	0	0	0	0	0	47	58	80	185	21	0	9	8	38	282
02:30 PM	10	50	0	0	60	0	0	0	0	0	0	48	56	18	122	47	0	21	2	70	252
02:45 PM	7	32	0	0	39	0	0	0	0	0	0	85	52	2	139	102	0	25	4	131	309
Total	42	175	0	0	217	0	0	0	0	0	0	231	218	102	551	254	0	80	14	348	1116
03:00 PM	16	81	0	0	97	0	0	0	0	0	0	95	60	4	159	107	0	36	0	143	399
03:15 PM	11	57	0	0	68	0	0	0	0	0	0	81	70	8	159	90	0	38	1	129	356
03:30 PM	15	66	0	0	81	0	0	0	0	0	0	82	82	8	172	92	0	27	4	123	376
03:45 PM	17	48	0	0	65	0	0	0	0	0	0	88	59	3	150	94	0	36	0	130	345
Total	59	252	0	0	311	0	0	0	0	0	0	346	271	23	640	383	0	137	5	525	1476
04:00 PM	23	83	0	0	106	0	0	0	0	0	0	94	58	5	157	96	0	30	0	126	389
04:15 PM	16	86	0	0	102	0	0	0	0	0	0	96	85	2	183	103	0	20	1	124	409
04:30 PM	15	92	0	0	107	0	0	0	0	0	0	100	66	3	169	135	0	27	2	164	440
04:45 PM	16	86	0	0	102	0	0	0	0	0	0	101	75	2	178	126	0	26	0	152	432
Total	70	347	0	0	417	0	0	0	0	0	0	391	284	12	687	460	0	103	3	566	1670
05:00 PM	20	59	0	0	79	0	0	0	0	0	0	110	70	0	180	111	0	37	0	148	407
05:15 PM	15	90	0	0	105	0	0	0	0	0	0	127	76	0	203	118	0	43	0	161	469
05:30 PM	21	90	0	0	111	0	0	0	0	0	0	120	79	0	199	114	0	42	0	156	466
05:45 PM	16	70	0	0	86	0	0	0	0	0	0	111	103	3	217	111	0	27	1	139	442
Total	72	309	0	0	381	0	0	0	0	0	0	468	328	3	799	454	0	149	1	604	1784
06:00 PM	18	81	0	0	99	0	0	0	0	0	0	83	73	1	157	110	0	36	0	146	402
06:15 PM	12	90	0	0	102	0	0	0	0	0	0	68	54	2	124	100	0	24	0	124	350
06:30 PM	16	76	0	0	92	0	0	0	0	0	0	66	61	0	127	75	0	21	0	96	315
06:45 PM	8	36	0	0	44	0	0	0	0	0	0	77	76	1	154	76	0	24	0	100	298
Total	54	283	0	0	337	0	0	0	0	0	0	294	264	4	562	361	0	105	0	466	1365
Grand Total	297	1366	0	0	1663	0	0	0	0	0	0	1730	1365	144	3239	1912	0	574	23	2509	7411
Apprch %	17.9	82.1	0	0		0	0	0	0		0	53.4	42.1	4.4		76.2	0	22.9	0.9		
Total %	4	18.4	0	0	22.4	0	0	0	0	0	0	23.3	18.4	1.9	43.7	25.8	0	7.7	0.3	33.9	

Start Time	MIDDLEFIELD RD Southbound				Westbound				MIDDLEFIELD RD Northbound				RAVENSWOOD AVE Eastbound				Int. Total
	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	Right	Thru	Left	App. Total	
Peak Hour Analysis From 02:00 PM to 06:45 PM - Peak 1 of 1																	
Peak Hour for Entire Intersection Begins at 05:00 PM																	
05:00 PM	20	59	0	79	0	0	0	0	0	110	70	180	111	0	37	148	407
05:15 PM	15	90	0	105	0	0	0	0	0	127	76	203	118	0	43	161	469
05:30 PM	21	90	0	111	0	0	0	0	0	120	79	199	114	0	42	156	466
05:45 PM	16	70	0	86	0	0	0	0	0	111	103	214	111	0	27	138	438
Total Volume	72	309	0	381	0	0	0	0	0	468	328	796	454	0	149	603	1780
% App. Total	18.9	81.1	0		0	0	0		0	58.8	41.2		75.3	0	24.7		
PHF	.857	.858	.000	.858	.000	.000	.000	.000	.000	.921	.796	.930	.962	.000	.866	.936	.949

TRAFFIC DATA SERVICE

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San Jose, CA 95119

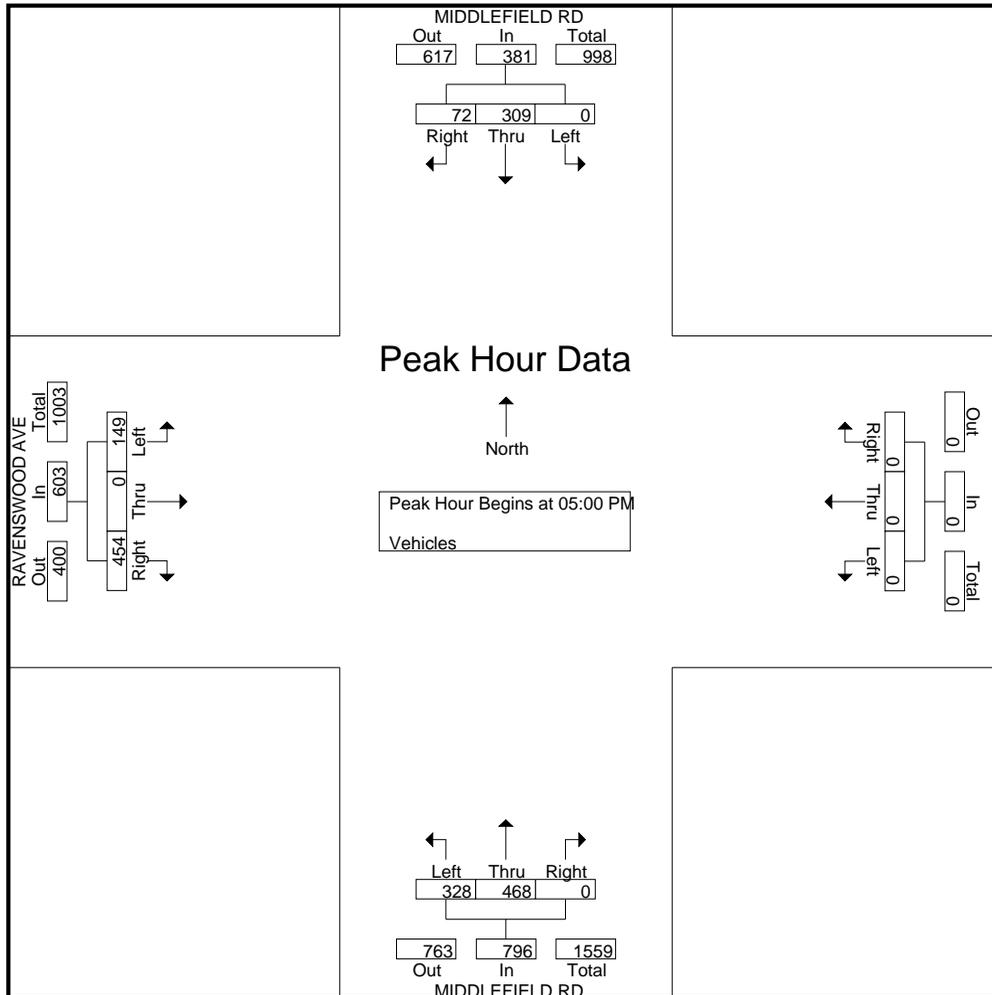
tdsbay@cs.com

File Name : 14PM FINAL

Site Code : 00000014

Start Date : 12/8/2022

Page No : 2



TRAFFIC DATA SERVICE

6280 San Ignacio Ave Suite C
San Jose, CA 95119

tdsbay@cs.com

File Name : 71PM FINAL
Site Code : 00000071
Start Date : 12/8/2022
Page No : 1

Groups Printed- Vehicles

Start Time	BAY RD Southbound						SONOMA AVE Southwestbound						RINGWOOD AVE Westbound						BAY RD Northbound						RINGWOOD AVE Eastbound						Int. Total
	Right	Thru	Left	Hard Left	Peds	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	Peds	App. Total	Hard Right	Right	Thru	Left	Peds	App. Total	Right	Bear Right	Thru	Left	Peds	App. Total	Right	Thru	Bear Left	Left	Peds	App. Total	
04:00 PM	27	40	1	0	1	69	1	3	2	0	1	7	0	1	2	0	0	3	1	1	14	25	0	41	50	1	7	39	1	98	218
04:15 PM	34	24	1	1	1	61	3	4	1	0	1	9	0	2	0	0	1	3	1	2	18	23	1	45	51	3	4	28	0	86	204
04:30 PM	17	24	0	0	7	48	1	2	3	0	4	10	0	0	1	0	2	3	1	0	15	21	0	37	70	0	5	27	0	102	200
04:45 PM	14	22	0	1	1	38	0	1	2	0	1	4	0	1	1	0	1	3	0	0	16	36	0	52	46	2	11	30	1	90	187
Total	92	110	2	2	10	216	5	10	8	0	7	30	0	4	4	0	4	12	3	3	63	105	1	175	217	6	27	124	2	376	809
05:00 PM	36	28	0	0	2	66	0	3	0	0	0	3	0	0	2	1	0	3	0	1	18	28	1	48	62	4	3	26	0	95	215
05:15 PM	34	14	1	1	0	50	1	2	2	0	0	5	0	0	0	0	0	0	2	1	15	40	1	59	61	3	5	36	1	106	220
05:30 PM	18	15	0	0	1	34	3	3	1	0	0	7	0	0	2	1	0	3	1	1	20	40	0	62	55	6	5	27	0	93	199
05:45 PM	27	13	0	0	0	40	2	7	0	0	0	9	0	0	4	1	0	5	0	2	20	24	0	46	41	4	6	34	0	85	185
Total	115	70	1	1	3	190	6	15	3	0	0	24	0	0	8	3	0	11	3	5	73	132	2	215	219	17	19	123	1	379	819
06:00 PM	16	14	1	0	0	31	1	2	1	1	0	5	0	0	0	0	0	0	0	0	22	11	0	33	24	1	4	15	0	44	113
06:15 PM	26	10	1	0	0	37	0	1	1	0	1	3	0	0	2	2	1	5	0	1	13	21	0	35	24	4	3	22	0	53	133
06:30 PM	19	17	0	0	0	36	0	1	0	0	0	1	0	1	1	1	0	3	0	0	16	13	0	29	25	3	4	23	0	55	124
06:45 PM	21	13	0	0	0	34	1	4	0	0	0	5	0	2	1	0	0	3	1	1	14	20	0	36	26	1	0	34	0	61	139
Total	82	54	2	0	0	138	2	8	2	1	1	14	0	3	4	3	1	11	1	2	65	65	0	133	99	9	11	94	0	213	509
Grand Total	289	234	5	3	13	544	13	33	13	1	8	68	0	7	16	6	5	34	7	10	201	302	3	523	535	32	57	341	3	968	2137
Apprch %	53.1	43	0.9	0.6	2.4		19.1	48.5	19.1	1.5	11.8		0	20.6	47.1	17.6	14.7		1.3	1.9	38.4	57.7	0.6		55.3	3.3	5.9	35.2	0.3		
Total %	13.5	10.9	0.2	0.1	0.6	25.5	0.6	1.5	0.6	0	0.4	3.2	0	0.3	0.7	0.3	0.2	1.6	0.3	0.5	9.4	14.1	0.1	24.5	25	1.5	2.7	16	0.1	45.3	

TRAFFIC DATA SERVICE

6280 San Ignacio Ave Suite C
San Jose, CA 95119

tdsbay@cs.com

File Name : 71PM FINAL
Site Code : 00000071
Start Date : 12/8/2022
Page No : 2

Start Time	BAY RD Southbound					SONOMA AVE Southwestbound					RINGWOOD AVE Westbound					BAY RD Northbound					RINGWOOD AVE Eastbound					Int. Total
	Right	Thru	Left	Hard Left	App. Total	Hard Right	Bear Right	Bear Left	Hard Left	App. Total	Hard Right	Right	Thru	Left	App. Total	Right	Bear Right	Thru	Left	App. Total	Right	Thru	Bear Left	Left	App. Total	
Peak Hour Analysis From 04:00 PM to 06:45 PM - Peak 1 of 1																										
Peak Hour for Entire Intersection Begins at 05:00 PM																										
05:00 PM	36	28	0	0	64	0	3	0	0	3	0	0	2	1	3	0	1	18	28	47	62	4	3	26	95	212
05:15 PM	34	14	1	1	50	1	2	2	0	5	0	0	0	0	0	2	1	15	40	58	61	3	5	36	105	218
05:30 PM	18	15	0	0	33	3	3	1	0	7	0	0	2	1	3	1	1	20	40	62	55	6	5	27	93	198
05:45 PM	27	13	0	0	40	2	7	0	0	9	0	0	4	1	5	0	2	20	24	46	41	4	6	34	85	185
Total Volume	115	70	1	1	187	6	15	3	0	24	0	0	8	3	11	3	5	73	132	213	219	17	19	123	378	813
% App. Total	61.5	37.4	0.5	0.5		2.5	62.5	12.5	0		0	0	72.7	27.3		1.4	2.3	34.3	62		57.9	4.5	5	32.5		
PHF	.799	.625	.250	.250	.730	.500	.536	.375	.000	.667	.000	.000	.500	.750	.550	.375	.625	.913	.825	.859	.883	.708	.792	.854	.900	.932

TRAFFIC DATA SERVICE

6280 San Ignacio Ave Suite C
San Jose, CA 95119

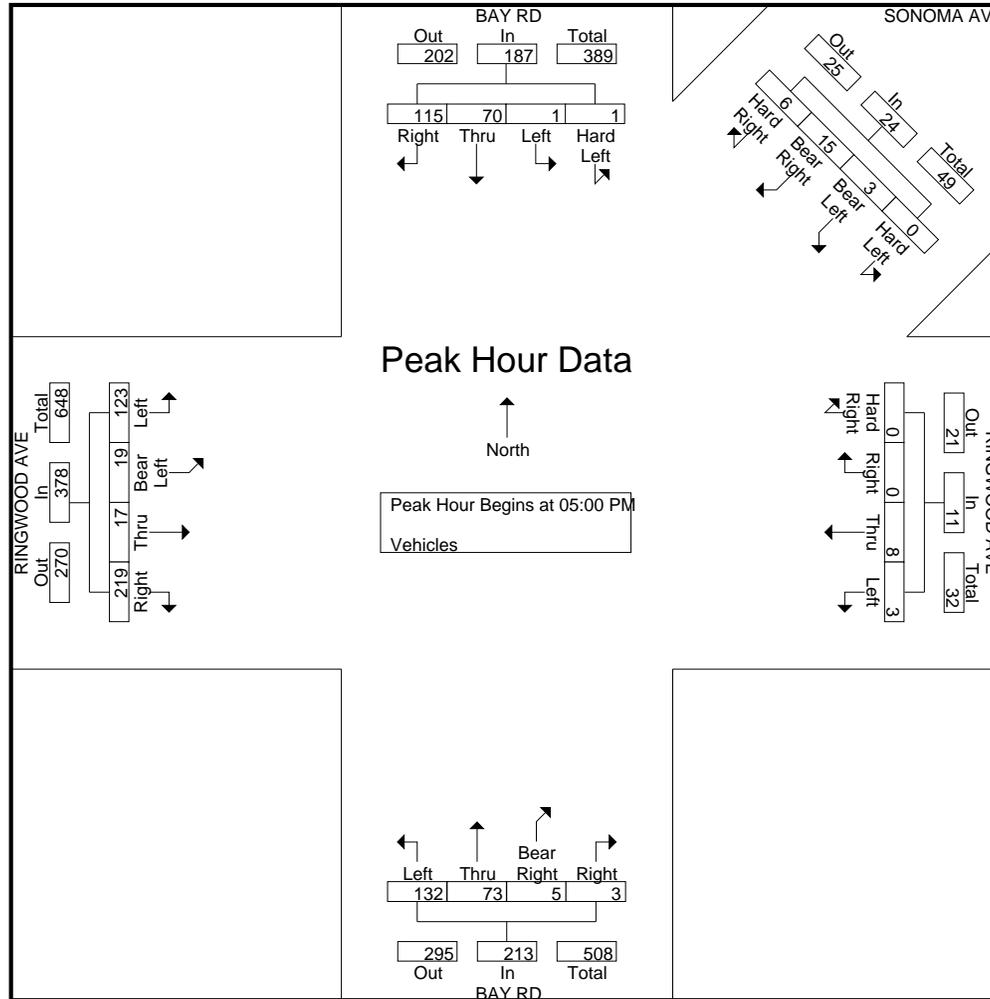
tdsbay@cs.com

File Name : 71PM FINAL

Site Code : 0000071

Start Date : 12/8/2022

Page No : 3



Appendix C

Traffic Volumes

Intersection Number: **1**
 Synchro Node Number: 1
 Intersection Name: El Camino Real and Selby Ln
 Peak Hour: AM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	170	1944	42	20	1	1	6	1104	204	267	0	3	3762
Proposed Project Trips	2	27	0	0	0	0	0	37	3	5	0	2	76
Existing + Project Conditions	172	1971	42	20	1	1	6	1141	207	272	0	5	3838
Cumulative Conditions	170	1952	42	20	1	1	6	1395	288	267	0	17	4159
Cumulative + Project Conditions	172	1979	42	20	1	1	6	1432	291	272	0	19	4235

Intersection Number: **2**
 Synchro Node Number: 2
 Intersection Name: Alameda de las Pulgas and Atherton Ave
 Peak Hour: AM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	9	423	313	175	17	191	107	280	10	18	23	11	1577
Proposed Project Trips	0	4	3	2	0	2	1	4	0	0	0	0	16
Existing + Project Conditions	9	427	316	177	17	193	108	284	10	18	23	11	1593
Cumulative Conditions	9	429	313	175	20	198	110	355	11	22	23	17	1682
Cumulative + Project Conditions	9	433	316	177	20	200	111	359	11	22	23	17	1698

Intersection Number: **3**
 Synchro Node Number: 3
 Intersection Name: El Camino Real and Fair Oaks Ln
 Peak Hour: AM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	178	1549	60	70	146	107	13	681	117	103	63	118	3205
Proposed Project Trips	2	25	1	1	2	1	0	34	1	1	1	1	70
Existing + Project Conditions	180	1574	61	71	148	108	13	715	118	104	64	119	3275
Cumulative Conditions	178	1551	75	73	151	114	15	961	119	119	86	118	3560
Cumulative + Project Conditions	180	1576	76	74	153	115	15	995	120	120	87	119	3630

Intersection Number: **4**
 Synchro Node Number: 4
 Intersection Name: Middlefield Rd and Marsh Rd
 Peak Hour: AM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	0	307	255	246	0	475	457	217	0	0	0	0	1957
Proposed Project Trips	0	3	3	4	0	5	5	3	0	0	0	0	23
Existing + Project Conditions	0	310	258	250	0	480	462	220	0	0	0	0	1980
Cumulative Conditions	0	326	255	388	0	475	474	270	0	0	0	0	2188
Cumulative + Project Conditions	0	329	258	392	0	480	479	273	0	0	0	0	2211

Intersection Number: **5**
 Synchro Node Number: 5
 Intersection Name: El Camino Real and Alejandra Ave
 Peak Hour: AM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	195	1613	0	0	0	0	0	890	87	76	0	47	2908
Proposed Project Trips	5	23	0	0	0	0	0	24	4	11	0	9	76
Existing + Project Conditions	200	1636	0	0	0	0	0	914	91	87	0	56	2984
Cumulative Conditions	195	1657	0	0	0	0	0	1149	87	76	0	47	3211
Cumulative + Project Conditions	200	1680	0	0	0	0	0	1173	91	87	0	56	3287

Intersection Number: **6**
 Synchro Node Number: 6
 Intersection Name: El Camino Real and Encinal Ave
 Peak Hour: AM
 Count Date: 03/02/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	26	1466	147	188	10	117	126	828	19	8	16	4	2955
Proposed Project Trips	0	30	2	3	0	3	2	24	0	0	0	0	64
Existing + Project Conditions	26	1496	149	191	10	120	128	852	19	8	16	4	3019
Cumulative Conditions	26	1486	172	325	10	117	134	828	19	8	16	4	3145
Cumulative + Project Conditions	26	1516	174	328	10	120	136	852	19	8	16	4	3209

Intersection Number: **7**
 Synchro Node Number: 7
 Intersection Name: El Camino Real and Valparaiso Ave/Glenwood Ave
 Peak Hour: AM
 Count Date: 03/02/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	199	1015	89	37	218	49	37	733	111	91	132	243	2954
Proposed Project Trips	4	25	1	1	2	0	0	17	3	7	1	9	70
Existing + Project Conditions	203	1040	90	38	220	49	37	750	114	98	133	252	3024
Cumulative Conditions	205	1017	100	37	218	49	37	834	114	91	135	265	3102
Cumulative + Project Conditions	209	1042	101	38	220	49	37	851	117	98	136	274	3172

Intersection Number: **8**
 Synchro Node Number: 8
 Intersection Name: Middlefield Rd and Ravenswood Ave
 Peak Hour: AM
 Count Date: 05/24/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	83	328	0	0	0	0	0	415	393	356	0	95	1670
Proposed Project Trips	1	4	0	0	0	0	0	6	7	4	0	1	23
Existing + Project Conditions	84	332	0	0	0	0	0	421	400	360	0	96	1693
Cumulative Conditions	77	369	0	0	0	0	0	468	490	446	0	103	1953
Cumulative + Project Conditions	78	373	0	0	0	0	0	474	497	450	0	104	1976

Intersection Number: **9**
 Synchro Node Number: 9
 Intersection Name: Bay Rd and Ringwood Ave/Sonoma Ave
 Peak Hour: AM
 Count Date: 12/08/22
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	219	147	10	8	101	12	3	60	324	216	15	129	1244
Proposed Project Trips	6	9	0	0	1	0	0	3	3	2	0	2	26
Existing + Project Conditions	225	156	10	8	102	12	3	63	327	218	15	131	1270
Cumulative Conditions	250	149	10	8	101	28	3	72	324	226	15	132	1318
Cumulative + Project Conditions	256	158	10	8	102	28	3	75	327	228	15	134	1344

Intersection Number: **1**
 Synchro Node Number: 1
 Intersection Name: El Camino Real and Selby Ln
 Peak Hour: PM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	50	1184	59	27	2	0	8	1745	234	197	0	7	3513
Proposed Project Trips	3	37	1	0	0	0	0	33	4	3	0	1	82
Existing + Project Conditions	53	1221	60	27	2	0	8	1778	238	200	0	8	3595
Cumulative Conditions	74	1304	59	27	2	0	8	1797	234	241	0	9	3755
Cumulative + Project Conditions	77	1341	60	27	2	0	8	1830	238	244	0	10	3837

Intersection Number: **2**
 Synchro Node Number: 2
 Intersection Name: Alameda de las Pulgas and Atherton Ave
 Peak Hour: PM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	10	321	82	263	11	105	104	495	6	10	4	7	1418
Proposed Project Trips	0	4	1	3	0	1	1	5	0	0	0	0	15
Existing + Project Conditions	10	325	83	266	11	106	105	500	6	10	4	7	1433
Cumulative Conditions	17	434	82	263	13	111	112	509	9	11	6	9	1576
Cumulative + Project Conditions	17	438	83	266	13	112	113	514	9	11	6	9	1591

Intersection Number: **3**
 Synchro Node Number: 3
 Intersection Name: El Camino Real and Fair Oaks Ln
 Peak Hour: PM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	66	871	54	44	63	55	32	1341	129	70	86	148	2959
Proposed Project Trips	1	36	1	1	1	1	0	30	2	1	1	1	76
Existing + Project Conditions	67	907	55	45	64	56	32	1371	131	71	87	149	3035
Cumulative Conditions	66	1065	54	83	106	55	32	1341	197	77	87	149	3312
Cumulative + Project Conditions	67	1101	55	84	107	56	32	1371	199	78	88	150	3388

Intersection Number: **4**
 Synchro Node Number: 4
 Intersection Name: Middlefield Rd and Marsh Rd
 Peak Hour: PM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	0	195	321	337	0	436	540	269	0	0	0	0	2098
Proposed Project Trips	0	4	3	3	0	5	5	3	0	0	0	0	23
Existing + Project Conditions	0	199	324	340	0	441	545	272	0	0	0	0	2121
Cumulative Conditions	0	365	321	337	0	478	540	325	0	0	0	0	2366
Cumulative + Project Conditions	0	369	324	340	0	483	545	328	0	0	0	0	2389

Intersection Number: **5**
 Synchro Node Number: 5
 Intersection Name: El Camino Real and Alejandra Ave
 Peak Hour: PM
 Count Date: 05/16/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	36	969	0	0	0	0	0	1540	40	49	0	70	2704
Proposed Project Trips	10	25	0	0	0	0	0	26	10	6	0	7	84
Existing + Project Conditions	46	994	0	0	0	0	0	1566	50	55	0	77	2788
Cumulative Conditions	36	1124	0	0	0	0	0	1599	40	49	0	70	2918
Cumulative + Project Conditions	46	1149	0	0	0	0	0	1625	50	55	0	77	3002

Intersection Number: **6**
 Synchro Node Number: 6
 Intersection Name: El Camino Real and Encinal Ave
 Peak Hour: PM
 Count Date: 03/02/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	10	949	103	188	3	115	112	1420	29	33	13	16	2991
Proposed Project Trips	0	29	3	3	0	2	3	34	0	0	0	0	74
Existing + Project Conditions	10	978	106	191	3	117	115	1454	29	33	13	16	3065
Cumulative Conditions	10	949	291	321	3	138	120	1420	29	33	13	16	3343
Cumulative + Project Conditions	10	978	294	324	3	140	123	1454	29	33	13	16	3417

Intersection Number: **7**
 Synchro Node Number: 7
 Intersection Name: El Camino Real and Valparaiso Ave/Glenwood Ave
 Peak Hour: PM
 Count Date: 03/02/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	119	827	38	43	180	37	48	1337	120	99	134	245	3227
Proposed Project Trips	7	22	1	2	2	0	0	30	8	6	1	7	86
Existing + Project Conditions	126	849	39	45	182	37	48	1367	128	105	135	252	3313
Cumulative Conditions	124	860	38	43	219	37	48	1345	120	100	135	256	3325
Cumulative + Project Conditions	131	882	39	45	221	37	48	1375	128	106	136	263	3411

Intersection Number: **8**
 Synchro Node Number: 8
 Intersection Name: Middlefield Rd and Ravenswood Ave
 Peak Hour: PM
 Count Date: 05/24/23
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	81	318	0	0	0	0	0	508	337	481	0	145	1870
Proposed Project Trips	1	6	0	0	0	0	0	6	5	8	0	1	27
Existing + Project Conditions	82	324	0	0	0	0	0	514	342	489	0	146	1897
Cumulative Conditions	72	469	0	0	0	0	0	540	381	587	0	149	2198
Cumulative + Project Conditions	73	475	0	0	0	0	0	546	386	595	0	150	2225

Intersection Number: **9**
 Synchro Node Number: 9
 Intersection Name: Bay Rd and Ringwood Ave/Sonoma Ave
 Peak Hour: PM
 Count Date: 12/08/22
 Date of Analysis: 06/01/23

Scenario	Movements												Total
	Southbound Approach			Westbound Approach			Northbound Approach			Eastbound Approach			
	RT	TH	LT	RT	TH	LT	RT	TH	LT	RT	TH	LT	
Existing Conditions	115	70	2	6	23	6	8	73	132	219	17	142	813
Proposed Project Trips	3	6	0	0	0	0	0	9	1	2	0	4	25
Existing + Project Conditions	118	76	2	6	23	6	8	82	133	221	17	146	838
Cumulative Conditions	131	84	2	6	24	20	8	108	132	244	17	142	918
Cumulative + Project Conditions	134	90	2	6	24	20	8	117	133	246	17	146	943

Appendix D

Level of Service Calculations

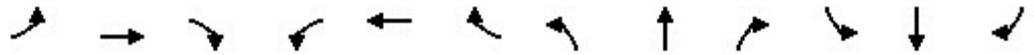
HCM Unsignalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Existing AM
 06/09/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	267	1	1	20	204	1104	6	42	1944	170
Future Volume (Veh/h)	3	0	267	1	1	20	204	1104	6	42	1944	170
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	3	0	275	1	1	21	210	1138	6	43	2004	175
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2998	3742	756	2590	3826	382	2179			1144		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2998	3742	756	2590	3826	382	2179			1144		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	22	0	0	97	13			93		
cM capacity (veh/h)	0	1	351	1	0	616	241			606		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4		
Volume Total	278	23	210	455	455	234	43	802	802	576		
Volume Left	3	1	210	0	0	0	43	0	0	0		
Volume Right	275	21	0	0	0	6	0	0	0	175		
cSH	0	6	241	1700	1700	1700	606	1700	1700	1700		
Volume to Capacity	Err	3.83	0.87	0.27	0.27	0.14	0.07	0.47	0.47	0.34		
Queue Length 95th (ft)	Err	Err	179	0	0	0	6	0	0	0		
Control Delay (s)	Err	Err	73.2	0.0	0.0	0.0	11.4	0.0	0.0	0.0		
Lane LOS	F	F	F				B					
Approach Delay (s)	Err	Err	11.4				0.2					
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			80.3%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Atherton Ave & Alameda de la Pulgas

Existing AM
 06/09/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕	↕	↕	↕		↕	↕	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	23	18	191	17	175	10	280	107	313	423	9
Future Volume (vph)	11	23	18	191	17	175	10	280	107	313	423	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	24	19	201	18	184	11	295	113	329	445	9

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	55	219	184	11	408	329	454
Volume Left (vph)	12	201	0	11	0	329	0
Volume Right (vph)	19	0	184	0	113	0	9
Hadj (s)	-0.13	0.22	-0.57	0.53	-0.16	0.53	0.02
Departure Headway (s)	7.3	7.0	3.2	7.2	6.5	6.8	6.2
Degree Utilization, x	0.11	0.43	0.16	0.02	0.74	0.62	0.79
Capacity (veh/h)	427	480	1121	476	533	523	565
Control Delay (s)	11.3	15.1	6.8	9.2	24.8	18.9	27.2
Approach Delay (s)	11.3	11.3		24.4		23.7	
Approach LOS	B	B		C		C	

Intersection Summary	
Delay	20.5
Level of Service	C
Intersection Capacity Utilization	66.7% ICU Level of Service C
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis
 3: Atherton Ave/Fair Oaks Lane & El Camino Real

Existing AM
 06/09/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↗	↖	↗	↖	↗
Traffic Volume (vph)	118	63	103	107	146	70	117	681	13	60	1549	178
Future Volume (vph)	118	63	103	107	146	70	117	681	13	60	1549	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1804	1583		1824	1583	1770	5071		1770	5007	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1804	1583		1824	1583	1770	5071		1770	5007	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	127	68	111	115	157	75	126	732	14	65	1666	191
RTOR Reduction (vph)	0	0	95	0	0	61	0	1	0	0	9	0
Lane Group Flow (vph)	0	195	16	0	272	14	126	745	0	65	1848	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)		19.3	19.3		24.8	24.8	13.4	64.2		8.2	59.0	
Effective Green, g (s)		19.3	19.3		24.8	24.8	13.4	64.2		8.2	59.0	
Actuated g/C Ratio		0.14	0.14		0.18	0.18	0.10	0.48		0.06	0.44	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		258	227		336	291	176	2420		107	2196	
v/s Ratio Prot		c0.11			c0.15		c0.07	0.15		0.04	c0.37	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.76	0.07		0.81	0.05	0.72	0.31		0.61	0.84	
Uniform Delay, d1		55.3	49.8		52.6	45.1	58.7	21.5		61.6	33.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.9	0.1		13.4	0.1	13.0	0.1		9.4	3.1	
Delay (s)		67.2	50.0		66.0	45.2	71.7	21.6		71.0	36.7	
Level of Service		E	D		E	D	E	C		E	D	
Approach Delay (s)		61.0			61.5			28.8			37.9	
Approach LOS		E			E			C			D	

Intersection Summary		
HCM 2000 Control Delay	40.0	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.81	D
Actuated Cycle Length (s)	134.5	Sum of lost time (s)
Intersection Capacity Utilization	78.8%	18.0
Analysis Period (min)	15	ICU Level of Service
		D

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Marsh Rd & Middlefield Rd

Existing AM
06/09/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	475	246	217	457	255	307
Future Volume (vph)	475	246	217	457	255	307
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.38	1.00
Satd. Flow (perm)	1770	1583	1863	1583	717	1863
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	495	256	226	476	266	320
RTOR Reduction (vph)	0	90	0	106	0	0
Lane Group Flow (vph)	495	166	226	370	266	320
Turn Type	Prot	pt+ov	NA	pt+ov	pm+pt	NA
Protected Phases	6	6 7	8	6 8	7	4
Permitted Phases					4	
Actuated Green, G (s)	28.1	48.2	17.3	49.9	37.4	37.4
Effective Green, g (s)	28.1	48.2	17.3	49.9	37.4	37.4
Actuated g/C Ratio	0.38	0.65	0.23	0.67	0.50	0.50
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	667	1024	432	1060	580	935
v/s Ratio Prot	c0.28	0.10	0.12	0.23	c0.10	0.17
v/s Ratio Perm					c0.13	
v/c Ratio	0.74	0.16	0.52	0.35	0.46	0.34
Uniform Delay, d1	20.1	5.2	25.0	5.3	11.5	11.2
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.5	0.1	1.1	0.2	0.6	0.2
Delay (s)	24.5	5.3	26.1	5.5	12.0	11.4
Level of Service	C	A	C	A	B	B
Approach Delay (s)	18.0		12.1			11.7
Approach LOS	B		B			B
Intersection Summary						
HCM 2000 Control Delay			14.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.61			
Actuated Cycle Length (s)			74.5		Sum of lost time (s)	13.5
Intersection Capacity Utilization			63.1%		ICU Level of Service	B
Analysis Period (min)			15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: Alejandra Ave & El Camino Real

