APPENDIX E
TRANSPORTATION IMPACT ANALYSIS

Transportation Impact Analysis

Serramonte Views

Daly City, California

January 2017

Transportation Impact Analysis

Serramonte Views

Daly City, California

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TABLE OF CONTENTS

1 Introduction 2

1.1 Project Description 2

1.2 Analysis Approach 2

1.3 Methodology 6

2 Existing Conditions 14

2.1 Roadway Network 14

2.2 Transit Facilities 16

2.3 Bicycle and Pedestrian Facitilites 19

2.4 Existing Traffic Conditions 24

3 Transportation Impact Analysis 31

Project Travel Demand 31

4. Existing Plus Project Conditions 37

4.1 Transportation Network Under Existing Plus Project Conditions 37

4.2 Existing Plus Project Traffic Volumes 37

4.3 Existing Plus Project Intersection Analysis 37

4.4 Existing Plus Project Conditions Freeway Analysis 41

4.5 Existing Plus Project Conditions Queuing Analysis at Freeway Off-Ramp Intersections 44

5. Cumulative Conditions 47

5.1 Cumulative Transportation Network and Traffic Volumes 47

5.2 Cumulative Conditions Intersection Analysis 49

5.3 Cumulative Conditions Freeway Analysis 52

5.4 Cumulative Conditions Freeway Off-Ramp Queue Analysis 53

6. Cumulative Plus Project Conditions 56

6.1 Cumulative Plus Project Transportation Network and Traffic Volumes 56

6.2 Cumulative Plus Project Conditions Intersection Analysis 56

6.3 Cumulative Plus Project Conditions Freeway Analysis 60

6.4 Cumulative Plus Project Conditions Queuing Analysis at Freeway Off-Ramp Intersections.. 63

7. Other Transportation Issues 66

7.1 Congestion Management Program 66

7.2 Parking Assessment 66

7.3 Exclusive Left-Turn Lane at Project Driveway 69

7.4 Vehicle Queueing Analysis at Project Driveway 69

7.5 Site Access 71

7.6 Safety Issues 71

8. Traffic Impacts during Project Construction 74

8.1 Construction Traffic Generation 74

8.2 Construction Traffic Distribution 74

8.3 Analysis Methodology 76

8.4 Impact Criteria 76

8.5 Intersection Operations 77

LIST OF FIGURES

Figure 1: Project Location 3
Figure 2: Study Locations 5
Figure 3: Existing SamTrans Service in the Study Area 18
Figure 4: Existing and Proposed Bicycle Network in the Study Area 22
Figure 5: Existing Pedestrian Facilities in the Study Area 23
Figure 6: Existing Intersection Volumes & Lane Configurations 25
Figure 7: Project Trip Distribution for Condo Land Use 33
Figure 8: Project Trip Distribution for Hotel Land Use 34
Figure 9: Project Only Trips – Weekday AM & PM Peak Hours 35
Figure 10: Project Construction Vehicle Trip Generation & Assignment 75

LIST OF TABLES

Table 1: Level-of-Service Definitions 8
Table 2: Level of Service Definition for Freeway Mainline Segment 10
Table 3: Bus Routes Serving the Study Area 17
Table 4: BART Service from Colma Station 19
Table 5: Intersection Level of Service – Existing Conditions 26
Table 6: Signal Warrant Analysis – Existing Conditions 27
Table 7: Freeway Level of Service – Existing Conditions 28
Table 8: Off-Ramp Queue Analysis – Existing Conditions – Weekday AM and PM Peak Hour 29
Table 9: Project Trip Generation 32
Table 10: Intersection Level of Service – Existing Plus Project Conditions – AM Peak Hour 38
Table 11: Intersection Level of Service – Existing Plus Project Conditions – PM Peak Hour 39
Table 12: Signal Warrant Analysis – Existing Plus Project Conditions 40
Table 13: Freeway Level of Service – Existing plus Project Conditions – AM Peak Hour 42
Table 14: Freeway Level of Service – Existing plus Project Conditions – PM Peak Hour 43
Table 15: Off-Ramp Queue Analysis – Existing and Existing plus Project Conditions – Weekday AM and PM Peak Hour 45
Table 16: Intersection Level of Service – Cumulative Conditions – AM Peak Hour 50
Table 17: Intersection Level of Service – Cumulative Conditions – PM Peak Hour 51
Table 18: Freeway Level of Service – Cumulative Conditions – AM Peak Hour 52
Table 19: Freeway Level of Service – Cumulative Conditions – PM Peak Hour 53
Table 20: Off-Ramp Queue Analysis – Cumulative Conditions – Weekday AM and PM Peak Hour 54
Table 21: Intersection Level of Service – Cumulative plus Project Conditions – AM Peak Hour 58
Table 22: Intersection Level of Service – Cumulative plus Project Conditions – PM Peak Hour 59
Table 23: Freeway Level of Service – Cumulative plus Project Conditions – AM Peak Hour 61
Table 24: Freeway Level of Service – Cumulative plus Project Conditions – PM Peak Hour 62
Table 25: Off-Ramp Queue Analysis – Cumulative and Cumulative plus Project Conditions – Weekday AM and PM Peak Hour 64
Table 26: Parking Generation and Requirements 68
Table 27: Vehicle Queuing Analysis at Project Driveway 71

Table 28: Intersection Level of Service – Existing Plus Construction Conditions – AM Peak Hour 78

Table 29: Intersection Level of Service – Existing Plus Construction Conditions – PM Peak Hour..... 78

APPENDICES

Appendix 1 Intersection Turning Movement Volume Figures

Appendix 2 Year 2016 Existing Conditions Level-of-Service Worksheets

Appendix 3 Year 2016 Existing Conditions Signal Warrant Worksheets

Appendix 4 Year 2016 Existing plus Project Conditions Intersection Lane Configurations

Appendix 5 Year 2016 Existing plus Project Conditions Level-of-Service Worksheets

Appendix 6 Year 2016 Existing plus Project Conditions Signal Warrant Worksheets

Appendix 7 Year 2035 Cumulative Conditions Intersection Lane Configurations

Appendix 8 Year 2035 Cumulative Conditions Level-of-Service Worksheets

Appendix 9 Year 2035 Cumulative plus Project Conditions Intersection Lane Configurations

Appendix 10 Year 2035 Cumulative plus Project Conditions Level-of-Service Worksheets

Appendix 11 Year 2016 Existing plus Construction Conditions Level-of-Service Worksheets

Chapter 1
Introduction

1 INTRODUCTION

This report presents the findings of the transportation impact analysis conducted for the proposed Serramonte Views Project (formerly known as Serramonte Terrace) located in Daly City, California ("Project"). AGH Management Corporation is proposing a new mixed-use development at 239 Serramonte Boulevard. The project site is currently a vacant lot. The Project will consist of 323 condominium units and a 176-room hotel. The Project location is shown in the vicinity map on Figure 1.

The purpose of the study is to assess the potential impacts resulting from the implementation of the Project on the surrounding transportation system and to identify measures to mitigate any significant impacts.

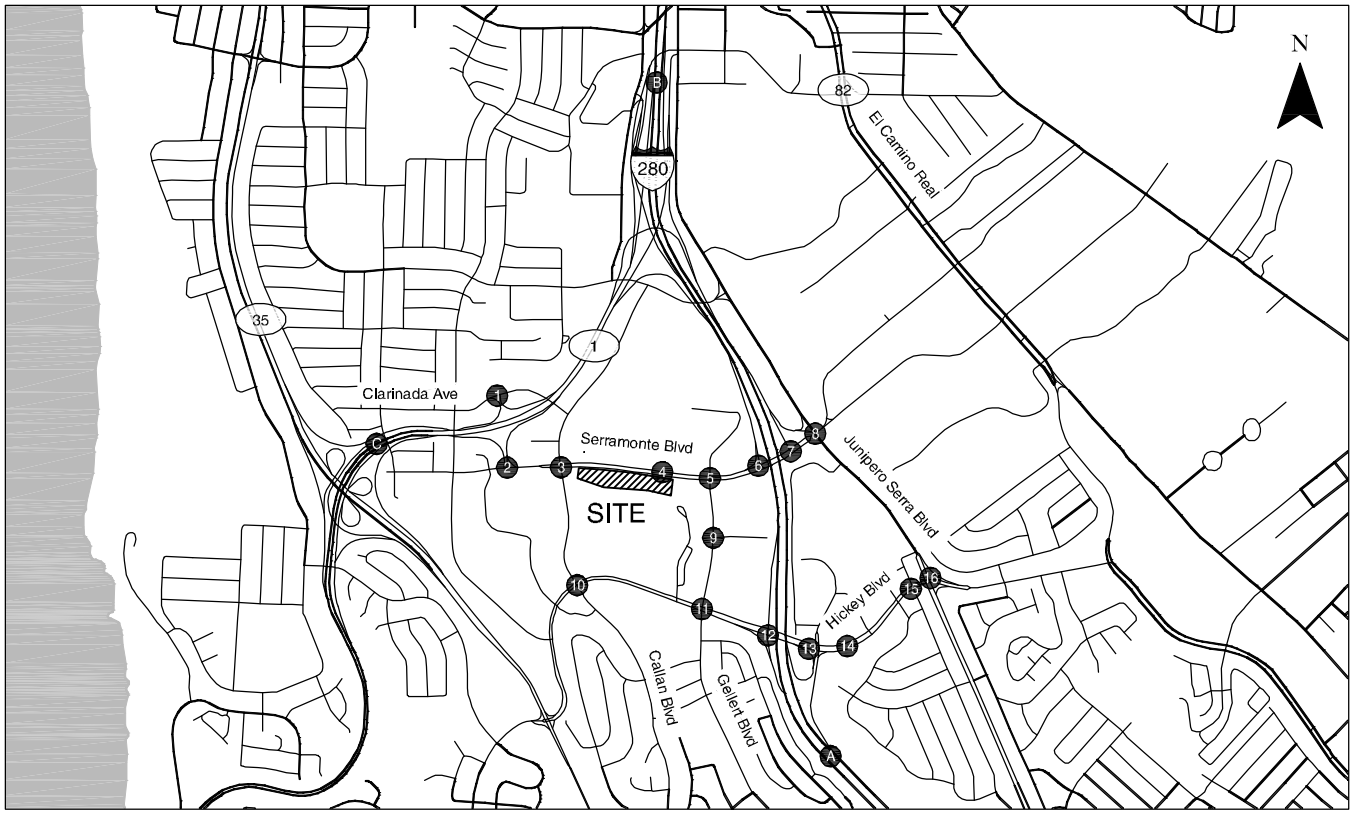
1.1 PROJECT DESCRIPTION

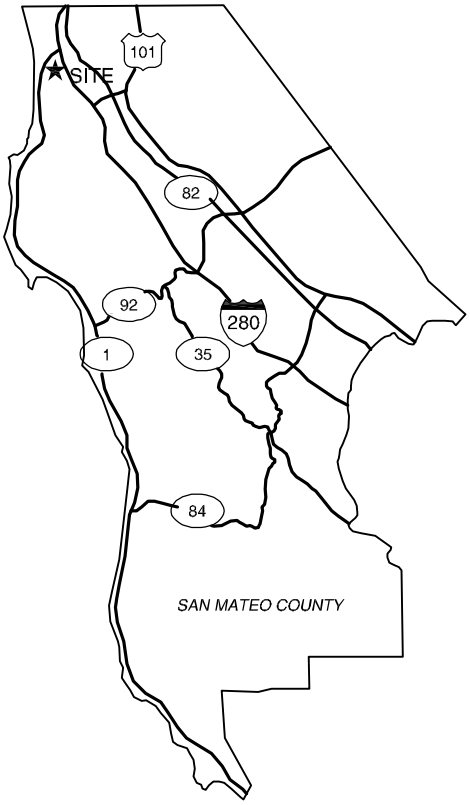
The Project is located between State Route 1 (SR-1) and Interstate 280 (I-280) immediately south of Serramonte Shopping Center in Daly City, California. The main access point to Serramonte Terrace will be provided as a new south leg at the existing Serramonte Boulevard and Serramonte Shopping Center Entrance intersection. Land uses immediately surrounding Serramonte Terrace are primarily residential to the west and commercial to the east, north, and south. Beyond the immediate area, the area is mostly residential with some commercial.

The Project would construct four buildings. The building on the east would consist of a 176-room hotel and 187 parking spaces for the hotel use. The remaining three buildings would consist of 323 condominium units and 420 parking spaces for residential uses.

1.2 ANALYSIS APPROACH

The analysis assessed the Project's potential effects on vehicular traffic, transit operations, bicycle, and pedestrian transportation. The Project may develop in multiple phases; however, for the purpose of this study, the Project was analyzed as one single phase in order to evaluate the potential impacts upon full implementation of the Project. The study does not assume any modifications to the existing and planned internal roadway network as part of the Project, except as necessary to accommodate the proposed Project components.





Site Vicinity Map
Daly City, CA

FIGURE
1

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Analysis Scenarios

A traffic operations analysis was performed to assess the performance of the circulation system for the peak hours occurring during the weekday AM (7:00 – 9:00 AM) and weekday PM (4:00 – 6:00 PM) peak periods, for the following scenarios (these scenarios are described in more details in their respective sections):

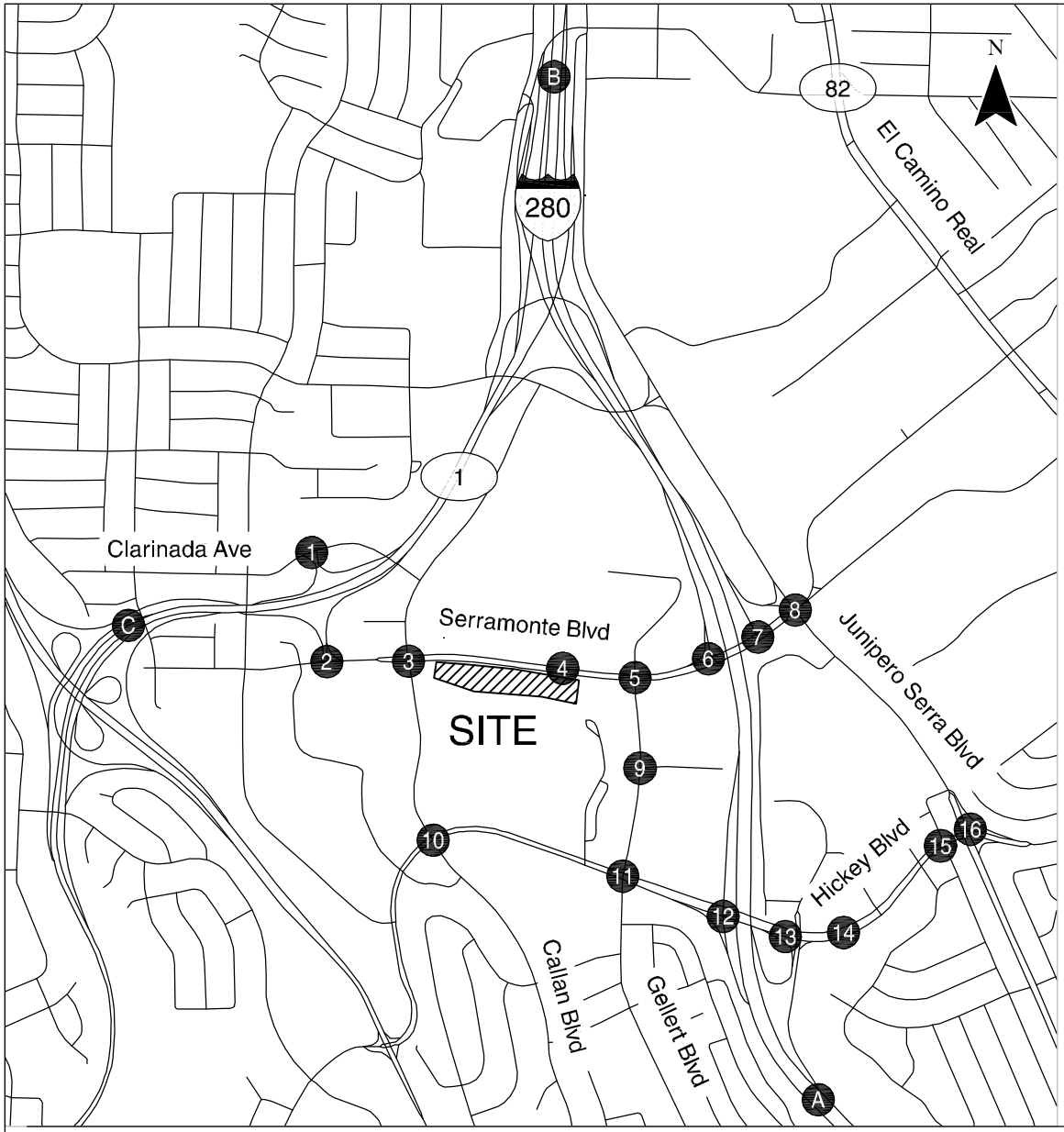
- Existing (2016) Conditions
- Existing (2016) plus Project
- Cumulative (2035) Conditions
- Cumulative (2035) plus Project

Study Locations

A set of intersections and freeway mainline segments were selected for analysis based upon the anticipated volumes and distributional patterns of Project traffic. The selections were made in collaboration with Daly City staff. The intersection and freeway segment locations are listed below and shown in Figure 2.

Intersection Analysis

1. Clarinada Avenue & SR-1 SB Ramps
2. Serramonte Boulevard & SR-1 NB Ramps
3. Serramonte Boulevard & Callan Boulevard
4. Serramonte Boulevard & Serramonte Shopping Center Entrance & Project Driveway
5. Serramonte Boulevard & Gellert Boulevard
6. Serramonte Boulevard & I-280 SB Off-Ramp
7. Serramonte Boulevard & I-280 NB On-Ramp
8. Serramonte Boulevard & Junipero Serra Boulevard
9. Gellert Boulevard & Serramonte Plaza
10. Hickey Boulevard & Callan Boulevard
11. Hickey Boulevard & Gellert Boulevard
12. Hickey Boulevard & I-280 SB Ramps
13. Hickey Boulevard & I-280 NB Ramps
14. Hickey Boulevard & Kaiser Driveway
15. Hickey Boulevard & Longford Drive
16. Hickey Boulevard & Junipero Serra Boulevard



LEGEND

Study Intersections

1 - SR-1 SB Ramps & Clarinada Ave
2 - SR-1 NB Ramps & Serramonte Blvd
3 - Callan Blvd & Serramonte Blvd
4 - Serramonte Shopping Center Entrance & Serramonte Blvd & Project Driveway
5 - Gellert Blvd & Serramonte Blvd
6 - I-280 SB Off-Ramp & Serramonte Blvd
7 - I-280 NB On-Ramp & Serramonte Blvd
8 - Junipero Serra Blvd & Serramonte Blvd
9 - Gellert Blvd & Serramonte Plaza
10 - Callan Blvd & Hickey Blvd
11 - Gellert Blvd & Hickey Blvd
12 - I-280 SB Ramps & Hickey Blvd
13 - I-280 NB Ramps & Hickey Blvd
14 - Kaiser Driveway & Hickey Blvd
15 - Longford Dr & Hickey Blvd
16 - Junipero Serra Blvd & Hickey Blvd

Study Freeway Segments

A - I-280 South of Hickey Blvd
B - I-280 North of SR-1
C - SR-1 South of Serramonte Blvd

Study Intersections & Freeway Segments
Daly City, CA

FIGURE
2

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Freeway Analysis

Freeway Mainline

1. I-280 south of Hickey Boulevard
2. I-280 north of SR-1
3. SR-1 south of Serramonte Boulevard

Freeway Weaving

1. Southbound I-280 between SR-1 and Serramonte Boulevard

Queuing Analysis at Freeway Off-Ramp

- Intersection #1 - SR-1 Southbound Off-Ramp to Clarinada Avenue
- Intersection #2 - SR-1 Northbound Off-Ramp to Serramonte Boulevard
- Intersection #6 - I-280 Southbound Off-Ramp to Serramonte Boulevard
- Intersection #12 - I-280 Southbound Off-Ramp to Hickey Boulevard
- Intersection #13 - I-280 Northbound Off-Ramp to Hickey Boulevard

CMP Compliance

As the Congestion Management Agency (CMA) for San Mateo County, the City/County Association of Governments (C/CAG) is responsible for maintaining the performance and standards of the Congestion Management Program (CMP) roadway network. The CMP requires new development projected to add 100 or more peak hour trips to the CMP roadway network to implement Travel Demand Management (TDM) measures that would reduce project impacts. In the vicinity of the project site, facilities that are part of the CMP network include SR-1 and I-280. The freeway mainline segments and freeway weaving section listed above are analyzed for CMP compliance.

1.3 METHODOLOGY

This section presents the methodology used to determine the transportation conditions for each scenario described above. It includes the descriptions of the data requirements, the analysis methodologies, and the application level of service standards.

Data Requirements

The data required for the analysis were obtained from new traffic counts, previous traffic studies, and information provided by the City of Daly City and City of South San Francisco. The following data were collected from these sources:

- Existing AM peak hour traffic counts
- Existing PM peak hour traffic from previous transportation impact studies
- Existing lane configuration
- Existing signal timing and phasing

For the AM peak hour, new traffic counts were collected in March 2016. For the PM peak hour, the weekday PM counts collected for the 372 Gellert Boulevard In-N-Out Transportation Impact Analysis were used for all 16 study intersections. These counts were collected in May 2015. At the time when the PM counts were collected, the approved project Christopher Highlands, located on 60 Christopher Court to the west of the project site, was not yet occupied. When the AM counts were conducted in March 2016, approximately 60 percent of the approved Christopher Highlands Project was occupied. To account for the partially occupied Christopher Highlands units in the PM peak hour, the PM peak hour counts were adjusted to include the estimated trips that would be generated by the occupied units at Christopher Highlands as of March 2016. These trips were estimated using the trip distribution from the Daly City Travel Demand Model and the trip generation rates based upon information compiled by the Institute of Transportation Engineers (ITE) (*Trip Generation Manual, Ninth Edition, 2012*.)

Analysis Methodologies and Level of Service Standards

"Levels of service" describes the operating conditions experienced by users of a facility. Level of service (LOS) is a qualitative measure of the effect of a number of factors, including speed and travel time, traffic interruptions, freedom to maneuver, driving comfort and convenience. Levels of service are designated "A" through "F" from best to worst, which cover the entire range of traffic operations that might occur. Level of Service "A" through "E" generally represents traffic volumes at less than roadway capacity, while LOS "F" represents over capacity and/or forced flow conditions. In general, LOS D or better is considered acceptable while LOS E or LOS F is not.

Intersection Analysis

Intersection analyses for both signalized and unsignalized intersections were conducted using the operational methodology outlined in the 2010 Highway Capacity Manual (HCM) (Transportation Research Board, Washington, D.C., 2010) as implemented by the Vistro Version 4 software analysis tool. The following summarizes the HCM methodologies for signalized and unsignalized intersections, respectively.

Signalized intersections. The HCM procedure calculates a weighted average stop delay in seconds per vehicle at a signalized intersection, and assigns a level of service designation based upon the average delay.

Unsignalized intersections. For all-way stop controlled intersections, the HCM methodology calculates a weighted average stop delay in seconds per vehicle for each controlled intersection leg and for the intersection as a whole. A level of service designation is based upon the weighted average control delay for all intersection legs, similar to the level of service designation for signalized intersections. For two-way stop controlled intersections, the HCM methodology provides an LOS for each controlled turn movement, but does not report an overall average LOS for the entire intersection. For Daly City, an average LOS is reported since the Daly City significance criteria are based on the weighted average control delay for all approaches. The LOS for the worst movement is also provided for informational purposes only.

Table 1 presents the relationship of average delay to level of service for both signalized and unsignalized intersections.

Table 1: Level-of-Service Definitions

Signalized Intersection			Unsignalized Intersection
Average Delay Per Vehicle (Seconds)	**LOS**	**Description of Traffic Conditions**	**Average Delay Per Vehicle (Seconds)**
≤10.0	A	Free flowing. Most vehicles do not have to stop.	≤10.0
>10.0 and ≤20.0	B	Minimal delays. Some vehicles have to stop, although waits are not bothersome.	>10.0 and ≤15.0
>20.0 and ≤35.0	C	Acceptable delays. Significant numbers of vehicles have to stop because of steady, high traffic volumes. Still, many pass without stopping.	>15.0 and ≤25.0
>35.0 and ≤55.0	D	Tolerable delays. Many vehicles have to stop. Drivers are aware of heavier traffic. Cars may have to wait through more than one red light. Queues begin to form, often on more than one approach.	>25.0 and ≤35.0
>55.0 and ≤80.0	E	Significant delays. Cars may have to wait through more than one red light. Long queues form, sometimes on several approaches.	>35.0 and ≤50.0
>80.0	F	Excessive delays. Intersection is jammed. Many cars have to wait through more than one red light, or more than 60 seconds. Traffic may back up into "up-stream" intersections.	>50.0

Source: Transportation Research Board, *Highway Capacity Manual*, Washington, D.C., 2010.

Freeway Mainline Segments

For both circulation system performance and congestion management program (CMP) analyses, the methodology outlined in the Highway Capacity Manual (HCM) (Transportation Research Board, Washington, D.C., 2010) as implemented by the Highway Capacity Software (HCS) tool were used to calculate the density in terms of passenger cars per mile per lane for the study freeway segments and to determine the LOS threshold from A to F.

Table 2 shows the relationship of freeway density to level of service.

Table 2: Level of Service Definition for Freeway Mainline Segment

Level of Service	Density (passenger vehicles per mile per lane)
A	≤11
B	>11-18
C	>18-26
D	>26-35
E	>35-45
F	>45 Demand exceeds capacity

Source: Transportation Research Board, Highway Capacity Manual Washington, D.C., 2010, 11-7.

Freeway Weaving Analysis

For the weaving analysis, the HCM 2010 methodology as implemented by the HCS software tool was used. Freeway weaving conditions are dependent upon traffic volumes and the weaving length between the interchanges; lane configurations, and free-flow speed of the freeway segment. A weaving analysis is typically applicable for freeway segments where the distance between an on-ramp and a downstream off-ramp is less than 2,500 feet.

Significant Impact Criteria

The project impact is considered to be significant if it would:

a. Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeway, pedestrian and bicycle path, and mass transit.

   Intersection Operations:

   City of Daly City: Daly City's General Plan contains level of service standards for intersection operations, whether an intersection is signalized or not. According to Policy CE-1, the minimum acceptable LOS is D.

   Town of Colma: The intersection of Serramonte Boulevard and Junipero Serra Boulevard is also located in the Town of Colma ("Colma") and, therefore, Colma's significance criteria were applied at this location. Colma's General Plan uses LOS D as the standard according to section 5.03.101 of the circulation element. LOS E is tolerated for the intersection of Serramonte Boulevard and Junipero Serra Boulevard (Table C-2 of Colma's circulation element).

City of South San Francisco: Two intersections are located in the City of South San Francisco, and therefore, South San Francisco's significance criteria were applied at these two locations: Hickey Boulevard and Longford Drive, and Hickey Boulevard and Junipero Serra Boulevard. South San Francisco uses LOS D as the standard according to Chapter 4 of the General Plan. LOS E or F are accepted after finding that there is no practical and feasible way to mitigate the lower level of service; and the uses resulting in the lower level of service are clear, overall public benefit.

Based on these criteria and for the purposes of this study, significant traffic impacts at intersections in the study area are identified if the Project causes:

- The intersection of Serramonte Boulevard and Junipero Serra Boulevard to worsen from LOS E or better;
- All other intersections to worsen from LOS D or better to LOS E or F for overall intersection delay; or
- An increase in overall average delay for intersections that operate below the LOS standard under No Project conditions.

Freeway Operations: As stated in the Caltrans Traffic Impact Study (TIS) Guide, "Caltrans endeavors to maintain a target LOS at the transition between LOS C and LOS D on State highway facilities; however, Caltrans acknowledges that this may not always be feasible… If an existing State highway facility is operating at less than the appropriate target LOS, the existing Measure of Effectiveness (MOE) should be maintained." For the purposes of this study, significant traffic impacts on I-280 and SR-1 in the study area are identified using the significance criteria from the C/CAG Congestion Management Program (CMP) described in the next section since all freeway analysis sections are also CMP segments.

b. Conflict with C/CAG Congestion Management Program, including, but not limited to level of service standards and travel demand measures, or other standards established by C/CAG for designated roadways or highways.

The San Mateo County Congestion Management Plan Appendix L "Traffic Impact Analysis (TIA) Policy," establishes the following criteria for evaluating impacts on CMP facilities:

- Freeway segments currently in compliance with the adopted LOS standard:
    - A project is considered to have a CMP impact if the project will cause the freeway segment to operate at a level of service that violates the standard adopted in the current Congestion Management Program (CMP).
    - A project is considered to have a CMP impact if the cumulative analysis indicates that the combination of the proposed project and future

cumulative traffic demand will result in the freeway segment to operate at a level of service that violates the standard adopted in the current CMP and the proposed project increases traffic demand on the freeway segment by an amount equal to one (1) percent or more of the segment capacity, or causes the freeway segment volume-to-capacity (v/c) ratio to increase by one (1) percent.

- Freeway segments currently not in compliance with the adopted LOS standard:
    - A project is considered to have a CMP impact if the project will add traffic demand equal to one (1) percent or more of the segment capacity or causes the freeway segment volume-to-capacity (v/c) ratio to increase by one (1) percent.

c. Create a condition, either by design or by the generation of traffic, that causes unsafe vehicular traffic movements.
d. Create a condition, either by design or by the generation of traffic, that provides a barrier to, or unsafe conditions for, pedestrian and bicycle circulation.
e. Create a transit demand that would exceed currently planned transit service.

Chapter 2
Existing Conditions

2 EXISTING CONDITIONS

The existing conditions analysis identifies the site conditions and current operational and geometric characteristics of the roadways within the study area. The existing transit, bicycle, and pedestrian components of the transportation system are also described below. These existing conditions will be compared with future conditions later in this report.

2.1 ROADWAY NETWORK

The existing roadway network in the study area is comprised of the freeway system that serves San Mateo County and an extensive street system made up of arterial and local roads.

Freeways

Interstate 280 (I-280) is an eight- to twelve-lane freeway with a posted speed limit of 65 miles per hour. The north-south freeway connects Daly City with nearby cities, such as San Francisco and San Bruno, and regional destinations, such as San Jose. It also provides access to the greater freeway network with direct connections to Interstates 680 and 880, US Highway 101, and State Routes 1, 92 and 85. The Project is served by interchanges at Serramonte Boulevard and Hickey Boulevard. The Serramonte Boulevard interchange contains a southbound off-ramp and a northbound on-ramp to I-280. The Hickey Boulevard interchange provides full access with on- and off-ramps to both northbound and southbound I-280. The average daily traffic on I-280 in the vicinity of Hickey Boulevard ranges between 174,000 and 182,000 vehicles per day (vpd)[1]. Bicyclists and pedestrians are not allowed on this facility.

State Route 1 (SR-1) is a four- to eight-lane freeway in the vicinity of the Project with a posted speed limit of 65 miles per hour. The north-south freeway connects Daly City with nearby cities, such as San Francisco and Pacifica, and regional destinations along the coast. The Project is served by interchanges at Serramonte Boulevard and Clarinada Avenue. The Serramonte Boulevard interchange provides access to and from SR-1 northbound while the Clarinada Avenue interchange provides access to and from SR-1 southbound. The average daily traffic on SR-1 in the vicinity of Clarinada Avenue is between 63,000 and 68,000 vehicles per day (vpd)[2]. Bicyclists and pedestrians are not allowed on this facility.

[1] 2013 Traffic Volumes, California Department of Transportation (Caltrans) http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm
[2] 2013 Traffic Volumes, California Department of Transportation (Caltrans) http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/index.htm

Arterials

State Highway 82 (El Camino Real) is a four- to six-lane, north-south road that extends between San Francisco and San Jose. The posted speed limit on this roadway is 40 miles per hour near the project site. On-street parking is generally allowed but is often not utilized due to the small number of business frontages. Sidewalks are present on the east side and intermittently available on the west side of the roadway in the vicinity of the Project. El Camino Real is proposed to be designated a Class III bike route and to have a Class I bike path according to the Town of Colma's General Plan within the vicinity of the Project.

Junipero Serra Boulevard is a four-lane, north-south roadway with a posted speed limit of 40 miles per hour near the project site. The facility extends from Daly City to South San Francisco. On-street parking is prohibited and a sidewalk is present along the east side of the street in the vicinity of the Project. Junipero Serra Boulevard has a designated Class II bike lane between D Street and the town limit for Colma.

Collectors

Southgate Avenue is a two- to four-lane, east-west road that extends between Westmoor Avenue and Junipero Serra Boulevard in the City of Daly City. The posted speed limit on this roadway is 25 miles per hour. On-street parking is generally allowed west of Cerro Drive. Sidewalks are present on both sides of the roadway.

Serramonte Boulevard is a four-lane, east-west roadway with a posted speed limit of 30 miles per hour that provides access to mostly residential land uses west of the Project and serves major regional roadways to the east such as Junipero Serra Boulevard and El Camino Real. Near the Project, sidewalks are primarily provided on the south side of the street with intermittent sidewalk on the north side. On-street parking is not allowed except for a small area located near St. Francis Boulevard. Serramonte Boulevard has a Class II bike lane between Gellert Boulevard and Callan Boulevard. The bike lane is planned to be expanded west towards St. Francis Boulevard, while a Class III bike route is proposed between Gellert Boulevard and Junipero Serra Boulevard.

Gellert Boulevard is a two- to six-lane, north-south road with a posted speed limit of 30 miles per hour that provides access between Serramonte Boulevard and King Drive, within the City of Daly City. On-street parking is not allowed in the project area but is allowed south of Hickey Boulevard. Sidewalks are provided on both sides of the street. Gellert Boulevard is currently classified as a Class III bike route between Serramonte Boulevard and Hickey Boulevard and has a Class II bike lane between Hickey Boulevard and King Drive.

Hickey Boulevard is a four-lane, east-west road with a posted speed limit of 35 miles per hour. Hickey Boulevard primarily serves as a connection between major regional facilities to the east (I-280, Junipero Serra Boulevard, and El Camino Real) and residential land uses to the west. Hickey

Boulevard is proposed to be a Class III bike route under the City's pedestrian and bicycle master plan.

Local Streets

Callan Boulevard is a four-lane, north-south roadway that connects Southgate Avenue, Serramonte Boulevard, and residential land uses to the south of Hickey Boulevard. Within the vicinity of the Project, parking is allowed in the east side of the roadway and sidewalks are present along both sides of the street.

Clarinada Avenue is a two- to four-lane roadway that connects residential land uses to the west with Serramonte Center and the major regional roadways to the east. It also serves the SR-1 southbound ramps. Parking is allowed on both sides of the street, and sidewalks are provided along both the north and south sides.

2.2 TRANSIT FACILITIES

Daly City is served by a well-developed transit system that includes bus and rail services provided by San Mateo County Transit District (SamTrans) and the Bay Area Rapid Transit system (BART). These services are described below.

SamTrans

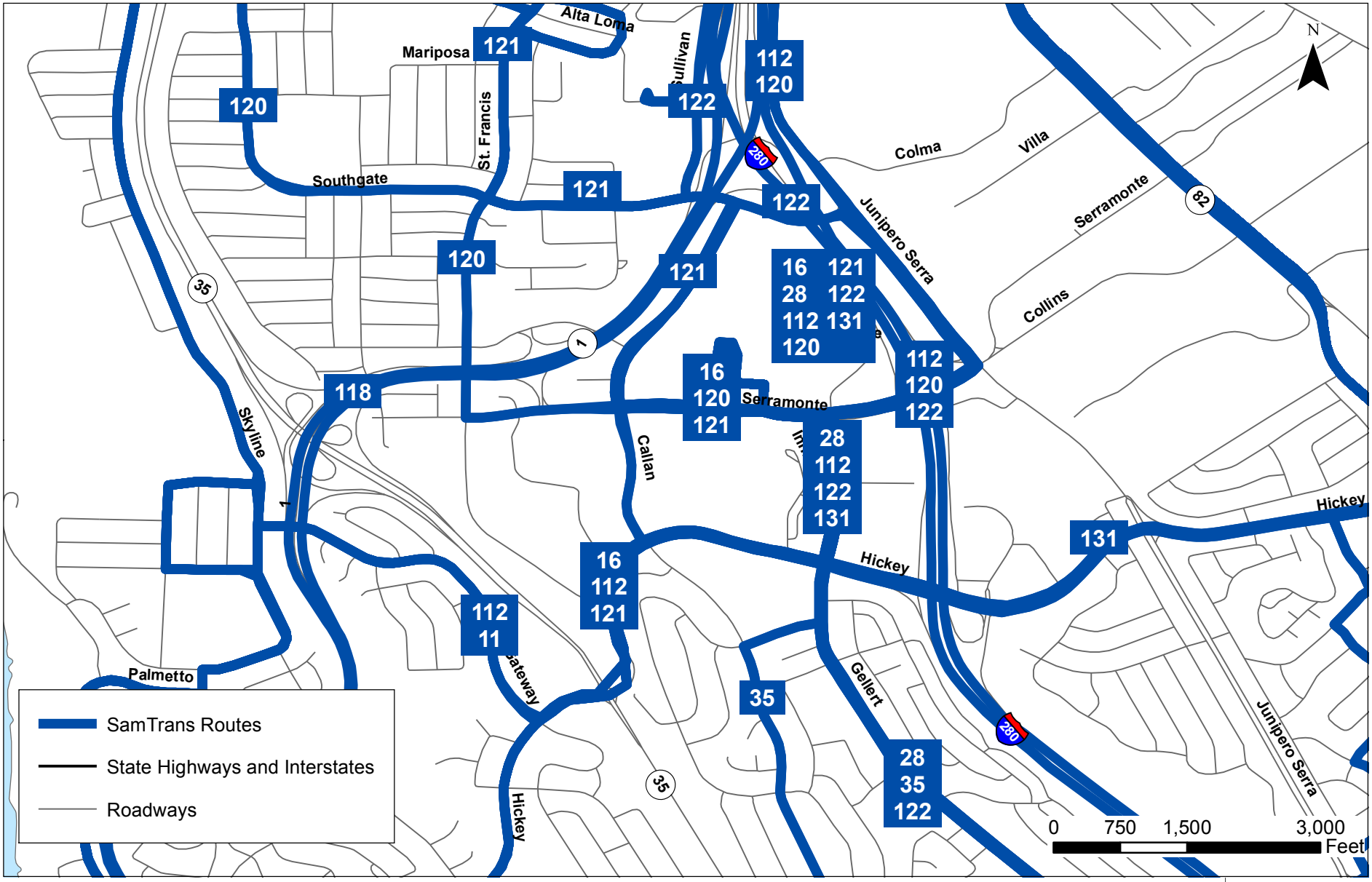
SamTrans provides the principal bus service in San Mateo County. It operates local and school buses, as well as express routes to San Francisco. It is also a service provider for paratransit. All scheduled buses are equipped with front-loading racks that can hold up to two bicycles.

SamTrans operates seven routes that serve the study area, and the closest bus stop is located at the Serramonte Shopping Center, which is to the north of the Project. Five routes provide local service (Routes 112, 120, 121, 122, and 131) while the other two routes serve public high schools on school days (Route 16 & 28). Routes 112 and 122 serve the Colma BART station while routes 120 and 121 serve both the Daly City and Colma BART stations. Bus service on these routes is detailed in Table 3 and illustrated in Figure 3.

Table 3: Bus Routes Serving the Study Area

Route	Serving	Day	Times	
16	Daly City, Pacifica, and Terra Nova High School	Weekday	Frequency	School Only
		Weekend	Frequency	N/A
28	Daly City, South San Francisco, and South San Francisco High School	Weekday	Frequency	School Only
		Weekend	Frequency	N/A
112	Colma BART and Linda Mar Park & Ride	Weekday	Frequency	1 per hour
		Weekend	Frequency	1 per hour
120	Brunswick/Templeton and Colma BART	Weekday	Frequency	4-6 per hour
		Weekend	Frequency	3-4 per hour
121	Lowell/Hanover and Skyline College	Weekday	Frequency	2 per hour
		Weekend	Frequency	1 per hour
122	South San Francisco BART and Stonestown/SF State	Weekday	Frequency	2 per hour
		Weekend	Frequency	2 per hour
131	Airport/Linden and Serramonte Center	Weekday	Frequency	4 per hour
		Weekend	Frequency	2 per hour

Source: SamTrans website, www.SamTrans.com, accessed in March 2016.
Kittelson & Associates, Inc., 2017



SamTrans Routes
Daly City, CA

Figure
3

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KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: GCS WGS 1984
Data Source: Delete if there isn't one.

BART

The Bay Area Rapid Transit District (BART) provides heavy-rail, regional transit service to Alameda, San Francisco, Contra Costa, and San Mateo counties. The nearest station is the Colma BART Station, located near Albert M. Teglia Boulevard and El Camino Real about 1.8 miles from the Project. BART's direct service from this station includes the Pittsburg-Bay Point line and the Richmond-Daly City/Millbrae line. Table 4 summarizes BART service from the Colma station.

Table 4: BART Service from Colma Station

Line	Day	Frequency
Pittsburg/Bay Point-SFO/Millbrae	Weekday	15-20 minutes
	Saturday	20 minutes
	Sunday	20 minutes
Richmond - Daly City/Millbrae	Weekday	15-20 minutes
	Saturday	20 minutes
	Sunday	No Service

Source: www.BART.gov, accessed in March 2016.
Kittelson & Associates, Inc., 2017.

2.3 BICYCLE AND PEDESTRIAN FACITILITES

Bicycling and pedestrian facilities are important components of the transportation network in the study area. They not only offer non-vehicular opportunities for both commute and recreational trips but also provide connections to BART and bus stations to allow access to the region's transit network.

Existing Bicycle Facilities

Bicycle routes and paths are typical examples of bicycle transportation facilities in the project area. Bicycle facilities are defined by the following three classes[3]:

- **Class I** – Provides a completely separated facility designed for the exclusive use of bicyclists and pedestrians with crossing points minimized.

[3] As detailed in Chapter 1000 of the California Department of Transportation's (Caltrans) Highway Design Manual

- **Class II** – Provides a restricted right-of-way designated lane for the exclusive or semi-exclusive use of bicycles with through travel by motor vehicles or pedestrians prohibited, but with vehicle parking and cross-flows by pedestrians and motorists permitted.
- **Class III** – Provides a right-of-way designated by signs or permanent markings and shared with pedestrians and motorists.

According to the Daly City Bicycle and Pedestrian Master Plan[4], the Town of Colma General Plan[5], and the City of South San Francisco General Plan[6], the following bikeways are currently present within the study area:

- **Class I Bike Paths**
    - None

- **Class II Bike Lanes**
    - Callan Boulevard between Serramonte Boulevard and King Drive
    - Gellert Boulevard between Hickey Boulevard and King Drive
    - Southgate Avenue west of St. Francis Boulevard
    - Junipero Serra Boulevard south of D Street

- **Class III Bike Routes**
    - Southgate Avenue between Junipero Serra Boulevard and St. Francis Boulevard
    - Callan Boulevard between Southgate Avenue and Serramonte Boulevard
    - Gellert Boulevard between Serramonte Boulevard and Hickey Boulevard

In the project vicinity, a Class II bike lane can be found on Serramonte Boulevard along the project frontage between Gellert Boulevard and Callan Boulevard. To the east of the project site, there is currently no bike route, but a Class III bike route is proposed between Gellert Boulevard and Junipero Serra Boulevard in the City's latest Bicycle and Pedestrian Master Plan.

Proposed Bicycle Facilities

The Daly City Bicycle and Pedestrian Master Plan and the Colma General Plan propose a number of improvements to better connect the existing bicycle networks in the cities. In the study area, they include the following proposed bikeways:

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[4] City of Daly City, *Daly City Bicycle and Pedestrian Master Plan*. Adopted February 2013.

[5] Town of Colma, *2014 Circulation Element Town of Colma General Plan.* Adopted September 2014

[6] City of South San Francisco, *South San Francisco General Plan*, Adopted October 1999.

- **Class I Bike Paths**
  - El Camino Real between F Street and Hickey Boulevard

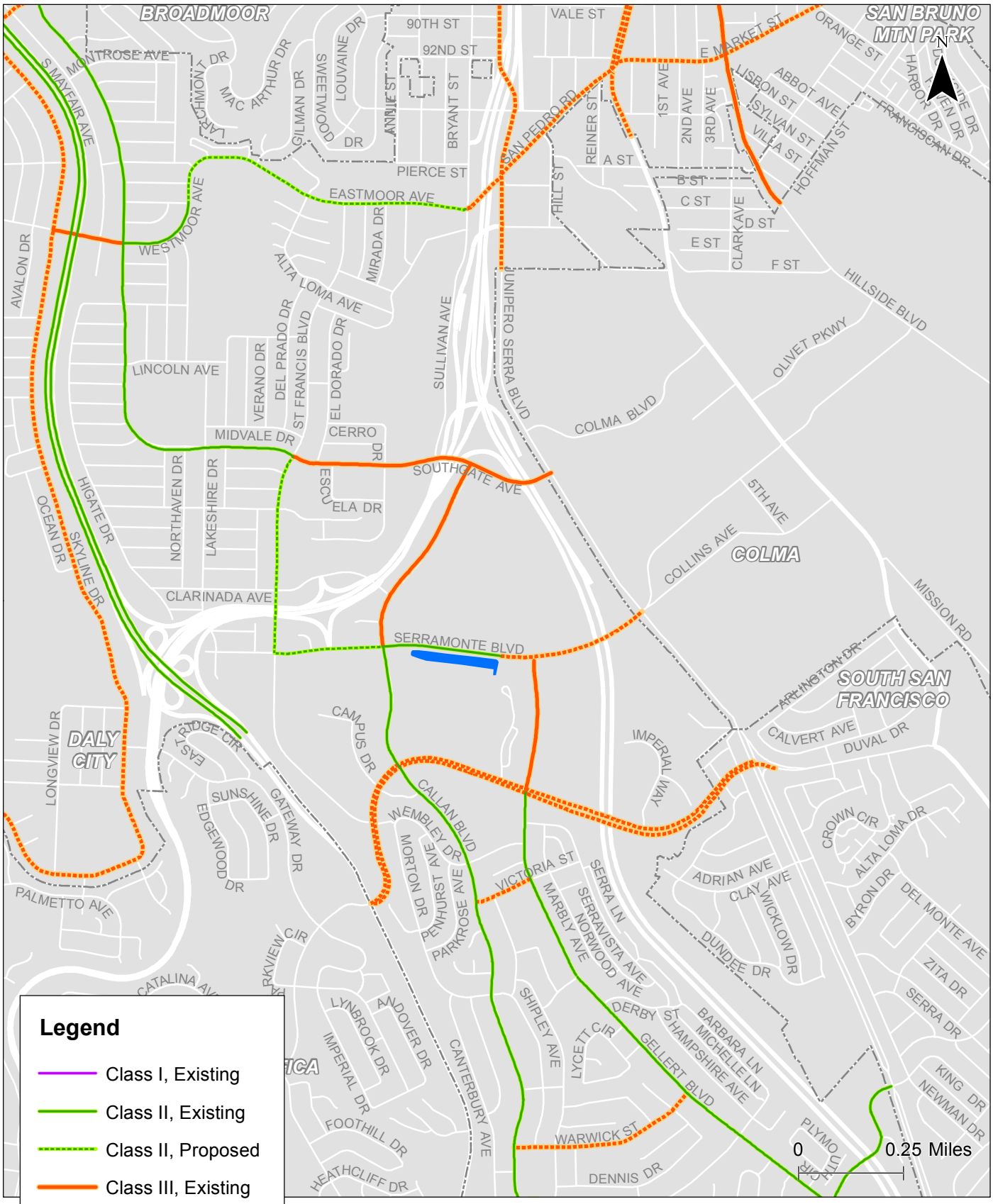
- **Class II Bike Lanes**
  - St Francis Boulevard between Southgate Avenue and Serramonte Boulevard
  - Serramonte Boulevard between St. Francis Boulevard and Callan Boulevard

- **Class III Bike Routes**
  - Hickey Boulevard between SR-35 and Junipero Serra Boulevard

The existing and proposed bicycle network in the project vicinity are shown in Figure 4.

Existing Pedestrian Facilities

Pedestrian facilities in the project vicinity are very limited. Partial five foot sidewalks border the Project on the north side along Serramonte Boulevard, east of the proposed driveway entrance. There is no sidewalk connection on the north side of Serramonte Boulevard between Gellert Boulevard and Callan Boulevard along the project frontage. Additionally, the intersection that accesses the project site does not have a striped crosswalk on the east leg. Figure 5 shows the existing crosswalks and the existing curb ramps in the study area. Figure 5 also illustrates the locations where sidewalks and crosswalks are missing near the project site.



Bicycle Network
Daly City, California

Figure
4

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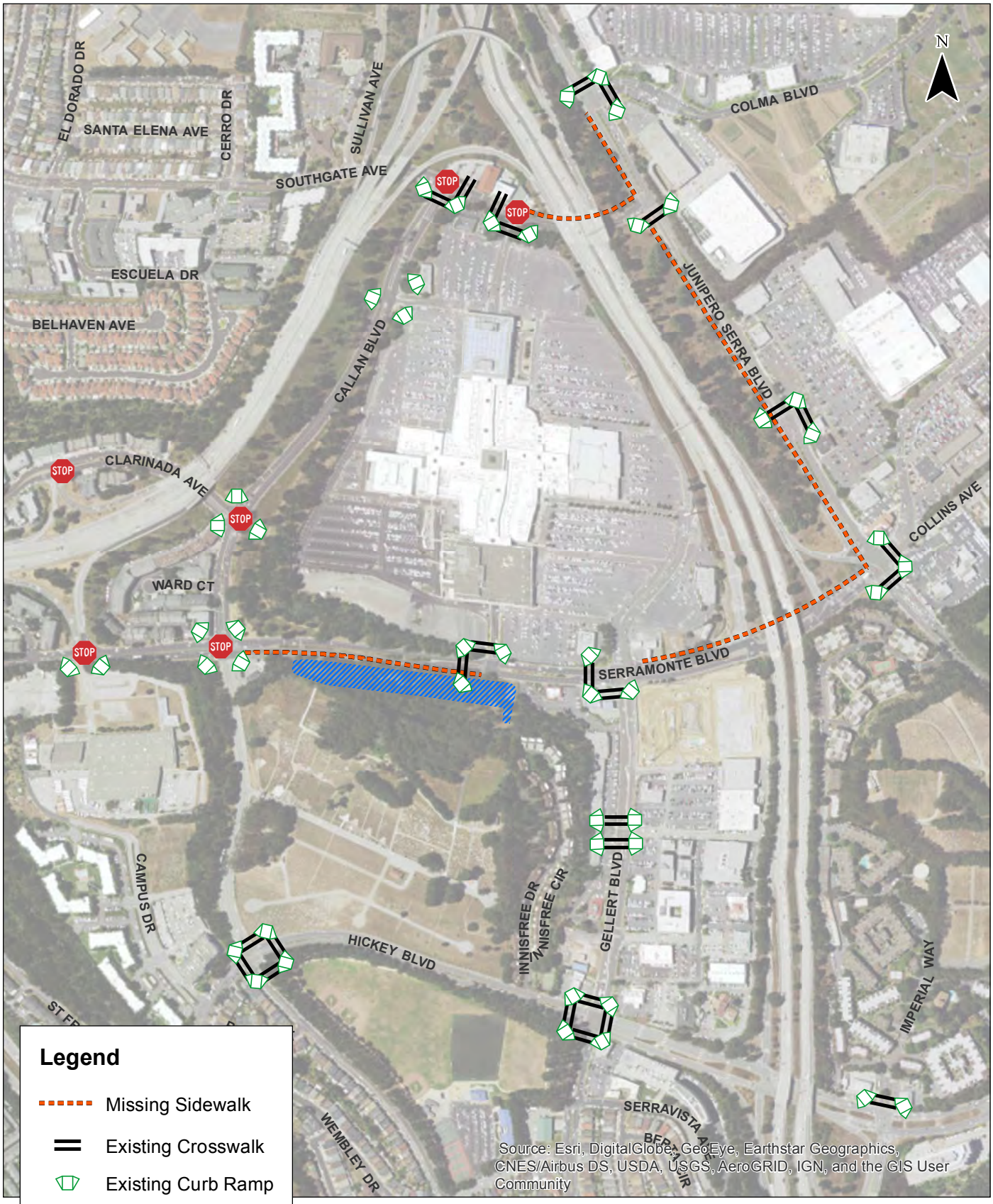
KITTELSON & ASSOCIATES, INC.
TRANSPORTATION ENGINEERING/PLANNING

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet
Data Source: Daly City, California



Legend

- Missing Sidewalk
- Existing Crosswalk
- Existing Curb Ramp
- Stop Signs
- Project Site

Pedestrian Facilities
Daly City, California

Figure
5

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Kittelson & Associates, Inc.
Transportation Engineering/Planning

Coordinate System: NAD 1983 StatePlane California III FIPS 0403 Feet

2.4 EXISTING TRAFFIC CONDITIONS

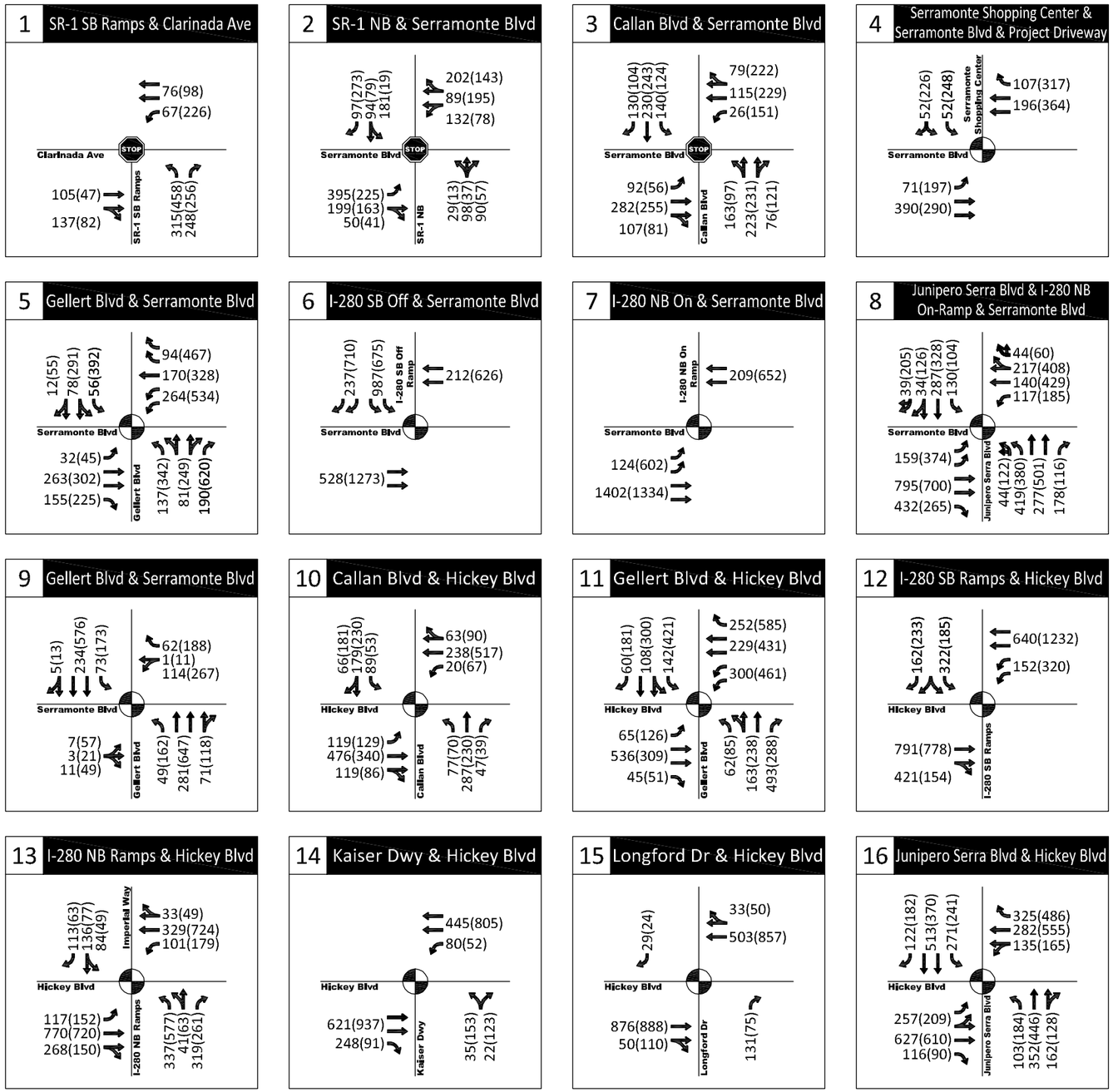
The existing operations of the study intersections and freeway facilities were assessed for the weekday AM peak hour (the peak hour of the morning commute period) and weekday PM peak hour (the peak hour of the afternoon commute peak period). The analysis was based on count data collected at the study intersections during the typical weekday morning peak period (7:00 AM to 9:00 AM) and afternoon peak period (4:00 PM to 6:00 PM) in March 2016 and May 2015, respectively. The PM peak period traffic counts were adjusted to include the partially occupied Christopher Highlands development to bring the traffic counts to March 2016 conditions, which was when the AM peak hour traffic counts were conducted. The existing intersection volumes and lane configurations are shown in Figure 6. Freeway volumes were compiled from Caltrans' California Freeway Performance Measurement System[7] (PeMS) and Caltrans' Traffic Volumes[8].

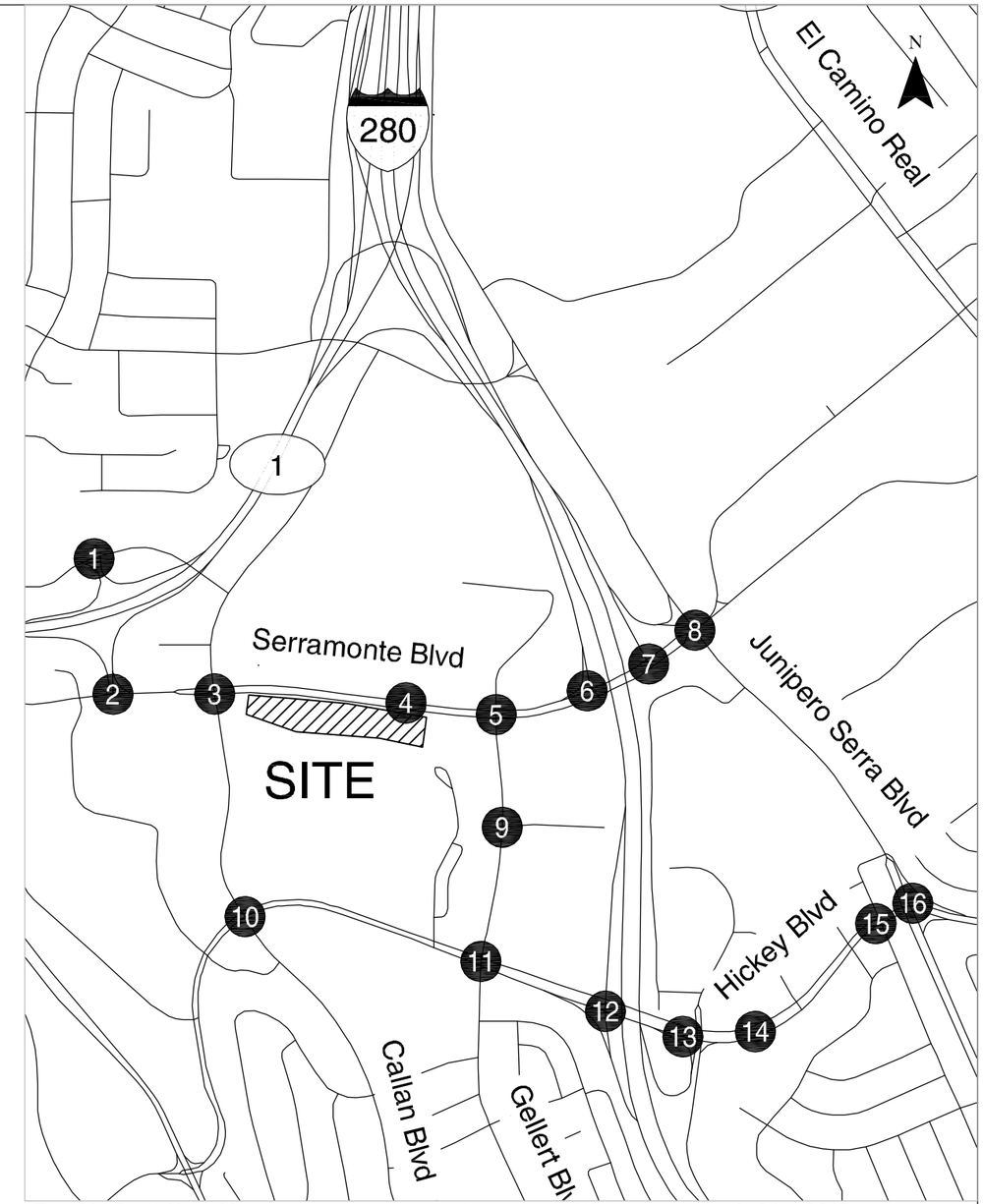
Existing Intersection Levels of Service

Intersection turning movement volumes, lane configurations, and traffic control were used to calculate the levels of service at the study intersections. As shown in Table 5, all study intersections operate at LOS D or better under Existing Conditions for the weekday AM and weekday PM peak hours, except for the intersection of the Northbound SR-1 Ramps and Serramonte Boulevard which operates at LOS E during the AM Peak Hour.

[7] 2016 Traffic Volumes, California Department of Transportation (Caltrans) http://pems.dot.ca.gov/

[8] 2016 Traffic Volumes, California Department of Transportation (Caltrans) http://traffic-counts.dot.ca.gov/





*The PM Peak Hour Volumes shown are based on the traffic counts taken in May 2015, and are adjusted to include the partially occupied Christopher Highlands development to bring the traffic counts to March 2016 conditions, which was when the AM Peak Hour traffic counts were conducted.