Existing AM
06/09/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR			
Lane Configurations									
Traffic Volume (veh/h)	47	76	87	890	1613	195			
Future Volume (Veh/h)	47	76	87	890	1613	195			
Sign Control	Stop			Free	Free				
Grade	0%			0%	0%				
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90			
Hourly flow rate (vph)	52	84	97	989	1792	217			
Pedestrians									
Lane Width (ft)									
Walking Speed (ft/s)									
Percent Blockage									
Right turn flare (veh)									
Median type				None	TWLTL				
Median storage (veh)						2			
Upstream signal (ft)				582					
pX, platoon unblocked	0.92								
vC, conflicting volume	2589	706	2009						
vC1, stage 1 conf vol	1900								
vC2, stage 2 conf vol	688								
vCu, unblocked vol	2552	706	2009						
tC, single (s)	6.8	6.9	4.1						
tC, 2 stage (s)	5.8								
tF (s)	3.5	3.3	2.2						
p0 queue free %	46	78	65						
cM capacity (veh/h)	96	378	281						
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3	
Volume Total	52	84	97	494	494	717	717	575	
Volume Left	52	0	97	0	0	0	0	0	
Volume Right	0	84	0	0	0	0	0	217	
cSH	96	378	281	1700	1700	1700	1700	1700	
Volume to Capacity	0.54	0.22	0.35	0.29	0.29	0.42	0.42	0.34	
Queue Length 95th (ft)	61	21	37	0	0	0	0	0	
Control Delay (s)	79.9	17.2	24.5	0.0	0.0	0.0	0.0	0.0	
Lane LOS	F	C	C						
Approach Delay (s)	41.2	2.2		0.0					
Approach LOS	E								
Intersection Summary									
Average Delay	2.5								
Intersection Capacity Utilization	53.7%		ICU Level of Service				A		
Analysis Period (min)	15								

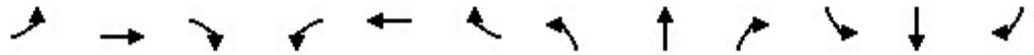
HCM Unsignalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Existing PM
 06/09/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	7	0	197	0	2	27	234	1745	8	59	1184	50
Future Volume (Veh/h)	7	0	197	0	2	27	234	1745	8	59	1184	50
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	7	0	199	0	2	27	236	1763	8	60	1196	51
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2429	3584	424	2957	3606	592	1247			1771		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2429	3584	424	2957	3606	592	1247			1771		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	66	100	20	94	57			83		
cM capacity (veh/h)	3	3	578	2	2	450	554			348		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4		
Volume Total	206	29	236	705	705	361	60	478	478	290		
Volume Left	7	0	236	0	0	0	60	0	0	0		
Volume Right	199	27	0	0	0	8	0	0	0	51		
cSH	84	34	554	1700	1700	1700	348	1700	1700	1700		
Volume to Capacity	2.45	0.86	0.43	0.41	0.41	0.21	0.17	0.28	0.28	0.17		
Queue Length 95th (ft)	481	76	53	0	0	0	15	0	0	0		
Control Delay (s)	764.5	287.5	16.2	0.0	0.0	0.0	17.5	0.0	0.0	0.0		
Lane LOS	F	F	C				C					
Approach Delay (s)	764.5	287.5	1.9				0.8					
Approach LOS	F	F										
Intersection Summary												
Average Delay			48.1									
Intersection Capacity Utilization			66.0%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
2: Atherton Ave & Alameda de la Pulgas

Existing PM
06/09/2023



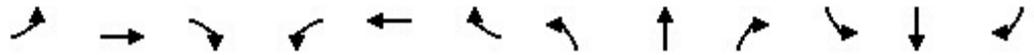
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↔			↔	↔	↔	↔		↔	↔	
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	4	10	105	11	263	6	495	104	82	321	10
Future Volume (vph)	7	4	10	105	11	263	6	495	104	82	321	10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	7	4	10	109	11	274	6	516	108	85	334	10

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	21	120	274	6	624	85	344
Volume Left (vph)	7	109	0	6	0	85	0
Volume Right (vph)	10	0	274	0	108	0	10
Hadj (s)	-0.19	0.22	-0.57	0.53	-0.09	0.53	0.01
Departure Headway (s)	6.6	6.7	3.2	6.0	5.4	6.2	5.7
Degree Utilization, x	0.04	0.22	0.24	0.01	0.94	0.15	0.54
Capacity (veh/h)	494	507	1112	578	659	569	623
Control Delay (s)	9.9	11.6	7.2	7.9	43.2	9.1	14.0
Approach Delay (s)	9.9	8.6		42.9		13.0	
Approach LOS	A	A		E		B	

Intersection Summary	
Delay	24.5
Level of Service	C
Intersection Capacity Utilization	62.0%
ICU Level of Service	B
Analysis Period (min)	15

HCM Signalized Intersection Capacity Analysis
 3: Atherton Ave/Fair Oaks Lane & El Camino Real

Existing PM
 06/09/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↑↑↑		↗	↑↑↑	
Traffic Volume (vph)	148	86	70	55	63	44	129	1341	32	54	871	66
Future Volume (vph)	148	86	70	55	63	44	129	1341	32	54	871	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1806	1583		1820	1583	1770	5068		1770	5031	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1806	1583		1820	1583	1770	5068		1770	5031	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	163	95	77	60	69	48	142	1474	35	59	957	73
RTOR Reduction (vph)	0	0	61	0	0	42	0	2	0	0	6	0
Lane Group Flow (vph)	0	258	16	0	129	6	142	1507	0	59	1024	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)		19.6	19.6		12.6	12.6	12.8	40.7		5.6	33.5	
Effective Green, g (s)		19.6	19.6		12.6	12.6	12.8	40.7		5.6	33.5	
Actuated g/C Ratio		0.20	0.20		0.13	0.13	0.13	0.42		0.06	0.35	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		366	321		237	206	234	2137		102	1746	
v/s Ratio Prot		c0.14			c0.07		c0.08	c0.30		0.03	0.20	
v/s Ratio Perm			0.01			0.00						
v/c Ratio		0.70	0.05		0.54	0.03	0.61	0.71		0.58	0.59	
Uniform Delay, d1		35.8	30.9		39.3	36.6	39.5	23.0		44.3	25.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.1	0.1		2.5	0.1	4.4	1.1		7.7	0.5	
Delay (s)		41.8	31.0		41.8	36.7	43.9	24.0		52.0	26.3	
Level of Service		D	C		D	D	D	C		D	C	
Approach Delay (s)		39.3			40.4			25.7			27.7	
Approach LOS		D			D			C			C	

Intersection Summary		
HCM 2000 Control Delay	28.6	HCM 2000 Level of Service
HCM 2000 Volume to Capacity ratio	0.69	C
Actuated Cycle Length (s)	96.5	Sum of lost time (s)
Intersection Capacity Utilization	61.4%	18.0
Analysis Period (min)	15	ICU Level of Service
		B

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Marsh Rd & Middlefield Rd

Existing PM
06/09/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	436	337	269	540	321	195
Future Volume (vph)	436	337	269	540	321	195
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.31	1.00
Satd. Flow (perm)	1770	1583	1863	1583	575	1863
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	469	362	289	581	345	210
RTOR Reduction (vph)	0	113	0	83	0	0
Lane Group Flow (vph)	469	249	289	498	345	210
Turn Type	Prot	pt+ov	NA	pt+ov	pm+pt	NA
Protected Phases	6	6 7	8	8 6	7	4
Permitted Phases					4	
Actuated Green, G (s)	31.4	57.7	22.6	58.5	48.9	48.9
Effective Green, g (s)	31.4	57.7	22.6	58.5	48.9	48.9
Actuated g/C Ratio	0.35	0.65	0.25	0.66	0.55	0.55
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	622	1022	471	1037	606	1020
v/s Ratio Prot	c0.27	0.16	0.16	0.31	c0.14	0.11
v/s Ratio Perm					c0.17	
v/c Ratio	0.75	0.24	0.61	0.48	0.57	0.21
Uniform Delay, d1	25.5	6.6	29.5	7.7	12.7	10.3
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.2	0.1	2.4	0.4	1.2	0.1
Delay (s)	30.7	6.8	31.9	8.1	13.9	10.4
Level of Service	C	A	C	A	B	B
Approach Delay (s)	20.3		16.0			12.6
Approach LOS	C		B			B
Intersection Summary						
HCM 2000 Control Delay			16.7		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.67			
Actuated Cycle Length (s)			89.3		Sum of lost time (s)	13.5
Intersection Capacity Utilization			67.3%		ICU Level of Service	C
Analysis Period (min)			15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: Alejandra Ave & El Camino Real

Existing PM
06/09/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	70	49	40	1540	969	36		
Future Volume (Veh/h)	70	49	40	1540	969	36		
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Hourly flow rate (vph)	74	52	43	1638	1031	38		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type				None	TWLTL			
Median storage (veh)					2			
Upstream signal (ft)				582				
pX, platoon unblocked	0.60							
vC, conflicting volume	1955	363	1069					
vC1, stage 1 conf vol	1050							
vC2, stage 2 conf vol	905							
vCu, unblocked vol	1251	363	1069					
tC, single (s)	6.8	6.9	4.1					
tC, 2 stage (s)	5.8							
tF (s)	3.5	3.3	2.2					
p0 queue free %	72	92	93					
cM capacity (veh/h)	268	634	648					
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	74	52	43	819	819	412	412	244
Volume Left	74	0	43	0	0	0	0	0
Volume Right	0	52	0	0	0	0	0	38
cSH	268	634	648	1700	1700	1700	1700	1700
Volume to Capacity	0.28	0.08	0.07	0.48	0.48	0.24	0.24	0.14
Queue Length 95th (ft)	27	7	5	0	0	0	0	0
Control Delay (s)	23.5	11.2	11.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C	B	B					
Approach Delay (s)	18.4		0.3			0.0		
Approach LOS	C							
Intersection Summary								
Average Delay			1.0					
Intersection Capacity Utilization			53.1%	ICU Level of Service	A			
Analysis Period (min)			15					

HCM Unsignalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Existing plus Project AM
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	5	0	272	1	1	20	207	1141	6	42	1971	172
Future Volume (Veh/h)	5	0	272	1	1	20	207	1141	6	42	1971	172
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	5	0	280	1	1	21	213	1176	6	43	2032	177
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3046	3815	766	2648	3900	395	2209			1182		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3046	3815	766	2648	3900	395	2209			1182		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	19	0	0	97	9			93		
cM capacity (veh/h)	0	0	345	0	0	604	234			587		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4		
Volume Total	285	23	213	470	470	241	43	813	813	583		
Volume Left	5	1	213	0	0	0	43	0	0	0		
Volume Right	280	21	0	0	0	6	0	0	0	177		
cSH	0	4	234	1700	1700	1700	587	1700	1700	1700		
Volume to Capacity	Err	6.01	0.91	0.28	0.28	0.14	0.07	0.48	0.48	0.34		
Queue Length 95th (ft)	Err	Err	193	0	0	0	6	0	0	0		
Control Delay (s/veh)	Err	Err	82.0	0.0	0.0	0.0	11.6	0.0	0.0	0.0		
Lane LOS	F	F	F				B					
Approach Delay (s/veh)	Err	Err	12.5				0.2					
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			82.2%		ICU Level of Service					E		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Atherton Ave & Alameda de la Pulgas

Existing plus Project AM
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	11	23	18	193	17	177	10	284	108	316	427	9
Future Volume (vph)	11	23	18	193	17	177	10	284	108	316	427	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	12	24	19	203	18	186	11	299	114	333	449	9
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	55	221	186	11	413	333	458					
Volume Left (vph)	12	203	0	11	0	333	0					
Volume Right (vph)	19	0	186	0	114	0	9					
Hadj (s)	-0.13	0.22	-0.57	0.53	-0.16	0.53	0.02					
Departure Headway (s)	7.4	7.0	3.2	7.3	6.6	6.8	6.3					
Degree Utilization, x	0.11	0.43	0.17	0.02	0.75	0.63	0.80					
Capacity (veh/h)	425	478	1121	475	531	522	563					
Control Delay (s/veh)	11.3	15.3	6.8	9.2	25.8	19.4	28.3					
Approach Delay (s/veh)	11.3	11.4		25.4		24.5						
Approach LOS	B	B		D		C						
Intersection Summary												
Delay			21.1									
Level of Service			C									
Intersection Capacity Utilization			67.3%		ICU Level of Service		C					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
 3: Atherton Ave/Fair Oaks Lane & El Camino Real

Existing plus Project AM
 09/27/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↘	↕↗↘		↘	↕↗↘	
Traffic Volume (vph)	119	64	104	108	148	71	118	715	13	61	1574	180
Future Volume (vph)	119	64	104	108	148	71	118	715	13	61	1574	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1804	1583		1824	1583	1770	5072		1770	5007	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1804	1583		1824	1583	1770	5072		1770	5007	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	128	69	112	116	159	76	127	769	14	66	1692	194
RTOR Reduction (vph)	0	0	95	0	0	62	0	1	0	0	8	0
Lane Group Flow (vph)	0	197	17	0	275	14	127	782	0	66	1878	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)		19.7	19.7		23.9	23.9	12.8	63.1		8.4	58.7	
Effective Green, g (s)		19.7	19.7		23.9	23.9	12.8	63.1		8.4	58.7	
Actuated g/C Ratio		0.15	0.15		0.18	0.18	0.10	0.47		0.06	0.44	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		267	234		327	284	170	2404		111	2208	
v/s Ratio Prot		c0.11			c0.15		c0.07	c0.15		0.04	c0.38	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.74	0.07		0.84	0.05	0.75	0.33		0.59	0.85	
Uniform Delay, d1		54.2	48.8		52.8	45.2	58.6	21.8		60.7	33.3	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.2	0.1		17.4	0.1	16.3	0.1		8.3	3.4	
Delay (s)		64.4	48.9		70.2	45.3	74.9	21.8		69.0	36.6	
Level of Service		E	D		E	D	E	C		E	D	
Approach Delay (s/veh)		58.8			64.8			29.2			37.7	
Approach LOS		E			E			C			D	

Intersection Summary		
HCM 2000 Control Delay (s/veh)	40.1	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.81	
Actuated Cycle Length (s)	133.1	Sum of lost time (s) 18.0
Intersection Capacity Utilization	79.7%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Marsh Rd & Middlefield Rd

Existing plus Project AM
09/27/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	480	250	220	462	258	310
Future Volume (vph)	480	250	220	462	258	310
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.38	1.00
Satd. Flow (perm)	1770	1583	1863	1583	709	1863
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	500	260	229	481	269	323
RTOR Reduction (vph)	0	92	0	104	0	0
Lane Group Flow (vph)	500	168	229	377	269	323
Turn Type	Prot	pt+ov	NA	pt+ov	pm+pt	NA
Protected Phases	6	6 7	8	6 8	7	4
Permitted Phases					4	
Actuated Green, G (s)	28.7	48.9	17.6	50.8	37.8	37.8
Effective Green, g (s)	28.7	48.9	17.6	50.8	37.8	37.8
Actuated g/C Ratio	0.38	0.65	0.23	0.67	0.50	0.50
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	672	1025	434	1065	575	932
v/s Ratio Prot	c0.28	0.11	0.12	0.24	c0.10	0.17
v/s Ratio Perm					c0.14	
v/c Ratio	0.74	0.16	0.53	0.35	0.47	0.35
Uniform Delay, d1	20.2	5.2	25.3	5.3	11.7	11.4
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.5	0.1	1.2	0.2	0.6	0.2
Delay (s)	24.7	5.3	26.5	5.5	12.3	11.6
Level of Service	C	A	C	A	B	B
Approach Delay (s/veh)	18.1		12.3			11.9
Approach LOS	B		B			B

Intersection Summary

HCM 2000 Control Delay (s/veh)	14.3	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.62		
Actuated Cycle Length (s)	75.5	Sum of lost time (s)	13.5
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 5: Alejandra Ave & El Camino Real

Existing plus Project AM
 09/27/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	56	87	91	914	1636	200		
Future Volume (Veh/h)	56	87	91	914	1636	200		
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly flow rate (vph)	62	97	101	1016	1818	222		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type				None	TWLTL			
Median storage (veh)					2			
Upstream signal (ft)				582				
pX, platoon unblocked	0.91							
vC, conflicting volume	2639	717	2040					
vC1, stage 1 conf vol	1929							
vC2, stage 2 conf vol	710							
vCu, unblocked vol	2605	717	2040					
tC, single (s)	6.8	6.9	4.1					
tC, 2 stage (s)	5.8							
tF (s)	3.5	3.3	2.2					
p0 queue free %	33	74	63					
cM capacity (veh/h)	92	372	273					
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	62	97	101	508	508	727	727	586
Volume Left	62	0	101	0	0	0	0	0
Volume Right	0	97	0	0	0	0	0	222
cSH	92	372	273	1700	1700	1700	1700	1700
Volume to Capacity	0.67	0.26	0.37	0.30	0.30	0.43	0.43	0.34
Queue Length 95th (ft)	82	26	41	0	0	0	0	0
Control Delay (s/veh)	101.3	18.1	25.7	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C	D					
Approach Delay (s/veh)	50.5		2.3			0.0		
Approach LOS	F							
Intersection Summary								
Average Delay			3.2					
Intersection Capacity Utilization			54.4%	ICU Level of Service	A			
Analysis Period (min)			15					

HCM Unsignalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Existing plus Project PM
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	8	0	200	0	2	27	238	1778	8	60	1221	53
Future Volume (Veh/h)	8	0	200	0	2	27	238	1778	8	60	1221	53
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	8	0	202	0	2	27	240	1796	8	61	1233	54
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
								None			None	
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2489	3666	438	3015	3689	603	1287			1804		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2489	3666	438	3015	3689	603	1287			1804		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	64	100	4	94	55			82		
cM capacity (veh/h)	1	2	567	2	2	442	535			338		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4		
Volume Total	210	29	240	718	718	367	61	493	493	301		
Volume Left	8	0	240	0	0	0	61	0	0	0		
Volume Right	202	27	0	0	0	8	0	0	0	54		
cSH	30	28	535	1700	1700	1700	338	1700	1700	1700		
Volume to Capacity	7.09	1.02	0.45	0.42	0.42	0.22	0.18	0.29	0.29	0.18		
Queue Length 95th (ft)	Err	83	57	0	0	0	16	0	0	0		
Control Delay (s/veh)	Err	378.5	17.1	0.0	0.0	0.0	18.0	0.0	0.0	0.0		
Lane LOS	F	F	C				C					
Approach Delay (s/veh)	Err	378.5	2.0				0.8					
Approach LOS	F	F										
Intersection Summary												
Average Delay			582.8									
Intersection Capacity Utilization			67.4%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Atherton Ave & Alameda de la Pulgas

Existing plus Project PM
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	7	4	10	106	11	266	6	500	105	83	325	10
Future Volume (vph)	7	4	10	106	11	266	6	500	105	83	325	10
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	7	4	10	110	11	277	6	521	109	86	339	10
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	21	121	277	6	630	86	349					
Volume Left (vph)	7	110	0	6	0	86	0					
Volume Right (vph)	10	0	277	0	109	0	10					
Hadj (s)	-0.19	0.22	-0.57	0.53	-0.09	0.53	0.01					
Departure Headway (s)	6.7	6.7	3.2	6.1	5.4	6.2	5.7					
Degree Utilization, x	0.04	0.23	0.25	0.01	0.95	0.15	0.55					
Capacity (veh/h)	493	506	1112	576	658	569	623					
Control Delay (s/veh)	10.0	11.7	7.2	7.9	45.5	9.1	14.3					
Approach Delay (s/veh)	10.0	8.6		45.2		13.3						
Approach LOS	A	A		E		B						
Intersection Summary												
Delay				25.6								
Level of Service				D								
Intersection Capacity Utilization			62.5%		ICU Level of Service			B				
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
 3: Atherton Ave/Fair Oaks Lane & El Camino Real

Existing plus Project PM
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	149	87	71	56	64	45	131	1371	32	55	907	67
Future Volume (vph)	149	87	71	56	64	45	131	1371	32	55	907	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1806	1583		1820	1583	1770	5068		1770	5033	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1806	1583		1820	1583	1770	5068		1770	5033	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	164	96	78	62	70	49	144	1507	35	60	997	74
RTOR Reduction (vph)	0	0	62	0	0	43	0	2	0	0	6	0
Lane Group Flow (vph)	0	260	16	0	132	6	144	1540	0	60	1065	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)		19.6	19.6		12.8	12.8	12.9	41.3		5.6	34.0	
Effective Green, g (s)		19.6	19.6		12.8	12.8	12.9	41.3		5.6	34.0	
Actuated g/C Ratio		0.20	0.20		0.13	0.13	0.13	0.42		0.06	0.35	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		363	318		239	208	234	2151		101	1758	
v/s Ratio Prot		c0.14			c0.07		c0.08	c0.30		0.03	0.21	
v/s Ratio Perm			0.01			0.00						
v/c Ratio		0.72	0.05		0.55	0.03	0.62	0.72		0.59	0.61	
Uniform Delay, d1		36.3	31.3		39.6	36.8	39.9	23.2		44.7	26.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		6.6	0.1		2.7	0.1	4.7	1.2		9.0	0.6	
Delay (s)		42.8	31.4		42.3	36.9	44.6	24.3		53.8	26.7	
Level of Service		D	C		D	D	D	C		D	C	
Approach Delay (s/veh)		40.2			40.9			26.0			28.2	
Approach LOS		D			D			C			C	
Intersection Summary												
HCM 2000 Control Delay (s/veh)			29.0				HCM 2000 Level of Service				C	
HCM 2000 Volume to Capacity ratio			0.70									
Actuated Cycle Length (s)			97.3				Sum of lost time (s)			18.0		
Intersection Capacity Utilization			62.1%				ICU Level of Service			B		
Analysis Period (min)			15									

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Marsh Rd & Middlefield Rd

Existing plus Project PM
09/27/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	441	340	272	545	324	199
Future Volume (vph)	441	340	272	545	324	199
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.31	1.00
Satd. Flow (perm)	1770	1583	1863	1583	569	1863
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	474	366	292	586	348	214
RTOR Reduction (vph)	0	111	0	80	0	0
Lane Group Flow (vph)	474	255	292	506	348	214
Turn Type	Prot	pt+ov	NA	pt+ov	pm+pt	NA
Protected Phases	6	6 7	8	8 6	7	4
Permitted Phases					4	
Actuated Green, G (s)	32.1	58.4	23.0	59.6	49.3	49.3
Effective Green, g (s)	32.1	58.4	23.0	59.6	49.3	49.3
Actuated g/C Ratio	0.36	0.65	0.25	0.66	0.55	0.55
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	628	1022	473	1043	599	1015
v/s Ratio Prot	c0.27	0.16	0.16	0.32	c0.14	0.11
v/s Ratio Perm					c0.18	
v/c Ratio	0.75	0.25	0.62	0.48	0.58	0.21
Uniform Delay, d1	25.7	6.8	29.8	7.7	13.0	10.6
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	5.1	0.1	2.4	0.4	1.4	0.1
Delay (s)	30.8	6.9	32.2	8.1	14.5	10.7
Level of Service	C	A	C	A	B	B
Approach Delay (s/veh)	20.4		16.1			13.0
Approach LOS	C		B			B

Intersection Summary			
HCM 2000 Control Delay (s/veh)	16.9	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	90.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	67.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 5: Alejandra Ave & El Camino Real

Existing plus Project PM
 09/27/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR				
Lane Configurations										
Traffic Volume (veh/h)	77	55	50	1566	994	46				
Future Volume (Veh/h)	77	55	50	1566	994	46				
Sign Control	Stop			Free	Free					
Grade	0%			0%	0%					
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94				
Hourly flow rate (vph)	82	59	53	1666	1057	49				
Pedestrians										
Lane Width (ft)										
Walking Speed (ft/s)										
Percent Blockage										
Right turn flare (veh)										
Median type				None	TWLTL					
Median storage (veh)						2				
Upstream signal (ft)				582						
pX, platoon unblocked	0.58									
vC, conflicting volume	2021	377	1106							
vC1, stage 1 conf vol	1082									
vC2, stage 2 conf vol	939									
vCu, unblocked vol	1310	377	1106							
tC, single (s)	6.8	6.9	4.1							
tC, 2 stage (s)	5.8									
tF (s)	3.5	3.3	2.2							
p0 queue free %	68	90	92							
cM capacity (veh/h)	255	621	627							
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3		
Volume Total	82	59	53	833	833	423	423	260		
Volume Left	82	0	53	0	0	0	0	0		
Volume Right	0	59	0	0	0	0	0	49		
cSH	255	621	627	1700	1700	1700	1700	1700		
Volume to Capacity	0.32	0.10	0.08	0.49	0.49	0.25	0.25	0.15		
Queue Length 95th (ft)	33	8	7	0	0	0	0	0		
Control Delay (s/veh)	25.6	11.4	11.3	0.0	0.0	0.0	0.0	0.0		
Lane LOS	D	B	B							
Approach Delay (s/veh)	19.7	0.3		0.0						
Approach LOS	C									
Intersection Summary										
Average Delay	1.1									
Intersection Capacity Utilization	54.2%		ICU Level of Service				A			
Analysis Period (min)	15									

HCM Signalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Existing plus Project AM - Mit
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	5	0	272	1	1	20	207	1141	6	42	1971	172
Future Volume (vph)	5	0	272	1	1	20	207	1141	6	42	1971	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frt		0.87			0.88		1.00	1.00		1.00	0.99	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1614			1630		1770	5081		1770	5024	
Flt Permitted		0.99			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1607			1568		1770	5081		1770	5024	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	5	0	280	1	1	21	213	1176	6	43	2032	177
RTOR Reduction (vph)	0	250	0	0	19	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	35	0	0	4	0	213	1182	0	43	2204	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6								
Actuated Green, G (s)		8.8			8.8		19.5	84.6		6.5	71.6	
Effective Green, g (s)		8.8			8.8		19.5	84.6		6.5	71.6	
Actuated g/C Ratio		0.08			0.08		0.17	0.75		0.06	0.63	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		124			121		304	3790		101	3172	
v/s Ratio Prot							c0.12	0.23		0.02	c0.44	
v/s Ratio Perm		c0.02			0.00							
v/c Ratio		0.28			0.03		0.70	0.31		0.43	0.69	
Uniform Delay, d1		49.3			48.4		44.2	4.8		51.6	13.7	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.3			0.1		7.1	0.0		2.9	0.7	
Delay (s)		50.6			48.5		51.3	4.8		54.5	14.4	
Level of Service		D			D		D	A		D	B	
Approach Delay (s/veh)		50.6			48.5			11.9			15.2	
Approach LOS		D			D			B			B	
Intersection Summary												
HCM 2000 Control Delay (s/veh)			16.8				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.66									
Actuated Cycle Length (s)			113.4				Sum of lost time (s)				13.5	
Intersection Capacity Utilization			83.4%				ICU Level of Service				E	
Analysis Period (min)			15									

c Critical Lane Group

Intersection				
Intersection Delay, s/veh	12.4			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	55	407	424	791
Demand Flow Rate, veh/h	55	415	432	807
Vehicles Circulating, veh/h	1005	328	376	236
Vehicles Exiting, veh/h	38	480	684	507
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	8.8	8.5	9.5	16.2
Approach LOS	A	A	A	C
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	55	415	432	807
Cap Entry Lane, veh/h	495	988	940	1085
Entry HV Adj Factor	0.991	0.980	0.982	0.980
Flow Entry, veh/h	55	407	424	791
Cap Entry, veh/h	491	968	923	1063
V/C Ratio	0.111	0.420	0.459	0.744
Control Delay, s/veh	8.8	8.5	9.5	16.2
LOS	A	A	A	C
95th %tile Queue, veh	0	2	2	7

HCM Signalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Existing plus Project PM - mit
 09/29/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	8	0	200	0	2	27	238	1778	8	60	1221	53
Future Volume (vph)	8	0	200	0	2	27	238	1778	8	60	1221	53
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frt		0.87			0.87		1.00	1.00		1.00	0.99	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1618			1629		1770	5082		1770	5053	
Flt Permitted		0.99			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1600			1629		1770	5082		1770	5053	
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Adj. Flow (vph)	8	0	202	0	2	27	240	1796	8	61	1233	54
RTOR Reduction (vph)	0	181	0	0	24	0	0	0	0	0	3	0
Lane Group Flow (vph)	0	29	0	0	5	0	240	1804	0	61	1284	0
Turn Type	Perm	NA			NA		Prot	NA		Prot	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6								
Actuated Green, G (s)		7.8			7.8		17.6	47.4		7.1	36.9	
Effective Green, g (s)		7.8			7.8		17.6	47.4		7.1	36.9	
Actuated g/C Ratio		0.10			0.10		0.23	0.63		0.09	0.49	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		164			167		410	3177		165	2459	
v/s Ratio Prot					0.00		c0.14	c0.35		0.03	0.25	
v/s Ratio Perm		c0.02										
v/c Ratio		0.18			0.03		0.59	0.57		0.37	0.52	
Uniform Delay, d1		31.1			30.6		25.9	8.2		32.2	13.4	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.5			0.1		2.1	0.2		1.4	0.2	
Delay (s)		31.6			30.7		28.0	8.5		33.7	13.6	
Level of Service		C			C		C	A		C	B	
Approach Delay (s/veh)		31.6			30.7			10.8			14.5	
Approach LOS		C			C			B			B	
Intersection Summary												
HCM 2000 Control Delay (s/veh)			13.5				HCM 2000 Level of Service				B	
HCM 2000 Volume to Capacity ratio			0.55									
Actuated Cycle Length (s)			75.8				Sum of lost time (s)			13.5		
Intersection Capacity Utilization			69.4%				ICU Level of Service			C		
Analysis Period (min)			15									

c Critical Lane Group

Intersection				
Intersection Delay, s/veh	8.9			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	21	398	636	435
Demand Flow Rate, veh/h	21	406	648	444
Vehicles Circulating, veh/h	546	544	99	129
Vehicles Exiting, veh/h	27	203	468	821
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	4.8	12.0	8.7	6.6
Approach LOS	A	B	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	21	406	648	444
Cap Entry Lane, veh/h	791	792	1247	1210
Entry HV Adj Factor	0.996	0.980	0.981	0.980
Flow Entry, veh/h	21	398	636	435
Cap Entry, veh/h	788	776	1223	1186
V/C Ratio	0.027	0.512	0.520	0.367
Control Delay, s/veh	4.8	12.0	8.7	6.6
LOS	A	B	A	A
95th %tile Queue, veh	0	3	3	2

HCM Unsignalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Cumulative AM
 06/09/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	17	0	267	1	1	20	288	1395	6	42	1952	170
Future Volume (Veh/h)	17	0	267	1	1	20	288	1395	6	42	1952	170
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	18	0	275	1	1	21	297	1438	6	43	2012	175
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3280	4224	758	3067	4308	482	2187			1444		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3280	4224	758	3067	4308	482	2187			1444		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	21	0	0	96	0			91		
cM capacity (veh/h)	0	0	349	0	0	530	239			465		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4		
Volume Total	293	23	297	575	575	294	43	805	805	577		
Volume Left	18	1	297	0	0	0	43	0	0	0		
Volume Right	275	21	0	0	0	6	0	0	0	175		
cSH	0	0	239	1700	1700	1700	465	1700	1700	1700		
Volume to Capacity	Err	Err	1.24	0.34	0.34	0.17	0.09	0.47	0.47	0.34		
Queue Length 95th (ft)	Err	Err	370	0	0	0	8	0	0	0		
Control Delay (s)	Err	Err	181.8	0.0	0.0	0.0	13.5	0.0	0.0	0.0		
Lane LOS	F	F	F				B					
Approach Delay (s)	Err	Err	31.0				0.3					
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			90.9%		ICU Level of Service				E			
Analysis Period (min)			15									

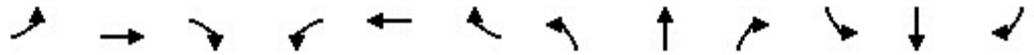
HCM Unsignalized Intersection Capacity Analysis
 2: Atherton Ave & Alameda de la Pulgas

Cumulative AM
 06/09/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	23	22	198	20	175	11	355	110	313	429	9
Future Volume (vph)	17	23	22	198	20	175	11	355	110	313	429	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	18	24	23	208	21	184	12	374	116	329	452	9
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	65	229	184	12	490	329	461					
Volume Left (vph)	18	208	0	12	0	329	0					
Volume Right (vph)	23	0	184	0	116	0	9					
Hadj (s)	-0.12	0.22	-0.57	0.53	-0.13	0.53	0.02					
Departure Headway (s)	7.8	7.4	3.2	7.5	6.8	7.1	6.6					
Degree Utilization, x	0.14	0.47	0.16	0.02	0.92	0.65	0.84					
Capacity (veh/h)	427	470	1121	466	524	491	538					
Control Delay (s)	12.1	16.7	6.8	9.5	47.2	21.1	34.3					
Approach Delay (s)	12.1	12.3		46.3		28.8						
Approach LOS	B	B		E		D						
Intersection Summary												
Delay				29.3								
Level of Service				D								
Intersection Capacity Utilization			71.4%		ICU Level of Service			C				
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
 3: Atherton Ave/Fair Oaks Lane & El Camino Real

Cumulative AM
 06/09/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↖	↗		↖	↗	↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	118	86	119	114	151	73	119	961	15	75	1551	178
Future Volume (vph)	118	86	119	114	151	73	119	961	15	75	1551	178
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1810	1583		1823	1583	1770	5074		1770	5007	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1810	1583		1823	1583	1770	5074		1770	5007	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	127	92	128	123	162	78	128	1033	16	81	1668	191
RTOR Reduction (vph)	0	0	107	0	0	64	0	1	0	0	9	0
Lane Group Flow (vph)	0	219	21	0	285	14	128	1048	0	81	1850	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)		21.7	21.7		24.6	24.6	12.8	59.5		10.4	57.1	
Effective Green, g (s)		21.7	21.7		24.6	24.6	12.8	59.5		10.4	57.1	
Actuated g/C Ratio		0.16	0.16		0.18	0.18	0.10	0.44		0.08	0.43	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		292	255		334	290	168	2249		137	2130	
v/s Ratio Prot		c0.12			c0.16		c0.07	0.21		0.05	c0.37	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.75	0.08		0.85	0.05	0.76	0.47		0.59	0.87	
Uniform Delay, d1		53.7	47.8		53.1	45.2	59.2	26.2		59.8	35.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		10.3	0.1		18.6	0.1	18.3	0.2		6.7	4.1	
Delay (s)		64.0	47.9		71.6	45.2	77.5	26.4		66.5	39.2	
Level of Service		E	D		E	D	E	C		E	D	
Approach Delay (s)		58.1			66.0			31.9			40.3	
Approach LOS		E			E			C			D	