Existing AM and PM Peak Hour Volumes & Lane Configurations
Daly City, CA

FIGURE 6

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Table 5: Intersection Level of Service – Existing Conditions

#	North/South Street	East/West Street	Control	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	SR-1 SB Ramps	Clarinada Avenue	AWSC/Signal*	13.4	B	23.9	C
2	SR-1 NB Ramps	Serramonte Boulevard	AWSC/Signal*	40.0	E	15.7	C
3	Callan Boulevard	Serramonte Boulevard	AWSC/Signal*	14.5	B	14.0	B
4	Serramonte Center Driveway/ Project Driveway	Serramonte Boulevard	Signalized	8.1	A	13.0	B
5	Gellert Boulevard	Serramonte Boulevard	Signalized	11.9	B	46.8	D
6	I-280 SB Off-Ramp	Serramonte Boulevard	Signalized	7.1	A	16.0	B
7	I-280 NB On-Ramp	Serramonte Boulevard	Signalized	1.7	A	4.1	A
8[1]	Junipero Serra Boulevard	Serramonte Boulevard	Signalized	27.0	C	28.4	C
9	Gellert Boulevard	Serramonte Plaza	Signalized	24.6	C	32.6	C
10	Callan Boulevard	Hickey Boulevard	Signalized	17.7	B	22.5	C
11	Gellert Boulevard	Hickey Boulevard	Signalized	29.7	C	49.4	D
12	I-280 SB Ramps	Hickey Boulevard	Signalized	9.2	A	10.5	B
13	I-280 NB Ramps	Hickey Boulevard	Signalized	26.9	C	24.0	C
14	Kaiser Driveway	Hickey Boulevard	Signalized	11.3	B	17.3	B
15[2]	Longford Drive	Hickey Boulevard	Signalized	52.4	D	51.8	D
16[2]	Junipero Serra Boulevard	Hickey Boulevard	Signalized	43.3	D	51.4	D

Source: Kittelson & Associates, Inc. 2017.
Signalized and Unsignalized intersections analyzed using HCM 2010 methodologies
AWSC/Signal* - Intersection signalized for cumulative conditions assuming implementation of mitigation measures from the General Plan
PM Peak Hour analyses were based on counts conducted in May 2015, with adjustments to add in the trips generated by the partially occupied Christopher Highlands Development.
Cells shaded in GREY indicate LOS exceeding standards
[1] Intersection under Town of Colma Jurisdiction [2] Intersections under City of South San Francisco Jurisdiction

Signal Warrant Analysis

The peak hour signal warrant was analyzed for the three stop-controlled intersections to determine if a signal is warranted at those locations. The results are summarized in Table 6. As shown in Table 6, the intersection of SR-1 Southbound Ramps/Clarinda Ave. meets the peak hour signal warrant during the PM peak hour; the intersection of SR-1 Northbound Ramps/Serramonte Blvd. meets the peak hour signal warrant during the AM peak hour; and the intersection of Callan Blvd./Serramonte Blvd. meets the peak hour signal warrant during both the AM and PM peak hours. Under the Daly City General Plan, all three unsignalized intersections are designated to be signalized.

Table 6: Signal Warrant Analysis – Existing Conditions

Intersection		Signal Warrant #3: Peak Hour Volume (Met?)	
		AM Peak Hour	PM Peak Hour
1	SR-1 Southbound Ramps / Clarinada Ave.	No	Yes
2	SR-1 Northbound Ramps / Serramonte Blvd.	Yes	No
3	Callan Blvd. / Serramonte Blvd.	Yes	Yes

Existing Freeway Levels of Service

Table 7 presents the level of service on the study freeway segments under Existing Conditions. All study segments are experiencing LOS D or better conditions with the exception of the I-280 southbound weaving segment between SR-1 and Serramonte Boulevard. This weaving segment experiences LOS E operations during the PM peak hour.

Existing Queuing Analysis at Freeway Off-Ramp Intersections

A queuing analysis for the freeway off-ramp intersections was performed to determine the impacts on state highways using the Vistro analysis software program. The queuing analysis assessed whether the queue length at the off-ramp's approach to the controlling intersection would extend beyond available storage on each analysis off-ramp. This analysis was done using the 95th percentile queue length. A 95th percentile queue indicates the maximum queue length likely to be experienced under normal conditions. Table 8 summarizes the queuing analysis for the Existing Conditions. Under the Existing Conditions, all freeway off-ramps were found to have sufficient storage to accommodate the off-ramp queues during both the AM and PM peak hours.

Table 7: Freeway Level of Service – Existing Conditions

Location	Type	Existing – AM Peak Hour			Existing – PM Peak Hour		
		Volume[1]	Density[2]	LOS[3]	Volume[1]	Density[2]	LOS[3]
Northbound							
I-280 South of Hickey Blvd.	Mainline	6,258	25.2	C	7,148	28.0	D
I-280 North of SR-1	Mainline	7,224	18.2	C	9,256	24.1	C
SR-1 South of Serramonte Blvd.	Mainline	3,822	14.5	B	3,577	13.6	B
Southbound							
I-280 South of Hickey Blvd.	Mainline	7,715	32.4	D	6,856	28.0	C
I-280 North of SR-1	Mainline	9,076	23.5	C	8,452	21.6	C
SR-1 South of Serramonte Blvd.	Mainline	1,394	5.3	A	1,984	7.5	A
I-280 SB between SR-1 and Serramonte Blvd.	Weave	7,681	33.9	D	8,802	40.8	E

Source: Kittelson & Associates, Inc., 2017.
1 Volume = vehicles per hour (vph)
2 Density = passenger car per mile per lane (pc/m/ln)
3 LOS = Level of Service
Cells shaded in GREY indicate LOS exceeding standards.

The intersection LOS and the freeway LOS calculation worksheets for the Existing Conditions can be found in Appendix 2. The signal warrant worksheets can be found in Appendix 3.

Table 8: Off-Ramp Queue Analysis – Existing Conditions – Weekday AM and PM Peak Hour

Freeway Off-Ramp	Queue Lengths (ft)	Existing					
		NBL	NBT	NBR	SBL	SBT	SBR
AM Peak Hour							
1. SR-1 SB off-ramp to Clarinada Ave	Storage Length (ft)	800	-	300	-	-	-
	95th Percentile Queue	100	-	50	-	-	-
2. SR-1 NB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	865	-	360
	95th Percentile Queue	-	-	-	175	-	25
6. I-280 SB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	1,100	-	600
	95th Percentile Queue	-	-	-	75	-	25
12. I-280 SB off-ramp to Hickey Blvd	Storage Length (ft)	-	-	-	420	1,130	190
	95th Percentile Queue	-	-	-	50	50	50
13. I-280 NB off-ramp to Hickey Blvd	Storage Length (ft)	1,250	350	600	-	-	-
	95th Percentile Queue	125	125	250	-	-	-
PM Peak Hour							
1. SR-1 SB off-ramp to Clarinada Ave	Storage Length (ft)	800	-	300	-	-	-
	95th Percentile Queue	250	-	50	-	-	-
2. SR-1 NB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	865	-	360
	95th Percentile Queue	-	-	-	25	-	100
6. I-280 SB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	1,100	-	600
	95th Percentile Queue	-	-	-	225	-	250
12. I-280 SB off-ramp to Hickey Blvd	Storage Length (ft)	-	-	-	420	1,130	190
	50th Percentile Queue	-	-	-	75	75	75
13. I-280 NB off-ramp to Hickey Blvd	Storage Length (ft)	1,250	350	600	-	-	-
	95th Percentile Queue	200	200	150	-	-	-

Source: Kittelson & Associates, Inc., 2017.
Storage length based on distance to the off-ramp gore point.

Chapter 3
Transportation Impact Analysis

3 TRANSPORTATION IMPACT ANALYSIS

The transportation impact analysis assesses how the study area's transportation system would operate with the implementation of the proposed Project. The potential impacts were identified based on a set of significance criteria based on the traffic impact guidelines set forth by the City of Daly City, the Town of Colma, the City of South San Francisco, California Department of Transportation, and C/CAG. These criteria are presented in Chapter 2.

PROJECT TRAVEL DEMAND

The Project consist of four buildings: the building on the east would consist of a 176-room hotel and 187 parking spaces for the hotel use; the remaining three buildings would consist of 323 condominium units and 420 parking spaces for residential uses.

Project Trip Generation

Trip generation of the Project is estimated based upon information compiled by the Institute of Transportation Engineers (ITE) (*Trip Generation Manual, Ninth Edition*, 2012 and *Trip Generation Manual, Ninth Edition, User Guide and Handbook*, 2012). Trips generated by the different project land uses on a typical weekday, weekday morning (AM) and weekday afternoon (PM) peak hours were estimated using average rates or fitted curve equations published in the ITE manual, as appropriate per the *Trip Generation Manual*.

No adjustments to the standard trip generation rates were made to account for non-auto trips, linked trips, and pass-by trips (vehicles already on the near-by roadways that divert to the project). The reason is that none of these adjustments apply to the land uses proposed for the site.

Overall, the Project was estimated to generate 3,315 trips on a typical weekday. Of these new trips, 235 trips would occur during the weekday AM peak hour and 274 trips would occur during the weekday PM peak hour. The Project trip generation is presented in Table 9.

Project Trip Distribution and Assignment

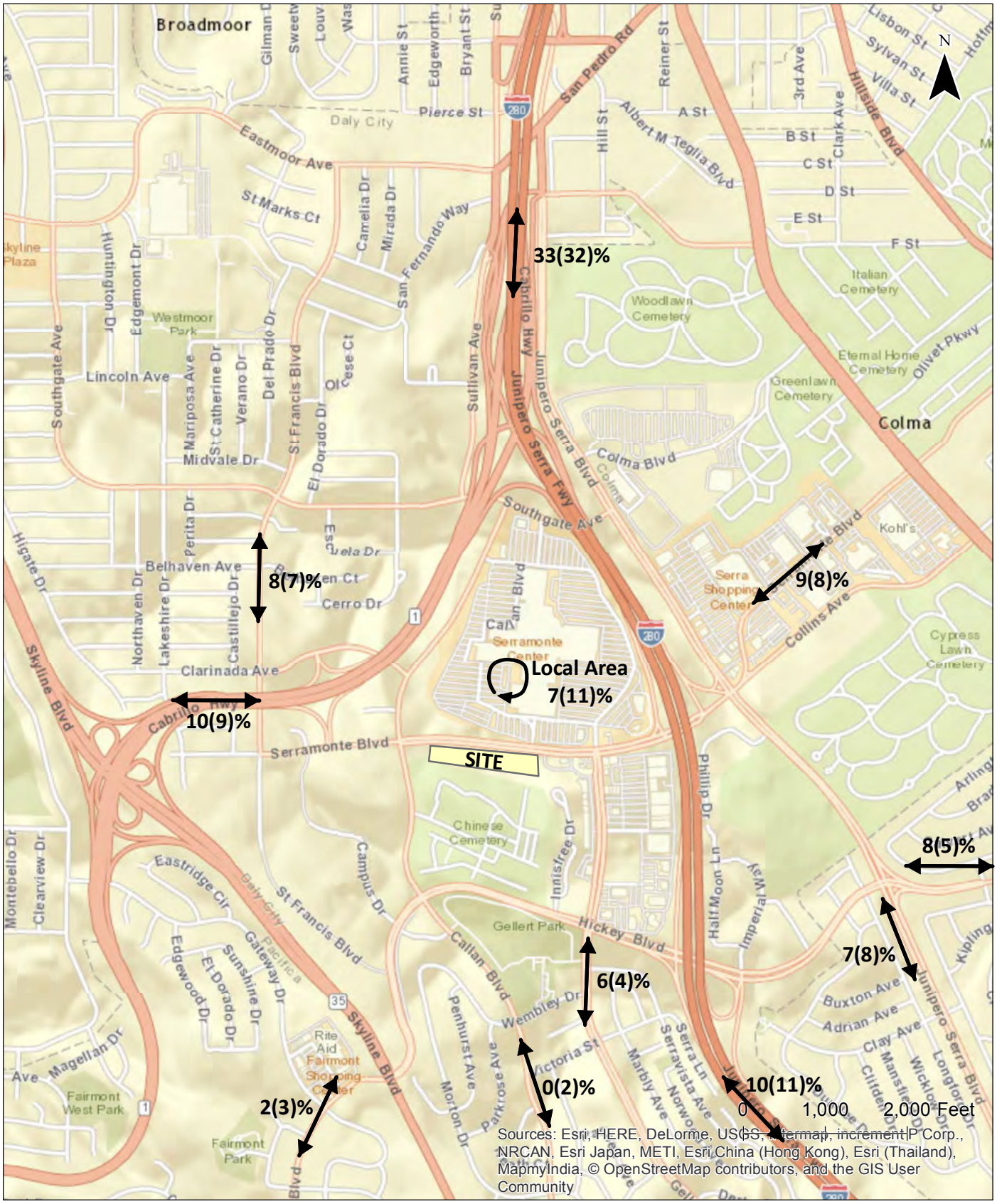
The Daly City Travel Demand Model was used to determine the trip distribution to and from the Project. The distributions under the Existing and Cumulative Conditions were found to be similar; therefore, the same project trip distribution was applied for the Existing plus Project and Cumulative plus Project Conditions. Figure 7 presents the projected trip distribution percentages for the condo land use for the weekday AM and PM peak hours. Figure 8 presents the projected trip distribution percentages for the hotel land use for the weekday AM and PM peak hours. These project trip distribution percentages are then applied to the total trip generation

within the Vistro software to assign the trips generated by the Project onto the roadway network. Figure 9 shows the Project-only trips for the weekday AM and PM peak hours.

Table 9: Project Trip Generation

Land Use Category	Amount		Source	Weekday Daily	AM Peak Hour			PM Peak Hour		
					In	Out	Total	In	Out	Total
Condo	323	Dwelling Unit	ITE 230	1,877	24	118	142	113	55	168
Hotel	187	Room	ITE 310	1,438	55	38	93	54	52	106
New External Trips				3,315	79	156	235	167	107	274

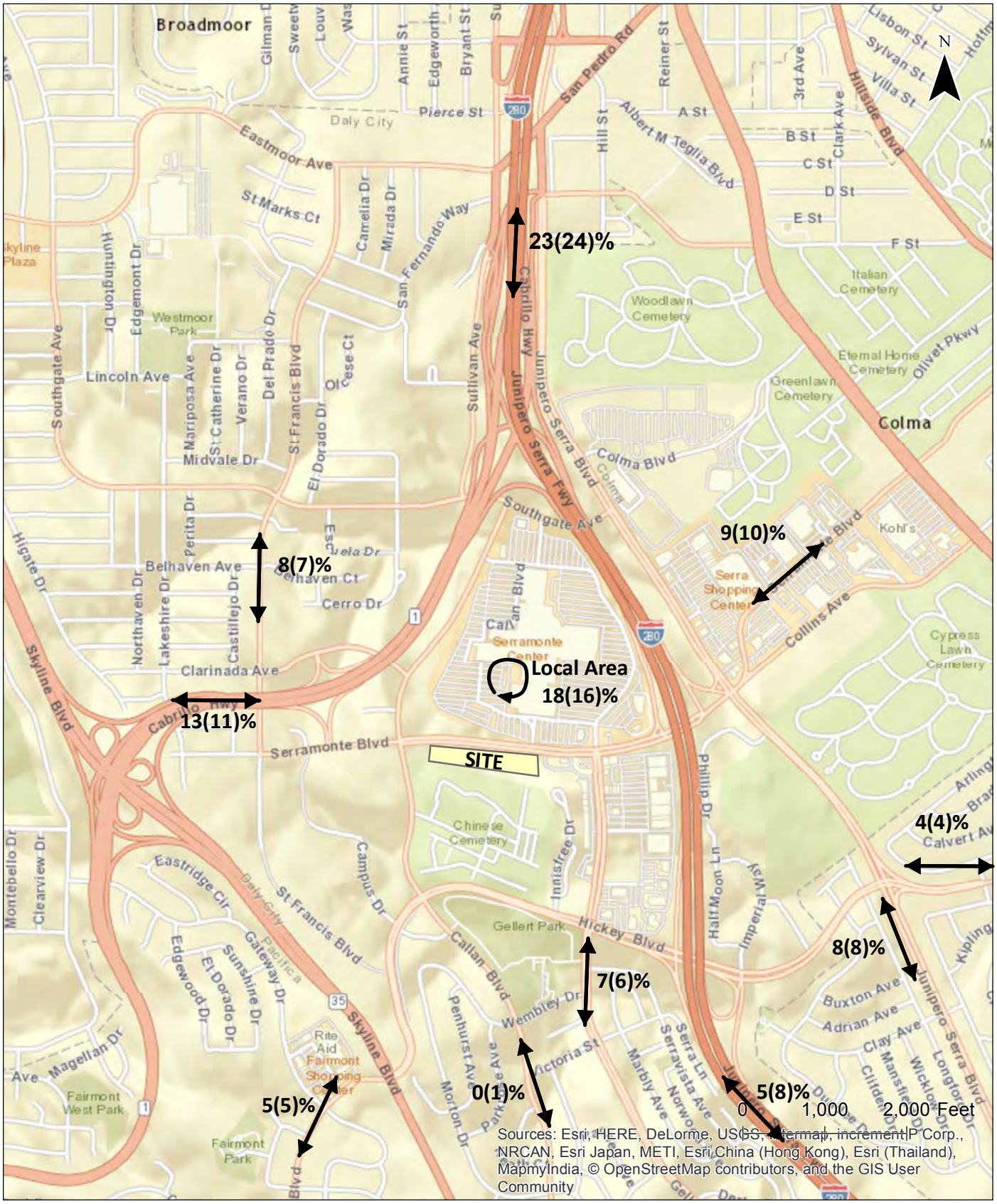
Source: Trip Generation Manual 9th Edition; Kittelson & Associates, Inc., 2017.



X(X)% **AM(PM)%**
Trip Distribution

Trip Distribution: Condo
Daly City, California

Figure
7

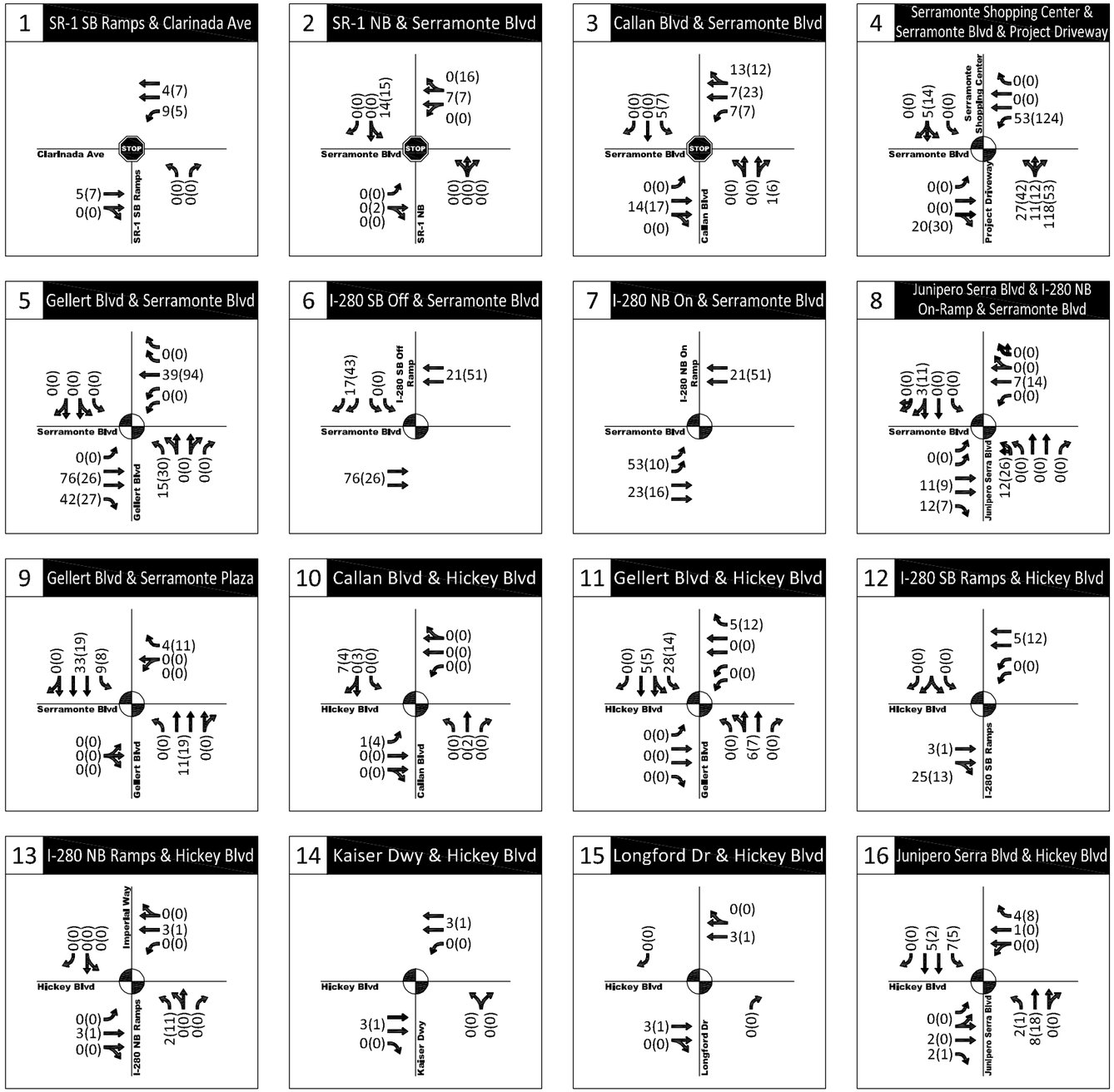


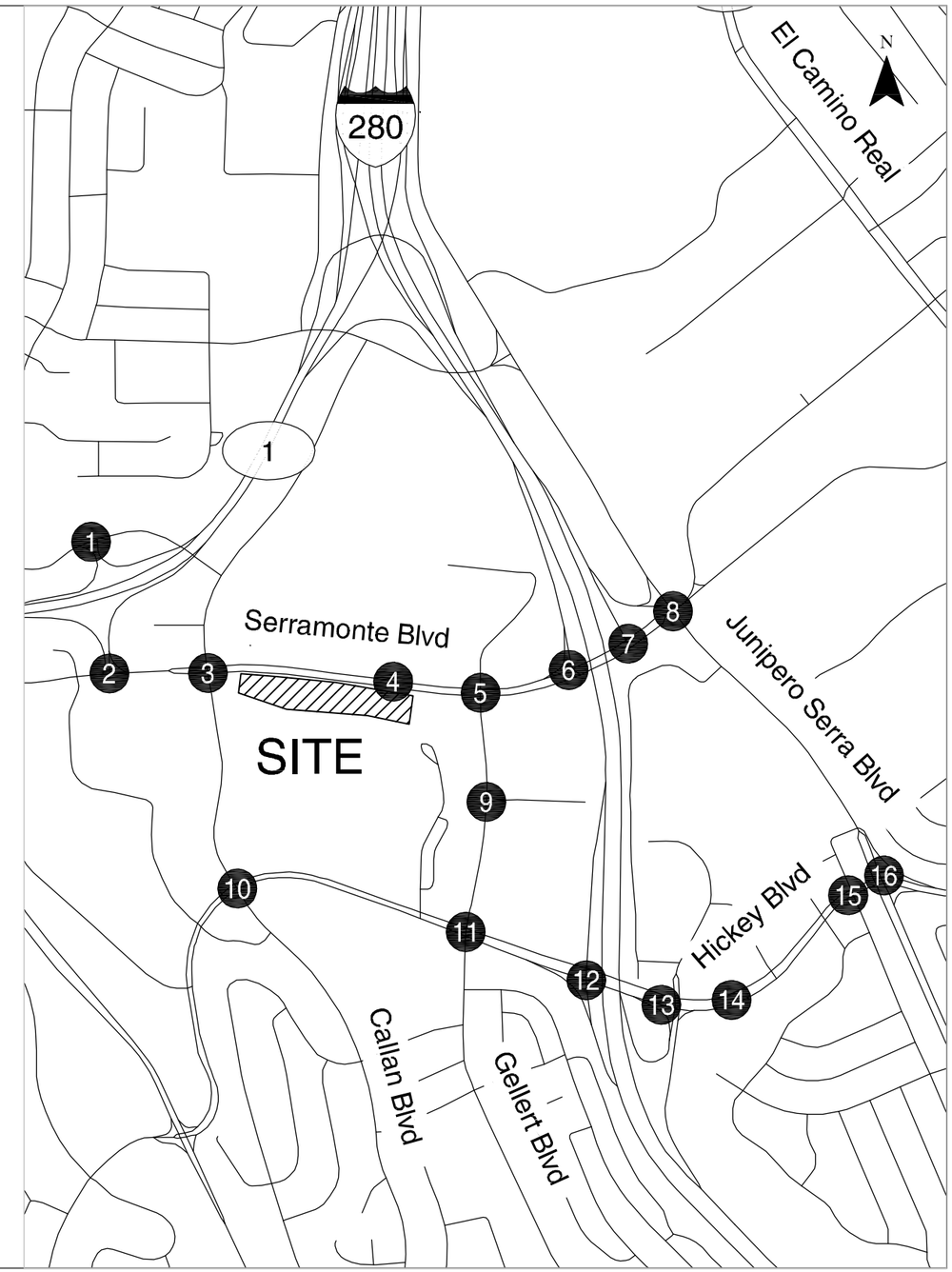
X(X)% **AM(PM)%**
Trip Distribution

Trip Distribution: Hotel
Daly City, California

Figure
8

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere





Proposed Project Trip Generation & Assignment
Daly City, CA

FIGURE 9

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Chapter 4
Existing Plus Project Conditions

4. EXISTING PLUS PROJECT CONDITIONS

This chapter describes the Existing Conditions with the addition of the traffic that would be generated by the Project. Existing plus Project Conditions were evaluated relative to Existing Conditions in order to determine potential Project impacts on the existing transportation network attributable to the Project only.

4.1 TRANSPORTATION NETWORK UNDER EXISTING PLUS PROJECT CONDITIONS

It is assumed in this analysis that the transportation network under Existing plus Project Conditions would be the same as described under Existing Conditions.

4.2 EXISTING PLUS PROJECT TRAFFIC VOLUMES

Project trips, as represented in Figure 9, were added to the Existing traffic volumes to obtain the Existing plus Project traffic volumes. The AM and PM peak hours Existing plus Project intersection traffic volumes for the Proposed Project are shown in Appendix 1.

4.3 EXISTING PLUS PROJECT INTERSECTION ANALYSIS

The results of the intersection LOS analysis under the Existing plus Project Conditions are summarized in Table 10 and Table 11, for AM and PM peak hour, respectively. The results indicate that all study intersections would operate at LOS D or better during both the AM and PM peak hours, except for the intersection of SR-1 Northbound Ramps and Serramonte Boulevard, which would operate at LOS E during the AM peak hour. The intersection average delay would increase from 40.0 seconds to 42.3 seconds due to the new Project trips. This increase in average delay would result in a significant impact. The Project impact and proposed improvements to mitigate the impact are described below.

Table 10: Intersection Level of Service – Existing Plus Project Conditions – AM Peak Hour

#	North/South Street	East/West Street	Control	Existing		Existing plus Project		After Mitigation	
				Delay	LOS	Delay	LOS	Delay	LOS
1	SR-1 SB Ramps	Clarinada Avenue	AWSC/Signal*	13.4	B	13.6	B		
2	SR-1 NB Ramps	Serramonte Boulevard	AWSC/Signal*	40.0	E	***42.2***	***E***	26.7	C
3	Callan Boulevard	Serramonte Boulevard	AWSC/Signal*	14.5	B	14.5	B		
4	Serramonte Center Driveway/ Project Driveway	Serramonte Boulevard	Signalized	8.1	A	22.6	C		
5	Gellert Boulevard	Serramonte Boulevard	Signalized	11.9	B	12.7	B		
6	I-280 SB Off-Ramp	Serramonte Boulevard	Signalized	7.1	A	7.3	A		
7	I-280 NB On-Ramp	Serramonte Boulevard	Signalized	1.7	A	1.9	A		
8[1]	Junipero Serra Boulevard	Serramonte Boulevard	Signalized	27.0	C	27.8	C		
9	Gellert Boulevard	Serramonte Plaza	Signalized	24.6	C	24.6	C		
10	Callan Boulevard	Hickey Boulevard	Signalized	17.7	B	17.8	B		
11	Gellert Boulevard	Hickey Boulevard	Signalized	29.7	C	30.0	C		
12	I-280 SB Ramps	Hickey Boulevard	Signalized	9.2	A	9.2	A		
13	I-280 NB Ramps	Hickey Boulevard	Signalized	26.9	C	27.0	C		
14	Kaiser Driveway	Hickey Boulevard	Signalized	11.3	B	11.2	B		
15[2]	Longford Drive	Hickey Boulevard	Signalized	52.4	D	52.5	D		
16[2]	Junipero Serra Boulevard	Hickey Boulevard	Signalized	43.3	D	43.6	D		

Source: Kittelson & Associates, Inc. 2017.
Signalized and Unsignalized intersections analyzed using HCM 2010 methodologies
AWSC/Signal* - Intersection signalized for Cumulative Conditions assuming implementation of mitigation measures from the General Plan
Cells shaded in GREY indicate LOS exceeding standards, ***bold italic*** indicates significant Project impacts
[1] Intersection under Town of Colma Jurisdiction
[2] Intersections under City of South San Francisco Jurisdiction

Table 11: Intersection Level of Service – Existing Plus Project Conditions – PM Peak Hour

#	North/South Street	East/West Street	Control	Existing		Existing plus Project		After Mitigation	
				Delay	LOS	Delay	LOS	Delay	LOS
1	SR-1 SB Ramps	Clarinada Avenue	AWSC/Signal*	23.9	C	24.5	C		
2	SR-1 NB Ramps	Serramonte Boulevard	AWSC/Signal*	15.7	C	16.0	C	16.2	B
3	Callan Boulevard	Serramonte Boulevard	AWSC/Signal*	14.0	B	14.4	B		
4	Serramonte Center Driveway/ Project Driveway	Serramonte Boulevard	Signalized	13.0	B	33.5	C		
5	Gellert Boulevard	Serramonte Boulevard	Signalized	46.8	D	50.1	D		
6	I-280 SB Off-Ramp	Serramonte Boulevard	Signalized	16.0	B	16.2	B		
7	I-280 NB On-Ramp	Serramonte Boulevard	Signalized	4.1	A	4.3	A		
8[1]	Junipero Serra Boulevard	Serramonte Boulevard	Signalized	28.4	C	29.0	C		
9	Gellert Boulevard	Serramonte Plaza	Signalized	32.6	C	32.8	C		
10	Callan Boulevard	Hickey Boulevard	Signalized	22.5	C	22.8	C		
11	Gellert Boulevard	Hickey Boulevard	Signalized	49.4	D	50.3	D		
12	I-280 SB Ramps	Hickey Boulevard	Signalized	10.5	B	10.5	B		
13	I-280 NB Ramps	Hickey Boulevard	Signalized	24.0	C	24.2	B		
14	Kaiser Driveway	Hickey Boulevard	Signalized	17.3	B	17.3	B		
15[2]	Longford Drive	Hickey Boulevard	Signalized	51.8	D	51.8	D		
16[2]	Junipero Serra Boulevard	Hickey Boulevard	Signalized	51.4	D	51.7	D		

Source: Kittelson & Associates, Inc. 2017.
Cells shaded in GREY indicate LOS exceeding standards, ***bold italic*** indicates significant Project impacts
Signalized and Unsignalized intersections analyzed using HCM 2010 methodologies
AWSC/Signal* - Intersection signalized for Cumulative Conditions assuming implementation of mitigation measures from the General Plan
PM Peak Hour analyses were based on counts conducted in May 2015, with adjustments to add in the trips generated by the partially occupied Christopher Highlands Development.
[1] Intersection under Town of Colma Jurisdiction
[2] Intersections under City of South San Francisco Jurisdiction

Signal Warrant Analysis

The peak hour signal warrant was analyzed for the three stop-controlled intersections to determine if a signal is warranted at those locations and the results are summarized in Table 12. As shown in Table 12, the intersection of SR-1 Southbound Ramps/Clarinda Ave. would meet the peak hour signal warrant during the PM peak hour; the intersection of SR-1 Northbound Ramps/Serramonte Blvd. would meet the peak hour signal warrant during the AM peak hour; and the intersection of Callan Blvd./Serramonte Blvd. would meet the peak hour signal warrant during both the AM and PM peak hours. These results are the same as existing conditions without the Project. Under the Daly City General Plan, all three unsignalized intersections are designated to be signalized.

Table 12: Signal Warrant Analysis – Existing Plus Project Conditions

Intersection		Signal Warrant #3: Peak Hour Volume (Met?)	
		AM Peak Hour	PM Peak Hour
1	SR-1 Southbound Ramps / Clarinada Ave.	No	Yes
2	SR-1 Northbound Ramps / Serramonte Blvd.	Yes	No
3	Callan Blvd. / Serramonte Blvd.	Yes	Yes

The intersection LOS calculation sheets are included in Appendix 5. The signal warrant worksheets can be found in Appendix 6.

Impacts and Mitigation Measures

Impact 1: **The Project would add delay to the intersection of SR-1 NB Ramps and Serramonte Boulevard, which would operate at a deficient level of service without the Project.** The intersection of SR-1 NB Ramps and Serramonte Boulevard would operate at LOS E during the AM peak hour under Existing plus Project Conditions, and the added Project trips would cause the average delay to increase by 2.2 seconds. Based on the City of Daly City's level of service impact criteria, this constitutes a significant impact.

Mitigation 1: The City of Daly City shall install a traffic signal at the intersection. As shown in Table 6, this intersection currently meets the peak hour signal warrant during the AM peak hour, without or with the Project. Signalizing this intersection would improve the average intersection delay to LOS C. The installation of a signal and turning lanes at this intersection is a planned intersection improvement under the Daly City General

Plan. The Project shall contribute a proportional share to the cost of the improvements.

With implementation of Mitigation 1, the impacts would be less than significant.

4.4 EXISTING PLUS PROJECT CONDITIONS FREEWAY ANALYSIS

Table 13 and Table 14 present the LOS on the study freeway segments under Existing plus Project Conditions for the AM and PM peak hours respectively. The results indicate that all freeway segments would operate at LOS D or better, except for the weaving segment on I-280 southbound between SR-1 and Serramonte Blvd., which would operate at LOS E without and with the Project during the PM peak hour.

Impacts and Mitigation Measures

Based on significance criteria from the C/CAG CMP, the Project would have an impact at the following freeway segment, and the proposed improvements to mitigate the impact are described below:

Impact 2: **The Project would add traffic to the I-280 southbound weaving segment between SR_1 and Serramonte Boulevard, which would operate at a deficient level of service without the Project.** The addition of Project traffic would cause the V/C ratio for this segment to increase by more than 1% (from 0.969 to 0.986) during the weekday PM peak hour. Therefore, the Project impact is considered to be **significant**.

Mitigation 2: Caltrans shall implement improvements on the weaving section on I-280 southbound between the SR-1 northbound off-ramp and the Serramonte Boulevard off-ramp, as included in the Daly City General Plan. Construction of these improvements would likely reduce the Project's impact to less than significant. However, because the freeway is under Caltrans' jurisdiction, the implementation and timing of the improvements called for in the City's General Plan are not under the City's control, therefore, the impact would remain **significant and unavoidable**.

The freeway LOS calculation sheets are included in Appendix 5.

Table 13: Freeway Level of Service – Existing plus Project Conditions – AM Peak Hour

Location	Type	Standard	Existing			Existing Plus Project			Increased Demand or V/C Ratio by 1%?	Significant ?
			Volume[1]	Density[2]	LOS[3]	Volume[1]	Density[2]	LOS[3]		
Northbound										
I-280 South of Hickey Blvd.	Mainline	D	6,258	25.2	C	6,260	25.2	C	--	No
I-280 North of SR-1	Mainline	E	7,224	18.2	C	7,277	18.3	C	--	No
SR-1 South of Serramonte Blvd.	Mainline	E	3,822	14.5	B	3,836	14.6	B	--	No
Southbound										
I-280 South of Hickey Blvd.	Mainline	D	7,715	32.4	D	7,740	32.6	D	--	No
I-280 North of SR-1	Mainline	E	9,076	23.5	C	9,093	23.6	C	--	No
SR-1 South of Serramonte Blvd.	Mainline	E	1,394	5.3	A	1,403	5.3	A	--	No
I-280 SB between SR-1 and Serramonte Blvd.	Weave	D	7,681	33.9	D	7,698	34.0	D	--	No

Source: Kittelson & Associates, Inc., 2017.
1 Volume = vehicles per hour (vph)
2 Density = passenger car per mile per lane (pc/m/ln)
3 LOS = Level of Service
Cells shaded in GREY indicate LOS exceeding standards, ***bold italic*** indicates significant Project impacts

Table 14: Freeway Level of Service – Existing plus Project Conditions – PM Peak Hour

Location	Type	Standard	Existing			Existing Plus Project			Increased Demand or V/C Ratio by 1%?	Significant ?
			Volume[1]	Density[2]	LOS[3]	Volume[1]	Density[2]	LOS[3]		
Northbound										
I-280 South of Hickey Blvd.	Mainline	D	7,148	28.0	D	7,159	28.1	D	--	No
I-280 North of SR-1	Mainline	E	9,256	24.1	C	9,282	24.1	C	--	No
SR-1 South of Serramonte Blvd.	Mainline	E	3,577	13.6	B	3,592	13.6	B	--	No
Southbound										
I-280 South of Hickey Blvd.	Mainline	D	6,856	28.0	C	6,869	28.1	D	--	No
I-280 North of SR-1	Mainline	E	8,452	21.6	C	8,495	21.7	C	--	No
SR-1 South of Serramonte Blvd.	Mainline	E	1,984	7.5	A	1,989	7.6	A	--	No
I-280 SB between SR-1 and Serramonte Blvd.	Weave	D	8,802	40.8	E	***8,845***	***41.3***	***E***	Yes	Yes

Source: Kittelson & Associates, Inc., 2017.
1 Volume = vehicles per hour (vph)
2 Density = passenger car per mile per lane (pc/m/ln)
3 LOS = Level of Service
Cells shaded in GREY indicate LOS exceeding standards, ***bold italic*** indicates significant Project impacts.

4.5 EXISTING PLUS PROJECT CONDITIONS QUEUING ANALYSIS AT FREEWAY OFF-RAMP INTERSECTIONS

Table 15 presents the queuing analysis for the Existing plus Project Conditions. The results indicate that all freeway off-ramps would have sufficient storage to accommodate the off-ramp queues during both the AM and PM peak hours.

Table 15: Off-Ramp Queue Analysis – Existing and Existing plus Project Conditions – Weekday AM and PM Peak Hour

Freeway Off-Ramp	Queue Lengths (ft)	Existing						Existing Plus Project					
		NBL	NBT	NBR	SBL	SBT	SBR	NBL	NBT	NBR	SBL	SBT	SBR
AM Peak Hour													
1. SR-1 SB off-ramp to Clarinada Ave	Storage Length (ft)	800	-	300	-	-	-	800	-	300	-	-	-
	95th Percentile Queue	100	-	50	-	-	-	125	-	50	-	-	-
2. SR-1 NB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	865	-	360	-	-	-	865	-	360
	95th Percentile Queue	-	-	-	175	-	25	-	-	-	200	-	25
6. I-280 SB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	1,100	-	600	-	-	-	1,100	-	600
	95th Percentile Queue	-	-	-	75	-	25	-	-	-	75	-	25
12. I-280 SB off-ramp to Hickey Blvd	Storage Length (ft)	-	-	-	420	1,130	190	-	-	-	420	1,130	190
	95th Percentile Queue	-	-	-	50	50	50				50	50	50
13. I-280 NB off-ramp to Hickey Blvd	Storage Length (ft)	1,250	350	600	-	-	-	1,250	350	600	-	-	-
	95th Percentile Queue	125	125	250	-	-	-	125	125	250	-	-	-
PM Peak Hour													
1. SR-1 SB off-ramp to Clarinada Ave	Storage Length (ft)	800	-	300	-	-	-	800	-	300	-	-	-
	95th Percentile Queue	250	-	50	-	-	-	275	-	50	-	-	-
2. SR-1 NB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	865	-	360	-	-	-	865	-	360
	95th Percentile Queue	-	-	-	25	-	100	-	-	-	50	-	100
6. I-280 SB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	1,100	-	600	-	-	-	1,100	-	600
	95th Percentile Queue	-	-	-	225	-	250	-	-	-	225	-	275
12. I-280 SB off-ramp to Hickey Blvd	Storage Length (ft)	-	-	-	420	1,130	190	-	-	-	420	1,130	190
	50th Percentile Queue	-	-	-	75	75	75	-	-	-	75	75	75
13. I-280 NB off-ramp to Hickey Blvd	Storage Length (ft)	1,250	350	600	-	-	-	1,250	350	600	-	-	-
	95th Percentile Queue	200	200	150	-	-	-	200	200	150	-	-	-

Source: Kittelson & Associates, Inc., 2017.
Storage length based on distance to the off-ramp gore point.

Chapter 5
Cumulative Conditions

5. CUMULATIVE CONDITIONS

This chapter presents a summary of the traffic conditions that would occur under the Cumulative Conditions. It includes descriptions of the procedure used to estimate traffic volumes associated with Cumulative Conditions without and with the Project, as well as the intersection and freeway LOS results.

5.1 CUMULATIVE TRANSPORTATION NETWORK AND TRAFFIC VOLUMES

The Cumulative Conditions analysis projects how the study area's transportation system would operate with the full buildout of the Daly City General Plan in combination with the growth and changes of the surrounding communities by the year 2035.

Planned Developments and Improvements

The land use and roadway network assumptions for the Cumulative Conditions are based on the City's travel demand model for year 2035. It includes all the planned land use developments and improvements identified under the Daly City General Plan, as well as mitigation improvements from any approved development projects.

The following Approved Projects within the study area are included in the Cumulative Conditions:

- Christopher Highlands
- Serramonte Shopping Center Expansion
- In-N-Out Burger
- Chinese Hospital Outpatient Center

The following intersection improvements as identified in the General Plan are included in the Cumulative Conditions:

- SR-1 SB Ramps & Clarinada Avenue intersection (#1) – install signal
- SR-1 NB Ramps & Serramonte Boulevard intersection (#2)
    - Install signal
    - Restripe the roadway of the eastbound approach (within the existing right-of-way) for the lane configurations to include:
        - Two exclusive left-turn lanes
        - One through-right turn lane
    - Restripe the roadway of the westbound approach (within the existing right-of-way) for the lane configurations to include:
        - One exclusive left-turn lane

        - One through lane
        - One through-right turn lane
- Callan Boulevard and Serramonte Boulevard intersection (#3) – install signal

The following mitigation improvements as identified in the Serramonte Center Master Plan Environmental Impact Report (EIR) are included in the Cumulative Conditions:

- Gellert Boulevard & Serramonte Boulevard intersection (#5)
    - Shift the center median of Gellert Boulevard approximately 12 feet to the west between Serramonte Boulevard and the entrance driveway to Gellert Market Place (at the southeast corner of Serramonte Boulevard and Gellert Boulevard).
    - Restripe the roadway of the northbound approach (within the existing right-of-way) for the lane configurations to include:
        - Two exclusive left-turn lanes
        - One through lane
        - One through-right turn lane
        - One exclusive right-turn lane
        - Reduce number of southbound receiving lanes from three to two
    - Restripe the roadway of the southbound approach (within the existing right-of-way) for the lane configurations to include:
        - Two exclusive left-turn lanes
        - One-through-right turn lane
    - Remove split-phasing for the northbound and southbound approaches and implement lead-lag left turn phasing. Lead-lag left turn phasing will eliminate any geometric constraints by having northbound and southbound left turn movements go at different times.
- Serramonte Center Driveway & Serramonte Boulevard intersection (#4)
    - Increase the queue storage of the eastbound left turn pocket by at least 100 feet (to have at least 285 feet of queue storage) in order to accommodate the entire 95th percentile queue within the available storage.
    - Modify the signal timing to increase the available green time for the eastbound left turn lane.
- Gellert Boulevard & Hickey Boulevard intersection (#11)
    - Install a right-turn overlap signal phase on the westbound approach.
    - Optimize the signal timing.

The AM and PM peak hour traffic volumes at the study intersections for the Cumulative Conditions are shown in Appendix 1. The intersection lane configurations for Cumulative Conditions are shown in Appendix 7.

Since I-280 and SR-1 are both part of the CMP roadway network, the C/CAG Countywide Travel Demand Model was used to forecast the freeway mainline volumes for the Cumulative Conditions, for CMP compliance.

5.2 CUMULATIVE CONDITIONS INTERSECTION ANALYSIS

The results of the intersection LOS analysis under the Cumulative Conditions are summarized in Table 16 and Table 17, for the AM and PM peak hours, respectively. The results indicate that all study intersections would operate at acceptable LOS, except for the intersection of Junipero Serra Boulevard and Hickey Boulevard during both the AM and PM peak hours, which would operate at LOS E. Note that this intersection is under the City of South San Francisco's jurisdiction.

The LOS calculation sheets are included in Appendix 8.

Table 16: Intersection Level of Service – Cumulative Conditions – AM Peak Hour

#	North/South Street	East/West Street	Control	Existing		Cumulative	
				Delay	LOS	Delay	LOS
1	SR-1 SB Ramps	Clarinada Avenue	AWSC/Signal*	13.4	B	11.5	B
2	SR-1 NB Ramps	Serramonte Boulevard	AWSC/Signal*	40.0	E	39.1	D
3	Callan Boulevard	Serramonte Boulevard	AWSC/Signal*	14.5	B	17.6	B
4	Serramonte Center Driveway/ Project Driveway	Serramonte Boulevard	Signalized	8.1	A	8.0	A
5	Gellert Boulevard	Serramonte Boulevard	Signalized	11.9	B	13.7	B
6	I-280 SB Off-Ramp	Serramonte Boulevard	Signalized	7.1	A	7.9	A
7	I-280 NB On-Ramp	Serramonte Boulevard	Signalized	1.7	A	1.7	A
8[1]	Junipero Serra Boulevard	Serramonte Boulevard	Signalized	27.0	C	58.6	E
9	Gellert Boulevard	Serramonte Plaza	Signalized	24.6	C	24.1	C
10	Callan Boulevard	Hickey Boulevard	Signalized	17.7	B	18.2	B
11	Gellert Boulevard	Hickey Boulevard	Signalized	29.7	C	28.5	C
12	I-280 SB Ramps	Hickey Boulevard	Signalized	9.2	A	9.0	A
13	I-280 NB Ramps	Hickey Boulevard	Signalized	26.9	C	29.2	C
14	Kaiser Driveway	Hickey Boulevard	Signalized	11.3	B	11.1	B
15[2]	Longford Drive	Hickey Boulevard	Signalized	52.4	D	54.2	D
16[2]	Junipero Serra Boulevard	Hickey Boulevard	Signalized	43.3	D	65.1	E

Source: Kittelson & Associates, Inc. 2017.
Signalized and Unsignalized intersections analyzed using HCM 2010 methodologies
AWSC/Signal* - Intersection signalized for Cumulative Conditions assuming implementation of mitigation measures from the General Plan
Cells shaded in GREY indicate LOS exceeding standards.
[1] Intersection under Town of Colma Jurisdiction
[2] Intersections under City of South San Francisco Jurisdiction

Table 17: Intersection Level of Service – Cumulative Conditions – PM Peak Hour

#	North/South Street	East/West Street	Control	Existing		Cumulative	
				Delay	LOS	Delay	LOS
1	SR-1 SB Ramps	Clarinada Avenue	AWSC/Signal*	23.9	C	16.0	B
2	SR-1 NB Ramps	Serramonte Boulevard	AWSC/Signal*	15.7	C	22.2	C
3	Callan Boulevard	Serramonte Boulevard	AWSC/Signal*	14.0	B	26.8	C
4	Serramonte Center Driveway/ Project Driveway	Serramonte Boulevard	Signalized	13.0	B	14.7	B
5	Gellert Boulevard	Serramonte Boulevard	Signalized	46.8	D	43.4	D
6	I-280 SB Off-Ramp	Serramonte Boulevard	Signalized	16.0	B	16.2	B
7	I-280 NB On-Ramp	Serramonte Boulevard	Signalized	4.1	A	4.5	A
8[1]	Junipero Serra Boulevard	Serramonte Boulevard	Signalized	28.4	C	67.6	E
9	Gellert Boulevard	Serramonte Plaza	Signalized	32.6	C	29.9	C
10	Callan Boulevard	Hickey Boulevard	Signalized	22.5	C	24.7	C
11	Gellert Boulevard	Hickey Boulevard	Signalized	49.4	D	43.1	D
12	I-280 SB Ramps	Hickey Boulevard	Signalized	10.5	B	12.7	B
13	I-280 NB Ramps	Hickey Boulevard	Signalized	24.0	C	29.9	C
14	Kaiser Driveway	Hickey Boulevard	Signalized	17.3	B	17.7	B
15[2]	Longford Drive	Hickey Boulevard	Signalized	51.8	D	54.0	D
16[2]	Junipero Serra Boulevard	Hickey Boulevard	Signalized	51.4	D	72.8	E

Source: Kittelson & Associates, Inc. 2017.
Signalized and Unsignalized intersections analyzed using HCM 2010 methodologies
AWSC/Signal* - Intersection signalized for Cumulative Conditions assuming implementation of mitigation measures from the General Plan.
Cells shaded in GREY indicate LOS exceeding standards.
[1] Intersection under Town of Colma Jurisdiction
[2] Intersections under City of South San Francisco Jurisdiction

5.3 CUMULATIVE CONDITIONS FREEWAY ANALYSIS

Table 18 and Table 19 present the LOS on the study freeway segments under Cumulative Conditions for the AM and PM peak hours respectively. All study segments would operate at LOS D or better except for the following freeway segments:

- The freeway mainline segment on northbound I-280 south of Hickey Blvd. would operate at LOS E during the AM and PM peak hours.
- The freeway mainline segment on southbound I-280 south of Hickey Blvd. would operate at LOS F during the AM peak hour, and at LOS E during the PM peak hour.
- The weaving segment on southbound I-280 between SR-1 and Serramonte Blvd. would operate at LOS E during the AM peak hour and at LOS F during the PM peak hour.

Table 18: Freeway Level of Service – Cumulative Conditions – AM Peak Hour

Location	Type	Existing			Cumulative		
		Volume[1]	Density[2]	LOS[3]	Volume[1]	Density[2]	LOS[3]
Northbound							
I-280 South of Hickey Blvd.	Mainline	6,258	25.2	C	8,090	37.2	E
I-280 North of SR-1	Mainline	7,224	18.2	C	8,399	21.4	C
SR-1 South of Serramonte Blvd.	Mainline	3,822	14.5	B	4,209	16.0	B
Southbound							
I-280 South of Hickey Blvd.	Mainline	7,715	32.4	D	9,370	47.3	F
I-280 North of SR-1	Mainline	9,076	23.5	C	10,493	28.4	D
SR-1 South of Serramonte Blvd.	Mainline	1,394	5.3	A	2,282	8.7	A
I-280 SB between SR-1 and Serramonte Blvd.	Weave	7,681	33.9	D	8,995	41.6	E

Source: Kittelson & Associates, Inc., 2017.
1 Volume = vehicles per hour (vph)
2 Density = passenger car per mile per lane (pc/m/ln)
3 LOS = Level of Service
Cells shaded in GREY indicate LOS exceeding standards.

Table 19: Freeway Level of Service – Cumulative Conditions – PM Peak Hour

Location	Type	Existing			Cumulative		
		Volume[1]	Density[2]	LOS[3]	Volume[1]	Density[2]	LOS[3]
Northbound							
I-280 South of Hickey Blvd.	Mainline	7,148	28.0	D	9,044	41.8	E
I-280 North of SR-1	Mainline	9,256	24.1	C	10,972	30.4	D
SR-1 South of Serramonte Blvd.	Mainline	3,577	13.6	B	4,521	17.2	B
Southbound							
I-280 South of Hickey Blvd.	Mainline	6,856	28.0	C	8,667	41.7	E
I-280 North of SR-1	Mainline	8,452	21.6	C	9,897	26.2	D
SR-1 South of Serramonte Blvd.	Mainline	1,984	7.5	A	2,636	10.0	A
I-280 SB between SR-1 and Serramonte Blvd.	Weave	8,802	40.8	E	9,904	n/a	F

Source: Kittelson & Associates, Inc., 2017.
1 Volume = vehicles per hour (vph)
2 Density = passenger car per mile per lane (pc/m/ln)
3 LOS = Level of Service
Cells shaded in GREY indicate LOS exceeding standards.

5.4 CUMULATIVE CONDITIONS FREEWAY OFF-RAMP QUEUE ANALYSIS

Table 20 presents the queuing analysis for the Cumulative Conditions. The results indicate that all freeway off-ramps would have sufficient storage to accommodate the off-ramp queues during both the AM and PM peak hours.

Table 20: Off-Ramp Queue Analysis – Cumulative Conditions – Weekday AM and PM Peak Hour

Freeway Off-Ramp	Queue Lengths (ft)	Cumulative					
		NBL	NBT	NBR	SBL	SBT	SBR
AM Peak Hour							
1. SR-1 SB off-ramp to Clarinada Ave	Storage Length (ft)	800	-	300	-	-	-
	95th Percentile Queue	100	-	75	-	-	-
2. SR-1 NB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	865	-	360
	95th Percentile Queue	-	-	-	425	-	125
6. I-280 SB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	1,100	-	600
	95th Percentile Queue	-	-	-	75	-	25
12. I-280 SB off-ramp to Hickey Blvd	Storage Length (ft)	-	-	-	420	1,130	190
	95th Percentile Queue	-	-	-	50	50	50
13. I-280 NB off-ramp to Hickey Blvd	Storage Length (ft)	1,250	350	600	-	-	-
	95th Percentile Queue	200	200	275	-	-	-
PM Peak Hour							
1. SR-1 SB off-ramp to Clarinada Ave	Storage Length (ft)	800	-	300	-	-	-
	95th Percentile Queue	200	-	125	-	-	-
2. SR-1 NB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	865	-	360
	95th Percentile Queue	-	-	-	75	-	175
6. I-280 SB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	1,100	-	600
	95th Percentile Queue	-	-	-	225	-	275
12. I-280 SB off-ramp to Hickey Blvd	Storage Length (ft)	-	-	-	420	1,130	190
	50th Percentile Queue	-	-	-	125	125	125
13. I-280 NB off-ramp to Hickey Blvd	Storage Length (ft)	1,250	350	600	-	-	-
	95th Percentile Queue	300	300	200	-	-	-

Source: Kittelson & Associates, Inc., 2017.
Storage length based on distance to the off-ramp gore point.

Chapter 6
Cumulative plus Project Conditions

6. CUMULATIVE PLUS PROJECT CONDITIONS

This chapter describes the Cumulative Conditions with the addition of the traffic that would be generated by the Project. Cumulative plus Project Conditions were evaluated relative to Cumulative Conditions in order to determine potential Project impacts on the Cumulative transportation network attributable to the Project only.

6.1 CUMULATIVE PLUS PROJECT TRANSPORTATION NETWORK AND TRAFFIC VOLUMES

It is assumed in this analysis that the transportation network under Cumulative plus Project Conditions would be the same as described under Cumulative Conditions. The intersection lane configurations assumed for the Cumulative plus Project Conditions are presented in Appendix 9.

For the study intersections, the Cumulative plus Project traffic volumes were estimated by adding the trips generated by the Project to the Cumulative (no project) volumes. The AM and PM peak hour traffic volumes at the study intersections are shown in Appendix 1.

For the freeway, the Cumulative plus Project traffic volumes were estimated by adding the trips generated by the Project to the Cumulative (no project) freeway mainline volumes.

6.2 CUMULATIVE PLUS PROJECT CONDITIONS INTERSECTION ANALYSIS

The results of the intersection LOS analysis under the Cumulative plus Project Conditions are summarized in Table 21 and Table 22, for AM and PM peak hour, respectively. The results indicate that all study intersections would operate at acceptable LOS, except for the intersection of Junipero Serra Boulevard and Hickey Boulevard, where it would operate at LOS E under both the AM and PM peak hours. The project impact and proposed improvements to mitigate the impact are described below.

Impacts and Mitigation Measures

Impact 3: **The Project would add delay to the intersection of Junipero Serra Boulevard and Hickey Boulevard, which would operate at a deficient level of service without the Project**. This intersection would operate at LOS E during both the AM and PM peak hours under the Cumulative plus Project Conditions. The added Project trips would cause the average delay to increase by 1.9 seconds during the AM peak hour, and by 2.2 seconds during the PM peak hour. Based on the City of South San Francisco's level of service impact criteria, this constitutes a significant impact.

Mitigation 3: The City of Daly City shall coordinate with the City of South San Francisco to optimize the signal timing at this intersection. The adjustments would improve the average intersection delay to 63.4 seconds during the AM peak hour, which would be better than the Cumulative No Project Conditions (65.1 seconds). Similar results were found for the PM peak hour, where optimizing signal timing would improve average delay (72.9 seconds) compared to Cumulative No Project Conditions (72.8 seconds). As a result, the Project would have a less-than-significant impact at this intersection after the mitigation.

The LOS calculation sheets are included in Appendix 10.

Table 21: Intersection Level of Service – Cumulative plus Project Conditions – AM Peak Hour

#	North/South Street	East/West Street	Control	Cumulative		Cumulative plus Project		After Mitigation	
				Delay	LOS	Delay	LOS	Delay	LOS
1	SR-1 SB Ramps	Clarinada Avenue	AWSC/Signal*	11.5	B	11.6	B		
2	SR-1 NB Ramps	Serramonte Boulevard	AWSC/Signal*	39.2	D	40.0	D		
3	Callan Boulevard	Serramonte Boulevard	AWSC/Signal*	17.6	B	18.1	B		
4	Serramonte Center Driveway/ Project Driveway	Serramonte Boulevard	Signalized	8.0	A	22.1	C		
5	Gellert Boulevard	Serramonte Boulevard	Signalized	13.7	B	14.6	B		
6	I-280 SB Off-Ramp	Serramonte Boulevard	Signalized	7.9	A	8.4	A		
7	I-280 NB On-Ramp	Serramonte Boulevard	Signalized	1.7	A	1.9	A		
8[1]	Junipero Serra Boulevard	Serramonte Boulevard	Signalized	58.6	E	60.0	E		
9	Gellert Boulevard	Serramonte Plaza	Signalized	24.1	C	24.1	C		
10	Callan Boulevard	Hickey Boulevard	Signalized	18.2	B	18.2	B		
11	Gellert Boulevard	Hickey Boulevard	Signalized	28.5	C	28.7	C		
12	I-280 SB Ramps	Hickey Boulevard	Signalized	9.0	A	9.0	A		
13	I-280 NB Ramps	Hickey Boulevard	Signalized	29.2	C	29.3	C		
14	Kaiser Driveway	Hickey Boulevard	Signalized	11.1	B	11.1	B		
15[2]	Longford Drive	Hickey Boulevard	Signalized	54.2	D	54.3	D		
16[2]	Junipero Serra Boulevard	Hickey Boulevard	Signalized	65.1	E	***67.0***	***E***	63.4	E

Signalized and Unsignalized intersections analyzed using HCM 2010 methodologies
AWSC/Signal* - Intersection signalized for Cumulative Conditions assuming implementation of mitigation measures from the General Plan
Cells shaded in GREY indicate LOS exceeding standards, ***bold italic*** indicates significant Project impacts
Source: Kittelson & Associates, Inc. 2017.

[1] Intersection under Town of Colma Jurisdiction

[2] Intersections under City of South San Francisco Jurisdiction

Table 22: Intersection Level of Service – Cumulative plus Project Conditions – PM Peak Hour

#	North/South Street	East/West Street	Control	Cumulative		Cumulative plus Project		After Mitigation	
				Delay	LOS	Delay	LOS	Delay	LOS
1	SR-1 SB Ramps	Clarinada Avenue	AWSC/Signal*	16.0	B	16.2	B		
2	SR-1 NB Ramps	Serramonte Boulevard	AWSC/Signal*	22.2	C	22.2	C		
3	Callan Boulevard	Serramonte Boulevard	AWSC/Signal*	26.8	C	28.9	C		
4	Serramonte Center Driveway/ Project Driveway	Serramonte Boulevard	Signalized	14.7	B	34.1	C		
5	Gellert Boulevard	Serramonte Boulevard	Signalized	43.4	D	43.5	D		
6	I-280 SB Off-Ramp	Serramonte Boulevard	Signalized	16.2	B	16.6	B		
7	I-280 NB On-Ramp	Serramonte Boulevard	Signalized	4.5	A	4.7	A		
8[1]	Junipero Serra Boulevard	Serramonte Boulevard	Signalized	67.6	E	69.5	E		
9	Gellert Boulevard	Serramonte Plaza	Signalized	29.9	C	30.2	C		
10	Callan Boulevard	Hickey Boulevard	Signalized	24.7	C	25.3	C		
11	Gellert Boulevard	Hickey Boulevard	Signalized	43.1	D	43.3	D		
12	I-280 SB Ramps	Hickey Boulevard	Signalized	12.7	B	12.8	B		
13	I-280 NB Ramps	Hickey Boulevard	Signalized	29.9	C	30.3	C		
14	Kaiser Driveway	Hickey Boulevard	Signalized	17.7	B	17.7	B		
15[2]	Longford Drive	Hickey Boulevard	Signalized	54.0	D	54.1	D		
16[2]	Junipero Serra Boulevard	Hickey Boulevard	Signalized	72.8	E	***75.0***	***E***	72.9	E

Signalized and Unsignalized intersections analyzed using HCM 2010 methodologies
AWSC/Signal* - Intersection signalized for Cumulative Conditions assuming implementation of mitigation measures from the General Plan
Cells shaded in GREY indicate LOS exceeding standards, ***bold italic*** indicates significant Project impacts.
Source: Kittelson & Associates, Inc. 2017.

[1] Intersection under Town of Colma Jurisdiction

[2] Intersections under City of South San Francisco Jurisdiction

6.3 CUMULATIVE PLUS PROJECT CONDITIONS FREEWAY ANALYSIS

Table 23 and Table 24 present the LOS on the study freeway segments under Cumulative plus Project Conditions for the AM and PM peak hours, respectively. The results indicate that the following freeway mainline segments would operate at a LOS worse than LOS D:

- Northbound I-280 south of Hickey Blvd. would operate at LOS E during the AM and PM peak hours; and
- Southbound I-280 south of Hickey Blvd. would operate at LOS F during the AM peak hour, and at LOS E during the PM peak hour.

The following weaving segment would operate worse than LOS D:

- Southbound I-280 between SR-1 and Serramonte Blvd. would operate at LOS E during the AM peak hour and at LOS F during the PM peak hour.

Based on significance criteria from the C/CAG CMP, the Project impacts on freeway segments and the proposed improvements to mitigate the impacts are described below:

Impacts and Mitigation Measures

Impact 4: **The Project would add traffic to the I-280 southbound weaving segment between SR_1 and Serramonte Boulevard which would operate at a deficient level of service without the Project.** The addition of Project traffic would cause the V/C ratio for this segment to increase by more than 1% (from 1.043 to 1.062) during the weekday PM peak hour. Therefore, the Project impact is considered to be **significant**.

Mitigation 4: Caltrans shall implement improvements on the weaving section on I-280 southbound between the SR-1 northbound off-ramp and the Serramonte Boulevard off-ramp, as included in the Daly City General Plan. Construction of these improvements would likely reduce the Project's impact to less than significant. However, because the freeway is under Caltrans' jurisdiction, the implementation and timing of the improvements called for in the City's General Plan are not under the City's control, therefore, the impact remains **significant and unavoidable**.

Table 23: Freeway Level of Service – Cumulative plus Project Conditions – AM Peak Hour

Location	Type	Standard	Cumulative			Cumulative Plus Project			Increased Demand or V/C Ratio by 1%?	Significant ?
			Volume[1]	Density[2]	LOS[3]	Volume[1]	Density[2]	LOS[3]		
Northbound										
I-280 South of Hickey Blvd.	Mainline	D	8,090	37.2	E	8,092	37.2	E	No	No
I-280 North of SR-1	Mainline	E	8,399	21.4	C	8,452	21.6	C	--	No
SR-1 South of Serramonte Blvd.	Mainline	E	4,209	16.0	B	4,223	16.0	B	--	No
Southbound										
I-280 South of Hickey Blvd.	Mainline	D	9,370	47.3	F	9,395	47.6	F	No	No
I-280 North of SR-1	Mainline	E	10,493	28.4	D	10,510	28.5	D	--	No
SR-1 South of Serramonte Blvd.	Mainline	E	2,282	8.7	A	2,291	8.7	A	--	No
I-280 SB between SR-1 and Serramonte Blvd.	Weave	D	8,995	41.6	E	9,012	41.8	E	No	No

Source: Kittelson & Associates, Inc., 2017.
1 Volume = vehicles per hour (vph)
2 Density = passenger car per mile per lane (pc/m/ln)
3 LOS = Level of Service
Cells shaded in GREY indicate LOS exceeding standards, ***bold italic*** indicates significant Project impacts.

Table 24: Freeway Level of Service – Cumulative plus Project Conditions – PM Peak Hour

Location	Type	Standard	Cumulative			Cumulative Plus Project			Increased Demand or V/C Ratio by 1%?	Significant ?
			Volume[1]	Density[2]	LOS[3]	Volume[1]	Density[2]	LOS[3]		
Northbound										
I-280 South of Hickey Blvd.	Mainline	D	9,044	41.8	E	9,055	41.9	E	No	No
I-280 North of SR-1	Mainline	E	10,972	30.4	D	10,998	30.5	D	--	No
SR-1 South of Serramonte Blvd.	Mainline	E	4,521	17.2	B	4,536	17.2	B	--	No
Southbound										
I-280 South of Hickey Blvd.	Mainline	D	8,667	41.7	E	8,680	41.8	E	No	No
I-280 North of SR-1	Mainline	E	9,897	26.2	D	9,940	26.4	D	--	No
SR-1 South of Serramonte Blvd.	Mainline	E	2,636	10.0	A	2,641	10.0	A	--	No
I-280 SB between SR-1 and Serramonte Blvd.	Weave	D	9,904	n/a	F	***9,947***	***n/a***	***F***	Yes	Yes

Source: Kittelson & Associates, Inc., 2017.
1 Volume = vehicles per hour (vph)
2 Density = passenger car per mile per lane (pc/m/ln)
3 LOS = Level of Service
Cells shaded in GREY indicate LOS exceeding standards, ***bold italic*** indicates significant Project impacts.

6.4 CUMULATIVE PLUS PROJECT CONDITIONS QUEUING ANALYSIS AT FREEWAY OFF-RAMP INTERSECTIONS

Table 25 presents the queuing analysis for the Cumulative plus Project Conditions. The results indicate that all freeway off-ramps would have sufficient storage to accommodate the off-ramp queues during both the AM and PM peak hours.

Table 25: Off-Ramp Queue Analysis – Cumulative and Cumulative plus Project Conditions – Weekday AM and PM Peak Hour

Freeway Off-Ramp	Queue Lengths (ft)	Cumulative						Cumulative Plus Project					
		NBL	NBT	NBR	SBL	SBT	SBR	NBL	NBT	NBR	SBL	SBT	SBR
AM Peak Hour													
1. SR-1 SB off-ramp to Clarinada Ave	Storage Length (ft)	800	-	300	-	-	-	800	-	300	-	-	-
	95th Percentile Queue	100	-	75	-	-	-	100	-	75	-	-	-
2. SR-1 NB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	865	-	360	-	-	-	865	-	360
	95th Percentile Queue	-	-	-	425	-	125	-	-	-	450	-	125
6. I-280 SB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	1,100	-	600	-	-	-	1,100	-	600
	95th Percentile Queue	-	-	-	75	-	25	-	-	-	100	-	25
12. I-280 SB off-ramp to Hickey Blvd	Storage Length (ft)	-	-	-	420	1,130	190	-	-	-	420	1,130	190
	95th Percentile Queue	-	-	-	50	50	50				50	50	50
13. I-280 NB off-ramp to Hickey Blvd	Storage Length (ft)	1,250	350	600	-	-	-	1,250	350	600	-	-	-
	95th Percentile Queue	200	200	275	-	-	-	200	200	275	-	-	-
PM Peak Hour													
1. SR-1 SB off-ramp to Clarinada Ave	Storage Length (ft)	800	-	300	-	-	-	800	-	300	-	-	-
	95th Percentile Queue	200	-	125	-	-	-	200	-	125	-	-	-
2. SR-1 NB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	865	-	360	-	-	-	865	-	360
	95th Percentile Queue	-	-	-	75	-	175	-	-	-	75	-	175
6. I-280 SB off-ramp to Serramonte Blvd	Storage Length (ft)	-	-	-	1,100	-	600	-	-	-	1,100	-	600
	95th Percentile Queue	-	-	-	225	-	275	-	-	-	225	-	275
12. I-280 SB off-ramp to Hickey Blvd	Storage Length (ft)	-	-	-	420	1,130	190	-	-	-	420	1,130	190
	50th Percentile Queue	-	-	-	125	125	125	-	-	-	125	125	125
13. I-280 NB off-ramp to Hickey Blvd	Storage Length (ft)	1,250	350	600	-	-	-	1,250	350	600	-	-	-
	95th Percentile Queue	300	300	200	-	-	-	300	300	200	-	-	-

Source: Kittelson & Associates, Inc., 2017.
Storage length based on distance to the off-ramp gore point.

Chapter 7
Other Transportation Issues

7. OTHER TRANSPORTATION ISSUES

7.1 CONGESTION MANAGEMENT PROGRAM

The Congestion Management Program analysis segments in the vicinity of the Project are the freeway facilities of Interstate 280 and State Route 1. The Project's impact on these facilities was discussed in the previous sections based on the CMP significance criteria. Therefore, all impacts and proposed mitigation measures were included in the freeway sections of the Existing plus Project and Cumulative plus Project Conditions analysis sections.

7.2 PARKING ASSESSMENT

The Project is proposed to provide a total of 607 parking spaces, of which 187 parking spaces would be for the hotel uses and 420 parking spaces for the residential uses. The two land uses will have their own parking areas and the parking spaces will not be shared. This parking analysis assessed the adequacy of the proposed number of parking spaces based on the City's parking requirements as well as the parking demand estimation according to *Parking Generation* (4th edition, 2010) published by the Institute of Transportation Engineers (ITE).

Proposed Land Uses

A review of the parking requirements and estimated parking demand for each of the proposed land uses is shown in Table 26. For this assessment, the residential and the hotel uses are analyzed separately as the proposed parking spaces would be in separate locations and would not be shared.

City Parking Requirement

Table 26 summarizes the number of parking spaces required based on the City of Daly City's Municipal Code[9] for the Project. The Project requires 606 parking spaces for the residential (condo) land use, and 210 parking spaces for the hotel land use. The site plan currently shows that the development will provide 420 parking spaces for the residential (condo) land use, and 187 parking spaces for the hotel land use. When comparing to the City's parking requirement, there will

[9] City of Daly City Municipal Code, Section 17.34.020
https://www.municode.com/library/ca/daly_city/codes/code_of_ordinances?nodeId=TIT17ZO_CH17.34OREPALO_17.34.020SCPARE

be a parking space shortage of 186 spaces for the residential uses and a parking space shortage of 23 spaces for the hotel uses.

Parking Demand

Parking demand for the Project was estimated by using the parking generation rates provided in the ITE's *Parking Generation Manual*. Similar to the trip generation, these rates were applied to the land uses for the proposed Project. A summary of the parking demand estimate for the Project is shown in Table 26. As shown in the table, there would not be sufficient parking provided by the Project to meet the estimated parking demand associated with the Project, specifically for the Condo land use.

Table 26: Parking Generation and Requirements

Land Use Category		Amount		Source	Parking Demand		City's Parking Requirement		Parking Spaces Provided	Meet City's Requirement ?
					Rate	Spaces	Rate	Spaces		
Condo	1 Bedroom Unit	80	Dwelling Unit	ITE 230	1.38	446	1.5/unit	120		
	2 Bedroom Unit	227	Dwelling Unit				2/unit	454		
	3 Bedroom Unit	16	Dwelling Unit				2/unit	32		
Condo - Total						*446*		*606*	*420*	*No*
Hotel		200	Room	ITE 310	0.89[1]	157	1/room & 1/ 300 ft^2 lobby	210		
Hotel - Total						*157*		*210*	*187*	*No*
Total Parking Spaces						603		816	607	--

Source: ITE Parking Generation Manual 4th Edition; Kittelson & Associates, Inc., 2017.

[1] Rate is based on numbers of occupied room. For this analysis, 100% occupancy rate is assumed, which is very conservative.

7.3 EXCLUSIVE LEFT-TURN LANE AT PROJECT DRIVEWAY

The intersection of Serramonte Boulevard/Serramonte Shopping Center Driveway/Project Driveway is currently a 3-way intersection with the north leg serving the Serramonte Shopping Center. With the Project, a south leg would be added to this intersection, which would serve as the only driveway for the Project. This intersection is currently a signalized intersection, with a protected eastbound left-turn lane into the Serramonte Shopping Center. For the westbound direction, this intersection currently has two westbound through lanes and an exclusive right-turn lane.

With the addition of the Project, the need for an exclusive westbound left-turn lane was analyzed. According to the Highway Capacity Manual (HCM) (Transportation Research Board, Washington, D.C., 2000), the presence of exclusive left-turn lanes should be determined based on the volume of left-turn traffic, opposing volumes and safety considerations. Based on Exhibit 10-13 in HCM2000, 100 left-turn vehicles per hour would warrant an exclusive left-turn lane. As shown in Figure 9, the Project would generate 124 westbound left-turn vehicles during the PM peak hour. Therefore, an exclusive westbound left-turn lane is recommended at this intersection.

To improve the Project driveway operations, the following intersection improvements are recommended at the intersection of Serramonte Boulevard/Serramonte Shopping Center Driveway/Project Driveway:

Recommendation 1: Re-stripe the westbound approach on Serramonte Boulevard to provide a left-turn lane, two through lanes, and one right-turn lane. Reconfigure the signal to allow for a protected left-turn for the westbound approach, and split phasing for the northbound and southbound approaches.

7.4 VEHICLE QUEUEING ANALYSIS AT PROJECT DRIVEWAY

A vehicle queuing analysis was performed at the intersection of Serramonte Boulevard/Serramonte Shopping Center Driveway/Project Driveway, which would serve as the only Project driveway for the Project. The operations analysis is based on vehicle queuing for high demand movements at the intersection. Vehicle queues were estimated using a Poisson probability distribution. The basis of the analysis is as follows:

1. The Poisson probability distribution is used to estimate the 95th percentile maximum number of queued vehicles per signal cycle for a particular movement;
2. The estimated maximum number of vehicles in the queue is translated into a queue length, assuming 25 feet per vehicle; and
3. The estimated maximum queue length is compared to the existing or planned available storage capacity for the movement.

This analysis thus provides a basis for estimating future storage requirements at the Project Driveway. The queue estimates and a tabulated summary of the findings are provided in Table 27 for the westbound left-turn movements on Serramonte Boulevard entering the project site.

Under the Existing Conditions and the Cumulative Conditions, there is no westbound left-turning movement at the intersection of Serramonte Boulevard/Serramonte Shopping Center Driveway/Project Driveway since the project site is currently undeveloped, and there is currently no westbound left-turn lane identified. Under the Existing plus Project and Cumulative plus Project Conditions, traffic would access the project site via three movements: 1) westbound left-turn movement; 2) eastbound right-turn movement; and 3) southbound through movement. For this analysis, only the westbound left-turn movement is considered. The results of the queue analysis are shown in Table 27.

Existing plus Project Conditions

The results of the queuing calculations for the intersection of Serramonte Boulevard/Serramonte Shopping Center Driveway/Project Driveway show that for the Existing plus Project Conditions, the westbound left-turn 95th percentile queue would be 105 feet during the AM peak hour, and 230 feet during the PM peak hour. Therefore the westbound left-turn pocket would need to be at least 230 feet to accommodate the anticipated queue.

Cumulative plus Project Conditions

The results of the queuing calculations for the intersection of Serramonte Boulevard/Serramonte Shopping Center Driveway/Project Driveway show that for the Cumulative plus Project Conditions, the westbound left-turn 95th percentile queue would be 115 feet during the AM peak hour, and 240 feet during the PM peak hour. Therefore the westbound left-turn pocket would need to be at least 240 feet to accommodate the anticipated queue.

Table 27: Vehicle Queuing Analysis at Project Driveway

Intersection	Scenario	95th Percentile Queue Length (feet)		Recommended Queue Pocket Length (feet)
		AM Peak Hour	PM Peak Hour	
Westbound Left Turn Movement at Serramonte Center Driveway /Serramonte Blvd /Project Driveway	Existing plus Project	105	230	240
	Cumulative plus Project	115	240	

Source: Kittelson & Associates, Inc., 2017.

Recommendation 2: Provide a westbound left-turn lane with a minimum of 240 feet turn pocket.

Recommendations 1 and 2 are assumed as part of the Project for the intersection of Serramonte Center Driveway/Project Driveway/Serramonte Boulevard, and the corresponding LOS are shown in Table 10, Table 11, Table 21 and Table 22.

7.5 SITE ACCESS

The conceptual site plan was reviewed to assess any potential hazards due to Project design. The primary design issues considered were a review of the queue lengths and the intersection design of the Project driveway. A review of the internal design was also performed, but because the conceptual plan lacks sufficient details, the internal design assessment is limited to a high level basis. A more thorough review should be performed during the entitlement process to ensure that all proposed designs comply with City standards.

As indicated in Section 7.3, the Project Driveway is via the intersection of Serramonte Boulevard/Serramonte Shopping Center Driveway/Project Driveway. Therefore, all inbound and outbound traffic from the Project would have to access this intersection. The conceptual site plan shows that at the main entrance of the project site, there are three internal roadways that would access the main entrance. This will potentially create a conflict for inbound and outbound traffic. The City should examine the operation at this main entrance in detail prior to finalizing the site plans to ensure that there would not be any operational conflicts at this location.

7.6 SAFETY ISSUES

An assessment of issues affecting safety including queuing at intersections and site access were reviewed. To improve safety and pedestrian accessibility to the project site, it is recommended that

the City of Daly City require the following pedestrian facility improvements as part of the proposed Project:

Recommendation 3: Following the Americans with Disabilities Act Accessibility Guidelines (ADAAG), construct a sidewalk on the south side of Serramonte Boulevard between the Project Driveway (at Serramonte Shopping Center Driveway West) and Callan Boulevard. In addition, construct a crosswalk on the east leg of the intersection of Serramonte Boulevard and Project Driveway/Serramonte Shopping Center Driveway West. With these two improvements, pedestrians would have the adequate access to the project site.

Chapter 8
Traffic Impacts During Construction

8. TRAFFIC IMPACTS DURING PROJECT CONSTRUCTION

This section provides an analysis of the potential impacts of construction vehicles on existing traffic conditions for the during project construction.

8.1 CONSTRUCTION TRAFFIC GENERATION

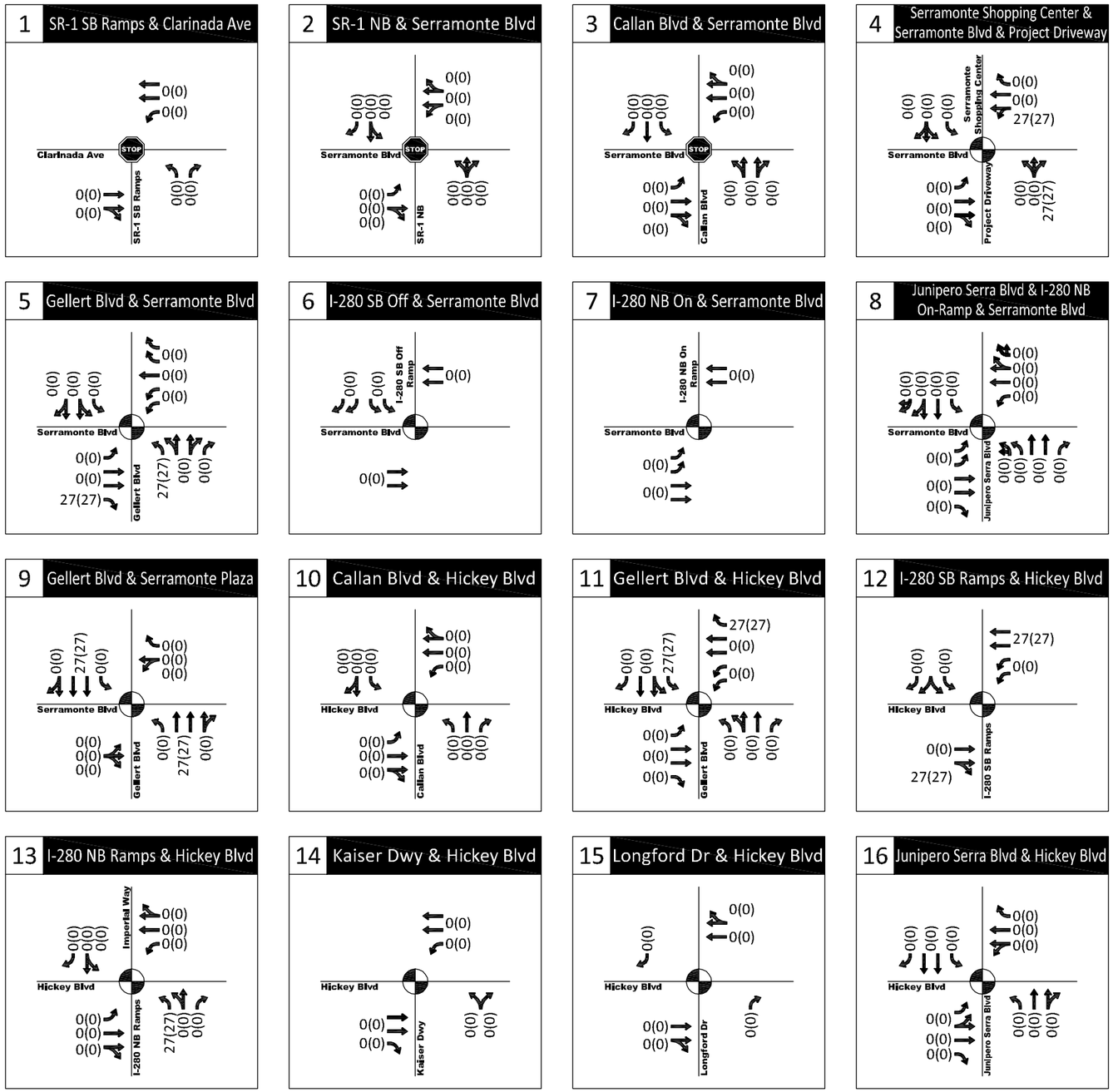
The number of trips generated by Project-related construction vehicles during the construction phase of the Project were estimated to evaluate the impact of construction vehicles on traffic operations in the project vicinity. The Project sponsor has indicated that 14,300 truck trips would be required over a 60-day grading period in order to off-haul all the soil from excavation at the project site. Assuming a nine-hour workday over a 60-day grading period, there would be an estimated 27 off-haul round trips per hour.

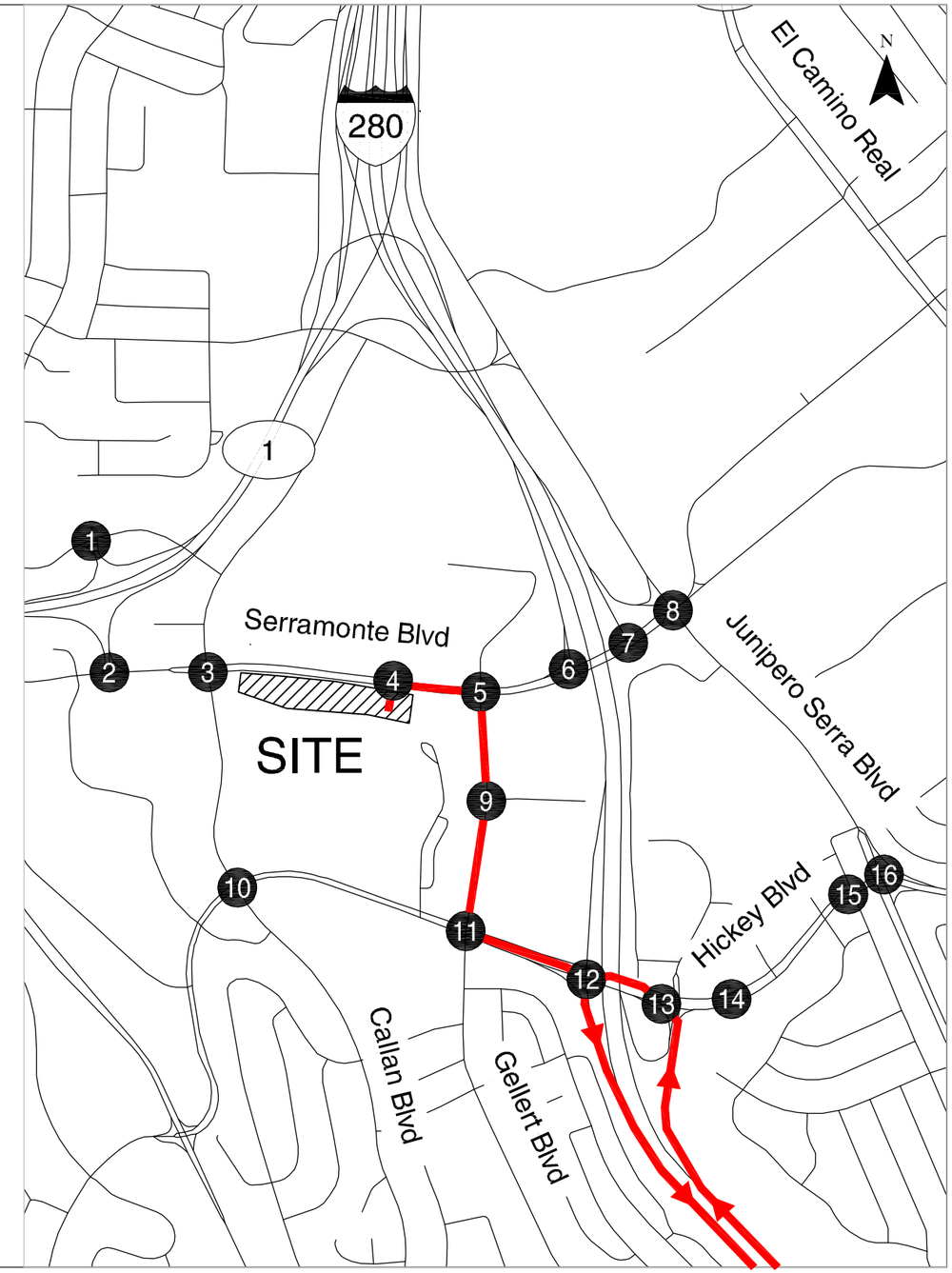
8.2 CONSTRUCTION TRAFFIC DISTRIBUTION

The proposed truck route would use the I-280 interchange at Hickey Boulevard and Gellert Boulevard to and from the project site. Figure 10 shows the proposed vehicle route and the resulting numbers of peak hour truck trips added to each intersection approach.

As shown in Figure 10, the construction vehicles would access the project site from South San Francisco via northbound I-280, exiting and making a left-turn at Hickey Boulevard, followed by a right-turn at Gellert Boulevard, then a left-turn at Serramonte Boulevard, and lastly a left-turn into the project site. The construction vehicles would depart the site using a reversed route. Based on this travel path, construction vehicles would travel through the following study intersections:

- #4: Serramonte Boulevard/Shopping Center Entrance/Project Driveway
- #5: Serramonte Boulevard/Gellert Boulevard
- #9: Gellert Boulevard/Serramonte Plaza
- #11: Gellert Boulevard/Hickey Boulevard
- #12: Hickey Boulevard/I-280 SB Ramps
- #13: Hickey Boulevard/I-280 NB Ramps





LEGEND

XX - AM PEAK

(0) - PM PEAK

- SIGNALIZED

- TWO-WAY STOP-CONTROL

- ALL-WAY STOP-CONTROL

CONSTRUCTION VEHICLE ROUTE TO/FROM PROJECT SITE

Project Construction Vehicle Trip Generation & Assignment
Daly City, CA

FIGURE
10

8.3 ANALYSIS METHODOLOGY

The hourly trips generated during construction were added to the Existing Conditions traffic volumes. The following assumptions were made for the analysis:

Intersection Configurations

The lane geometry at each intersection was assumed to be the same for both the Existing and Existing plus Construction scenarios.

At the Serramonte Boulevard/Shopping Center Entrance/Project Driveway intersection (#4), a signal phase was added to allow for construction vehicles to exit the site, which would run concurrently with the southbound shopping center driveway approach at the intersection.

Truck Impacts on Intersection Operations

The intersection LOS calculations were updated to account for heavy vehicles using the operational methodology outlined in the 2010 *Highway Capacity Manual* (HCM) (Transportation Research Board, Washington, D.C., 2010). Heavy vehicles are accounted for by converting them to 2.0 "passenger car equivalents" (PCE). The heavy vehicle percentage was recalculated along the construction vehicle travel path for each affected turning movement at each study intersection to include the project construction vehicles. The recalculated heavy vehicle percentage was based on the original traffic count, the original heavy vehicle percentage, and the number of project construction vehicles added by turning movement. The Vistro Version 4 software was used to update the intersection operations calculations accounting for the higher percentages of heavy vehicles.

8.4 IMPACT CRITERIA

An impact due to project construction vehicles was considered to be significant if the intersection operations would conflict with level of service (LOS) impact criteria from the appropriate jurisdiction for each study intersection.

8.5 INTERSECTION OPERATIONS

The results of the intersection LOS analysis under the Existing and Existing plus Construction conditions are summarized in Table 28 and Table 29, for the AM and PM peak hour, respectively. The results indicate that all study intersections along the heavy vehicle travel path would operate at LOS D or better during both the AM and PM peak hours. There would be no intersection operational issues or impacts under the Existing plus Construction Conditions.

The LOS calculation sheets are included in Appendix 11.

Table 28: Intersection Level of Service – Existing Plus Construction Conditions – AM Peak Hour

#	North/South Street	East/West Street	Control	Existing		Existing plus Construction	
				Delay	LOS	Delay	LOS
4	Serramonte Center Driveway/ Project Driveway	Serramonte Boulevard	Signalized	8.1	A	9.0	A
5	Gellert Boulevard	Serramonte Boulevard	Signalized	11.9	B	12.3	B
9	Gellert Boulevard	Serramonte Plaza	Signalized	24.6	C	24.6	C
11	Gellert Boulevard	Hickey Boulevard	Signalized	29.7	C	30.0	C
12	I-280 SB Ramps	Hickey Boulevard	Signalized	9.2	A	9.2	A
13	I-280 NB Ramps	Hickey Boulevard	Signalized	26.9	C	27.0	C

Table 29: Intersection Level of Service – Existing Plus Construction Conditions – PM Peak Hour

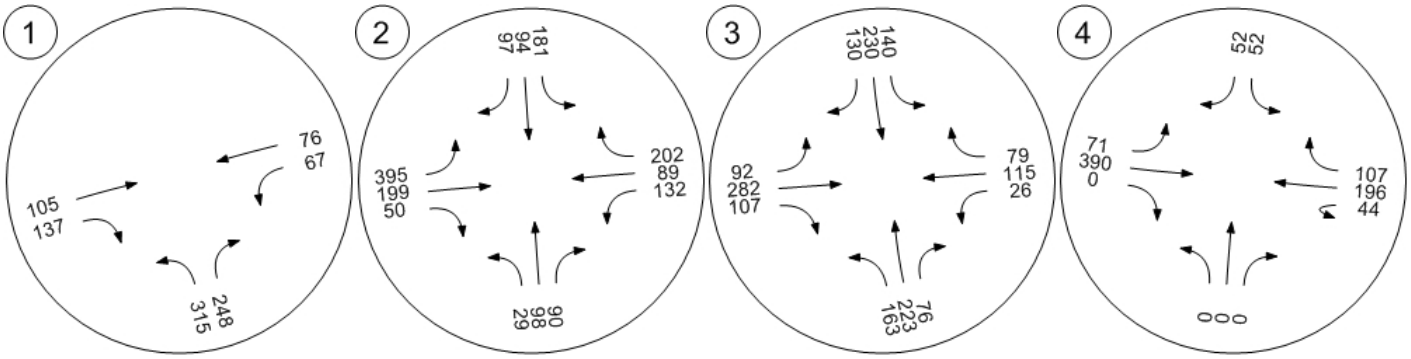
#	North/South Street	East/West Street	Control	Existing		Existing plus Construction	
				Delay	LOS	Delay	LOS
4	Serramonte Center Driveway/ Project Driveway	Serramonte Boulevard	Signalized	13.0	B	14.5	B
5	Gellert Boulevard	Serramonte Boulevard	Signalized	46.8	D	52.6	D
9	Gellert Boulevard	Serramonte Plaza	Signalized	32.6	C	32.5	C
11	Gellert Boulevard	Hickey Boulevard	Signalized	49.4	D	53.2	D
12	I-280 SB Ramps	Hickey Boulevard	Signalized	10.5	B	10.6	B
13	I-280 NB Ramps	Hickey Boulevard	Signalized	24.0	C	24.7	C

Source: Kittelson & Associates, Inc. 2017.
PM Peak Hour analyses were based on counts conducted in May 2015, with adjustments to add in the trips generated by the partially occupied Christopher Highlands Development.
Note: Only intersections that are along the Project construction vehicle path are shown in the table above.

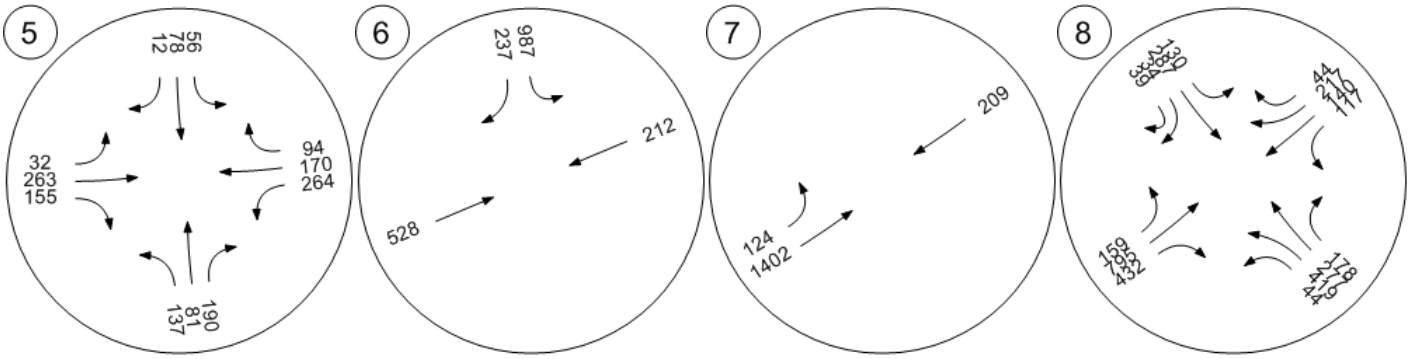
Appendix 1
Intersection Turning Movement Volume Figures

Traffic Volume - Base Volume

WB Hwy 1 Ramps / Clarinad EB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

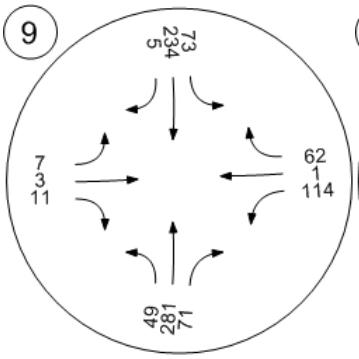


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

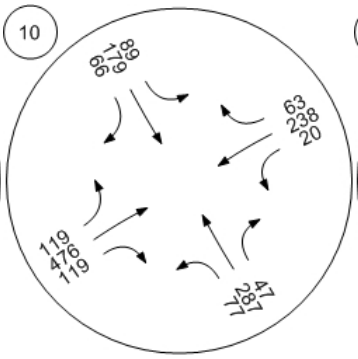


Traffic Volume - Base Volume

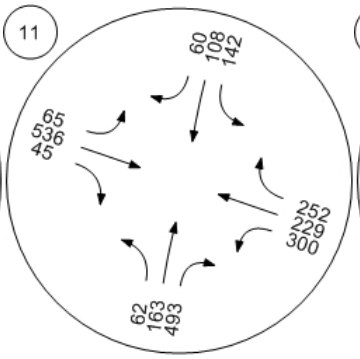
Gellert Blvd / Serramonte Pla



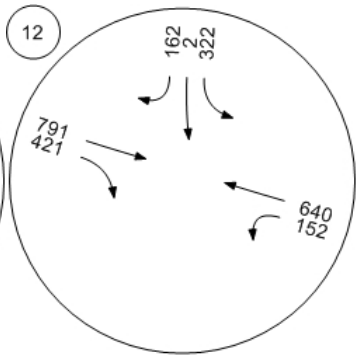
Callan Blvd / Hickey Blvd



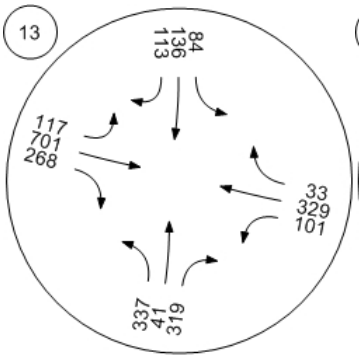
Gellert Blvd / Hickey Blvd



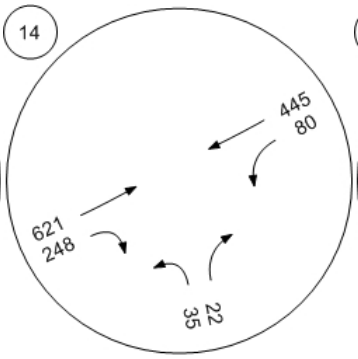
I-280 SB Ramps / Hickey Blv



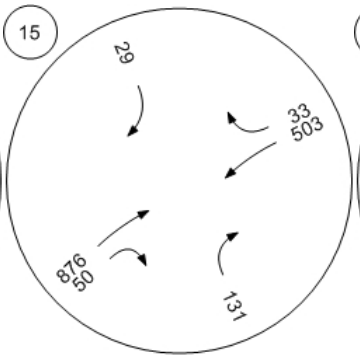
I-280 NB Ramps / Hickey Blv



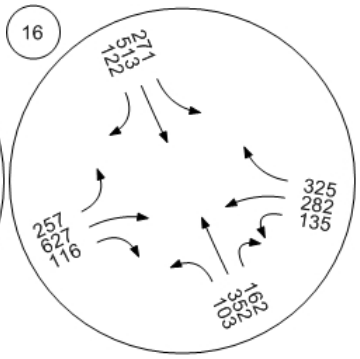
Kaiser / Hickey Blvd



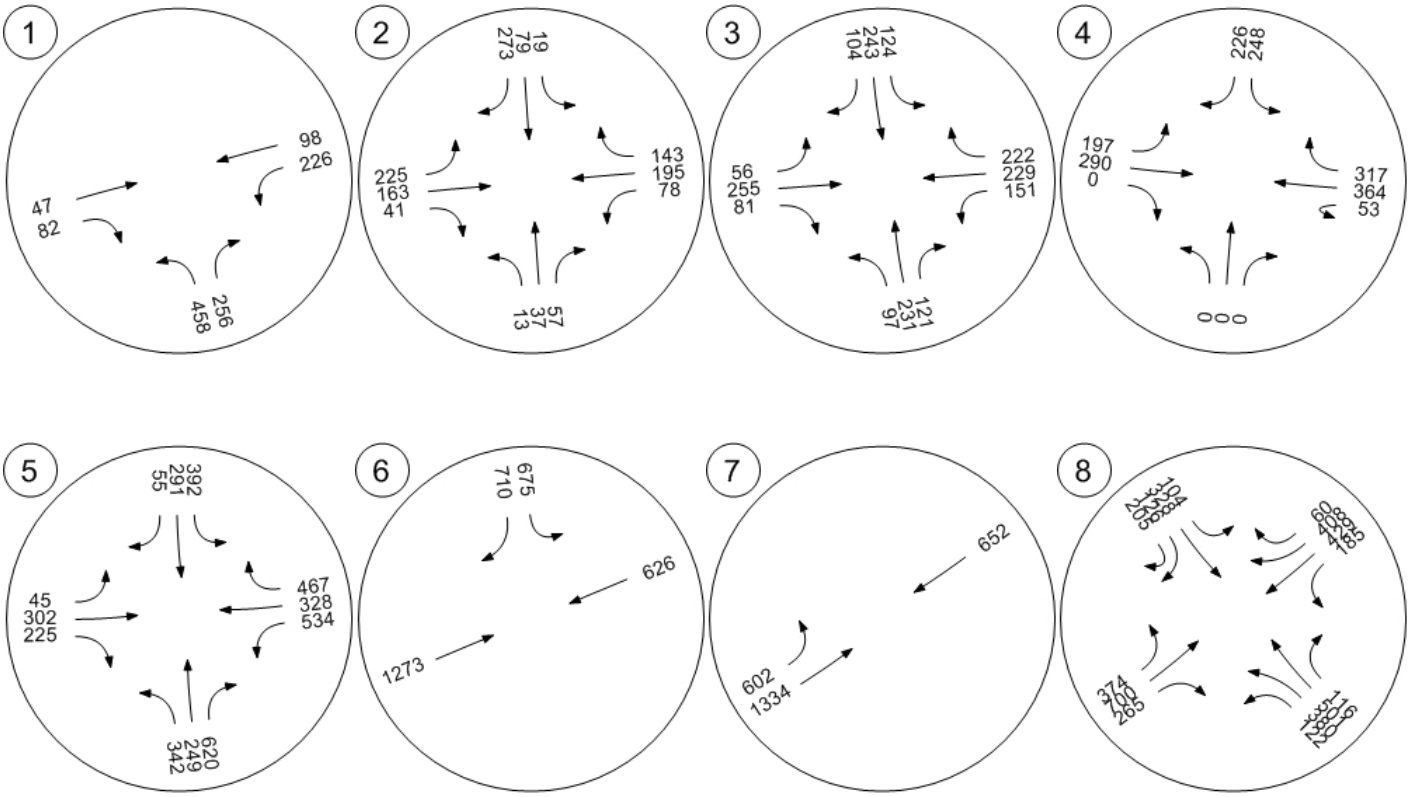
Longford Dr / Hickey Blvd



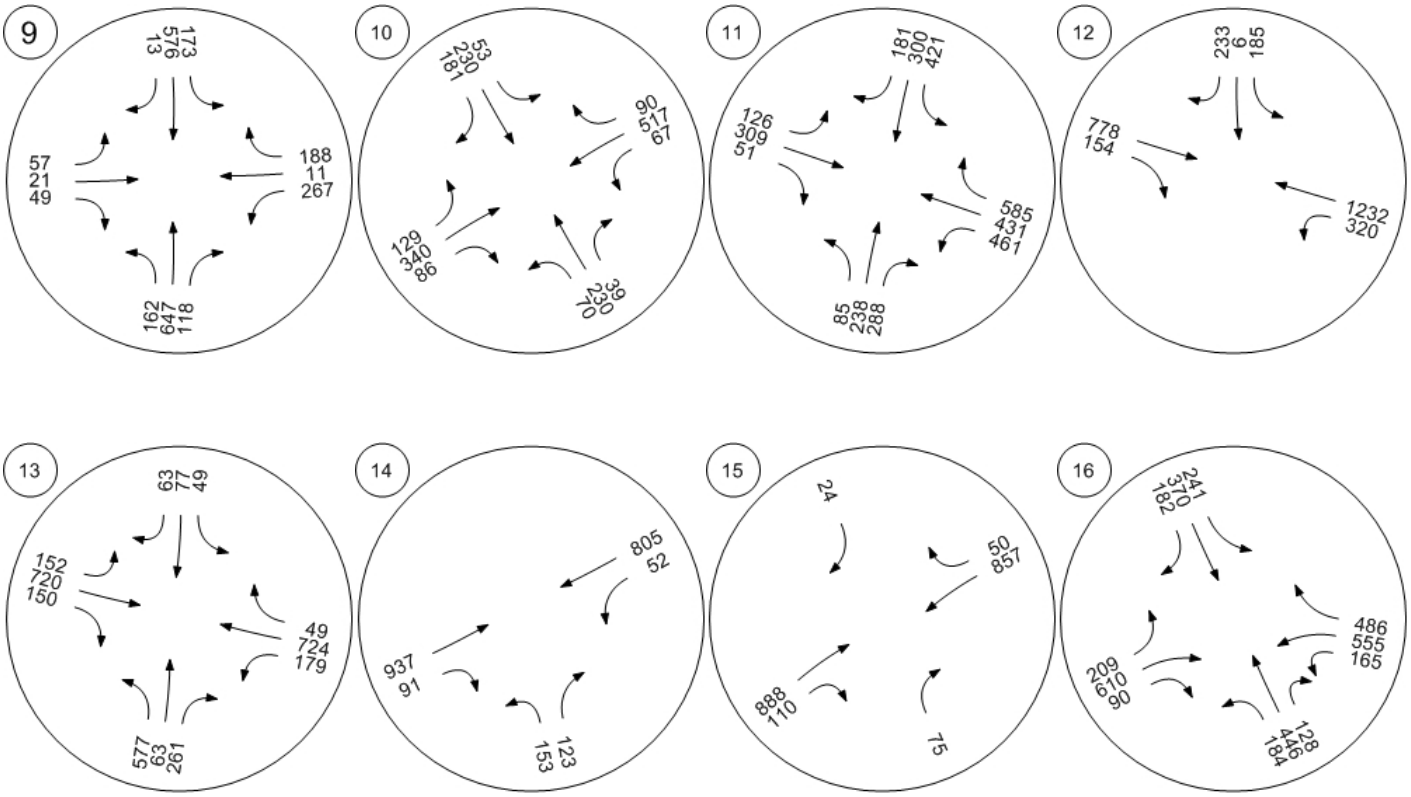
Junipero Serra Blvd / Hickey



Traffic Volume - Future Total Volume

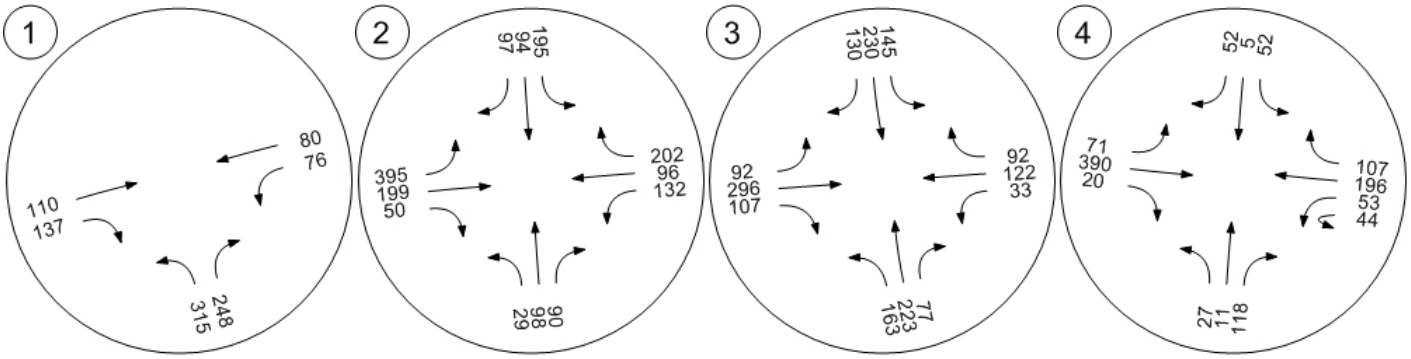


Traffic Volume - Future Total Volume

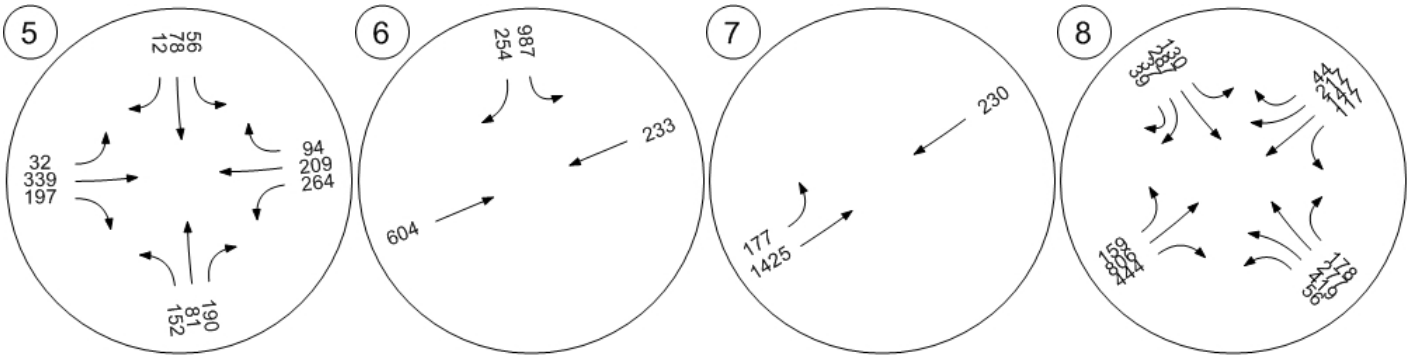


Traffic Volume - Future Total Volume

WB Hwy 1 Ramps / Clarinad EB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

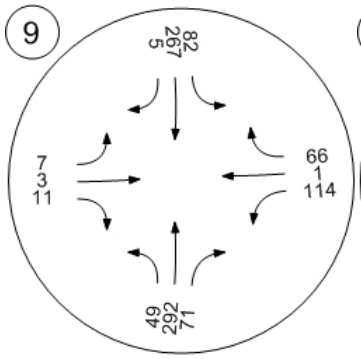


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

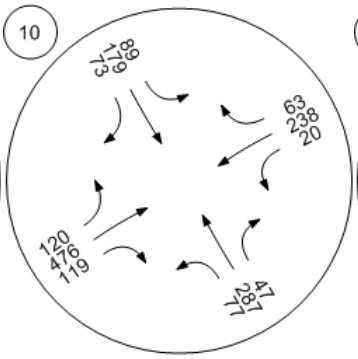


Traffic Volume - Future Total Volume

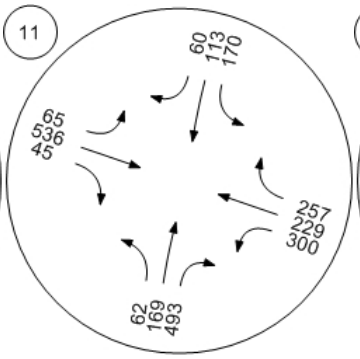
Gellert Blvd / Serramonte Pla



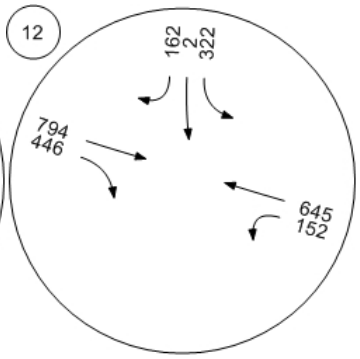
Callan Blvd / Hickey Blvd



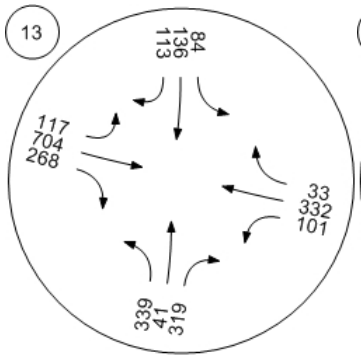
Gellert Blvd / Hickey Blvd



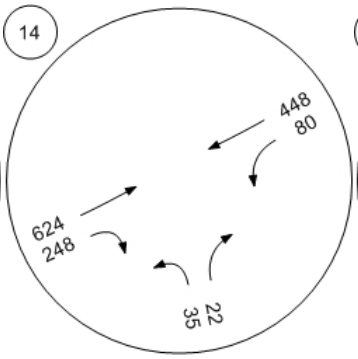
I-280 SB Ramps / Hickey Blv



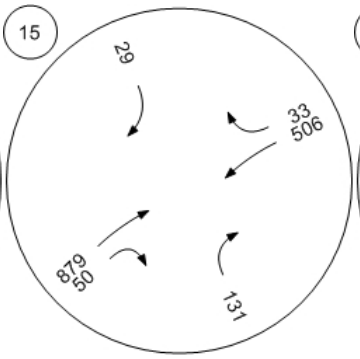
I-280 NB Ramps / Hickey Blv



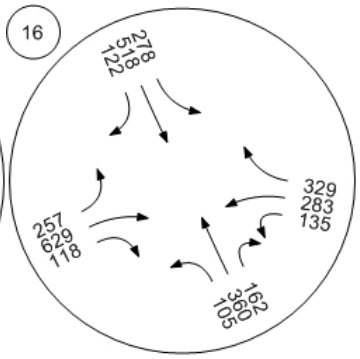
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd

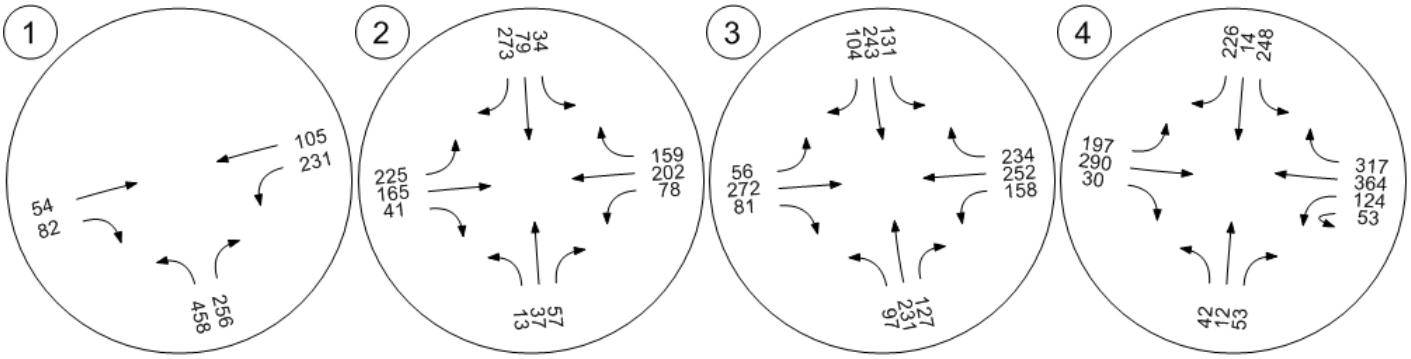


Junipero Serra Blvd / Hickey

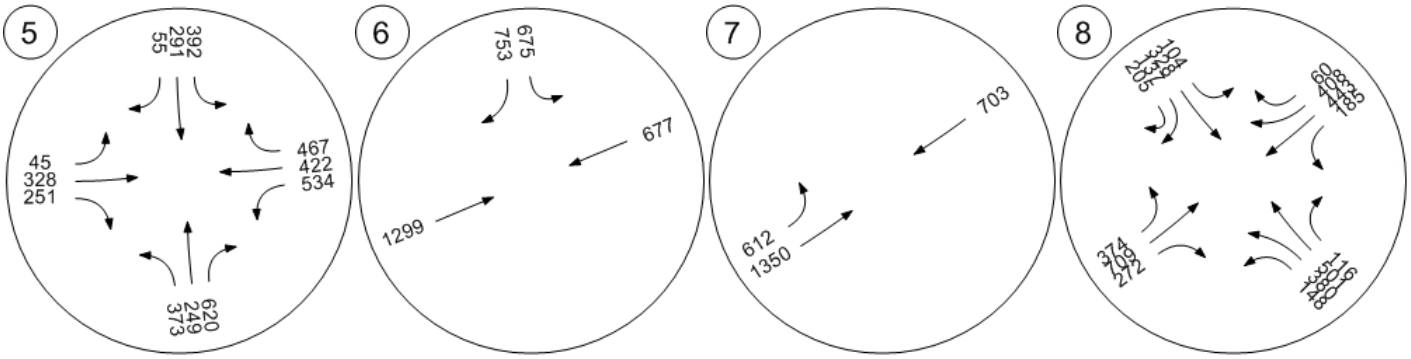


Traffic Volume - Future Total Volume

SB Hwy 1 Ramps / Clarinada NB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

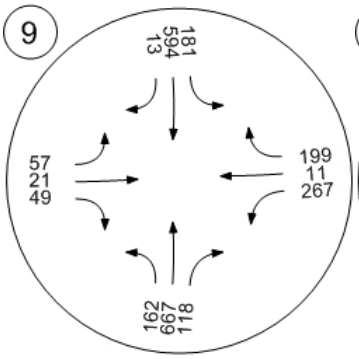


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

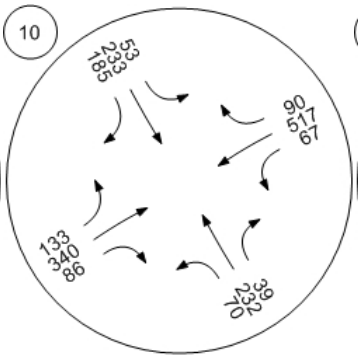


Traffic Volume - Future Total Volume

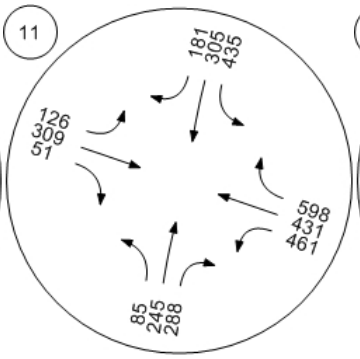
Gellert Blvd / Serramonte Pla



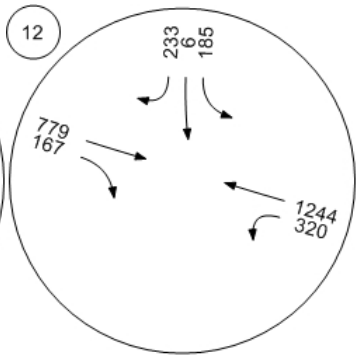
Callan Blvd / Hickey Blvd



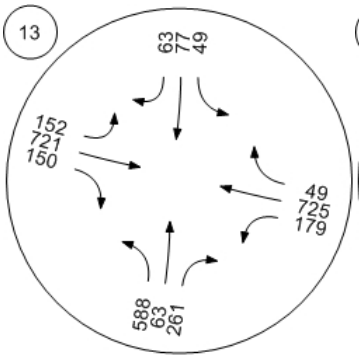
Gellert Blvd / Hickey Blvd



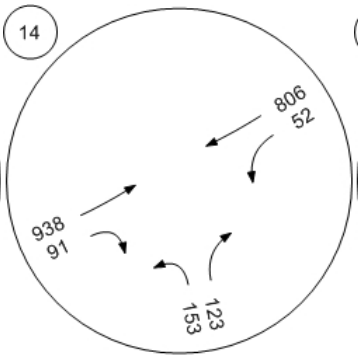
I-280 SB Ramps / Hickey Blv



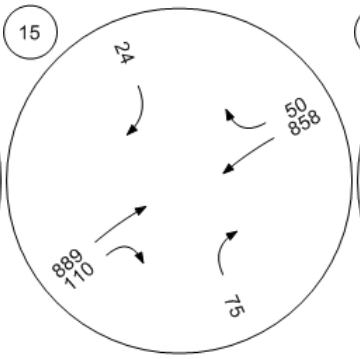
I-280 NB Ramps / Hickey Blv



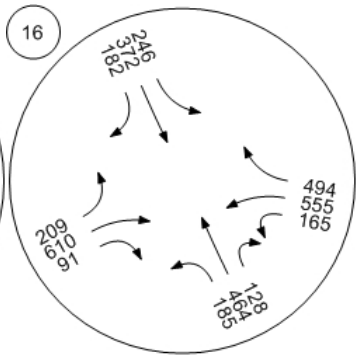
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd

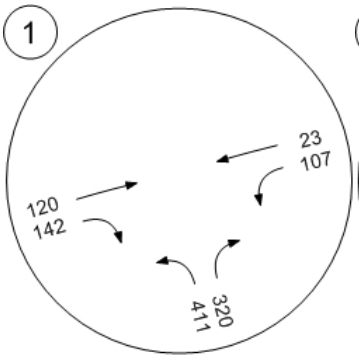


Juniper Serra Blvd / Hickey B

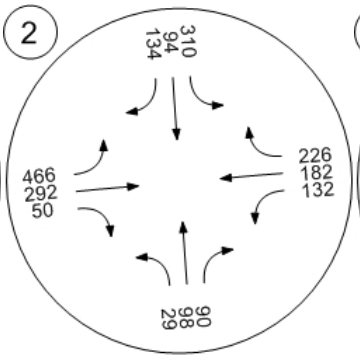


Traffic Volume - Base Volume

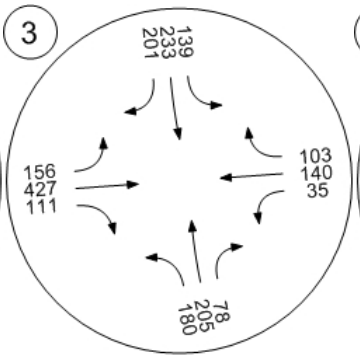
WB Hwy 1 Ramps / Clarinad



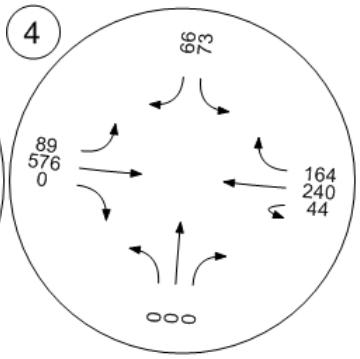
EB Hwy 1 Ramps / Serramon



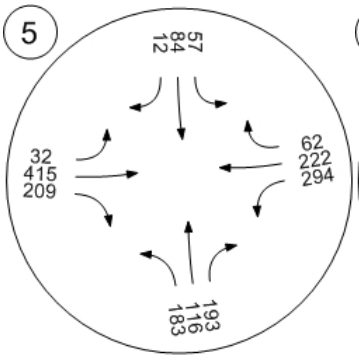
Callan Blvd / Serramonte Blv



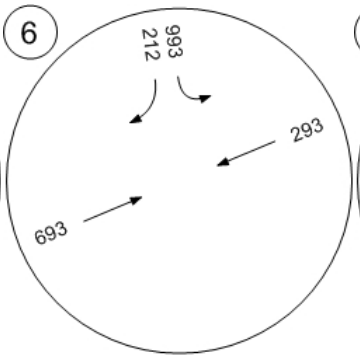
Serramonte Shopping Center



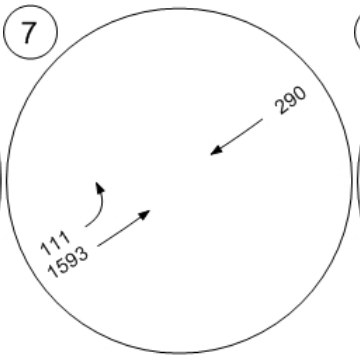
Gellert Blvd / Serramonte Blv

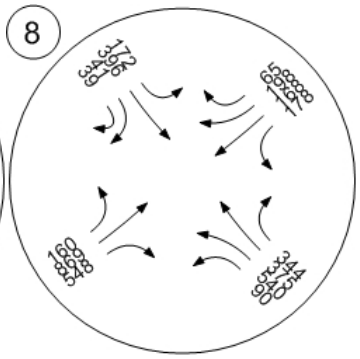


I-280 SB Off-Ramp / Serramo



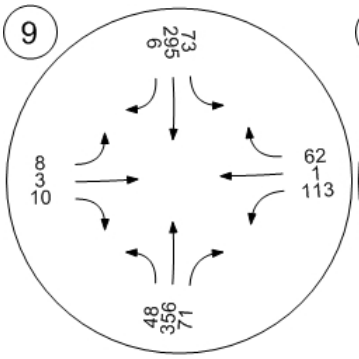
I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram



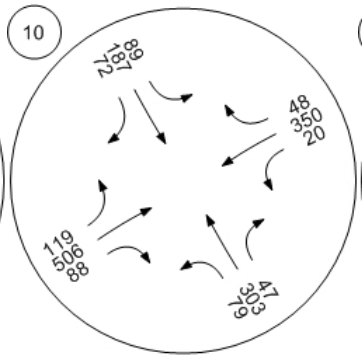


Traffic Volume - Base Volume

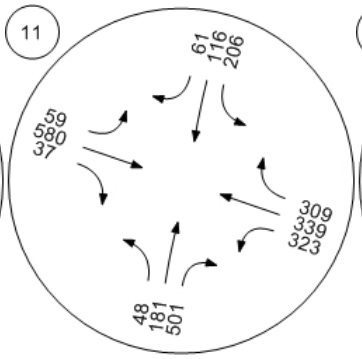
Gellert Blvd / Serramonte Pla



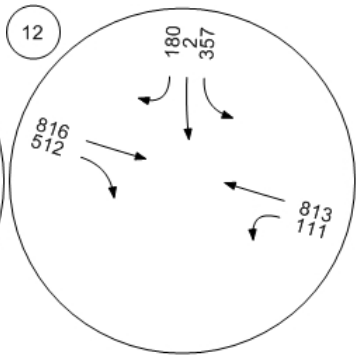
Callan Blvd / Hickey Blvd



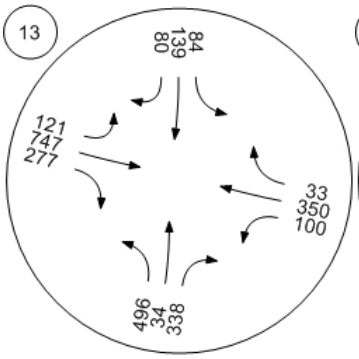
Gellert Blvd / Hickey Blvd



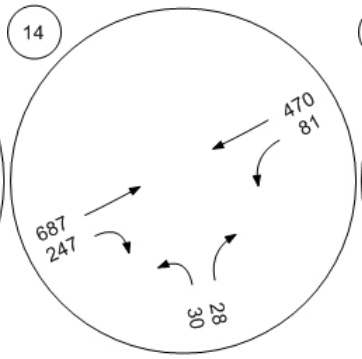
I-280 SB Ramps / Hickey Blv



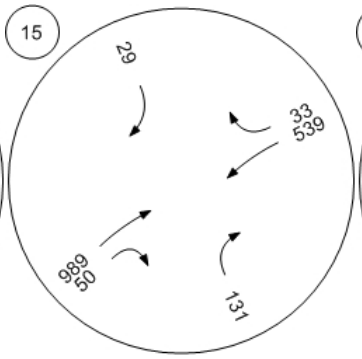
I-280 NB Ramps / Hickey Blv



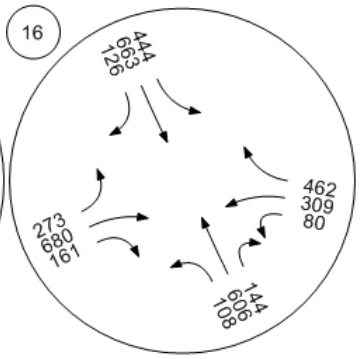
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd

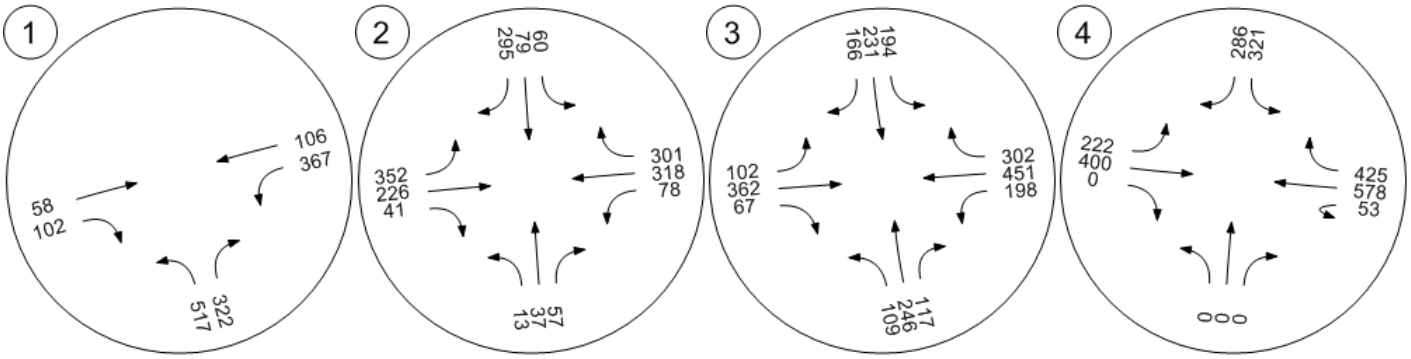


Junipero Serra Blvd / Hickey

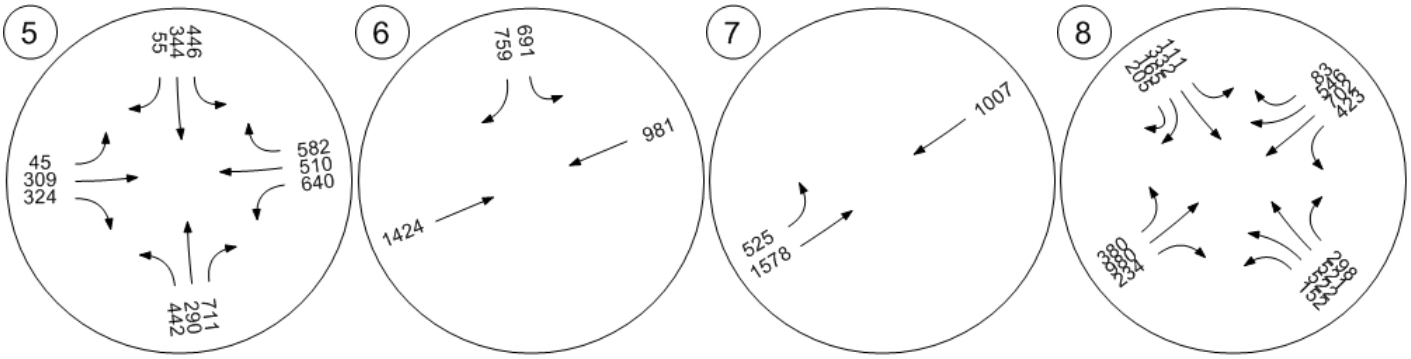


Traffic Volume - Base Volume

SB Hwy 1 Ramps / Clarinada NB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

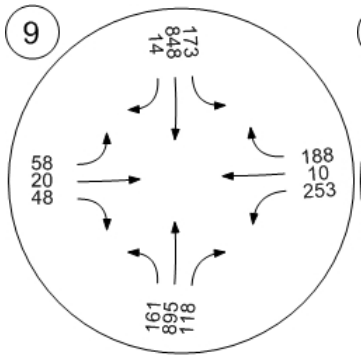


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

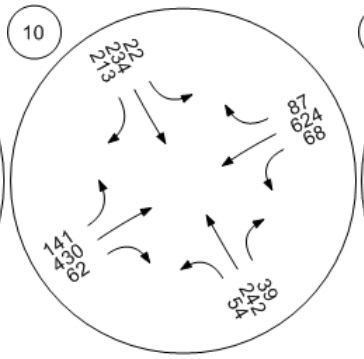


Traffic Volume - Base Volume

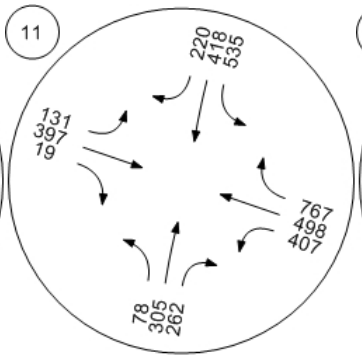
Gellert Blvd / Serramonte Pla



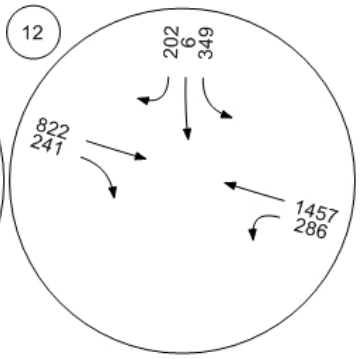
Callan Blvd / Hickey Blvd



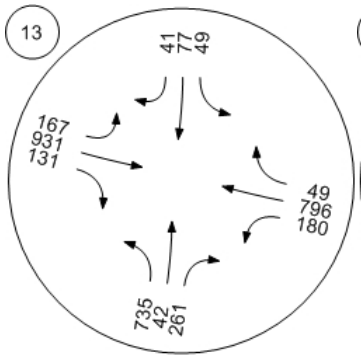
Gellert Blvd / Hickey Blvd



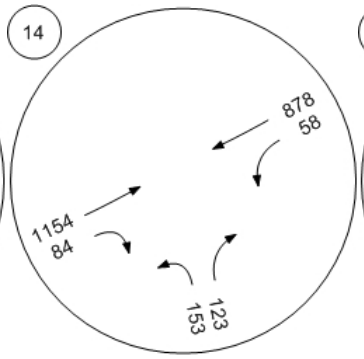
I-280 SB Ramps / Hickey Blv



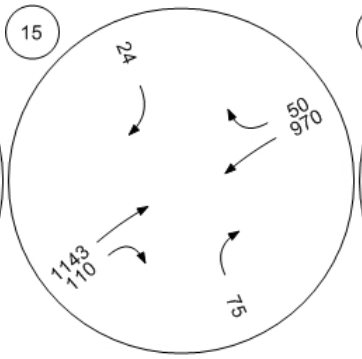
I-280 NB Ramps / Hickey Blv



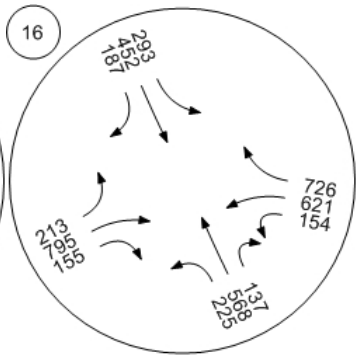
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd

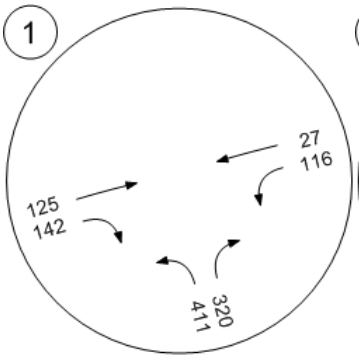


Juniper Serra Blvd / Hickey B

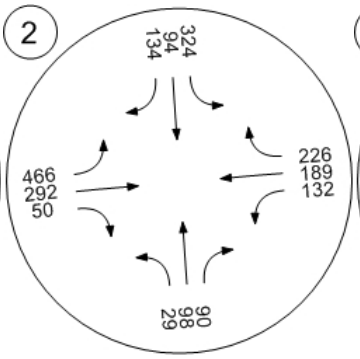


Traffic Volume - Future Total Volume

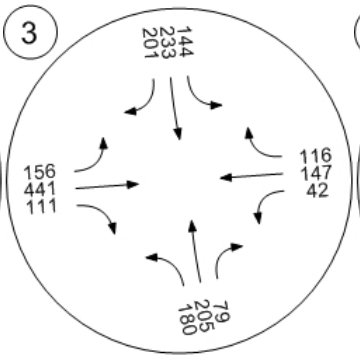
WB Hwy 1 Ramps / Clarinad



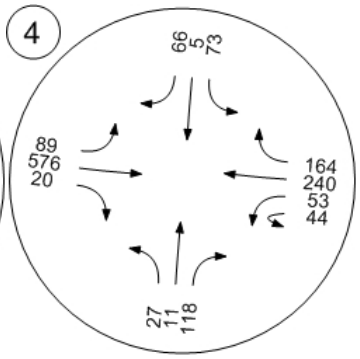
EB Hwy 1 Ramps / Serramon



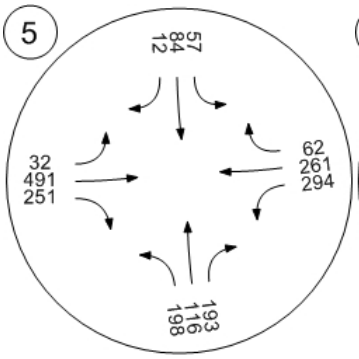
Callan Blvd / Serramonte Blv



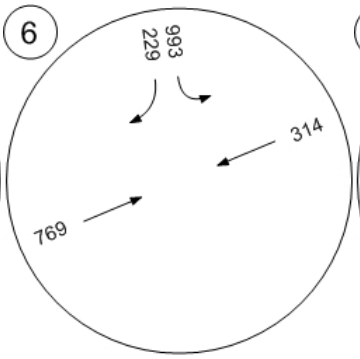
Serramonte Shopping Center



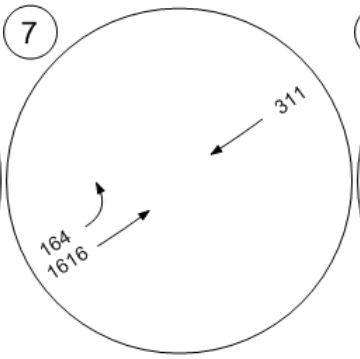
Gellert Blvd / Serramonte Blv

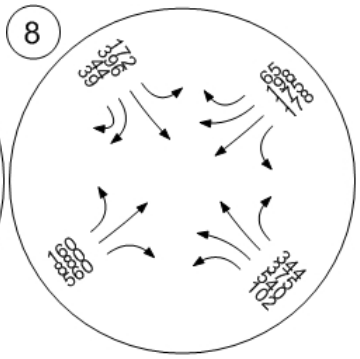


I-280 SB Off-Ramp / Serramo



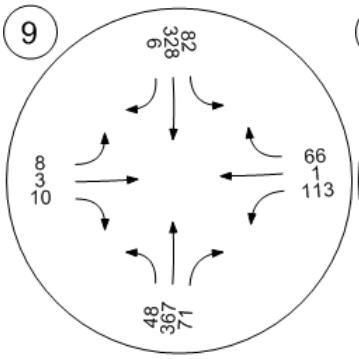
I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram



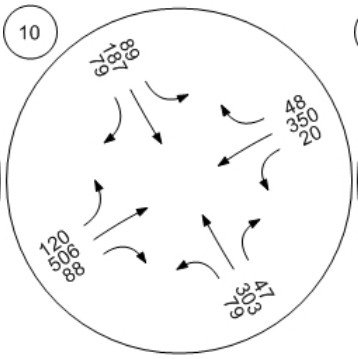


Traffic Volume - Future Total Volume

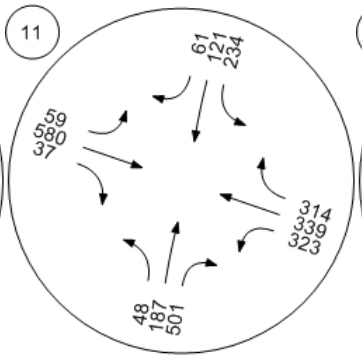
Gellert Blvd / Serramonte Pla



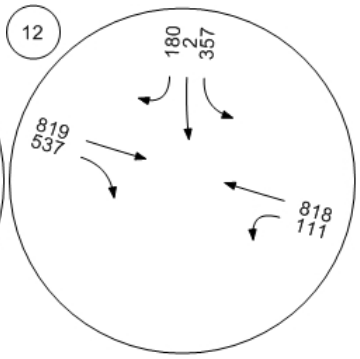
Callan Blvd / Hickey Blvd



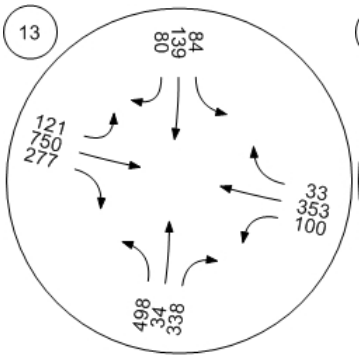
Gellert Blvd / Hickey Blvd



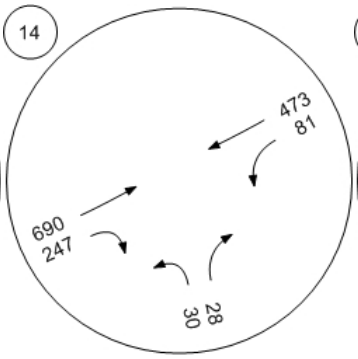
I-280 SB Ramps / Hickey Blv



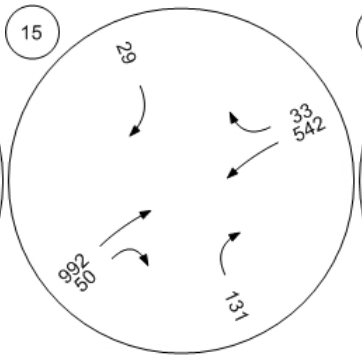
I-280 NB Ramps / Hickey Blv



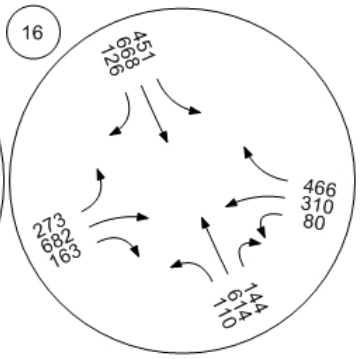
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd

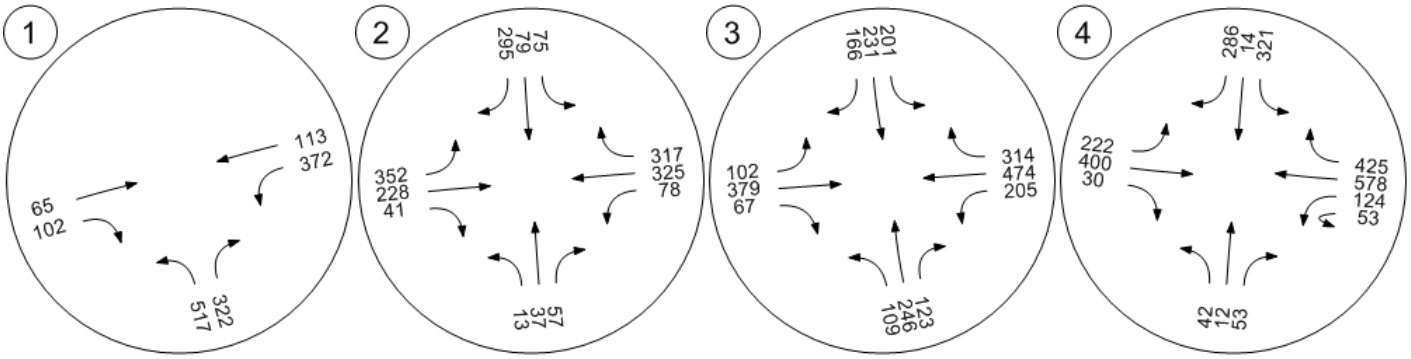


Junipero Serra Blvd / Hickey

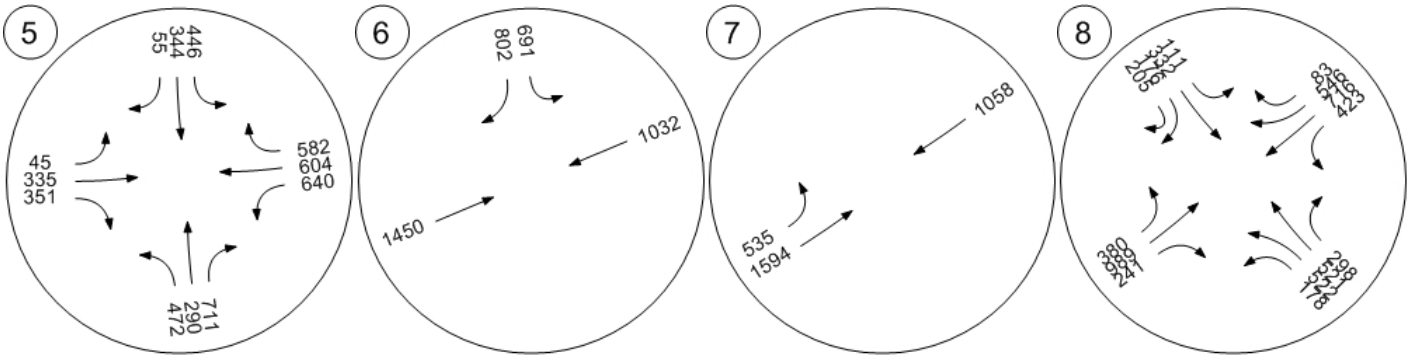


Traffic Volume - Future Total Volume

SB Hwy 1 Ramps / Clarinada NB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

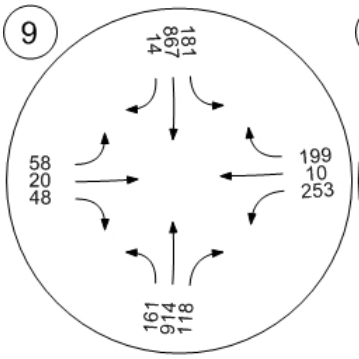


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

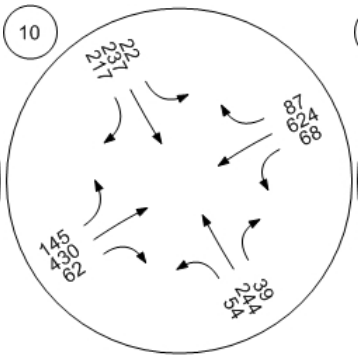


Traffic Volume - Future Total Volume

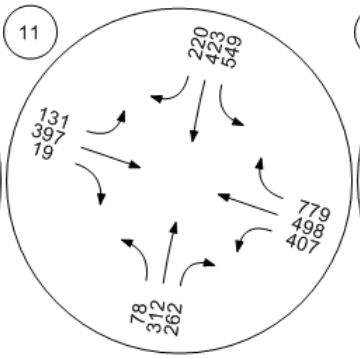
Gellert Blvd / Serramonte Pla



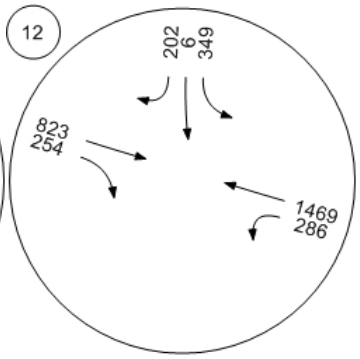
Callan Blvd / Hickey Blvd



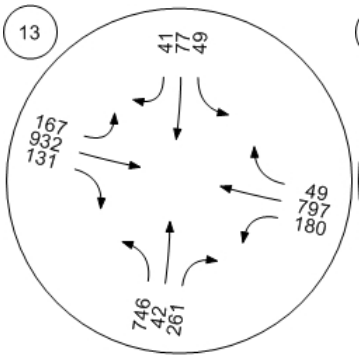
Gellert Blvd / Hickey Blvd



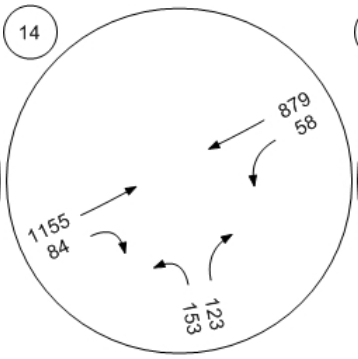
I-280 SB Ramps / Hickey Blv



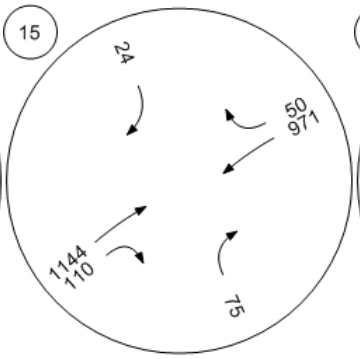
I-280 NB Ramps / Hickey Blv



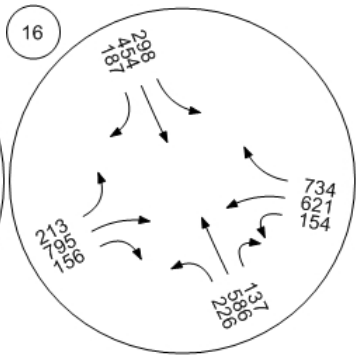
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd



Juniper Serra Blvd / Hickey B



Appendix 2
Year 2016 Existing Conditions Level-of-Service Worksheets

19898 Daly City Serramonte Terrace TIA

Vistro File: K:\...\19898_Vistro_20160516.vistro
Scenario 1: Existing 2016 AM

Report File: K:\...\Existing AM LOS.pdf
5/16/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	WB Hwy 1 Ramps / Clarinada Ave.	All-way stop	HCM 2010	NB Left		13.4	B
2	EB Hwy 1 Ramps / Serramonte Blvd	All-way stop	HCM 2010	EB Left		40.0	E
3	Callan Blvd / Serramonte Blvd	All-way stop	HCM 2010	SB Thru		14.5	B
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	EB Left	0.188	8.1	A
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	WB Thru	0.419	11.9	B
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	NEB Thru	0.760	7.1	A
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.658	1.7	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	SWB Left	0.743	27.0	C
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	WB Left	0.309	24.6	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.573	17.7	B
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.656	29.7	C
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.521	9.2	A
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.758	26.9	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.323	11.3	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.391	52.4	D
16	Junipero Serra Blvd / Hickey Blvd	Signalized	HCM 2010	SEB Left	0.697	43.3	D

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

Intersection Level Of Service Report
Intersection 1: WB Hwy 1 Ramps / Clarinada Ave.

Control Type:	All-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	315	248	105	137	67	76
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.60	3.60	1.90	1.50	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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
Total Hourly Volume [veh/h]	315	248	105	137	67	76
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	67	29	37	18	21
Total Analysis Volume [veh/h]	342	270	114	149	73	83
Pedestrian Volume [ped/h]	0		0		0	

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.98	1.84	0.81	0.99	0.53	0.26	0.26
95th-Percentile Queue Length [ft]	99.39	46.09	20.27	24.78	13.22	6.50	6.50
Approach Delay [s/veh]	15.06		11.05		10.83		
Approach LOS	C		B		B		
Intersection Delay [s/veh]	13.39						
Intersection LOS	B						

Intersection Level Of Service Report
Intersection 2: EB Hwy 1 Ramps / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	40.0
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	29	98	90	181	94	97	395	199	50	132	89	202
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	1.10	1.10	4.30	4.10	1.30	3.00	4.00	3.80	9.00	1.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	29	98	90	181	94	97	395	199	50	132	89	202
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
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	0.0000
Total 15-Minute Volume [veh/h]	8	28	26	53	27	28	115	58	15	38	26	0
Total Analysis Volume [veh/h]	34	114	105	210	109	113	459	231	58	153	103	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.43	6.12	0.90	14.72	4.06	1.78	0.96
95th-Percentile Queue Length [ft]	85.74	152.99	22.49	367.94	101.41	44.42	23.96
Approach Delay [s/veh]	21.06	27.08		62.08		16.04	
Approach LOS	C	D		F		C	
Intersection Delay [s/veh]	40.01						
Intersection LOS	E						

Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	14.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	163	223	76	140	230	130	92	282	107	26	115	79
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 [%]	1.80	1.30	1.30	16.40	4.80	7.70	8.70	0.40	0.00	0.00	1.70	22.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	163	223	76	140	230	130	92	282	107	26	115	79
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]	44	60	20	38	62	35	25	76	29	7	31	21
Total Analysis Volume [veh/h]	175	240	82	151	247	140	99	303	115	28	124	85
Pedestrian Volume [ped/h]	0			0			0			0		

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.60	2.30	1.46	2.79	1.05	0.84	2.15	1.99	0.18	0.77	0.72
95th-Percentile Queue Length [ft]	64.93	57.47	36.38	69.82	26.14	20.94	53.87	49.87	4.62	19.16	17.99
Approach Delay [s/veh]	15.20		15.13			14.79			11.26		
Approach LOS	C		C			B			B		
Intersection Delay [s/veh]	14.54										
Intersection LOS	B										

Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	8.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.188

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	175.00	100.00	100.00	100.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	52	0	52	71	390	0	44	0	196	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	11.50	2.00	0.00	0.00	5.90	0.00	0.00	2.00	11.90	4.70
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	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	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	52	0	52	71	390	0	44	0	196	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	13	0	13	18	98	0	11	0	49	27
Total Analysis Volume [veh/h]	0	0	0	52	0	52	71	390	0	44	0	196	107
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Protecte	Permiss	Permiss	Permi	Permi	Permi	Overl
Signal group	0	0	0	4	0	0	1	6	0	0	0	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	4	8	0	0	0	8	8
Maximum Green [s]	0	0	0	30	0	0	20	40	0	0	0	40	40
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	3.0	3.6	0.0	0.0	0.0	3.6	3.6
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0
Split [s]	0	0	0	18	0	0	12	38	0	0	0	26	26
Vehicle Extension [s]	0.0	0.0	0.0	2.5	0.0	0.0	2.0	3.0	0.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	7	0	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	20	0	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	2.0	2.6	0.0	0.0	0.0	2.6	2.6
Minimum Recall				No			No	No				No	No
Maximum Recall				No			No	No				No	No
Pedestrian Recall				No			No	No				No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.60	4.60	4.60	4.60	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.60	2.60	2.60	2.60	0.00
g_i, Effective Green Time [s]		6	6	3	51	51	43	43	54
g / C, Green / Cycle		0.09	0.09	0.05	0.78	0.78	0.66	0.66	0.83
(v / s)_i Volume / Saturation Flow Rate		0.03	0.03	0.04	0.11	0.11	0.09	0.08	0.07
s, saturation flow rate [veh/h]		1623	1620	1810	1794	1794	1267	1545	1543
c, Capacity [veh/h]		151	151	96	1391	1391	914	1021	1271
d1, Uniform Delay [s]		27.72	27.78	30.46	1.85	1.85	4.03	4.09	1.08
k, delay calibration		0.08	0.08	0.04	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		0.96	1.06	4.08	0.21	0.21	0.28	0.25	0.13
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.33	0.36	0.74	0.14	0.14	0.12	0.12	0.08
d, Delay for Lane Group [s/veh]		28.68	28.84	34.54	2.06	2.06	4.31	4.33	1.21
Lane Group LOS		C	C	C	A	A	A	A	A
Critical Lane Group		No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh]		0.74	0.80	1.16	0.34	0.34	0.46	0.51	0.08
50th-Percentile Queue Length [ft]		18.60	19.91	29.10	8.40	8.40	11.61	12.76	1.94
95th-Percentile Queue Length [veh]		1.34	1.43	2.09	0.60	0.60	0.84	0.92	0.14
95th-Percentile Queue Length [ft]		33.49	35.84	52.37	15.11	15.11	20.90	22.97	3.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	28.68	0.00	28.84	34.54	2.06	2.06	4.31	0.00	4.33	1.21
Movement LOS				C		C	C	A	A	A		A	A
d_A, Approach Delay [s/veh]	0.00			28.76			7.06			3.37			
Approach LOS	A			C			A			A			
d_I, Intersection Delay [s/veh]	8.13												
Intersection LOS	A												
Intersection V/C	0.188												

Sequence

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

Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	11.9
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.419

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	137	81	190	56	78	12	32	263	155	264	170	94
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 [%]	10.20	0.00	2.60	1.80	6.40	8.30	0.00	4.60	7.70	1.10	7.10	2.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	137	81	190	56	78	12	32	263	155	264	170	94
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]	37	22	51	15	21	3	9	71	42	71	46	25
Total Analysis Volume [veh/h]	147	87	204	60	84	13	34	283	167	284	183	101
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	3	3	3	4	4	0	5	2	2	1	6	6
Auxiliary Signal Groups			1,3						2,3			4,6
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	4	4	4	4	0	4	6	6	4	6	6
Maximum Green [s]	25	25	25	30	30	0	20	26	26	25	26	26
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.5	0.5	0.5	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0	0	0	0	0	29	29
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	7	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	18	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	1.5	1.5	1.5	1.5	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		Yes	Yes		No		No	Yes	Yes	No	Yes	Yes
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	5	5	22	4	4	4	6	6	15	5	6	14
g / C, Green / Cycle	0.15	0.15	0.62	0.12	0.12	0.12	0.16	0.17	0.43	0.15	0.16	0.38
(v / s)_i Volume / Saturation Flow Rate	0.07	0.07	0.07	0.02	0.04	0.03	0.02	0.08	0.11	0.08	0.10	0.04
s, saturation flow rate [veh/h]	1642	1872	2786	1414	1677	1557	1810	3459	1500	3476	1774	2800
c, Capacity [veh/h]	251	286	1732	302	344	191	284	577	650	524	285	1068
d1, Uniform Delay [s]	13.80	13.80	2.77	15.84	14.38	14.28	13.01	13.57	6.48	14.09	14.09	7.13
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.11	0.11	0.04	0.11	0.04
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
d2, Incremental Delay [s]	0.44	0.39	0.01	0.06	0.11	0.28	0.07	0.65	0.21	0.33	2.40	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.44	0.44	0.12	0.11	0.21	0.27	0.12	0.49	0.26	0.54	0.64	0.09
d, Delay for Lane Group [s/veh]	14.25	14.19	2.78	15.90	14.49	14.57	13.08	14.22	6.68	14.42	16.49	7.14
Lane Group LOS	B	B	A	B	B	B	B	B	A	B	B	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.68	0.77	0.10	0.22	0.44	0.33	0.20	0.89	0.56	0.89	1.31	0.17
50th-Percentile Queue Length [ft]	17.06	19.33	2.49	5.61	11.01	8.25	4.91	22.15	13.92	22.15	32.72	4.33
95th-Percentile Queue Length [veh]	1.23	1.39	0.18	0.40	0.79	0.59	0.35	1.59	1.00	1.60	2.36	0.31
95th-Percentile Queue Length [ft]	30.70	34.79	4.49	10.10	19.83	14.85	8.84	39.87	25.06	39.88	58.89	7.79

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.23	14.19	2.78	15.57	14.52	14.57	13.08	14.22	6.68	14.42	16.49	7.14
Movement LOS	B	B	A	B	B	B	B	B	A	B	B	A
d_A, Approach Delay [s/veh]	8.89			14.82			11.54			13.79		
Approach LOS	A			B			B			B		
d_I, Intersection Delay [s/veh]	11.92											
Intersection LOS	B											
Intersection V/C	0.419											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	7.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	987	237	212	0	0	528
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.80	0.80	5.70	2.00	2.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	987	237	212	0	0	528
Peak Hour Factor	0.8500	0.8500	0.8500	1.0000	1.0000	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	290	70	62	0	0	155
Total Analysis Volume [veh/h]	1161	279	249	0	0	621
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	12	12	7	8
g / C, Green / Cycle	0.44	0.44	0.25	0.29
(v / s)_i Volume / Saturation Flow Rate	0.33	0.10	0.07	0.18
s, saturation flow rate [veh/h]	3486	2836	3423	3512
c, Capacity [veh/h]	1547	1258	869	1020
d1, Uniform Delay [s]	6.37	4.71	8.24	8.39
k, delay calibration	0.04	0.04	0.04	0.04
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.03	0.07	0.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.22	0.29	0.61
d, Delay for Lane Group [s/veh]	6.65	4.74	8.30	8.61
Lane Group LOS	A	A	A	A
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh]	1.24	0.21	0.38	0.98
50th-Percentile Queue Length [ft]	30.92	5.37	9.55	24.41
95th-Percentile Queue Length [veh]	2.23	0.39	0.69	1.76
95th-Percentile Queue Length [ft]	55.65	9.67	17.18	43.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.65	4.74	8.30	0.00	0.00	8.61
Movement LOS	A	A	A			A
d_A, Approach Delay [s/veh]	6.28		8.30		8.61	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.13					
Intersection LOS	A					
Intersection V/C	0.760					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	1.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	124	1402	209	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.40	1.90	7.70	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	124	1402	209	0	0	0
Peak Hour Factor	0.8400	0.8400	0.8400	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	417	62	0	0	0
Total Analysis Volume [veh/h]	148	1669	249	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	3.90	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	1.90	2.10	
g_i, Effective Green Time [s]	3	17	10	
g / C, Green / Cycle	0.14	0.81	0.50	
(v / s)_i Volume / Saturation Flow Rate	0.04	0.47	0.07	
s, saturation flow rate [veh/h]	3432	3550	3359	
c, Capacity [veh/h]	496	2895	1665	
d1, Uniform Delay [s]	8.08	0.68	2.90	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.33	0.18	0.04	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.30	0.58	0.15	
d, Delay for Lane Group [s/veh]	8.41	0.86	2.94	
Lane Group LOS	A	A	A	
Critical Lane Group	No	Yes	No	
50th-Percentile Queue Length [veh]	0.19	0.07	0.02	
50th-Percentile Queue Length [ft]	4.69	1.84	0.42	
95th-Percentile Queue Length [veh]	0.34	0.13	0.03	
95th-Percentile Queue Length [ft]	8.45	3.31	0.76	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.41	0.86	2.94	0.00	0.00	0.00
Movement LOS	A	A	A			
d_A, Approach Delay [s/veh]	1.48		2.94		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.65					
Intersection LOS	A					
Intersection V/C	0.658					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	159	0	795	432	117	140	217	44
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	0	0	0	159	0	795	432	117	140	217	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9050	1.0000	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
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	0	0	0	44	0	220	119	32	39	60	12
Total Analysis Volume [veh/h]	0	0	0	0	176	0	878	477	129	155	240	49
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lead	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	28	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		6	28	28	7	28	28	28
g / C, Green / Cycle		0.08	0.36	0.36	0.09	0.37	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate		0.05	0.25	0.30	0.07	0.08	0.09	0.09
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1583	1583
c, Capacity [veh/h]		275	1274	569	167	680	578	578
d1, Uniform Delay [s]		34.32	21.00	22.61	34.06	16.90	17.05	17.05
k, delay calibration		0.11	0.11	0.15	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.46	0.67	4.61	7.47	0.17	0.22	0.22
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.64	0.69	0.84	0.77	0.23	0.25	0.25
d, Delay for Lane Group [s/veh]		36.78	21.67	27.22	41.53	17.07	17.28	17.28
Lane Group LOS		D	C	C	D	B	B	B
Critical Lane Group		No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh]		1.65	6.41	8.09	2.63	1.83	1.73	1.73
50th-Percentile Queue Length [ft]		41.15	160.28	202.24	65.81	45.83	43.26	43.26
95th-Percentile Queue Length [veh]		2.96	10.56	12.75	4.74	3.30	3.11	3.11
95th-Percentile Queue Length [ft]		74.08	264.10	318.86	118.46	82.50	77.86	77.86

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	36.78	0.00	21.67	27.22	41.53	17.07	17.28	17.28
Movement LOS					D		C	C	D	B	B	B
d_A, Approach Delay [s/veh]	0.00				25.14				22.68			
Approach LOS	A				C				C			
d_I, Intersection Delay [s/veh]	27.03											
Intersection LOS	C											
Intersection V/C	0.743											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	44	419	277	178	130	287	34	39
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	419	277	178	130	287	34	39
Peak Hour Factor	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	12	116	77	49	36	79	9	0
Total Analysis Volume [veh/h]	49	463	306	197	144	317	38	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	39	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	16	16	16	11	11	11	11
g / C, Green / Cycle	0.20	0.20	0.20	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.15	0.09	0.12	0.08	0.07	0.10	0.02
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1863	1583
c, Capacity [veh/h]	701	721	322	250	262	262	223
d1, Uniform Delay [s]	28.68	26.72	27.88	30.90	30.41	31.69	29.09
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.49	0.40	1.88	2.09	1.31	4.05	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

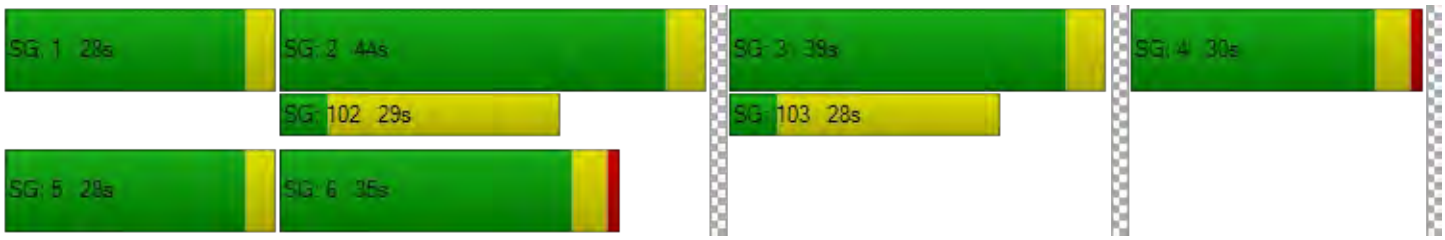
X, volume / capacity	0.73	0.42	0.61	0.58	0.47	0.74	0.17
d, Delay for Lane Group [s/veh]	30.16	27.12	29.77	33.00	31.71	35.74	29.45
Lane Group LOS	C	C	C	C	C	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	4.39	2.40	3.34	2.56	2.13	3.63	0.62
50th-Percentile Queue Length [ft]	109.65	60.04	83.55	64.12	53.30	90.86	15.58
95th-Percentile Queue Length [veh]	7.82	4.32	6.02	4.62	3.84	6.54	1.12
95th-Percentile Queue Length [ft]	195.52	108.07	150.39	115.41	95.93	163.54	28.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.16	30.16	27.12	29.77	33.00	34.17	35.74	29.45
Movement LOS	C	C	C	C	C	C	D	C
d_A, Approach Delay [s/veh]	29.17				33.48			
Approach LOS	C				C			
d_I, Intersection Delay [s/veh]	27.03							
Intersection LOS	C							
Intersection V/C	0.743							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.309

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	49	281	71	73	234	5	7	3	11	114	1	62
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	5.00	4.20	4.10	6.80	0.00	0.00	0.00	0.00	1.80	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	49	281	71	73	234	5	7	3	11	114	1	62
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	13	77	20	20	64	1	2	1	3	31	0	17
Total Analysis Volume [veh/h]	54	309	78	80	257	5	8	3	12	125	1	68
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	26	39	0	24	39	0	0	29	0	0	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	35	35	21	35	35	25	25	25
g / C, Green / Cycle	0.24	0.37	0.37	0.22	0.37	0.37	0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.07	0.08	0.05	0.05	0.05	0.03	0.15	0.04
s, saturation flow rate [veh/h]	1810	3445	1635	1738	3387	1762	696	815	1615
c, Capacity [veh/h]	429	1280	607	375	1259	655	234	290	425
d1, Uniform Delay [s]	28.52	20.28	20.36	30.62	19.76	19.77	27.24	31.70	26.92
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	0.36	0.79	1.30	0.23	0.44	0.83	4.68	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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

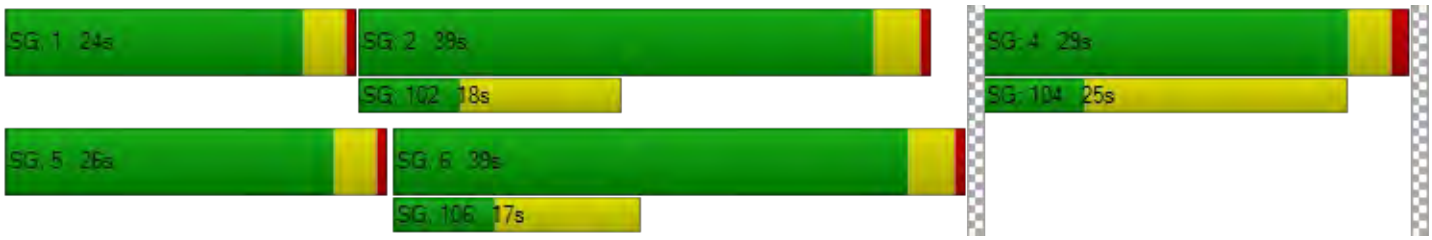
X, volume / capacity	0.13	0.20	0.21	0.21	0.14	0.14	0.10	0.43	0.16
d, Delay for Lane Group [s/veh]	29.12	20.63	21.16	31.92	19.99	20.21	28.07	36.39	27.73
Lane Group LOS	C	C	C	C	B	C	C	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	1.03	1.98	2.05	1.63	1.28	1.38	0.44	2.94	1.27
50th-Percentile Queue Length [ft]	25.81	49.41	51.17	40.72	32.02	34.46	11.01	73.58	31.77
95th-Percentile Queue Length [veh]	1.86	3.56	3.68	2.93	2.31	2.48	0.79	5.30	2.29
95th-Percentile Queue Length [ft]	46.46	88.93	92.10	73.29	57.64	62.04	19.81	132.44	57.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.12	20.72	21.16	31.92	20.06	20.21	28.07	28.07	28.07	36.39	36.39	27.73
Movement LOS	C	C	C	C	C	C	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	21.83			22.84			28.07			33.35		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.55											
Intersection LOS	C											
Intersection V/C	0.309											

Sequence

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



Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.573

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	119	476	119	20	238	63	77	287	47	89	179	66
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	1.70	2.90	15.00	3.80	4.80	0.00	0.70	0.00	5.60	0.60	1.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	119	476	119	20	238	63	77	287	47	89	179	66
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	32	127	32	5	63	17	20	76	13	24	48	18
Total Analysis Volume [veh/h]	127	506	127	21	253	67	82	305	50	95	190	70
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	4	10	10	1	7	7	3	9	9	3	9
g / C, Green / Cycle	0.10	0.25	0.25	0.03	0.18	0.18	0.07	0.22	0.22	0.08	0.22
(v / s)_i Volume / Saturation Flow Rate	0.07	0.18	0.18	0.01	0.09	0.09	0.05	0.16	0.03	0.06	0.14
s, saturation flow rate [veh/h]	1810	1868	1741	1573	1830	1702	1810	1887	1615	1714	1803
c, Capacity [veh/h]	175	467	435	42	330	306	136	413	354	140	407
d1, Uniform Delay [s]	18.16	14.11	14.11	19.87	15.28	15.32	18.55	15.06	13.03	18.48	14.50
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	5.62	1.91	2.07	9.03	1.16	1.32	4.29	2.60	0.18	5.71	1.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.70	0.70	0.50	0.50	0.51	0.61	0.74	0.14	0.68	0.64
d, Delay for Lane Group [s/veh]	23.78	16.02	16.19	28.90	16.43	16.64	22.84	17.66	13.21	24.19	16.18
Lane Group LOS	C	B	B	C	B	B	C	B	B	C	B
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.29	2.51	2.37	0.28	1.27	1.23	0.82	2.50	0.33	0.99	2.01
50th-Percentile Queue Length [ft]	32.32	62.79	59.20	7.02	31.82	30.84	20.59	62.62	8.27	24.72	50.23
95th-Percentile Queue Length [veh]	2.33	4.52	4.26	0.51	2.29	2.22	1.48	4.51	0.60	1.78	3.62
95th-Percentile Queue Length [ft]	58.18	113.03	106.56	12.63	57.27	55.52	37.07	112.71	14.88	44.50	90.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.78	16.08	16.19	28.90	16.51	16.64	22.84	17.66	13.21	24.19	16.18	16.18
Movement LOS	C	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	17.39			17.30			18.12			18.33		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.72											
Intersection LOS	B											
Intersection V/C	0.573											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	29.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.656

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	62	163	493	142	108	60	65	536	45	300	229	252
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 [%]	1.60	3.10	0.80	7.70	2.80	11.70	4.60	1.10	11.10	0.70	5.20	4.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	62	163	493	142	108	60	65	536	45	300	229	252
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	16	43	131	38	29	16	17	143	12	80	61	67
Total Analysis Volume [veh/h]	66	173	524	151	115	64	69	570	48	319	244	268
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	8	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	0	6	10	0	6	10	0
Maximum Green [s]	27	27	27	22	22	0	22	30	0	27	30	0
Amber [s]	3.2	3.2	3.2	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	25	25	25	31	31	0	9	34	0	20	45	0
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Walk [s]	7	7	7	7	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	25	25	25	23	23	0	0	22	0	0	23	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.2	2.2	2.2	2.2	2.2	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No	No		No		No	Yes		No	Yes	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	3.00	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	0.00	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	57	10	10	10	10	6	46	46	17	58	58
g / C, Green / Cycle	0.19	0.19	0.19	0.51	0.09	0.09	0.09	0.09	0.05	0.42	0.42	0.15	0.53	0.53
(v / s)_i Volume / Saturation Flow Rate	0.04	0.05	0.05	0.33	0.05	0.06	0.06	0.04	0.04	0.16	0.03	0.09	0.07	0.17
s, saturation flow rate [veh/h]	1781	1843	1677	1602	1337	1542	1682	1446	1730	3578	1454	3490	3439	1541
c, Capacity [veh/h]	342	354	322	823	163	199	153	131	88	1511	614	539	1810	811
d1, Uniform Delay [s]	37.27	37.89	37.58	19.31	49.95	48.31	48.25	47.58	51.62	21.83	18.98	43.27	13.29	14.94
k, delay calibration	0.04	0.04	0.04	0.50	0.04	0.04	0.04	0.04	0.16	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.10	0.15	0.14	3.74	0.69	0.70	1.63	1.04	19.67	0.72	0.25	0.39	0.15	1.09
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	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

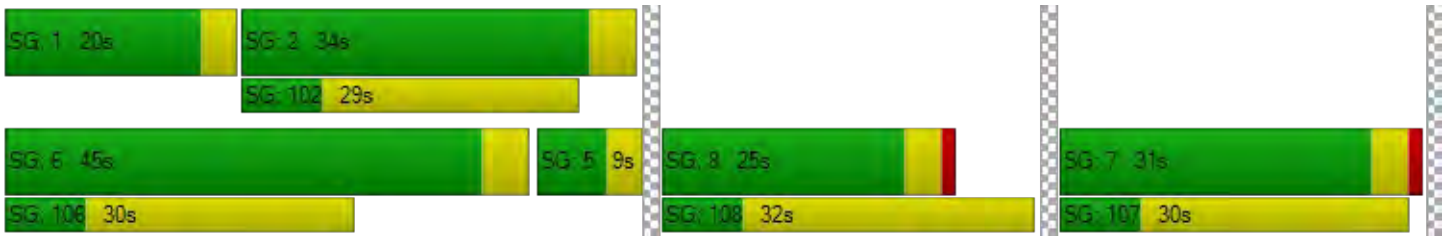
X, volume / capacity	0.19	0.28	0.23	0.64	0.44	0.49	0.64	0.49	0.79	0.38	0.08	0.59	0.13	0.33
d, Delay for Lane Group [s/veh]	37.37	38.05	37.72	23.05	50.63	49.01	49.88	48.62	71.30	22.55	19.22	43.65	13.44	16.03
Lane Group LOS	D	D	D	C	D	D	D	D	E	C	B	D	B	B
Critical Lane Group	No	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	1.50	2.26	1.74	10.16	1.94	2.64	2.63	1.70	2.36	5.16	0.78	4.06	1.56	4.01
50th-Percentile Queue Length [ft]	37.57	56.42	43.40	253.9	48.53	65.90	65.76	42.62	58.92	129.07	19.41	101.44	39.08	100.30
95th-Percentile Queue Length [veh]	2.71	4.06	3.12	15.39	3.49	4.74	4.73	3.07	4.24	8.89	1.40	7.30	2.81	7.22
95th-Percentile Queue Length [ft]	67.63	101.5	78.12	384.6	87.35	118.6	118.3	76.71	106.06	222.22	34.93	182.59	70.35	180.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.37	37.90	23.05	49.83	49.75	48.62	71.30	22.55	19.22	43.65	13.44	16.03
Movement LOS	D	D	C	D	D	D	E	C	B	D	B	B
d_A, Approach Delay [s/veh]	27.65			49.54			27.21			25.87		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	29.74											
Intersection LOS	C											
Intersection V/C	0.656											

Sequence

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



Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.521

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	322	2	162	0	791	421	152	640	0
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	3.10	0.00	0.60	2.00	1.10	2.40	0.70	3.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	0	0	322	2	162	0	791	421	152	640	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9400	0.9400	0.9400	1.0000	0.9400	0.9400	0.9400	0.9400	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	86	1	43	0	210	0	40	170	0
Total Analysis Volume [veh/h]	0	0	0	343	2	172	0	841	0	162	681	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		6	6	6	10	10	4	17
g / C, Green / Cycle		0.19	0.19	0.19	0.33	0.33	0.12	0.55
(v / s)_i Volume / Saturation Flow Rate		0.10	0.10	0.10	0.22	0.22	0.05	0.19
s, saturation flow rate [veh/h]		1755	1797	1605	1879	1879	3490	3512
c, Capacity [veh/h]		331	339	303	621	621	426	1927
d1, Uniform Delay [s]		11.43	11.43	11.43	9.02	9.02	12.63	3.95
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.32	1.29	1.44	1.30	1.30	0.56	0.11
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.53	0.53	0.53	0.68	0.68	0.38	0.35
d, Delay for Lane Group [s/veh]		12.74	12.71	12.87	10.31	10.31	13.19	4.06
Lane Group LOS		B	B	B	B	B	B	A
Critical Lane Group		No	No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]		0.93	0.95	0.86	1.80	1.80	0.43	0.46
50th-Percentile Queue Length [ft]		23.25	23.74	21.53	45.00	45.00	10.83	11.53
95th-Percentile Queue Length [veh]		1.67	1.71	1.55	3.24	3.24	0.78	0.83
95th-Percentile Queue Length [ft]		41.85	42.72	38.76	81.01	81.01	19.49	20.76

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	12.73	12.71	12.87	0.00	10.31	10.31	13.19	4.06	0.00
Movement LOS				B	B	B		B	B	B	A	
d_A, Approach Delay [s/veh]	0.00			12.77			10.31			5.81		
Approach LOS	A			B			B			A		
d_I, Intersection Delay [s/veh]	9.17											
Intersection LOS	A											
Intersection V/C	0.521											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	26.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	337	41	319	84	136	113	117	701	268	101	329	33
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 [%]	5.00	0.00	2.50	0.00	2.90	0.00	1.70	2.00	0.70	0.00	1.80	9.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	337	41	319	84	136	113	117	701	268	101	329	33
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	93	11	88	23	37	31	32	193	0	28	90	9
Total Analysis Volume [veh/h]	370	45	351	92	149	124	129	770	0	111	362	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	135
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	42	42	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	18	11	11	6	17	17	6	17	17
g / C, Green / Cycle	0.27	0.27	0.27	0.17	0.17	0.10	0.25	0.25	0.08	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.12	0.12	0.22	0.13	0.08	0.07	0.21	0.21	0.06	0.11	0.11
s, saturation flow rate [veh/h]	1723	1828	1576	1812	1615	1779	1863	1863	1810	1866	1808
c, Capacity [veh/h]	463	491	423	303	270	170	475	475	148	463	449
d1, Uniform Delay [s]	20.64	20.63	23.44	27.24	25.58	30.04	23.84	23.84	30.60	21.57	21.59
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	0.65	0.61	4.40	4.73	1.21	6.77	3.39	3.39	7.42	0.64	0.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

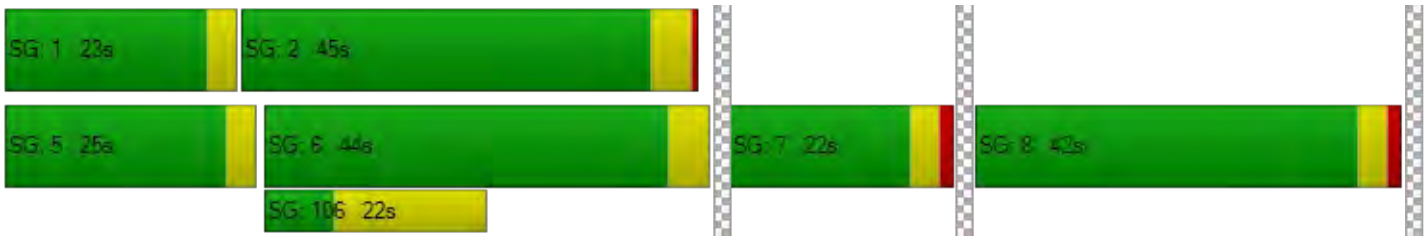
X, volume / capacity	0.44	0.43	0.83	0.79	0.46	0.76	0.81	0.81	0.75	0.43	0.44
d, Delay for Lane Group [s/veh]	21.28	21.23	27.85	31.96	26.79	36.81	27.23	27.23	38.02	22.22	22.27
Lane Group LOS	C	C	C	C	C	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	2.58	2.72	5.44	3.96	1.81	2.29	5.87	5.87	2.01	2.63	2.57
50th-Percentile Queue Length [ft]	64.38	67.90	136.08	99.00	45.30	57.26	146.66	146.66	50.28	65.81	64.33
95th-Percentile Queue Length [veh]	4.64	4.89	9.27	7.13	3.26	4.12	9.84	9.84	3.62	4.74	4.63
95th-Percentile Queue Length [ft]	115.88	122.22	231.73	178.20	81.55	103.06	245.96	245.96	90.50	118.45	115.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.26	21.23	27.85	31.96	31.96	26.79	36.81	27.23	27.23	38.02	22.24	22.27
Movement LOS	C	C	C	C	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	24.28			30.21			28.61			25.68		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	26.94											
Intersection LOS	C											
Intersection V/C	0.758											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	11.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.323

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	35	22	621	248	80	445
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.90	4.50	2.60	0.40	0.00	3.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	35	22	621	248	80	445
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]	9	6	167	67	22	120
Total Analysis Volume [veh/h]	38	24	668	267	86	478
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	6	85	85	6	95
g / C, Green / Cycle	0.05	0.78	0.78	0.05	0.87
(v / s)_i Volume / Saturation Flow Rate	0.04	0.21	0.18	0.05	0.15
s, saturation flow rate [veh/h]	1489	3173	1448	1629	3137
c, Capacity [veh/h]	77	2459	1122	90	2718
d1, Uniform Delay [s]	51.60	3.52	3.41	51.84	1.16
k, delay calibration	0.08	0.50	0.50	0.25	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.45	0.27	0.50	57.01	0.14
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	0.81	0.27	0.24	0.96	0.18
d, Delay for Lane Group [s/veh]	65.05	3.80	3.91	108.84	1.30
Lane Group LOS	E	A	A	F	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.98	1.77	1.46	3.78	0.39
50th-Percentile Queue Length [ft]	49.40	44.32	36.39	94.50	9.69
95th-Percentile Queue Length [veh]	3.56	3.19	2.62	6.80	0.70
95th-Percentile Queue Length [ft]	88.92	79.78	65.51	170.09	17.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.05	65.05	3.80	3.91	108.84	1.30
Movement LOS	E	E	A	A	F	A
d_A, Approach Delay [s/veh]	65.05		3.83		17.70	
Approach LOS	E		A		B	
d_I, Intersection Delay [s/veh]	11.27					
Intersection LOS	B					
Intersection V/C	0.323					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	52.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.391

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	876	50	0	503	33	0	0	131	0	0	29
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	2.60	0.00	2.00	2.00	6.10	2.00	2.00	0.00	2.00	2.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	876	50	0	503	33	0	0	131	0	0	29
Peak Hour Factor	1.0000	0.9100	0.9100	1.0000	0.9100	0.9100	1.0000	1.0000	0.9100	1.0000	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	241	14	0	0	0	0	0	36	0	0	0
Total Analysis Volume [veh/h]	0	963	55	0	0	0	0	0	144	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	44	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	33	33		12	
g / C, Green / Cycle	0.30	0.30		0.11	
(v / s)_i Volume / Saturation Flow Rate	0.27	0.28		0.09	
s, saturation flow rate [veh/h]	1852	1817		1615	
c, Capacity [veh/h]	556	545		170	
d1, Uniform Delay [s]	37.18	37.46		48.37	
k, delay calibration	0.22	0.23		0.18	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	11.93	14.59		17.03	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

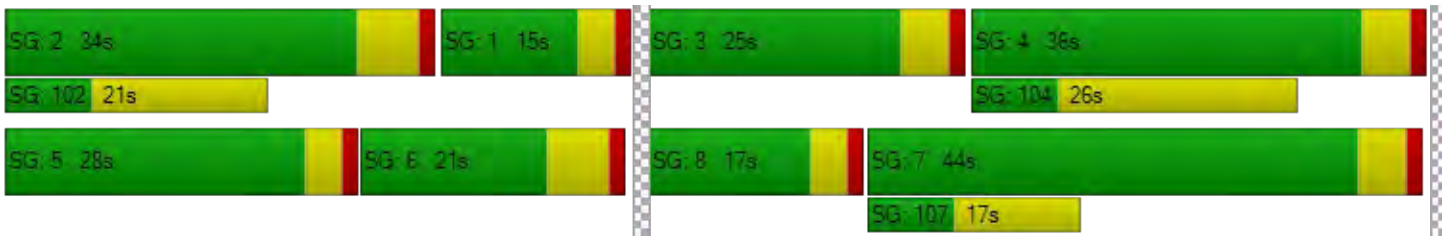
X, volume / capacity	0.92	0.93		0.85	
d, Delay for Lane Group [s/veh]	49.12	52.05		65.41	
Lane Group LOS	D	D		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	14.84	15.30		4.67	
50th-Percentile Queue Length [ft]	370.98	382.57		116.85	
95th-Percentile Queue Length [veh]	21.16	21.72		8.22	
95th-Percentile Queue Length [ft]	528.92	542.95		205.50	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	50.50	52.05	0.00	0.00	0.00	0.00	0.00	65.41	0.00	0.00	0.00
Movement LOS		D	D						E			
d_A, Approach Delay [s/veh]	50.58			0.00			65.41			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	52.42											
Intersection LOS	D											
Intersection V/C	0.391											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Junipero Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	43.3
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.697

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	135	282	325	257	627	116	103	352	162	271	513	122
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 [%]	27.00	2.50	5.80	1.90	2.20	0.90	1.00	2.00	0.60	1.50	0.80	2.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	135	282	325	257	627	116	103	352	162	271	513	122
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	79	0	72	176	33	29	99	0	76	144	34
Total Analysis Volume [veh/h]	152	317	0	289	704	130	116	396	0	304	576	137
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

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	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	8	0	4	10	0	4	10	0
Maximum Green [s]	0	25	0	0	30	0	20	40	0	20	40	0
Amber [s]	0.0	3.9	0.0	0.0	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	25	0	0	36	0	15	21	0	28	34	0
Vehicle Extension [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
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	2.0	4.0	0.0	2.0	4.0	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	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	17	17	17	26	26	26	26	9	27	27	21	39	39
g / C, Green / Cycle	0.15	0.15	0.15	0.23	0.23	0.23	0.23	0.08	0.25	0.25	0.19	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.00	0.16	0.21	0.19	0.08	0.06	0.11	0.11	0.17	0.16	0.09
s, saturation flow rate [veh/h]	1797	1687	1526	1776	1859	1692	1601	1792	1863	1863	1783	3589	1576
c, Capacity [veh/h]	277	260	235	413	433	394	373	145	458	458	334	1266	556
d1, Uniform Delay [s]	45.61	45.55	0.00	38.73	41.00	39.85	35.29	49.78	35.05	35.05	43.84	27.48	25.27
k, delay calibration	0.13	0.12	0.04	0.04	0.12	0.06	0.04	0.09	0.50	0.50	0.24	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.18	9.93	0.00	0.81	7.70	2.28	0.21	7.87	2.95	2.95	18.23	1.18	1.06
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

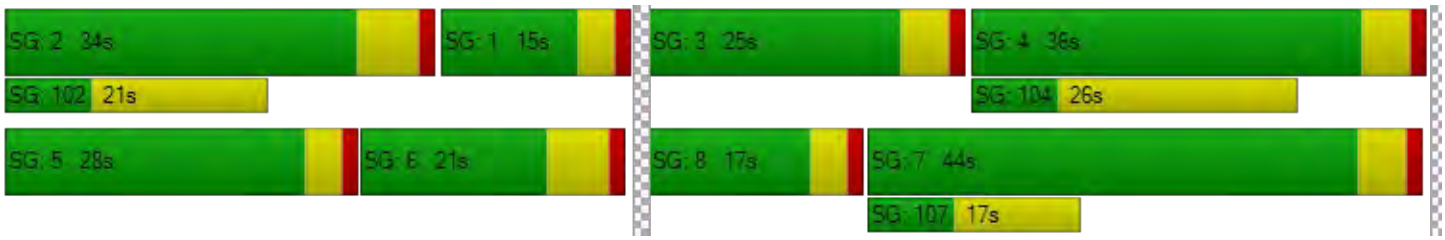
X, volume / capacity	0.88	0.87	0.00	0.70	0.90	0.80	0.35	0.80	0.43	0.43	0.91	0.45	0.25
d, Delay for Lane Group [s/veh]	55.79	55.49	0.00	39.53	48.70	42.13	35.50	57.65	38.00	38.00	62.07	28.66	26.33
Lane Group LOS	E	E	A	D	D	D	D	E	D	D	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	7.24	6.72	0.00	7.20	11.05	8.23	2.93	3.45	4.84	4.84	9.75	6.00	2.70
50th-Percentile Queue Length [ft]	181.06	168.05	0.00	179.9	276.1	205.6	73.36	86.18	120.99	120.99	243.66	149.93	67.38
95th-Percentile Queue Length [veh]	11.66	10.97	0.00	11.60	16.50	12.93	5.28	6.21	8.45	8.45	14.87	10.01	4.85
95th-Percentile Queue Length [ft]	291.40	274.34	0.00	289.9	412.4	323.2	132.0	155.13	211.18	211.18	371.66	250.33	121.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	55.79	55.58	0.00	39.53	45.76	35.50	57.65	38.00	38.00	62.07	28.66	26.33
Movement LOS	E	E	A	D	D	D	E	D	D	E	C	C
d_A, Approach Delay [s/veh]	55.65			42.97			42.45			38.33		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	43.28											
Intersection LOS	D											
Intersection V/C	0.697											

Sequence

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



19898 Daly City Serramonte Terrace TIA

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Scenario 3: Adjusted Existing 2016 PM

Report File: K:\...\Existing PM LOS.pdf
5/16/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SB Hwy 1 Ramps / Clarinada Ave.	All-way stop	HCM 2010	NB Left		23.9	C
2	NB Hwy 1 Ramps / Serramonte Blvd	All-way stop	HCM 2010	EB Left		15.7	C
3	Callan Blvd / Serramonte Blvd	All-way stop	HCM 2010	SB Thru		14.0	B
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	EB Left	0.517	13.0	B
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	NB Left	0.716	46.8	D
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	SB Right	0.703	16.0	B
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.482	4.1	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	SWB Left	0.710	28.4	C
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	NB Left	0.590	32.6	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	NWB Left	0.697	22.5	C
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.879	49.4	D
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	SB Right	0.695	10.5	B
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	EB Left	0.700	24.0	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	NB Left	0.559	17.3	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.352	51.8	D
16	Juniper Serra Blvd / Hickey Blvd	Signalized	HCM 2010	SEB Left	0.750	51.4	D

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

Intersection Level Of Service Report
Intersection 1: SB Hwy 1 Ramps / Clarinada Ave.