Intersection Summary		
HCM 2000 Control Delay	41.8	HCM 2000 Level of Service D
HCM 2000 Volume to Capacity ratio	0.83	
Actuated Cycle Length (s)	134.2	Sum of lost time (s) 18.0
Intersection Capacity Utilization	80.8%	ICU Level of Service D
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Marsh Rd & Middlefield Rd

Cumulative AM
06/09/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	475	388	270	474	255	326
Future Volume (vph)	475	388	270	474	255	326
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.33	1.00
Satd. Flow (perm)	1770	1583	1863	1583	621	1863
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	495	404	281	494	266	340
RTOR Reduction (vph)	0	131	0	91	0	0
Lane Group Flow (vph)	495	273	281	403	266	340
Turn Type	Prot	pt+ov	NA	pt+ov	pm+pt	NA
Protected Phases	6	6 7	8	6 8	7	4
Permitted Phases					4	
Actuated Green, G (s)	30.4	50.8	21.1	56.0	41.5	41.5
Effective Green, g (s)	30.4	50.8	21.1	56.0	41.5	41.5
Actuated g/C Ratio	0.38	0.63	0.26	0.69	0.51	0.51
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	665	994	485	1095	544	955
v/s Ratio Prot	c0.28	0.17	c0.15	0.25	c0.10	0.18
v/s Ratio Perm					0.15	
v/c Ratio	0.74	0.28	0.58	0.37	0.49	0.36
Uniform Delay, d1	21.9	6.8	26.0	5.1	12.3	11.7
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.5	0.2	1.7	0.2	0.7	0.2
Delay (s)	26.4	6.9	27.7	5.4	13.0	12.0
Level of Service	C	A	C	A	B	B
Approach Delay (s)	17.6		13.5			12.4
Approach LOS	B		B			B
Intersection Summary						
HCM 2000 Control Delay			14.8		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.64			
Actuated Cycle Length (s)			80.9		Sum of lost time (s)	13.5
Intersection Capacity Utilization			65.9%		ICU Level of Service	C
Analysis Period (min)			15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: Alejandra Ave & El Camino Real

Cumulative AM
06/09/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	47	76	87	1149	1657	195		
Future Volume (Veh/h)	47	76	87	1149	1657	195		
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly flow rate (vph)	52	84	97	1277	1841	217		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type				None	TWLTL			
Median storage (veh)					2			
Upstream signal (ft)				582				
pX, platoon unblocked	0.91							
vC, conflicting volume	2782	722	2058					
vC1, stage 1 conf vol	1950							
vC2, stage 2 conf vol	832							
vCu, unblocked vol	2761	722	2058					
tC, single (s)	6.8	6.9	4.1					
tC, 2 stage (s)	5.8							
tF (s)	3.5	3.3	2.2					
p0 queue free %	41	77	64					
cM capacity (veh/h)	89	369	268					
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	52	84	97	638	638	736	736	585
Volume Left	52	0	97	0	0	0	0	0
Volume Right	0	84	0	0	0	0	0	217
cSH	89	369	268	1700	1700	1700	1700	1700
Volume to Capacity	0.59	0.23	0.36	0.38	0.38	0.43	0.43	0.34
Queue Length 95th (ft)	67	22	40	0	0	0	0	0
Control Delay (s)	91.8	17.6	25.8	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C	D					
Approach Delay (s)	46.0		1.8			0.0		
Approach LOS	E							
Intersection Summary								
Average Delay			2.5					
Intersection Capacity Utilization			54.5%	ICU Level of Service	A			
Analysis Period (min)			15					

HCM Unsignalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Cumulative PM
 06/09/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	9	0	241	0	2	27	234	1797	8	59	1304	74
Future Volume (Veh/h)	9	0	241	0	2	27	234	1797	8	59	1304	74
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	9	0	243	0	2	27	236	1815	8	60	1317	75
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2580	3770	476	3093	3803	609	1392			1823		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2580	3770	476	3093	3803	609	1392			1823		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	55	100	0	94	52			82		
cM capacity (veh/h)	0	2	535	1	2	438	487			332		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4		
Volume Total	252	29	236	726	726	371	60	527	527	338		
Volume Left	9	0	236	0	0	0	60	0	0	0		
Volume Right	243	27	0	0	0	8	0	0	0	75		
cSH	0	22	487	1700	1700	1700	332	1700	1700	1700		
Volume to Capacity	Err	1.29	0.48	0.43	0.43	0.22	0.18	0.31	0.31	0.20		
Queue Length 95th (ft)	Err	93	65	0	0	0	16	0	0	0		
Control Delay (s)	Err	542.0	19.1	0.0	0.0	0.0	18.2	0.0	0.0	0.0		
Lane LOS	F	F	C				C					
Approach Delay (s)	Err	542.0	2.2				0.8					
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			71.9%		ICU Level of Service					C		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Atherton Ave & Alameda de la Pulgas

Cumulative PM
 06/09/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	6	11	111	13	263	9	509	112	82	434	17
Future Volume (vph)	9	6	11	111	13	263	9	509	112	82	434	17
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	9	6	11	116	14	274	9	530	117	85	452	18
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	26	130	274	9	647	85	470					
Volume Left (vph)	9	116	0	9	0	85	0					
Volume Right (vph)	11	0	274	0	117	0	18					
Hadj (s)	-0.15	0.21	-0.57	0.53	-0.09	0.53	0.01					
Departure Headway (s)	7.1	7.0	3.2	6.3	5.7	6.3	5.8					
Degree Utilization, x	0.05	0.25	0.24	0.02	1.02	0.15	0.75					
Capacity (veh/h)	465	487	1112	552	627	561	611					
Control Delay (s)	10.5	12.3	7.2	8.2	63.5	9.2	23.2					
Approach Delay (s)	10.5	8.9		62.7		21.0						
Approach LOS	B	A		F		C						
Intersection Summary												
Delay				34.5								
Level of Service				D								
Intersection Capacity Utilization			63.2%		ICU Level of Service				B			
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
3: Atherton Ave/Fair Oaks Lane & El Camino Real

Cumulative PM
06/09/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↗	↑↑↑		↗	↑↑↑	
Traffic Volume (vph)	149	87	77	55	106	83	197	1341	32	54	1065	66
Future Volume (vph)	149	87	77	55	106	83	197	1341	32	54	1065	66
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1806	1583		1832	1583	1770	5068		1770	5040	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1806	1583		1832	1583	1770	5068		1770	5040	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	164	96	85	60	116	91	216	1474	35	59	1170	73
RTOR Reduction (vph)	0	0	68	0	0	77	0	2	0	0	5	0
Lane Group Flow (vph)	0	260	17	0	176	14	216	1507	0	59	1238	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)		20.2	20.2		15.5	15.5	15.8	44.3		5.8	34.3	
Effective Green, g (s)		20.2	20.2		15.5	15.5	15.8	44.3		5.8	34.3	
Actuated g/C Ratio		0.19	0.19		0.15	0.15	0.15	0.43		0.06	0.33	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		351	308		273	236	269	2162		98	1665	
v/s Ratio Prot		c0.14			c0.10		c0.12	c0.30		0.03	0.25	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.74	0.05		0.64	0.06	0.80	0.70		0.60	0.74	
Uniform Delay, d1		39.3	34.0		41.6	37.9	42.5	24.3		47.9	30.8	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		8.2	0.1		5.1	0.1	15.7	1.0		10.0	1.8	
Delay (s)		47.5	34.1		46.7	38.0	58.2	25.3		57.9	32.7	
Level of Service		D	C		D	D	E	C		E	C	
Approach Delay (s)		44.2			43.7			29.4			33.8	
Approach LOS		D			D			C			C	

Intersection Summary

HCM 2000 Control Delay	33.4	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.74		
Actuated Cycle Length (s)	103.8	Sum of lost time (s)	18.0
Intersection Capacity Utilization	63.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Marsh Rd & Middlefield Rd

Cumulative PM
06/09/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	478	337	325	540	321	365
Future Volume (vph)	478	337	325	540	321	365
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.25	1.00
Satd. Flow (perm)	1770	1583	1863	1583	473	1863
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	514	362	349	581	345	392
RTOR Reduction (vph)	0	90	0	68	0	0
Lane Group Flow (vph)	514	272	349	513	345	392
Turn Type	Prot	pt+ov	NA	pt+ov	pm+pt	NA
Protected Phases	6	6 7	8	8 6	7	4
Permitted Phases					4	
Actuated Green, G (s)	35.7	62.1	27.2	67.4	53.6	53.6
Effective Green, g (s)	35.7	62.1	27.2	67.4	53.6	53.6
Actuated g/C Ratio	0.36	0.63	0.28	0.69	0.55	0.55
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	642	1000	515	1085	546	1015
v/s Ratio Prot	c0.29	0.17	0.19	0.32	c0.14	0.21
v/s Ratio Perm					c0.20	
v/c Ratio	0.80	0.27	0.68	0.47	0.63	0.39
Uniform Delay, d1	28.1	8.0	31.6	7.2	14.9	12.9
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.1	0.1	3.5	0.3	2.4	0.2
Delay (s)	35.2	8.2	35.2	7.5	17.3	13.1
Level of Service	D	A	D	A	B	B
Approach Delay (s)	24.0		17.9			15.1
Approach LOS	C		B			B
Intersection Summary						
HCM 2000 Control Delay			19.2		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.72			
Actuated Cycle Length (s)			98.3		Sum of lost time (s)	13.5
Intersection Capacity Utilization			72.6%		ICU Level of Service	C
Analysis Period (min)			15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
5: Alejandra Ave & El Camino Real

Cumulative PM
06/09/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	70	49	40	1599	1124	36		
Future Volume (Veh/h)	70	49	40	1599	1124	36		
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Hourly flow rate (vph)	74	52	43	1701	1196	38		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type				None	TWLTL			
Median storage (veh)					2			
Upstream signal (ft)				582				
pX, platoon unblocked	0.60							
vC, conflicting volume	2152	418	1234					
vC1, stage 1 conf vol	1215							
vC2, stage 2 conf vol	936							
vCu, unblocked vol	1585	418	1234					
tC, single (s)	6.8	6.9	4.1					
tC, 2 stage (s)	5.8							
tF (s)	3.5	3.3	2.2					
p0 queue free %	67	91	92					
cM capacity (veh/h)	221	584	560					
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	74	52	43	850	850	478	478	277
Volume Left	74	0	43	0	0	0	0	0
Volume Right	0	52	0	0	0	0	0	38
cSH	221	584	560	1700	1700	1700	1700	1700
Volume to Capacity	0.33	0.09	0.08	0.50	0.50	0.28	0.28	0.16
Queue Length 95th (ft)	35	7	6	0	0	0	0	0
Control Delay (s)	29.3	11.8	12.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B	B					
Approach Delay (s)	22.0		0.3			0.0		
Approach LOS	C							
Intersection Summary								
Average Delay			1.1					
Intersection Capacity Utilization			54.7%	ICU Level of Service	A			
Analysis Period (min)			15					

HCM Unsignalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Cumulative plus Project AM
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	19	0	272	1	1	20	291	1432	6	42	1979	172
Future Volume (Veh/h)	19	0	272	1	1	20	291	1432	6	42	1979	172
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Hourly flow rate (vph)	20	0	280	1	1	21	300	1476	6	43	2040	177
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage (veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	3328	4297	769	3125	4382	495	2217			1482		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	3328	4297	769	3125	4382	495	2217			1482		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	0	19	0	0	96	0			90		
cM capacity (veh/h)	0	0	344	0	0	520	232			450		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4		
Volume Total	300	23	300	590	590	301	43	816	816	585		
Volume Left	20	1	300	0	0	0	43	0	0	0		
Volume Right	280	21	0	0	0	6	0	0	0	177		
cSH	0	0	232	1700	1700	1700	450	1700	1700	1700		
Volume to Capacity	Err	Err	1.29	0.35	0.35	0.18	0.10	0.48	0.48	0.34		
Queue Length 95th (ft)	Err	Err	391	0	0	0	8	0	0	0		
Control Delay (s/veh)	Err	Err	201.2	0.0	0.0	0.0	13.8	0.0	0.0	0.0		
Lane LOS	F	F	F				B					
Approach Delay (s/veh)	Err	Err	33.9				0.3					
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			92.7%		ICU Level of Service				F			
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Atherton Ave & Alameda de la Pulgas

Cumulative plus Project AM
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	17	23	22	200	20	177	11	359	111	316	433	9
Future Volume (vph)	17	23	22	200	20	177	11	359	111	316	433	9
Peak Hour Factor	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Hourly flow rate (vph)	18	24	23	211	21	186	12	378	117	333	456	9
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	65	232	186	12	495	333	465					
Volume Left (vph)	18	211	0	12	0	333	0					
Volume Right (vph)	23	0	186	0	117	0	9					
Hadj (s)	-0.12	0.22	-0.57	0.53	-0.13	0.53	0.02					
Departure Headway (s)	7.9	7.4	3.2	7.5	6.8	7.1	6.6					
Degree Utilization, x	0.14	0.48	0.17	0.03	0.94	0.66	0.86					
Capacity (veh/h)	426	468	1121	465	523	489	536					
Control Delay (s/veh)	12.2	16.9	6.8	9.5	50.2	21.8	36.0					
Approach Delay (s/veh)	12.2	12.4		49.2		30.0						
Approach LOS	B	B		E		D						
Intersection Summary												
Delay			30.7									
Level of Service			D									
Intersection Capacity Utilization			71.9%		ICU Level of Service		C					
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis

3: Atherton Ave/Fair Oaks Lane & El Camino Real

Cumulative plus Project AM
09/27/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	119	87	120	115	153	74	120	995	15	76	1576	180
Future Volume (vph)	119	87	120	115	153	74	120	995	15	76	1576	180
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.98	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1811	1583		1824	1583	1770	5074		1770	5007	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1811	1583		1824	1583	1770	5074		1770	5007	
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	128	94	129	124	165	80	129	1070	16	82	1695	194
RTOR Reduction (vph)	0	0	108	0	0	65	0	1	0	0	9	0
Lane Group Flow (vph)	0	222	21	0	289	15	129	1085	0	82	1880	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)		21.9	21.9		24.8	24.8	12.9	60.2		10.5	57.8	
Effective Green, g (s)		21.9	21.9		24.8	24.8	12.9	60.2		10.5	57.8	
Actuated g/C Ratio		0.16	0.16		0.18	0.18	0.10	0.44		0.08	0.43	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		292	256		334	289	168	2255		137	2137	
v/s Ratio Prot		c0.12			c0.16		c0.07	0.21		0.05	c0.38	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.76	0.08		0.87	0.05	0.77	0.48		0.60	0.88	
Uniform Delay, d1		54.2	48.2		53.7	45.6	59.8	26.6		60.4	35.6	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		11.1	0.1		20.2	0.1	18.7	0.2		6.9	4.5	
Delay (s)		65.3	48.3		73.8	45.7	78.5	26.7		67.3	40.1	
Level of Service		E	D		E	D	E	C		E	D	
Approach Delay (s/veh)		59.1			67.7			32.2			41.3	
Approach LOS		E			E			C			D	

Intersection Summary

HCM 2000 Control Delay (s/veh)	42.5	HCM 2000 Level of Service	D
HCM 2000 Volume to Capacity ratio	0.84		
Actuated Cycle Length (s)	135.4	Sum of lost time (s)	18.0
Intersection Capacity Utilization	81.7%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Marsh Rd & Middlefield Rd

Cumulative plus Project AM
09/27/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	480	392	273	479	258	329
Future Volume (vph)	480	392	273	479	258	329
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.33	1.00
Satd. Flow (perm)	1770	1583	1863	1583	612	1863
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	500	408	284	499	269	343
RTOR Reduction (vph)	0	128	0	88	0	0
Lane Group Flow (vph)	500	280	284	411	269	343
Turn Type	Prot	pt+ov	NA	pt+ov	pm+pt	NA
Protected Phases	6	6 7	8	6 8	7	4
Permitted Phases					4	
Actuated Green, G (s)	31.2	51.7	21.4	57.1	41.9	41.9
Effective Green, g (s)	31.2	51.7	21.4	57.1	41.9	41.9
Actuated g/C Ratio	0.38	0.63	0.26	0.70	0.51	0.51
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	672	996	485	1100	538	950
v/s Ratio Prot	c0.28	0.18	c0.15	0.26	c0.10	0.18
v/s Ratio Perm					0.16	
v/c Ratio	0.74	0.28	0.59	0.37	0.50	0.36
Uniform Delay, d1	22.0	6.8	26.5	5.1	12.7	12.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	4.5	0.2	1.8	0.2	0.7	0.2
Delay (s)	26.5	7.0	28.3	5.4	13.4	12.3
Level of Service	C	A	C	A	B	B
Approach Delay (s/veh)	17.7		13.7			12.8
Approach LOS	B		B			B
Intersection Summary						
HCM 2000 Control Delay (s/veh)			15.0		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.64			
Actuated Cycle Length (s)			82.1		Sum of lost time (s)	13.5
Intersection Capacity Utilization			66.5%		ICU Level of Service	C
Analysis Period (min)			15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 5: Alejandra Ave & El Camino Real

Cumulative plus Project AM
 09/27/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	56	87	91	1173	1680	200		
Future Volume (Veh/h)	56	87	91	1173	1680	200		
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Peak Hour Factor	0.90	0.90	0.90	0.90	0.90	0.90		
Hourly flow rate (vph)	62	97	101	1303	1867	222		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type				None	TWLTL			
Median storage (veh)					2			
Upstream signal (ft)				582				
pX, platoon unblocked	0.91							
vC, conflicting volume	2832	733	2089					
vC1, stage 1 conf vol	1978							
vC2, stage 2 conf vol	854							
vCu, unblocked vol	2815	733	2089					
tC, single (s)	6.8	6.9	4.1					
tC, 2 stage (s)	5.8							
tF (s)	3.5	3.3	2.2					
p0 queue free %	27	73	61					
cM capacity (veh/h)	85	363	261					
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	62	97	101	652	652	747	747	595
Volume Left	62	0	101	0	0	0	0	0
Volume Right	0	97	0	0	0	0	0	222
cSH	85	363	261	1700	1700	1700	1700	1700
Volume to Capacity	0.73	0.27	0.39	0.38	0.38	0.44	0.44	0.35
Queue Length 95th (ft)	90	27	44	0	0	0	0	0
Control Delay (s/veh)	118.9	18.5	27.2	0.0	0.0	0.0	0.0	0.0
Lane LOS	F	C	D					
Approach Delay (s/veh)	57.6		2.0			0.0		
Approach LOS	F							
Intersection Summary								
Average Delay			3.3					
Intersection Capacity Utilization			55.3%	ICU Level of Service	B			
Analysis Period (min)			15					

HCM Unsignalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Cumulative plus project PM
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	10	0	244	0	2	27	238	1830	8	60	1341	77
Future Volume (Veh/h)	10	0	244	0	2	27	238	1830	8	60	1341	77
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99
Hourly flow rate (vph)	10	0	246	0	2	27	240	1848	8	61	1355	78
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type												
Median storage veh												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	2640	3852	491	3152	3887	620	1433			1856		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	2640	3852	491	3152	3887	620	1433			1856		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	0	100	53	100	0	94	49			81		
cM capacity (veh/h)	0	1	524	1	1	431	470			322		
Direction, Lane #	EB 1	WB 1	NB 1	NB 2	NB 3	NB 4	SB 1	SB 2	SB 3	SB 4		
Volume Total	256	29	240	739	739	378	61	542	542	349		
Volume Left	10	0	240	0	0	0	61	0	0	0		
Volume Right	246	27	0	0	0	8	0	0	0	78		
cSH	0	19	470	1700	1700	1700	322	1700	1700	1700		
Volume to Capacity	Err	1.56	0.51	0.43	0.43	0.22	0.19	0.32	0.32	0.21		
Queue Length 95th (ft)	Err	100	71	0	0	0	17	0	0	0		
Control Delay (s/veh)	Err	711.3	20.4	0.0	0.0	0.0	18.8	0.0	0.0	0.0		
Lane LOS	F	F	C				C					
Approach Delay (s/veh)	Err	711.3	2.3				0.8					
Approach LOS	F	F										
Intersection Summary												
Average Delay			Err									
Intersection Capacity Utilization			73.1%		ICU Level of Service					D		
Analysis Period (min)			15									

HCM Unsignalized Intersection Capacity Analysis
 2: Atherton Ave & Alameda de la Pulgas

Cumulative plus project PM
 09/27/2023

												
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	9	6	11	112	13	266	9	514	113	83	438	17
Future Volume (vph)	9	6	11	112	13	266	9	514	113	83	438	17
Peak Hour Factor	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Hourly flow rate (vph)	9	6	11	117	14	277	9	535	118	86	456	18
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2					
Volume Total (vph)	26	131	277	9	653	86	474					
Volume Left (vph)	9	117	0	9	0	86	0					
Volume Right (vph)	11	0	277	0	118	0	18					
Hadj (s)	-0.15	0.21	-0.57	0.53	-0.09	0.53	0.01					
Departure Headway (s)	7.1	7.0	3.2	6.3	5.7	6.3	5.8					
Degree Utilization, x	0.05	0.25	0.25	0.02	1.03	0.15	0.76					
Capacity (veh/h)	464	486	1112	552	629	560	611					
Control Delay (s/veh)	10.5	12.4	7.2	8.2	67.0	9.2	23.7					
Approach Delay (s/veh)	10.5	8.9		66.2		21.5						
Approach LOS	B	A		F		C						
Intersection Summary												
Delay			36.1									
Level of Service			E									
Intersection Capacity Utilization			63.7%		ICU Level of Service					B		
Analysis Period (min)			15									

HCM Signalized Intersection Capacity Analysis
 3: Atherton Ave/Fair Oaks Lane & El Camino Real

Cumulative plus project PM
 09/27/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕	↗		↕	↗	↖	↑↑↑		↖	↑↑↑	
Traffic Volume (vph)	150	88	78	56	107	84	199	1371	32	55	1101	67
Future Volume (vph)	150	88	78	56	107	84	199	1371	32	55	1101	67
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00	1.00		1.00	1.00	1.00	0.91		1.00	0.91	
Frt		1.00	0.85		1.00	0.85	1.00	1.00		1.00	0.99	
Flt Protected		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1806	1583		1831	1583	1770	5068		1770	5041	
Flt Permitted		0.97	1.00		0.98	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1806	1583		1831	1583	1770	5068		1770	5041	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	165	97	86	62	118	92	219	1507	35	60	1210	74
RTOR Reduction (vph)	0	0	69	0	0	78	0	2	0	0	5	0
Lane Group Flow (vph)	0	262	17	0	180	14	219	1540	0	60	1279	0
Turn Type	Split	NA	Perm	Split	NA	Perm	Prot	NA		Prot	NA	
Protected Phases	2	2		6	6		3	8		7	4	
Permitted Phases			2			6						
Actuated Green, G (s)		20.3	20.3		15.8	15.8	15.7	45.2		5.8	35.3	
Effective Green, g (s)		20.3	20.3		15.8	15.8	15.7	45.2		5.8	35.3	
Actuated g/C Ratio		0.19	0.19		0.15	0.15	0.15	0.43		0.06	0.34	
Clearance Time (s)		4.5	4.5		4.5	4.5	4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0	3.0		3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		348	305		275	237	264	2179		97	1693	
v/s Ratio Prot		c0.15			c0.10		c0.12	c0.30		0.03	0.25	
v/s Ratio Perm			0.01			0.01						
v/c Ratio		0.75	0.05		0.65	0.06	0.83	0.71		0.62	0.76	
Uniform Delay, d1		40.0	34.6		42.1	38.3	43.4	24.5		48.6	31.1	
Progression Factor		1.00	1.00		1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		8.9	0.1		5.5	0.1	18.9	1.1		11.2	2.0	
Delay (s)		48.9	34.6		47.6	38.4	62.3	25.6		59.8	33.0	
Level of Service		D	C		D	D	E	C		E	C	
Approach Delay (s/veh)		45.4			44.5			30.2			34.2	
Approach LOS		D			D			C			C	

Intersection Summary		
HCM 2000 Control Delay (s/veh)	34.1	HCM 2000 Level of Service C
HCM 2000 Volume to Capacity ratio	0.75	
Actuated Cycle Length (s)	105.1	Sum of lost time (s) 18.0
Intersection Capacity Utilization	64.6%	ICU Level of Service C
Analysis Period (min)	15	

c Critical Lane Group

HCM Signalized Intersection Capacity Analysis
4: Marsh Rd & Middlefield Rd

Cumulative plus project PM
09/27/2023

						
Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (vph)	483	340	328	545	324	369
Future Volume (vph)	483	340	328	545	324	369
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.5	4.5	4.5	4.5	4.5	4.5
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.85	1.00	0.85	1.00	1.00
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	1583	1863	1583	1770	1863
Flt Permitted	0.95	1.00	1.00	1.00	0.25	1.00
Satd. Flow (perm)	1770	1583	1863	1583	464	1863
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	519	366	353	586	348	397
RTOR Reduction (vph)	0	88	0	66	0	0
Lane Group Flow (vph)	519	278	353	520	348	397
Turn Type	Prot	pt+ov	NA	pt+ov	pm+pt	NA
Protected Phases	6	6 7	8	8 6	7	4
Permitted Phases					4	
Actuated Green, G (s)	36.2	62.7	27.5	68.2	54.0	54.0
Effective Green, g (s)	36.2	62.7	27.5	68.2	54.0	54.0
Actuated g/C Ratio	0.36	0.63	0.28	0.69	0.54	0.54
Clearance Time (s)	4.5		4.5		4.5	4.5
Vehicle Extension (s)	3.0		3.0		3.0	3.0
Lane Grp Cap (vph)	645	1000	516	1088	542	1014
v/s Ratio Prot	c0.29	0.18	0.19	0.33	c0.14	0.21
v/s Ratio Perm					c0.21	
v/c Ratio	0.80	0.28	0.68	0.48	0.64	0.39
Uniform Delay, d1	28.3	8.1	32.0	7.2	15.2	13.1
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	7.2	0.2	3.7	0.3	2.6	0.3
Delay (s)	35.5	8.3	35.7	7.5	17.8	13.3
Level of Service	D	A	D	A	B	B
Approach Delay (s/veh)	24.3		18.1			15.4
Approach LOS	C		B			B
Intersection Summary						
HCM 2000 Control Delay (s/veh)			19.5		HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio			0.73			
Actuated Cycle Length (s)			99.2		Sum of lost time (s)	13.5
Intersection Capacity Utilization			73.2%		ICU Level of Service	D
Analysis Period (min)			15			

c Critical Lane Group

HCM Unsignalized Intersection Capacity Analysis
 5: Alejandra Ave & El Camino Real

Cumulative plus project PM
 09/27/2023



Movement	EBL	EBR	NBL	NBT	SBT	SBR		
Lane Configurations								
Traffic Volume (veh/h)	77	55	50	1625	1149	46		
Future Volume (Veh/h)	77	55	50	1625	1149	46		
Sign Control	Stop			Free	Free			
Grade	0%			0%	0%			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94		
Hourly flow rate (vph)	82	59	53	1729	1222	49		
Pedestrians								
Lane Width (ft)								
Walking Speed (ft/s)								
Percent Blockage								
Right turn flare (veh)								
Median type				None	TWLTL			
Median storage (veh)					2			
Upstream signal (ft)				582				
pX, platoon unblocked	0.60							
vC, conflicting volume	2217	432	1271					
vC1, stage 1 conf vol	1247							
vC2, stage 2 conf vol	971							
vCu, unblocked vol	1690	432	1271					
tC, single (s)	6.8	6.9	4.1					
tC, 2 stage (s)	5.8							
tF (s)	3.5	3.3	2.2					
p0 queue free %	61	90	90					
cM capacity (veh/h)	212	572	542					
Direction, Lane #	EB 1	EB 2	NB 1	NB 2	NB 3	SB 1	SB 2	SB 3
Volume Total	82	59	53	865	865	489	489	293
Volume Left	82	0	53	0	0	0	0	0
Volume Right	0	59	0	0	0	0	0	49
cSH	212	572	542	1700	1700	1700	1700	1700
Volume to Capacity	0.39	0.10	0.10	0.51	0.51	0.29	0.29	0.17
Queue Length 95th (ft)	43	9	8	0	0	0	0	0
Control Delay (s/veh)	32.4	12.0	12.4	0.0	0.0	0.0	0.0	0.0
Lane LOS	D	B	B					
Approach Delay (s/veh)	23.9		0.4			0.0		
Approach LOS	C							
Intersection Summary								
Average Delay			1.3					
Intersection Capacity Utilization			55.9%	ICU Level of Service	B			
Analysis Period (min)			15					

HCM Signalized Intersection Capacity Analysis

Cumulative plus Project AM - mit

1: Selby Lane & El Camino Real

09/27/2023



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations		↕			↕		↙	↑↑↑		↘	↑↑↑	
Traffic Volume (vph)	19	0	272	1	1	20	291	1432	6	42	1979	172
Future Volume (vph)	19	0	272	1	1	20	291	1432	6	42	1979	172
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91	
Frt		0.87			0.88		1.00	1.00		1.00	0.99	
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1623			1630		1770	5082		1770	5024	
Flt Permitted		0.97			0.96		0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1586			1574		1770	5082		1770	5024	
Peak-hour factor, PHF	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97	0.97
Adj. Flow (vph)	20	0	280	1	1	21	300	1476	6	43	2040	177
RTOR Reduction (vph)	0	258	0	0	19	0	0	0	0	0	5	0
Lane Group Flow (vph)	0	42	0	0	4	0	300	1482	0	43	2212	0
Turn Type	Perm	NA		Perm	NA		Prot	NA		Prot	NA	
Protected Phases		2			6		3	8		7	4	
Permitted Phases	2			6								
Actuated Green, G (s)		9.4			9.4		25.4	90.0		6.5	71.1	
Effective Green, g (s)		9.4			9.4		25.4	90.0		6.5	71.1	
Actuated g/C Ratio		0.08			0.08		0.21	0.75		0.05	0.60	
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5	
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		124			123		376	3830		96	2991	
v/s Ratio Prot							c0.17	0.29		0.02	c0.44	
v/s Ratio Perm		c0.03			0.00							
v/c Ratio		0.34			0.03		0.80	0.39		0.45	0.74	
Uniform Delay, d1		52.1			50.8		44.6	5.1		54.7	17.5	
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2		1.6			0.1		11.2	0.1		3.3	1.0	
Delay (s)		53.7			50.9		55.8	5.2		58.0	18.4	
Level of Service		D			D		E	A		E	B	
Approach Delay (s/veh)		53.7			50.9			13.7			19.2	
Approach LOS		D			D			B			B	

Intersection Summary

HCM 2000 Control Delay (s/veh)	19.5	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.72		
Actuated Cycle Length (s)	119.4	Sum of lost time (s)	13.5
Intersection Capacity Utilization	94.0%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

Intersection				
Intersection Delay, s/veh	13.6			
Intersection LOS	B			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	65	418	507	798
Demand Flow Rate, veh/h	65	426	517	814
Vehicles Circulating, veh/h	1020	416	382	248
Vehicles Exiting, veh/h	42	483	703	594
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.2	10.0	11.4	17.2
Approach LOS	A	B	B	C
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	65	426	517	814
Cap Entry Lane, veh/h	488	903	935	1071
Entry HV Adj Factor	0.993	0.980	0.981	0.980
Flow Entry, veh/h	65	418	507	798
Cap Entry, veh/h	484	885	917	1050
V/C Ratio	0.133	0.472	0.553	0.760
Control Delay, s/veh	9.2	10.0	11.4	17.2
LOS	A	B	B	C
95th %tile Queue, veh	0	3	3	8

HCM Signalized Intersection Capacity Analysis
 1: Selby Lane & El Camino Real

Cumulative plus project PM - mit
 09/29/2023

													
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR	
Lane Configurations													
Traffic Volume (vph)	10	0	244	0	2	27	238	1830	8	60	1341	77	
Future Volume (vph)	10	0	244	0	2	27	238	1830	8	60	1341	77	
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	
Total Lost time (s)		4.5			4.5		4.5	4.5		4.5	4.5		
Lane Util. Factor		1.00			1.00		1.00	0.91		1.00	0.91		
Frt		0.87			0.87		1.00	1.00		1.00	0.99		
Flt Protected		1.00			1.00		0.95	1.00		0.95	1.00		
Satd. Flow (prot)		1618			1629		1770	5082		1770	5044		
Flt Permitted		0.99			1.00		0.95	1.00		0.95	1.00		
Satd. Flow (perm)		1599			1629		1770	5082		1770	5044		
Peak-hour factor, PHF	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	
Adj. Flow (vph)	10	0	246	0	2	27	240	1848	8	61	1355	78	
RTOR Reduction (vph)	0	221	0	0	24	0	0	0	0	0	3	0	
Lane Group Flow (vph)	0	35	0	0	5	0	240	1856	0	61	1430	0	
Turn Type	Perm	NA			NA		Prot	NA		Prot	NA		
Protected Phases		2			6		3	8		7	4		
Permitted Phases	2			6									
Actuated Green, G (s)		8.1			8.1		18.2	51.0		7.3	40.1		
Effective Green, g (s)		8.1			8.1		18.2	51.0		7.3	40.1		
Actuated g/C Ratio		0.10			0.10		0.23	0.64		0.09	0.50		
Clearance Time (s)		4.5			4.5		4.5	4.5		4.5	4.5		
Vehicle Extension (s)		3.0			3.0		3.0	3.0		3.0	3.0		
Lane Grp Cap (vph)		162			165		403	3243		161	2531		
v/s Ratio Prot					0.00		c0.14	c0.37		0.03	0.28		
v/s Ratio Perm		c0.02											
v/c Ratio		0.22			0.03		0.60	0.57		0.38	0.56		
Uniform Delay, d1		33.0			32.4		27.6	8.2		34.2	13.8		
Progression Factor		1.00			1.00		1.00	1.00		1.00	1.00		
Incremental Delay, d2		0.7			0.1		2.4	0.2		1.5	0.3		
Delay (s)		33.7			32.4		29.9	8.5		35.7	14.1		
Level of Service		C			C		C	A		D	B		
Approach Delay (s/veh)		33.7			32.4			10.9			15.0		
Approach LOS		C			C			B			B		
Intersection Summary													
HCM 2000 Control Delay (s/veh)			14.2				HCM 2000 Level of Service				B		
HCM 2000 Volume to Capacity ratio			0.56										
Actuated Cycle Length (s)			79.9				Sum of lost time (s)				13.5		
Intersection Capacity Utilization			74.4%				ICU Level of Service				D		
Analysis Period (min)			15										

c Critical Lane Group

Intersection				
Intersection Delay, s/veh	9.7			
Intersection LOS	A			
Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	26	408	662	560
Demand Flow Rate, veh/h	26	416	675	571
Vehicles Circulating, veh/h	672	564	103	142
Vehicles Exiting, veh/h	41	214	595	838
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	5.6	12.7	9.1	8.3
Approach LOS	A	B	A	A
Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Follow-Up Headway, s	2.609	2.609	2.609	2.609
Critical Headway, s	4.976	4.976	4.976	4.976
Entry Flow, veh/h	26	416	675	571
Cap Entry Lane, veh/h	695	776	1242	1194
Entry HV Adj Factor	0.995	0.980	0.981	0.981
Flow Entry, veh/h	26	408	662	560
Cap Entry, veh/h	692	761	1219	1171
V/C Ratio	0.037	0.536	0.543	0.478
Control Delay, s/veh	5.6	12.7	9.1	8.3
LOS	A	B	A	A
95th %tile Queue, veh	0	3	3	3

Vistro File: \...\Vistro_AllScenarios_AM.vistro

Scenario 16 Existing AM

Report File: \...\EXAM.pdf

6/9/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
9	Middlefield Rd/Ravenswood Ave	Signalized	HCM 7th Edition	NEB Right	0.760	43.7	D
29	El Camino Real (SR 82) /Encinal Ave-Menlo College Entrance	Signalized	HCM 7th Edition	SWB Left	13.239	47.0	D
30	El Camino Real (SR 82) /Glenwood Ave-Valparaiso Ave	Signalized	HCM 7th Edition	NWB Left	0.626	31.6	C
40	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 7th Edition	WB Left	0.845	29.6	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 9: Middlefield Rd/Ravenswood Ave

Control Type:	Signalized	Delay (sec / veh):	43.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

Intersection Setup

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Approach	Northeastbound		Northwestbound		Southeastbound	
Lane Configuration	↵↵		↵		↵	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	120.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		35.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Base Volume Input [veh/h]	95	356	393	415	328	83
Base Volume Adjustment Factor	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
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	95	356	393	415	328	83
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	96	106	112	88	22
Total Analysis Volume [veh/h]	102	383	423	446	353	89
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10		11		0	
v_di, Inbound Pedestrian Volume crossing m	11		10		0	
v_co, Outbound Pedestrian Volume crossing	1		0		1	
v_ci, Inbound Pedestrian Volume crossing mi	1		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	22		39		37	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	61.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	3	2	1	6	2	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	4	10	4	10	10	0
Maximum Green [s]	50	35	35	70	35	0
Amber [s]	3.2	3.6	3.0	3.6	3.6	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	30	52	38	90	52	0
Vehicle Extension [s]	2.5	3.6	3.0	3.6	3.6	0.0
Walk [s]	7	7	0	7	7	0
Pedestrian Clearance [s]	10	12	0	12	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	Yes	Yes	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	0.0	20.0	0.0
I, Upstream Filtering Factor	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	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120
L, Total Lost Time per Cycle [s]	2.00	2.00	2.00	4.60	2.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	2.60	0.00
g_i, Effective Green Time [s]	28	28	32	85	54
g / C, Green / Cycle	0.23	0.23	0.27	0.71	0.45
(v / s)_i Volume / Saturation Flow Rate	0.06	0.25	0.24	0.24	0.25
s, saturation flow rate [veh/h]	1781	1537	1781	1870	1783
c, Capacity [veh/h]	418	361	476	1328	799
d1, Uniform Delay [s]	37.31	45.50	42.27	6.62	24.33
k, delay calibration	0.08	0.16	0.35	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.22	44.93	16.16	0.68	2.75
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	1.06	0.89	0.34	0.55
d, Delay for Lane Group [s/veh]	37.53	90.42	58.43	7.30	27.09
Lane Group LOS	D	F	E	A	C
Critical Lane Group	No	Yes	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	2.48	15.08	13.97	4.07	9.58
50th-Percentile Queue Length [ft/ln]	61.94	377.00	349.25	101.87	239.58
95th-Percentile Queue Length [veh/ln]	4.46	22.18	20.10	7.33	14.66
95th-Percentile Queue Length [ft/ln]	111.49	554.45	502.49	183.36	366.51

Movement, Approach, & Intersection Results

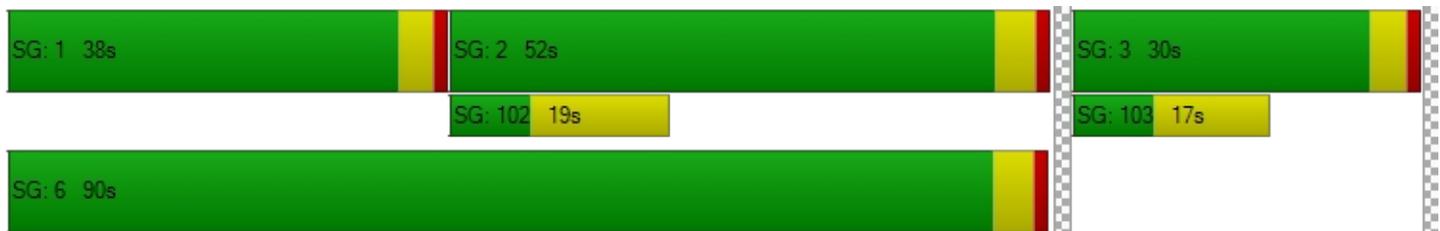
d_M, Delay for Movement [s/veh]	37.53	90.42	58.43	7.30	27.09	27.09
Movement LOS	D	F	E	A	C	C
d_A, Approach Delay [s/veh]	79.30		32.19		27.09	
Approach LOS	E		C		C	
d_I, Intersection Delay [s/veh]	43.65					
Intersection LOS	D					
Intersection V/C	0.760					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.53	49.53	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.278	2.601	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	430	1423	790
d_b, Bicycle Delay [s]	37.41	5.10	22.40
I_b,int, Bicycle LOS Score for Intersection	1.560	2.993	2.289
Bicycle LOS	A	C	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 29: El Camino Real (SR 82)/Encinal Ave-Menlo College Entrance

Control Type:	Signalized	Delay (sec / veh):	47.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	13.239

Intersection Setup

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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]	15.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			No			No		

Volumes

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	4	16	8	117	10	188	19	828	126	147	1466	26
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
Proportion of CAVs [%]	0.00											
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]	4	16	8	117	10	188	19	828	126	147	1466	26
Peak Hour Factor	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
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]	1	4	2	31	3	49	5	217	33	38	383	7
Total Analysis Volume [veh/h]	4	17	8	122	10	197	20	866	132	154	1533	27
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 m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	1			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			4			2			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	150
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	84.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	10	10	0	10	10	0
Maximum Green [s]	0	40	0	0	40	0	10	35	0	25	35	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [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
Split [s]	0	40	0	0	40	0	15	85	0	25	95	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	7	0	0	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	0	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	1.0	0.0	0.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No			No		Yes	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	20.0	0.0	0.0	20.0	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	R	C	R	L	C	R	L	C	C
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	3.00	3.00	3.00	3.00	3.00	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
l2, Clearance Lost Time [s]	1.00	1.00	1.00	1.00	1.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	37	37	37	37	6	93	93	106	97	97
g / C, Green / Cycle	0.25	0.25	0.25	0.25	0.04	0.62	0.62	0.71	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.05	0.01	12.59	0.13	0.01	0.24	0.08	0.22	0.29	0.29
s, saturation flow rate [veh/h]	423	1589	10	1565	1781	3560	1556	690	3560	1851
c, Capacity [veh/h]	133	390	49	384	67	2212	967	529	2315	1203
d1, Uniform Delay [s]	45.88	42.91	73.46	48.73	69.32	5.67	5.08	1.75	4.12	4.12
k, delay calibration	0.11	0.11	0.50	0.11	0.11	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
d2, Incremental Delay [s]	0.55	0.02	822.91	1.06	2.44	0.52	0.29	1.39	0.62	1.19
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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
PF, progression factor	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	0.16	0.02	2.71	0.51	0.30	0.39	0.14	0.29	0.44	0.44
d, Delay for Lane Group [s/veh]	46.44	42.93	896.36	49.79	71.76	6.20	5.38	3.14	4.73	5.31
Lane Group LOS	D	D	F	D	E	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.64	0.24	13.04	6.53	0.79	3.02	0.88	0.49	2.78	3.09
50th-Percentile Queue Length [ft/ln]	16.01	5.93	325.91	163.21	19.71	75.50	22.12	12.22	69.49	77.15
95th-Percentile Queue Length [veh/ln]	1.15	0.43	23.47	10.72	1.42	5.44	1.59	0.88	5.00	5.55
95th-Percentile Queue Length [ft/ln]	28.83	10.67	586.64	267.96	35.47	135.90	39.81	21.99	125.09	138.87

Movement, Approach, & Intersection Results

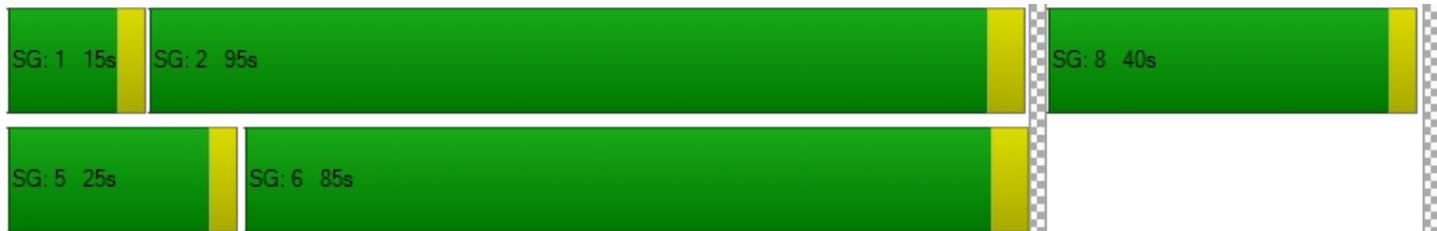
d_M, Delay for Movement [s/veh]	46.44	46.44	42.93	896.36	896.36	49.79	71.76	6.20	5.38	3.14	4.92	5.31
Movement LOS	D	D	D	F	F	D	E	A	A	A	A	A
d_A, Approach Delay [s/veh]	45.47			389.45			7.38			4.77		
Approach LOS	D			F			A			A		
d_I, Intersection Delay [s/veh]	46.97											
Intersection LOS	D											
Intersection V/C	13.239											

Other Modes

g_Walk,mi, Effective Walk Time [s]	91.0	0.0	0.0	0.0
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]	11.60	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	1.910	0.000	0.000	0.000
Crosswalk LOS	A	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	493	493	1080	1213
d_b, Bicycle Delay [s]	42.56	42.65	15.89	11.63
I_b,int, Bicycle LOS Score for Intersection	1.607	2.102	2.399	2.502
Bicycle LOS	A	B	B	B

Sequence

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



Intersection Level Of Service Report

Intersection 30: El Camino Real (SR 82)/Glenwood Ave-Valparaiso Ave

Control Type:	Signalized	Delay (sec / veh):	31.6
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.626

Intersection Setup

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	205.00	100.00	130.00	120.00	100.00	100.00	190.00	100.00	105.00	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			25.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	243	132	91	49	218	37	111	733	37	89	1015	199
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
Proportion of CAVs [%]	0.00											
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]	243	132	91	49	218	37	111	733	37	89	1015	199
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
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]	65	35	24	13	59	10	30	197	10	24	273	53
Total Analysis Volume [veh/h]	261	142	98	53	234	40	119	788	40	96	1091	214
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	5			2			5			3		
v_di, Inbound Pedestrian Volume crossing m	5			3			5			2		
v_co, Outbound Pedestrian Volume crossing	2			6			6			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			6			6			2		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	18			15			4			9		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	150
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	80.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	3	0	0	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	12	0	8	10	0	8	10	0
Maximum Green [s]	0	50	0	0	50	0	50	50	0	50	50	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.7	0.0	3.5	4.1	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	0	32	0	0	32	0	15	71	0	15	71	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	4	0	0	4	0	0	4	0	0	4	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	16	0	0	18	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	1.5	0.0	0.0	1.5	0.0	1.5	2.2	0.0	2.0	2.6	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	50.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	50.0	50.0	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	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.20	4.20	4.00	4.60	4.60
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]	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.20	2.20	2.00	2.60	2.60
g_i, Effective Green Time [s]	22	22	22	22	22	22	12	81	81	10	80	80
g / C, Green / Cycle	0.15	0.15	0.15	0.15	0.15	0.15	0.08	0.54	0.54	0.07	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.07	0.03	0.13	0.03	0.07	0.22	0.03	0.05	0.31	0.14
s, saturation flow rate [veh/h]	1781	1842	1496	1781	1870	1519	1781	3560	1536	1781	3560	1542
c, Capacity [veh/h]	260	269	219	259	272	221	137	1926	831	117	1888	818
d1, Uniform Delay [s]	61.57	61.57	58.31	56.46	62.62	56.20	66.59	11.43	9.75	67.59	13.65	11.38
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	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]	4.56	4.41	1.43	0.38	7.74	0.39	14.77	0.65	0.11	12.92	1.30	0.78
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	1.33	1.33	1.33	1.33	1.33	1.33
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	0.76	0.76	0.45	0.20	0.86	0.18	0.87	0.41	0.05	0.82	0.58	0.26
d, Delay for Lane Group [s/veh]	66.13	65.98	59.75	56.85	70.36	56.58	81.36	12.08	9.86	80.52	14.95	12.16
Lane Group LOS	E	E	E	E	E	E	F	B	A	F	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.62	7.87	3.50	1.83	9.40	1.38	4.94	4.58	0.42	3.99	8.02	2.60
50th-Percentile Queue Length [ft/ln]	190.55	196.78	87.59	45.71	235.07	34.41	123.49	114.60	10.48	99.76	200.46	65.01
95th-Percentile Queue Length [veh/ln]	12.15	12.47	6.31	3.29	14.43	2.48	8.58	8.10	0.75	7.18	12.66	4.68
95th-Percentile Queue Length [ft/ln]	303.74	311.80	157.66	82.28	360.79	61.94	214.62	202.38	18.86	179.56	316.56	117.01

Movement, Approach, & Intersection Results

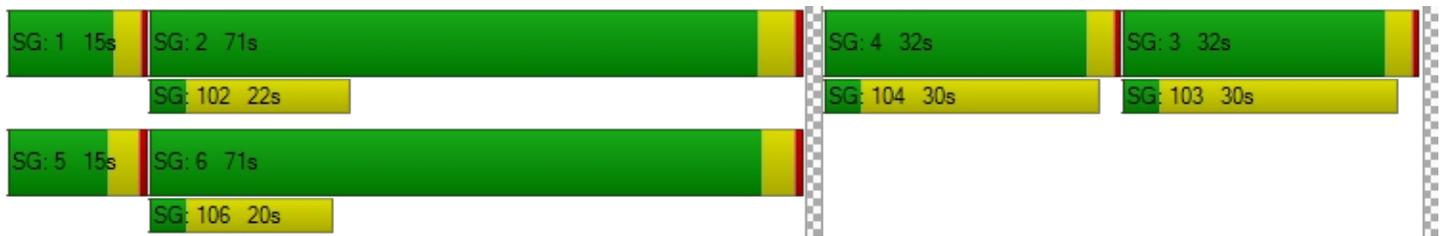
d_M, Delay for Movement [s/veh]	66.09	65.98	59.75	56.85	70.36	56.58	81.36	12.08	9.86	80.52	14.95	12.16
Movement LOS	E	E	E	E	E	E	F	B	A	F	B	B
d_A, Approach Delay [s/veh]	64.82			66.48			20.69			19.02		
Approach LOS	E			E			C			B		
d_I, Intersection Delay [s/veh]	31.63											
Intersection LOS	C											
Intersection V/C	0.626											

Other Modes

g_Walk,mi, Effective Walk Time [s]	8.0	8.0	8.0	8.0
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]	67.25	67.25	67.25	67.25
I_p,int, Pedestrian LOS Score for Intersectio	2.417	2.280	2.894	2.884
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]	380	380	890	885
d_b, Bicycle Delay [s]	49.69	49.61	23.15	23.43
I_b,int, Bicycle LOS Score for Intersection	2.386	2.099	2.341	2.715
Bicycle LOS	B	B	B	B

Sequence

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



Intersection Level Of Service Report
Intersection 40: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	29.6
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.845

Intersection Setup

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	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	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	122	7	15	216	0	7	33	5	4	6	147	219
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
Total Hourly Volume [veh/h]	122	7	15	216	0	7	33	5	4	6	147	219
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
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]	34	2	4	60	0	2	9	1	1	2	41	61
Total Analysis Volume [veh/h]	136	8	17	240	0	8	37	6	4	7	163	243
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	533	437	540
Degree of Utilization, x	0.75	0.12	0.77

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.52	0.39	7.00
95th-Percentile Queue Length [ft]	163.10	9.83	174.88
Approach Delay [s/veh]	27.43	12.33	28.74
Approach LOS	D	B	D
Intersection Delay [s/veh]	29.61		
Intersection LOS	D		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	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	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	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
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	324	60	0	3	5	68	3	0
Base Volume Adjustment Factor	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
Growth Factor	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	324	60	0	3	5	68	3	0
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	17	0	1	1	19	1	0
Total Analysis Volume [veh/h]	360	67	0	3	6	76	3	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	509	436
Degree of Utilization, x	0.85	0.20

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	8.70	0.72
95th-Percentile Queue Length [ft]	217.57	17.90
Approach Delay [s/veh]	37.77	13.26
Approach LOS	E	B
Intersection Delay [s/veh]	29.61	
Intersection LOS	D	

Vistro File: \\...\Vistro_AllScenarios_PM.vistro

Scenario 16 Existing PM

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

6/13/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
9	Middlefield Rd/Ravenswood Ave	Signalized	HCM 7th Edition	NWB Left	0.788	33.0	C
29	El Camino Real (SR 82) /Encinal Ave-Menlo College Entrance	Signalized	HCM 7th Edition	SWB Left	5.277	26.9	C
30	El Camino Real (SR 82) /Glenwood Ave-Valparaiso Ave	Signalized	HCM 7th Edition	NWB Left	0.646	28.3	C
40	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 7th Edition	NB Right	0.546	12.0	B

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 9: Middlefield Rd/Ravenswood Ave

Control Type:	Signalized	Delay (sec / veh):	33.0
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.788

Intersection Setup

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Approach	Northeastbound		Northwestbound		Southeastbound	
Lane Configuration	↔↔		↔↑		↑↔	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	120.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		35.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Base Volume Input [veh/h]	145	481	337	508	318	81
Base Volume Adjustment Factor	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
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	145	481	337	508	318	81
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	127	89	134	84	21
Total Analysis Volume [veh/h]	153	506	355	535	335	85
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	11		12		0	
v_di, Inbound Pedestrian Volume crossing m	12		11		0	
v_co, Outbound Pedestrian Volume crossing	6		0		5	
v_ci, Inbound Pedestrian Volume crossing mi	5		0		6	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	11		27		9	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	58.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	3	2	1	6	2	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	4	10	4	5	10	0
Maximum Green [s]	50	35	35	70	35	0
Amber [s]	3.2	3.6	3.0	3.6	3.6	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	50	50	60	110	50	0
Vehicle Extension [s]	2.5	3.6	3.0	3.0	3.6	0.0
Walk [s]	7	7	0	7	7	0
Pedestrian Clearance [s]	10	12	0	12	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	Yes	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	0.0
I, Upstream Filtering Factor	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	R	L	C	C
C, Cycle Length [s]	107	107	107	107	107
L, Total Lost Time per Cycle [s]	2.00	2.00	2.00	4.60	2.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	2.60	0.00
g_i, Effective Green Time [s]	38	38	25	62	38
g / C, Green / Cycle	0.36	0.36	0.24	0.58	0.35
(v / s)_i Volume / Saturation Flow Rate	0.09	0.32	0.20	0.29	0.24
s, saturation flow rate [veh/h]	1781	1560	1781	1870	1786
c, Capacity [veh/h]	635	556	421	1088	627
d1, Uniform Delay [s]	24.27	32.54	39.01	13.13	29.53
k, delay calibration	0.08	0.24	0.19	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.14	12.25	7.99	0.35	5.63
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.91	0.84	0.49	0.67
d, Delay for Lane Group [s/veh]	24.41	44.79	47.01	13.48	35.16
Lane Group LOS	C	D	D	B	D
Critical Lane Group	No	Yes	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	2.75	13.96	9.63	7.09	9.87
50th-Percentile Queue Length [ft/ln]	68.66	348.99	240.63	177.23	246.64
95th-Percentile Queue Length [veh/ln]	4.94	20.09	14.71	11.46	15.02
95th-Percentile Queue Length [ft/ln]	123.59	502.18	367.83	286.40	375.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.41	44.79	47.01	13.48	35.16	35.16
Movement LOS	C	D	D	B	D	D
d_A, Approach Delay [s/veh]	40.06		26.85		35.16	
Approach LOS	D		C		D	
d_I, Intersection Delay [s/veh]	33.04					
Intersection LOS	C					
Intersection V/C	0.788					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	43.09	43.09	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.306	2.632	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	856	1969	848
d_b, Bicycle Delay [s]	17.62	0.01	17.84
I_b,int, Bicycle LOS Score for Intersection	1.560	3.028	2.253
Bicycle LOS	A	C	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 29: El Camino Real (SR 82)/Encinal Ave-Menlo College Entrance

Control Type:	Signalized	Delay (sec / veh):	26.9
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	5.277

Intersection Setup

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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]	15.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			No			No		

Volumes

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	16	13	33	115	3	188	29	1420	112	103	949	10
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 [%]	0.00	0.00	0.00	0.00	0.00	1.30	0.00	1.40	0.00	1.50	1.20	0.00
Proportion of CAVs [%]	0.00											
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	13	33	115	3	188	29	1420	112	103	949	10
Peak Hour Factor	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540
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	3	9	30	1	49	8	372	29	27	249	3
Total Analysis Volume [veh/h]	17	14	35	121	3	197	30	1488	117	108	995	10
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 m	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]	3			3			14			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	15.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	10	10	0	10	10	0
Maximum Green [s]	0	30	0	0	30	0	10	35	0	25	35	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [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
Split [s]	0	27	0	0	27	0	15	58	0	25	68	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	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	1.0	0.0	0.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No			No		Yes	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	20.0	0.0	0.0	20.0	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	R	C	R	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	3.00	3.00	3.00	3.00	3.00	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
l2, Clearance Lost Time [s]	1.00	1.00	1.00	1.00	1.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	24	6	66	66	79	70	70
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.05	0.60	0.60	0.72	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.22	0.02	4.66	0.13	0.02	0.42	0.07	0.21	0.18	0.18
s, saturation flow rate [veh/h]	139	1591	27	1574	1810	3578	1569	516	3583	1871
c, Capacity [veh/h]	81	345	70	341	99	2161	948	412	2285	1193
d1, Uniform Delay [s]	36.52	34.47	54.68	38.46	48.99	6.18	4.40	5.01	3.29	3.29
k, delay calibration	0.34	0.11	0.50	0.11	0.11	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
d2, Incremental Delay [s]	9.08	0.13	393.40	1.54	1.70	1.82	0.27	1.54	0.32	0.61
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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
PF, progression factor	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	0.38	0.10	1.76	0.58	0.30	0.69	0.12	0.26	0.29	0.29
d, Delay for Lane Group [s/veh]	45.60	34.59	448.08	40.00	50.70	7.99	4.67	6.56	3.61	3.90
Lane Group LOS	D	C	F	D	D	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.89	0.79	9.65	4.87	0.82	4.79	0.62	0.27	1.32	1.48
50th-Percentile Queue Length [ft/ln]	22.19	19.71	241.22	121.74	20.61	119.78	15.53	6.72	32.97	36.90
95th-Percentile Queue Length [veh/ln]	1.60	1.42	17.37	8.49	1.48	8.38	1.12	0.48	2.37	2.66
95th-Percentile Queue Length [ft/ln]	39.94	35.48	434.19	212.21	37.10	209.53	27.95	12.09	59.35	66.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.60	45.60	34.59	448.08	448.08	40.00	50.70	7.99	4.67	6.56	3.71	3.90
Movement LOS	D	D	C	F	F	D	D	A	A	A	A	A
d_A, Approach Delay [s/veh]	39.76			197.64			8.54			3.99		
Approach LOS	D			F			A			A		
d_I, Intersection Delay [s/veh]	26.94											
Intersection LOS	C											
Intersection V/C	5.277											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	0.0	0.0
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]	44.54	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	1.967	0.000	0.000	0.000
Crosswalk LOS	A	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	436	436	982	1164
d_b, Bicycle Delay [s]	33.66	33.66	14.35	9.63
I_b,int, Bicycle LOS Score for Intersection	1.669	2.089	2.908	2.172
Bicycle LOS	A	B	C	B

Sequence

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



Intersection Level Of Service Report

Intersection 30: El Camino Real (SR 82)/Glenwood Ave-Valparaiso Ave

Control Type:	Signalized	Delay (sec / veh):	28.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.646

Intersection Setup

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	205.00	100.00	130.00	120.00	100.00	100.00	190.00	100.00	105.00	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			25.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	245	134	99	37	180	43	120	1337	48	38	827	119
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
Proportion of CAVs [%]	0.00											
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]	245	134	99	37	180	43	120	1337	48	38	827	119
Peak Hour Factor	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490
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]	65	35	26	10	47	11	32	352	13	10	218	31
Total Analysis Volume [veh/h]	258	141	104	39	190	45	126	1409	51	40	871	125
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	8			1			9			2		
v_di, Inbound Pedestrian Volume crossing m	9			2			8			1		
v_co, Outbound Pedestrian Volume crossing	1			5			4			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			4			5			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	6			5			4			9		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	40.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	3	0	0	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	12	0	8	10	0	8	10	0
Maximum Green [s]	0	50	0	0	50	0	50	50	0	50	50	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.7	0.0	3.5	4.1	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	0	35	0	0	35	0	20	70	0	20	70	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	4	0	0	4	0	0	4	0	0	4	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	16	0	0	18	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	1.5	0.0	0.0	1.5	0.0	1.5	2.2	0.0	2.0	2.6	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
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	50.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	50.0	50.0	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	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	160	160	160	160	160	160	160	160	160	160	160	160
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.20	4.20	4.00	4.60	4.60
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]	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.20	2.20	2.00	2.60	2.60
g_i, Effective Green Time [s]	24	24	24	19	19	19	13	95	95	7	89	89
g / C, Green / Cycle	0.15	0.15	0.15	0.12	0.12	0.12	0.08	0.59	0.59	0.04	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.07	0.02	0.10	0.03	0.07	0.40	0.03	0.02	0.24	0.08
s, saturation flow rate [veh/h]	1781	1842	1504	1781	1870	1544	1781	3560	1542	1781	3560	1545
c, Capacity [veh/h]	266	275	225	215	225	186	148	2112	914	75	1969	855
d1, Uniform Delay [s]	65.09	65.09	61.98	63.31	68.93	63.73	70.26	9.75	6.93	74.03	11.41	9.89
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	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]	3.97	3.84	1.48	0.40	8.31	0.67	12.89	1.69	0.12	5.76	0.72	0.36
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	1.33	1.33	1.33	1.33	1.33	1.33
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	0.74	0.74	0.46	0.18	0.84	0.24	0.85	0.67	0.06	0.53	0.44	0.15
d, Delay for Lane Group [s/veh]	69.06	68.93	63.46	63.71	77.24	64.40	83.15	11.44	7.05	79.79	12.13	10.25
Lane Group LOS	E	E	E	E	E	E	F	B	A	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.00	8.26	3.98	1.48	8.23	1.72	5.47	8.13	0.43	1.72	5.26	1.39
50th-Percentile Queue Length [ft/ln]	199.88	206.47	99.52	36.94	205.75	43.07	136.81	203.16	10.68	43.02	131.46	34.75
95th-Percentile Queue Length [veh/ln]	12.63	12.97	7.17	2.66	12.93	3.10	9.31	12.80	0.77	3.10	9.02	2.50
95th-Percentile Queue Length [ft/ln]	315.81	324.30	179.14	66.49	323.37	77.52	232.72	320.04	19.22	77.44	225.48	62.54

Movement, Approach, & Intersection Results

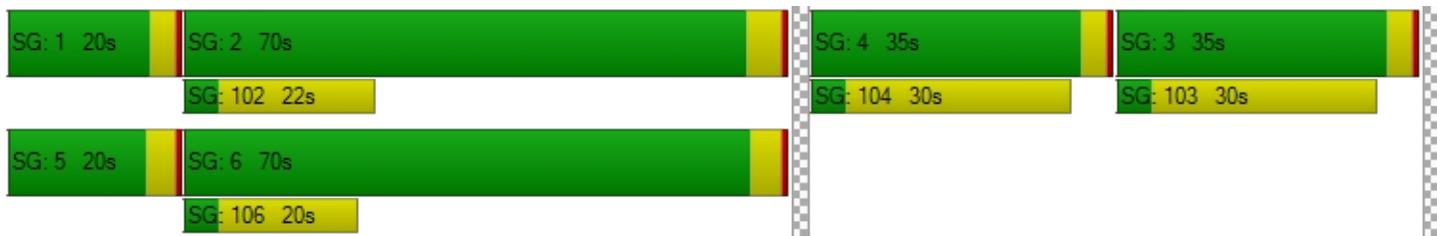
d_M, Delay for Movement [s/veh]	69.03	68.93	63.46	63.71	77.24	64.40	83.15	11.44	7.05	79.79	12.13	10.25
Movement LOS	E	E	E	E	E	E	F	B	A	E	B	B
d_A, Approach Delay [s/veh]	67.85			73.21			17.00			14.51		
Approach LOS	E			E			B			B		
d_I, Intersection Delay [s/veh]	28.30											
Intersection LOS	C											
Intersection V/C	0.646											

Other Modes

g_Walk,mi, Effective Walk Time [s]	8.0	8.0	8.0	8.0
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]	72.23	72.23	72.23	72.23
I_p,int, Pedestrian LOS Score for Intersectio	2.390	2.263	2.975	2.928
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]	394	394	822	817
d_b, Bicycle Delay [s]	51.78	51.76	27.81	28.12
I_b,int, Bicycle LOS Score for Intersection	2.390	2.012	2.868	2.414
Bicycle LOS	B	B	C	B

Sequence

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



Intersection Level Of Service Report
Intersection 40: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	12.0
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.546

Intersection Setup

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	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	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	123	19	17	219	0	3	15	6	1	1	70	115
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
Total Hourly Volume [veh/h]	123	19	17	219	0	3	15	6	1	1	70	115
Peak Hour Factor	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320
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]	33	5	5	59	0	1	4	2	0	0	19	31
Total Analysis Volume [veh/h]	132	20	18	235	0	3	16	6	1	1	75	123
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	742	641	710
Degree of Utilization, x	0.55	0.04	0.28

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.34	0.12	1.16
95th-Percentile Queue Length [ft]	83.44	3.04	28.93
Approach Delay [s/veh]	13.51	8.84	10.06
Approach LOS	B	A	B
Intersection Delay [s/veh]	11.96		
Intersection LOS	B		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	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	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	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
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	132	73	5	3	3	8	0	0
Base Volume Adjustment Factor	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
Growth Factor	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	132	73	5	3	3	8	0	0
Peak Hour Factor	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	20	1	1	1	2	0	0
Total Analysis Volume [veh/h]	142	78	5	3	3	9	0	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	657	619
Degree of Utilization, x	0.35	0.02

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.55	0.06
95th-Percentile Queue Length [ft]	38.72	1.48
Approach Delay [s/veh]	11.36	8.94
Approach LOS	B	A
Intersection Delay [s/veh]	11.96	
Intersection LOS	B	

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Scenario 17 Existing plus Project AM

Report File: P:\...\EPAM 2023-09-27.pdf

9/27/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
9	Middlefield Rd/Ravenswood Ave	Signalized	HCM 7th Edition	NEB Right	0.770	44.7	D
29	El Camino Real (SR 82) /Encinal Ave-Menlo College Entrance	Signalized	HCM 7th Edition	SWB Left	14.528	49.0	D
30	El Camino Real (SR 82) /Glenwood Ave-Valparaiso Ave	Signalized	HCM 7th Edition	NWB Left	0.641	32.1	C
40	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 7th Edition	WB Left	0.870	31.5	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 9: Middlefield Rd/Ravenswood Ave

Control Type:	Signalized	Delay (sec / veh):	44.7
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.770