Control Type:	All-way stop	Delay (sec / veh):	23.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	458	256	47	82	226	98
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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
Total Hourly Volume [veh/h]	458	256	47	82	226	98
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	119	67	12	21	59	26
Total Analysis Volume [veh/h]	477	267	49	85	235	102
Pedestrian Volume [ped/h]	0		0		0	

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.87	1.96	0.35	0.59	2.75	0.34	0.34
95th-Percentile Queue Length [ft]	246.80	48.92	8.80	14.79	68.77	8.42	8.42
Approach Delay [s/veh]	29.90		11.23		15.66		
Approach LOS	D		B		C		
Intersection Delay [s/veh]	23.89						
Intersection LOS	C						

Intersection Level Of Service Report
Intersection 2: NB Hwy 1 Ramps / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	15.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	13	37	57	19	79	273	221	153	41	78	165	143
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	4	10	0	0	30	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]	13	37	57	19	79	273	225	163	41	78	195	143
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
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	0.0000
Total 15-Minute Volume [veh/h]	4	11	17	6	23	80	66	48	12	23	57	0
Total Analysis Volume [veh/h]	15	44	67	22	93	321	265	192	48	92	229	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.02	0.90	3.68	3.28	2.35	1.47	1.39
95th-Percentile Queue Length [ft]	25.56	22.42	92.00	81.94	58.81	36.81	34.84
Approach Delay [s/veh]	12.94	16.34		17.13		13.75	
Approach LOS	B	C		C		B	
Intersection Delay [s/veh]	15.72						
Intersection LOS	C						

Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	14.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	91	231	121	124	243	104	56	247	79	151	205	222
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	0	0	0	0	0	0	8	2	0	24	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]	97	231	121	124	243	104	56	255	81	151	229	222
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	25	60	32	32	63	27	15	66	21	39	60	58
Total Analysis Volume [veh/h]	101	241	126	129	253	108	58	266	84	157	239	231
Pedestrian Volume [ped/h]	0			0			0			0		

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.07	1.85	1.09	2.76	0.72	0.41	1.53	1.45	1.46	2.50	2.17
95th-Percentile Queue Length [ft]	51.87	46.29	27.13	69.06	18.00	10.30	38.29	36.13	36.55	62.59	54.16
Approach Delay [s/veh]	13.17		14.45			12.95			15.03		
Approach LOS	B		B			B			C		
Intersection Delay [s/veh]	14.02										
Intersection LOS	B										

Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	13.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.517

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	175.00	100.00	100.00	100.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	248	0	221	195	284	0	53	0	345	317
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	5	2	6	0	0	0	19	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	248	0	226	197	290	0	53	0	364	317
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	0.9500	0.950	1.000	0.950	0.950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	65	0	59	52	76	0	14	0	96	83
Total Analysis Volume [veh/h]	0	0	0	261	0	238	207	305	0	56	0	383	334
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	50
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Protecte	Permiss	Permiss	Permi	Permi	Permi	Overl
Signal group	0	0	0	4	0	0	1	6	0	0	0	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	4	8	0	0	0	8	8
Maximum Green [s]	0	0	0	30	0	0	20	40	0	0	0	40	40
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	3.0	3.6	0.0	0.0	0.0	3.6	3.6
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0
Split [s]	0	0	0	18	0	0	12	32	0	0	0	20	20
Vehicle Extension [s]	0.0	0.0	0.0	2.5	0.0	0.0	2.0	3.0	0.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	7	0	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	20	0	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	2.0	2.6	0.0	0.0	0.0	2.6	2.6
Minimum Recall				No			No	No				No	No
Maximum Recall				No			No	No				No	No
Pedestrian Recall				No			No	No				No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.60	4.60	4.60	4.60	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.60	2.60	2.60	2.60	0.00
g_i, Effective Green Time [s]		11	11	7	31	31	19	19	35
g / C, Green / Cycle		0.21	0.21	0.15	0.61	0.61	0.39	0.39	0.69
(v / s)_i Volume / Saturation Flow Rate		0.15	0.15	0.12	0.08	0.08	0.13	0.13	0.21
s, saturation flow rate [veh/h]		1774	1583	1774	1863	1863	1647	1695	1583
c, Capacity [veh/h]		381	340	261	1143	1143	728	656	1098
d1, Uniform Delay [s]		18.14	18.21	20.68	4.08	4.08	10.68	10.86	2.99
k, delay calibration		0.08	0.08	0.12	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.62	1.94	5.94	0.24	0.24	1.05	1.40	0.71
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

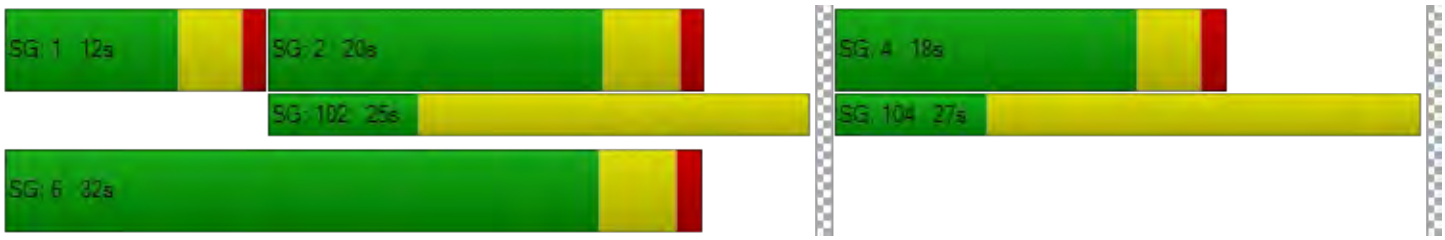
X, volume / capacity		0.68	0.70	0.79	0.13	0.13	0.30	0.34	0.30
d, Delay for Lane Group [s/veh]		19.76	20.15	26.61	4.32	4.32	11.72	12.25	3.70
Lane Group LOS		B	C	C	A	A	B	B	A
Critical Lane Group		No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		2.64	2.44	2.54	0.49	0.49	1.59	1.69	0.80
50th-Percentile Queue Length [ft]		65.94	61.02	63.49	12.22	12.22	39.78	42.30	19.94
95th-Percentile Queue Length [veh]		4.75	4.39	4.57	0.88	0.88	2.86	3.05	1.44
95th-Percentile Queue Length [ft]		118.70	109.83	114.29	22.00	22.00	71.61	76.14	35.88

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	19.78	0.00	20.15	26.61	4.32	4.32	11.72	0.00	12.03	3.70
Movement LOS				B		C	C	A	A	B		B	A
d_A, Approach Delay [s/veh]	0.00			19.95			13.33			8.41			
Approach LOS	A			B			B			A			
d_I, Intersection Delay [s/veh]	13.05												
Intersection LOS	B												
Intersection V/C	0.517												

Sequence

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



Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	46.8
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.716

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	340	249	620	392	291	55	45	299	221	534	311	467
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	0	0	3	4	0	17	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]	342	249	620	392	291	55	45	302	225	534	328	467
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
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]	88	64	160	101	75	14	12	78	58	138	85	120
Total Analysis Volume [veh/h]	353	257	639	404	300	57	46	311	232	551	338	481
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	13.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	0	3	3	0	4	0	5	2	2	1	6	6
Auxiliary Signal Groups		3	1,3						2,3			4,6
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	4	4	0	4	0	4	6	6	4	6	6
Maximum Green [s]	0	25	25	0	30	0	20	26	26	25	26	26
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	20	20	0	25	0	12	35	35	30	53	53
Vehicle Extension [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	0	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	1.5	1.5	0.0	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		No	No		No		No	No	No	No	No	No
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	17	17	65	21	21	21	4	37	58	20	54	79
g / C, Green / Cycle	0.15	0.15	0.59	0.19	0.19	0.19	0.03	0.34	0.52	0.19	0.49	0.72
(v / s)_i Volume / Saturation Flow Rate	0.17	0.17	0.23	0.17	0.17	0.17	0.03	0.09	0.15	0.16	0.18	0.17
s, saturation flow rate [veh/h]	1774	1848	2802	1412	1364	1637	1774	3547	1583	3445	1863	2803
c, Capacity [veh/h]	267	278	1663	310	319	316	60	1198	832	641	913	2004
d1, Uniform Delay [s]	46.75	46.75	11.79	45.28	44.61	43.33	52.72	26.46	14.53	43.38	17.49	5.40
k, delay calibration	0.50	0.50	0.04	0.33	0.35	0.35	0.04	0.50	0.50	0.04	0.50	0.04
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
d2, Incremental Delay [s]	99.78	82.91	0.05	11.43	10.71	23.05	7.28	0.53	0.84	1.35	1.16	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.14	1.10	0.38	0.77	0.75	0.90	0.76	0.26	0.28	0.86	0.37	0.24
d, Delay for Lane Group [s/veh]	146.53	129.66	11.85	56.71	55.32	66.38	60.00	26.98	15.37	44.73	18.65	5.42
Lane Group LOS	F	F	B	E	E	E	E	C	B	D	B	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	14.63	13.94	3.95	7.40	7.27	9.50	1.38	3.05	3.36	7.33	5.55	1.69
50th-Percentile Queue Length [ft]	365.75	348.51	98.86	184.97	181.76	237.50	34.51	76.25	84.01	183.31	138.64	42.35
95th-Percentile Queue Length [veh]	22.23	20.96	7.12	11.86	11.69	14.55	2.48	5.49	6.05	11.77	9.41	3.05
95th-Percentile Queue Length [ft]	555.70	524.08	177.95	296.50	292.31	363.87	62.11	137.24	151.22	294.33	235.19	76.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	144.24	129.66	11.85	56.19	63.69	66.38	60.00	26.98	15.37	44.73	18.65	5.42
Movement LOS	F	F	B	E	E	E	E	C	B	D	B	A
d_A, Approach Delay [s/veh]	73.51			59.88			24.99			24.49		
Approach LOS	E			E			C			C		
d_I, Intersection Delay [s/veh]	46.78											
Intersection LOS	D											
Intersection V/C	0.716											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	675	710	609	0	0	1270
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	17	0	0	3
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]	675	710	626	0	0	1273
Peak Hour Factor	0.9900	0.9900	0.9900	1.0000	1.0000	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	170	179	158	0	0	321
Total Analysis Volume [veh/h]	682	717	632	0	0	1286
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	30	30	43	0	0	42
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		No			No
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	22	22	45	46
g / C, Green / Cycle	0.29	0.29	0.60	0.61
(v / s)_i Volume / Saturation Flow Rate	0.20	0.26	0.18	0.36
s, saturation flow rate [veh/h]	3445	2803	3547	3547
c, Capacity [veh/h]	1009	821	2115	2163
d1, Uniform Delay [s]	23.36	25.17	7.42	8.95
k, delay calibration	0.04	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.30	1.19	0.36	1.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	0.87	0.30	0.59
d, Delay for Lane Group [s/veh]	23.65	26.37	7.79	10.16
Lane Group LOS	C	C	A	B
Critical Lane Group	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	5.08	5.84	2.23	5.65
50th-Percentile Queue Length [ft]	126.89	145.99	55.72	141.30
95th-Percentile Queue Length [veh]	8.77	9.80	4.01	9.55
95th-Percentile Queue Length [ft]	219.25	245.07	100.29	238.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.65	26.37	7.79	0.00	0.00	10.16
Movement LOS	C	C	A			B
d_A, Approach Delay [s/veh]	25.04		7.79		10.16	
Approach LOS	C		A		B	
d_I, Intersection Delay [s/veh]	15.99					
Intersection LOS	B					
Intersection V/C	0.703					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	4.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.482

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	602	1331	635	0	0	0
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	17	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]	602	1334	652	0	0	0
Peak Hour Factor	0.9800	0.9800	0.9800	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	154	340	166	0	0	0
Total Analysis Volume [veh/h]	614	1361	665	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2,6				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	4.10	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	0.00	2.10	
g_i, Effective Green Time [s]	9	28	15	
g / C, Green / Cycle	0.28	0.88	0.49	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.38	0.19	
s, saturation flow rate [veh/h]	3445	3547	3547	
c, Capacity [veh/h]	952	3113	1721	
d1, Uniform Delay [s]	10.16	0.39	5.20	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.74	0.10	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.65	0.44	0.39	
d, Delay for Lane Group [s/veh]	10.90	0.48	5.34	
Lane Group LOS	B	A	A	
Critical Lane Group	Yes	Yes	No	
50th-Percentile Queue Length [veh]	1.41	0.04	0.71	
50th-Percentile Queue Length [ft]	35.22	1.05	17.81	
95th-Percentile Queue Length [veh]	2.54	0.08	1.28	
95th-Percentile Queue Length [ft]	63.39	1.89	32.06	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.90	0.48	5.34	0.00	0.00	0.00
Movement LOS	B	A	A			
d_A, Approach Delay [s/veh]	3.72		5.34		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.13					
Intersection LOS	A					
Intersection V/C	0.482					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	374	0	699	263	185	417	408	60
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	1	2	0	12	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]	0	0	0	0	374	0	700	265	185	429	408	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9100	1.0000	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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	0	0	0	103	0	192	73	51	118	112	16
Total Analysis Volume [veh/h]	0	0	0	0	411	0	769	291	203	471	448	66
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lag	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	23	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		11	20	20	10	18	18	18
g / C, Green / Cycle		0.16	0.27	0.27	0.14	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate		0.12	0.22	0.18	0.11	0.19	0.19	0.19
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1672	1583
c, Capacity [veh/h]		544	965	431	252	462	415	393
d1, Uniform Delay [s]		29.15	24.49	23.50	30.07	25.31	25.34	25.35
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.17	1.55	1.85	5.94	2.78	3.15	3.35
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.76	0.80	0.68	0.80	0.77	0.78	0.78
d, Delay for Lane Group [s/veh]		31.32	26.04	25.35	36.01	28.09	28.49	28.71
Lane Group LOS		C	C	C	D	C	C	C
Critical Lane Group		No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh]		3.43	5.95	4.39	3.70	5.74	5.23	4.98
50th-Percentile Queue Length [ft]		85.71	148.86	109.87	92.38	143.49	130.63	124.59
95th-Percentile Queue Length [veh]		6.17	9.96	7.83	6.65	9.67	8.97	8.64
95th-Percentile Queue Length [ft]		154.28	248.90	195.82	166.29	241.72	224.35	216.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	31.32	0.00	26.04	25.35	36.01	28.18	28.62	28.71
Movement LOS					C		C	C	D	C	C	C
d_A, Approach Delay [s/veh]	0.00				27.38				29.71			
Approach LOS	A				C				C			
d_I, Intersection Delay [s/veh]	28.36											
Intersection LOS	C											
Intersection V/C	0.710											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	117	380	501	116	104	328	126	205
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	122	380	501	116	104	328	126	205
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	34	104	138	32	29	90	35	0
Total Analysis Volume [veh/h]	134	418	551	127	114	360	138	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	34	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	16	16	16	10	10	10	10
g / C, Green / Cycle	0.23	0.23	0.23	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.16	0.16	0.08	0.06	0.09	0.10	0.09
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1863	1583
c, Capacity [veh/h]	779	802	358	255	268	268	228
d1, Uniform Delay [s]	25.81	25.66	23.56	28.35	29.25	29.48	29.06
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.20	1.06	0.60	1.22	2.62	3.23	2.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

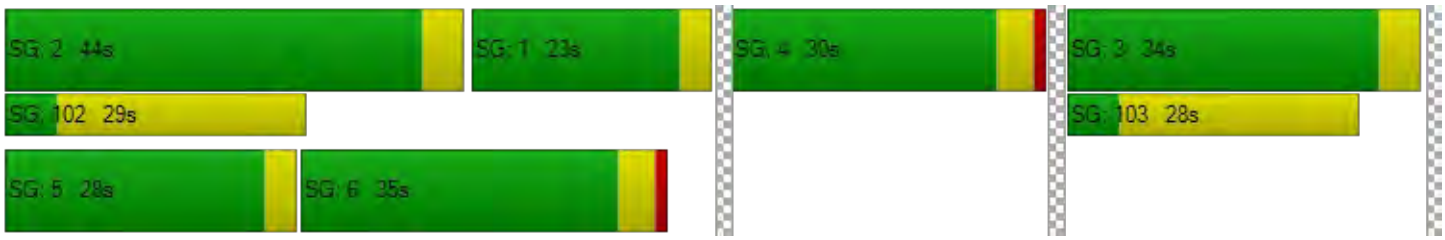
X, volume / capacity	0.71	0.69	0.35	0.45	0.65	0.69	0.61
d, Delay for Lane Group [s/veh]	27.01	26.72	24.16	29.57	31.88	32.70	31.64
Lane Group LOS	C	C	C	C	C	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	4.28	4.23	1.80	1.82	2.93	3.20	2.32
50th-Percentile Queue Length [ft]	106.95	105.86	45.05	45.62	73.19	79.88	58.01
95th-Percentile Queue Length [veh]	7.67	7.61	3.24	3.28	5.27	5.75	4.18
95th-Percentile Queue Length [ft]	191.75	190.22	81.08	82.12	131.74	143.78	104.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.01	27.01	26.72	24.16	29.57	32.30	32.70	31.64
Movement LOS	C	C	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	26.58				31.65			
Approach LOS	C				C			
d_I, Intersection Delay [s/veh]	28.36							
Intersection LOS	C							
Intersection V/C	0.710							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	32.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.590

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	162	646	118	172	573	13	57	21	49	267	11	187
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	1	3	0	0	0	0	0	0	1
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]	162	647	118	173	576	13	57	21	49	267	11	188
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	45	178	32	48	158	4	16	6	13	73	3	52
Total Analysis Volume [veh/h]	178	711	130	190	633	14	63	23	54	293	12	207
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	88.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	15	53	0	21	59	0	0	36	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	Yes		No	Yes			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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	53	53	14	55	55	32	32	32
g / C, Green / Cycle	0.10	0.48	0.48	0.12	0.50	0.50	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.10	0.16	0.16	0.11	0.12	0.12	0.14	0.27	0.13
s, saturation flow rate [veh/h]	1774	3547	1720	1774	3547	1842	1007	1114	1583
c, Capacity [veh/h]	187	1718	833	220	1784	927	339	387	459
d1, Uniform Delay [s]	48.87	17.37	17.39	47.21	15.42	15.42	32.20	39.91	31.89
k, delay calibration	0.38	0.50	0.50	0.20	0.50	0.50	0.11	0.41	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	46.26	0.51	1.07	16.48	0.32	0.61	0.80	12.56	0.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.33	0.33	0.86	0.24	0.24	0.41	0.79	0.45
d, Delay for Lane Group [s/veh]	95.13	17.88	18.46	63.69	15.73	16.03	33.00	52.47	32.59
Lane Group LOS	F	B	B	E	B	B	C	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	7.24	4.45	4.48	6.08	3.05	3.25	3.13	9.36	4.56
50th-Percentile Queue Length [ft]	181.00	111.23	111.95	152.12	76.24	81.27	78.30	233.92	114.11
95th-Percentile Queue Length [veh]	11.65	7.91	7.95	10.13	5.49	5.85	5.64	14.37	8.07
95th-Percentile Queue Length [ft]	291.32	197.71	198.72	253.26	137.24	146.28	140.93	359.34	201.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	95.13	18.00	18.46	63.69	15.83	16.03	33.00	33.00	33.00	52.47	52.47	32.59
Movement LOS	F	B	B	E	B	B	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	31.53			26.70			33.00			44.43		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	32.63											
Intersection LOS	C											
Intersection V/C	0.590											

Sequence

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

Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.697

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	128	340	86	67	517	88	70	227	39	52	229	181
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	2	0	3	0	1	1	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]	129	340	86	67	517	90	70	230	39	53	230	181
Peak Hour Factor	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440
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	90	23	18	137	24	19	61	10	14	61	48
Total Analysis Volume [veh/h]	137	360	91	71	548	95	74	244	41	56	244	192
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	138
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	6	15	15	3	13	13	3	17	17	3	17
g / C, Green / Cycle	0.10	0.27	0.27	0.06	0.23	0.23	0.06	0.30	0.30	0.05	0.29
(v / s)_i Volume / Saturation Flow Rate	0.08	0.12	0.13	0.04	0.18	0.18	0.04	0.13	0.03	0.03	0.25
s, saturation flow rate [veh/h]	1774	1863	1735	1774	1863	1768	1774	1863	1583	1774	1728
c, Capacity [veh/h]	184	512	477	106	431	409	109	566	481	93	510
d1, Uniform Delay [s]	24.67	17.01	17.04	26.08	20.33	20.35	26.05	15.79	14.09	26.28	18.83
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	5.91	0.63	0.69	7.04	2.85	3.04	7.28	0.52	0.08	6.21	4.23
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.45	0.46	0.67	0.76	0.77	0.68	0.43	0.09	0.60	0.86
d, Delay for Lane Group [s/veh]	30.58	17.64	17.72	33.12	23.18	23.39	33.34	16.31	14.16	32.48	23.06
Lane Group LOS	C	B	B	C	C	C	C	B	B	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]	1.96	2.34	2.22	1.08	4.01	3.84	1.13	2.34	0.35	0.85	5.37
50th-Percentile Queue Length [ft]	49.02	58.58	55.42	27.12	100.25	96.10	28.35	58.45	8.71	21.31	134.17
95th-Percentile Queue Length [veh]	3.53	4.22	3.99	1.95	7.22	6.92	2.04	4.21	0.63	1.53	9.17
95th-Percentile Queue Length [ft]	88.24	105.44	99.76	48.81	180.46	172.97	51.02	105.20	15.67	38.35	229.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.58	17.67	17.72	33.12	23.26	23.39	33.34	16.31	14.16	32.48	23.06	23.06
Movement LOS	C	B	B	C	C	C	C	B	B	C	C	C
d_A, Approach Delay [s/veh]	20.68			24.26			19.57			24.13		
Approach LOS	C			C			B			C		
d_I, Intersection Delay [s/veh]	22.47											
Intersection LOS	C											
Intersection V/C	0.697											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	49.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.879

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	84	237	288	419	299	181	126	309	50	461	430	585
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	1	0	2	1	0	0	0	1	0	1	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]	85	238	288	421	300	181	126	309	51	461	431	585
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	22	62	75	110	78	47	33	80	13	120	112	152
Total Analysis Volume [veh/h]	89	248	300	439	313	189	131	322	53	480	449	609
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	10	0	6	10	0
Maximum Green [s]	27	27	0	22	22	0	22	30	0	27	30	0
Amber [s]	3.2	3.2	0.0	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	33	33	0	31	31	0	11	31	0	25	45	0
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Walk [s]	7	7	0	7	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	25	25	0	23	23	0	0	22	0	0	23	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.2	2.2	0.0	2.2	2.2	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]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	25	25	20	20	20	20	8	41	41	19	52	52
g / C, Green / Cycle	0.21	0.21	0.21	0.21	0.16	0.16	0.16	0.16	0.07	0.35	0.35	0.16	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.05	0.08	0.06	0.19	0.14	0.14	0.14	0.12	0.07	0.09	0.03	0.14	0.13	0.38
s, saturation flow rate [veh/h]	1774	1863	1695	1583	1774	1798	1695	1583	1774	3547	1583	3445	3547	1583
c, Capacity [veh/h]	365	383	348	325	291	295	278	260	120	1225	547	539	1539	687
d1, Uniform Delay [s]	39.88	40.98	40.43	46.73	48.89	48.89	48.89	47.59	55.93	28.27	26.60	49.61	22.01	31.24
k, delay calibration	0.04	0.04	0.04	0.26	0.06	0.06	0.06	0.04	0.49	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.13	0.22	0.18	21.20	4.38	4.32	4.57	1.46	106.28	0.52	0.35	2.10	0.48	15.63
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	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.37	0.31	0.92	0.87	0.87	0.87	0.73	1.09	0.26	0.10	0.89	0.29	0.89
d, Delay for Lane Group [s/veh]	40.01	41.20	40.61	67.93	53.27	53.21	53.45	49.05	162.21	28.80	26.95	51.71	22.49	46.87
Lane Group LOS	D	D	D	E	D	D	D	D	F	C	C	D	C	D
Critical Lane Group	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.22	3.62	2.71	10.65	7.73	7.83	7.40	5.47	7.20	3.44	1.09	7.20	4.21	18.79
50th-Percentile Queue Length [ft]	55.58	90.59	67.75	266.1	193.3	195.8	185.1	136.6	180.03	86.08	27.31	179.88	105.23	469.87
95th-Percentile Queue Length [veh]	4.00	6.52	4.88	16.00	12.29	12.42	11.87	9.30	11.92	6.20	1.97	11.59	7.57	25.90
95th-Percentile Queue Length [ft]	100.0	163.0	121.9	399.9	307.3	310.5	296.6	232.4	298.07	154.95	49.16	289.86	189.35	647.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.01	40.95	67.93	53.24	53.40	49.05	162.21	28.80	26.95	51.71	22.49	46.87
Movement LOS	D	D	E	D	D	D	F	C	C	D	C	D
d_A, Approach Delay [s/veh]	53.52			52.45			63.14			41.26		
Approach LOS	D			D			E			D		
d_I, Intersection Delay [s/veh]	49.38											
Intersection LOS	D											
Intersection V/C	0.879											

Sequence

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

Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	10.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.695

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	185	6	233	0	778	152	320	1231	0
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	2	0	1	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]	0	0	0	185	6	233	0	778	154	320	1232	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.8100	0.8100	0.8100	1.0000	0.8100	0.8100	0.8100	0.8100	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	57	2	72	0	240	0	99	380	0
Total Analysis Volume [veh/h]	0	0	0	228	7	288	0	960	0	395	1521	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		7	7	7	13	13	7	24
g / C, Green / Cycle		0.18	0.18	0.18	0.35	0.35	0.18	0.61
(v / s)_i Volume / Saturation Flow Rate		0.10	0.10	0.10	0.26	0.26	0.11	0.43
s, saturation flow rate [veh/h]		1774	1637	1583	1863	1863	3445	3547
c, Capacity [veh/h]		319	294	285	648	648	633	2160
d1, Uniform Delay [s]		14.58	14.58	14.58	11.12	11.12	14.61	5.20
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.68	1.82	1.89	1.69	1.69	1.02	0.43
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.58	0.58	0.58	0.74	0.74	0.62	0.70
d, Delay for Lane Group [s/veh]		16.27	16.41	16.47	12.80	12.80	15.63	5.63
Lane Group LOS		B	B	B	B	B	B	A
Critical Lane Group		No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]		1.38	1.29	1.25	2.97	2.97	1.40	1.89
50th-Percentile Queue Length [ft]		34.49	32.13	31.20	74.32	74.32	35.09	47.26
95th-Percentile Queue Length [veh]		2.48	2.31	2.25	5.35	5.35	2.53	3.40
95th-Percentile Queue Length [ft]		62.09	57.83	56.17	133.78	133.78	63.16	85.07

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	16.30	16.41	16.44	0.00	12.80	12.80	15.63	5.63	0.00
Movement LOS				B	B	B		B	B	B	A	
d_A, Approach Delay [s/veh]	0.00			16.38			12.80			7.69		
Approach LOS	A			B			B			A		
d_I, Intersection Delay [s/veh]	10.47											
Intersection LOS	B											
Intersection V/C	0.695											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	24.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.700

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	576	63	261	49	77	63	152	720	150	179	724	49
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	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]	577	63	261	49	77	63	152	720	150	179	724	49
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	148	16	67	13	20	16	39	184	0	46	185	13
Total Analysis Volume [veh/h]	591	64	267	50	79	64	156	737	0	183	741	50
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	123
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	32	32	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	15	15	15	6	6	7	15	15	8	16	16
g / C, Green / Cycle	0.25	0.25	0.25	0.10	0.10	0.12	0.25	0.25	0.13	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.18	0.18	0.17	0.07	0.04	0.09	0.20	0.20	0.10	0.21	0.21
s, saturation flow rate [veh/h]	1774	1791	1583	1827	1583	1774	1863	1863	1774	1863	1822
c, Capacity [veh/h]	439	443	392	191	165	206	470	470	237	519	508
d1, Uniform Delay [s]	20.57	20.53	20.18	25.56	24.76	25.38	20.63	20.63	24.78	19.62	19.62
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	2.53	2.44	2.09	4.13	1.48	5.62	2.90	2.90	5.24	2.45	2.50
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

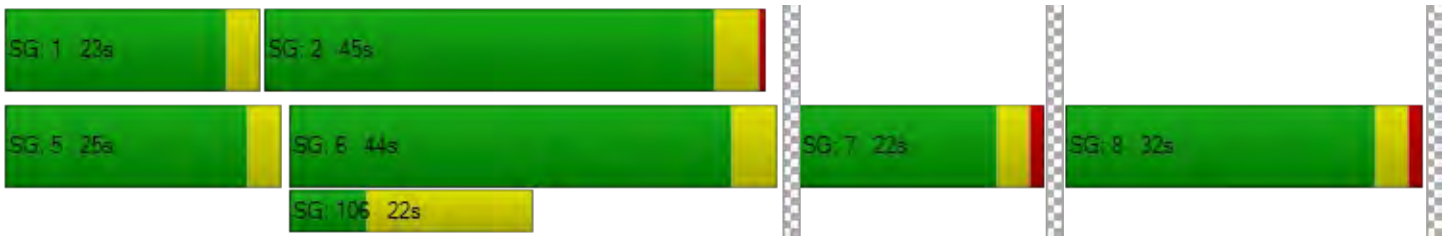
X, volume / capacity	0.75	0.74	0.68	0.68	0.39	0.76	0.78	0.78	0.77	0.77	0.77
d, Delay for Lane Group [s/veh]	23.10	22.98	22.27	29.69	26.23	30.99	23.53	23.53	30.02	22.07	22.12
Lane Group LOS	C	C	C	C	C	C	C	C	C	C	C
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	4.10	4.09	3.26	1.86	0.85	2.31	4.68	4.68	2.65	4.90	4.80
50th-Percentile Queue Length [ft]	102.50	102.31	81.56	46.39	21.36	57.65	117.06	117.06	66.34	122.61	120.10
95th-Percentile Queue Length [veh]	7.38	7.37	5.87	3.34	1.54	4.15	8.23	8.23	4.78	8.54	8.40
95th-Percentile Queue Length [ft]	184.50	184.17	146.81	83.51	38.44	103.77	205.78	205.78	119.42	213.41	209.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.05	22.98	22.27	29.69	29.69	26.23	30.99	23.53	23.53	30.02	22.09	22.12
Movement LOS	C	C	C	C	C	C	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	22.82			28.55			24.83			23.58		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.04											
Intersection LOS	C											
Intersection V/C	0.700											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	17.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	153	123	937	91	52	805
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	153	123	937	91	52	805
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	32	243	24	13	209
Total Analysis Volume [veh/h]	159	128	973	94	54	836
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	23	70	70	5	78
g / C, Green / Cycle	0.21	0.63	0.63	0.04	0.71
(v / s)_i Volume / Saturation Flow Rate	0.19	0.30	0.07	0.03	0.26
s, saturation flow rate [veh/h]	1515	3192	1425	1597	3192
c, Capacity [veh/h]	312	2022	903	67	2273
d1, Uniform Delay [s]	42.75	10.63	7.91	52.21	6.18
k, delay calibration	0.24	0.50	0.50	0.04	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	20.35	0.82	0.23	7.95	0.46
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	0.92	0.48	0.10	0.80	0.37
d, Delay for Lane Group [s/veh]	63.09	11.45	8.14	60.17	6.64
Lane Group LOS	E	B	A	E	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	9.33	6.05	0.89	1.62	3.50
50th-Percentile Queue Length [ft]	233.28	151.17	22.36	40.59	87.40
95th-Percentile Queue Length [veh]	14.34	10.08	1.61	2.92	6.29
95th-Percentile Queue Length [ft]	358.53	251.99	40.25	73.06	157.31

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	63.09	63.09	11.45	8.14	60.17	6.64
Movement LOS	E	E	B	A	E	A
d_A, Approach Delay [s/veh]	63.09		11.16		9.89	
Approach LOS	E		B		A	
d_I, Intersection Delay [s/veh]	17.30					
Intersection LOS	B					
Intersection V/C	0.559					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	51.8
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.352

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	888	110	0	857	50	0	0	75	0	0	24
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	888	110	0	857	50	0	0	75	0	0	24
Peak Hour Factor	1.0000	0.9730	0.9730	1.0000	0.9730	0.9730	1.0000	1.0000	0.9730	1.0000	1.0000	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	228	28	0	0	0	0	0	19	0	0	0
Total Analysis Volume [veh/h]	0	913	113	0	0	0	0	0	77	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	48	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	37	37		7	
g / C, Green / Cycle	0.30	0.30		0.06	
(v / s)_i Volume / Saturation Flow Rate	0.28	0.29		0.05	
s, saturation flow rate [veh/h]	1863	1793		1583	
c, Capacity [veh/h]	568	547		96	
d1, Uniform Delay [s]	40.03	40.63		55.69	
k, delay calibration	0.17	0.19		0.04	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	8.39	13.08		5.78	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

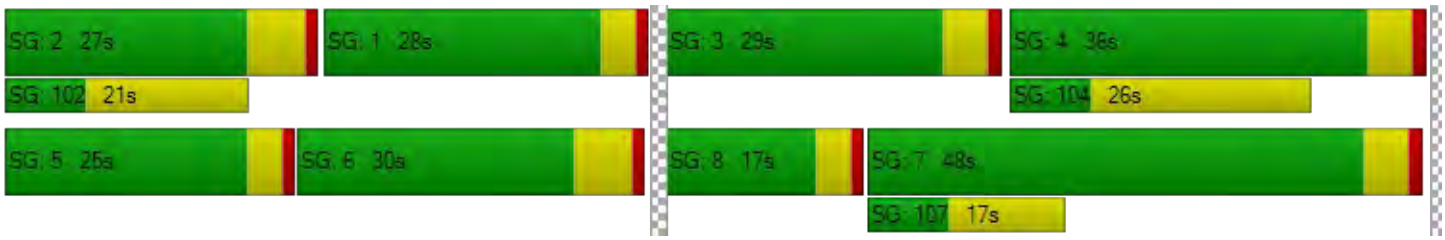
X, volume / capacity	0.90	0.94		0.80	
d, Delay for Lane Group [s/veh]	48.42	53.71		61.47	
Lane Group LOS	D	D		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	15.69	16.57		2.46	
50th-Percentile Queue Length [ft]	392.28	414.24		61.41	
95th-Percentile Queue Length [veh]	22.19	23.25		4.42	
95th-Percentile Queue Length [ft]	554.69	581.13		110.54	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	50.74	53.71	0.00	0.00	0.00	0.00	0.00	61.47	0.00	0.00	0.00
Movement LOS		D	D						E			
d_A, Approach Delay [s/veh]	51.06			0.00			61.47			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	51.79											
Intersection LOS	D											
Intersection V/C	0.352											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Juniper Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	51.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.750

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	165	555	484	209	610	90	184	443	128	240	369	182
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	0	0	0	0	3	0	1	1	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]	165	555	486	209	610	90	184	446	128	241	370	182
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	145	0	54	159	23	48	116	0	63	96	47
Total Analysis Volume [veh/h]	172	578	0	218	635	94	192	465	0	251	385	190
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	3	0	4	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	8	8	0	4	10	0	4	10	0
Maximum Green [s]	25	25	0	30	30	0	20	40	0	20	40	0
Amber [s]	3.9	3.9	0.0	3.9	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	29	0	36	36	0	28	30	0	25	27	0
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	0	0	7	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	19	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.9	2.9	0.0	2.9	2.9	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
Maximum Recall		No			No		No	No		No	Yes	
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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	28	28	28	26	26	26	26	15	28	28	19	32	32
g / C, Green / Cycle	0.23	0.23	0.23	0.22	0.22	0.22	0.22	0.12	0.23	0.23	0.16	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.00	0.12	0.20	0.16	0.06	0.11	0.12	0.12	0.14	0.11	0.12
s, saturation flow rate [veh/h]	1822	1695	1583	1774	1863	1695	1583	1774	1863	1863	1774	3547	1583
c, Capacity [veh/h]	421	391	365	383	402	366	342	221	432	432	278	937	418
d1, Uniform Delay [s]	45.17	45.15	0.00	42.11	45.90	43.97	39.27	51.64	40.50	40.50	49.74	36.48	36.95
k, delay calibration	0.24	0.23	0.04	0.04	0.13	0.04	0.04	0.04	0.50	0.50	0.26	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.53	17.28	0.00	0.50	9.10	1.12	0.16	4.10	4.76	4.76	21.01	1.33	3.53
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

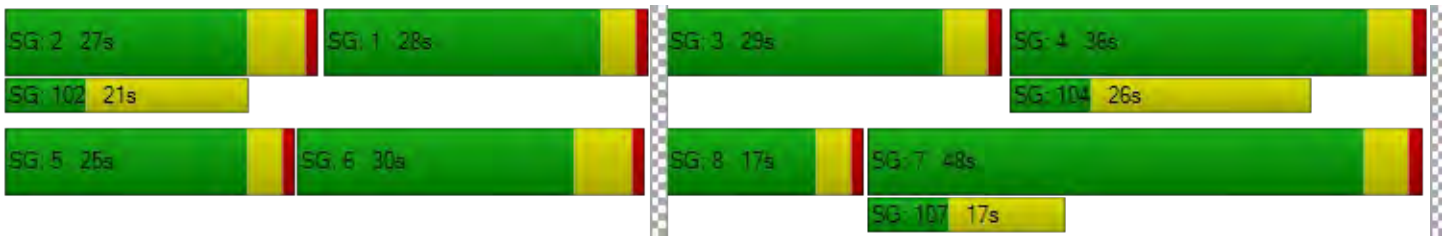
X, volume / capacity	0.92	0.92	0.00	0.57	0.91	0.74	0.28	0.87	0.54	0.54	0.90	0.41	0.45
d, Delay for Lane Group [s/veh]	61.70	62.43	0.00	42.61	55.00	45.09	39.43	55.74	45.26	45.26	70.74	37.81	40.48
Lane Group LOS	E	E	A	D	D	D	D	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	13.19	12.33	0.00	5.84	11.54	7.63	2.34	5.92	6.61	6.61	9.00	4.85	5.08
50th-Percentile Queue Length [ft]	329.66	308.28	0.00	145.9	288.5	190.7	58.54	147.98	165.14	165.14	225.08	121.13	127.03
95th-Percentile Queue Length [veh]	19.14	18.09	0.00	9.80	17.11	12.16	4.21	9.91	10.82	10.82	13.92	8.46	8.78
95th-Percentile Queue Length [ft]	478.54	452.26	0.00	245.0	427.7	303.9	105.3	247.73	270.51	270.51	348.11	211.38	219.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	61.70	62.16	0.00	42.61	50.77	39.43	55.74	45.26	45.26	70.74	37.81	40.48
Movement LOS	E	E	A	D	D	D	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	62.05			47.76			48.32			48.43		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	51.42											
Intersection LOS	D											
Intersection V/C	0.750											

Sequence

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



BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6258*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1691*	pc/h/ln
S	*67.2*	mph
D = v_p / S	*25.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7224*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1274*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3822*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1016*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.5*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7715*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2019*	pc/h/ln
S	*62.2*	mph
D = v_p / S	*32.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/20156*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9076*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*6*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1600*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*68.1*	mph	S	mph
D = v_p / S	*23.5*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1394*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*4*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*371*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*70.0*	mph	S	mph
D = v_p / S	*5.3*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*A*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	Joel Amarillas
Agency/Company	Kittelson & Associates, Inc.
Date Performed	3/28/2016
Analysis Time Period	AM Peak Hour

Site Information

Freeway/Dir of Travel	I-280 Southbound
Weaving Segment Location	SR-1 On to Serramonte Off
Analysis Year	Existing (2016)

Project Description Serramonte Terrace TIA

Inputs

Weaving configuration	One-Sided
Weaving number of lanes, N	5
Weaving segment length, L_S	700ft
Freeway free-flow speed, FFS	70 mph
Segment type	Freeway
Freeway minimum speed, S_{MIN}	15
Freeway maximum capacity, C_{IFL}	2400
Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	5650	0.97	1	0	1.5	1.2	0.995	1.00	5854
V_{RF}	807	0.97	1	0	1.5	1.2	0.995	1.00	836
V_{FR}	1224	0.97	1	0	1.5	1.2	0.995	1.00	1268
V_{RR}	0	0.97	1	0	1.5	1.2	0.995	1.00	0
V_{NW}	5854							V =	7958
V_W	2104								
VR	0.264								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	2104 lc/h
Interchange density, ID	2.0 int/mi	Weaving lane changes, LC_W	2574 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	622 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	3196 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	820

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	7919 veh/h	Weaving intensity factor, W	0.749
Weaving segment capacity, c_w	9032 veh/h	Weaving segment speed, S	47.0 mph
Weaving segment v/c ratio	0.877	Average weaving speed, S_W	46.4 mph
Weaving segment density, D	33.9 pc/mi/ln	Average non-weaving speed, S_{NW}	47.2 mph
Level of Service, LOS	D	Maximum weaving length, L_{MAX}	5205 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7148*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1833*	pc/h/ln
S	*65.4*	mph
D = v_p / S	*28.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9256*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*6*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1632*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*67.8*	mph	S	mph
D = v_p / S	*24.1*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*C*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3577*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*951*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*13.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6856*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1833*	pc/h/ln
S	*65.4*	mph
D = v_p / S	*28.0*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	mph
D = v_p / S	pc/mi/ln
Required Number of Lanes, N	

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/20156*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8452*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1490*	pc/h/ln
S	*69.0*	mph
D = v_p / S	*21.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1984*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*527*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*7.5*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	Joel Amarillas
Agency/Company	Kittelson & Associates, Inc.
Date Performed	03/28/2016
Analysis Time Period	PM Peak Hour

Site Information

Freeway/Dir of Travel	I-280 Southbound
Weaving Segment Location	SR-1 On to Serramonte Off
Analysis Year	Existing (2016)

Project Description Serramonte Terrace TIA

Inputs

Weaving configuration	One-Sided
Weaving number of lanes, N	5
Weaving segment length, L_S	700ft
Freeway free-flow speed, FFS	70 mph
Segment type	Freeway
Freeway minimum speed, S_{MIN}	15
Freeway maximum capacity, C_{IFL}	2400
Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	6557	0.97	1	0	1.5	1.2	0.995	1.00	6794
V_{RF}	860	0.97	1	0	1.5	1.2	0.995	1.00	891
V_{FR}	1385	0.97	1	0	1.5	1.2	0.995	1.00	1435
V_{RR}	0	0.97	1	0	1.5	1.2	0.995	1.00	0
V_{NW}	6794							V =	9120
V_W	2326								
VR	0.255								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	2326 lc/h
Interchange density, ID	2.0 int/mi	Weaving lane changes, LC_W	2796 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	816 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	3612 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	951

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	9075 veh/h	Weaving intensity factor, W	0.825
Weaving segment capacity, c_w	9363 veh/h	Weaving segment speed, S	44.7 mph
Weaving segment v/c ratio	0.969	Average weaving speed, S_W	45.1 mph
Weaving segment density, D	40.8 pc/mi/ln	Average non-weaving speed, S_{NW}	44.5 mph
Level of Service, LOS	E	Maximum weaving length, L_{MAX}	5107 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Appendix 3
Year 2016 Existing Conditions
Signal Warrant Worksheets

Signal Warrants Report For Intersection 1: WB Hwy 1 Ramps / Clarinada Ave.

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	3	5	11
2	3	5	11
3	4	7	17
4	4	7	17
5	6	10	23
6	14	24	56
7	16	27	62
8	29	48	113
9	50	85	197
10	51	87	203
11	51	87	203
12	56	94	220
13	61	104	242
14	64	109	253
15	64	109	253
16	69	116	270
17	86	145	338
18	90	152	355
19	97	165	383
20	109	184	428
21	114	194	450
22	134	227	529
23	137	232	540
24	143	242	563

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	8	2	11	No	No	No	No	No	No	No	No	No	No
2	5	8	2	11	No	No	No	No	No	No	No	No	No	No
3	5	11	2	17	No	No	No	No	No	No	No	No	No	No
4	5	11	2	17	No	No	No	No	No	No	No	No	No	No
5	5	16	2	23	No	No	No	No	No	No	No	No	No	No
6	5	38	2	56	No	No	No	No	No	No	No	No	No	No
7	5	43	2	62	No	No	No	No	No	No	No	No	No	No
8	5	77	2	113	No	No	No	No	No	No	No	No	No	No
9	5	135	2	197	No	No	No	No	No	No	No	No	No	No
10	5	138	2	203	No	No	No	No	No	No	No	No	No	No
11	5	138	2	203	No	No	No	No	No	No	No	No	No	No
12	5	150	2	220	No	No	No	No	No	No	No	No	No	No
13	5	165	2	242	No	No	No	No	No	No	No	No	No	No
14	5	173	2	253	No	No	No	No	No	No	No	No	No	No
15	5	173	2	253	No	No	No	No	No	No	No	No	No	No
16	5	185	2	270	No	No	No	No	No	No	No	No	No	No
17	5	231	2	338	No	No	No	No	No	No	No	No	No	No
18	5	242	2	355	No	No	No	No	No	No	No	No	No	No
19	5	262	2	383	No	No	No	No	No	No	No	No	No	No
20	5	293	2	428	No	No	No	No	No	No	No	No	No	No
21	5	308	2	450	No	No	No	No	No	No	No	No	No	No
22	5	361	2	529	No	No	No	Yes	No	No	No	No	Yes	No
23	5	369	2	540	No	No	No	Yes	No	No	No	No	Yes	No
24	5	385	2	563	No	No	No	Yes	No	No	No	No	Yes	No
Hours Met					0	0	0	3	0	0	0	0	3	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	15.1
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	2:21
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	563
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	948
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 2: EB Hwy 1 Ramps / Serramonte Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	4	7	8	13
2	4	7	8	13
3	7	11	13	19
4	7	11	13	19
5	9	15	17	26
6	22	37	42	64
7	24	41	47	71
8	43	74	85	129
9	76	130	148	225
10	78	134	152	232
11	78	134	152	232
12	85	145	165	251
13	93	160	182	277
14	98	167	190	290
15	98	167	190	290
16	104	179	203	309
17	130	223	254	386
18	137	234	266	406
19	148	253	288	438
20	165	283	321	489
21	174	298	338	515
22	204	350	398	605
23	208	357	406	618
24	217	372	423	644

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	11	4	21	No	No	No	No	No	No	No	No	No	No
2	3	11	4	21	No	No	No	No	No	No	No	No	No	No
3	3	18	4	32	No	No	No	No	No	No	No	No	No	No
4	3	18	4	32	No	No	No	No	No	No	No	No	No	No
5	3	24	4	43	No	No	No	No	No	No	No	No	No	No
6	3	59	4	106	No	No	No	No	No	No	No	No	No	No
7	3	65	4	118	No	No	No	No	No	No	No	No	No	No
8	3	117	4	214	No	No	No	No	No	No	No	No	No	No
9	3	206	4	373	No	No	No	No	No	No	No	No	No	No
10	3	212	4	384	No	No	No	No	No	No	No	No	No	No
11	3	212	4	384	No	No	No	No	No	No	No	No	No	No
12	3	230	4	416	No	No	No	No	No	No	No	No	No	No
13	3	253	4	459	No	No	No	No	No	No	No	No	No	No
14	3	265	4	480	No	No	No	No	No	No	No	No	No	No
15	3	265	4	480	No	No	No	No	No	No	No	No	No	No
16	3	283	4	512	No	No	No	No	No	No	No	No	No	No
17	3	353	4	640	No	No	No	Yes	No	No	No	No	No	No
18	3	371	4	672	No	No	No	Yes	No	No	No	No	No	No
19	3	401	4	726	No	No	No	Yes	No	No	No	No	No	No
20	3	448	4	810	No	No	Yes	Yes	No	No	No	No	Yes	No
21	3	472	4	853	No	No	Yes	Yes	No	No	No	No	Yes	No
22	3	554	4	1003	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
23	3	565	4	1024	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
24	3	589	4	1067	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Hours Met					0	3	5	8	0	0	0	3	5	3

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	16	62.1
Number of Lanes on Minor Street Approach	2	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	1:53	11:06
Delay Condition Met	No	Yes
Volume on Minor Street Approach During Same Hour	423	644
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	1656	1656
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	Yes
Warrant Met for Intersection	**Yes**	

Signal Warrants Report For Intersection 3: Callan Blvd / Serramonte Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	9	10	4	10
2	9	10	4	10
3	14	15	7	14
4	14	15	7	14
5	18	20	9	19
6	46	50	22	48
7	51	55	24	53
8	92	100	44	96
9	162	175	77	168
10	166	180	79	173
11	166	180	79	173
12	180	195	86	188
13	199	215	95	207
14	208	225	99	216
15	208	225	99	216
16	222	240	106	231
17	277	300	132	289
18	291	315	139	303
19	314	340	150	327
20	351	380	167	366
21	370	400	176	385
22	434	470	207	452
23	444	480	211	462
24	462	500	220	481

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	19	6	14	No	No	No	No	No	No	No	No	No	No
2	5	19	6	14	No	No	No	No	No	No	No	No	No	No
3	5	29	6	21	No	No	No	No	No	No	No	No	No	No
4	5	29	6	21	No	No	No	No	No	No	No	No	No	No
5	5	38	6	28	No	No	No	No	No	No	No	No	No	No
6	5	96	6	70	No	No	No	No	No	No	No	No	No	No
7	5	106	6	77	No	No	No	No	No	No	No	No	No	No
8	5	192	6	140	No	No	No	No	No	No	No	No	No	No
9	5	337	6	245	No	No	No	Yes	No	No	No	No	No	No
10	5	346	6	252	No	No	No	Yes	No	No	No	No	No	No
11	5	346	6	252	No	No	No	Yes	No	No	No	No	No	No
12	5	375	6	274	No	No	No	Yes	No	No	No	No	No	No
13	5	414	6	302	No	No	No	Yes	No	No	No	No	No	No
14	5	433	6	315	No	No	Yes	Yes	No	No	No	No	No	No
15	5	433	6	315	No	No	Yes	Yes	No	No	No	No	No	No
16	5	462	6	337	No	No	Yes	Yes	No	No	No	No	No	No
17	5	577	6	421	No	Yes	Yes	Yes	No	No	No	Yes	No	No
18	5	606	6	442	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
19	5	654	6	477	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No
20	5	731	6	533	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
21	5	770	6	561	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
22	5	904	6	659	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	5	924	6	673	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	5	962	6	701	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hours Met					7	8	11	16	3	5	6	8	7	4

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.3	14.8
Number of Lanes on Minor Street Approach	3	3
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:41	1:58
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	220	481
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	1663	1663
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 1: SB Hwy 1 Ramps / Clarinada Ave.