Intersection Setup

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Approach	Northeastbound		Northwestbound		Southeastbound	
Lane Configuration	↵↶		↵↷		↷	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	120.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		35.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Base Volume Input [veh/h]	96	360	400	421	332	84
Base Volume Adjustment Factor	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
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	96	360	400	421	332	84
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	26	97	108	113	89	23
Total Analysis Volume [veh/h]	103	387	430	453	357	90
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10		11		0	
v_di, Inbound Pedestrian Volume crossing m	11		10		0	
v_co, Outbound Pedestrian Volume crossing	1		0		1	
v_ci, Inbound Pedestrian Volume crossing mi	1		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	22		39		37	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	61.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	3	2	1	6	2	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	4	10	4	10	10	0
Maximum Green [s]	50	35	35	70	35	0
Amber [s]	3.2	3.6	3.0	3.6	3.6	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	30	52	38	90	52	0
Vehicle Extension [s]	2.5	3.6	3.0	3.6	3.6	0.0
Walk [s]	7	7	0	7	7	0
Pedestrian Clearance [s]	10	12	0	12	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	Yes	Yes	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	0.0	20.0	0.0
I, Upstream Filtering Factor	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	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120
L, Total Lost Time per Cycle [s]	2.00	2.00	2.00	4.60	2.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	2.60	0.00
g_i, Effective Green Time [s]	28	28	32	85	53
g / C, Green / Cycle	0.23	0.23	0.27	0.71	0.45
(v / s)_i Volume / Saturation Flow Rate	0.06	0.25	0.24	0.24	0.25
s, saturation flow rate [veh/h]	1781	1537	1781	1870	1783
c, Capacity [veh/h]	418	361	483	1328	792
d1, Uniform Delay [s]	37.33	45.50	42.08	6.65	24.74
k, delay calibration	0.08	0.17	0.37	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.23	49.12	16.67	0.70	2.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.25	1.07	0.89	0.34	0.56
d, Delay for Lane Group [s/veh]	37.55	94.62	58.74	7.35	27.64
Lane Group LOS	D	F	E	A	C
Critical Lane Group	No	Yes	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	2.50	15.50	14.26	4.16	9.82
50th-Percentile Queue Length [ft/ln]	62.58	387.50	356.43	104.00	245.41
95th-Percentile Queue Length [veh/ln]	4.51	22.83	20.45	7.49	14.95
95th-Percentile Queue Length [ft/ln]	112.65	570.82	511.24	187.20	373.87

Movement, Approach, & Intersection Results

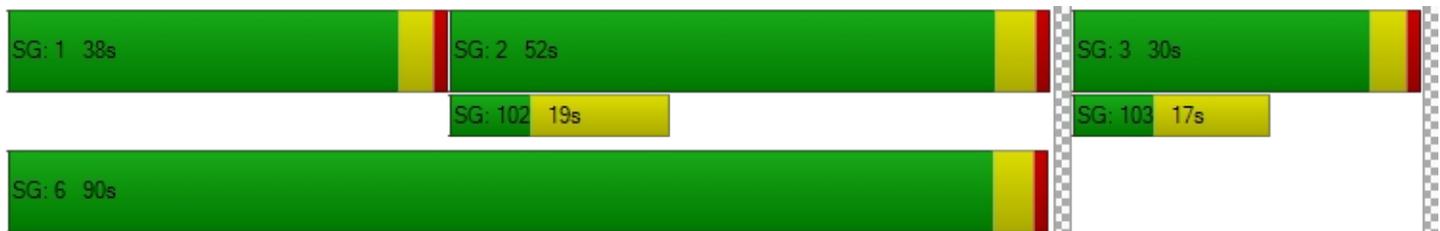
d_M, Delay for Movement [s/veh]	37.55	94.62	58.74	7.35	27.64	27.64
Movement LOS	D	F	E	A	C	C
d_A, Approach Delay [s/veh]	82.62		32.38		27.64	
Approach LOS	F		C		C	
d_I, Intersection Delay [s/veh]	44.74					
Intersection LOS	D					
Intersection V/C	0.770					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.53	49.53	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.282	2.608	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	430	1423	790
d_b, Bicycle Delay [s]	37.41	5.10	22.40
I_b,int, Bicycle LOS Score for Intersection	1.560	3.017	2.297
Bicycle LOS	A	C	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 29: El Camino Real (SR 82)/Encinal Ave-Menlo College Entrance

Control Type:	Signalized	Delay (sec / veh):	49.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	14.528

Intersection Setup

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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]	15.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			No			No		

Volumes

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	4	16	8	120	10	191	19	852	128	149	1496	26
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
Proportion of CAVs [%]	0.00											
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]	4	16	8	120	10	191	19	852	128	149	1496	26
Peak Hour Factor	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
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]	1	4	2	31	3	50	5	223	33	39	391	7
Total Analysis Volume [veh/h]	4	17	8	126	10	200	20	891	134	156	1565	27
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 m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	1			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			4			2			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	150
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	84.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	10	10	0	10	10	0
Maximum Green [s]	0	40	0	0	40	0	10	35	0	25	35	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [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
Split [s]	0	40	0	0	40	0	15	85	0	25	95	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	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	1.0	0.0	0.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
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	20.0	0.0	0.0	20.0	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	R	C	R	L	C	R	L	C	C
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	3.00	3.00	3.00	3.00	3.00	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
l2, Clearance Lost Time [s]	1.00	1.00	1.00	1.00	1.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	37	37	37	37	6	93	93	106	97	97
g / C, Green / Cycle	0.25	0.25	0.25	0.25	0.04	0.62	0.62	0.71	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.05	0.01	13.84	0.13	0.01	0.25	0.09	0.23	0.29	0.29
s, saturation flow rate [veh/h]	423	1589	10	1565	1781	3560	1556	678	3560	1851
c, Capacity [veh/h]	133	391	49	385	67	2211	966	518	2314	1203
d1, Uniform Delay [s]	45.86	42.88	73.50	48.81	69.32	5.72	5.10	1.84	4.15	4.15
k, delay calibration	0.11	0.11	0.50	0.11	0.11	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
d2, Incremental Delay [s]	0.55	0.02	861.89	1.09	2.44	0.55	0.30	1.49	0.64	1.23
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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
PF, progression factor	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	0.16	0.02	2.80	0.52	0.30	0.40	0.14	0.30	0.45	0.45
d, Delay for Lane Group [s/veh]	46.42	42.90	935.39	49.90	71.76	6.27	5.40	3.33	4.79	5.39
Lane Group LOS	D	D	F	D	E	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.64	0.24	13.53	6.64	0.79	3.12	0.90	0.50	2.85	3.17
50th-Percentile Queue Length [ft/ln]	16.01	5.93	338.37	166.06	19.71	78.11	22.49	12.58	71.26	79.19
95th-Percentile Queue Length [veh/ln]	1.15	0.43	24.36	10.87	1.42	5.62	1.62	0.91	5.13	5.70
95th-Percentile Queue Length [ft/ln]	28.82	10.67	609.07	271.72	35.47	140.60	40.49	22.64	128.26	142.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.42	46.42	42.90	935.39	935.39	49.90	71.76	6.27	5.40	3.33	4.99	5.39
Movement LOS	D	D	D	F	F	D	E	A	A	A	A	A
d_A, Approach Delay [s/veh]	45.45			408.31			7.41			4.85		
Approach LOS	D			F			A			A		
d_I, Intersection Delay [s/veh]	49.00											
Intersection LOS	D											
Intersection V/C	14.528											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	0.0	0.0
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]	64.40	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	1.979	0.000	0.000	0.000
Crosswalk LOS	A	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	493	493	1080	1213
d_b, Bicycle Delay [s]	42.56	42.65	15.89	11.63
I_b,int, Bicycle LOS Score for Intersection	1.607	2.114	2.422	2.521
Bicycle LOS	A	B	B	B

Sequence

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



Intersection Level Of Service Report

Intersection 30: El Camino Real (SR 82)/Glenwood Ave-Valparaiso Ave

Control Type:	Signalized	Delay (sec / veh):	32.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.641

Intersection Setup

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	205.00	100.00	130.00	120.00	100.00	100.00	190.00	100.00	105.00	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			25.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	252	133	98	49	220	38	114	750	37	90	1040	203
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
Proportion of CAVs [%]	0.00											
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]	252	133	98	49	220	38	114	750	37	90	1040	203
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
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]	68	36	26	13	59	10	31	202	10	24	280	55
Total Analysis Volume [veh/h]	271	143	105	53	237	41	123	806	40	97	1118	218
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	5			2			5			3		
v_di, Inbound Pedestrian Volume crossing m	5			3			5			2		
v_co, Outbound Pedestrian Volume crossing	2			6			6			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			6			6			2		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	18			15			4			9		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	150
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	80.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	3	0	0	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	12	0	8	10	0	8	10	0
Maximum Green [s]	0	50	0	0	50	0	50	50	0	50	50	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.7	0.0	3.5	4.1	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	0	32	0	0	32	0	15	71	0	15	71	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	4	0	0	4	0	0	4	0	0	4	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	16	0	0	18	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	1.5	0.0	0.0	1.5	0.0	1.5	2.2	0.0	2.0	2.6	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	50.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	50.0	50.0	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	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.20	4.20	4.00	4.60	4.60
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]	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.20	2.20	2.00	2.60	2.60
g_i, Effective Green Time [s]	22	22	22	22	22	22	12	81	81	10	79	79
g / C, Green / Cycle	0.15	0.15	0.15	0.15	0.15	0.15	0.08	0.54	0.54	0.07	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.07	0.03	0.13	0.03	0.07	0.23	0.03	0.05	0.31	0.14
s, saturation flow rate [veh/h]	1781	1841	1498	1781	1870	1519	1781	3560	1536	1781	3560	1542
c, Capacity [veh/h]	265	274	223	262	275	224	137	1909	824	118	1874	811
d1, Uniform Delay [s]	61.39	61.39	58.22	56.28	62.52	56.05	66.75	11.90	10.08	67.53	14.22	11.73
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	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]	4.64	4.49	1.54	0.38	7.81	0.39	17.68	0.69	0.11	12.91	1.41	0.81
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	1.33	1.33	1.33	1.33	1.33	1.33
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	0.77	0.77	0.47	0.20	0.86	0.18	0.90	0.42	0.05	0.82	0.60	0.27
d, Delay for Lane Group [s/veh]	66.03	65.88	59.76	56.65	70.33	56.44	84.43	12.58	10.19	80.45	15.63	12.54
Lane Group LOS	E	E	E	E	E	E	F	B	B	F	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	7.84	8.09	3.76	1.82	9.53	1.41	5.21	4.83	0.43	4.03	8.59	2.71
50th-Percentile Queue Length [ft/ln]	195.90	202.15	94.01	45.62	238.18	35.23	130.21	120.77	10.73	100.74	214.85	67.73
95th-Percentile Queue Length [veh/ln]	12.43	12.75	6.77	3.28	14.59	2.54	8.95	8.44	0.77	7.25	13.40	4.88
95th-Percentile Queue Length [ft/ln]	310.68	318.73	169.22	82.12	364.73	63.41	223.77	210.89	19.31	181.33	335.04	121.91

Movement, Approach, & Intersection Results

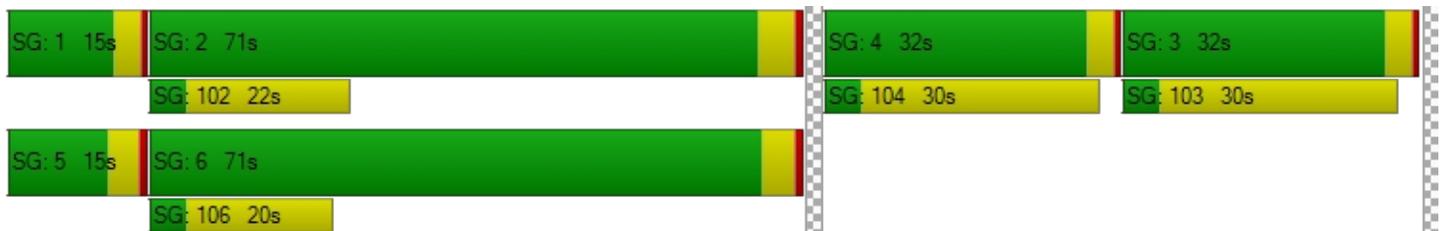
d_M, Delay for Movement [s/veh]	66.00	65.88	59.76	56.65	70.33	56.44	84.43	12.58	10.19	80.45	15.63	12.54
Movement LOS	E	E	E	E	E	E	F	B	B	F	B	B
d_A, Approach Delay [s/veh]	64.70			66.42			21.60			19.54		
Approach LOS	E			E			C			B		
d_I, Intersection Delay [s/veh]	32.14											
Intersection LOS	C											
Intersection V/C	0.641											

Other Modes

g_Walk,mi, Effective Walk Time [s]	8.0	8.0	8.0	8.0
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]	67.25	67.25	67.25	67.25
I_p,int, Pedestrian LOS Score for Intersectio	2.425	2.281	2.905	2.893
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]	380	380	890	885
d_b, Bicycle Delay [s]	49.69	49.61	23.15	23.43
I_b,int, Bicycle LOS Score for Intersection	2.416	2.106	2.359	2.742
Bicycle LOS	B	B	B	B

Sequence

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



Intersection Level Of Service Report
Intersection 40: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	31.5
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.870

Intersection Setup

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	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	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	0	131	15	218	0	12	102	8	0	10	156	225
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
Total Hourly Volume [veh/h]	0	131	15	218	0	12	102	8	0	10	156	225
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
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]	0	36	4	61	0	3	28	2	0	3	43	63
Total Analysis Volume [veh/h]	0	146	17	242	0	13	113	9	0	11	173	250
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	556	432	534
Degree of Utilization, x	0.73	0.31	0.81

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.09	1.32	7.97
95th-Percentile Queue Length [ft]	152.27	32.89	199.27
Approach Delay [s/veh]	24.93	15.06	32.81
Approach LOS	C	C	D
Intersection Delay [s/veh]	31.51		
Intersection LOS	D		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	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	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	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
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	327	63	3	0	0	0	0	0
Base Volume Adjustment Factor	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
Growth Factor	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	327	63	3	0	0	0	0	0
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	91	18	1	0	0	0	0	0
Total Analysis Volume [veh/h]	363	70	3	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	501	426
Degree of Utilization, x	0.87	0.00

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.34	0.00
95th-Percentile Queue Length [ft]	233.41	0.00
Approach Delay [s/veh]	41.42	0.00
Approach LOS	E	A
Intersection Delay [s/veh]	31.51	
Intersection LOS	D	

Vistro File: P:\...\Vistro_AllScenarios_PM 2023-09-27.vistro

Scenario 17 Existing plus Project PM

Report File: P:\...\EPPM 2023-09-27.pdf

9/27/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
9	Middlefield Rd/Ravenswood Ave	Signalized	HCM 7th Edition	NWB Left	0.801	34.2	C
29	El Camino Real (SR 82) /Encinal Ave-Menlo College Entrance	Signalized	HCM 7th Edition	SWB Left	5.502	27.5	C
30	El Camino Real (SR 82) /Glenwood Ave-Valparaiso Ave	Signalized	HCM 7th Edition	NWB Left	0.658	28.8	C
40	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 7th Edition	NB Right	0.563	12.4	B

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 9: Middlefield Rd/Ravenswood Ave

Control Type:	Signalized	Delay (sec / veh):	34.2
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.801

Intersection Setup

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Approach	Northeastbound		Northwestbound		Southeastbound	
Lane Configuration	↵↵		↵		↵	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	120.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		35.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Base Volume Input [veh/h]	146	489	342	514	324	82
Base Volume Adjustment Factor	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
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	146	489	342	514	324	82
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	129	90	135	85	22
Total Analysis Volume [veh/h]	154	515	360	541	341	86
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	11		12		0	
v_di, Inbound Pedestrian Volume crossing m	12		11		0	
v_co, Outbound Pedestrian Volume crossing	6		0		5	
v_ci, Inbound Pedestrian Volume crossing mi	5		0		6	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	11		27		9	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	58.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	3	2	1	6	2	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	4	10	4	5	10	0
Maximum Green [s]	50	35	35	70	35	0
Amber [s]	3.2	3.6	3.0	3.6	3.6	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	50	50	60	110	50	0
Vehicle Extension [s]	2.5	3.6	3.0	3.0	3.6	0.0
Walk [s]	7	7	0	7	7	0
Pedestrian Clearance [s]	10	12	0	12	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	Yes	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	0.0
I, Upstream Filtering Factor	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	R	L	C	C
C, Cycle Length [s]	109	109	109	109	109
L, Total Lost Time per Cycle [s]	2.00	2.00	2.00	4.60	2.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	2.60	0.00
g_i, Effective Green Time [s]	39	39	26	63	38
g / C, Green / Cycle	0.36	0.36	0.24	0.58	0.35
(v / s)_i Volume / Saturation Flow Rate	0.09	0.33	0.20	0.29	0.24
s, saturation flow rate [veh/h]	1781	1560	1781	1870	1786
c, Capacity [veh/h]	644	564	425	1081	616
d1, Uniform Delay [s]	24.33	32.88	39.59	13.65	30.72
k, delay calibration	0.08	0.26	0.21	0.11	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.14	13.34	8.73	0.36	6.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.91	0.85	0.50	0.69
d, Delay for Lane Group [s/veh]	24.47	46.22	48.33	14.01	37.02
Lane Group LOS	C	D	D	B	D
Critical Lane Group	No	Yes	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	2.80	14.61	10.02	7.45	10.44
50th-Percentile Queue Length [ft/ln]	69.90	365.24	250.46	186.18	260.99
95th-Percentile Queue Length [veh/ln]	5.03	20.88	15.21	11.92	15.74
95th-Percentile Queue Length [ft/ln]	125.81	521.95	380.23	298.07	393.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.47	46.22	48.33	14.01	37.02	37.02
Movement LOS	C	D	D	B	D	D
d_A, Approach Delay [s/veh]	41.21		27.72		37.02	
Approach LOS	D		C		D	
d_I, Intersection Delay [s/veh]	34.23					
Intersection LOS	C					
Intersection V/C	0.801					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	43.98	43.98	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.312	2.640	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	841	1936	834
d_b, Bicycle Delay [s]	18.36	0.06	18.58
I_b,int, Bicycle LOS Score for Intersection	1.560	3.046	2.264
Bicycle LOS	A	C	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 29: El Camino Real (SR 82)/Encinal Ave-Menlo College Entrance

Control Type:	Signalized	Delay (sec / veh):	27.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	5.502

Intersection Setup

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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]	15.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			No			No		

Volumes

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	16	13	33	117	3	191	29	1454	115	106	978	10
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 [%]	0.00	0.00	0.00	0.00	0.00	1.30	0.00	1.40	0.00	1.50	1.20	0.00
Proportion of CAVs [%]	0.00											
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	13	33	117	3	191	29	1454	115	106	978	10
Peak Hour Factor	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540
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	3	9	31	1	50	8	381	30	28	256	3
Total Analysis Volume [veh/h]	17	14	35	123	3	200	30	1524	121	111	1025	10
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 m	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]	3			3			14			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	15.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	10	10	0	10	10	0
Maximum Green [s]	0	30	0	0	30	0	10	35	0	25	35	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [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
Split [s]	0	27	0	0	27	0	15	58	0	25	68	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	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	1.0	0.0	0.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No			No		Yes	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	20.0	0.0	0.0	20.0	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	R	C	R	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	3.00	3.00	3.00	3.00	3.00	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
l2, Clearance Lost Time [s]	1.00	1.00	1.00	1.00	1.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	24	6	66	66	79	70	70
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.05	0.60	0.60	0.72	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.22	0.02	4.87	0.13	0.02	0.43	0.08	0.22	0.19	0.19
s, saturation flow rate [veh/h]	138	1591	26	1574	1810	3578	1569	506	3583	1871
c, Capacity [veh/h]	81	345	70	342	99	2159	947	403	2284	1193
d1, Uniform Delay [s]	36.50	34.45	54.68	38.52	48.99	6.32	4.43	5.92	3.31	3.31
k, delay calibration	0.34	0.11	0.50	0.11	0.11	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
d2, Incremental Delay [s]	9.14	0.13	407.02	1.59	1.70	1.97	0.28	1.69	0.33	0.64
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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
PF, progression factor	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	0.38	0.10	1.79	0.59	0.30	0.71	0.13	0.28	0.30	0.30
d, Delay for Lane Group [s/veh]	45.64	34.57	461.70	40.11	50.70	8.29	4.71	7.60	3.64	3.95
Lane Group LOS	D	C	F	D	D	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.89	0.79	9.90	4.96	0.82	4.98	0.65	0.28	1.36	1.53
50th-Percentile Queue Length [ft/ln]	22.21	19.71	247.40	123.89	20.61	124.56	16.13	7.09	34.10	38.18
95th-Percentile Queue Length [veh/ln]	1.60	1.42	17.81	8.61	1.48	8.64	1.16	0.51	2.46	2.75
95th-Percentile Queue Length [ft/ln]	39.98	35.47	445.32	215.17	37.10	216.08	29.03	12.77	61.38	68.73

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.64	45.64	34.57	461.70	461.70	40.11	50.70	8.29	4.71	7.60	3.75	3.95
Movement LOS	D	D	C	F	F	D	D	A	A	A	A	A
d_A, Approach Delay [s/veh]	39.77			203.06			8.79			4.12		
Approach LOS	D			F			A			A		
d_I, Intersection Delay [s/veh]	27.47											
Intersection LOS	C											
Intersection V/C	5.502											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	0.0	0.0
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]	44.54	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	1.967	0.000	0.000	0.000
Crosswalk LOS	A	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	436	436	982	1164
d_b, Bicycle Delay [s]	33.66	33.66	14.35	9.63
I_b,int, Bicycle LOS Score for Intersection	1.669	2.098	2.941	2.190
Bicycle LOS	A	B	C	B

Sequence

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



Intersection Level Of Service Report

Intersection 30: El Camino Real (SR 82)/Glenwood Ave-Valparaiso Ave

Control Type:	Signalized	Delay (sec / veh):	28.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	205.00	100.00	130.00	120.00	100.00	100.00	190.00	100.00	105.00	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			25.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	252	135	105	37	182	45	128	1367	48	37	849	126
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
Proportion of CAVs [%]	0.00											
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]	252	135	105	37	182	45	128	1367	48	37	849	126
Peak Hour Factor	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490
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]	66	36	28	10	48	12	34	360	13	10	224	33
Total Analysis Volume [veh/h]	266	142	111	39	192	47	135	1440	51	39	895	133
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	8			1			9			2		
v_di, Inbound Pedestrian Volume crossing m	9			2			8			1		
v_co, Outbound Pedestrian Volume crossing	1			5			4			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			4			5			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	6			5			4			9		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	40.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	3	0	0	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	12	0	8	10	0	8	10	0
Maximum Green [s]	0	50	0	0	50	0	50	50	0	50	50	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.7	0.0	3.5	4.1	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	0	35	0	0	35	0	20	70	0	20	70	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	4	0	0	4	0	0	4	0	0	4	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	16	0	0	18	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	1.5	0.0	0.0	1.5	0.0	1.5	2.2	0.0	2.0	2.6	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
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	50.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	50.0	50.0	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	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	160	160	160	160	160	160	160	160	160	160	160	160
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.20	4.20	4.00	4.60	4.60
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]	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.20	2.20	2.00	2.60	2.60
g_i, Effective Green Time [s]	24	24	24	19	19	19	14	95	95	7	87	87
g / C, Green / Cycle	0.15	0.15	0.15	0.12	0.12	0.12	0.09	0.59	0.59	0.04	0.55	0.55
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.07	0.02	0.10	0.03	0.08	0.40	0.03	0.02	0.25	0.09
s, saturation flow rate [veh/h]	1781	1841	1505	1781	1870	1545	1781	3560	1542	1781	3560	1545
c, Capacity [veh/h]	270	279	228	216	227	188	156	2102	910	74	1941	842
d1, Uniform Delay [s]	64.98	64.97	61.98	63.17	68.85	63.66	69.74	10.15	7.09	74.05	12.21	10.52
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	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]	4.06	3.93	1.61	0.39	8.34	0.69	12.97	1.84	0.12	5.62	0.79	0.40
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	1.33	1.33	1.33	1.33	1.33	1.33
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	0.74	0.74	0.49	0.18	0.85	0.25	0.86	0.68	0.06	0.52	0.46	0.16
d, Delay for Lane Group [s/veh]	69.03	68.90	63.60	63.56	77.19	64.36	82.71	11.99	7.21	79.68	13.01	10.92
Lane Group LOS	E	E	E	E	E	E	F	B	A	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.18	8.45	4.26	1.48	8.32	1.80	5.85	8.77	0.43	1.68	5.78	1.55
50th-Percentile Queue Length [ft/ln]	204.61	211.22	106.53	36.89	207.92	44.99	146.14	219.34	10.86	41.93	144.51	38.70
95th-Percentile Queue Length [veh/ln]	12.88	13.22	7.65	2.66	13.05	3.24	9.81	13.63	0.78	3.02	9.72	2.79
95th-Percentile Queue Length [ft/ln]	321.91	330.40	191.17	66.40	326.16	80.97	245.27	340.78	19.55	75.47	243.08	69.66

Movement, Approach, & Intersection Results

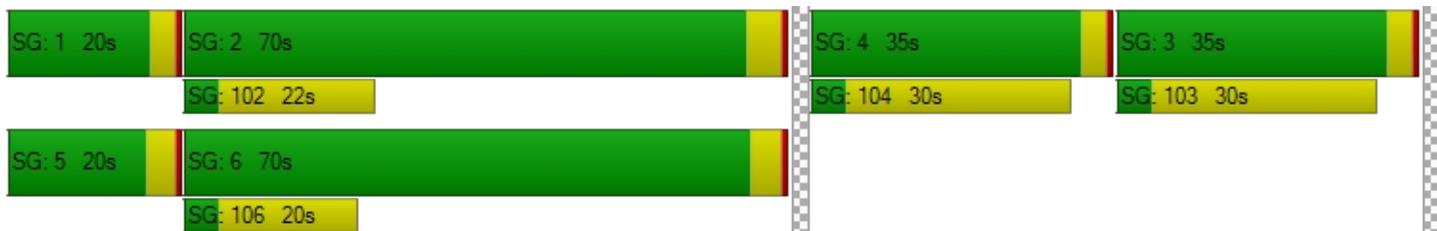
d_M, Delay for Movement [s/veh]	69.00	68.90	63.60	63.56	77.19	64.36	82.71	11.99	7.21	79.68	13.01	10.92
Movement LOS	E	E	E	E	E	E	F	B	A	E	B	B
d_A, Approach Delay [s/veh]	67.82			73.11			17.71			15.18		
Approach LOS	E			E			B			B		
d_I, Intersection Delay [s/veh]	28.80											
Intersection LOS	C											
Intersection V/C	0.658											

Other Modes

g_Walk,mi, Effective Walk Time [s]	8.0	8.0	8.0	8.0
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]	72.23	72.23	72.23	72.23
I_p,int, Pedestrian LOS Score for Intersectio	2.399	2.264	2.988	2.940
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]	394	394	822	817
d_b, Bicycle Delay [s]	51.78	51.76	27.81	28.12
I_b,int, Bicycle LOS Score for Intersection	2.416	2.018	2.901	2.440
Bicycle LOS	B	B	C	B

Sequence

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



Intersection Level Of Service Report
Intersection 40: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	12.4
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.563

Intersection Setup

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	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	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	0	146	17	221	0	6	23	6	0	2	76	118
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
Total Hourly Volume [veh/h]	0	146	17	221	0	6	23	6	0	2	76	118
Peak Hour Factor	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320
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]	0	39	5	59	0	2	6	2	0	1	20	32
Total Analysis Volume [veh/h]	0	157	18	237	0	6	25	6	0	2	82	127
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	732	623	697
Degree of Utilization, x	0.56	0.06	0.30

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.55	0.19	1.28
95th-Percentile Queue Length [ft]	88.80	4.73	31.90
Approach Delay [s/veh]	14.07	9.15	10.39
Approach LOS	B	A	B
Intersection Delay [s/veh]	12.40		
Intersection LOS	B		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	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	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	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
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	133	82	8	0	0	0	0	0
Base Volume Adjustment Factor	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
Growth Factor	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	82	8	0	0	0	0	0
Peak Hour Factor	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	22	2	0	0	0	0	0
Total Analysis Volume [veh/h]	143	88	9	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	648	609
Degree of Utilization, x	0.37	0.00

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.71	0.00
95th-Percentile Queue Length [ft]	42.65	0.00
Approach Delay [s/veh]	11.78	0.00
Approach LOS	B	A
Intersection Delay [s/veh]	12.40	
Intersection LOS	B	

Vistro File: \\...\Vistro_AllScenarios_AM.vistro

Scenario 18 Cumulative AM

Report File: \\...\CAM.pdf

6/13/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
9	Middlefield Rd/Ravenswood Ave	Signalized	HCM 7th Edition	NEB Right	0.906	77.5	E
29	El Camino Real (SR 82) /Encinal Ave-Menlo College Entrance	Signalized	HCM 7th Edition	SWB Left	5.211	44.8	D
30	El Camino Real (SR 82) /Glenwood Ave-Valparaiso Ave	Signalized	HCM 7th Edition	NWB Left	0.637	32.3	C
40	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 7th Edition	WB Left	0.927	39.3	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 9: Middlefield Rd/Ravenswood Ave

Control Type:	Signalized	Delay (sec / veh):	77.5
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.906

Intersection Setup

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Approach	Northeastbound		Northwestbound		Southeastbound	
Lane Configuration	↵↵		↵		↵	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	120.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		35.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Base Volume Input [veh/h]	103	446	490	468	369	77
Base Volume Adjustment Factor	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
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	103	446	490	468	369	77
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	120	132	126	99	21
Total Analysis Volume [veh/h]	111	480	527	503	397	83
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10		11		0	
v_di, Inbound Pedestrian Volume crossing m	11		10		0	
v_co, Outbound Pedestrian Volume crossing	1		0		1	
v_ci, Inbound Pedestrian Volume crossing mi	1		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	22		39		37	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	61.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	3	2	1	6	2	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	4	10	4	10	10	0
Maximum Green [s]	50	35	35	70	35	0
Amber [s]	3.2	3.6	3.0	3.6	3.6	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	30	52	38	90	52	0
Vehicle Extension [s]	2.5	3.6	3.0	3.6	3.6	0.0
Walk [s]	7	7	0	7	7	0
Pedestrian Clearance [s]	10	12	0	12	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	Yes	Yes	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	0.0	20.0	0.0
I, Upstream Filtering Factor	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	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120
L, Total Lost Time per Cycle [s]	2.00	2.00	2.00	4.60	2.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	2.60	0.00
g_i, Effective Green Time [s]	28	28	36	85	50
g / C, Green / Cycle	0.23	0.23	0.30	0.71	0.42
(v / s)_i Volume / Saturation Flow Rate	0.06	0.31	0.30	0.27	0.27
s, saturation flow rate [veh/h]	1781	1537	1781	1870	1794
c, Capacity [veh/h]	418	361	534	1328	745
d1, Uniform Delay [s]	37.51	45.50	41.81	6.89	28.01
k, delay calibration	0.08	0.29	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	159.49	35.88	0.82	4.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	1.33	0.99	0.38	0.64
d, Delay for Lane Group [s/veh]	37.76	204.99	77.69	7.72	32.26
Lane Group LOS	D	F	E	A	C
Critical Lane Group	No	Yes	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	2.71	26.56	20.47	4.79	11.60
50th-Percentile Queue Length [ft/ln]	67.78	664.06	511.68	119.87	290.08
95th-Percentile Queue Length [veh/ln]	4.88	40.39	27.89	8.39	17.19
95th-Percentile Queue Length [ft/ln]	122.01	1009.69	697.16	209.65	429.74

Movement, Approach, & Intersection Results

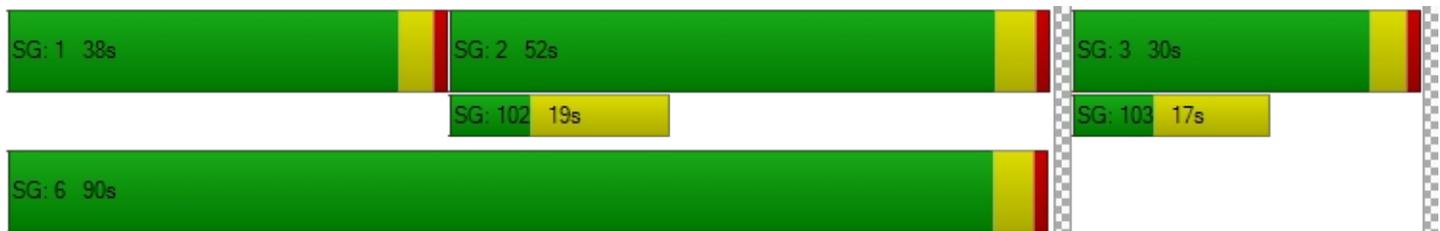
d_M, Delay for Movement [s/veh]	37.76	204.99	77.69	7.72	32.26	32.26
Movement LOS	D	F	E	A	C	C
d_A, Approach Delay [s/veh]	173.58		43.52		32.26	
Approach LOS	F		D		C	
d_I, Intersection Delay [s/veh]	77.53					
Intersection LOS	E					
Intersection V/C	0.906					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.53	49.53	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.344	2.687	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	430	1423	790
d_b, Bicycle Delay [s]	37.41	5.10	22.40
I_b,int, Bicycle LOS Score for Intersection	1.560	3.259	2.352
Bicycle LOS	A	C	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 29: El Camino Real (SR 82)/Encinal Ave-Menlo College Entrance

Control Type:	Signalized	Delay (sec / veh):	44.8
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	5.211

Intersection Setup

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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]	15.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			No			No		

Volumes

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	4	16	8	117	10	325	19	828	134	172	1486	26
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
Proportion of CAVs [%]	0.00											
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]	4	16	8	117	10	325	19	828	134	172	1486	26
Peak Hour Factor	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
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]	1	4	2	31	3	85	5	217	35	45	389	7
Total Analysis Volume [veh/h]	4	17	8	122	10	340	20	866	140	180	1554	27
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 m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	1			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			4			2			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	150
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	84.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	10	10	0	10	10	0
Maximum Green [s]	0	40	0	0	40	0	10	35	0	25	35	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [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
Split [s]	0	40	0	0	40	0	15	85	0	25	95	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	7	0	0	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	0	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	1.0	0.0	0.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
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	20.0	0.0	0.0	20.0	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	R	C	R	L	C	R	L	C	C
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	3.00	3.00	3.00	3.00	3.00	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
l2, Clearance Lost Time [s]	1.00	1.00	1.00	1.00	1.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	37	37	37	37	6	93	93	106	97	97
g / C, Green / Cycle	0.25	0.25	0.25	0.25	0.04	0.62	0.62	0.71	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.05	0.01	4.77	0.22	0.01	0.24	0.09	0.26	0.29	0.29
s, saturation flow rate [veh/h]	428	1589	28	1565	1781	3560	1556	687	3560	1851
c, Capacity [veh/h]	134	391	53	385	67	2210	966	524	2314	1203
d1, Uniform Delay [s]	45.84	42.86	73.54	54.25	69.30	5.70	5.12	1.91	4.15	4.15
k, delay calibration	0.11	0.11	0.50	0.34	0.11	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
d2, Incremental Delay [s]	0.54	0.02	723.40	17.99	2.44	0.52	0.32	1.79	0.63	1.22
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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
PF, progression factor	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	0.16	0.02	2.49	0.88	0.30	0.39	0.14	0.34	0.45	0.45
d, Delay for Lane Group [s/veh]	46.38	42.88	796.94	72.24	71.74	6.23	5.44	3.69	4.78	5.37
Lane Group LOS	D	D	F	E	E	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.64	0.24	12.70	14.26	0.79	3.03	0.94	0.59	2.83	3.14
50th-Percentile Queue Length [ft/ln]	16.00	5.92	317.62	356.40	19.70	75.67	23.58	14.86	70.69	78.54
95th-Percentile Queue Length [veh/ln]	1.15	0.43	22.87	20.45	1.42	5.45	1.70	1.07	5.09	5.65
95th-Percentile Queue Length [ft/ln]	28.80	10.66	571.72	511.21	35.47	136.21	42.45	26.75	127.25	141.37

Movement, Approach, & Intersection Results

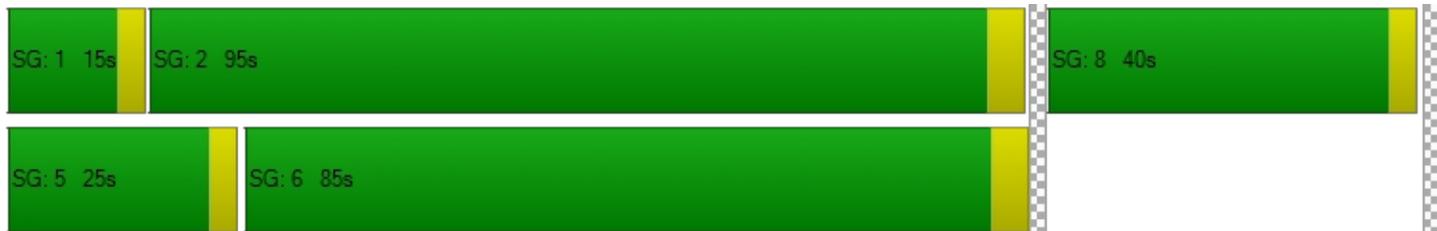
d_M, Delay for Movement [s/veh]	46.38	46.38	42.88	796.94	796.94	72.24	71.74	6.23	5.44	3.69	4.97	5.37
Movement LOS	D	D	D	F	F	E	E	A	A	A	A	A
d_A, Approach Delay [s/veh]	45.42			274.91			7.40			4.85		
Approach LOS	D			F			A			A		
d_I, Intersection Delay [s/veh]	44.77											
Intersection LOS	D											
Intersection V/C	5.211											

Other Modes

g_Walk,mi, Effective Walk Time [s]	91.0	0.0	0.0	0.0
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]	11.60	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	1.910	0.000	0.000	0.000
Crosswalk LOS	A	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	493	493	1080	1213
d_b, Bicycle Delay [s]	42.55	42.64	15.88	11.62
I_b,int, Bicycle LOS Score for Intersection	1.607	2.338	2.406	2.528
Bicycle LOS	A	B	B	B

Sequence

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



Intersection Level Of Service Report

Intersection 30: El Camino Real (SR 82)/Glenwood Ave-Valparaiso Ave

Control Type:	Signalized	Delay (sec / veh):	32.3
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.637

Intersection Setup

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	205.00	100.00	130.00	120.00	100.00	100.00	190.00	100.00	105.00	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			25.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	265	135	91	49	218	37	114	834	37	100	1017	205
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
Proportion of CAVs [%]	0.00											
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]	265	135	91	49	218	37	114	834	37	100	1017	205
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
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]	71	36	24	13	59	10	31	224	10	27	273	55
Total Analysis Volume [veh/h]	285	145	98	53	234	40	123	897	40	108	1094	220
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	5			2			5			3		
v_di, Inbound Pedestrian Volume crossing m	5			3			5			2		
v_co, Outbound Pedestrian Volume crossing	2			6			6			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			6			6			2		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	18			15			4			9		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	150
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	80.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	3	0	0	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	12	0	8	10	0	8	10	0
Maximum Green [s]	0	50	0	0	50	0	50	50	0	50	50	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.7	0.0	3.5	4.1	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	0	32	0	0	32	0	15	71	0	15	71	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	4	0	0	4	0	0	4	0	0	4	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	16	0	0	18	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	1.5	0.0	0.0	1.5	0.0	1.5	2.2	0.0	2.0	2.6	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	50.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	50.0	50.0	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	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.20	4.20	4.00	4.60	4.60
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]	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.20	2.20	2.00	2.60	2.60
g_i, Effective Green Time [s]	23	23	23	22	22	22	12	79	79	11	79	79
g / C, Green / Cycle	0.15	0.15	0.15	0.15	0.15	0.15	0.08	0.53	0.53	0.07	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.12	0.12	0.07	0.03	0.13	0.03	0.07	0.25	0.03	0.06	0.31	0.14
s, saturation flow rate [veh/h]	1781	1839	1499	1781	1870	1519	1781	3560	1536	1781	3560	1542
c, Capacity [veh/h]	272	281	229	259	272	221	137	1879	811	129	1866	808
d1, Uniform Delay [s]	61.18	61.18	57.45	56.46	62.62	56.20	66.75	13.00	10.67	66.90	14.31	11.92
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	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]	4.81	4.66	1.27	0.38	7.74	0.39	17.68	0.87	0.12	12.90	1.36	0.83
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	1.33	1.33	1.33	1.33	1.33	1.33
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	0.78	0.78	0.43	0.20	0.86	0.18	0.90	0.48	0.05	0.83	0.59	0.27
d, Delay for Lane Group [s/veh]	65.99	65.83	58.72	56.85	70.36	56.58	84.43	13.87	10.79	79.80	15.66	12.75
Lane Group LOS	E	E	E	E	E	E	F	B	B	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.15	8.41	3.47	1.83	9.40	1.38	5.21	5.75	0.45	4.46	8.39	2.77
50th-Percentile Queue Length [ft/ln]	203.83	210.14	86.73	45.71	235.07	34.41	130.21	143.68	11.18	111.59	209.83	69.16
95th-Percentile Queue Length [veh/ln]	12.84	13.16	6.24	3.29	14.43	2.48	8.95	9.68	0.80	7.93	13.14	4.98
95th-Percentile Queue Length [ft/ln]	320.90	329.01	156.12	82.28	360.79	61.94	223.77	241.97	20.12	198.22	328.61	124.49

Movement, Approach, & Intersection Results

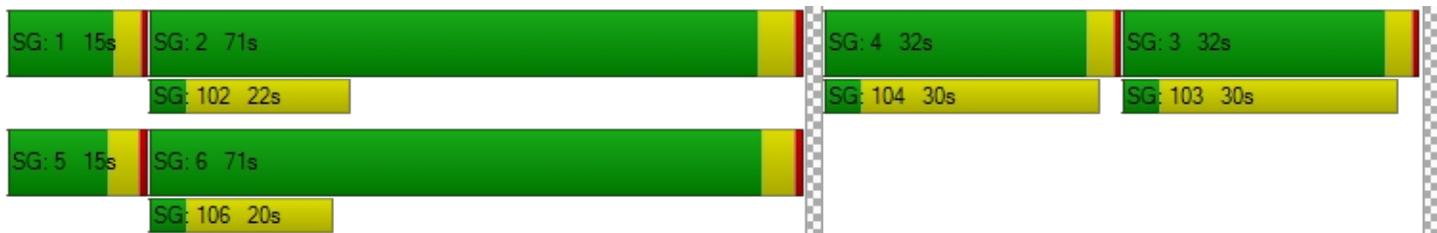
d_M, Delay for Movement [s/veh]	65.95	65.83	58.72	56.85	70.36	56.58	84.43	13.87	10.79	79.80	15.66	12.75
Movement LOS	E	E	E	E	E	E	F	B	B	E	B	B
d_A, Approach Delay [s/veh]	64.57			66.48			21.94			20.08		
Approach LOS	E			E			C			C		
d_I, Intersection Delay [s/veh]	32.26											
Intersection LOS	C											
Intersection V/C	0.637											

Other Modes

g_Walk,mi, Effective Walk Time [s]	8.0	8.0	8.0	8.0
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]	67.25	67.25	67.25	67.25
I_p,int, Pedestrian LOS Score for Intersectio	2.426	2.283	2.916	2.909
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]	380	380	890	885
d_b, Bicycle Delay [s]	49.69	49.61	23.15	23.43
I_b,int, Bicycle LOS Score for Intersection	2.431	2.099	2.434	2.733
Bicycle LOS	B	B	B	B

Sequence

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



Intersection Level Of Service Report
Intersection 40: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	39.3
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.927

Intersection Setup

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	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	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	0	132	15	226	0	28	101	8	0	10	149	250
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
Total Hourly Volume [veh/h]	0	132	15	226	0	28	101	8	0	10	149	250
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
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]	0	37	4	63	0	8	28	2	0	3	41	69
Total Analysis Volume [veh/h]	0	147	17	251	0	31	112	9	0	11	166	278
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	542	411	511
Degree of Utilization, x	0.77	0.37	0.89

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	6.85	1.68	10.06
95th-Percentile Queue Length [ft]	171.17	41.92	251.44
Approach Delay [s/veh]	28.10	16.83	44.21
Approach LOS	D	C	E
Intersection Delay [s/veh]	39.34		
Intersection LOS	E		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	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	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	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
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	324	72	3	0	0	0	0	0
Base Volume Adjustment Factor	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
Growth Factor	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	324	72	3	0	0	0	0	0
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	90	20	1	0	0	0	0	0
Total Analysis Volume [veh/h]	360	80	3	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	478	408
Degree of Utilization, x	0.93	0.00

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	10.90	0.00
95th-Percentile Queue Length [ft]	272.48	0.00
Approach Delay [s/veh]	52.59	0.00
Approach LOS	F	A
Intersection Delay [s/veh]	39.34	
Intersection LOS	E	

Vistro File: \...\Vistro_AllScenarios_PM.vistro

Scenario 18 Cumulative PM

Report File: \...\CPM.pdf

6/13/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
9	Middlefield Rd/Ravenswood Ave	Signalized	HCM 7th Edition	SEB Thru	0.966	61.4	E
29	El Camino Real (SR 82) /Encinal Ave-Menlo College Entrance	Signalized	HCM 7th Edition	SWB Left	7.882	42.2	D
30	El Camino Real (SR 82) /Glenwood Ave-Valparaiso Ave	Signalized	HCM 7th Edition	NWB Left	0.675	30.5	C
40	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 7th Edition	NB Right	0.611	13.6	B

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 9: Middlefield Rd/Ravenswood Ave

Control Type:	Signalized	Delay (sec / veh):	61.4
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.966

Intersection Setup

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Approach	Northeastbound		Northwestbound		Southeastbound	
Lane Configuration	↵↻		↵↑		↑↻	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	120.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		35.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Base Volume Input [veh/h]	149	587	381	540	469	72
Base Volume Adjustment Factor	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
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	149	587	381	540	469	72
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	154	100	142	123	19
Total Analysis Volume [veh/h]	157	618	401	568	494	76
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	11		12		0	
v_di, Inbound Pedestrian Volume crossing m	12		11		0	
v_co, Outbound Pedestrian Volume crossing	6		0		5	
v_ci, Inbound Pedestrian Volume crossing mi	5		0		6	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	11		27		9	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	58.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	3	2	1	6	2	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	4	10	4	5	10	0
Maximum Green [s]	50	35	35	70	35	0
Amber [s]	3.2	3.6	3.0	3.6	3.6	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	50	50	60	110	50	0
Vehicle Extension [s]	2.5	3.6	3.0	3.0	3.6	0.0
Walk [s]	7	7	0	7	7	0
Pedestrian Clearance [s]	10	12	0	12	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	Yes	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	0.0
I, Upstream Filtering Factor	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	R	L	C	C
C, Cycle Length [s]	128	128	128	128	128
L, Total Lost Time per Cycle [s]	2.00	2.00	2.00	4.60	2.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	2.60	0.00
g_i, Effective Green Time [s]	52	52	33	70	38
g / C, Green / Cycle	0.41	0.41	0.25	0.54	0.29
(v / s)_i Volume / Saturation Flow Rate	0.09	0.40	0.23	0.30	0.31
s, saturation flow rate [veh/h]	1781	1561	1781	1870	1813
c, Capacity [veh/h]	724	635	452	1014	531
d1, Uniform Delay [s]	24.78	36.97	46.13	19.34	45.37
k, delay calibration	0.08	0.50	0.36	0.14	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	29.85	17.08	0.62	60.25
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.22	0.97	0.89	0.56	1.07
d, Delay for Lane Group [s/veh]	24.89	66.82	63.20	19.95	105.62
Lane Group LOS	C	E	E	B	F
Critical Lane Group	No	Yes	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	3.17	23.72	14.30	10.96	25.47
50th-Percentile Queue Length [ft/ln]	79.14	593.06	357.61	273.99	636.79
95th-Percentile Queue Length [veh/ln]	5.70	31.71	20.51	16.39	35.32
95th-Percentile Queue Length [ft/ln]	142.46	792.76	512.67	409.72	882.93

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.89	66.82	63.20	19.95	105.62	105.62
Movement LOS	C	E	E	B	F	F
d_A, Approach Delay [s/veh]	58.33		37.85		105.62	
Approach LOS	E		D		F	
d_I, Intersection Delay [s/veh]	61.40					
Intersection LOS	E					
Intersection V/C	0.966					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	53.62	53.62	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.364	2.740	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	714	1643	708
d_b, Bicycle Delay [s]	26.67	2.07	26.90
I_b,int, Bicycle LOS Score for Intersection	1.560	3.158	2.500
Bicycle LOS	A	C	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 29: El Camino Real (SR 82)/Encinal Ave-Menlo College Entrance

Control Type:	Signalized	Delay (sec / veh):	42.2
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	7.882

Intersection Setup

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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]	15.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			No			No		

Volumes

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	16	13	33	138	3	321	29	1420	120	291	949	10
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 [%]	0.00	0.00	0.00	0.00	0.00	1.30	0.00	1.40	0.00	1.50	1.20	0.00
Proportion of CAVs [%]	0.00											
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	13	33	138	3	321	29	1420	120	291	949	10
Peak Hour Factor	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540
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	3	9	36	1	84	8	372	31	76	249	3
Total Analysis Volume [veh/h]	17	14	35	145	3	336	30	1488	126	305	995	10
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 m	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]	3			3			14			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	15.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	10	10	0	10	10	0
Maximum Green [s]	0	30	0	0	30	0	10	35	0	25	35	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [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
Split [s]	0	27	0	0	27	0	15	58	0	25	68	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	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	1.0	0.0	0.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No			No		Yes	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	20.0	0.0	0.0	20.0	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	R	C	R	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	3.00	3.00	3.00	3.00	3.00	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
l2, Clearance Lost Time [s]	1.00	1.00	1.00	1.00	1.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	24	6	66	66	79	70	70
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.05	0.60	0.60	0.72	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.23	0.02	7.15	0.21	0.02	0.42	0.08	0.58	0.18	0.18
s, saturation flow rate [veh/h]	137	1591	21	1574	1810	3578	1569	522	3583	1871
c, Capacity [veh/h]	81	347	69	344	99	2141	939	409	2279	1190
d1, Uniform Delay [s]	36.42	34.33	54.72	42.53	48.99	6.55	4.65	25.07	3.35	3.35
k, delay calibration	0.35	0.11	0.50	0.31	0.11	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
d2, Incremental Delay [s]	9.36	0.13	555.44	32.96	1.70	1.89	0.30	11.70	0.32	0.62
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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
PF, progression factor	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	0.38	0.10	2.13	0.98	0.30	0.69	0.13	0.75	0.29	0.29
d, Delay for Lane Group [s/veh]	45.78	34.46	610.17	75.48	50.70	8.44	4.95	36.77	3.67	3.97
Lane Group LOS	D	C	F	E	D	A	A	D	A	A
Critical Lane Group	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.89	0.79	12.62	12.08	0.82	4.97	0.69	1.60	1.33	1.49
50th-Percentile Queue Length [ft/ln]	22.31	19.69	315.40	302.02	20.61	124.33	17.32	40.01	33.23	37.16
95th-Percentile Queue Length [veh/ln]	1.61	1.42	22.71	17.78	1.48	8.63	1.25	2.88	2.39	2.68
95th-Percentile Queue Length [ft/ln]	40.16	35.44	567.72	444.52	37.10	215.76	31.18	72.03	59.81	66.89

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.78	45.78	34.46	610.17	610.17	75.48	50.70	8.44	4.95	36.77	3.77	3.97
Movement LOS	D	D	C	F	F	E	D	A	A	D	A	A
d_A, Approach Delay [s/veh]	39.77			238.98			8.94			11.46		
Approach LOS	D			F			A			B		
d_I, Intersection Delay [s/veh]	42.24											
Intersection LOS	D											
Intersection V/C	7.882											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	0.0	0.0
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]	44.54	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	1.967	0.000	0.000	0.000
Crosswalk LOS	A	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	436	436	982	1164
d_b, Bicycle Delay [s]	33.66	33.66	14.35	9.63
I_b,int, Bicycle LOS Score for Intersection	1.669	2.358	2.916	2.280
Bicycle LOS	A	B	C	B

Sequence

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



Intersection Level Of Service Report

Intersection 30: El Camino Real (SR 82)/Glenwood Ave-Valparaiso Ave

Control Type:	Signalized	Delay (sec / veh):	30.5
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.675

Intersection Setup

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	205.00	100.00	130.00	120.00	100.00	100.00	190.00	100.00	105.00	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			25.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	256	135	100	37	219	43	120	1345	48	38	860	124
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
Proportion of CAVs [%]	0.00											
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]	256	135	100	37	219	43	120	1345	48	38	860	124
Peak Hour Factor	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490
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]	67	36	26	10	58	11	32	354	13	10	227	33
Total Analysis Volume [veh/h]	270	142	105	39	231	45	126	1417	51	40	906	131
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	8			1			9			2		
v_di, Inbound Pedestrian Volume crossing m	9			2			8			1		
v_co, Outbound Pedestrian Volume crossing	1			5			4			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			4			5			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	6			5			4			9		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	40.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	3	0	0	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	12	0	8	10	0	8	10	0
Maximum Green [s]	0	50	0	0	50	0	50	50	0	50	50	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.7	0.0	3.5	4.1	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	0	35	0	0	35	0	20	70	0	20	70	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	4	0	0	4	0	0	4	0	0	4	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	16	0	0	18	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	1.5	0.0	0.0	1.5	0.0	1.5	2.2	0.0	2.0	2.6	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
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	50.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	50.0	50.0	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	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	160	160	160	160	160	160	160	160	160	160	160	160
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.20	4.20	4.00	4.60	4.60
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]	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.20	2.20	2.00	2.60	2.60
g_i, Effective Green Time [s]	24	24	24	23	23	23	13	91	91	7	85	85
g / C, Green / Cycle	0.15	0.15	0.15	0.14	0.14	0.14	0.08	0.57	0.57	0.04	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.11	0.11	0.07	0.02	0.12	0.03	0.07	0.40	0.03	0.02	0.25	0.08
s, saturation flow rate [veh/h]	1781	1840	1505	1781	1870	1548	1781	3560	1541	1781	3560	1545
c, Capacity [veh/h]	270	279	228	251	263	218	148	2031	879	75	1888	819
d1, Uniform Delay [s]	64.99	64.99	61.67	60.42	67.42	60.82	70.26	12.14	8.40	74.03	13.67	11.66
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	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]	4.15	4.02	1.44	0.29	9.07	0.46	12.89	2.02	0.13	5.76	0.88	0.42
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	1.33	1.33	1.33	1.33	1.33	1.33
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	0.75	0.75	0.46	0.16	0.88	0.21	0.85	0.70	0.06	0.53	0.48	0.16
d, Delay for Lane Group [s/veh]	69.14	69.00	63.11	60.70	76.49	61.28	83.15	14.16	8.52	79.79	14.54	12.07
Lane Group LOS	E	E	E	E	E	E	F	B	A	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.28	8.54	4.01	1.44	10.03	1.67	5.47	10.33	0.49	1.72	6.50	1.64
50th-Percentile Queue Length [ft/ln]	206.90	213.52	100.19	35.94	250.82	41.86	136.81	258.26	12.30	43.02	162.57	41.04
95th-Percentile Queue Length [veh/ln]	12.99	13.33	7.21	2.59	15.23	3.01	9.31	15.60	0.89	3.10	10.68	2.95
95th-Percentile Queue Length [ft/ln]	324.85	333.34	180.34	64.68	380.69	75.35	232.72	390.04	22.14	77.44	267.12	73.87

Movement, Approach, & Intersection Results

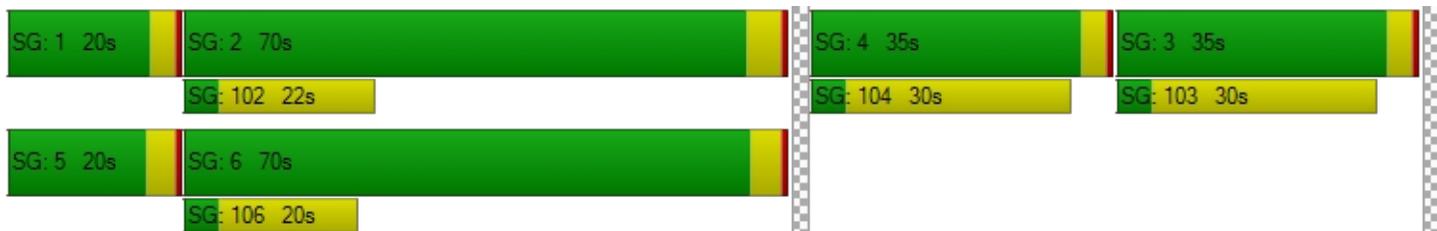
d_M, Delay for Movement [s/veh]	69.11	69.00	63.11	60.70	76.49	61.28	83.15	14.16	8.52	79.79	14.54	12.07
Movement LOS	E	E	E	E	E	E	F	B	A	E	B	B
d_A, Approach Delay [s/veh]	67.86			72.36			19.43			16.67		
Approach LOS	E			E			B			B		
d_I, Intersection Delay [s/veh]	30.49											
Intersection LOS	C											
Intersection V/C	0.675											

Other Modes

g_Walk,mi, Effective Walk Time [s]	8.0	8.0	8.0	8.0
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]	72.23	72.23	72.23	72.23
I_p,int, Pedestrian LOS Score for Intersectio	2.405	2.271	2.983	2.938
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]	394	394	822	817
d_b, Bicycle Delay [s]	51.78	51.76	27.81	28.12
I_b,int, Bicycle LOS Score for Intersection	2.413	2.079	2.875	2.448
Bicycle LOS	B	B	C	B

Sequence

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



Intersection Level Of Service Report
Intersection 40: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	13.6
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.611

Intersection Setup

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	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	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	0	142	17	244	0	20	24	6	0	2	84	131
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
Total Hourly Volume [veh/h]	0	142	17	244	0	20	24	6	0	2	84	131
Peak Hour Factor	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320
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]	0	38	5	65	0	5	6	2	0	1	23	35
Total Analysis Volume [veh/h]	0	152	18	262	0	21	26	6	0	2	90	141
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	708	587	669
Degree of Utilization, x	0.61	0.09	0.35

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.20	0.30	1.56
95th-Percentile Queue Length [ft]	104.89	7.41	38.99
Approach Delay [s/veh]	15.74	9.74	11.23
Approach LOS	C	A	B
Intersection Delay [s/veh]	13.59		
Intersection LOS	B		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	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	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	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
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	132	108	8	0	0	0	0	0
Base Volume Adjustment Factor	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
Growth Factor	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	132	108	8	0	0	0	0	0
Peak Hour Factor	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	29	2	0	0	0	0	0
Total Analysis Volume [veh/h]	142	116	9	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	627	579
Degree of Utilization, x	0.43	0.00

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.13	0.00
95th-Percentile Queue Length [ft]	53.17	0.00
Approach Delay [s/veh]	12.94	0.00
Approach LOS	B	A
Intersection Delay [s/veh]	13.59	
Intersection LOS	B	

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Report File: P:\...\CPAM 2023-09-27.pdf

Scenario 19 Cumulative plus Project AM

9/27/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
9	Middlefield Rd/Ravenswood Ave	Signalized	HCM 7th Edition	NEB Right	0.916	79.4	E
29	El Camino Real (SR 82) /Encinal Ave-Menlo College Entrance	Signalized	HCM 7th Edition	SWB Left	5.817	47.0	D
30	El Camino Real (SR 82) /Glenwood Ave-Valparaiso Ave	Signalized	HCM 7th Edition	NWB Left	0.651	32.8	C
40	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 7th Edition	WB Left	0.958	44.9	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 9: Middlefield Rd/Ravenswood Ave

Control Type:	Signalized	Delay (sec / veh):	79.4
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.916

Intersection Setup

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Approach	Northeastbound		Northwestbound		Southeastbound	
Lane Configuration	↵↶		↵↷		↷	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	120.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		35.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Base Volume Input [veh/h]	104	450	497	474	373	78
Base Volume Adjustment Factor	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
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	104	450	497	474	373	78
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	28	121	134	127	100	21
Total Analysis Volume [veh/h]	112	484	534	510	401	84
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	10		11		0	
v_di, Inbound Pedestrian Volume crossing m	11		10		0	
v_co, Outbound Pedestrian Volume crossing	1		0		1	
v_ci, Inbound Pedestrian Volume crossing mi	1		0		1	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	22		39		37	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	61.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	3	2	1	6	2	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	4	10	4	10	10	0
Maximum Green [s]	50	35	35	70	35	0
Amber [s]	3.2	3.6	3.0	3.6	3.6	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	30	52	38	90	52	0
Vehicle Extension [s]	2.5	3.6	3.0	3.6	3.6	0.0
Walk [s]	7	7	0	7	7	0
Pedestrian Clearance [s]	10	12	0	12	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	Yes	Yes	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	0.0	20.0	0.0
I, Upstream Filtering Factor	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	R	L	C	C
C, Cycle Length [s]	120	120	120	120	120
L, Total Lost Time per Cycle [s]	2.00	2.00	2.00	4.60	2.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	2.60	0.00
g_i, Effective Green Time [s]	28	28	36	85	50
g / C, Green / Cycle	0.23	0.23	0.30	0.71	0.42
(v / s)_i Volume / Saturation Flow Rate	0.06	0.31	0.30	0.27	0.27
s, saturation flow rate [veh/h]	1781	1537	1781	1870	1794
c, Capacity [veh/h]	418	361	534	1328	745
d1, Uniform Delay [s]	37.53	45.50	42.05	6.93	28.12
k, delay calibration	0.08	0.30	0.50	0.50	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	164.43	38.97	0.84	4.38
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.27	1.34	1.00	0.38	0.65
d, Delay for Lane Group [s/veh]	37.78	209.93	81.02	7.77	32.49
Lane Group LOS	D	F	F	A	C
Critical Lane Group	No	Yes	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	2.74	27.06	21.21	4.89	11.78
50th-Percentile Queue Length [ft/ln]	68.44	676.45	530.29	122.19	294.55
95th-Percentile Queue Length [veh/ln]	4.93	41.19	28.77	8.51	17.41
95th-Percentile Queue Length [ft/ln]	123.18	1029.74	719.16	212.83	435.28

Movement, Approach, & Intersection Results

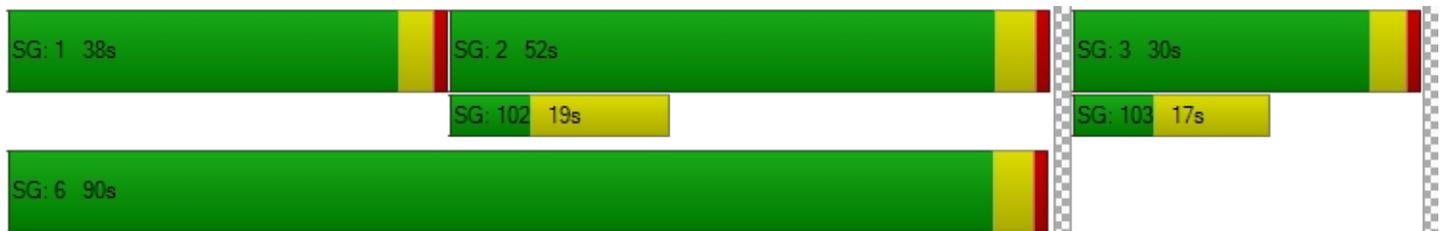
d_M, Delay for Movement [s/veh]	37.78	209.93	81.02	7.77	32.49	32.49
Movement LOS	D	F	F	A	C	C
d_A, Approach Delay [s/veh]	177.58		45.24		32.49	
Approach LOS	F		D		C	
d_I, Intersection Delay [s/veh]	79.45					
Intersection LOS	E					
Intersection V/C	0.916					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	49.53	49.53	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.349	2.693	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	430	1423	790
d_b, Bicycle Delay [s]	37.41	5.10	22.40
I_b,int, Bicycle LOS Score for Intersection	1.560	3.282	2.360
Bicycle LOS	A	C	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 29: El Camino Real (SR 82)/Encinal Ave-Menlo College Entrance

Control Type:	Signalized	Delay (sec / veh):	47.0
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	5.817

Intersection Setup

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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]	15.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			No			No		

Volumes

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	4	16	8	120	10	328	19	852	136	174	1516	26
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
Proportion of CAVs [%]	0.00											
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]	4	16	8	120	10	328	19	852	136	174	1516	26
Peak Hour Factor	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560	0.9560
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]	1	4	2	31	3	86	5	223	36	46	396	7
Total Analysis Volume [veh/h]	4	17	8	126	10	343	20	891	142	182	1586	27
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 m	0			0			0			0		
v_co, Outbound Pedestrian Volume crossing	1			0			0			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			0			0			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			4			2			4		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	150
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	84.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	10	10	0	10	10	0
Maximum Green [s]	0	40	0	0	40	0	10	35	0	25	35	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [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
Split [s]	0	40	0	0	40	0	15	85	0	25	95	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	7	0	0	7	0	0	7	0	0	0	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	0	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	1.0	0.0	0.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No			No		Yes	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	20.0	0.0	0.0	20.0	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	R	C	R	L	C	R	L	C	C
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	3.00	3.00	3.00	3.00	3.00	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
l2, Clearance Lost Time [s]	1.00	1.00	1.00	1.00	1.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	37	37	37	37	6	93	93	106	97	97
g / C, Green / Cycle	0.25	0.25	0.25	0.25	0.04	0.62	0.62	0.71	0.65	0.65
(v / s)_i Volume / Saturation Flow Rate	0.05	0.01	5.35	0.22	0.01	0.25	0.09	0.27	0.30	0.30
s, saturation flow rate [veh/h]	428	1589	25	1565	1781	3560	1556	674	3560	1851
c, Capacity [veh/h]	134	391	53	385	67	2209	965	514	2313	1203
d1, Uniform Delay [s]	45.82	42.84	73.57	54.35	69.30	5.75	5.14	2.01	4.18	4.18
k, delay calibration	0.11	0.11	0.50	0.34	0.11	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
d2, Incremental Delay [s]	0.54	0.02	767.77	18.98	2.44	0.55	0.32	1.91	0.66	1.27
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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
PF, progression factor	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	0.16	0.02	2.59	0.89	0.30	0.40	0.15	0.35	0.46	0.46
d, Delay for Lane Group [s/veh]	46.36	42.86	841.34	73.33	71.74	6.30	5.46	3.92	4.84	5.45
Lane Group LOS	D	D	F	E	E	A	A	A	A	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh/ln]	0.64	0.24	13.23	14.50	0.79	3.13	0.96	0.61	2.90	3.22
50th-Percentile Queue Length [ft/ln]	16.00	5.92	330.81	362.53	19.70	78.28	23.96	15.29	72.47	80.59
95th-Percentile Queue Length [veh/ln]	1.15	0.43	23.82	20.75	1.42	5.64	1.73	1.10	5.22	5.80
95th-Percentile Queue Length [ft/ln]	28.80	10.66	595.46	518.66	35.47	140.91	43.13	27.52	130.44	145.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.36	46.36	42.86	841.34	841.34	73.33	71.74	6.30	5.46	3.92	5.04	5.45
Movement LOS	D	D	D	F	F	E	E	A	A	A	A	A
d_A, Approach Delay [s/veh]	45.40			291.39			7.43			4.93		
Approach LOS	D			F			A			A		
d_I, Intersection Delay [s/veh]	46.95											
Intersection LOS	D											
Intersection V/C	5.817											

Other Modes

g_Walk,mi, Effective Walk Time [s]	91.0	0.0	0.0	0.0
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]	11.60	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	1.910	0.000	0.000	0.000
Crosswalk LOS	A	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	493	493	1080	1213
d_b, Bicycle Delay [s]	42.55	42.64	15.88	11.62
I_b,int, Bicycle LOS Score for Intersection	1.607	2.350	2.428	2.547
Bicycle LOS	A	B	B	B

Sequence

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



Intersection Level Of Service Report

Intersection 30: El Camino Real (SR 82)/Glenwood Ave-Valparaiso Ave

Control Type:	Signalized	Delay (sec / veh):	32.8
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.651