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	6	3	14
2	6	3	14
3	10	4	21
4	10	4	21
5	13	5	29
6	32	13	71
7	36	14	79
8	65	26	143
9	113	45	250
10	117	46	257
11	117	46	257
12	126	50	278
13	139	55	307
14	146	58	321
15	146	58	321
16	156	62	343
17	194	77	428
18	204	81	450
19	220	88	486
20	246	98	543
21	259	103	571
22	305	121	671
23	311	124	685
24	324	129	714

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	9	2	14	No	No	No	No	No	No	No	No	No	No
2	5	9	2	14	No	No	No	No	No	No	No	No	No	No
3	5	14	2	21	No	No	No	No	No	No	No	No	No	No
4	5	14	2	21	No	No	No	No	No	No	No	No	No	No
5	5	18	2	29	No	No	No	No	No	No	No	No	No	No
6	5	45	2	71	No	No	No	No	No	No	No	No	No	No
7	5	50	2	79	No	No	No	No	No	No	No	No	No	No
8	5	91	2	143	No	No	No	No	No	No	No	No	No	No
9	5	158	2	250	No	No	No	No	No	No	No	No	No	No
10	5	163	2	257	No	No	No	No	No	No	No	No	No	No
11	5	163	2	257	No	No	No	No	No	No	No	No	No	No
12	5	176	2	278	No	No	No	No	No	No	No	No	No	No
13	5	194	2	307	No	No	No	No	No	No	No	No	No	No
14	5	204	2	321	No	No	No	No	No	No	No	No	No	No
15	5	204	2	321	No	No	No	No	No	No	No	No	No	No
16	5	218	2	343	No	No	No	No	No	No	No	No	No	No
17	5	271	2	428	No	No	No	No	No	No	No	No	No	No
18	5	285	2	450	No	No	No	No	No	No	No	No	No	No
19	5	308	2	486	No	No	No	No	No	No	No	No	No	No
20	5	344	2	543	No	No	No	Yes	No	No	No	No	Yes	No
21	5	362	2	571	No	No	No	Yes	No	No	No	No	Yes	No
22	5	426	2	671	No	No	Yes	Yes	No	No	No	No	Yes	No
23	5	435	2	685	No	No	Yes	Yes	No	No	No	No	Yes	Yes
24	5	453	2	714	No	No	Yes	Yes	No	No	No	No	Yes	Yes
Hours Met					0	0	3	5	0	0	0	0	5	2

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	29.9
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	5:55
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	714
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1167
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 2: NB Hwy 1 Ramps / Serramonte Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	107	371	416	429
2	103	356	399	412
3	101	349	391	403
4	86	297	333	343
5	81	282	316	326
6	73	252	283	292
7	67	234	262	270
8	64	223	250	257
9	51	178	200	206
10	48	167	187	193
11	48	167	187	193
12	46	160	179	184
13	42	145	162	167
14	39	134	150	154
15	39	134	150	154
16	37	130	146	150
17	21	74	83	86
18	12	41	46	47
19	11	37	42	43
20	4	15	17	17
21	3	11	12	13
22	3	11	12	13
23	2	7	8	9
24	2	7	8	9

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	478	4	845	No	No	Yes	Yes	No	No	No	No	Yes	No
2	3	459	4	811	No	No	Yes	Yes	No	No	No	No	No	No
3	3	450	4	794	No	No	Yes	Yes	No	No	No	No	No	No
4	3	383	4	676	No	No	No	Yes	No	No	No	No	No	No
5	3	363	4	642	No	No	No	Yes	No	No	No	No	No	No
6	3	325	4	575	No	No	No	No	No	No	No	No	No	No
7	3	301	4	532	No	No	No	No	No	No	No	No	No	No
8	3	287	4	507	No	No	No	No	No	No	No	No	No	No
9	3	229	4	406	No	No	No	No	No	No	No	No	No	No
10	3	215	4	380	No	No	No	No	No	No	No	No	No	No
11	3	215	4	380	No	No	No	No	No	No	No	No	No	No
12	3	206	4	363	No	No	No	No	No	No	No	No	No	No
13	3	187	4	329	No	No	No	No	No	No	No	No	No	No
14	3	173	4	304	No	No	No	No	No	No	No	No	No	No
15	3	173	4	304	No	No	No	No	No	No	No	No	No	No
16	3	167	4	296	No	No	No	No	No	No	No	No	No	No
17	3	95	4	169	No	No	No	No	No	No	No	No	No	No
18	3	53	4	93	No	No	No	No	No	No	No	No	No	No
19	3	48	4	85	No	No	No	No	No	No	No	No	No	No
20	3	19	4	34	No	No	No	No	No	No	No	No	No	No
21	3	14	4	25	No	No	No	No	No	No	No	No	No	No
22	3	14	4	25	No	No	No	No	No	No	No	No	No	No
23	3	9	4	17	No	No	No	No	No	No	No	No	No	No
24	3	9	4	17	No	No	No	No	No	No	No	No	No	No
Hours Met					0	0	3	5	0	0	0	0	1	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	13.8	17.1
Number of Lanes on Minor Street Approach	2	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	1:35	2:02
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	416	429
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	1323	1323
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 3: Callan Blvd / Serramonte Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	449	471	602	392
2	431	452	578	376
3	422	443	566	368
4	359	377	482	314
5	341	358	458	298
6	305	320	409	267
7	283	297	379	247
8	269	283	361	235
9	216	226	289	188
10	202	212	271	176
11	202	212	271	176
12	193	203	259	169
13	175	184	235	153
14	162	170	217	141
15	162	170	217	141
16	157	165	211	137
17	90	94	120	78
18	49	52	66	43
19	45	47	60	39
20	18	19	24	16
21	13	14	18	12
22	13	14	18	12
23	9	9	12	8
24	9	9	12	8

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	920	6	994	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2	5	883	6	954	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
3	5	865	6	934	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
4	5	736	6	796	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
5	5	699	6	756	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
6	5	625	6	676	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
7	5	580	6	626	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
8	5	552	6	596	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
9	5	442	6	477	No	No	Yes	Yes	No	No	No	No	No	No
10	5	414	6	447	No	No	No	Yes	No	No	No	No	No	No
11	5	414	6	447	No	No	No	Yes	No	No	No	No	No	No
12	5	396	6	428	No	No	No	Yes	No	No	No	No	No	No
13	5	359	6	388	No	No	No	Yes	No	No	No	No	No	No
14	5	332	6	358	No	No	No	No	No	No	No	No	No	No
15	5	332	6	358	No	No	No	No	No	No	No	No	No	No
16	5	322	6	348	No	No	No	No	No	No	No	No	No	No
17	5	184	6	198	No	No	No	No	No	No	No	No	No	No
18	5	101	6	109	No	No	No	No	No	No	No	No	No	No
19	5	92	6	99	No	No	No	No	No	No	No	No	No	No
20	5	37	6	40	No	No	No	No	No	No	No	No	No	No
21	5	27	6	30	No	No	No	No	No	No	No	No	No	No
22	5	27	6	30	No	No	No	No	No	No	No	No	No	No
23	5	18	6	20	No	No	No	No	No	No	No	No	No	No
24	5	18	6	20	No	No	No	No	No	No	No	No	No	No
Hours Met					6	8	9	13	1	4	5	8	8	5

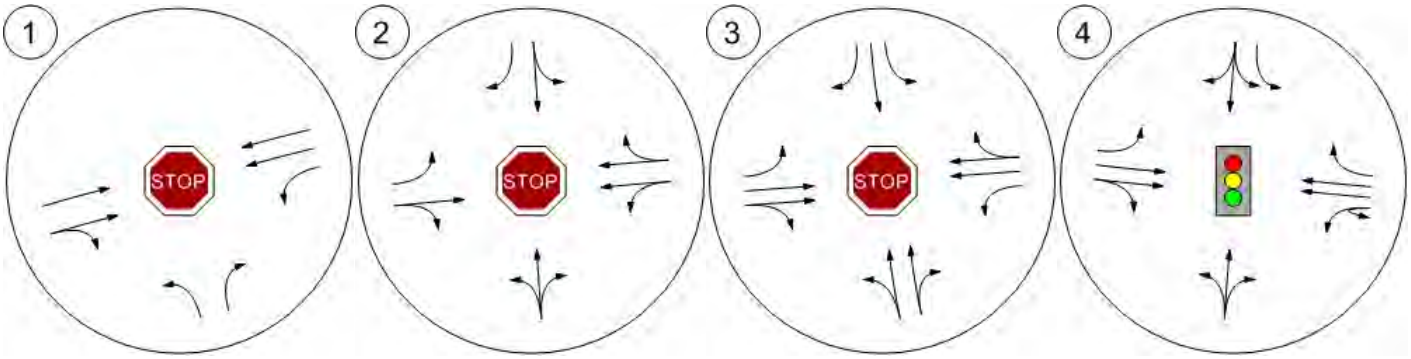
Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	15	12.9
Number of Lanes on Minor Street Approach	3	3
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	2:30	1:24
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	602	392
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	1914	1914
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

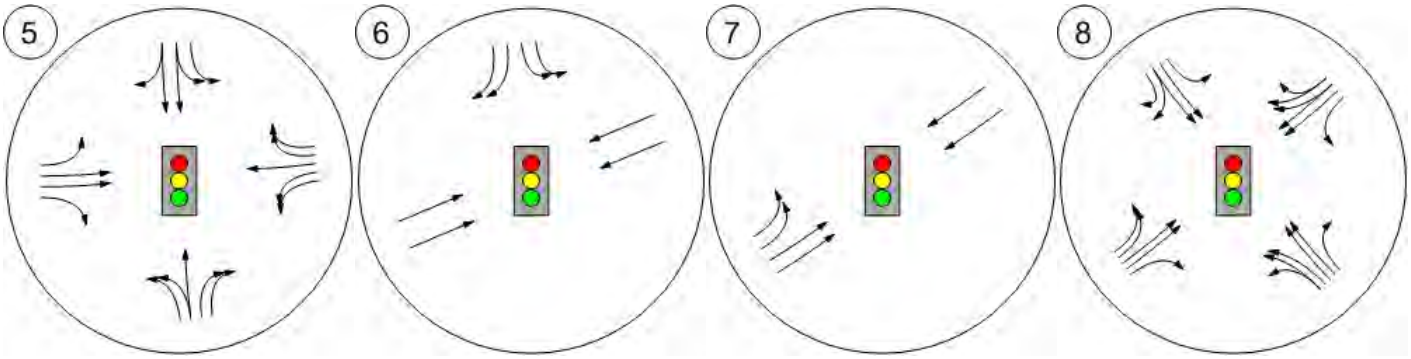
Appendix 4
Year 2016 Existing plus Project Conditions Intersection Lane Configurations

Lane Configuration and Traffic Control

WB Hwy 1 Ramps / Clarinad EB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

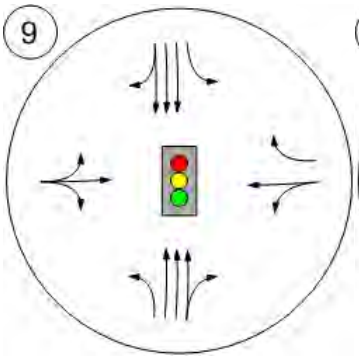


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

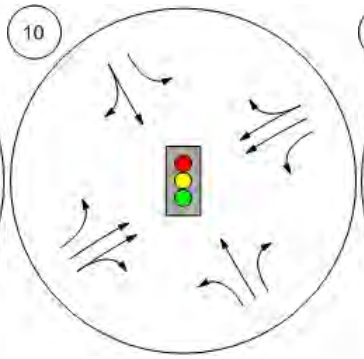


Lane Configuration and Traffic Control

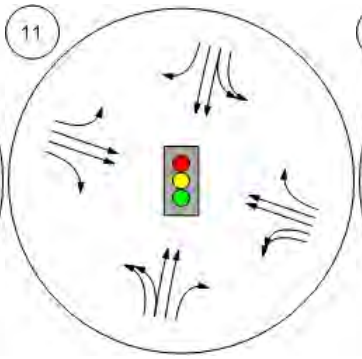
Gellert Blvd / Serramonte Pla



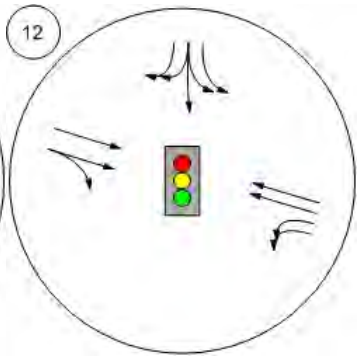
Callan Blvd / Hickey Blvd



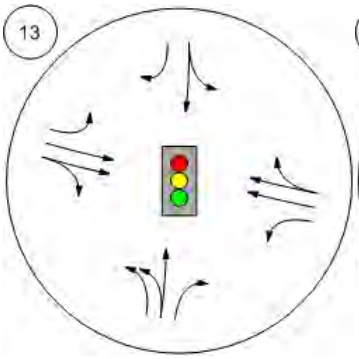
Gellert Blvd / Hickey Blvd



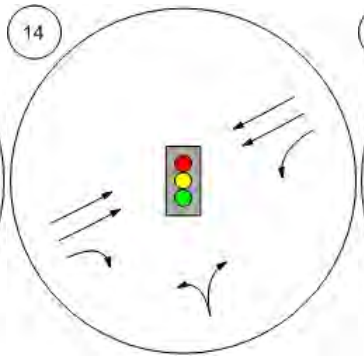
I-280 SB Ramps / Hickey Blv



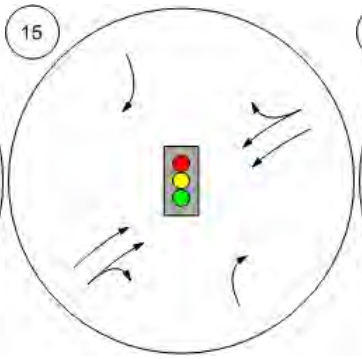
I-280 NB Ramps / Hickey Blv



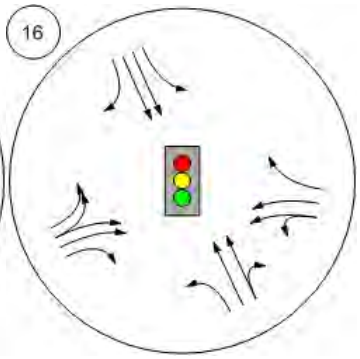
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd



Junipero Serra Blvd / Hickey



Appendix 5
Year 2016 Existing plus Project Conditions Level-of-Service Worksheets

19898 Daly City Serramonte Views TIA

Vistro File: K:\...\19898_Vistro_20170104.vistro
Scenario 4: Existing 2016 AM + Project

Report File: K:\...\ExAM_wProj_LOS_Summary.pdf
1/4/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	WB Hwy 1 Ramps / Clarinada Ave.	All-way stop	HCM 2010	NB Left		13.6	B
2	EB Hwy 1 Ramps / Serramonte Blvd	All-way stop	HCM 2010	EB Left		42.2	E
3	Callan Blvd / Serramonte Blvd	All-way stop	HCM 2010	SB Thru		14.5	B
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	EB Left	0.336	22.6	C
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	WB Thru	0.445	12.7	B
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	NEB Thru	0.795	7.3	A
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.661	1.9	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	SWB Left	0.753	27.8	C
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	WB Left	0.317	24.6	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.573	17.8	B
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.665	30.0	C
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.522	9.2	A
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.759	27.0	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.324	11.2	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.391	52.5	D
16	Junipero Serra Blvd / Hickey Blvd	Signalized	HCM 2010	SEB Left	0.706	43.6	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 1: WB Hwy 1 Ramps / Clarinada Ave.

Control Type:	All-way stop	Delay (sec / veh):	13.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	315	248	105	137	67	76
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.60	3.60	1.90	1.50	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	5	0	9	4
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
Total Hourly Volume [veh/h]	315	248	110	137	76	80
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	67	30	37	21	22
Total Analysis Volume [veh/h]	342	270	120	149	83	87
Pedestrian Volume [ped/h]	0		0		0	

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	4.06	1.88	0.87	1.00	0.62	0.28	0.28
95th-Percentile Queue Length [ft]	101.47	47.02	21.84	25.07	15.47	6.88	6.88
Approach Delay [s/veh]	15.35		11.21		11.02		
Approach LOS	C		B		B		
Intersection Delay [s/veh]	13.59						
Intersection LOS	B						

Intersection Level Of Service Report
Intersection 2: EB Hwy 1 Ramps / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	42.2
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	29	98	90	181	94	97	395	199	50	132	89	202
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	1.10	1.10	4.30	4.10	1.30	3.00	4.00	3.80	9.00	1.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	14	0	0	0	0	0	0	7	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]	29	98	90	195	94	97	395	199	50	132	96	202
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
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	0.0000
Total 15-Minute Volume [veh/h]	8	28	26	57	27	28	115	58	15	38	28	0
Total Analysis Volume [veh/h]	34	114	105	227	109	113	459	231	58	153	112	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.50	7.00	0.91	15.14	4.17	1.80	1.08
95th-Percentile Queue Length [ft]	87.55	175.09	22.65	378.38	104.31	45.06	27.09
Approach Delay [s/veh]	21.52	30.60		65.39		16.32	
Approach LOS	C	D		F		C	
Intersection Delay [s/veh]	42.22						
Intersection LOS	E						

Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	14.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	163	223	76	140	230	130	92	282	107	26	115	79
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 [%]	1.80	1.30	1.30	16.40	4.80	7.70	8.70	0.40	0.00	0.00	1.70	22.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	1	5	0	0	0	14	0	7	7	13
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]	163	223	77	145	230	130	92	296	107	33	122	92
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]	44	60	21	39	62	35	25	80	29	9	33	25
Total Analysis Volume [veh/h]	175	240	83	156	247	140	99	318	115	35	131	99
Pedestrian Volume [ped/h]	0			0			0			0		

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.55	2.26	1.51	2.77	1.04	0.83	2.26	2.09	0.23	0.86	0.81
95th-Percentile Queue Length [ft]	63.77	56.51	37.86	69.31	26.02	20.76	56.46	52.37	5.87	21.62	20.21
Approach Delay [s/veh]	14.94		15.09			14.94			11.46		
Approach LOS	B		C			B			B		
Intersection Delay [s/veh]	14.48										
Intersection LOS	B										

Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	22.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.336

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	175.00	100.00	100.00	200.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	52	0	52	71	390	0	44	0	196	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	11.50	2.00	0.00	0.00	5.90	0.00	0.00	2.00	11.90	4.70
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	11	118	0	5	0	0	0	20	0	53	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	11	118	52	5	52	71	390	20	44	53	196	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	7	3	30	13	1	13	18	98	5	11	13	49	27
Total Analysis Volume [veh/h]	27	11	118	52	5	52	71	390	20	44	53	196	107
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permi	Prote	Permi	Overl
Signal group	0	8	0	4	4	0	1	6	0	0	5	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	Lead	-	-
Minimum Green [s]	0	5	0	6	6	0	4	8	0	0	4	8	8
Maximum Green [s]	0	30	0	30	30	0	20	40	0	0	20	40	40
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.6	0.0	0.0	3.0	3.6	3.6
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0	1.0
Split [s]	0	18	0	18	18	0	12	26	0	0	12	26	26
Vehicle Extension [s]	0.0	2.5	0.0	2.5	2.5	0.0	2.0	3.0	0.0	0.0	2.0	3.0	3.0
Walk [s]	0	7	0	7	7	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	20	0	20	20	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.6	0.0	0.0	2.0	2.6	2.6
Minimum Recall		No			No		No	No			No	No	No
Maximum Recall		No			No		No	No			No	No	No
Pedestrian Recall		No			No		No	No			No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.60	4.60	4.00	4.60	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.60	2.60	2.00	2.60	0.00
g_i, Effective Green Time [s]	10	6	6	5	51	51	6	52	63
g / C, Green / Cycle	0.12	0.07	0.07	0.05	0.56	0.56	0.07	0.58	0.70
(v / s)_i Volume / Saturation Flow Rate	0.09	0.03	0.04	0.04	0.11	0.12	0.05	0.06	0.07
s, saturation flow rate [veh/h]	1664	1623	1583	1810	1794	1764	1790	3233	1543
c, Capacity [veh/h]	193	109	107	94	1009	992	125	1877	1078
d1, Uniform Delay [s]	38.88	40.52	40.82	42.19	9.75	9.76	41.23	8.44	4.39
k, delay calibration	0.08	0.08	0.08	0.04	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	5.90	2.37	3.69	4.60	0.46	0.47	3.79	0.11	0.18
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

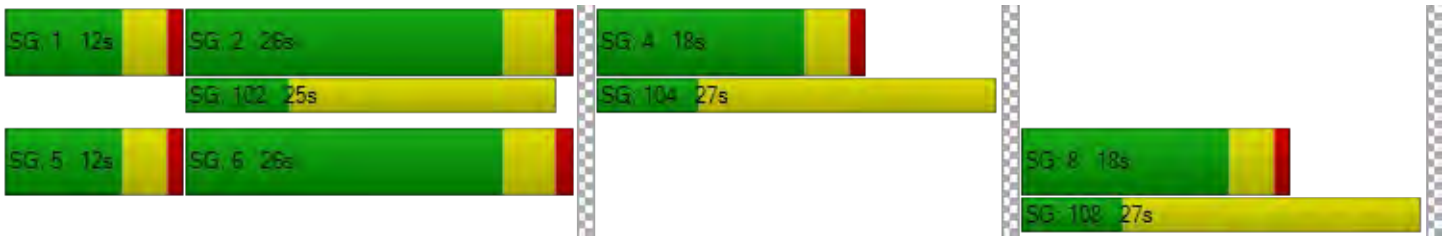
X, volume / capacity	0.81	0.48	0.58	0.76	0.20	0.21	0.77	0.10	0.10
d, Delay for Lane Group [s/veh]	44.78	42.89	44.51	46.79	10.21	10.23	45.02	8.55	4.57
Lane Group LOS	D	D	D	D	B	B	D	A	A
Critical Lane Group	Yes	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	3.63	1.17	1.43	1.66	2.00	1.98	2.22	0.82	0.59
50th-Percentile Queue Length [ft]	90.77	29.29	35.75	41.53	50.00	49.45	55.61	20.48	14.66
95th-Percentile Queue Length [veh]	6.54	2.11	2.57	2.99	3.60	3.56	4.00	1.47	1.06
95th-Percentile Queue Length [ft]	163.38	52.72	64.35	74.75	90.00	89.01	100.09	36.86	26.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	44.78	44.78	44.78	42.89	44.51	44.51	46.79	10.22	10.23	45.02	45.02	8.55	4.57
Movement LOS	D	D	D	D	D	D	D	B	B	D	D	A	A
d_A, Approach Delay [s/veh]	44.78			43.77			15.62			16.33			
Approach LOS	D			D			B			B			
d_I, Intersection Delay [s/veh]	22.61												
Intersection LOS	C												
Intersection V/C	0.336												

Sequence

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



Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	12.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.445

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	137	81	190	56	78	12	32	263	155	264	170	94
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 [%]	10.20	0.00	2.60	1.80	6.40	8.30	0.00	4.60	7.70	1.10	7.10	2.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	0	0	0	0	0	0	76	42	0	39	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]	152	81	190	56	78	12	32	339	197	264	209	94
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]	41	22	51	15	21	3	9	91	53	71	56	25
Total Analysis Volume [veh/h]	163	87	204	60	84	13	34	365	212	284	225	101
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	3	3	3	4	4	0	5	2	2	1	6	6
Auxiliary Signal Groups			1,3						2,3			4,6
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	4	4	4	4	0	4	6	6	4	6	6
Maximum Green [s]	25	25	25	30	30	0	20	26	26	25	26	26
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.5	0.5	0.5	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0	0	0	0	0	29	29
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	7	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	18	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	1.5	1.5	1.5	1.5	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		Yes	Yes		No		No	Yes	Yes	No	Yes	Yes
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	6	6	24	5	5	5	6	7	18	6	7	15
g / C, Green / Cycle	0.17	0.17	0.62	0.12	0.12	0.12	0.15	0.19	0.46	0.14	0.18	0.40
(v / s)_i Volume / Saturation Flow Rate	0.07	0.07	0.07	0.02	0.04	0.03	0.02	0.11	0.14	0.08	0.13	0.04
s, saturation flow rate [veh/h]	1642	1868	2786	1414	1679	1557	1810	3459	1500	3476	1774	2800
c, Capacity [veh/h]	274	312	1716	283	334	190	269	644	690	503	323	1106
d1, Uniform Delay [s]	14.35	14.35	3.06	17.09	15.44	15.34	14.18	14.23	6.52	15.30	14.72	7.29
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.11	0.11	0.04	0.11	0.04
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
d2, Incremental Delay [s]	0.39	0.34	0.01	0.07	0.12	0.29	0.08	0.79	0.25	0.37	2.71	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.43	0.43	0.12	0.12	0.21	0.28	0.13	0.57	0.31	0.56	0.70	0.09
d, Delay for Lane Group [s/veh]	14.74	14.69	3.07	17.16	15.55	15.63	14.26	15.01	6.77	15.67	17.42	7.31
Lane Group LOS	B	B	A	B	B	B	B	B	A	B	B	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.79	0.89	0.14	0.24	0.49	0.37	0.22	1.26	0.76	0.99	1.75	0.19
50th-Percentile Queue Length [ft]	19.70	22.30	3.40	6.03	12.36	9.21	5.53	31.44	19.09	24.85	43.85	4.72
95th-Percentile Queue Length [veh]	1.42	1.61	0.24	0.43	0.89	0.66	0.40	2.26	1.37	1.79	3.16	0.34
95th-Percentile Queue Length [ft]	35.46	40.14	6.11	10.85	22.25	16.58	9.95	56.59	34.36	44.73	78.92	8.50

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.73	14.69	3.07	16.77	15.59	15.63	14.26	15.01	6.77	15.67	17.42	7.31
Movement LOS	B	B	A	B	B	B	B	B	A	B	B	A
d_A, Approach Delay [s/veh]	9.48			15.91			12.11			14.93		
Approach LOS	A			B			B			B		
d_I, Intersection Delay [s/veh]	12.73											
Intersection LOS	B											
Intersection V/C	0.445											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	7.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.795

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	987	237	212	0	0	528
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.80	0.80	5.70	2.00	2.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	21	0	0	76
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]	987	254	233	0	0	604
Peak Hour Factor	0.8500	0.8500	0.8500	1.0000	1.0000	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	290	75	69	0	0	178
Total Analysis Volume [veh/h]	1161	299	274	0	0	711
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	12	12	7	8
g / C, Green / Cycle	0.44	0.44	0.26	0.29
(v / s)_i Volume / Saturation Flow Rate	0.33	0.11	0.08	0.20
s, saturation flow rate [veh/h]	3486	2836	3423	3512
c, Capacity [veh/h]	1546	1257	877	1027
d1, Uniform Delay [s]	6.42	4.79	8.31	8.67
k, delay calibration	0.04	0.04	0.04	0.04
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.04	0.07	0.32
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.24	0.31	0.69
d, Delay for Lane Group [s/veh]	6.70	4.82	8.38	8.99
Lane Group LOS	A	A	A	A
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh]	1.26	0.24	0.43	1.17
50th-Percentile Queue Length [ft]	31.57	5.93	10.68	29.33
95th-Percentile Queue Length [veh]	2.27	0.43	0.77	2.11
95th-Percentile Queue Length [ft]	56.82	10.67	19.23	52.79

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.70	4.82	8.38	0.00	0.00	8.99
Movement LOS	A	A	A			A
d_A, Approach Delay [s/veh]	6.32		8.38		8.99	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.33					
Intersection LOS	A					
Intersection V/C	0.795					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	1.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.661

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	124	1402	209	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.40	1.90	7.70	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	53	23	21	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]	177	1425	230	0	0	0
Peak Hour Factor	0.8400	0.8400	0.8400	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	53	424	68	0	0	0
Total Analysis Volume [veh/h]	211	1696	274	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	3.90	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	1.90	2.10	
g_i, Effective Green Time [s]	4	18	10	
g / C, Green / Cycle	0.17	0.82	0.48	
(v / s)_i Volume / Saturation Flow Rate	0.06	0.48	0.08	
s, saturation flow rate [veh/h]	3432	3550	3359	
c, Capacity [veh/h]	590	2914	1607	
d1, Uniform Delay [s]	7.94	0.67	3.22	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.37	0.19	0.05	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.36	0.58	0.17	
d, Delay for Lane Group [s/veh]	8.31	0.86	3.27	
Lane Group LOS	A	A	A	
Critical Lane Group	No	Yes	No	
50th-Percentile Queue Length [veh]	0.27	0.08	0.05	
50th-Percentile Queue Length [ft]	6.69	1.88	1.20	
95th-Percentile Queue Length [veh]	0.48	0.14	0.09	
95th-Percentile Queue Length [ft]	12.04	3.38	2.16	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.31	0.86	3.27	0.00	0.00	0.00
Movement LOS	A	A	A			
d_A, Approach Delay [s/veh]	1.68		3.27		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.88					
Intersection LOS	A					
Intersection V/C	0.661					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	27.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.753

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	159	0	795	432	117	140	217	44
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	11	12	0	7	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]	0	0	0	0	159	0	806	444	117	147	217	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9050	1.0000	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
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	0	0	0	44	0	223	123	32	41	60	12
Total Analysis Volume [veh/h]	0	0	0	0	176	0	891	491	129	162	240	49
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lead	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	28	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		6	29	29	7	29	29	29
g / C, Green / Cycle		0.08	0.37	0.37	0.09	0.37	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate		0.05	0.25	0.31	0.07	0.09	0.09	0.09
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1583	1583
c, Capacity [veh/h]		273	1296	579	166	694	589	589
d1, Uniform Delay [s]		35.49	21.36	23.18	35.20	17.14	17.22	17.22
k, delay calibration		0.11	0.11	0.18	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.55	0.66	5.66	7.60	0.17	0.21	0.21
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.65	0.69	0.85	0.78	0.23	0.25	0.25
d, Delay for Lane Group [s/veh]		38.04	22.01	28.84	42.80	17.31	17.44	17.44
Lane Group LOS		D	C	C	D	B	B	B
Critical Lane Group		No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh]		1.71	6.72	8.80	2.73	1.97	1.78	1.78
50th-Percentile Queue Length [ft]		42.74	167.92	220.06	68.16	49.36	44.38	44.38
95th-Percentile Queue Length [veh]		3.08	10.97	13.67	4.91	3.55	3.20	3.20
95th-Percentile Queue Length [ft]		76.93	274.18	341.71	122.68	88.85	79.88	79.88

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	38.04	0.00	22.01	28.84	42.80	17.31	17.44	17.44
Movement LOS					D		C	C	D	B	B	B
d_A, Approach Delay [s/veh]	0.00				25.97				23.04			
Approach LOS	A				C				C			
d_I, Intersection Delay [s/veh]	27.84											
Intersection LOS	C											
Intersection V/C	0.753											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	44	419	277	178	130	287	34	39
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	0	0	0	0	0	3	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	56	419	277	178	130	287	37	39
Peak Hour Factor	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	15	116	77	49	36	79	10	0
Total Analysis Volume [veh/h]	62	463	306	197	144	317	41	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	39	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	16	16	16	11	11	11	11
g / C, Green / Cycle	0.21	0.21	0.21	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.15	0.09	0.12	0.08	0.07	0.10	0.03
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1863	1583
c, Capacity [veh/h]	708	728	325	247	259	259	220
d1, Uniform Delay [s]	29.59	27.45	28.64	32.03	31.54	32.83	30.22
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.56	0.39	1.82	2.18	1.37	4.19	0.40
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

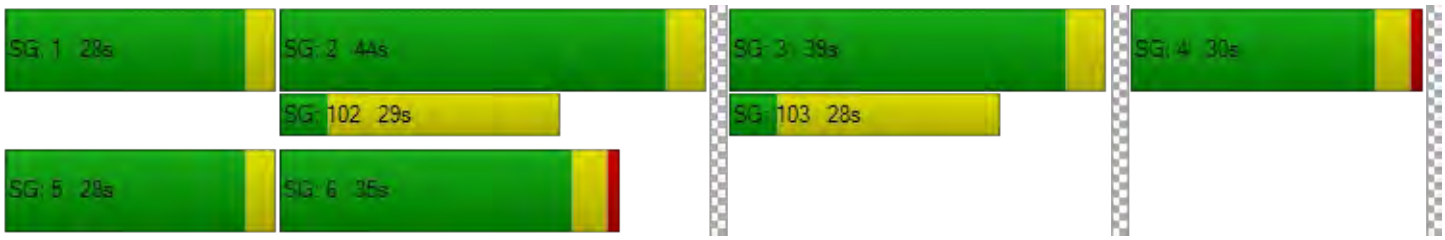
X, volume / capacity	0.74	0.42	0.61	0.58	0.48	0.74	0.19
d, Delay for Lane Group [s/veh]	31.15	27.83	30.46	34.21	32.91	37.02	30.62
Lane Group LOS	C	C	C	C	C	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	4.68	2.49	3.45	2.67	2.24	3.76	0.70
50th-Percentile Queue Length [ft]	116.98	62.16	86.31	66.71	55.97	93.93	17.53
95th-Percentile Queue Length [veh]	8.23	4.48	6.21	4.80	4.03	6.76	1.26
95th-Percentile Queue Length [ft]	205.68	111.88	155.37	120.07	100.75	169.08	31.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.15	31.15	27.83	30.46	34.21	35.41	37.02	30.62
Movement LOS	C	C	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	30.03				34.68			
Approach LOS	C				C			
d_I, Intersection Delay [s/veh]	27.84							
Intersection LOS	C							
Intersection V/C	0.753							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.317

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	49	281	71	73	234	5	7	3	11	114	1	62
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	5.00	4.20	4.10	6.80	0.00	0.00	0.00	0.00	1.80	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	11	0	9	33	0	0	0	0	0	0	4
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]	49	292	71	82	267	5	7	3	11	114	1	66
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	13	80	20	23	73	1	2	1	3	31	0	18
Total Analysis Volume [veh/h]	54	321	78	90	293	5	8	3	12	125	1	73
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	26	39	0	24	39	0	0	29	0	0	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	35	35	21	35	35	25	25	25
g / C, Green / Cycle	0.24	0.37	0.37	0.22	0.37	0.37	0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.08	0.08	0.05	0.06	0.06	0.03	0.15	0.05
s, saturation flow rate [veh/h]	1810	3445	1639	1738	3387	1764	696	815	1615
c, Capacity [veh/h]	429	1280	609	375	1259	655	234	290	425
d1, Uniform Delay [s]	28.52	20.33	20.41	30.81	19.91	19.91	27.24	31.70	27.01
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	0.37	0.82	1.51	0.26	0.51	0.83	4.68	0.88
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

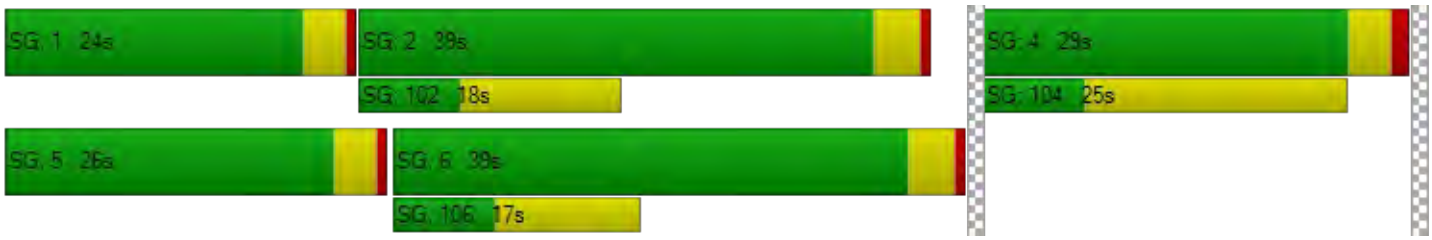
X, volume / capacity	0.13	0.21	0.22	0.24	0.16	0.16	0.10	0.43	0.17
d, Delay for Lane Group [s/veh]	29.12	20.70	21.23	32.32	20.17	20.42	28.07	36.39	27.89
Lane Group LOS	C	C	C	C	C	C	C	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	1.03	2.04	2.12	1.85	1.47	1.58	0.44	2.94	1.37
50th-Percentile Queue Length [ft]	25.81	51.07	52.91	46.19	36.71	39.52	11.01	73.58	34.24
95th-Percentile Queue Length [veh]	1.86	3.68	3.81	3.33	2.64	2.85	0.79	5.30	2.47
95th-Percentile Queue Length [ft]	46.46	91.92	95.23	83.14	66.07	71.14	19.81	132.44	61.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.12	20.79	21.23	32.32	20.25	20.42	28.07	28.07	28.07	36.39	36.39	27.89
Movement LOS	C	C	C	C	C	C	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	21.86			23.05			28.07			33.27		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.57											
Intersection LOS	C											
Intersection V/C	0.317											

Sequence

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



Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	17.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.573

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	119	476	119	20	238	63	77	287	47	89	179	66
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	1.70	2.90	15.00	3.80	4.80	0.00	0.70	0.00	5.60	0.60	1.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	0	0	0	0	0	0	7
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]	120	476	119	20	238	63	77	287	47	89	179	73
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	32	127	32	5	63	17	20	76	13	24	48	19
Total Analysis Volume [veh/h]	128	506	127	21	253	67	82	305	50	95	190	78
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	4	10	10	1	7	7	3	9	9	3	9
g / C, Green / Cycle	0.10	0.25	0.25	0.03	0.18	0.18	0.07	0.22	0.22	0.08	0.22
(v / s)_i Volume / Saturation Flow Rate	0.07	0.18	0.18	0.01	0.09	0.09	0.05	0.16	0.03	0.06	0.15
s, saturation flow rate [veh/h]	1810	1868	1741	1573	1830	1702	1810	1887	1615	1714	1796
c, Capacity [veh/h]	176	467	435	42	328	305	136	413	354	140	405
d1, Uniform Delay [s]	18.14	14.11	14.11	19.87	15.31	15.35	18.55	15.06	13.03	18.48	14.59
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	5.58	1.91	2.07	9.03	1.17	1.34	4.29	2.60	0.18	5.71	1.85
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.70	0.70	0.50	0.50	0.51	0.61	0.74	0.14	0.68	0.66
d, Delay for Lane Group [s/veh]	23.71	16.02	16.19	28.90	16.48	16.69	22.84	17.66	13.21	24.19	16.44
Lane Group LOS	C	B	B	C	B	B	C	B	B	C	B
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.30	2.51	2.37	0.28	1.28	1.24	0.82	2.50	0.33	0.99	2.10
50th-Percentile Queue Length [ft]	32.50	62.80	59.20	7.02	31.88	30.91	20.59	62.62	8.27	24.72	52.38
95th-Percentile Queue Length [veh]	2.34	4.52	4.26	0.51	2.30	2.23	1.48	4.51	0.60	1.78	3.77
95th-Percentile Queue Length [ft]	58.50	113.03	106.56	12.63	57.39	55.64	37.07	112.71	14.88	44.50	94.29

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.71	16.08	16.19	28.90	16.55	16.69	22.84	17.66	13.21	24.19	16.44	16.44
Movement LOS	C	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	17.38			17.34			18.12			18.47		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.75											
Intersection LOS	B											
Intersection V/C	0.573											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	30.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.665

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	62	163	493	142	108	60	65	536	45	300	229	252
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 [%]	1.60	3.10	0.80	7.70	2.80	11.70	4.60	1.10	11.10	0.70	5.20	4.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	28	5	0	0	0	0	0	0	5
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]	62	169	493	170	113	60	65	536	45	300	229	257
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	16	45	131	45	30	16	17	143	12	80	61	68
Total Analysis Volume [veh/h]	66	180	524	181	120	64	69	570	48	319	244	273
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	8	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	0	6	10	0	6	10	0
Maximum Green [s]	27	27	27	22	22	0	22	30	0	27	30	0
Amber [s]	3.2	3.2	3.2	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	25	25	25	31	31	0	9	34	0	20	45	0
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Walk [s]	7	7	7	7	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	25	25	25	23	23	0	0	22	0	0	23	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.2	2.2	2.2	2.2	2.2	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No	No		No		No	Yes		No	Yes	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	3.00	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	0.00	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	57	11	11	11	11	6	46	46	17	57	57
g / C, Green / Cycle	0.19	0.19	0.19	0.52	0.10	0.10	0.10	0.10	0.05	0.41	0.41	0.15	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.04	0.06	0.05	0.33	0.06	0.07	0.07	0.04	0.04	0.16	0.03	0.09	0.07	0.18
s, saturation flow rate [veh/h]	1781	1843	1677	1602	1337	1503	1682	1446	1730	3578	1454	3490	3439	1541
c, Capacity [veh/h]	342	354	322	836	173	211	166	143	88	1483	603	539	1783	799
d1, Uniform Delay [s]	37.27	37.99	37.63	18.69	49.50	47.86	47.87	46.76	51.62	22.42	19.50	43.27	13.73	15.50
k, delay calibration	0.04	0.04	0.04	0.50	0.04	0.04	0.04	0.04	0.16	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.10	0.17	0.14	3.54	0.74	0.71	1.79	0.82	19.67	0.76	0.26	0.39	0.16	1.17
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	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

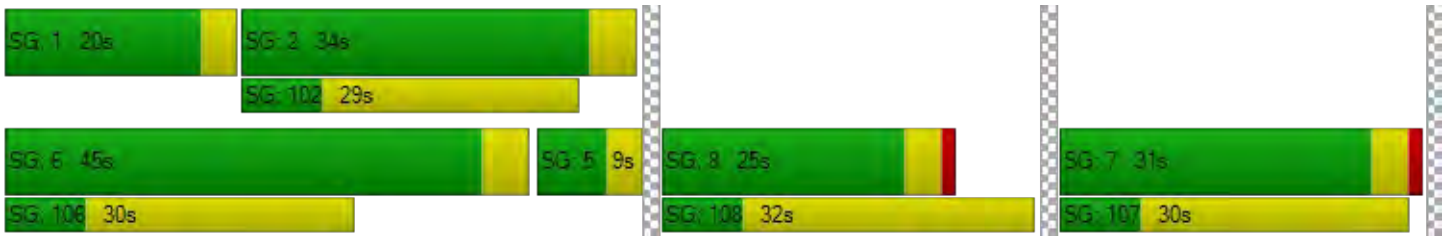
X, volume / capacity	0.19	0.29	0.24	0.63	0.47	0.51	0.67	0.45	0.79	0.38	0.08	0.59	0.14	0.34
d, Delay for Lane Group [s/veh]	37.37	38.16	37.77	22.23	50.23	48.57	49.66	47.58	71.30	23.18	19.75	43.65	13.89	16.67
Lane Group LOS	D	D	D	C	D	D	D	D	E	C	B	D	B	B
Critical Lane Group	No	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	1.50	2.37	1.79	9.94	2.22	2.89	3.04	1.68	2.36	5.25	0.79	4.06	1.60	4.19
50th-Percentile Queue Length [ft]	37.57	59.36	44.74	248.4	55.49	72.32	75.96	42.08	58.92	131.21	19.72	101.44	39.89	104.74
95th-Percentile Queue Length [veh]	2.71	4.27	3.22	15.11	4.00	5.21	5.47	3.03	4.24	9.01	1.42	7.30	2.87	7.54
95th-Percentile Queue Length [ft]	67.63	106.8	80.53	377.7	99.88	130.1	136.7	75.75	106.06	225.14	35.50	182.59	71.80	188.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.37	37.99	22.23	49.37	49.59	47.58	71.30	23.18	19.75	43.65	13.89	16.67
Movement LOS	D	D	C	D	D	D	E	C	B	D	B	B
d_A, Approach Delay [s/veh]	27.21			49.10			27.77			26.15		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.03											
Intersection LOS	C											
Intersection V/C	0.665											

Sequence

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



Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	9.2
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.522

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	322	2	162	0	791	421	152	640	0
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	3.10	0.00	0.60	2.00	1.10	2.40	0.70	3.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	3	25	0	5	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]	0	0	0	322	2	162	0	794	446	152	645	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9400	0.9400	0.9400	1.0000	0.9400	0.9400	0.9400	0.9400	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	86	1	43	0	211	0	40	172	0
Total Analysis Volume [veh/h]	0	0	0	343	2	172	0	845	0	162	686	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		6	6	6	10	10	4	17
g / C, Green / Cycle		0.19	0.19	0.19	0.33	0.33	0.12	0.55
(v / s)_i Volume / Saturation Flow Rate		0.10	0.10	0.10	0.22	0.22	0.05	0.20
s, saturation flow rate [veh/h]		1755	1797	1605	1879	1879	3490	3512
c, Capacity [veh/h]		331	339	303	623	623	425	1930
d1, Uniform Delay [s]		11.45	11.45	11.45	9.02	9.02	12.66	3.95
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.32	1.29	1.45	1.30	1.30	0.56	0.11
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.53	0.53	0.53	0.68	0.68	0.38	0.36
d, Delay for Lane Group [s/veh]		12.78	12.75	12.90	10.32	10.32	13.22	4.06
Lane Group LOS		B	B	B	B	B	B	A
Critical Lane Group		No	No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]		0.93	0.95	0.86	1.81	1.81	0.43	0.47
50th-Percentile Queue Length [ft]		23.33	23.82	21.61	45.32	45.32	10.87	11.66
95th-Percentile Queue Length [veh]		1.68	1.72	1.56	3.26	3.26	0.78	0.84
95th-Percentile Queue Length [ft]		42.00	42.88	38.90	81.57	81.57	19.56	20.99

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	12.76	12.75	12.90	0.00	10.32	10.32	13.22	4.06	0.00
Movement LOS				B	B	B		B	B	B	A	
d_A, Approach Delay [s/veh]	0.00			12.80			10.32			5.81		
Approach LOS	A			B			B			A		
d_I, Intersection Delay [s/veh]	9.17											
Intersection LOS	A											
Intersection V/C	0.522											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.759

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	337	41	319	84	136	113	117	701	268	101	329	33
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 [%]	5.00	0.00	2.50	0.00	2.90	0.00	1.70	2.00	0.70	0.00	1.80	9.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	0	0	3	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	339	41	319	84	136	113	117	704	268	101	332	33
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	93	11	88	23	37	31	32	193	0	28	91	9
Total Analysis Volume [veh/h]	373	45	351	92	149	124	129	774	0	111	365	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	135
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	42	42	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	18	11	11	6	17	17	6	17	17
g / C, Green / Cycle	0.27	0.27	0.27	0.17	0.17	0.10	0.26	0.26	0.08	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.12	0.12	0.22	0.13	0.08	0.07	0.21	0.21	0.06	0.11	0.11
s, saturation flow rate [veh/h]	1723	1828	1576	1812	1615	1779	1863	1863	1810	1866	1808
c, Capacity [veh/h]	463	491	423	303	270	170	476	476	148	465	451
d1, Uniform Delay [s]	20.73	20.72	23.53	27.34	25.67	30.14	23.89	23.89	30.70	21.61	21.63
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	0.66	0.62	4.46	4.75	1.22	6.78	3.40	3.40	7.43	0.65	0.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

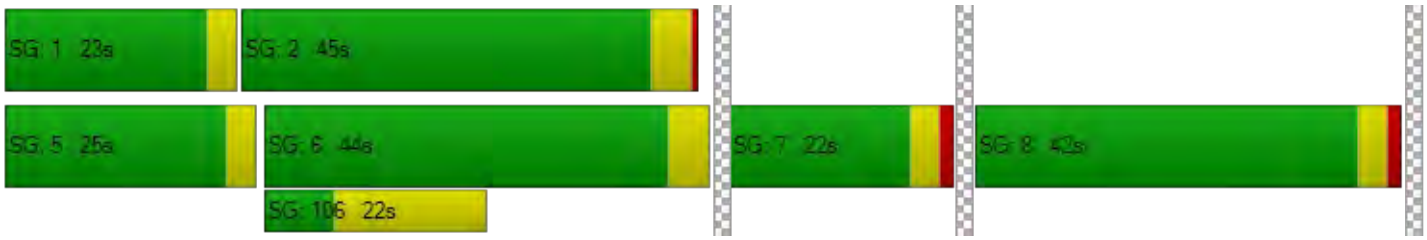
X, volume / capacity	0.44	0.44	0.83	0.80	0.46	0.76	0.81	0.81	0.75	0.44	0.44
d, Delay for Lane Group [s/veh]	21.39	21.34	27.99	32.08	26.89	36.92	27.29	27.29	38.13	22.25	22.30
Lane Group LOS	C	C	C	C	C	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	2.61	2.75	5.47	3.98	1.82	2.30	5.92	5.92	2.02	2.66	2.60
50th-Percentile Queue Length [ft]	65.19	68.76	136.78	99.41	45.49	57.47	147.96	147.96	50.45	66.52	65.03
95th-Percentile Queue Length [veh]	4.69	4.95	9.31	7.16	3.28	4.14	9.91	9.91	3.63	4.79	4.68
95th-Percentile Queue Length [ft]	117.35	123.76	232.69	178.94	81.88	103.44	247.70	247.70	90.81	119.73	117.06

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.36	21.34	27.99	32.08	32.08	26.89	36.92	27.29	27.29	38.13	22.28	22.30
Movement LOS	C	C	C	C	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	24.39			30.32			28.66			25.71		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.02											
Intersection LOS	C											
Intersection V/C	0.759											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	11.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.324

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	35	22	621	248	80	445
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.90	4.50	2.60	0.40	0.00	3.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	3	0	0	3
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]	35	22	624	248	80	448
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]	9	6	168	67	22	120
Total Analysis Volume [veh/h]	38	24	671	267	86	482
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	6	85	85	6	95
g / C, Green / Cycle	0.05	0.78	0.78	0.05	0.87
(v / s)_i Volume / Saturation Flow Rate	0.04	0.21	0.18	0.05	0.15
s, saturation flow rate [veh/h]	1489	3173	1448	1629	3137
c, Capacity [veh/h]	77	2459	1122	90	2718
d1, Uniform Delay [s]	51.60	3.53	3.41	51.84	1.16
k, delay calibration	0.08	0.50	0.50	0.25	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.45	0.27	0.50	57.01	0.14
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	0.81	0.27	0.24	0.96	0.18
d, Delay for Lane Group [s/veh]	65.05	3.80	3.91	108.84	1.30
Lane Group LOS	E	A	A	F	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.98	1.78	1.46	3.78	0.39
50th-Percentile Queue Length [ft]	49.40	44.58	36.39	94.50	9.78
95th-Percentile Queue Length [veh]	3.56	3.21	2.62	6.80	0.70
95th-Percentile Queue Length [ft]	88.92	80.24	65.51	170.09	17.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.05	65.05	3.80	3.91	108.84	1.30
Movement LOS	E	E	A	A	F	A
d_A, Approach Delay [s/veh]	65.05		3.83		17.58	
Approach LOS	E		A		B	
d_I, Intersection Delay [s/veh]	11.24					
Intersection LOS	B					
Intersection V/C	0.324					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	52.5
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.391

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	876	50	0	503	33	0	0	131	0	0	29
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	2.60	0.00	2.00	2.00	6.10	2.00	2.00	0.00	2.00	2.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	3	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]	0	879	50	0	506	33	0	0	131	0	0	29
Peak Hour Factor	1.0000	0.9100	0.9100	1.0000	0.9100	0.9100	1.0000	1.0000	0.9100	1.0000	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	241	14	0	0	0	0	0	36	0	0	0
Total Analysis Volume [veh/h]	0	966	55	0	0	0	0	0	144	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	44	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	33	33		12	
g / C, Green / Cycle	0.30	0.30		0.11	
(v / s)_i Volume / Saturation Flow Rate	0.28	0.28		0.09	
s, saturation flow rate [veh/h]	1852	1817		1615	
c, Capacity [veh/h]	557	547		170	
d1, Uniform Delay [s]	37.14	37.41		48.37	
k, delay calibration	0.22	0.24		0.18	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	12.02	14.69		17.03	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

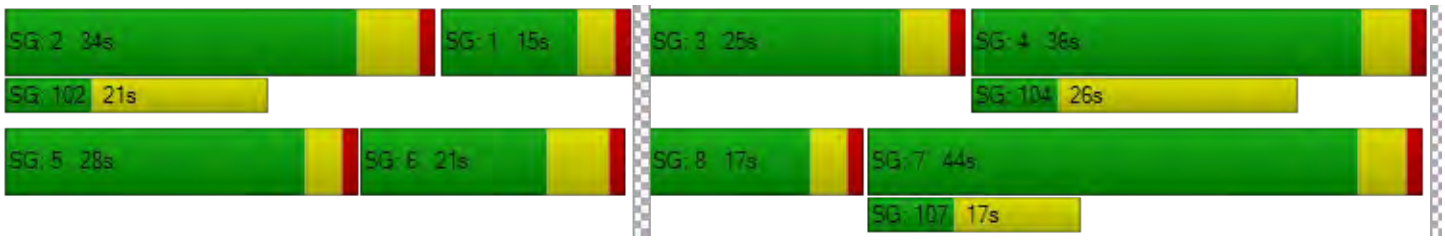
X, volume / capacity	0.92	0.93		0.85	
d, Delay for Lane Group [s/veh]	49.16	52.10		65.41	
Lane Group LOS	D	D		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	14.89	15.36		4.67	
50th-Percentile Queue Length [ft]	372.33	383.97		116.85	
95th-Percentile Queue Length [veh]	21.22	21.79		8.22	
95th-Percentile Queue Length [ft]	530.56	544.65		205.50	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	50.55	52.10	0.00	0.00	0.00	0.00	0.00	65.41	0.00	0.00	0.00
Movement LOS		D	D						E			
d_A, Approach Delay [s/veh]	50.63			0.00			65.41			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	52.46											
Intersection LOS	D											
Intersection V/C	0.391											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Junipero Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	43.6
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.706

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	135	282	325	257	627	116	103	352	162	271	513	122
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 [%]	27.00	2.50	5.80	1.90	2.20	0.90	1.00	2.00	0.60	1.50	0.80	2.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	4	0	2	2	2	8	0	7	5	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]	135	283	329	257	629	118	105	360	162	278	518	122
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	79	0	72	177	33	29	101	0	78	146	34
Total Analysis Volume [veh/h]	152	318	0	289	707	133	118	404	0	312	582	137
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

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	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	8	0	4	10	0	4	10	0
Maximum Green [s]	0	25	0	0	30	0	20	40	0	20	40	0
Amber [s]	0.0	3.9	0.0	0.0	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	25	0	0	36	0	15	21	0	28	34	0
Vehicle Extension [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
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	2.0	4.0	0.0	2.0	4.0	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	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	17	17	17	26	26	26	26	9	27	27	21	39	39
g / C, Green / Cycle	0.15	0.15	0.15	0.23	0.23	0.23	0.23	0.08	0.24	0.24	0.19	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.00	0.16	0.21	0.19	0.08	0.07	0.11	0.11	0.18	0.16	0.09
s, saturation flow rate [veh/h]	1798	1687	1526	1776	1859	1692	1601	1792	1863	1863	1783	3589	1576
c, Capacity [veh/h]	277	260	235	415	435	396	374	147	448	448	342	1257	552
d1, Uniform Delay [s]	45.60	45.54	0.00	38.62	40.94	39.77	35.26	49.71	35.66	35.66	43.61	27.75	25.47
k, delay calibration	0.13	0.13	0.04	0.04	0.13	0.07	0.04	0.09	0.50	0.50	0.26	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.48	10.24	0.00	0.79	7.98	2.37	0.21	8.59	3.26	3.26	19.25	1.23	1.07
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

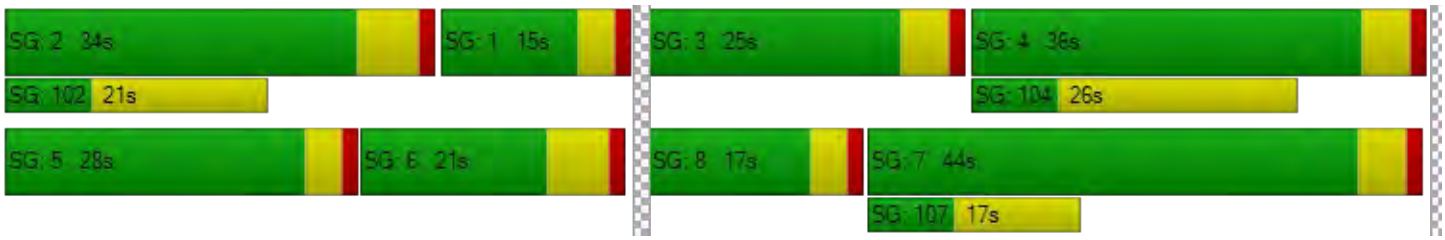
X, volume / capacity	0.88	0.87	0.00	0.70	0.90	0.80	0.36	0.80	0.45	0.45	0.91	0.46	0.25
d, Delay for Lane Group [s/veh]	56.08	55.78	0.00	39.41	48.92	42.14	35.48	58.30	38.92	38.92	62.86	28.98	26.54
Lane Group LOS	E	E	A	D	D	D	D	E	D	D	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	7.28	6.76	0.00	7.19	11.14	8.25	3.00	3.53	5.01	5.01	10.09	6.10	2.71
50th-Percentile Queue Length [ft]	182.01	168.94	0.00	179.6	278.3	206.3	75.09	88.36	125.24	125.24	252.23	152.57	67.71
95th-Percentile Queue Length [veh]	11.71	11.02	0.00	11.58	16.61	12.97	5.41	6.36	8.68	8.68	15.30	10.15	4.87
95th-Percentile Queue Length [ft]	292.63	275.52	0.00	289.5	415.2	324.1	135.1	159.05	217.00	217.00	382.47	253.85	121.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	56.08	55.87	0.00	39.41	45.89	35.48	58.30	38.92	38.92	62.86	28.98	26.54
Movement LOS	E	E	A	D	D	D	E	D	D	E	C	C
d_A, Approach Delay [s/veh]	55.93			43.00			43.30			38.91		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	43.64											
Intersection LOS	D											
Intersection V/C	0.706											

Sequence

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



19898 Daly City Serramonte Views TIA

Vistro File: K:\...\19898_Vistro_20170104.vistro Scenario 5: Adjusted Existing 2016 PM + Project

Report File: K:\...\ExPM_wProj_LOS_Summary.pdf 1/4/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SB Hwy 1 Ramps / Clarinada Ave.	All-way stop	HCM 2010	NB Left		24.5	C
2	NB Hwy 1 Ramps / Serramonte Blvd	All-way stop	HCM 2010	EB Left		16.0	C
3	Callan Blvd / Serramonte Blvd	All-way stop	HCM 2010	WB Thru		14.4	B
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	EB Left	0.566	33.5	C
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	NB Left	0.732	50.1	D
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	SB Right	0.729	16.2	B
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.488	4.3	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	SWB Left	0.717	29.0	C
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	NB Left	0.600	32.8	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	NWB Left	0.702	22.8	C
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.892	50.3	D
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	SB Right	0.700	10.5	B
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	EB Left	0.703	24.2	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	NB Left	0.559	17.3	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.353	51.8	D
16	Juniper Serra Blvd / Hickey Blvd	Signalized	HCM 2010	SEB Left	0.758	51.7	D

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

Intersection Level Of Service Report
Intersection 1: SB Hwy 1 Ramps / Clarinada Ave.

Control Type:	All-way stop	Delay (sec / veh):	24.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	458	256	47	82	226	98
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	7	0	5	7
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
Total Hourly Volume [veh/h]	458	256	54	82	231	105
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	119	67	14	21	60	27
Total Analysis Volume [veh/h]	477	267	56	85	241	109
Pedestrian Volume [ped/h]	0		0		0	

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	10.11	1.99	0.41	0.60	2.90	0.36	0.36
95th-Percentile Queue Length [ft]	252.83	49.86	10.30	14.92	72.59	9.12	9.12
Approach Delay [s/veh]	30.99		11.37		16.00		
Approach LOS	D		B		C		
Intersection Delay [s/veh]	24.50						
Intersection LOS	C						

Intersection Level Of Service Report
Intersection 2: NB Hwy 1 Ramps / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	16.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	13	37	57	19	79	273	221	153	41	78	165	143
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	15	0	0	4	12	0	0	37	16
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]	13	37	57	34	79	273	225	165	41	78	202	159
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
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	0.0000
Total 15-Minute Volume [veh/h]	4	11	17	10	23	80	66	49	12	23	59	0
Total Analysis Volume [veh/h]	15	44	67	40	93	321	265	194	48	92	238	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.04	1.10	3.73	3.34	2.43	1.55	1.47
95th-Percentile Queue Length [ft]	25.91	27.59	93.29	83.54	60.81	38.78	36.75
Approach Delay [s/veh]	13.08	16.54		17.49		14.06	
Approach LOS	B	C		C		B	
Intersection Delay [s/veh]	15.99						
Intersection LOS	C						

Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	14.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	91	231	121	124	243	104	56	247	79	151	205	222
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	0	6	7	0	0	0	25	2	7	47	12
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]	97	231	127	131	243	104	56	272	81	158	252	234
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	25	60	33	34	63	27	15	71	21	41	66	61
Total Analysis Volume [veh/h]	101	241	132	136	253	108	58	283	84	165	263	244
Pedestrian Volume [ped/h]	0			0			0			0		

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.11	1.88	1.18	2.81	0.73	0.41	1.65	1.56	1.58	2.88	2.49
95th-Percentile Queue Length [ft]	52.79	47.08	29.47	70.26	18.26	10.33	41.29	39.06	39.47	71.97	62.16
Approach Delay [s/veh]	13.22		14.69			13.26			15.86		
Approach LOS	B		B			B			C		
Intersection Delay [s/veh]	14.44										
Intersection LOS	B										

Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	33.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.566

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	175.00	100.00	100.00	200.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	248	0	221	195	284	0	53	0	345	317
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	42	12	53	0	14	5	2	6	30	0	124	19	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	12	53	248	14	226	197	290	30	53	124	364	317
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	0.9500	0.950	1.000	0.950	0.950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	11	3	14	65	4	59	52	76	8	14	31	96	83
Total Analysis Volume [veh/h]	44	13	56	261	14	238	207	305	32	56	124	383	334
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permi	Prote	Permi	Overl
Signal group	0	8	0	4	4	0	1	6	0	0	5	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	4	8	0	0	4	8	8
Maximum Green [s]	0	30	0	30	30	0	20	40	0	0	20	40	40
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.6	0.0	0.0	3.0	3.6	3.6
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0	1.0
Split [s]	0	31	0	31	31	0	23	20	0	0	33	30	30
Vehicle Extension [s]	0.0	2.5	0.0	2.5	2.5	0.0	2.0	3.0	0.0	0.0	2.0	3.0	3.0
Walk [s]	0	7	0	7	7	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	20	0	20	20	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.6	0.0	0.0	2.0	2.6	2.6
Minimum Recall		No			No		No	No			No	No	No
Maximum Recall		No			No		No	No			No	No	No
Pedestrian Recall		No			No		No	No			No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.60	4.60	4.00	4.60	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.60	2.60	2.00	2.60	0.00
g_i, Effective Green Time [s]	10	23	23	15	52	52	14	50	92
g / C, Green / Cycle	0.09	0.20	0.20	0.13	0.45	0.45	0.12	0.44	0.80
(v / s)_i Volume / Saturation Flow Rate	0.07	0.15	0.17	0.12	0.09	0.09	0.10	0.11	0.21
s, saturation flow rate [veh/h]	1579	1774	1583	1774	1863	1802	1774	3547	1583
c, Capacity [veh/h]	181	351	313	237	842	815	211	1551	1262
d1, Uniform Delay [s]	51.60	43.44	44.53	48.93	19.02	19.03	49.77	20.43	3.01
k, delay calibration	0.08	0.08	0.08	0.17	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.63	2.33	4.83	14.13	0.54	0.57	3.80	0.38	0.51
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

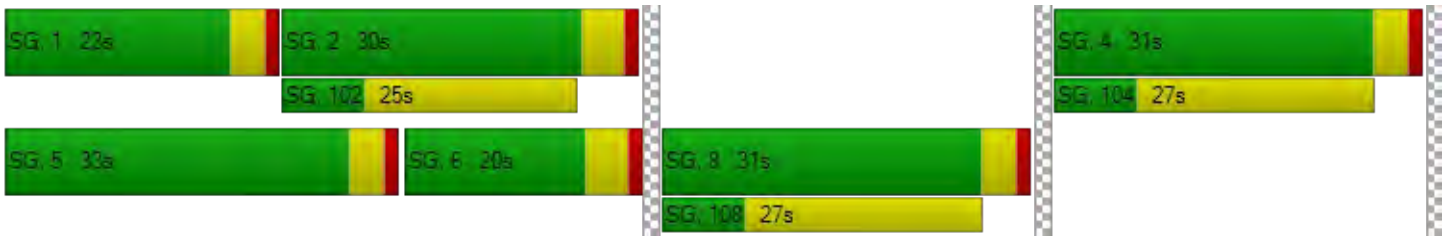
X, volume / capacity	0.63	0.74	0.85	0.87	0.20	0.20	0.85	0.25	0.26
d, Delay for Lane Group [s/veh]	54.23	45.77	49.35	63.06	19.56	19.60	53.56	20.81	3.52
Lane Group LOS	D	D	D	E	B	B	D	C	A
Critical Lane Group	Yes	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	3.33	7.20	7.70	6.75	2.87	2.80	5.29	3.32	1.70
50th-Percentile Queue Length [ft]	83.31	179.90	192.51	168.73	71.77	70.01	132.25	82.89	42.52
95th-Percentile Queue Length [veh]	6.00	11.60	12.25	11.01	5.17	5.04	9.06	5.97	3.06
95th-Percentile Queue Length [ft]	149.96	289.88	306.28	275.24	129.19	126.02	226.55	149.21	76.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	54.23	54.23	54.23	45.83	49.35	49.35	63.06	19.58	19.60	53.56	53.56	20.81	3.52
Movement LOS	D	D	D	D	D	D	E	B	B	D	D	C	A
d_A, Approach Delay [s/veh]	54.23			47.58			36.12			20.95			
Approach LOS	D			D			D			C			
d_I, Intersection Delay [s/veh]	33.47												
Intersection LOS	C												
Intersection V/C	0.566												

Sequence

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



Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	50.1
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.732

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	340	249	620	392	291	55	45	299	221	534	311	467
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	33	0	0	0	0	0	0	29	30	0	111	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]	373	249	620	392	291	55	45	328	251	534	422	467
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
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]	96	64	160	101	75	14	12	85	65	138	109	120
Total Analysis Volume [veh/h]	385	257	639	404	300	57	46	338	259	551	435	481
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	13.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	0	3	3	0	4	0	5	2	2	1	6	6
Auxiliary Signal Groups		3	1,3						2,3			4,6
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	4	4	0	4	0	4	6	6	4	6	6
Maximum Green [s]	0	25	25	0	30	0	20	26	26	25	26	26
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	20	20	0	25	0	12	35	35	30	53	53
Vehicle Extension [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	0	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	1.5	1.5	0.0	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		No	No		No		No	No	No	No	No	No
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	17	17	65	21	21	21	4	37	58	20	54	79
g / C, Green / Cycle	0.15	0.15	0.59	0.19	0.19	0.19	0.03	0.34	0.52	0.19	0.49	0.72
(v / s)_i Volume / Saturation Flow Rate	0.18	0.17	0.23	0.17	0.17	0.17	0.03	0.10	0.16	0.16	0.23	0.17
s, saturation flow rate [veh/h]	1774	1844	2802	1412	1364	1637	1774	3547	1583	3445	1863	2803
c, Capacity [veh/h]	267	277	1663	310	319	316	60	1198	832	641	913	2004
d1, Uniform Delay [s]	46.75	46.75	11.79	45.28	44.61	43.33	52.72	26.68	14.83	43.38	18.68	5.40
k, delay calibration	0.50	0.50	0.04	0.33	0.35	0.35	0.04	0.50	0.50	0.04	0.50	0.04
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
d2, Incremental Delay [s]	121.95	103.88	0.05	11.43	10.71	23.05	7.28	0.59	0.98	1.35	1.78	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.20	1.16	0.38	0.77	0.75	0.90	0.76	0.28	0.31	0.86	0.48	0.24
d, Delay for Lane Group [s/veh]	168.71	150.63	11.85	56.71	55.32	66.38	60.00	27.27	15.81	44.73	20.46	5.42
Lane Group LOS	F	F	B	E	E	E	E	C	B	D	C	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	16.27	15.53	3.95	7.40	7.27	9.50	1.38	3.34	3.83	7.33	7.67	1.69
50th-Percentile Queue Length [ft]	406.79	388.13	98.86	184.97	181.76	237.50	34.51	83.62	95.84	183.31	191.78	42.35
95th-Percentile Queue Length [veh]	24.86	23.51	7.12	11.86	11.69	14.55	2.48	6.02	6.90	11.77	12.21	3.05
95th-Percentile Queue Length [ft]	621.49	587.76	177.95	296.50	292.31	363.87	62.11	150.51	172.52	294.33	305.34	76.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	165.70	150.63	11.85	56.19	63.69	66.38	60.00	27.27	15.81	44.73	20.46	5.42
Movement LOS	F	F	B	E	E	E	E	C	B	D	C	A
d_A, Approach Delay [s/veh]	85.93			59.88			24.99			24.65		
Approach LOS	F			E			C			C		
d_I, Intersection Delay [s/veh]	50.07											
Intersection LOS	D											
Intersection V/C	0.732											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	16.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.729