Intersection Setup

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	205.00	100.00	130.00	120.00	100.00	100.00	190.00	100.00	105.00	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			25.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	274	136	98	49	220	38	117	851	37	101	1042	209
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
Proportion of CAVs [%]	0.00											
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]	274	136	98	49	220	38	117	851	37	101	1042	209
Peak Hour Factor	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300	0.9300
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]	74	37	26	13	59	10	31	229	10	27	280	56
Total Analysis Volume [veh/h]	295	146	105	53	237	41	126	915	40	109	1120	225
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	5			2			5			3		
v_di, Inbound Pedestrian Volume crossing m	5			3			5			2		
v_co, Outbound Pedestrian Volume crossing	2			6			6			2		
v_ci, Inbound Pedestrian Volume crossing mi	2			6			6			2		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	18			15			4			9		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	150
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	80.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	3	0	0	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	12	0	8	10	0	8	10	0
Maximum Green [s]	0	50	0	0	50	0	50	50	0	50	50	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.7	0.0	3.5	4.1	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	0	32	0	0	32	0	15	71	0	15	71	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	4	0	0	4	0	0	4	0	0	4	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	16	0	0	18	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	1.5	0.0	0.0	1.5	0.0	1.5	2.2	0.0	2.0	2.6	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	50.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	50.0	50.0	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	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	150	150	150	150	150	150	150	150	150	150	150	150
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.20	4.20	4.00	4.60	4.60
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]	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.20	2.20	2.00	2.60	2.60
g_i, Effective Green Time [s]	23	23	23	22	22	22	12	79	79	11	78	78
g / C, Green / Cycle	0.16	0.16	0.16	0.15	0.15	0.15	0.08	0.52	0.52	0.07	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.12	0.12	0.07	0.03	0.13	0.03	0.07	0.26	0.03	0.06	0.31	0.15
s, saturation flow rate [veh/h]	1781	1838	1501	1781	1870	1519	1781	3560	1535	1781	3560	1542
c, Capacity [veh/h]	276	285	233	262	275	224	137	1863	803	130	1851	802
d1, Uniform Delay [s]	61.00	61.00	57.36	56.28	62.52	56.05	66.87	13.51	11.01	66.84	14.88	12.28
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	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]	4.90	4.74	1.36	0.38	7.81	0.39	20.36	0.93	0.12	12.90	1.48	0.87
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	1.33	1.33	1.33	1.33	1.33	1.33
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	0.79	0.78	0.45	0.20	0.86	0.18	0.92	0.49	0.05	0.84	0.60	0.28
d, Delay for Lane Group [s/veh]	65.90	65.74	58.72	56.65	70.33	56.44	87.23	14.44	11.12	79.75	16.35	13.16
Lane Group LOS	E	E	E	E	E	E	F	B	B	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh/ln]	8.37	8.62	3.72	1.82	9.53	1.41	5.43	6.10	0.46	4.50	8.97	2.89
50th-Percentile Queue Length [ft/ln]	209.23	215.52	93.09	45.62	238.18	35.23	135.73	152.62	11.43	112.58	224.28	72.34
95th-Percentile Queue Length [veh/ln]	13.11	13.44	6.70	3.28	14.59	2.54	9.25	10.16	0.82	7.98	13.88	5.21
95th-Percentile Queue Length [ft/ln]	327.85	335.91	167.56	82.12	364.73	63.41	231.27	253.92	20.57	199.59	347.09	130.22

Movement, Approach, & Intersection Results

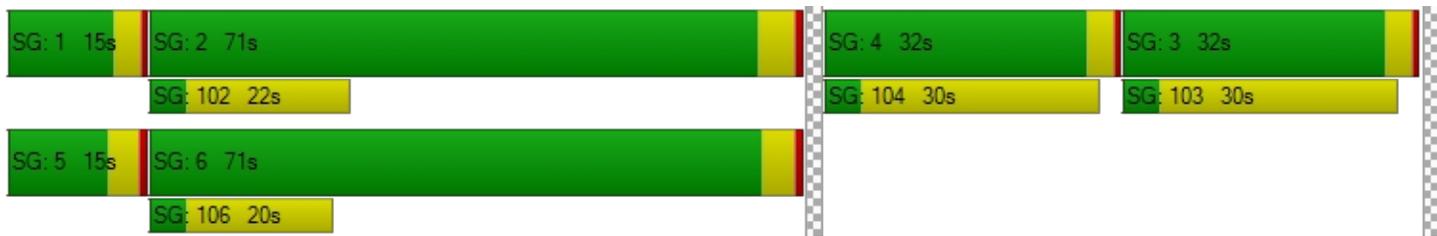
d_M, Delay for Movement [s/veh]	65.86	65.74	58.72	56.65	70.33	56.44	87.23	14.44	11.12	79.75	16.35	13.16
Movement LOS	E	E	E	E	E	E	F	B	B	E	B	B
d_A, Approach Delay [s/veh]	64.46			66.42			22.80			20.61		
Approach LOS	E			E			C			C		
d_I, Intersection Delay [s/veh]	32.77											
Intersection LOS	C											
Intersection V/C	0.651											

Other Modes

g_Walk,mi, Effective Walk Time [s]	8.0	8.0	8.0	8.0
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]	67.25	67.25	67.25	67.25
I_p,int, Pedestrian LOS Score for Intersectio	2.434	2.284	2.926	2.918
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]	380	380	890	885
d_b, Bicycle Delay [s]	49.69	49.61	23.15	23.43
I_b,int, Bicycle LOS Score for Intersection	2.461	2.106	2.451	2.759
Bicycle LOS	B	B	B	C

Sequence

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



Intersection Level Of Service Report
Intersection 40: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	44.9
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.958

Intersection Setup

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	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	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	0	134	15	228	0	28	102	8	0	10	158	256
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
Total Hourly Volume [veh/h]	0	134	15	228	0	28	102	8	0	10	158	256
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
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]	0	37	4	63	0	8	28	2	0	3	44	71
Total Analysis Volume [veh/h]	0	149	17	253	0	31	113	9	0	11	176	284
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	536	400	502
Degree of Utilization, x	0.78	0.38	0.94

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	7.22	1.76	11.52
95th-Percentile Queue Length [ft]	180.49	43.90	288.01
Approach Delay [s/veh]	29.81	17.45	53.26
Approach LOS	D	C	F
Intersection Delay [s/veh]	44.89		
Intersection LOS	E		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	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	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	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
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	327	75	3	0	0	0	0	0
Base Volume Adjustment Factor	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
Growth Factor	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	327	75	3	0	0	0	0	0
Peak Hour Factor	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000	0.9000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	91	21	1	0	0	0	0	0
Total Analysis Volume [veh/h]	363	83	3	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings**Lanes**

Capacity per Entry Lane [veh/h]	469	399
Degree of Utilization, x	0.96	0.00

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	11.80	0.00
95th-Percentile Queue Length [ft]	295.04	0.00
Approach Delay [s/veh]	59.53	0.00
Approach LOS	F	A
Intersection Delay [s/veh]	44.89	
Intersection LOS	E	

Vistro File: P:\...\Vistro_AllScenarios_PM 2023-09-27.vistro

Report File: P:\...\CPPM 2023-09-27.pdf

Scenario 19 Cumulative plus Project PM

9/29/2023

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
9	Middlefield Rd/Ravenswood Ave	Signalized	HCM 7th Edition	SEB Thru	0.978	64.1	E
29	El Camino Real (SR 82) /Encinal Ave-Menlo College Entrance	Signalized	HCM 7th Edition	SWB Left	13.732	44.4	D
30	El Camino Real (SR 82) /Glenwood Ave-Valparaiso Ave	Signalized	HCM 7th Edition	NWB Left	0.688	31.1	C
40	Bay Rd/Ringwood Ave/Sonoma Ave	All-way stop	HCM 7th Edition	NB Right	0.629	14.1	B

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 9: Middlefield Rd/Ravenswood Ave

Control Type:	Signalized	Delay (sec / veh):	64.1
Analysis Method:	HCM 7th Edition	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.978

Intersection Setup

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Approach	Northeastbound		Northwestbound		Southeastbound	
Lane Configuration	↵↵		↵		↵	
Turning Movement	Left	Right	Left	Thru	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Entry Pocket	0	1	0	0	0	0
Entry Pocket Length [ft]	100.00	120.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	0	0	0	0	0	0
Exit Pocket Length [ft]	0.00	0.00	0.00	0.00	0.00	0.00
Speed [mph]	30.00		35.00		35.00	
Grade [%]	0.00		0.00		0.00	
Curb Present	No		No		No	
Crosswalk	Yes		Yes		No	

Volumes

Name	Ravenswood Avenue		Middlefield Road		Middlefield Road	
Base Volume Input [veh/h]	150	595	386	546	475	73
Base Volume Adjustment Factor	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
Proportion of CAVs [%]	0.00					
Growth Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0
Right Turn on Red Volume [veh/h]	0	0	0	0	0	0
Total Hourly Volume [veh/h]	150	595	386	546	475	73
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	0.9500	0.9500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	39	157	102	144	125	19
Total Analysis Volume [veh/h]	158	626	406	575	500	77
Presence of On-Street Parking	No	No	No	No	No	No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0
v_do, Outbound Pedestrian Volume crossing	11		12		0	
v_di, Inbound Pedestrian Volume crossing m	12		11		0	
v_co, Outbound Pedestrian Volume crossing	6		0		5	
v_ci, Inbound Pedestrian Volume crossing mi	5		0		6	
v_ab, Corner Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	11		27		9	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	58.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permissive	Permissive	Protected	Permissive	Permissive	Permissive
Signal Group	3	2	1	6	2	4
Auxiliary Signal Groups						
Lead / Lag	Lead	-	Lead	-	-	-
Minimum Green [s]	4	10	4	5	10	0
Maximum Green [s]	50	35	35	70	35	0
Amber [s]	3.2	3.6	3.0	3.6	3.6	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0
Split [s]	50	50	60	110	50	0
Vehicle Extension [s]	2.5	3.6	3.0	3.0	3.6	0.0
Walk [s]	7	7	0	7	7	0
Pedestrian Clearance [s]	10	12	0	12	12	0
Delayed Vehicle Green [s]	0.0	0.0	0.0	0.0	0.0	0.0
Rest In Walk	No			No	No	
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall	No		No	No	No	
Maximum Recall	No		No	No	Yes	
Pedestrian Recall	No		No	No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	20.0	20.0	20.0	20.0	20.0	0.0
I, Upstream Filtering Factor	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	R	L	C	C
C, Cycle Length [s]	129	129	129	129	129
L, Total Lost Time per Cycle [s]	2.00	2.00	2.00	4.60	2.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	0.00	0.00	2.60	0.00
g_i, Effective Green Time [s]	52	52	33	70	38
g / C, Green / Cycle	0.41	0.41	0.26	0.54	0.29
(v / s)_i Volume / Saturation Flow Rate	0.09	0.40	0.23	0.31	0.32
s, saturation flow rate [veh/h]	1781	1561	1781	1870	1812
c, Capacity [veh/h]	722	633	456	1016	529
d1, Uniform Delay [s]	24.99	37.57	46.15	19.38	45.58
k, delay calibration	0.08	0.50	0.37	0.14	0.50
l, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.11	33.33	17.61	0.66	65.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.22	0.99	0.89	0.57	1.09
d, Delay for Lane Group [s/veh]	25.10	70.90	63.76	20.04	111.50
Lane Group LOS	C	E	E	C	F
Critical Lane Group	No	Yes	Yes	No	Yes
50th-Percentile Queue Length [veh/ln]	3.21	24.83	14.59	11.16	26.29
50th-Percentile Queue Length [ft/ln]	80.20	620.80	364.72	279.09	657.15
95th-Percentile Queue Length [veh/ln]	5.77	33.00	20.85	16.64	36.65
95th-Percentile Queue Length [ft/ln]	144.36	825.11	521.33	416.08	916.19

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	25.10	70.90	63.76	20.04	111.50	111.50
Movement LOS	C	E	E	C	F	F
d_A, Approach Delay [s/veh]	61.67		38.13		111.50	
Approach LOS	E		D		F	
d_I, Intersection Delay [s/veh]	64.09					
Intersection LOS	E					
Intersection V/C	0.978					

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	11.0	0.0
M_corner, Corner Circulation Area [ft ² /ped]	0.00	0.00	0.00
M_CW, Crosswalk Circulation Area [ft ² /ped]	0.00	0.00	0.00
d_p, Pedestrian Delay [s]	53.83	53.83	0.00
I_p,int, Pedestrian LOS Score for Intersectio	2.369	2.747	0.000
Crosswalk LOS	B	B	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	712	1638	705
d_b, Bicycle Delay [s]	26.86	2.14	27.09
I_b,int, Bicycle LOS Score for Intersection	1.560	3.178	2.512
Bicycle LOS	A	C	B

Sequence

Ring 1	1	2	3	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report

Intersection 29: El Camino Real (SR 82)/Encinal Ave-Menlo College Entrance

Control Type:	Signalized	Delay (sec / veh):	44.4
Analysis Method:	HCM 7th Edition	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	13.732

Intersection Setup

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	0	0	0	1	0	1	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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]	15.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			No			No			No		

Volumes

Name	Menlo College			Encinal Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	16	13	33	140	3	324	29	1454	123	294	978	10
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 [%]	0.00	0.00	0.00	0.00	0.00	1.30	0.00	1.40	0.00	1.50	1.20	0.00
Proportion of CAVs [%]	0.00											
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	13	33	140	3	324	29	1454	123	294	978	10
Peak Hour Factor	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540	0.9540
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	3	9	37	1	85	8	381	32	77	256	3
Total Analysis Volume [veh/h]	17	14	35	147	3	340	30	1524	129	308	1025	10
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 m	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]	3			3			14			3		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	110
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	15.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	ProtPer	Permiss	Permiss
Signal Group	0	8	0	0	8	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	10	0	0	10	0	10	10	0	10	10	0
Maximum Green [s]	0	30	0	0	30	0	10	35	0	25	35	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [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
Split [s]	0	27	0	0	27	0	15	58	0	25	68	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	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	20	0	0	20	0	0	20	0	0	20	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	1.0	0.0	0.0	1.0	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No			No		Yes	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	20.0	0.0	0.0	20.0	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	R	C	R	L	C	R	L	C	C
C, Cycle Length [s]	110	110	110	110	110	110	110	110	110	110
L, Total Lost Time per Cycle [s]	3.00	3.00	3.00	3.00	3.00	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
l2, Clearance Lost Time [s]	1.00	1.00	1.00	1.00	1.00	2.00	2.00	0.00	2.00	2.00
g_i, Effective Green Time [s]	24	24	24	24	6	66	66	79	70	70
g / C, Green / Cycle	0.22	0.22	0.22	0.22	0.05	0.60	0.60	0.72	0.64	0.64
(v / s)_i Volume / Saturation Flow Rate	0.23	0.02	12.78	0.22	0.02	0.43	0.08	0.60	0.19	0.19
s, saturation flow rate [veh/h]	134	1591	12	1574	1810	3578	1569	512	3583	1871
c, Capacity [veh/h]	80	347	67	344	99	2142	939	402	2280	1190
d1, Uniform Delay [s]	36.43	34.35	54.74	42.68	49.01	6.66	4.66	27.04	3.36	3.36
k, delay calibration	0.36	0.11	0.50	0.32	0.11	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
d2, Incremental Delay [s]	10.00	0.13	596.72	36.09	1.71	2.04	0.31	13.09	0.34	0.64
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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.33	1.33	1.33	1.33	1.33	1.33
PF, progression factor	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	0.39	0.10	2.23	0.99	0.30	0.71	0.14	0.77	0.30	0.30
d, Delay for Lane Group [s/veh]	46.43	34.47	651.45	78.77	50.71	8.71	4.96	40.13	3.69	4.00
Lane Group LOS	D	C	F	E	D	A	A	D	A	A
Critical Lane Group	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	0.90	0.79	13.03	12.51	0.82	5.15	0.71	1.73	1.37	1.54
50th-Percentile Queue Length [ft/ln]	22.62	19.69	325.80	312.87	20.61	128.85	17.75	43.36	34.31	38.39
95th-Percentile Queue Length [veh/ln]	1.63	1.42	23.46	18.32	1.48	8.88	1.28	3.12	2.47	2.76
95th-Percentile Queue Length [ft/ln]	40.71	35.44	586.43	457.92	37.10	221.93	31.96	78.05	61.75	69.11

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.43	46.43	34.47	651.45	651.45	78.77	50.71	8.71	4.96	40.13	3.80	4.00
Movement LOS	D	D	C	F	F	E	D	A	A	D	A	A
d_A, Approach Delay [s/veh]	40.09			254.08			9.17			12.13		
Approach LOS	D			F			A			B		
d_I, Intersection Delay [s/veh]	44.35											
Intersection LOS	D											
Intersection V/C	13.732											

Other Modes

g_Walk,mi, Effective Walk Time [s]	11.0	0.0	0.0	0.0
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]	44.55	0.00	0.00	0.00
I_p,int, Pedestrian LOS Score for Intersectio	1.967	0.000	0.000	0.000
Crosswalk LOS	A	F	F	F
s_b, Saturation Flow Rate of the bicycle lane	2000	2000	2000	2000
c_b, Capacity of the bicycle lane [bicycles/h]	436	436	982	1164
d_b, Bicycle Delay [s]	33.66	33.66	14.35	9.63
I_b,int, Bicycle LOS Score for Intersection	1.669	2.368	2.948	2.298
Bicycle LOS	A	B	C	B

Sequence

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



Intersection Level Of Service Report

Intersection 30: El Camino Real (SR 82)/Glenwood Ave-Valparaiso Ave

Control Type:	Signalized	Delay (sec / veh):	31.1
Analysis Method:	HCM 7th Edition	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.688

Intersection Setup

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Approach	Northeastbound			Southwestbound			Northwestbound			Southeastbound		
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	1	0	1	1	0	1	1	0	1	1	0	0
Entry Pocket Length [ft]	205.00	100.00	130.00	120.00	100.00	100.00	190.00	100.00	105.00	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			25.00			35.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Curb Present	No			No			No			No		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Valparaiso Avenue			Glenwood Avenue			El Camino Real (SR 82)			El Camino Real (SR 82)		
Base Volume Input [veh/h]	263	136	106	37	221	45	128	1375	48	39	882	131
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
Proportion of CAVs [%]	0.00											
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]	263	136	106	37	221	45	128	1375	48	39	882	131
Peak Hour Factor	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490	0.9490
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]	69	36	28	10	58	12	34	362	13	10	232	35
Total Analysis Volume [veh/h]	277	143	112	39	233	47	135	1449	51	41	929	138
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	8			1			9			2		
v_di, Inbound Pedestrian Volume crossing m	9			2			8			1		
v_co, Outbound Pedestrian Volume crossing	1			5			4			1		
v_ci, Inbound Pedestrian Volume crossing mi	1			4			5			1		
v_ab, Corner Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	6			5			4			9		

Intersection Settings

Located in CBD	No
Signal Coordination Group	1 - ECR
Cycle Length [s]	160
Active Pattern	Pattern 1
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	40.0
Offset Reference	Lead Green - Beginning of First Green
Permissive Mode	SingleBand
Lost time [s]	4.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal Group	0	3	0	0	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	12	0	8	10	0	8	10	0
Maximum Green [s]	0	50	0	0	50	0	50	50	0	50	50	0
Amber [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.7	0.0	3.5	4.1	0.0
All red [s]	0.0	0.5	0.0	0.0	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	0	35	0	0	35	0	20	70	0	20	70	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	4	0	0	4	0	0	4	0	0	4	0
Pedestrian Clearance [s]	0	26	0	0	26	0	0	16	0	0	18	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	1.5	0.0	0.0	1.5	0.0	1.5	2.2	0.0	2.0	2.6	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
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	50.0	0.0	0.0	0.0	0.0	50.0	50.0	0.0	50.0	50.0	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	R	L	C	R	L	C	R	L	C	R
C, Cycle Length [s]	160	160	160	160	160	160	160	160	160	160	160	160
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.20	4.20	4.00	4.60	4.60
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]	1.50	1.50	1.50	1.50	1.50	1.50	1.50	2.20	2.20	2.00	2.60	2.60
g_i, Effective Green Time [s]	25	25	25	23	23	23	14	91	91	7	84	84
g / C, Green / Cycle	0.15	0.15	0.15	0.14	0.14	0.14	0.09	0.57	0.57	0.04	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.12	0.12	0.07	0.02	0.12	0.03	0.08	0.41	0.03	0.02	0.26	0.09
s, saturation flow rate [veh/h]	1781	1840	1506	1781	1870	1548	1781	3560	1541	1781	3560	1545
c, Capacity [veh/h]	273	282	231	253	265	220	156	2019	874	76	1860	807
d1, Uniform Delay [s]	64.88	64.88	61.70	60.28	67.35	60.75	69.74	12.68	8.60	74.00	14.54	12.32
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.50	0.50	0.11	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]	4.23	4.10	1.57	0.28	9.09	0.48	12.97	2.23	0.13	5.91	0.96	0.46
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	1.33	1.33	1.33	1.33	1.33	1.33
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	0.76	0.76	0.48	0.15	0.88	0.21	0.86	0.72	0.06	0.54	0.50	0.17
d, Delay for Lane Group [s/veh]	69.12	68.98	63.27	60.56	76.44	61.23	82.71	14.90	8.73	79.91	15.50	12.78
Lane Group LOS	E	E	E	E	E	E	F	B	A	E	B	B
Critical Lane Group	Yes	No	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh/ln]	8.45	8.71	4.29	1.44	10.12	1.75	5.85	11.16	0.50	1.77	7.09	1.80
50th-Percentile Queue Length [ft/ln]	211.13	217.76	107.21	35.89	253.01	43.73	146.14	279.02	12.53	44.13	177.29	45.01
95th-Percentile Queue Length [veh/ln]	13.21	13.55	7.68	2.58	15.34	3.15	9.81	16.64	0.90	3.18	11.46	3.24
95th-Percentile Queue Length [ft/ln]	330.28	338.77	192.12	64.59	383.44	78.71	245.27	415.99	22.55	79.43	286.47	81.02

Movement, Approach, & Intersection Results

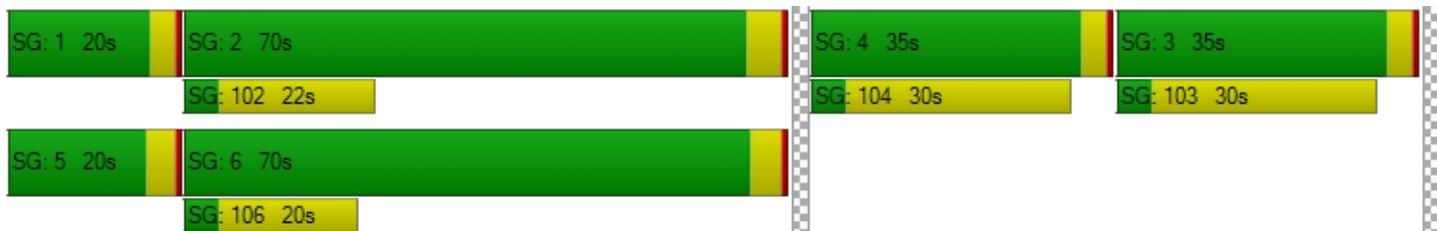
d_M, Delay for Movement [s/veh]	69.08	68.98	63.27	60.56	76.44	61.23	82.71	14.90	8.73	79.91	15.50	12.78
Movement LOS	E	E	E	E	E	E	F	B	A	E	B	B
d_A, Approach Delay [s/veh]	67.83			72.26			20.31			17.55		
Approach LOS	E			E			C			B		
d_I, Intersection Delay [s/veh]	31.10											
Intersection LOS	C											
Intersection V/C	0.688											

Other Modes

g_Walk,mi, Effective Walk Time [s]	8.0	8.0	8.0	8.0
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]	72.23	72.23	72.23	72.23
I_p,int, Pedestrian LOS Score for Intersectio	2.413	2.273	2.997	2.950
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]	394	394	822	817
d_b, Bicycle Delay [s]	51.78	51.76	27.81	28.12
I_b,int, Bicycle LOS Score for Intersection	2.437	2.086	2.908	2.474
Bicycle LOS	B	B	C	B

Sequence

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



Intersection Level Of Service Report
Intersection 40: Bay Rd/Ringwood Ave/Sonoma Ave

Control Type:	All-way stop	Delay (sec / veh):	14.1
Analysis Method:	HCM 7th Edition	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.629

Intersection Setup

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Approach	Northbound				Southbound				Eastbound			
Lane Configuration												
Turning Movement	Left2	Left	Thru	Right	Left2	Left	Thru	Right	Left2	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	0	0	0	0	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	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				25.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	Ringwood Avenue				Sonoma Avenue				Bay Road			
Base Volume Input [veh/h]	0	146	17	246	0	20	24	6	0	2	90	134
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
Total Hourly Volume [veh/h]	0	146	17	246	0	20	24	6	0	2	90	134
Peak Hour Factor	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320
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]	0	39	5	66	0	5	6	2	0	1	24	36
Total Analysis Volume [veh/h]	0	157	18	264	0	21	26	6	0	2	97	144
Pedestrian Volume [ped/h]	0				0				0			

Intersection Settings

Lanes

Capacity per Entry Lane [veh/h]	698	576	660
Degree of Utilization, x	0.63	0.09	0.37

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.47	0.30	1.69
95th-Percentile Queue Length [ft]	111.81	7.56	42.36
Approach Delay [s/veh]	16.50	9.88	11.61
Approach LOS	C	A	B
Intersection Delay [s/veh]	14.14		
Intersection LOS	B		

Intersection Setup

Name	Bay Road				Ringwood Avenue			
Approach	Westbound				Southwestbound			
Lane Configuration								
Turning Movement	Left	Thru	Right	Right2	Left	Thru	Right	Right2
Lane Width [ft]	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	0	0	0	0	0
Entry Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
No. of Lanes in Exit Pocket	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
Speed [mph]	30.00				25.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Bay Road				Ringwood Avenue			
Base Volume Input [veh/h]	133	117	8	0	0	0	0	0
Base Volume Adjustment Factor	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
Growth Factor	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
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	133	117	8	0	0	0	0	0
Peak Hour Factor	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320	0.9320
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	36	31	2	0	0	0	0	0
Total Analysis Volume [veh/h]	143	126	9	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			

Intersection Settings**Lanes**

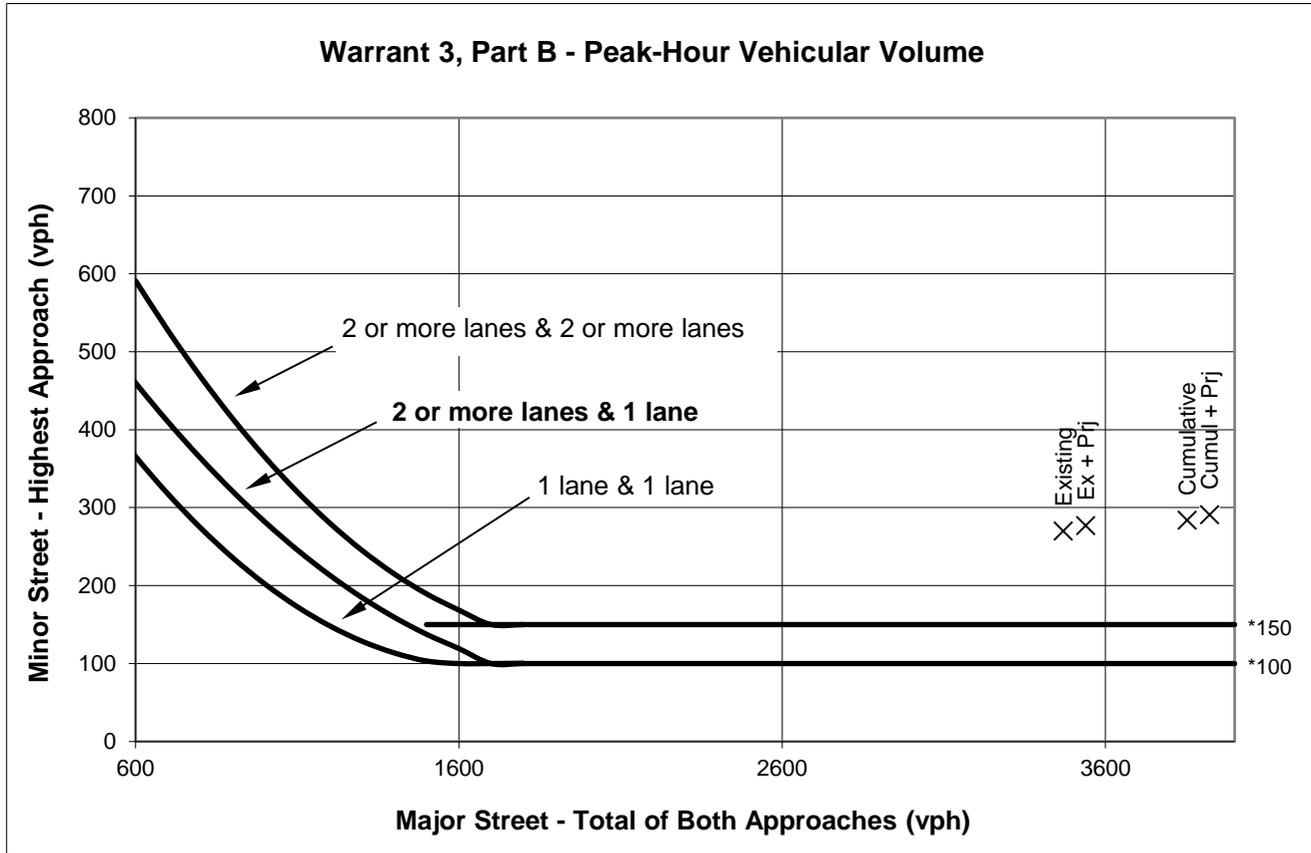
Capacity per Entry Lane [veh/h]	620	568
Degree of Utilization, x	0.45	0.00

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.31	0.00
95th-Percentile Queue Length [ft]	57.83	0.00
Approach Delay [s/veh]	13.44	0.00
Approach LOS	B	A
Intersection Delay [s/veh]	14.14	
Intersection LOS	B	

Appendix E

Signal Warrants



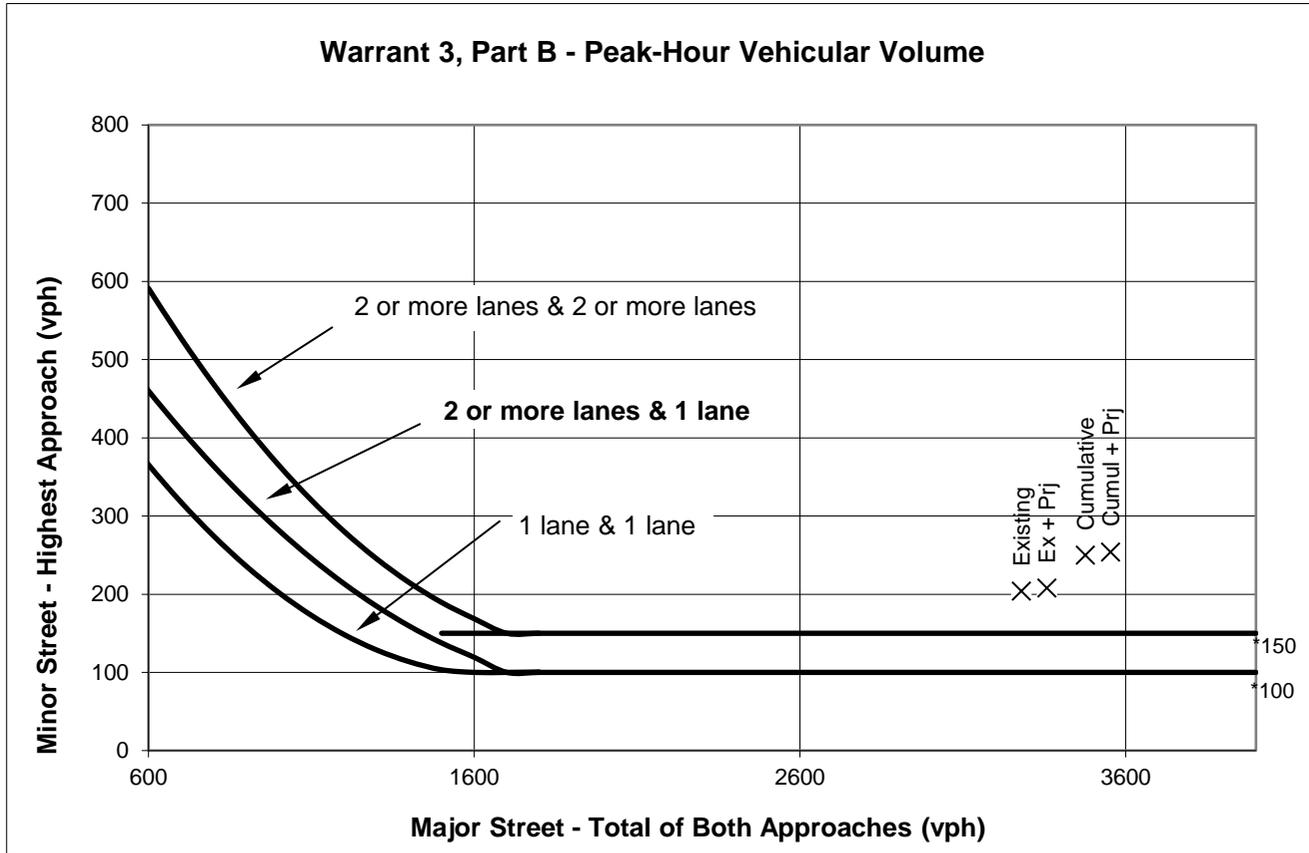
Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).

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

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		AM PEAK PERIOD									
				Existing	Ex + Prj	Cumulative	Cumul + Prj						
		2 or One	More										
Major Street - Both Approaches	El Camino Real		X	3470	3539	3853	3922						
Minor Street - Highest Approach	Selby Ln	X		270	277	284	291						
Signal Warranted Based on Part B - Peak-Hour Volumes?				Yes	Yes	Yes	Yes						

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).

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

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		PM PEAK HOUR									
				Existing	Ex + Prj	Cumulative	Cumul + Prj						
		2 or One	More										
Major Street - Both Approaches	El Camino Real		X	3280	3358	3476	3554						
Minor Street - Highest Approach	Selby Ln	X		204	208	250	254						
Signal Warranted Based on Part B - Peak-Hour Volumes?				Yes	Yes	Yes	Yes						

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

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TRAFFIC SIGNAL WARRANTS WORKSHEET

Major Street: Alameda de las Pulgas
 Minor Street: Atherton Ave

Analyst: JL date: 6/21/23
 Critical Approach Speed* (mph) 25
 Critical Approach Speed* (mph) 25
 *Posted Speed.

Critical speed of major street traffic > 50 mph (64 km/h)..... }
 In built up area of isolated community of < 10,000 population..... } **Rural (R)**
 } **Urban (U)**

AM PEAK PERIOD

Warrant 3 - Peak Hour

The need for a traffic control signal should be considered if an engineering study finds that the criteria in either of the following two categories (Parts A and B) are met:

PART A

(All parts 1, 2, and 3 below must be satisfied)

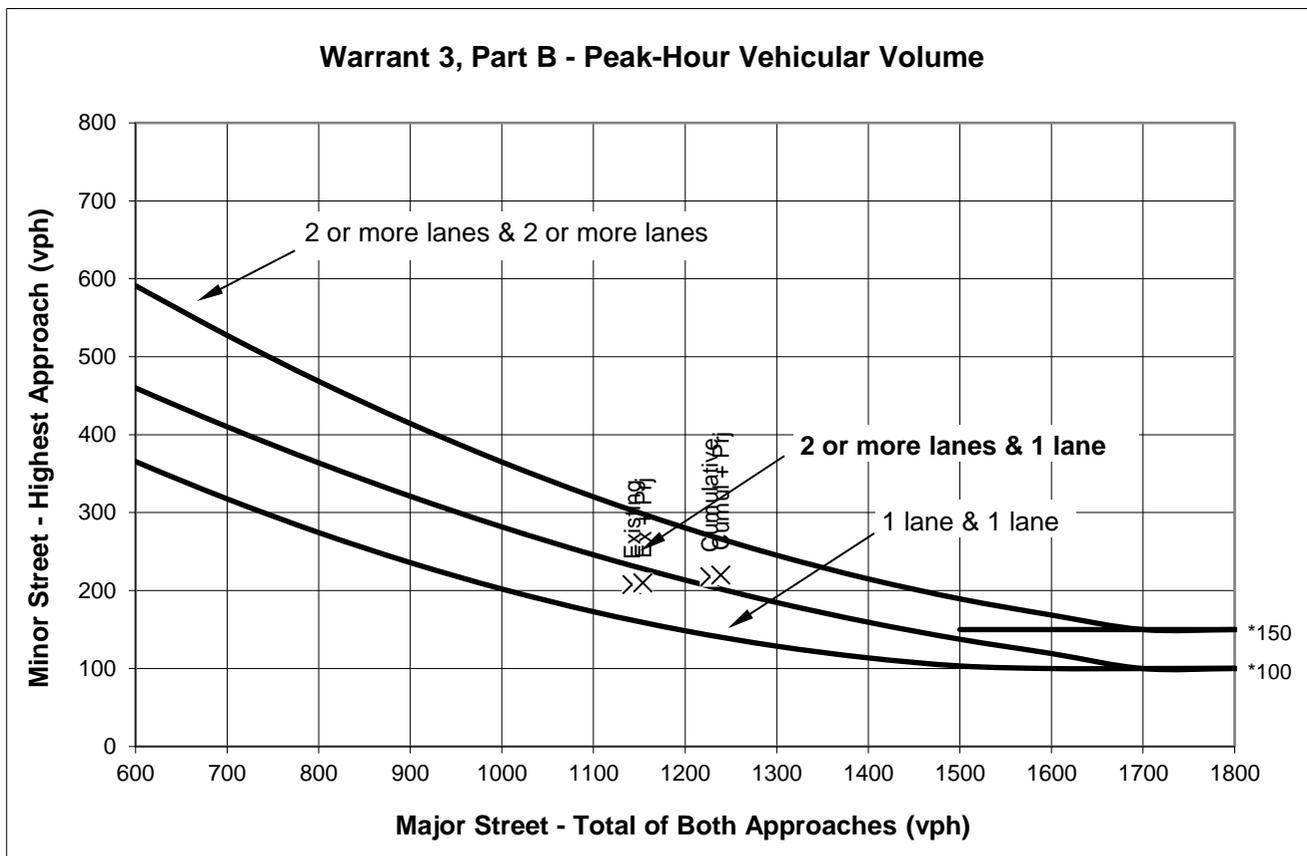
	AM PEAK PERIOD							
	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Minor Street Approach Direction w/ Highest Delay	WB	WB	WB	WB				
Highest Minor Street Average Delay (sec/veh)	11.3	11.4	12.3	12.4				
Corresponding Minor Street Approach Volume (veh/hr)	383	387	393	397				
Minor Street Total Delay (veh-hrs)	1.2	1.2	1.3	1.4				
Total Entering Volume (veh/hr)	1577	1593	1682	1698				
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; <u>AND</u>	No	No	No	No				
2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; <u>AND</u>	Yes	Yes	Yes	Yes				
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	Yes	Yes	Yes	Yes				
Signal Warranted based on Part A?	No	No	No	No				

PART B

		Approach Lanes		AM PEAK PERIOD							
		One	2 or More	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Major Street - Both Approaches	Alameda de las Pulgas		X	1142	1154	1227	1239				
Minor Street - Highest Approach	Atherton Ave	X		208	210	218	220				
Signal Warranted based on Part B?				No	No	Yes	Yes				

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).

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

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		AM PEAK PERIOD									
				Existing	Ex + Prj	Cumulative	Cumul + Prj						
		2 or One	More										
Major Street - Both Approaches	Alameda de las Pulgas		X	1142	1154	1227	1239						
Minor Street - Highest Approach	Atherton Ave	X		208	210	218	220						
Signal Warranted Based on Part B - Peak-Hour Volumes?				No	No	Yes	Yes						

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

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TRAFFIC SIGNAL WARRANTS WORKSHEET

Major Street: Alameda de las Pulgas
 Minor Street: Atherton Ave

Analyst: JL date: 6/21/23
 Critical Approach Speed* (mph) 25
 Critical Approach Speed* (mph) 25
 *Posted Speed.

Critical speed of major street traffic > 50 mph (64 km/h)..... }
 In built up area of isolated community of < 10,000 population..... } **Rural (R)**
 } **Urban (U)**

PM PEAK HOUR

Warrant 3 - Peak Hour

The need for a traffic control signal should be considered if an engineering study finds that the criteria in either of the following two categories (Parts A and B) are met:

PART A

(All parts 1, 2, and 3 below must be satisfied)

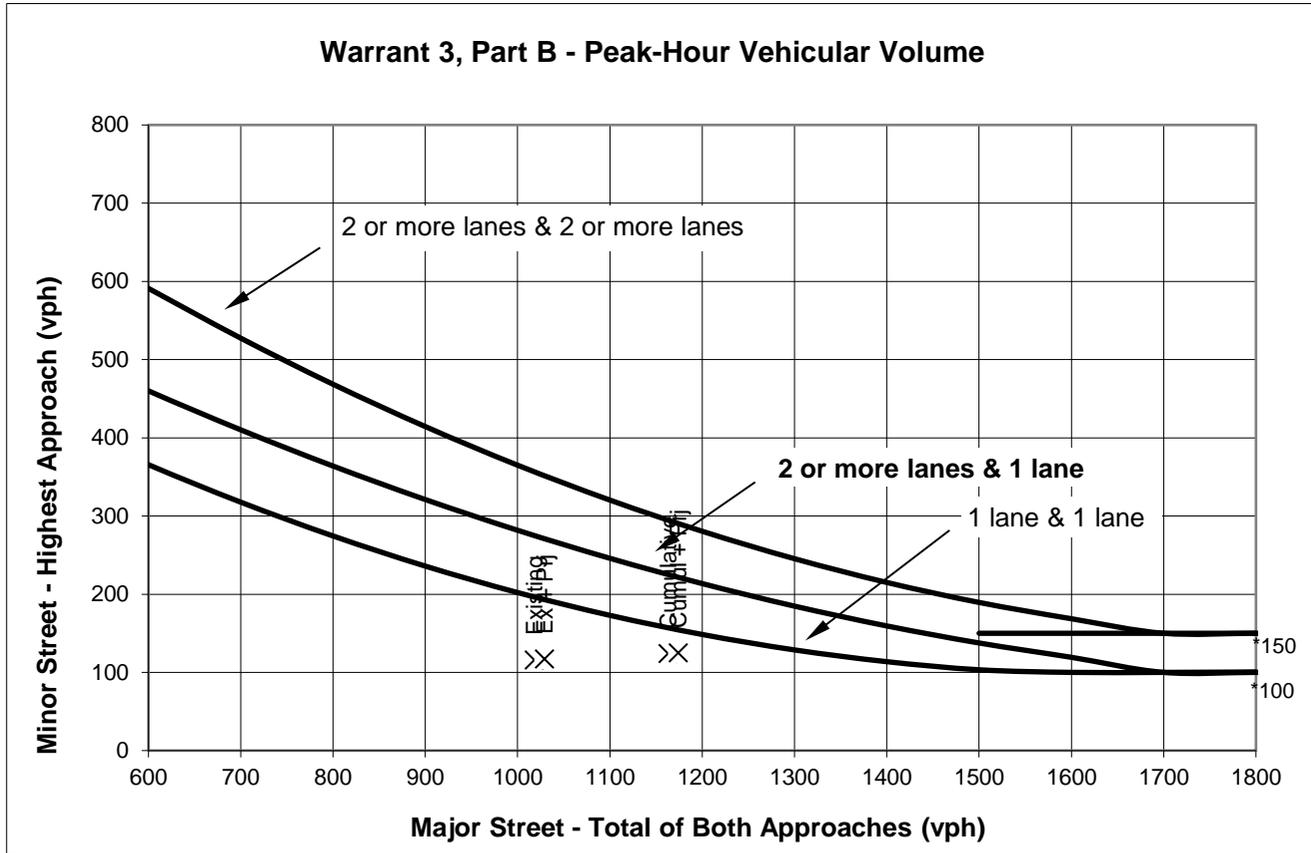
	PM PEAK HOUR							
	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Minor Street Approach Direction w/ Highest Delay	EB	EB	EB	EB				
Highest Minor Street Average Delay (sec/veh)	9.9	10.0	10.5	10.5				
Corresponding Minor Street Approach Volume (veh/hr)	21	21	26	26				
Minor Street Total Delay (veh-hrs)	0.1	0.1	0.1	0.1				
Total Entering Volume (veh/hr)	1418	1433	1576	1591				
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; <u>AND</u>	No	No	No	No				
2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; <u>AND</u>	No	No	No	No				
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	Yes	Yes	Yes	Yes				
Signal Warranted based on Part A?	No	No	No	No				

PART B

	Approach Lanes	PM PEAK HOUR									
		Existing	Ex + Prj	Cumulative	Cumul + Prj						
										One	2 or More
Major Street - Both Approaches	Alameda de las Pulgas		X	1018	1029	1163	1174				
Minor Street - Highest Approach	Atherton Ave	X		116	117	124	125				
Signal Warranted based on Part B?				No	No	No	No				

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).

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

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		PM PEAK HOUR									
				Existing	Ex + Prj	Cumulative	Cumul + Prj						
		2 or One	More										
Major Street - Both Approaches	Alameda de las Pulgas		X	1018	1029	1163	1174						
Minor Street - Highest Approach	Atherton Ave	X		116	117	124	125						
Signal Warranted Based on Part B - Peak-Hour Volumes?				No	No	No	No						

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

0

TRAFFIC SIGNAL WARRANTS WORKSHEET

Major Street: El Camino Real
 Minor Street: Alejandra Ave

Analyst: JL date: 9/27/23
 Critical Approach Speed* (mph) 35
 Critical Approach Speed* (mph) 25
 *Posted Speed.

Critical speed of major street traffic > 50 mph (64 km/h)..... }
 or } **Rural (R)**
 }
 In built up area of isolated community of < 10,000 population..... } **Urban (U)**

AM PEAK PERIOD

Warrant 3 - Peak Hour

The need for a traffic control signal should be considered if an engineering study finds that the criteria in either of the following two categories (Parts A and B) are met:

PART A

(All parts 1, 2, and 3 below must be satisfied)

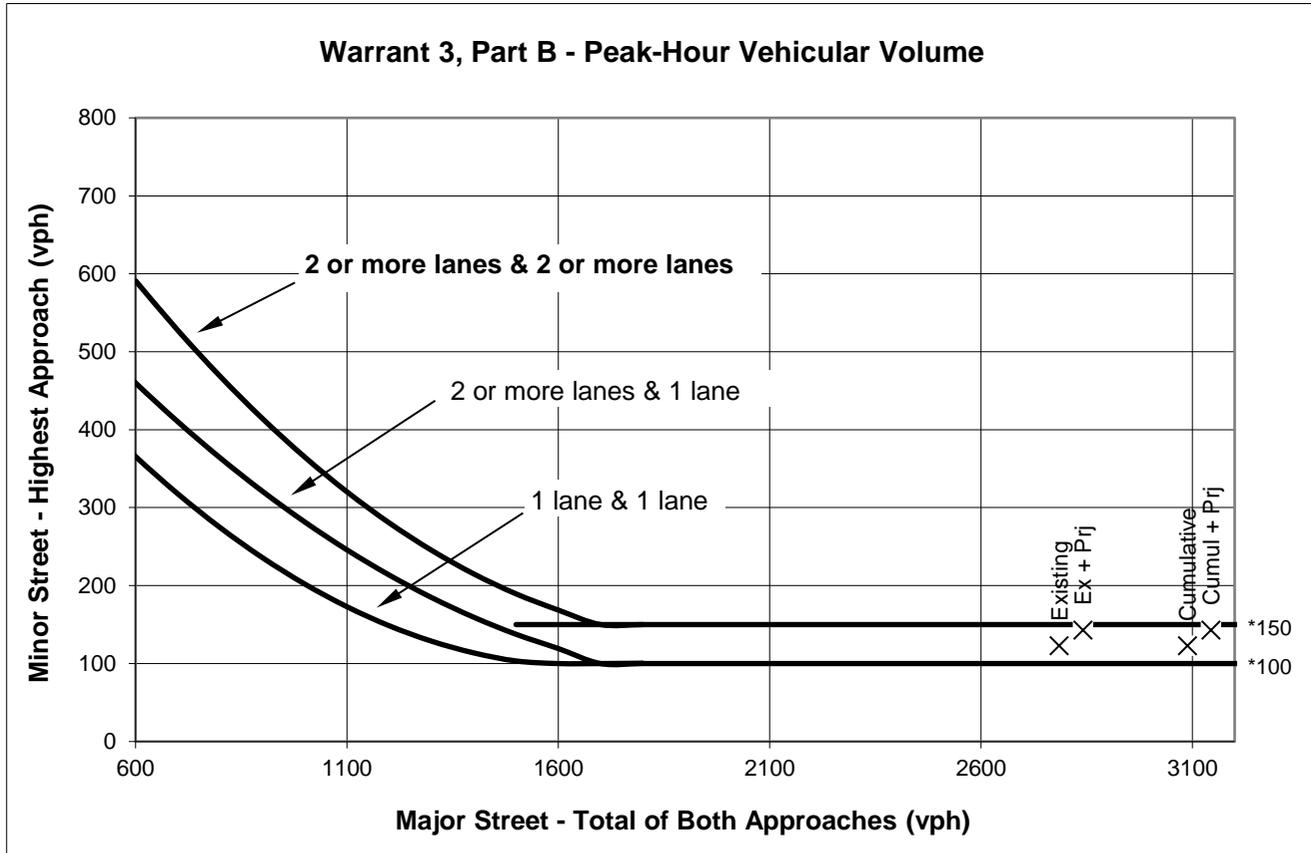
	AM PEAK PERIOD							
	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Minor Street Approach Direction w/ Highest Delay	EB	EB	EB	EB				
Highest Minor Street Average Delay (sec/veh)	41.2	50.5	46.0	57.6				
Corresponding Minor Street Approach Volume (veh/hr)	123	143	123	143				
Minor Street Total Delay (veh-hrs)	1.4	2.0	1.6	2.3				
Total Entering Volume (veh/hr)	2908	2984	3211	3287				
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; <u>AND</u>	No	No	No	No				
2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; <u>AND</u>	No	No	No	No				
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	Yes	Yes	Yes	Yes				
Signal Warranted based on Part A?	No	No	No	No				

PART B

	Approach Lanes	AM PEAK PERIOD							
		Existing	Ex + Prj	Cumulative	Cumul + Prj				
Major Street - Both Approaches	El Camino Real								
			X						
Minor Street - Highest Approach	Alejandra Ave								
			X						
Signal Warranted based on Part B?		No	No	No	No				

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).

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

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		AM PEAK PERIOD									
				Existing	Ex + Prj	Cumulative	Cumul + Prj						
		2 or One	More										
Major Street - Both Approaches	El Camino Real		X	2785	2841	3088	3144						
Minor Street - Highest Approach	Alejandra Ave		X	123	143	123	143						
Signal Warranted Based on Part B - Peak-Hour Volumes?				No	No	No	No						

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

0

TRAFFIC SIGNAL WARRANTS WORKSHEET

Major Street: El Camino Real
 Minor Street: Alejandra Ave

Analyst: JL date: 9/27/23
 Critical Approach Speed* (mph) 35
 Critical Approach Speed* (mph) 25
 *Posted Speed.

Critical speed of major street traffic > 50 mph (64 km/h)..... }
 In built up area of isolated community of < 10,000 population..... } **Rural (R)**
 } **Urban (U)**

PM PEAK HOUR

Warrant 3 - Peak Hour

The need for a traffic control signal should be considered if an engineering study finds that the criteria in either of the following two categories (Parts A and B) are met:

PART A

(All parts 1, 2, and 3 below must be satisfied)

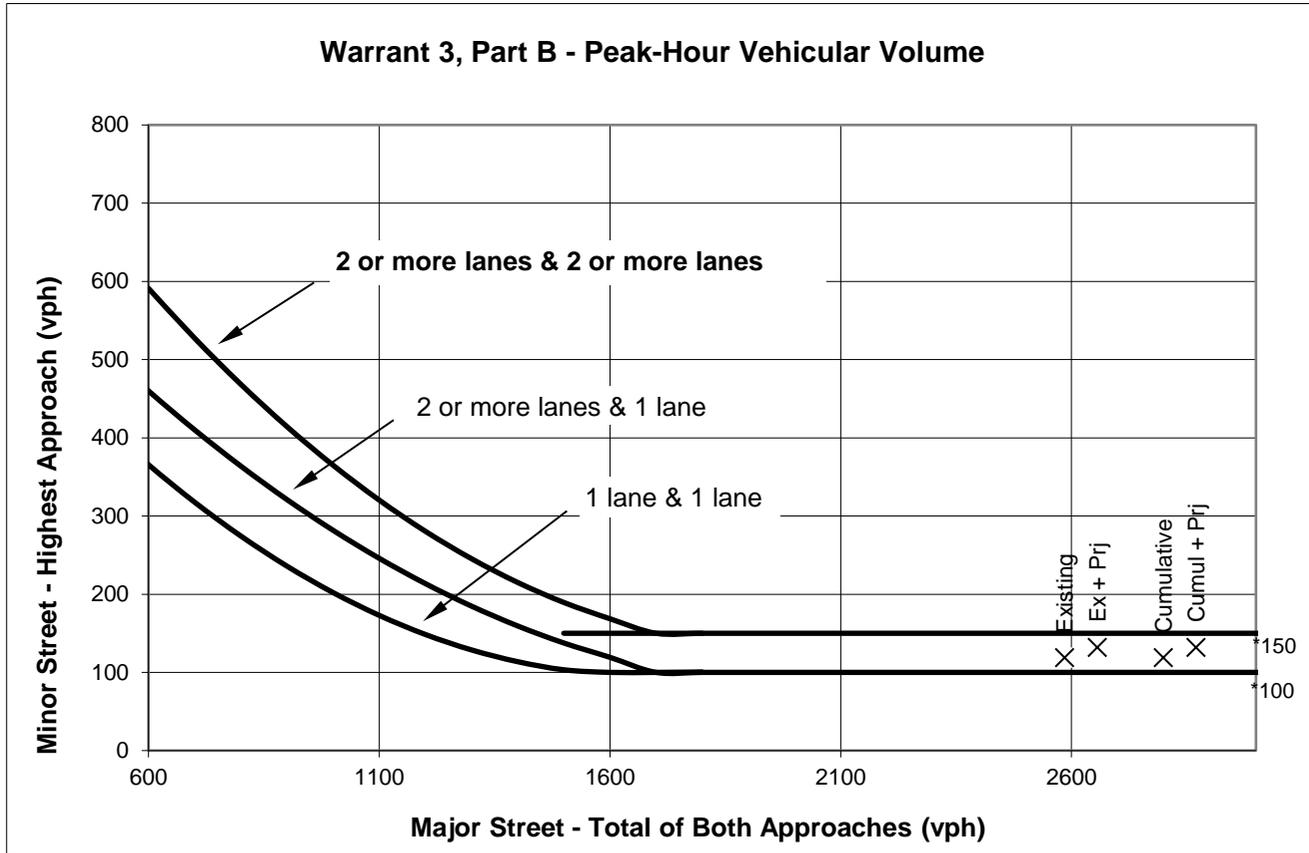
	PM PEAK HOUR							
	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Minor Street Approach Direction w/ Highest Delay	EB	EB	EB	EB				
Highest Minor Street Average Delay (sec/veh)	18.4	19.7	22.0	23.9				
Corresponding Minor Street Approach Volume (veh/hr)	119	132	119	132				
Minor Street Total Delay (veh-hrs)	0.6	0.7	0.7	0.9				
Total Entering Volume (veh/hr)	2704	2788	2918	3002				
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; <u>AND</u>	No	No	No	No				
2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; <u>AND</u>	No	No	No	No				
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	Yes	Yes	Yes	Yes				
Signal Warranted based on Part A?	No	No	No	No				

PART B

		Approach Lanes		PM PEAK HOUR							
		One	2 or More	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Major Street - Both Approaches	El Camino Real		X	2585	2656	2799	2870				
Minor Street - Highest Approach	Alejandra Ave		X	119	132	119	132				
Signal Warranted based on Part B?				No	No	No	No				

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).

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

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		PM PEAK HOUR									
				Existing	Ex + Prj	Cumulative	Cumul + Prj						
		2 or One	More										
Major Street - Both Approaches	El Camino Real		X	2585	2656	2799	2870						
Minor Street - Highest Approach	Alejandra Ave		X	119	132	119	132						
Signal Warranted Based on Part B - Peak-Hour Volumes?				No	No	No	No						

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

0

TRAFFIC SIGNAL WARRANTS WORKSHEET

Major Street: Bay Road
 Minor Street: Sonoma Ave/ Ringwood Ave

Analyst: JL date: 9/27/23
 Critical Approach Speed* (mph) 25
 Critical Approach Speed* (mph) 25
 *Posted Speed.

Critical speed of major street traffic > 50 mph (64 km/h)..... }
 or } **Rural (R)**
 }
 In built up area of isolated community of < 10,000 population..... } **Urban (U)**

AM PEAK PERIOD

Warrant 3 - Peak Hour

The need for a traffic control signal should be considered if an engineering study finds that the criteria in either of the following two categories (Parts A and B) are met:

PART A

(All parts 1, 2, and 3 below must be satisfied)

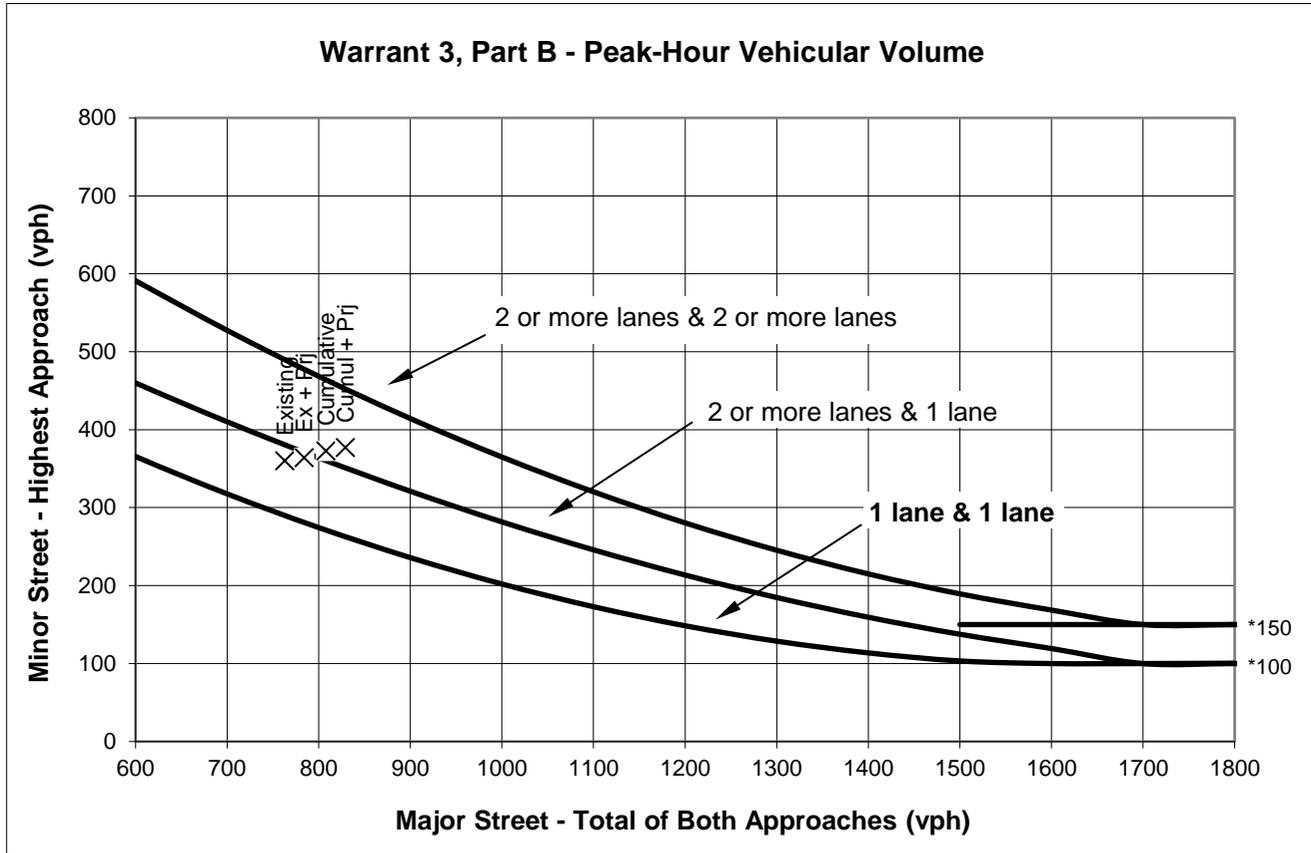
	AM PEAK PERIOD							
	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Minor Street Approach Direction w/ Highest Delay	EB	EB	EB	EB				
Highest Minor Street Average Delay (sec/veh)	27.4	32.8	28.1	53.3				
Corresponding Minor Street Approach Volume (veh/hr)	360	364	373	377				
Minor Street Total Delay (veh-hrs)	2.7	3.3	2.9	5.6				
Total Entering Volume (veh/hr)	1244	1270	1318	1344				
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; <u>AND</u>	No	No	No	Yes				
2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; <u>AND</u>	Yes	Yes	Yes	Yes				
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	Yes	Yes	Yes	Yes				
Signal Warranted based on Part A?	No	No	No	Yes				

PART B

		Approach Lanes		AM PEAK PERIOD							
		One	2 or More	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Major Street - Both Approaches	Bay Road	X		763	784	808	829				
Minor Street - Highest Approach	Sonoma Ave/ Ringwood Ave	X		360	364	373	377				
Signal Warranted based on Part B?		Yes	Yes	Yes	Yes	Yes	Yes				

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).

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

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		AM PEAK PERIOD							
		2 or One	More	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Major Street - Both Approaches	Bay Road			X		763	784	808	829		
Minor Street - Highest Approach	Sonoma Ave/ Ringwood Ave	X		360	364	373	377				
Signal Warranted Based on Part B - Peak-Hour Volumes?				Yes	Yes	Yes	Yes				

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.

0

TRAFFIC SIGNAL WARRANTS WORKSHEET

Major Street: Bay Road
 Minor Street: Sonoma Ave/ Ringwood Ave

Analyst: JL date: 9/27/23
 Critical Approach Speed* (mph) 25
 Critical Approach Speed* (mph) 25
 *Posted Speed.

Critical speed of major street traffic > 50 mph (64 km/h)..... }
 or } **Rural (R)**
 }
 In built up area of isolated community of < 10,000 population..... } **Urban (U)**

PM PEAK HOUR

Warrant 3 - Peak Hour

The need for a traffic control signal should be considered if an engineering study finds that the criteria in either of the following two categories (Parts A and B) are met:

PART A

(All parts 1, 2, and 3 below must be satisfied)

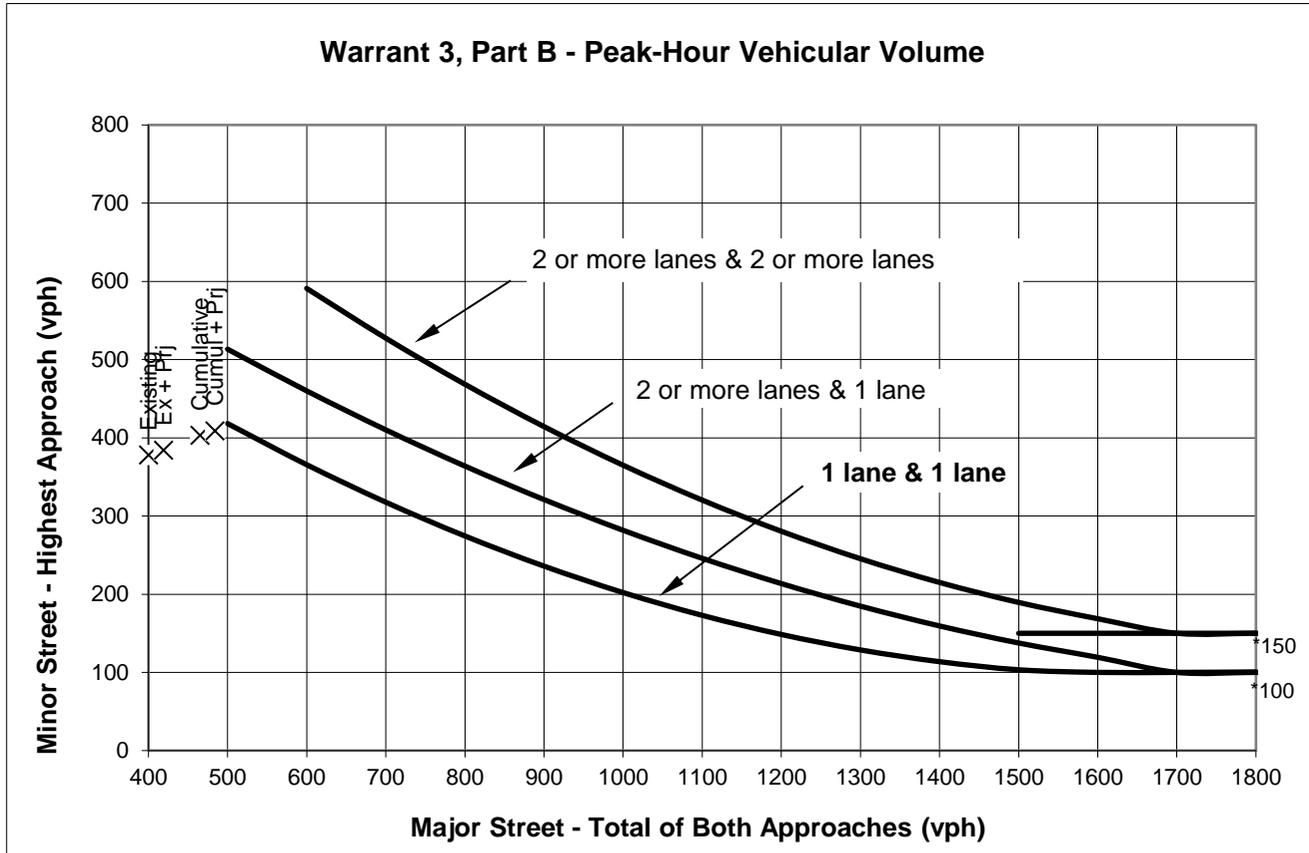
	PM PEAK HOUR							
	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Minor Street Approach Direction w/ Highest Delay	NB	NB	NB	NB				
Highest Minor Street Average Delay (sec/veh)	13.5	14.1	15.7	16.6				
Corresponding Minor Street Approach Volume (veh/hr)	213	223	248	258				
Minor Street Total Delay (veh-hrs)	0.8	0.9	1.1	1.2				
Total Entering Volume (veh/hr)	813	838	918	943				
1. The total delay experienced for traffic on one minor street approach controlled by a STOP sign equals or exceeds 4 vehicle-hours for a 1-lane approach and 5 vehicle-hours for a 2-lane approach; <u>AND</u>	No	No	No	No				
2. The volume on the same minor street approach equals or exceeds 100 vph for 1 moving lane of traffic or 150 vph for 2 moving lanes; <u>AND</u>	Yes	Yes	Yes	Yes				
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with 4 or more approaches or 650 vph for intersections with 3 approaches.	Yes	Yes	Yes	Yes				
Signal Warranted based on Part A?	No	No	No	No				

PART B

		Approach Lanes		PM PEAK HOUR							
		One	2 or More	Existing	Ex + Prj	Cumulative	Cumul + Prj				
Major Street - Both Approaches	Bay Road	X		400	419	465	484				
Minor Street - Highest Approach	Sonoma Ave/ Ringwood Ave	X		378	384	403	409				
Signal Warranted based on Part B?				No	No	No	No				

The Warrant is satisfied if the plotted point for vehicles per hour on the major street (both approaches) and the corresponding per hour higher vehicle volume minor street approach (one direction only) for one hour (any four consecutive 15-minute periods) fall above the applicable curves in California MUTCD Figure 4C-3 or 4C-4.

Source: California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).



Source: Figure 4C-3 California Manual on Uniform Traffic Control Devices for Streets and Highways (FHWA's MUTCD 2009 Edition, as amended for use in California).

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

Warrant 3, Part B - Peak-Hour Vehicular Volume

		Approach Lanes		PM PEAK HOUR									
				Existing	Ex + Prj	Cumulative	Cumul + Prj						
Major Street - Both Approaches	Bay Road	X		400	419	465	484						
Minor Street - Highest Approach	Sonoma Ave/ Ringwood Ave	X		378	384	403	409						
Signal Warranted Based on Part B - Peak-Hour Volumes?				No	No	No	No						

*Warrant is satisfied if plotted points fall above the appropriate curve in graph above.