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	675	710	609	0	0	1270
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	43	68	0	0	29
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]	675	753	677	0	0	1299
Peak Hour Factor	0.9900	0.9900	0.9900	1.0000	1.0000	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	170	190	171	0	0	328
Total Analysis Volume [veh/h]	682	761	684	0	0	1312
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	30	30	43	0	0	42
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		No			No
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	23	23	44	45
g / C, Green / Cycle	0.31	0.31	0.58	0.60
(v / s)_i Volume / Saturation Flow Rate	0.20	0.27	0.19	0.37
s, saturation flow rate [veh/h]	3445	2803	3547	3547
c, Capacity [veh/h]	1057	860	2065	2112
d1, Uniform Delay [s]	22.41	24.67	8.09	9.71
k, delay calibration	0.04	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.25	1.26	0.43	1.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.65	0.88	0.33	0.62
d, Delay for Lane Group [s/veh]	22.66	25.93	8.52	11.10
Lane Group LOS	C	C	A	B
Critical Lane Group	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	4.94	6.18	2.58	6.16
50th-Percentile Queue Length [ft]	123.57	154.45	64.61	154.09
95th-Percentile Queue Length [veh]	8.59	10.25	4.65	10.24
95th-Percentile Queue Length [ft]	214.72	256.36	116.30	255.88

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.66	25.93	8.52	0.00	0.00	11.10
Movement LOS	C	C	A			B
d_A, Approach Delay [s/veh]	24.39		8.52		11.10	
Approach LOS	C		A		B	
d_I, Intersection Delay [s/veh]	16.16					
Intersection LOS	B					
Intersection V/C	0.729					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	4.3
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.488

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	602	1331	635	0	0	0
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	19	68	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]	612	1350	703	0	0	0
Peak Hour Factor	0.9800	0.9800	0.9800	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	156	344	179	0	0	0
Total Analysis Volume [veh/h]	624	1378	717	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2,6				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	4.10	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	0.00	2.10	
g_i, Effective Green Time [s]	9	29	16	
g / C, Green / Cycle	0.28	0.88	0.49	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.39	0.20	
s, saturation flow rate [veh/h]	3445	3547	3547	
c, Capacity [veh/h]	950	3129	1755	
d1, Uniform Delay [s]	10.61	0.38	5.30	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.78	0.10	0.15	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.66	0.44	0.41	
d, Delay for Lane Group [s/veh]	11.39	0.47	5.45	
Lane Group LOS	B	A	A	
Critical Lane Group	Yes	Yes	No	
50th-Percentile Queue Length [veh]	1.54	0.04	0.82	
50th-Percentile Queue Length [ft]	38.45	1.06	20.59	
95th-Percentile Queue Length [veh]	2.77	0.08	1.48	
95th-Percentile Queue Length [ft]	69.20	1.91	37.05	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.39	0.47	5.45	0.00	0.00	0.00
Movement LOS	B	A	A			
d_A, Approach Delay [s/veh]	3.88		5.45		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.29					
Intersection LOS	A					
Intersection V/C	0.488					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	29.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.717

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	374	0	699	263	185	417	408	60
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	10	9	0	26	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]	0	0	0	0	374	0	709	272	185	443	408	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9100	1.0000	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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	0	0	0	103	0	195	75	51	122	112	16
Total Analysis Volume [veh/h]	0	0	0	0	411	0	779	299	203	487	448	66
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lag	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	23	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		12	20	20	10	19	19	19
g / C, Green / Cycle		0.16	0.27	0.27	0.14	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate		0.12	0.22	0.19	0.11	0.19	0.20	0.20
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1679	1583
c, Capacity [veh/h]		540	972	434	251	467	421	397
d1, Uniform Delay [s]		29.96	25.06	24.11	30.87	25.86	25.89	25.91
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.24	1.59	1.96	6.07	2.79	3.16	3.39
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.76	0.80	0.69	0.81	0.78	0.78	0.78
d, Delay for Lane Group [s/veh]		32.20	26.65	26.07	36.95	28.65	29.06	29.30
Lane Group LOS		C	C	C	D	C	C	C
Critical Lane Group		No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh]		3.54	6.22	4.67	3.81	5.99	5.48	5.21
50th-Percentile Queue Length [ft]		88.43	155.51	116.79	95.14	149.72	136.92	130.18
95th-Percentile Queue Length [veh]		6.37	10.31	8.22	6.85	10.00	9.31	8.95
95th-Percentile Queue Length [ft]		159.18	257.77	205.41	171.25	250.05	232.87	223.74

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	32.20	0.00	26.65	26.07	36.95	28.76	29.20	29.30
Movement LOS					C		C	C	D	C	C	C
d_A, Approach Delay [s/veh]	0.00				28.06				30.33			
Approach LOS	A				C				C			
d_I, Intersection Delay [s/veh]	29.01											
Intersection LOS	C											
Intersection V/C	0.717											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	117	380	501	116	104	328	126	205
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	31	0	0	0	0	0	11	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	148	380	501	116	104	328	137	205
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	41	104	138	32	29	90	38	0
Total Analysis Volume [veh/h]	163	418	551	127	114	360	151	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	34	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	17	17	17	10	10	10	10
g / C, Green / Cycle	0.23	0.23	0.23	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.17	0.16	0.08	0.06	0.10	0.10	0.10
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1863	1583
c, Capacity [veh/h]	803	827	369	250	263	263	223
d1, Uniform Delay [s]	26.25	25.84	23.73	29.27	30.29	30.35	30.28
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.25	0.93	0.55	1.30	3.07	3.25	3.56
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

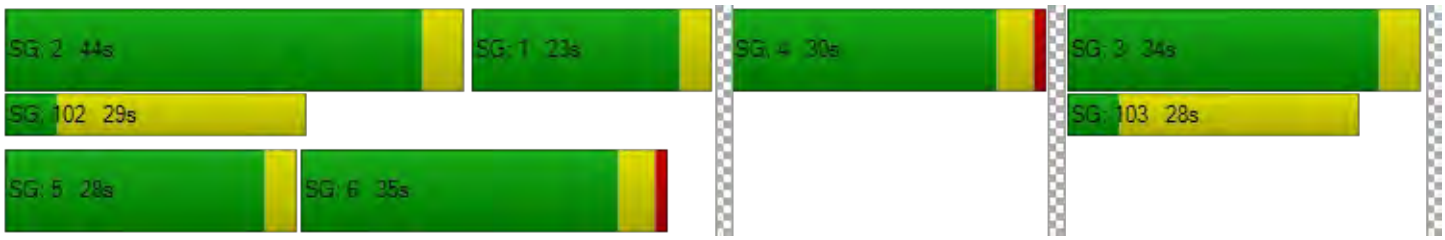
X, volume / capacity	0.72	0.67	0.34	0.46	0.68	0.69	0.68
d, Delay for Lane Group [s/veh]	27.51	26.78	24.28	30.57	33.35	33.60	33.83
Lane Group LOS	C	C	C	C	C	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	4.64	4.31	1.83	1.89	3.13	3.21	2.69
50th-Percentile Queue Length [ft]	115.94	107.64	45.85	47.22	78.35	80.27	67.13
95th-Percentile Queue Length [veh]	8.17	7.71	3.30	3.40	5.64	5.78	4.83
95th-Percentile Queue Length [ft]	204.24	192.72	82.52	84.99	141.03	144.48	120.83

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.51	27.51	26.78	24.28	30.57	33.48	33.60	33.83
Movement LOS	C	C	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	26.86				33.03			
Approach LOS	C				C			
d_I, Intersection Delay [s/veh]	29.01							
Intersection LOS	C							
Intersection V/C	0.717							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	32.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.600

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	162	646	118	172	573	13	57	21	49	267	11	187
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	21	0	9	21	0	0	0	0	0	0	12
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]	162	667	118	181	594	13	57	21	49	267	11	199
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	45	183	32	50	163	4	16	6	13	73	3	55
Total Analysis Volume [veh/h]	178	733	130	199	653	14	63	23	54	293	12	219
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	88.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	15	53	0	21	59	0	0	36	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	Yes		No	Yes			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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	53	53	14	55	55	32	32	32
g / C, Green / Cycle	0.10	0.48	0.48	0.13	0.50	0.50	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.10	0.16	0.16	0.11	0.12	0.12	0.14	0.27	0.14
s, saturation flow rate [veh/h]	1774	3547	1723	1774	3547	1843	1007	1114	1583
c, Capacity [veh/h]	187	1701	826	229	1784	927	339	387	459
d1, Uniform Delay [s]	48.87	17.79	17.81	46.95	15.48	15.49	32.20	39.91	32.17
k, delay calibration	0.38	0.50	0.50	0.22	0.50	0.50	0.11	0.41	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	46.26	0.55	1.13	18.07	0.33	0.63	0.80	12.55	0.77
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.34	0.34	0.87	0.25	0.25	0.41	0.79	0.48
d, Delay for Lane Group [s/veh]	95.13	18.34	18.95	65.02	15.81	16.12	33.00	52.46	32.94
Lane Group LOS	F	B	B	E	B	B	C	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	7.24	4.64	4.68	6.46	3.16	3.37	3.13	9.36	4.88
50th-Percentile Queue Length [ft]	181.00	116.04	116.94	161.58	78.94	84.16	78.30	233.90	121.88
95th-Percentile Queue Length [veh]	11.65	8.18	8.22	10.63	5.68	6.06	5.64	14.37	8.50
95th-Percentile Queue Length [ft]	291.32	204.38	205.62	265.81	142.10	151.49	140.93	359.31	212.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	95.13	18.47	18.95	65.02	15.91	16.12	33.00	33.00	33.00	52.46	52.46	32.94
Movement LOS	F	B	B	E	B	B	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	31.63			27.20			33.00			44.30		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	32.80											
Intersection LOS	C											
Intersection V/C	0.600											

Sequence

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

Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	22.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.702

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	128	340	86	67	517	88	70	227	39	52	229	181
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	0	0	0	0	2	0	5	0	1	4	4
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]	133	340	86	67	517	90	70	232	39	53	233	185
Peak Hour Factor	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	35	90	23	18	137	24	19	61	10	14	62	49
Total Analysis Volume [veh/h]	141	360	91	71	548	95	74	246	41	56	247	196
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	138
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	6	16	16	3	13	13	3	18	18	3	17
g / C, Green / Cycle	0.11	0.28	0.28	0.06	0.23	0.23	0.06	0.31	0.31	0.05	0.30
(v / s)_i Volume / Saturation Flow Rate	0.08	0.12	0.13	0.04	0.18	0.18	0.04	0.13	0.03	0.03	0.26
s, saturation flow rate [veh/h]	1774	1863	1735	1774	1863	1768	1774	1863	1583	1774	1728
c, Capacity [veh/h]	189	517	481	105	429	408	108	572	487	92	516
d1, Uniform Delay [s]	24.97	17.17	17.20	26.52	20.70	20.72	26.50	15.91	14.18	26.72	19.05
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	5.81	0.61	0.67	7.24	2.90	3.10	7.51	0.51	0.07	6.34	4.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.45	0.45	0.67	0.77	0.77	0.69	0.43	0.08	0.61	0.86
d, Delay for Lane Group [s/veh]	30.78	17.79	17.87	33.77	23.61	23.82	34.00	16.42	14.25	33.06	23.35
Lane Group LOS	C	B	B	C	C	C	C	B	B	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.04	2.38	2.25	1.11	4.10	3.93	1.16	2.39	0.35	0.87	5.56
50th-Percentile Queue Length [ft]	51.11	59.52	56.29	27.68	102.46	98.21	28.94	59.84	8.83	21.72	139.03
95th-Percentile Queue Length [veh]	3.68	4.29	4.05	1.99	7.38	7.07	2.08	4.31	0.64	1.56	9.43
95th-Percentile Queue Length [ft]	92.00	107.14	101.32	49.82	184.44	176.78	52.09	107.71	15.90	39.10	235.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.78	17.82	17.87	33.77	23.69	23.82	34.00	16.42	14.25	33.06	23.35	23.35
Movement LOS	C	B	B	C	C	C	C	B	B	C	C	C
d_A, Approach Delay [s/veh]	20.91			24.71			19.78			24.44		
Approach LOS	C			C			B			C		
d_I, Intersection Delay [s/veh]	22.79											
Intersection LOS	C											
Intersection V/C	0.702											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	50.3
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.892

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	84	237	288	419	299	181	126	309	50	461	430	585
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	8	0	16	6	0	0	0	1	0	1	13
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]	85	245	288	435	305	181	126	309	51	461	431	598
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	22	64	75	113	79	47	33	80	13	120	112	156
Total Analysis Volume [veh/h]	89	255	300	453	318	189	131	322	53	480	449	623
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	10	0	6	10	0
Maximum Green [s]	27	27	0	22	22	0	22	30	0	27	30	0
Amber [s]	3.2	3.2	0.0	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	33	33	0	31	31	0	11	31	0	25	45	0
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Walk [s]	7	7	0	7	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	25	25	0	23	23	0	0	22	0	0	23	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.2	2.2	0.0	2.2	2.2	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]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	25	25	20	20	20	20	8	41	41	19	52	52
g / C, Green / Cycle	0.21	0.21	0.21	0.21	0.17	0.17	0.17	0.17	0.07	0.34	0.34	0.16	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.05	0.08	0.06	0.19	0.15	0.15	0.15	0.12	0.07	0.09	0.03	0.14	0.13	0.39
s, saturation flow rate [veh/h]	1774	1863	1695	1583	1774	1797	1695	1583	1774	3547	1583	3445	3547	1583
c, Capacity [veh/h]	365	383	348	325	298	302	285	266	120	1212	541	539	1526	681
d1, Uniform Delay [s]	39.88	41.09	40.48	46.73	48.67	48.67	48.67	47.18	55.93	28.59	26.90	49.61	22.30	32.11
k, delay calibration	0.04	0.04	0.04	0.26	0.07	0.07	0.07	0.04	0.49	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.13	0.23	0.19	21.17	5.25	5.18	5.47	1.32	106.28	0.54	0.36	2.10	0.49	18.92
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	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.38	0.31	0.92	0.87	0.87	0.87	0.71	1.09	0.27	0.10	0.89	0.29	0.91
d, Delay for Lane Group [s/veh]	40.00	41.32	40.67	67.90	53.92	53.85	54.14	48.50	162.21	29.13	27.26	51.71	22.79	51.02
Lane Group LOS	D	D	D	E	D	D	D	D	F	C	C	D	C	D
Critical Lane Group	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.22	3.76	2.77	10.64	8.00	8.09	7.66	5.43	7.20	3.47	1.10	7.20	4.24	20.12
50th-Percentile Queue Length [ft]	55.58	93.92	69.26	266.1	199.9	202.3	191.4	135.7	180.03	86.66	27.49	179.88	106.05	502.91
95th-Percentile Queue Length [veh]	4.00	6.76	4.99	15.99	12.63	12.76	12.20	9.25	11.92	6.24	1.98	11.59	7.62	27.47
95th-Percentile Queue Length [ft]	100.0	169.0	124.6	399.8	315.8	318.9	304.9	231.3	298.07	155.99	49.49	289.86	190.50	686.81

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.00	41.05	67.90	53.89	54.08	48.50	162.21	29.13	27.26	51.71	22.79	51.02
Movement LOS	D	D	E	D	D	D	F	C	C	D	C	D
d_A, Approach Delay [s/veh]	53.41			52.89			63.38			43.07		
Approach LOS	D			D			E			D		
d_I, Intersection Delay [s/veh]	50.27											
Intersection LOS	D											
Intersection V/C	0.892											

Sequence

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

Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	10.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.700

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	185	6	233	0	778	152	320	1231	0
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	1	15	0	13	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]	0	0	0	185	6	233	0	779	167	320	1244	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.8100	0.8100	0.8100	1.0000	0.8100	0.8100	0.8100	0.8100	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	57	2	72	0	240	0	99	384	0
Total Analysis Volume [veh/h]	0	0	0	228	7	288	0	962	0	395	1536	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		7	7	7	14	14	7	24
g / C, Green / Cycle		0.18	0.18	0.18	0.35	0.35	0.18	0.61
(v / s)_i Volume / Saturation Flow Rate		0.10	0.10	0.10	0.26	0.26	0.11	0.43
s, saturation flow rate [veh/h]		1774	1637	1583	1863	1863	3445	3547
c, Capacity [veh/h]		318	294	284	652	652	631	2164
d1, Uniform Delay [s]		14.66	14.66	14.66	11.10	11.10	14.69	5.22
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.70	1.84	1.90	1.65	1.65	1.02	0.44
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.58	0.58	0.58	0.74	0.74	0.63	0.71
d, Delay for Lane Group [s/veh]		16.36	16.50	16.56	12.75	12.75	15.71	5.66
Lane Group LOS		B	B	B	B	B	B	A
Critical Lane Group		No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]		1.39	1.30	1.26	2.98	2.98	1.42	1.93
50th-Percentile Queue Length [ft]		34.78	32.39	31.46	74.54	74.54	35.39	48.26
95th-Percentile Queue Length [veh]		2.50	2.33	2.27	5.37	5.37	2.55	3.47
95th-Percentile Queue Length [ft]		62.61	58.31	56.64	134.17	134.17	63.70	86.87

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	16.39	16.50	16.54	0.00	12.75	12.75	15.71	5.66	0.00
Movement LOS				B	B	B		B	B	B	A	
d_A, Approach Delay [s/veh]	0.00			16.47			12.75			7.72		
Approach LOS	A			B			B			A		
d_I, Intersection Delay [s/veh]	10.47											
Intersection LOS	B											
Intersection V/C	0.700											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	24.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	576	63	261	49	77	63	152	720	150	179	724	49
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	0	0	0	0	0	0	1	0	0	1	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]	588	63	261	49	77	63	152	721	150	179	725	49
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	150	16	67	13	20	16	39	184	0	46	186	13
Total Analysis Volume [veh/h]	602	64	267	50	79	64	156	738	0	183	742	50
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	123
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	32	32	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	15	15	15	6	6	7	15	15	8	17	17
g / C, Green / Cycle	0.25	0.25	0.25	0.10	0.10	0.12	0.25	0.25	0.13	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.19	0.19	0.17	0.07	0.04	0.09	0.20	0.20	0.10	0.21	0.21
s, saturation flow rate [veh/h]	1774	1790	1583	1827	1583	1774	1863	1863	1774	1863	1822
c, Capacity [veh/h]	444	448	396	190	165	206	470	470	237	519	507
d1, Uniform Delay [s]	20.67	20.64	20.20	25.79	24.98	25.60	20.82	20.82	25.00	19.81	19.81
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	2.57	2.47	2.00	4.16	1.48	5.64	2.93	2.93	5.27	2.47	2.53
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

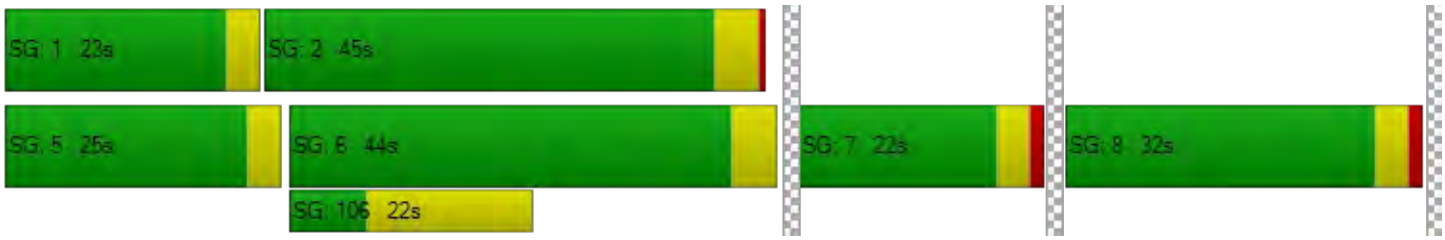
X, volume / capacity	0.75	0.74	0.67	0.68	0.39	0.76	0.78	0.78	0.77	0.77	0.77
d, Delay for Lane Group [s/veh]	23.24	23.11	22.20	29.95	26.46	31.24	23.75	23.75	30.26	22.28	22.34
Lane Group LOS	C	C	C	C	C	C	C	C	C	C	C
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	4.21	4.20	3.27	1.87	0.86	2.33	4.74	4.74	2.68	4.97	4.87
50th-Percentile Queue Length [ft]	105.28	105.03	81.86	46.87	21.58	58.21	118.56	118.56	67.01	124.22	121.68
95th-Percentile Queue Length [veh]	7.58	7.56	5.89	3.37	1.55	4.19	8.31	8.31	4.82	8.62	8.49
95th-Percentile Queue Length [ft]	189.42	189.05	147.35	84.37	38.84	104.78	207.84	207.84	120.62	215.62	212.13

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.18	23.11	22.20	29.95	29.95	26.46	31.24	23.75	23.75	30.26	22.31	22.34
Movement LOS	C	C	C	C	C	C	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	22.89			28.80			25.06			23.80		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.22											
Intersection LOS	C											
Intersection V/C	0.703											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	17.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	153	123	937	91	52	805
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	1	0	0	1
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]	153	123	938	91	52	806
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	32	244	24	13	209
Total Analysis Volume [veh/h]	159	128	974	94	54	837
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	23	70	70	5	78
g / C, Green / Cycle	0.21	0.63	0.63	0.04	0.71
(v / s)_i Volume / Saturation Flow Rate	0.19	0.31	0.07	0.03	0.26
s, saturation flow rate [veh/h]	1515	3192	1425	1597	3192
c, Capacity [veh/h]	312	2022	903	67	2273
d1, Uniform Delay [s]	42.75	10.63	7.91	52.21	6.18
k, delay calibration	0.24	0.50	0.50	0.04	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	20.35	0.82	0.23	7.95	0.46
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	0.92	0.48	0.10	0.80	0.37
d, Delay for Lane Group [s/veh]	63.09	11.46	8.14	60.17	6.64
Lane Group LOS	E	B	A	E	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	9.33	6.06	0.89	1.62	3.50
50th-Percentile Queue Length [ft]	233.28	151.40	22.36	40.59	87.54
95th-Percentile Queue Length [veh]	14.34	10.09	1.61	2.92	6.30
95th-Percentile Queue Length [ft]	358.53	252.29	40.25	73.06	157.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	63.09	63.09	11.46	8.14	60.17	6.64
Movement LOS	E	E	B	A	E	A
d_A, Approach Delay [s/veh]	63.09		11.17		9.89	
Approach LOS	E		B		A	
d_I, Intersection Delay [s/veh]	17.30					
Intersection LOS	B					
Intersection V/C	0.559					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	51.8
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.353

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	888	110	0	857	50	0	0	75	0	0	24
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	1	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]	0	889	110	0	858	50	0	0	75	0	0	24
Peak Hour Factor	1.0000	0.9730	0.9730	1.0000	0.9730	0.9730	1.0000	1.0000	0.9730	1.0000	1.0000	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	228	28	0	0	0	0	0	19	0	0	0
Total Analysis Volume [veh/h]	0	914	113	0	0	0	0	0	77	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	48	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	37	37		7	
g / C, Green / Cycle	0.31	0.31		0.06	
(v / s)_i Volume / Saturation Flow Rate	0.28	0.29		0.05	
s, saturation flow rate [veh/h]	1863	1793		1583	
c, Capacity [veh/h]	568	547		96	
d1, Uniform Delay [s]	40.02	40.62		55.69	
k, delay calibration	0.17	0.19		0.04	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	8.41	13.11		5.78	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

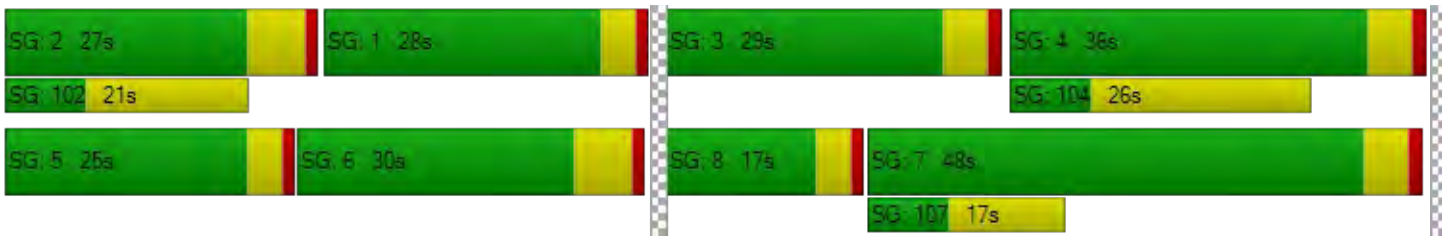
X, volume / capacity	0.90	0.94		0.80	
d, Delay for Lane Group [s/veh]	48.43	53.72		61.47	
Lane Group LOS	D	D		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	15.71	16.59		2.46	
50th-Percentile Queue Length [ft]	392.73	414.72		61.41	
95th-Percentile Queue Length [veh]	22.21	23.27		4.42	
95th-Percentile Queue Length [ft]	555.24	581.71		110.54	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	50.75	53.72	0.00	0.00	0.00	0.00	0.00	61.47	0.00	0.00	0.00
Movement LOS		D	D						E			
d_A, Approach Delay [s/veh]	51.07			0.00			61.47			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	51.80											
Intersection LOS	D											
Intersection V/C	0.353											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Juniper Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	51.7
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.758

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	165	555	484	209	610	90	184	443	128	240	369	182
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	10	0	0	1	1	21	0	6	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	165	555	494	209	610	91	185	464	128	246	372	182
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	145	0	54	159	24	48	121	0	64	97	47
Total Analysis Volume [veh/h]	172	578	0	218	635	95	193	483	0	256	388	190
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	3	0	4	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	8	8	0	4	10	0	4	10	0
Maximum Green [s]	25	25	0	30	30	0	20	40	0	20	40	0
Amber [s]	3.9	3.9	0.0	3.9	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	29	0	36	36	0	28	30	0	25	27	0
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	0	0	7	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	19	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.9	2.9	0.0	2.9	2.9	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
Maximum Recall		No			No		No	No		No	Yes	
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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	28	28	28	26	26	26	26	15	28	28	19	32	32
g / C, Green / Cycle	0.23	0.23	0.23	0.22	0.22	0.22	0.22	0.12	0.23	0.23	0.16	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.00	0.12	0.20	0.16	0.06	0.11	0.13	0.13	0.14	0.11	0.12
s, saturation flow rate [veh/h]	1822	1695	1583	1774	1863	1695	1583	1774	1863	1863	1774	3547	1583
c, Capacity [veh/h]	421	391	365	383	402	366	342	222	427	427	283	935	417
d1, Uniform Delay [s]	45.17	45.16	0.00	42.11	45.90	43.97	39.29	51.60	41.01	41.01	49.58	36.56	37.01
k, delay calibration	0.24	0.24	0.04	0.04	0.13	0.04	0.04	0.04	0.50	0.50	0.27	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.60	17.36	0.00	0.50	9.15	1.12	0.16	4.33	5.36	5.36	21.84	1.36	3.55
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

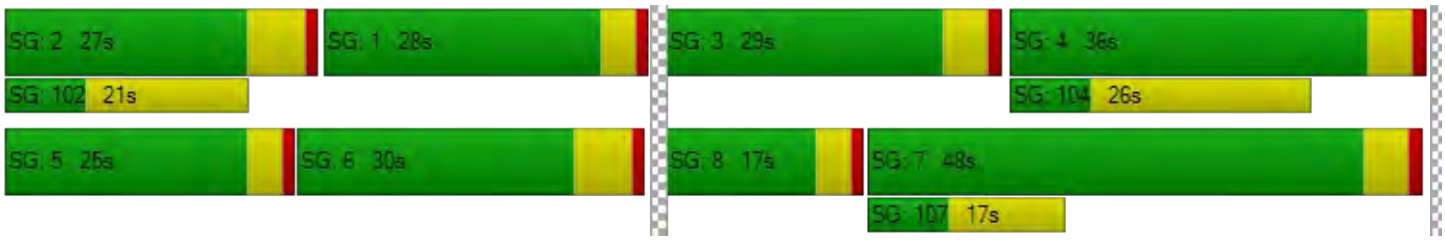
X, volume / capacity	0.92	0.92	0.00	0.57	0.91	0.74	0.28	0.87	0.57	0.57	0.90	0.41	0.46
d, Delay for Lane Group [s/veh]	61.78	62.51	0.00	42.61	55.05	45.09	39.46	55.93	46.37	46.37	71.42	37.92	40.56
Lane Group LOS	E	E	A	D	E	D	D	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	13.20	12.34	0.00	5.84	11.55	7.63	2.37	5.96	6.96	6.96	9.24	4.89	5.09
50th-Percentile Queue Length [ft]	329.89	308.50	0.00	145.9	288.6	190.7	59.20	149.09	174.08	174.08	231.05	122.33	127.17
95th-Percentile Queue Length [veh]	19.15	18.10	0.00	9.80	17.12	12.16	4.26	9.97	11.29	11.29	14.23	8.52	8.79
95th-Percentile Queue Length [ft]	478.82	452.53	0.00	245.0	427.9	303.9	106.5	249.21	282.27	282.27	355.70	213.02	219.64

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	61.78	62.24	0.00	42.61	50.80	39.46	55.93	46.37	46.37	71.42	37.92	40.56
Movement LOS	E	E	A	D	D	D	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	62.13			47.78			49.10			48.81		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	51.68											
Intersection LOS	D											
Intersection V/C	0.758											

Sequence

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



BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6260*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1691*	pc/h/ln
S	*67.2*	mph
D = v_p / S	*25.2*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7277*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1283*	pc/h/ln
S	*69.9*	mph
D = v_p / S	*18.3*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3836*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1020*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*14.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7740*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2026*	pc/h/ln
S	*62.1*	mph
D = v_p / S	*32.6*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/20156*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9093*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1603*	pc/h/ln
S	*68.1*	mph
D = v_p / S	*23.5*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1403*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*373*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*5.3*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	Lillian Tsang
Agency/Company	Kittelson & Associates, Inc.
Date Performed	01/20/2017
Analysis Time Period	AM Peak Hour

Site Information

Freeway/Dir of Travel	I-280 Southbound
Weaving Segment Location	SR-1 On to Serramonte Off
Analysis Year	Existing (2016) plus Project

Project Description Serramonte Terrace TIA

Inputs

Weaving configuration	One-Sided
Weaving number of lanes, N	5
Weaving segment length, L_S	700ft
Freeway free-flow speed, FFS	70 mph
Segment type	Freeway
Freeway minimum speed, S_{MIN}	15
Freeway maximum capacity, C_{IFL}	2400
Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	5650	0.97	1	0	1.5	1.2	0.995	1.00	5854
V_{RF}	807	0.97	1	0	1.5	1.2	0.995	1.00	836
V_{FR}	1241	0.97	1	0	1.5	1.2	0.995	1.00	1286
V_{RR}	0	0.97	1	0	1.5	1.2	0.995	1.00	0
V_{NW}	5854							V =	7976
V_W	2122								
VR	0.266								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	2122 lc/h
Interchange density, ID	2.0 int/mi	Weaving lane changes, LC_W	2592 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	622 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	3214 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	820

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	7937 veh/h	Weaving intensity factor, W	0.752
Weaving segment capacity, c_w	8976 veh/h	Weaving segment speed, S	46.9 mph
Weaving segment v/c ratio	0.884	Average weaving speed, S_W	46.4 mph
Weaving segment density, D	34.0 pc/mi/ln	Average non-weaving speed, S_{NW}	47.1 mph
Level of Service, LOS	D	Maximum weaving length, L_{MAX}	5223 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*7159*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1835*	pc/h/ln
S	*65.3*	mph
D = v_p / S	*28.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9282*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1637*	pc/h/ln
S	*67.8*	mph
D = v_p / S	*24.1*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*3592*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*955*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*13.6*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*6869*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1836*	pc/h/ln
S	*65.3*	mph
D = v_p / S	*28.1*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/20156*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8495*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1498*	pc/h/ln
S	*69.0*	mph
D = v_p / S	*21.7*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Existing Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*1989*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*529*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*7.6*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	Lillian Tsang
Agency/Company	Kittelson & Associates, Inc.
Date Performed	01/20/2017
Analysis Time Period	PM Peak Hour

Site Information

Freeway/Dir of Travel	I-280 Southbound
Weaving Segment Location	SR-1 On to Serramonte Off
Analysis Year	Existing (2016) plus Project

Project Description Serramonte Terrace TIA

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	5	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	700ft	Freeway maximum capacity, C_{IFL}	2400
Freeway free-flow speed, FFS	70 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	6557	0.97	1	0	1.5	1.2	0.995	1.00	6794
V_{RF}	860	0.97	1	0	1.5	1.2	0.995	1.00	891
V_{FR}	1428	0.97	1	0	1.5	1.2	0.995	1.00	1480
V_{RR}	0	0.97	1	0	1.5	1.2	0.995	1.00	0
V_{NW}	6794							V =	9165
V_W	2371								
VR	0.259								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	2371 lc/h
Interchange density, ID	2.0 int/mi	Weaving lane changes, LC_W	2841 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	816 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	3657 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	951

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	9119 veh/h	Weaving intensity factor, W	0.833
Weaving segment capacity, c_w	9231 veh/h	Weaving segment speed, S	44.4 mph
Weaving segment v/c ratio	0.988	Average weaving speed, S_W	45.0 mph
Weaving segment density, D	41.3 pc/mi/ln	Average non-weaving speed, S_{NW}	44.1 mph
Level of Service, LOS	E	Maximum weaving length, L_{MAX}	5145 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Appendix 6
Year 2016 Existing plus Project Conditions
Signal Warrant Worksheets

Signal Warrants Report For Intersection 1: WB Hwy 1 Ramps / Clarinada Ave.

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	3	5	11
2	3	5	11
3	5	7	17
4	5	7	17
5	6	10	23
6	16	25	56
7	17	27	62
8	31	49	113
9	55	86	197
10	56	89	203
11	56	89	203
12	61	96	220
13	67	106	242
14	70	111	253
15	70	111	253
16	75	119	270
17	94	148	338
18	98	156	355
19	106	168	383
20	119	188	428
21	125	198	450
22	147	232	529
23	150	237	540
24	156	247	563

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	8	2	11	No	No	No	No	No	No	No	No	No	No
2	5	8	2	11	No	No	No	No	No	No	No	No	No	No
3	5	12	2	17	No	No	No	No	No	No	No	No	No	No
4	5	12	2	17	No	No	No	No	No	No	No	No	No	No
5	5	16	2	23	No	No	No	No	No	No	No	No	No	No
6	5	41	2	56	No	No	No	No	No	No	No	No	No	No
7	5	44	2	62	No	No	No	No	No	No	No	No	No	No
8	5	80	2	113	No	No	No	No	No	No	No	No	No	No
9	5	141	2	197	No	No	No	No	No	No	No	No	No	No
10	5	145	2	203	No	No	No	No	No	No	No	No	No	No
11	5	145	2	203	No	No	No	No	No	No	No	No	No	No
12	5	157	2	220	No	No	No	No	No	No	No	No	No	No
13	5	173	2	242	No	No	No	No	No	No	No	No	No	No
14	5	181	2	253	No	No	No	No	No	No	No	No	No	No
15	5	181	2	253	No	No	No	No	No	No	No	No	No	No
16	5	194	2	270	No	No	No	No	No	No	No	No	No	No
17	5	242	2	338	No	No	No	No	No	No	No	No	No	No
18	5	254	2	355	No	No	No	No	No	No	No	No	No	No
19	5	274	2	383	No	No	No	No	No	No	No	No	No	No
20	5	307	2	428	No	No	No	No	No	No	No	No	No	No
21	5	323	2	450	No	No	No	No	No	No	No	No	No	No
22	5	379	2	529	No	No	No	Yes	No	No	No	No	Yes	No
23	5	387	2	540	No	No	No	Yes	No	No	No	No	Yes	No
24	5	403	2	563	No	No	No	Yes	No	No	No	No	Yes	No
Hours Met					0	0	0	3	0	0	0	0	3	0

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	15.4
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	2:24
Delay Condition Met	No
Volume on Minor Street Approach During Same Hour	563
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	966
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	No
Warrant Met for Intersection	**No**

Signal Warrants Report For Intersection 2: EB Hwy 1 Ramps / Serramonte Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	4	8	9	13
2	4	8	9	13
3	7	12	13	19
4	7	12	13	19
5	9	15	17	26
6	22	39	43	64
7	24	42	47	71
8	43	77	86	129
9	76	135	151	225
10	78	139	155	232
11	78	139	155	232
12	85	151	168	251
13	93	166	185	277
14	98	174	194	290
15	98	174	194	290
16	104	185	206	309
17	130	232	258	386
18	137	243	271	406
19	148	262	292	438
20	165	293	327	489
21	174	309	344	515
22	204	363	404	605
23	208	371	413	618
24	217	386	430	644

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	12	4	22	No	No	No	No	No	No	No	No	No	No
2	3	12	4	22	No	No	No	No	No	No	No	No	No	No
3	3	19	4	32	No	No	No	No	No	No	No	No	No	No
4	3	19	4	32	No	No	No	No	No	No	No	No	No	No
5	3	24	4	43	No	No	No	No	No	No	No	No	No	No
6	3	61	4	107	No	No	No	No	No	No	No	No	No	No
7	3	66	4	118	No	No	No	No	No	No	No	No	No	No
8	3	120	4	215	No	No	No	No	No	No	No	No	No	No
9	3	211	4	376	No	No	No	No	No	No	No	No	No	No
10	3	217	4	387	No	No	No	No	No	No	No	No	No	No
11	3	217	4	387	No	No	No	No	No	No	No	No	No	No
12	3	236	4	419	No	No	No	No	No	No	No	No	No	No
13	3	259	4	462	No	No	No	No	No	No	No	No	No	No
14	3	272	4	484	No	No	No	No	No	No	No	No	No	No
15	3	272	4	484	No	No	No	No	No	No	No	No	No	No
16	3	289	4	515	No	No	No	No	No	No	No	No	No	No
17	3	362	4	644	No	No	No	Yes	No	No	No	No	No	No
18	3	380	4	677	No	No	No	Yes	No	No	No	No	No	No
19	3	410	4	730	No	No	No	Yes	No	No	No	No	No	No
20	3	458	4	816	No	No	Yes	Yes	No	No	No	No	Yes	No
21	3	483	4	859	No	Yes	Yes	Yes	No	No	No	No	Yes	No
22	3	567	4	1009	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
23	3	579	4	1031	No	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
24	3	603	4	1074	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes
Hours Met					1	4	5	8	0	0	0	3	5	3

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	16.3	65.4
Number of Lanes on Minor Street Approach	2	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	1:56	11:41
Delay Condition Met	No	Yes
Volume on Minor Street Approach During Same Hour	430	644
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	1677	1677
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	Yes
Warrant Met for Intersection	**Yes**	

Signal Warrants Report For Intersection 3: Callan Blvd / Serramonte Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	9	10	5	10
2	9	10	5	10
3	14	15	7	15
4	14	15	7	15
5	19	20	10	20
6	46	51	25	50
7	51	56	27	54
8	93	101	49	99
9	162	177	86	173
10	167	182	89	178
11	167	182	89	178
12	181	197	96	193
13	199	217	106	213
14	208	227	111	223
15	208	227	111	223
16	222	242	119	238
17	278	303	148	297
18	292	318	156	312
19	315	343	168	337
20	352	384	188	376
21	370	404	198	396
22	435	475	232	465
23	444	485	237	475
24	463	505	247	495

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	19	6	15	No	No	No	No	No	No	No	No	No	No
2	5	19	6	15	No	No	No	No	No	No	No	No	No	No
3	5	29	6	22	No	No	No	No	No	No	No	No	No	No
4	5	29	6	22	No	No	No	No	No	No	No	No	No	No
5	5	39	6	30	No	No	No	No	No	No	No	No	No	No
6	5	97	6	75	No	No	No	No	No	No	No	No	No	No
7	5	107	6	81	No	No	No	No	No	No	No	No	No	No
8	5	194	6	148	No	No	No	No	No	No	No	No	No	No
9	5	339	6	259	No	No	No	Yes	No	No	No	No	No	No
10	5	349	6	267	No	No	No	Yes	No	No	No	No	No	No
11	5	349	6	267	No	No	No	Yes	No	No	No	No	No	No
12	5	378	6	289	No	No	No	Yes	No	No	No	No	No	No
13	5	416	6	319	No	No	No	Yes	No	No	No	No	No	No
14	5	435	6	334	No	No	Yes	Yes	No	No	No	No	No	No
15	5	435	6	334	No	No	Yes	Yes	No	No	No	No	No	No
16	5	464	6	357	No	No	Yes	Yes	No	No	No	No	No	No
17	5	581	6	445	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
18	5	610	6	468	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	No
19	5	658	6	505	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No
20	5	736	6	564	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No
21	5	774	6	594	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
22	5	910	6	697	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
23	5	929	6	712	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
24	5	968	6	742	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hours Met					7	8	11	16	3	5	6	8	8	4

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	11.5	14.9
Number of Lanes on Minor Street Approach	3	3
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	0:47	2:03
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	247	495
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	1710	1710
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 1: SB Hwy 1 Ramps / Clarinada Ave.

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	E, W
Minor Approaches	S
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets
	E	W	S
1	7	3	14
2	7	3	14
3	10	4	21
4	10	4	21
5	13	5	29
6	34	14	71
7	37	15	79
8	67	27	143
9	118	48	250
10	121	49	257
11	121	49	257
12	131	53	278
13	144	58	307
14	151	61	321
15	151	61	321
16	161	65	343
17	202	82	428
18	212	86	450
19	228	92	486
20	255	103	543
21	269	109	571
22	316	128	671
23	323	131	685
24	336	136	714

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	10	2	14	No	No	No	No	No	No	No	No	No	No
2	5	10	2	14	No	No	No	No	No	No	No	No	No	No
3	5	14	2	21	No	No	No	No	No	No	No	No	No	No
4	5	14	2	21	No	No	No	No	No	No	No	No	No	No
5	5	18	2	29	No	No	No	No	No	No	No	No	No	No
6	5	48	2	71	No	No	No	No	No	No	No	No	No	No
7	5	52	2	79	No	No	No	No	No	No	No	No	No	No
8	5	94	2	143	No	No	No	No	No	No	No	No	No	No
9	5	166	2	250	No	No	No	No	No	No	No	No	No	No
10	5	170	2	257	No	No	No	No	No	No	No	No	No	No
11	5	170	2	257	No	No	No	No	No	No	No	No	No	No
12	5	184	2	278	No	No	No	No	No	No	No	No	No	No
13	5	202	2	307	No	No	No	No	No	No	No	No	No	No
14	5	212	2	321	No	No	No	No	No	No	No	No	No	No
15	5	212	2	321	No	No	No	No	No	No	No	No	No	No
16	5	226	2	343	No	No	No	No	No	No	No	No	No	No
17	5	284	2	428	No	No	No	No	No	No	No	No	No	No
18	5	298	2	450	No	No	No	No	No	No	No	No	No	No
19	5	320	2	486	No	No	No	No	No	No	No	No	No	No
20	5	358	2	543	No	No	No	Yes	No	No	No	No	Yes	No
21	5	378	2	571	No	No	No	Yes	No	No	No	No	Yes	No
22	5	444	2	671	No	No	Yes	Yes	No	No	No	No	Yes	Yes
23	5	454	2	685	No	No	Yes	Yes	No	No	No	No	Yes	Yes
24	5	472	2	714	No	No	Yes	Yes	No	No	No	No	Yes	Yes
Hours Met					0	0	3	5	0	0	0	0	5	3

Warrant 3 Condition A

Orientation	S
Total Stopped Delay Per Vehicle on Minor Approach (s)	31
Number of Lanes on Minor Street Approach	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	6:08
Delay Condition Met	Yes
Volume on Minor Street Approach During Same Hour	714
High Minor Volume Condition Met	Yes
Total Entering Volume on All Approaches During Same Hour	1186
Number of Approaches on Intersection	3
Total Volume Condition Met	Yes
Warrant Met for Approach	Yes
Warrant Met for Intersection	**Yes**

Signal Warrants Report For Intersection 2: NB Hwy 1 Ramps / Serramonte Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	No
#3	Peak Hour	No

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	2	8	8	8
2	2	8	8	8
3	3	12	12	13
4	3	12	12	13
5	4	15	16	17
6	11	39	41	42
7	12	42	45	46
8	21	77	82	83
9	37	135	143	146
10	39	139	147	150
11	39	139	147	150
12	42	151	160	163
13	46	166	176	179
14	48	174	184	188
15	48	174	184	188
16	51	185	196	200
17	64	232	245	250
18	67	243	258	263
19	73	262	278	284
20	81	293	311	317
21	86	309	327	334
22	101	363	384	392
23	103	371	393	400
24	107	386	409	417

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	3	10	4	16	No	No	No	No	No	No	No	No	No	No
2	3	10	4	16	No	No	No	No	No	No	No	No	No	No
3	3	15	4	25	No	No	No	No	No	No	No	No	No	No
4	3	15	4	25	No	No	No	No	No	No	No	No	No	No
5	3	19	4	33	No	No	No	No	No	No	No	No	No	No
6	3	50	4	83	No	No	No	No	No	No	No	No	No	No
7	3	54	4	91	No	No	No	No	No	No	No	No	No	No
8	3	98	4	165	No	No	No	No	No	No	No	No	No	No
9	3	172	4	289	No	No	No	No	No	No	No	No	No	No
10	3	178	4	297	No	No	No	No	No	No	No	No	No	No
11	3	178	4	297	No	No	No	No	No	No	No	No	No	No
12	3	193	4	323	No	No	No	No	No	No	No	No	No	No
13	3	212	4	355	No	No	No	No	No	No	No	No	No	No
14	3	222	4	372	No	No	No	No	No	No	No	No	No	No
15	3	222	4	372	No	No	No	No	No	No	No	No	No	No
16	3	236	4	396	No	No	No	No	No	No	No	No	No	No
17	3	296	4	495	No	No	No	No	No	No	No	No	No	No
18	3	310	4	521	No	No	No	No	No	No	No	No	No	No
19	3	335	4	562	No	No	No	No	No	No	No	No	No	No
20	3	374	4	628	No	No	No	Yes	No	No	No	No	No	No
21	3	395	4	661	No	No	No	Yes	No	No	No	No	No	No
22	3	464	4	776	No	No	Yes	Yes	No	No	No	No	No	No
23	3	474	4	793	No	No	Yes	Yes	No	No	No	No	No	No
24	3	493	4	826	No	Yes	Yes	Yes	No	No	No	No	Yes	No
Hours Met					0	1	3	5	0	0	0	0	1	0

Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	13.3	16.6
Number of Lanes on Minor Street Approach	2	2
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	1:30	1:55
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	409	417
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	1319	1319
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

Signal Warrants Report For Intersection 3: Callan Blvd / Serramonte Blvd

Warrants Summary

Warrant	Name	Met?
#1	Eight Hour Vehicular Volume	No
#2	Four Hour Vehicular Volume	Yes
#3	Peak Hour	Yes

Intersection Warrants Parameters

Major Approaches	S, N
Minor Approaches	E, W
Speed > 40mph	No
Population < 10,000	No
Warrant Factor	100%

Warrant Analysis Traffic Volumes

Hour	Major Streets		Minor Streets	
	S	N	E	W
1	9	10	12	8
2	9	10	12	8
3	13	14	19	12
4	13	14	19	12
5	18	19	25	16
6	45	48	62	40
7	49	53	68	44
8	90	96	124	80
9	157	167	217	140
10	162	172	223	144
11	162	172	223	144
12	175	186	242	156
13	193	206	267	172
14	202	215	279	180
15	202	215	279	180
16	216	229	298	192
17	269	287	372	239
18	283	301	391	251
19	305	325	422	271
20	341	363	471	303
21	359	382	496	319
22	422	449	583	375
23	431	459	595	383
24	449	478	620	399

Warrant Analysis by Hour

Hour	Major Lanes		Minor Lanes		Warrant 1 Condition A				Warrant 1 Condition B				Warrant 2	Warrant 3
	Number	Volume	Number	Volume	100%	80%	70%	56%	100%	80%	70%	56%		Condition B
1	5	19	6	20	No	No	No	No	No	No	No	No	No	No
2	5	19	6	20	No	No	No	No	No	No	No	No	No	No
3	5	27	6	31	No	No	No	No	No	No	No	No	No	No
4	5	27	6	31	No	No	No	No	No	No	No	No	No	No
5	5	37	6	41	No	No	No	No	No	No	No	No	No	No
6	5	93	6	102	No	No	No	No	No	No	No	No	No	No
7	5	102	6	112	No	No	No	No	No	No	No	No	No	No
8	5	186	6	204	No	No	No	No	No	No	No	No	No	No
9	5	324	6	357	No	No	No	No	No	No	No	No	No	No
10	5	334	6	367	No	No	No	No	No	No	No	No	No	No
11	5	334	6	367	No	No	No	No	No	No	No	No	No	No
12	5	361	6	398	No	No	No	Yes	No	No	No	No	No	No
13	5	399	6	439	No	No	No	Yes	No	No	No	No	No	No
14	5	417	6	459	No	No	No	Yes	No	No	No	No	No	No
15	5	417	6	459	No	No	No	Yes	No	No	No	No	No	No
16	5	445	6	490	No	No	Yes	Yes	No	No	No	No	No	No
17	5	556	6	611	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
18	5	584	6	642	No	Yes	Yes	Yes	No	No	No	Yes	Yes	No
19	5	630	6	693	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	No
20	5	704	6	774	Yes	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Yes
21	5	741	6	815	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
22	5	871	6	958	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
23	5	890	6	978	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes
24	5	927	6	1019	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Hours Met					6	8	9	13	1	4	6	8	8	5

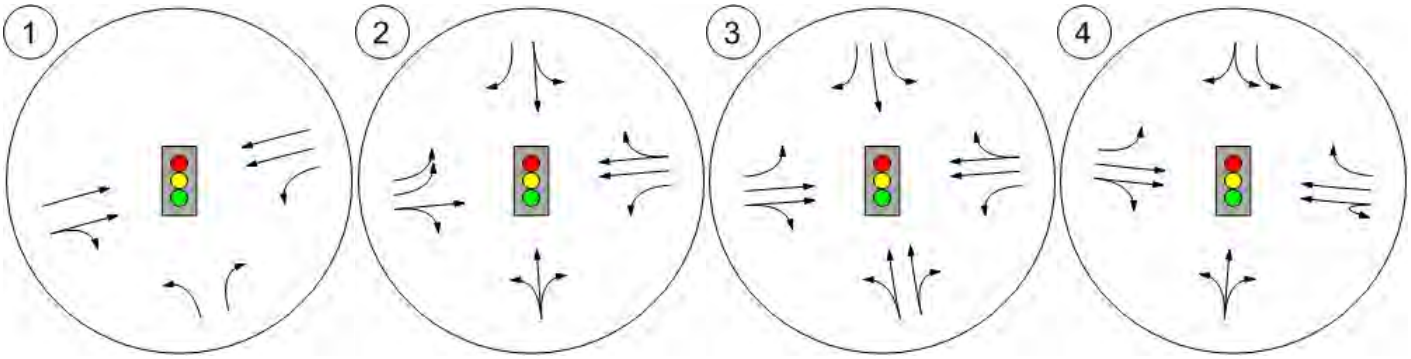
Warrant 3 Condition A

Orientation	E	W
Total Stopped Delay Per Vehicle on Minor Approach (s)	15.3	13.1
Number of Lanes on Minor Street Approach	3	3
VehicleHours of Stopped Delay on Minor Approach ([h]h:mm)	2:37	1:26
Delay Condition Met	No	No
Volume on Minor Street Approach During Same Hour	620	399
High Minor Volume Condition Met	Yes	Yes
Total Entering Volume on All Approaches During Same Hour	1946	1946
Number of Approaches on Intersection	4	4
Total Volume Condition Met	Yes	Yes
Warrant Met for Approach	No	No
Warrant Met for Intersection	**No**	

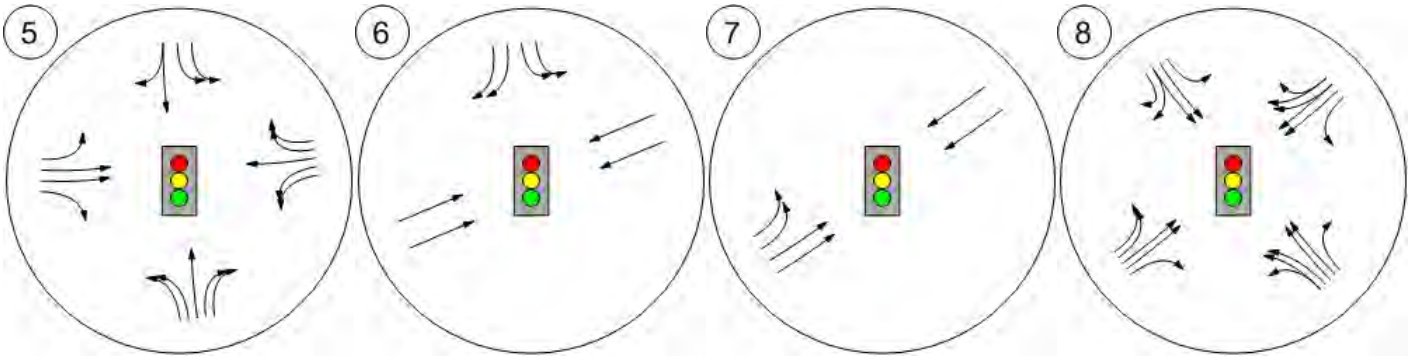
Appendix 7
Year 2035 Cumulative Conditions Intersection Lane Configurations

Lane Configuration and Traffic Control

WB Hwy 1 Ramps / Clarinad EB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

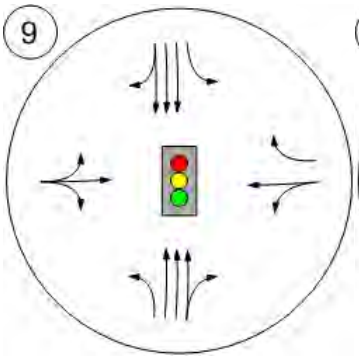


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

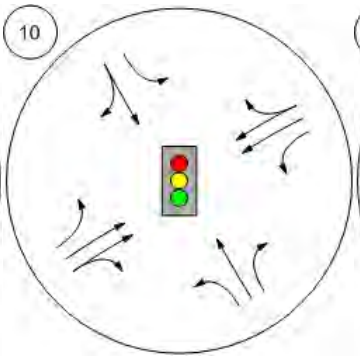


Lane Configuration and Traffic Control

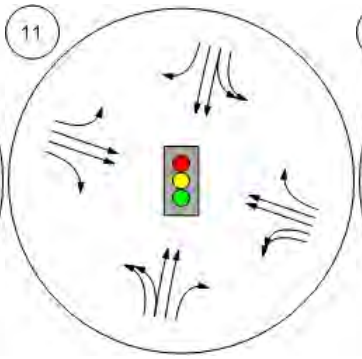
Gellert Blvd / Serramonte Pla



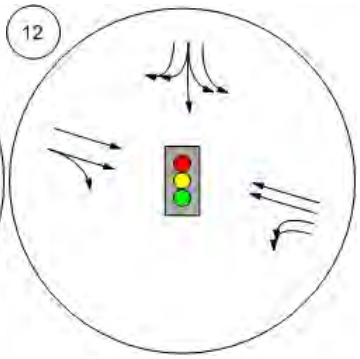
Callan Blvd / Hickey Blvd



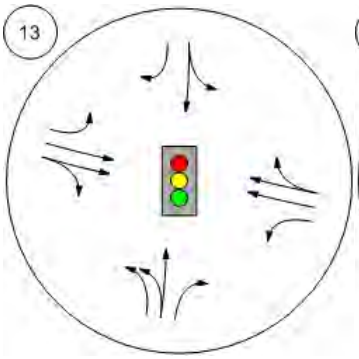
Gellert Blvd / Hickey Blvd



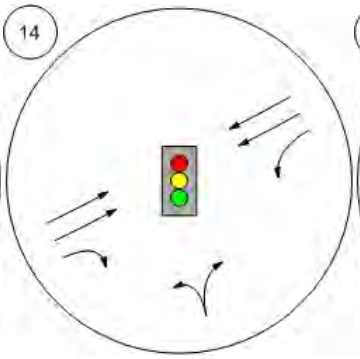
I-280 SB Ramps / Hickey Blv



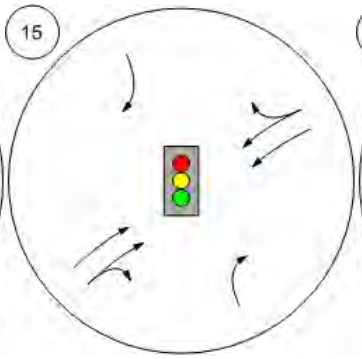
I-280 NB Ramps / Hickey Blv



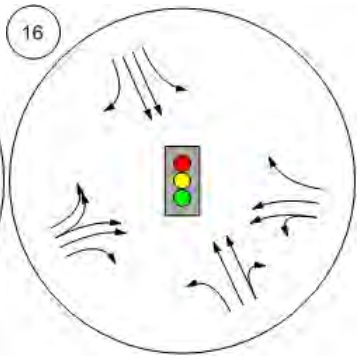
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd



Junipero Serra Blvd / Hickey



Appendix 8
Year 2035 Cumulative Conditions Level-of-Service Worksheets

19898 Daly City Serramonte Terrace TIA

Vistro File: K:\...\19898_Vistro_20160516.vistro
Scenario 6: Cumulative 2035 AM

Report File: K:\...\Cumulative AM.pdf
5/16/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	WB Hwy 1 Ramps / Clarinada Ave.	Signalized	HCM 2010	WB Left	0.584	11.5	B
2	EB Hwy 1 Ramps / Serramonte Blvd	Signalized	HCM 2010	WB Left	0.831	39.2	D
3	Callan Blvd / Serramonte Blvd	Signalized	HCM 2010	WB Left	0.632	17.6	B
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	EB Left	0.237	8.0	A
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	WB Thru	0.488	13.7	B
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	NEB Thru	0.823	7.9	A
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.693	1.6	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	NEB Right	0.975	58.6	E
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	WB Left	0.301	24.1	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.580	18.2	B
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.733	28.5	C
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.526	9.0	A
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.778	29.2	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.347	11.1	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.426	54.2	D
16	Junipero Serra Blvd / Hickey Blvd	Signalized	HCM 2010	SEB Left	0.916	65.1	E

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

Intersection Level Of Service Report
Intersection 1: WB Hwy 1 Ramps / Clarinada Ave.

Control Type:	Signalized	Delay (sec / veh):	11.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.584

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	411	320	120	142	107	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.60	3.60	1.90	1.50	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	411	320	120	142	107	23
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	112	87	33	39	29	6
Total Analysis Volume [veh/h]	447	348	130	154	116	25
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	2	0	4	0	3	8
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	4	0	4	0	4	4
Maximum Green [s]	28	0	27	0	8	39
Amber [s]	3.5	0.0	3.5	0.0	3.5	3.5
All red [s]	0.5	0.0	0.5	0.0	0.5	0.5
Split [s]	32	0	31	0	12	43
Vehicle Extension [s]	3.0	0.0	3.0	0.0	3.0	3.0
Walk [s]	5	0	5	0	5	0
Pedestrian Clearance [s]	23	0	22	0	10	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
Minimum Recall	No		No		No	No
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	6.0	0.0	6.0	6.0
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	C	C	L	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	5	5	3	12
g / C, Green / Cycle	0.36	0.36	0.16	0.16	0.08	0.38
(v / s)_i Volume / Saturation Flow Rate	0.25	0.22	0.07	0.10	0.06	0.01
s, saturation flow rate [veh/h]	1781	1559	1865	1585	1810	3618
c, Capacity [veh/h]	640	560	309	263	153	1376
d1, Uniform Delay [s]	8.42	8.12	11.50	11.85	13.76	5.94
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.39	1.13	0.91	2.08	7.41	0.01
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.70	0.62	0.42	0.59	0.76	0.02
d, Delay for Lane Group [s/veh]	9.82	9.25	12.41	13.93	21.18	5.95
Lane Group LOS	A	A	B	B	C	A
Critical Lane Group	Yes	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh]	1.78	1.32	0.67	0.87	0.92	0.03
50th-Percentile Queue Length [ft]	44.38	33.07	16.64	21.71	23.05	0.77
95th-Percentile Queue Length [veh]	3.20	2.38	1.20	1.56	1.66	0.06
95th-Percentile Queue Length [ft]	79.89	59.53	29.96	39.09	41.49	1.39

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	9.82	9.25	12.41	13.93	21.18	5.95
Movement LOS	A	A	B	B	C	A
d_A, Approach Delay [s/veh]	9.57		13.24		18.48	
Approach LOS	A		B		B	
d_I, Intersection Delay [s/veh]	11.45					
Intersection LOS	B					
Intersection V/C	0.584					

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: EB Hwy 1 Ramps / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	39.2
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.831

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	2	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	29	98	90	310	94	134	466	292	50	132	182	226
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	1.10	1.10	4.30	4.10	1.30	3.00	4.00	3.80	9.00	1.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	29	98	90	310	94	134	466	292	50	132	182	226
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
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	0.0000
Total 15-Minute Volume [veh/h]	8	28	26	90	27	39	135	85	15	38	53	0
Total Analysis Volume [veh/h]	34	114	105	360	109	156	542	340	58	153	212	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	4	0	0	4	0	4	4	0	5	4	0
Maximum Green [s]	0	30	0	0	35	0	35	35	0	35	30	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	3.5	3.5	0.0	3.5	3.5	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	27	0	0	29	0	9	32	0	17	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	11	0	0	31	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	15	27	27	17	22	10	15	15
g / C, Green / Cycle	0.17	0.30	0.30	0.19	0.25	0.11	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.14	0.27	0.10	0.16	0.22	0.09	0.06	0.06
s, saturation flow rate [veh/h]	1759	1754	1551	3469	1798	1743	1743	1743
c, Capacity [veh/h]	297	520	460	665	445	192	289	289
d1, Uniform Delay [s]	36.40	30.50	24.85	34.95	32.80	39.18	33.42	33.42
k, delay calibration	0.11	0.23	0.11	0.11	0.14	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.82	11.54	0.43	2.51	8.10	7.40	0.78	0.78
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

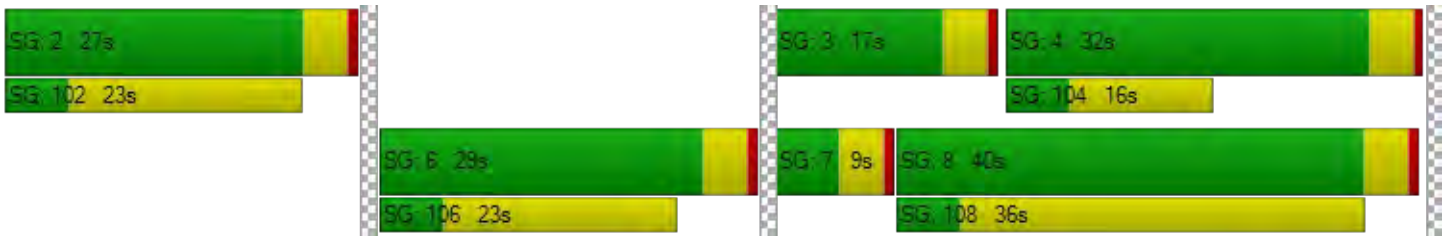
X, volume / capacity	0.85	0.90	0.34	0.82	0.89	0.80	0.37	0.37
d, Delay for Lane Group [s/veh]	43.22	42.04	25.28	37.45	40.90	46.58	34.19	34.19
Lane Group LOS	D	D	C	D	D	D	C	C
Critical Lane Group	Yes	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	5.85	11.08	2.61	5.80	9.14	3.64	2.09	2.09
50th-Percentile Queue Length [ft]	146.24	277.05	65.17	144.89	228.54	91.05	52.25	52.25
95th-Percentile Queue Length [veh]	9.82	16.54	4.69	9.74	14.10	6.56	3.76	3.76
95th-Percentile Queue Length [ft]	245.41	413.54	117.31	243.59	352.50	163.89	94.05	94.05

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.22	43.22	43.22	42.04	42.04	25.28	37.45	40.90	40.90	46.58	34.19	34.19
Movement LOS	D	D	D	D	D	C	D	D	D	D	C	C
d_A, Approach Delay [s/veh]	43.22			37.86			38.91			39.38		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.19											
Intersection LOS	D											
Intersection V/C	0.831											

Sequence

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



Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	17.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.632

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	180	205	78	139	233	201	156	427	111	35	140	103
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 [%]	1.80	1.30	1.30	16.40	4.80	7.70	8.70	0.40	0.00	0.00	1.70	22.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	180	205	78	139	233	201	156	427	111	35	140	103
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]	48	55	21	37	63	54	42	115	30	9	38	28
Total Analysis Volume [veh/h]	194	220	84	149	251	216	168	459	119	38	151	111
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	4	0	4	4	0	4	4	0	4	4	0
Maximum Green [s]	4	35	0	12	32	0	6	32	0	5	31	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	3.5	3.5	0.0	3.5	3.5	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	19	39	0	16	36	0	10	36	0	9	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	30	0	0	22	0	0	26	0	0	25	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	Yes	Yes		No	Yes		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	12	23	15	15	6	10	10	2	6	6
g / C, Green / Cycle	0.49	0.25	0.49	0.31	0.31	0.13	0.22	0.22	0.03	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.17	0.19	0.16	0.14	0.14	0.10	0.16	0.16	0.02	0.07	0.08
s, saturation flow rate [veh/h]	1111	1627	938	1813	1500	1665	1892	1760	1810	1868	1617
c, Capacity [veh/h]	772	405	485	570	472	210	421	391	61	242	210
d1, Uniform Delay [s]	6.85	16.15	10.42	12.70	12.78	19.78	16.73	16.74	22.21	19.02	19.12
k, delay calibration	0.50	0.11	0.11	0.11	0.11	0.18	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	0.78	2.81	0.36	0.53	0.69	10.80	2.23	2.43	9.99	2.03	2.74
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

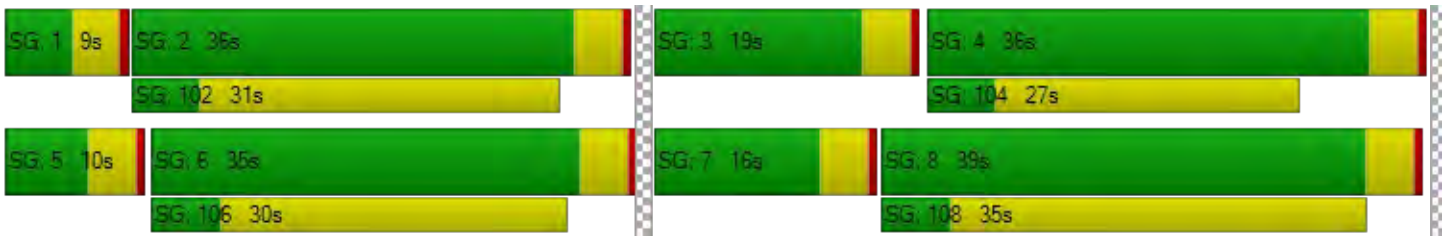
X, volume / capacity	0.25	0.75	0.31	0.44	0.46	0.80	0.71	0.71	0.62	0.56	0.60
d, Delay for Lane Group [s/veh]	7.63	18.97	10.77	13.23	13.47	30.58	18.96	19.17	32.20	21.05	21.86
Lane Group LOS	A	B	B	B	B	C	B	B	C	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.98	2.86	1.01	1.82	1.60	2.20	2.80	2.64	0.54	1.36	1.30
50th-Percentile Queue Length [ft]	24.46	71.59	25.17	45.60	39.94	54.98	70.03	65.93	13.53	34.05	32.48
95th-Percentile Queue Length [veh]	1.76	5.15	1.81	3.28	2.88	3.96	5.04	4.75	0.97	2.45	2.34
95th-Percentile Queue Length [ft]	44.02	128.85	45.31	82.08	71.89	98.96	126.05	118.67	24.35	61.30	58.46

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	7.63	18.97	18.97	10.77	13.23	13.47	30.58	19.03	19.17	32.20	21.13	21.86
Movement LOS	A	B	B	B	B	B	C	B	B	C	C	C
d_A, Approach Delay [s/veh]	14.55			12.72			21.65			22.80		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	17.63											
Intersection LOS	B											
Intersection V/C	0.632											

Sequence

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



Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	8.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.237

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	285.00	100.00	100.00	100.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	73	0	66	89	576	0	44	0	240	164
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	11.50	2.00	0.00	0.00	5.90	0.00	0.00	2.00	11.90	4.70
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	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	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	73	0	66	89	576	0	44	0	240	164
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	18	0	17	22	144	0	11	0	60	41
Total Analysis Volume [veh/h]	0	0	0	73	0	66	89	576	0	44	0	240	164
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Protecte	Permiss	Permiss	Permi	Permi	Permi	Overl
Signal group	0	0	0	4	0	0	1	6	0	0	0	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	4	8	0	0	0	8	8
Maximum Green [s]	0	0	0	30	0	0	20	40	0	0	0	40	40
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	3.0	3.6	0.0	0.0	0.0	3.6	3.6
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0
Split [s]	0	0	0	18	0	0	12	38	0	0	0	26	26
Vehicle Extension [s]	0.0	0.0	0.0	2.5	0.0	0.0	2.0	3.0	0.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	7	0	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	20	0	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	2.0	2.6	0.0	0.0	0.0	2.6	2.6
Minimum Recall				No			No	No				No	No
Maximum Recall				No			No	No				No	No
Pedestrian Recall				No			No	No				No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.60	4.60	4.60	4.60	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.60	2.60	2.60	2.60	0.00
g_i, Effective Green Time [s]		6	6	4	50	50	42	42	53
g / C, Green / Cycle		0.09	0.09	0.07	0.77	0.77	0.65	0.65	0.81
(v / s)_i Volume / Saturation Flow Rate		0.04	0.04	0.05	0.16	0.16	0.11	0.10	0.11
s, saturation flow rate [veh/h]		1623	1628	1810	1794	1794	1201	1545	1543
c, Capacity [veh/h]		153	154	120	1388	1388	850	999	1251
d1, Uniform Delay [s]		27.94	28.00	29.93	1.99	1.99	4.44	4.54	1.30
k, delay calibration		0.08	0.08	0.04	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.48	1.62	3.36	0.34	0.34	0.38	0.33	0.22
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.44	0.46	0.74	0.21	0.21	0.15	0.15	0.13
d, Delay for Lane Group [s/veh]		29.41	29.62	33.29	2.33	2.33	4.82	4.87	1.52
Lane Group LOS		C	C	C	A	A	A	A	A
Critical Lane Group		No	Yes	No	Yes	No	No	No	No
50th-Percentile Queue Length [veh]		1.02	1.08	1.43	0.54	0.54	0.58	0.69	0.17
50th-Percentile Queue Length [ft]		25.43	26.97	35.64	13.48	13.48	14.46	17.19	4.25
95th-Percentile Queue Length [veh]		1.83	1.94	2.57	0.97	0.97	1.04	1.24	0.31
95th-Percentile Queue Length [ft]		45.77	48.55	64.15	24.27	24.27	26.04	30.94	7.64

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	29.42	0.00	29.62	33.29	2.33	2.33	4.82	0.00	4.85	1.52
Movement LOS				C		C	C	A	A	A		A	A
d_A, Approach Delay [s/veh]	0.00			29.52			6.47			3.63			
Approach LOS	A			C			A			A			
d_I, Intersection Delay [s/veh]	8.01												
Intersection LOS	A												
Intersection V/C	0.237												

Sequence

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

Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	13.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.488

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	183	116	193	57	84	12	32	415	209	294	222	62
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 [%]	10.20	0.00	2.60	1.80	6.40	8.30	0.00	4.60	7.70	1.10	7.10	2.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	183	116	193	57	84	12	32	415	209	294	222	62
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]	49	31	52	15	23	3	9	112	56	79	60	17
Total Analysis Volume [veh/h]	197	125	208	61	90	13	34	446	225	316	239	67
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	3	3	3	4	4	0	5	2	2	1	6	6
Auxiliary Signal Groups			1,3						2,3			4,6
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	4	4	4	4	0	4	6	6	4	6	6
Maximum Green [s]	25	25	25	30	30	0	20	26	26	25	26	26
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.5	0.5	0.5	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0	0	0	0	0	29	29
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	7	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	18	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	1.5	1.5	1.5	1.5	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		Yes	Yes		No		No	Yes	Yes	No	Yes	Yes
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	7	7	25	5	5	7	9	20	6	8	16
g / C, Green / Cycle	0.17	0.17	0.60	0.11	0.11	0.17	0.21	0.48	0.15	0.19	0.38
(v / s)_i Volume / Saturation Flow Rate	0.06	0.07	0.07	0.02	0.06	0.02	0.13	0.15	0.09	0.13	0.02
s, saturation flow rate [veh/h]	3189	1900	2786	2747	1747	1810	3459	1500	3476	1774	2800
c, Capacity [veh/h]	548	326	1683	345	190	317	727	723	529	332	1069
d1, Uniform Delay [s]	14.95	15.02	3.47	18.43	17.26	14.18	14.65	6.45	16.17	15.61	8.01
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.04	0.11	0.11	0.04	0.11	0.04
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
d2, Incremental Delay [s]	0.15	0.27	0.01	0.09	0.90	0.05	0.84	0.24	0.40	2.93	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.38	0.12	0.18	0.54	0.11	0.61	0.31	0.60	0.72	0.06
d, Delay for Lane Group [s/veh]	15.10	15.29	3.48	18.52	18.16	14.24	15.49	6.69	16.57	18.54	8.02
Lane Group LOS	B	B	A	B	B	B	B	A	B	B	A
Critical Lane Group	No	Yes	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.70	0.90	0.18	0.25	0.84	0.23	1.64	0.85	1.20	2.02	0.14
50th-Percentile Queue Length [ft]	17.40	22.44	4.57	6.14	20.89	5.74	41.11	21.14	30.04	50.62	3.57
95th-Percentile Queue Length [veh]	1.25	1.62	0.33	0.44	1.50	0.41	2.96	1.52	2.16	3.64	0.26
95th-Percentile Queue Length [ft]	31.32	40.39	8.22	11.06	37.60	10.32	74.00	38.05	54.08	91.12	6.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.10	15.29	3.48	18.52	18.16	18.16	14.24	15.49	6.69	16.57	18.54	8.02
Movement LOS	B	B	A	B	B	B	B	B	A	B	B	A
d_A, Approach Delay [s/veh]	10.59			18.29			12.62			16.41		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	13.71											
Intersection LOS	B											
Intersection V/C	0.488											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	7.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.823

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	993	212	293	0	0	693
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.80	0.80	5.70	2.00	2.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	993	212	293	0	0	693
Peak Hour Factor	0.8500	0.8500	0.8500	1.0000	1.0000	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	292	62	86	0	0	204
Total Analysis Volume [veh/h]	1168	249	345	0	0	815
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	13	13	8	9
g / C, Green / Cycle	0.44	0.44	0.28	0.31
(v / s)_i Volume / Saturation Flow Rate	0.34	0.09	0.10	0.23
s, saturation flow rate [veh/h]	3486	2836	3423	3512
c, Capacity [veh/h]	1528	1243	946	1092
d1, Uniform Delay [s]	6.91	5.03	8.47	9.00
k, delay calibration	0.04	0.04	0.04	0.04
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.31	0.03	0.09	0.39
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.20	0.36	0.75
d, Delay for Lane Group [s/veh]	7.21	5.06	8.56	9.38
Lane Group LOS	A	A	A	A
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh]	1.51	0.23	0.58	1.47
50th-Percentile Queue Length [ft]	37.65	5.72	14.40	36.83
95th-Percentile Queue Length [veh]	2.71	0.41	1.04	2.65
95th-Percentile Queue Length [ft]	67.76	10.30	25.93	66.30

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	7.21	5.06	8.56	0.00	0.00	9.38
Movement LOS	A	A	A			A
d_A, Approach Delay [s/veh]	6.83		8.56		9.38	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.87					
Intersection LOS	A					
Intersection V/C	0.823					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	1.6
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.693

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	111	1593	290	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.40	1.90	7.70	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	111	1593	290	0	0	0
Peak Hour Factor	0.8400	0.8400	0.8400	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	33	474	86	0	0	0
Total Analysis Volume [veh/h]	132	1896	345	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	3.90	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	1.90	2.10	
g_i, Effective Green Time [s]	3	22	15	
g / C, Green / Cycle	0.12	0.85	0.59	
(v / s)_i Volume / Saturation Flow Rate	0.04	0.53	0.10	
s, saturation flow rate [veh/h]	3432	3550	3359	
c, Capacity [veh/h]	420	3024	1977	
d1, Uniform Delay [s]	10.53	0.62	2.48	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.42	0.22	0.04	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.31	0.63	0.17	
d, Delay for Lane Group [s/veh]	10.96	0.84	2.52	
Lane Group LOS	B	A	A	
Critical Lane Group	No	Yes	No	
50th-Percentile Queue Length [veh]	0.27	0.09	0.03	
50th-Percentile Queue Length [ft]	6.67	2.27	0.78	
95th-Percentile Queue Length [veh]	0.48	0.16	0.06	
95th-Percentile Queue Length [ft]	12.00	4.08	1.41	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.96	0.84	2.52	0.00	0.00	0.00
Movement LOS	B	A	A			
d_A, Approach Delay [s/veh]	1.50		2.52		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.64					
Intersection LOS	A					
Intersection V/C	0.693					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	58.6
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.975

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	160	0	869	548	178	168	198	65
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	0	0	0	160	0	869	548	178	168	198	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9050	1.0000	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
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	0	0	0	44	0	240	151	49	46	55	18
Total Analysis Volume [veh/h]	0	0	0	0	177	0	960	606	197	186	219	72
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lead	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	28	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		9	40	40	15	46	46	46
g / C, Green / Cycle		0.07	0.33	0.33	0.13	0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate		0.05	0.27	0.38	0.11	0.09	0.09	0.10
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1602	1583
c, Capacity [veh/h]		245	1170	522	226	710	610	603
d1, Uniform Delay [s]		55.14	37.34	40.64	51.93	25.62	25.66	25.66
k, delay calibration		0.11	0.11	0.50	0.22	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.97	1.49	91.81	17.92	0.18	0.21	0.21
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.72	0.82	1.16	0.87	0.25	0.25	0.25
d, Delay for Lane Group [s/veh]		59.11	38.84	132.45	69.85	25.80	25.87	25.88
Lane Group LOS		E	D	F	E	C	C	C
Critical Lane Group		No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh]		2.78	13.19	28.64	7.00	3.49	3.05	3.02
50th-Percentile Queue Length [ft]		69.61	329.67	716.08	174.95	87.20	76.21	75.43
95th-Percentile Queue Length [veh]		5.01	19.14	41.11	11.34	6.28	5.49	5.43
95th-Percentile Queue Length [ft]		125.30	478.56	1027.64	283.41	156.95	137.17	135.77

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	59.11	0.00	38.84	132.45	69.85	25.81	25.87	25.88
Movement LOS					E		D	F	E	C	C	C
d_A, Approach Delay [s/veh]	0.00				73.45				38.71			
Approach LOS	A				E				D			
d_I, Intersection Delay [s/veh]	58.64											
Intersection LOS	E											
Intersection V/C	0.975											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	90	540	375	344	172	396	41	39
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	90	540	375	344	172	396	41	39
Peak Hour Factor	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	25	149	104	95	48	109	11	0
Total Analysis Volume [veh/h]	99	597	414	380	190	438	45	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	39	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	30	30	30	20	20	20	20
g / C, Green / Cycle	0.25	0.25	0.25	0.17	0.17	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.20	0.12	0.24	0.11	0.09	0.14	0.03
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1863	1583
c, Capacity [veh/h]	852	877	392	296	310	310	264
d1, Uniform Delay [s]	43.05	38.89	45.20	47.16	46.31	49.23	43.34
k, delay calibration	0.11	0.11	0.43	0.11	0.11	0.21	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.99	0.40	35.34	2.33	1.48	13.27	0.30
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

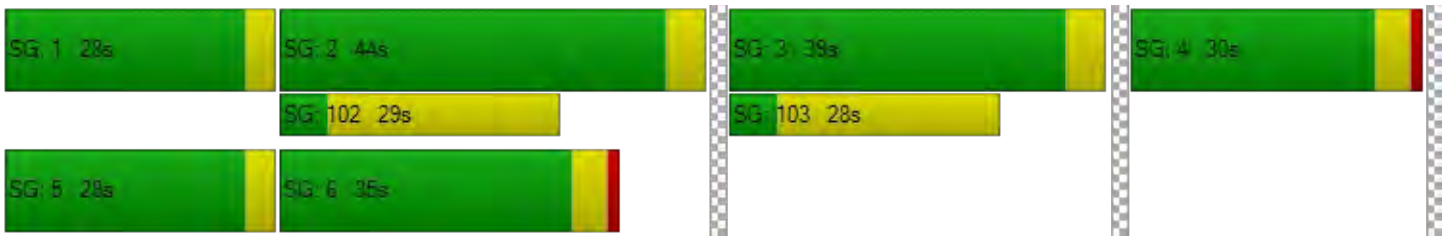
X, volume / capacity	0.82	0.47	0.97	0.64	0.54	0.87	0.17
d, Delay for Lane Group [s/veh]	45.03	39.29	80.54	49.49	47.79	62.50	43.65
Lane Group LOS	D	D	F	D	D	E	D
Critical Lane Group	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh]	10.02	5.31	15.07	5.55	4.80	9.07	1.19
50th-Percentile Queue Length [ft]	250.59	132.71	376.69	138.73	119.99	226.73	29.71
95th-Percentile Queue Length [veh]	15.22	9.09	21.43	9.41	8.39	14.01	2.14
95th-Percentile Queue Length [ft]	380.39	227.17	535.84	235.31	209.81	350.20	53.48

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.03	45.03	39.29	80.54	49.49	56.83	62.50	43.65
Movement LOS	D	D	D	F	D	E	E	D
d_A, Approach Delay [s/veh]	52.49				53.88			
Approach LOS	D				D			
d_I, Intersection Delay [s/veh]	58.64							
Intersection LOS	E							
Intersection V/C	0.975							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	24.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.301

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	48	356	71	73	295	6	8	3	10	113	1	62
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	5.00	4.20	4.10	6.80	0.00	0.00	0.00	0.00	1.80	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	48	356	71	73	295	6	8	3	10	113	1	62
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	13	98	20	20	81	2	2	1	3	31	0	17
Total Analysis Volume [veh/h]	53	391	78	80	324	7	9	3	11	124	1	68
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	26	39	0	24	39	0	0	29	0	0	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	35	35	21	35	35	25	25	25
g / C, Green / Cycle	0.24	0.37	0.37	0.22	0.37	0.37	0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.09	0.05	0.06	0.06	0.03	0.13	0.04
s, saturation flow rate [veh/h]	1810	3445	1663	1738	3387	1760	793	943	1615
c, Capacity [veh/h]	429	1280	618	375	1259	654	261	324	425
d1, Uniform Delay [s]	28.50	20.63	20.70	30.62	20.04	20.05	27.00	30.88	26.92
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.59	0.45	0.98	1.30	0.30	0.58	0.66	3.46	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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

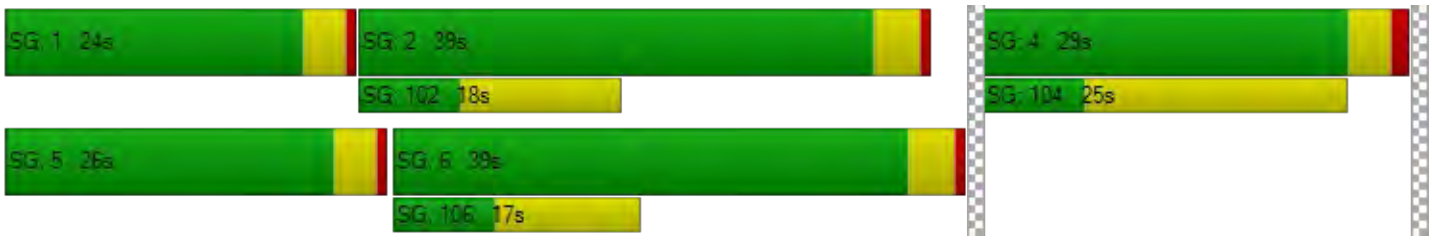
X, volume / capacity	0.12	0.24	0.25	0.21	0.17	0.17	0.09	0.39	0.16
d, Delay for Lane Group [s/veh]	29.09	21.09	21.69	31.92	20.34	20.63	27.66	34.34	27.73
Lane Group LOS	C	C	C	C	C	C	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	1.01	2.44	2.53	1.63	1.64	1.77	0.43	2.79	1.27
50th-Percentile Queue Length [ft]	25.31	60.93	63.26	40.72	41.09	44.21	10.85	69.75	31.77
95th-Percentile Queue Length [veh]	1.82	4.39	4.55	2.93	2.96	3.18	0.78	5.02	2.29
95th-Percentile Queue Length [ft]	45.56	109.67	113.86	73.29	73.96	79.58	19.54	125.55	57.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.09	21.21	21.69	31.92	20.44	20.63	27.66	27.66	27.66	34.34	34.34	27.73
Movement LOS	C	C	C	C	C	C	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	22.08			22.68			27.66			32.01		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.07											
Intersection LOS	C											
Intersection V/C	0.301											

Sequence

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



Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	18.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.580

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	119	506	88	20	350	48	79	303	47	89	187	72
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	1.70	2.90	15.00	3.80	4.80	0.00	0.70	0.00	5.60	0.60	1.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	119	506	88	20	350	48	79	303	47	89	187	72
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	32	135	23	5	93	13	21	81	13	24	50	19
Total Analysis Volume [veh/h]	127	538	94	21	372	51	84	322	50	95	199	77
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	4	11	11	1	8	8	3	10	10	3	10
g / C, Green / Cycle	0.10	0.25	0.25	0.03	0.18	0.18	0.08	0.23	0.23	0.08	0.23
(v / s)_i Volume / Saturation Flow Rate	0.07	0.17	0.17	0.01	0.12	0.12	0.05	0.17	0.03	0.06	0.15
s, saturation flow rate [veh/h]	1810	1868	1773	1573	1830	1755	1810	1887	1615	1714	1800
c, Capacity [veh/h]	175	473	449	42	334	321	136	430	368	138	420
d1, Uniform Delay [s]	18.64	14.34	14.35	20.41	16.08	16.10	19.05	15.27	13.07	19.01	14.75
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	5.57	1.77	1.87	9.05	2.06	2.22	4.48	2.63	0.17	5.95	1.76
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.69	0.69	0.50	0.64	0.65	0.62	0.75	0.14	0.69	0.66
d, Delay for Lane Group [s/veh]	24.21	16.11	16.22	29.46	18.14	18.32	23.54	17.90	13.24	24.96	16.51
Lane Group LOS	C	B	B	C	B	B	C	B	B	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.33	2.54	2.43	0.29	1.82	1.79	0.87	2.72	0.34	1.02	2.20
50th-Percentile Queue Length [ft]	33.17	63.57	60.82	7.17	45.62	44.64	21.80	67.95	8.41	25.60	55.05
95th-Percentile Queue Length [veh]	2.39	4.58	4.38	0.52	3.28	3.21	1.57	4.89	0.61	1.84	3.96
95th-Percentile Queue Length [ft]	59.71	114.42	109.48	12.91	82.12	80.36	39.25	122.30	15.14	46.09	99.09

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.21	16.15	16.22	29.46	18.22	18.32	23.54	17.90	13.24	24.96	16.51	16.51
Movement LOS	C	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	17.51			18.76			18.43			18.67		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	18.20											
Intersection LOS	B											
Intersection V/C	0.580											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	28.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.733

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	48	181	501	206	116	61	59	580	37	323	339	309
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 [%]	1.60	3.10	0.80	7.70	2.80	11.70	4.60	1.10	11.10	0.70	5.20	4.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	48	181	501	206	116	61	59	580	37	323	339	309
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	13	48	133	55	31	16	16	154	10	86	90	82
Total Analysis Volume [veh/h]	51	193	533	219	123	65	63	617	39	344	361	329
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal group	8	8	8	7	7	0	5	2	0	1	6	6
Auxiliary Signal Groups			1,8									6,7
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	0	6	10	0	6	10	10
Maximum Green [s]	27	27	27	22	22	0	22	30	0	27	30	30
Amber [s]	3.2	3.2	3.2	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	4.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	25	25	25	31	31	0	9	34	0	20	45	45
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	4.0
Walk [s]	7	7	7	7	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	25	25	25	23	23	0	0	22	0	0	23	23
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.2	2.2	2.2	2.2	2.2	0.0	1.0	2.0	0.0	1.0	2.0	2.0
Minimum Recall		No	No		No		No	Yes		No	Yes	Yes
Maximum Recall		No	No		No		No	No		No	No	No
Pedestrian Recall		No	No		No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	3.00	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	0.00	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	0.00
g_i, Effective Green Time [s]	22	22	22	62	15	15	15	15	5	41	41	17	53	72
g / C, Green / Cycle	0.20	0.20	0.20	0.56	0.13	0.13	0.13	0.13	0.05	0.38	0.38	0.15	0.48	0.65
(v / s)_i Volume / Saturation Flow Rate	0.03	0.06	0.05	0.33	0.08	0.07	0.07	0.04	0.04	0.17	0.03	0.10	0.10	0.21
s, saturation flow rate [veh/h]	1781	1843	1677	1602	1337	1464	1682	1446	1730	3578	1454	3490	3439	1541
c, Capacity [veh/h]	350	363	330	898	217	259	223	192	81	1346	547	539	1665	1009
d1, Uniform Delay [s]	36.53	37.86	37.19	15.94	47.06	44.39	44.66	43.34	51.88	25.87	22.00	43.61	16.36	8.33
k, delay calibration	0.04	0.04	0.04	0.50	0.04	0.04	0.04	0.04	0.11	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.19	0.13	2.89	0.67	0.41	0.80	0.39	14.78	1.13	0.25	0.47	0.30	0.86
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	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

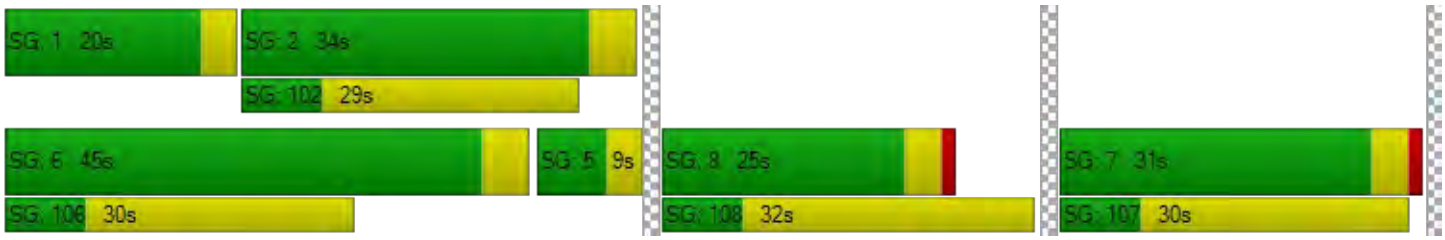
X, volume / capacity	0.15	0.32	0.23	0.59	0.50	0.42	0.55	0.34	0.78	0.46	0.07	0.64	0.22	0.33
d, Delay for Lane Group [s/veh]	36.60	38.05	37.33	18.83	47.73	44.79	45.45	43.73	66.66	26.99	22.25	44.08	16.66	9.19
Lane Group LOS	D	D	D	B	D	D	D	D	E	C	C	D	B	A
Critical Lane Group	No	No	No	Yes	No	No	No	No	No	Yes	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	1.14	2.70	1.76	9.13	2.92	2.81	3.18	1.63	2.05	6.25	0.69	4.41	2.67	3.45
50th-Percentile Queue Length [ft]	28.59	67.40	44.08	228.3	73.12	70.30	79.55	40.68	51.18	156.20	17.19	110.35	66.75	86.22
95th-Percentile Queue Length [veh]	2.06	4.85	3.17	14.09	5.26	5.06	5.73	2.93	3.68	10.35	1.24	7.86	4.81	6.21
95th-Percentile Queue Length [ft]	51.47	121.3	79.35	352.2	131.6	126.5	143.2	73.23	92.12	258.68	30.93	196.49	120.16	155.19

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.60	37.76	18.83	46.26	45.45	43.73	66.66	26.99	22.25	44.08	16.66	9.19
Movement LOS	D	D	B	D	D	D	E	C	C	D	B	A
d_A, Approach Delay [s/veh]	24.70			45.61			30.21			23.41		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	28.49											
Intersection LOS	C											
Intersection V/C	0.733											

Sequence

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



Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.526

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	357	2	180	0	816	512	111	813	0
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	3.10	0.00	0.60	2.00	1.10	2.40	0.70	3.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	0	0	357	2	180	0	816	512	111	813	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9400	0.9400	0.9400	1.0000	0.9400	0.9400	0.9400	0.9400	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	95	1	48	0	217	0	30	216	0
Total Analysis Volume [veh/h]	0	0	0	380	2	191	0	868	0	118	865	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		6	6	6	11	11	3	17
g / C, Green / Cycle		0.20	0.20	0.20	0.34	0.34	0.10	0.54
(v / s)_i Volume / Saturation Flow Rate		0.11	0.11	0.11	0.23	0.23	0.03	0.25
s, saturation flow rate [veh/h]		1755	1797	1605	1879	1879	3490	3512
c, Capacity [veh/h]		359	368	328	635	635	361	1883
d1, Uniform Delay [s]		11.26	11.26	11.26	9.01	9.01	13.16	4.51
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.28	1.25	1.40	1.31	1.31	0.52	0.18
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.54	0.54	0.54	0.68	0.68	0.33	0.46
d, Delay for Lane Group [s/veh]		12.53	12.51	12.67	10.32	10.32	13.69	4.69
Lane Group LOS		B	B	B	B	B	B	A
Critical Lane Group		No	No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]		1.02	1.04	0.95	1.88	1.88	0.33	0.72
50th-Percentile Queue Length [ft]		25.55	26.09	23.74	46.92	46.92	8.24	18.08
95th-Percentile Queue Length [veh]		1.84	1.88	1.71	3.38	3.38	0.59	1.30
95th-Percentile Queue Length [ft]		45.99	46.96	42.73	84.45	84.45	14.83	32.54

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	12.52	12.51	12.67	0.00	10.32	10.32	13.69	4.69	0.00
Movement LOS				B	B	B		B	B	B	A	
d_A, Approach Delay [s/veh]	0.00			12.57			10.32			5.77		
Approach LOS	A			B			B			A		
d_I, Intersection Delay [s/veh]	9.01											
Intersection LOS	A											
Intersection V/C	0.526											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	29.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.778

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	496	34	338	84	139	80	121	747	277	100	350	33
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 [%]	5.00	0.00	2.50	0.00	2.90	0.00	1.70	2.00	0.70	0.00	1.80	9.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	496	34	338	84	139	80	121	747	277	100	350	33
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	136	9	93	23	38	22	33	205	0	27	96	9
Total Analysis Volume [veh/h]	545	37	371	92	153	88	133	821	0	110	385	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	135
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	42	42	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	12	12	7	20	20	6	19	19
g / C, Green / Cycle	0.28	0.28	0.28	0.17	0.17	0.10	0.27	0.27	0.08	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.16	0.16	0.24	0.14	0.05	0.07	0.22	0.22	0.06	0.11	0.11
s, saturation flow rate [veh/h]	1723	1820	1576	1812	1615	1779	1863	1863	1810	1866	1811
c, Capacity [veh/h]	483	510	441	299	267	173	494	494	146	476	462
d1, Uniform Delay [s]	23.01	22.99	25.14	29.88	27.33	32.65	25.68	25.68	33.38	23.23	23.25
k, delay calibration	0.11	0.11	0.17	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	1.14	1.07	6.79	5.52	0.72	6.95	3.68	3.68	7.71	0.66	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

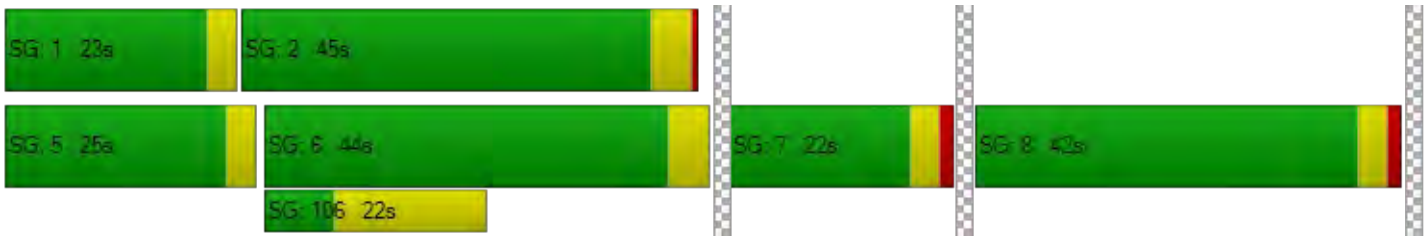
X, volume / capacity	0.59	0.58	0.84	0.82	0.33	0.77	0.83	0.83	0.76	0.45	0.45
d, Delay for Lane Group [s/veh]	24.16	24.06	31.93	35.40	28.04	39.60	29.36	29.36	41.09	23.89	23.93
Lane Group LOS	C	C	C	D	C	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	4.20	4.40	6.61	4.50	1.38	2.58	6.93	6.93	2.19	3.07	3.00
50th-Percentile Queue Length [ft]	104.93	109.88	165.18	112.46	34.50	64.61	173.30	173.30	54.64	76.80	75.12
95th-Percentile Queue Length [veh]	7.55	7.83	10.82	7.98	2.48	4.65	11.25	11.25	3.93	5.53	5.41
95th-Percentile Queue Length [ft]	188.87	195.83	270.57	199.41	62.10	116.29	281.24	281.24	98.34	138.24	135.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.11	24.06	31.93	35.40	35.40	28.04	39.60	29.36	29.36	41.09	23.91	23.93
Movement LOS	C	C	C	D	D	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	27.15			33.46			30.79			27.47		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	29.22											
Intersection LOS	C											
Intersection V/C	0.778											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	11.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.348

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	30	28	687	247	81	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.90	4.50	2.60	0.40	0.00	3.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	3	0	0	3
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]	30	28	690	247	81	473
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]	8	8	185	66	22	127
Total Analysis Volume [veh/h]	32	30	742	266	87	509
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	6	85	85	6	95
g / C, Green / Cycle	0.05	0.78	0.78	0.05	0.87
(v / s)_i Volume / Saturation Flow Rate	0.04	0.23	0.18	0.05	0.16
s, saturation flow rate [veh/h]	1473	3173	1448	1629	3137
c, Capacity [veh/h]	77	2458	1121	90	2717
d1, Uniform Delay [s]	51.58	3.64	3.42	51.87	1.18
k, delay calibration	0.08	0.50	0.50	0.26	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.69	0.32	0.50	60.61	0.15
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	0.81	0.30	0.24	0.97	0.19
d, Delay for Lane Group [s/veh]	65.27	3.96	3.92	112.48	1.33
Lane Group LOS	E	A	A	F	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.98	2.04	1.45	3.90	0.42
50th-Percentile Queue Length [ft]	49.50	50.91	36.33	97.47	10.53
95th-Percentile Queue Length [veh]	3.56	3.67	2.62	7.02	0.76
95th-Percentile Queue Length [ft]	89.10	91.64	65.39	175.44	18.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.27	65.27	3.96	3.92	112.48	1.33
Movement LOS	E	E	A	A	F	A
d_A, Approach Delay [s/veh]	65.27		3.95		17.56	
Approach LOS	E		A		B	
d_I, Intersection Delay [s/veh]	11.10					
Intersection LOS	B					
Intersection V/C	0.348					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	54.2
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.426

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	989	50	0	539	33	0	0	131	0	0	29
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	2.60	0.00	2.00	2.00	6.10	2.00	2.00	0.00	2.00	2.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	989	50	0	539	33	0	0	131	0	0	29
Peak Hour Factor	1.0000	0.9100	0.9100	1.0000	0.9100	0.9100	1.0000	1.0000	0.9100	1.0000	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	272	14	0	0	0	0	0	36	0	0	0
Total Analysis Volume [veh/h]	0	1087	55	0	0	0	0	0	144	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	44	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	37	37		12	
g / C, Green / Cycle	0.33	0.33		0.11	
(v / s)_i Volume / Saturation Flow Rate	0.31	0.31		0.09	
s, saturation flow rate [veh/h]	1852	1821		1615	
c, Capacity [veh/h]	614	604		170	
d1, Uniform Delay [s]	35.56	35.83		48.37	
k, delay calibration	0.30	0.31		0.18	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	15.65	18.52		17.03	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

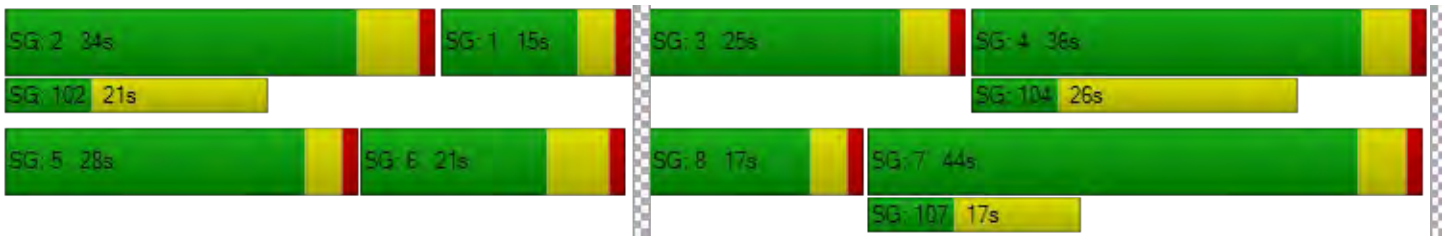
X, volume / capacity	0.93	0.95		0.85	
d, Delay for Lane Group [s/veh]	51.22	54.35		65.41	
Lane Group LOS	D	D		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	17.15	17.70		4.67	
50th-Percentile Queue Length [ft]	428.80	442.45		116.85	
95th-Percentile Queue Length [veh]	23.94	24.60		8.22	
95th-Percentile Queue Length [ft]	598.60	614.94		205.50	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	52.70	54.35	0.00	0.00	0.00	0.00	0.00	65.41	0.00	0.00	0.00
Movement LOS		D	D						E			
d_A, Approach Delay [s/veh]	52.78			0.00			65.41			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	54.20											
Intersection LOS	D											
Intersection V/C	0.426											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Junipero Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	65.1
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.916

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	80	309	462	273	680	161	108	606	144	444	663	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 [%]	27.00	2.50	5.80	1.90	2.20	0.90	1.00	2.00	0.60	1.50	0.80	2.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	80	309	462	273	680	161	108	606	144	444	663	126
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	87	0	77	191	45	30	170	0	125	186	35
Total Analysis Volume [veh/h]	90	347	0	307	764	181	121	681	0	499	745	142
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

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	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	8	0	4	10	0	4	10	0
Maximum Green [s]	0	25	0	0	30	0	20	40	0	20	40	0
Amber [s]	0.0	3.9	0.0	0.0	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	25	0	0	36	0	15	21	0	28	34	0
Vehicle Extension [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
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	2.0	4.0	0.0	2.0	4.0	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	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	16	16	16	28	28	28	28	9	23	23	24	38	38
g / C, Green / Cycle	0.14	0.14	0.14	0.25	0.25	0.25	0.25	0.08	0.21	0.21	0.22	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.13	0.12	0.00	0.17	0.23	0.20	0.11	0.07	0.18	0.18	0.28	0.21	0.09
s, saturation flow rate [veh/h]	1818	1687	1526	1776	1859	1692	1601	1792	1863	1863	1783	3589	1576
c, Capacity [veh/h]	262	243	220	448	469	427	404	150	385	385	388	1222	536
d1, Uniform Delay [s]	46.14	46.10	0.00	37.26	39.93	38.56	34.74	49.61	42.44	42.44	43.11	30.25	26.34
k, delay calibration	0.09	0.09	0.04	0.04	0.16	0.09	0.04	0.11	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.58	7.59	0.00	0.70	9.65	2.93	0.29	9.64	24.38	24.38	147.31	2.27	1.20
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

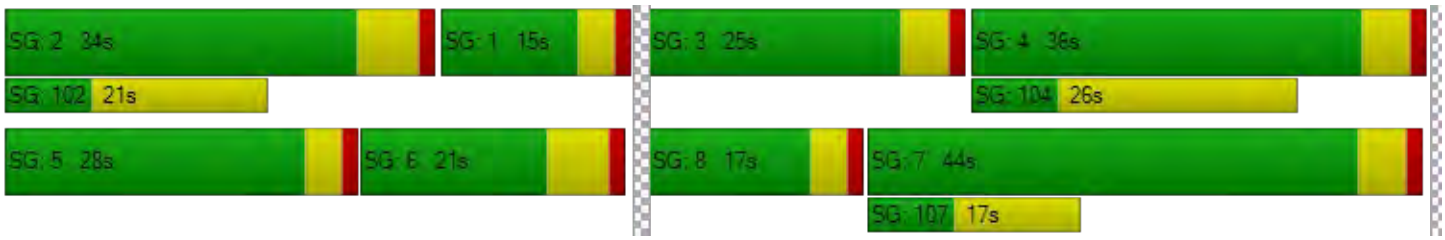
X, volume / capacity	0.87	0.86	0.00	0.69	0.91	0.80	0.45	0.81	0.88	0.88	1.29	0.61	0.26
d, Delay for Lane Group [s/veh]	53.72	53.70	0.00	37.96	49.58	41.49	35.03	59.25	66.82	66.82	190.42	32.52	27.54
Lane Group LOS	D	D	A	D	D	D	D	E	E	E	F	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	6.61	6.09	0.00	7.51	12.25	8.85	4.11	3.67	11.51	11.51	26.29	8.50	2.87
50th-Percentile Queue Length [ft]	165.14	152.33	0.00	187.7	306.2	221.1	102.8	91.64	287.85	287.85	657.32	212.47	71.82
95th-Percentile Queue Length [veh]	10.82	10.14	0.00	12.00	17.99	13.72	7.40	6.60	17.08	17.08	39.39	13.28	5.17
95th-Percentile Queue Length [ft]	270.51	253.54	0.00	300.0	449.7	343.0	185.0	164.94	426.97	426.97	984.79	331.99	129.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	53.72	53.71	0.00	37.96	45.98	35.03	59.25	66.82	66.82	190.42	32.52	27.54
Movement LOS	D	D	A	D	D	D	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	53.71			42.43			65.68			88.86		
Approach LOS	D			D			E			F		
d_I, Intersection Delay [s/veh]	65.11											
Intersection LOS	E											
Intersection V/C	0.916											

Sequence

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



19898 Daly City Serramonte Terrace TIA

Vistro File: K:\...\19898_Vistro_20160516.vistro
Scenario 7: Cumulative 2035 PM

Report File: K:\...\Cumulative PM.pdf
5/16/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SB Hwy 1 Ramps / Clarinada Ave.	Signalized	HCM 2010	EB Right	0.729	16.0	B
2	NB Hwy 1 Ramps / Serramonte Blvd	Signalized	HCM 2010	WB Left	0.674	22.2	C
3	Callan Blvd / Serramonte Blvd	Signalized	HCM 2010	WB Left	0.705	26.8	C
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	EB Left	0.635	14.7	B
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	SB Thru	0.891	43.4	D
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	SB Right	0.772	16.2	B
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.523	4.5	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	SWB Left	0.985	67.6	E
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	NB Left	0.628	29.9	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.736	24.7	C
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.496	43.1	D
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.776	12.7	B
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	SB Thru	0.776	29.9	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	NB Left	0.637	17.7	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.426	54.0	D
16	Juniper Serra Blvd / Hickey Blvd	Signalized	HCM 2010	NWB Thru	0.917	72.8	E

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

Intersection Level Of Service Report
Intersection 1: SB Hwy 1 Ramps / Clarinada Ave.

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.729

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	517	322	58	102	367	106
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	517	322	58	102	367	106
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	135	84	15	27	96	28
Total Analysis Volume [veh/h]	539	335	60	106	382	110
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	2	0	4	0	3	8
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	4	0	4	0	4	4
Maximum Green [s]	30	0	30	0	20	55
Amber [s]	3.5	0.0	3.5	0.0	3.5	3.5
All red [s]	0.5	0.0	0.5	0.0	0.5	0.5
Split [s]	35	0	31	0	24	55
Vehicle Extension [s]	3.0	0.0	3.0	0.0	3.0	3.0
Walk [s]	5	0	5	0	0	0
Pedestrian Clearance [s]	23	0	22	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
Minimum Recall	No		No		No	No
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	6.0	0.0	6.0	6.0
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	C	C	L	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	5	5	12	21
g / C, Green / Cycle	0.37	0.37	0.10	0.10	0.26	0.45
(v / s)_i Volume / Saturation Flow Rate	0.30	0.21	0.03	0.07	0.22	0.03
s, saturation flow rate [veh/h]	1774	1583	1863	1583	1774	3547
c, Capacity [veh/h]	662	591	193	164	465	1607
d1, Uniform Delay [s]	12.99	11.47	19.11	19.82	15.97	7.11
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.49	0.86	0.90	4.18	3.67	0.02
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

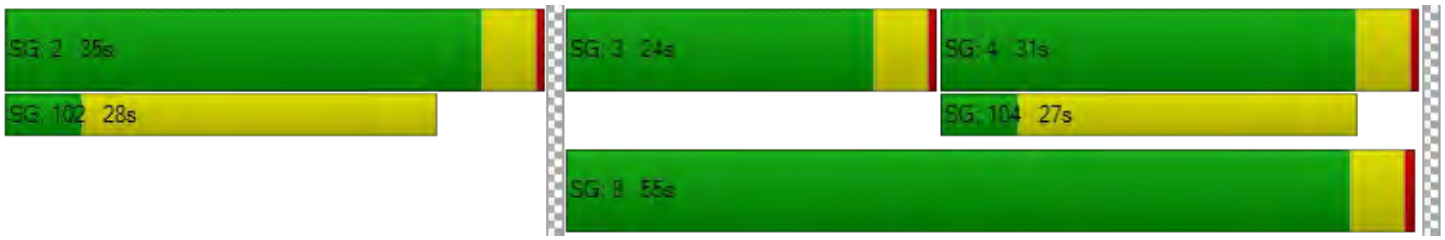
X, volume / capacity	0.81	0.57	0.31	0.64	0.82	0.07
d, Delay for Lane Group [s/veh]	15.48	12.33	20.01	24.00	19.64	7.13
Lane Group LOS	B	B	C	C	B	A
Critical Lane Group	Yes	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh]	4.41	2.31	0.58	1.16	3.65	0.24
50th-Percentile Queue Length [ft]	110.30	57.76	14.45	29.03	91.22	5.90
95th-Percentile Queue Length [veh]	7.86	4.16	1.04	2.09	6.57	0.43
95th-Percentile Queue Length [ft]	196.42	103.97	26.00	52.25	164.20	10.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.48	12.33	20.01	24.00	19.64	7.13
Movement LOS	B	B	C	C	B	A
d_A, Approach Delay [s/veh]	14.27		22.56		16.84	
Approach LOS	B		C		B	
d_I, Intersection Delay [s/veh]	16.00					
Intersection LOS	B					
Intersection V/C	0.729					

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: NB Hwy 1 Ramps / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	22.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.674

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	2	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	13	37	57	60	79	295	352	226	41	78	318	301
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	13	37	57	60	79	295	352	226	41	78	318	301
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
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	0.0000
Total 15-Minute Volume [veh/h]	4	11	17	18	23	87	104	66	12	23	94	0
Total Analysis Volume [veh/h]	15	44	67	71	93	347	414	266	48	92	374	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	4	0	0	4	0	4	4	0	5	4	0
Maximum Green [s]	0	25	0	0	25	0	20	60	0	30	40	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	3.5	3.5	0.0	3.5	3.5	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	27	0	0	31	0	12	38	0	14	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	11	0	0	31	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	14	14	9	13	4	8	8
g / C, Green / Cycle	0.10	0.27	0.27	0.17	0.25	0.07	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.07	0.09	0.22	0.12	0.17	0.05	0.10	0.10
s, saturation flow rate [veh/h]	1694	1823	1583	3445	1814	1774	1863	1863
c, Capacity [veh/h]	168	493	428	597	459	127	282	282
d1, Uniform Delay [s]	22.92	15.29	17.82	20.31	17.63	23.78	20.94	20.94
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.60	0.39	3.72	1.46	1.81	7.68	2.68	2.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

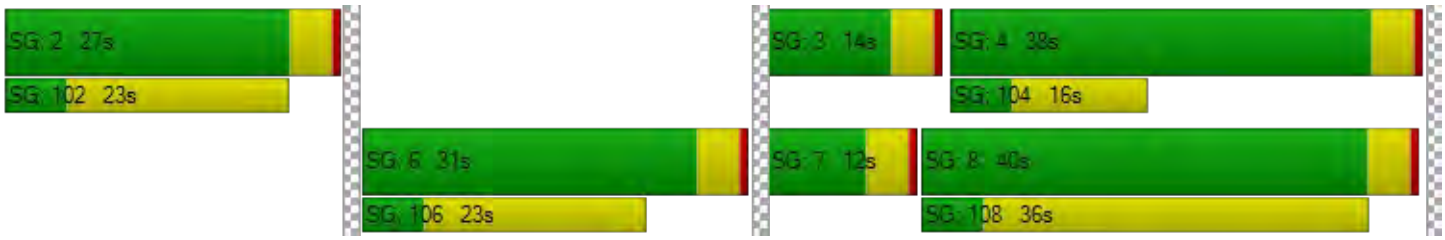
X, volume / capacity	0.75	0.33	0.81	0.69	0.68	0.73	0.66	0.66
d, Delay for Lane Group [s/veh]	29.52	15.69	21.55	21.76	19.44	31.46	23.61	23.61
Lane Group LOS	C	B	C	C	B	C	C	C
Critical Lane Group	Yes	No	Yes	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.69	1.44	3.85	2.25	3.24	1.29	2.16	2.16
50th-Percentile Queue Length [ft]	42.20	35.88	96.24	56.34	80.90	32.31	54.01	54.01
95th-Percentile Queue Length [veh]	3.04	2.58	6.93	4.06	5.82	2.33	3.89	3.89
95th-Percentile Queue Length [ft]	75.95	64.59	173.23	101.41	145.62	58.16	97.21	97.21

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.52	29.52	29.52	15.69	15.69	21.55	21.76	19.44	19.44	31.46	23.61	23.61
Movement LOS	C	C	C	B	B	C	C	B	B	C	C	C
d_A, Approach Delay [s/veh]	29.52			19.67			20.76			25.16		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	22.18											
Intersection LOS	C											
Intersection V/C	0.674											

Sequence

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



Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	26.8
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.705

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	109	246	117	194	231	166	102	362	67	198	451	302
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	109	246	117	194	231	166	102	362	67	198	451	302
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	28	64	30	51	60	43	27	94	17	52	117	79
Total Analysis Volume [veh/h]	114	256	122	202	241	173	106	377	70	206	470	315
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	4	0	4	4	0	4	4	0	4	4	0
Maximum Green [s]	4	35	0	15	40	0	10	35	0	10	30	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	3.5	3.5	0.0	3.5	3.5	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	18	39	0	15	36	0	12	35	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	30	0	0	22	0	0	26	0	0	25	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	Yes	Yes		No	Yes		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	34	17	34	26	26	5	15	15	10	19	19
g / C, Green / Cycle	0.48	0.24	0.48	0.37	0.37	0.08	0.21	0.21	0.14	0.27	0.27
(v / s)_i Volume / Saturation Flow Rate	0.14	0.20	0.20	0.13	0.11	0.06	0.12	0.12	0.12	0.23	0.23
s, saturation flow rate [veh/h]	1263	1586	1001	1863	1583	1774	1863	1763	1774	1863	1616
c, Capacity [veh/h]	703	373	335	691	587	137	386	366	247	502	436
d1, Uniform Delay [s]	10.43	25.79	21.17	16.10	15.74	32.06	25.35	25.38	29.66	24.39	24.39
k, delay calibration	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.25	0.11	0.11
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
d2, Incremental Delay [s]	0.87	5.12	1.75	0.30	0.28	8.93	1.45	1.57	15.27	3.79	4.33
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

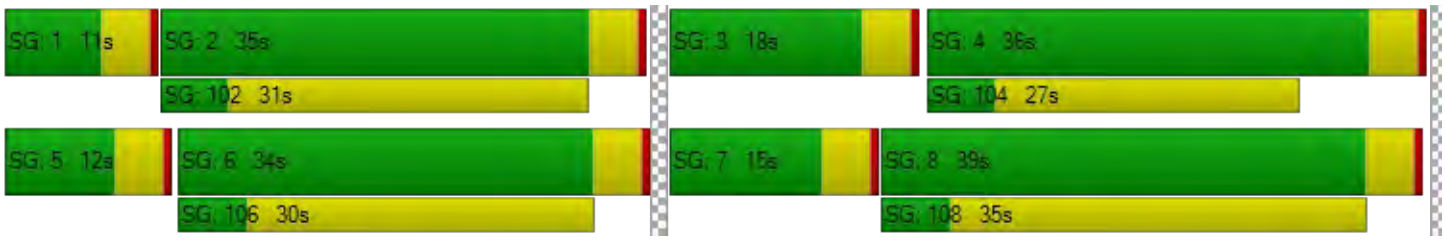
X, volume / capacity	0.25	0.84	0.60	0.35	0.29	0.77	0.59	0.60	0.83	0.84	0.84
d, Delay for Lane Group [s/veh]	11.30	30.91	22.92	16.40	16.01	40.99	26.80	26.95	44.93	28.17	28.72
Lane Group LOS	B	C	C	B	B	D	C	C	D	C	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	1.60	5.27	1.24	2.68	1.89	2.06	3.46	3.32	4.31	6.74	5.92
50th-Percentile Queue Length [ft]	39.96	131.79	31.03	67.03	47.14	51.41	86.39	82.97	107.82	168.55	147.92
95th-Percentile Queue Length [veh]	2.88	9.04	2.23	4.83	3.39	3.70	6.22	5.97	7.72	11.00	9.91
95th-Percentile Queue Length [ft]	71.93	225.93	55.86	120.65	84.86	92.53	155.51	149.35	192.97	275.01	247.66

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.30	26.00	30.91	22.92	16.40	16.01	40.99	26.86	26.95	44.93	28.23	28.72
Movement LOS	B	C	C	C	B	B	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	23.81			18.43			29.58			31.86		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	26.77											
Intersection LOS	C											
Intersection V/C	0.705											

Sequence

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



Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	14.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.635

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	285.00	100.00	100.00	100.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	321	0	286	222	400	0	53	0	578	425
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	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	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	0	321	0	286	222	400	0	53	0	578	425
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	0.9500	0.950	1.000	0.950	0.950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	0	84	0	75	58	105	0	14	0	152	112
Total Analysis Volume [veh/h]	0	0	0	338	0	301	234	421	0	56	0	608	447
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	50
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Protecte	Permiss	Permiss	Permi	Permi	Permi	Overl
Signal group	0	0	0	4	0	0	1	6	0	0	0	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	-	-	-
Minimum Green [s]	0	0	0	6	0	0	4	8	0	0	0	8	8
Maximum Green [s]	0	0	0	30	0	0	20	40	0	0	0	40	40
Amber [s]	0.0	0.0	0.0	3.0	0.0	0.0	3.0	3.6	0.0	0.0	0.0	3.6	3.6
All red [s]	0.0	0.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0
Split [s]	0	0	0	18	0	0	12	32	0	0	0	20	20
Vehicle Extension [s]	0.0	0.0	0.0	2.5	0.0	0.0	2.0	3.0	0.0	0.0	0.0	3.0	3.0
Walk [s]	0	0	0	7	0	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	0	0	20	0	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.0	0.0	0.0	2.0	2.6	0.0	0.0	0.0	2.6	2.6
Minimum Recall				No			No	No				No	No
Maximum Recall				No			No	No				No	No
Pedestrian Recall				No			No	No				No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]		4.00	4.00	4.00	4.60	4.60	4.60	4.60	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]		2.00	2.00	2.00	2.60	2.60	2.60	2.60	0.00
g_i, Effective Green Time [s]		13	13	8	29	29	17	17	34
g / C, Green / Cycle		0.26	0.26	0.16	0.57	0.57	0.33	0.33	0.68
(v / s)_i Volume / Saturation Flow Rate		0.19	0.19	0.13	0.11	0.11	0.20	0.20	0.28
s, saturation flow rate [veh/h]		1774	1585	1774	1863	1863	1700	1695	1583
c, Capacity [veh/h]		461	411	284	1060	1060	643	558	1077
d1, Uniform Delay [s]		16.97	17.01	20.39	5.26	5.26	13.77	14.04	3.57
k, delay calibration		0.08	0.08	0.19	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.66	1.93	9.91	0.42	0.42	2.96	4.60	1.18
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

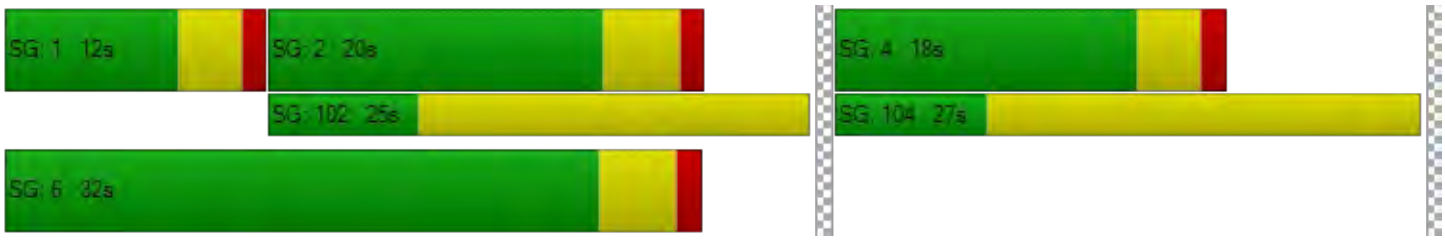
X, volume / capacity		0.73	0.74	0.82	0.20	0.20	0.52	0.59	0.41
d, Delay for Lane Group [s/veh]		18.64	18.94	30.30	5.68	5.68	16.73	18.64	4.75
Lane Group LOS		B	B	C	A	A	B	B	A
Critical Lane Group		No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]		3.29	3.01	3.16	0.86	0.86	3.14	3.36	1.33
50th-Percentile Queue Length [ft]		82.36	75.19	78.90	21.50	21.50	78.45	84.12	33.22
95th-Percentile Queue Length [veh]		5.93	5.41	5.68	1.55	1.55	5.65	6.06	2.39
95th-Percentile Queue Length [ft]		148.25	135.34	142.02	38.69	38.69	141.22	151.42	59.80

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	18.65	0.00	18.94	30.30	5.68	5.68	16.73	0.00	17.77	4.75
Movement LOS				B		B	C	A	A	B		B	A
d_A, Approach Delay [s/veh]	0.00			18.78			14.47			12.48			
Approach LOS	A			B			B			B			
d_I, Intersection Delay [s/veh]	14.70												
Intersection LOS	B												
Intersection V/C	0.635												

Sequence

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



Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	43.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.891

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	442	290	711	446	344	55	45	309	324	640	510	582
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	442	290	711	446	344	55	45	309	324	640	510	582
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
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]	114	75	183	115	89	14	12	80	84	165	131	150
Total Analysis Volume [veh/h]	456	299	733	460	355	57	46	319	334	660	526	600
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	13.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	0	3	3	0	4	0	5	2	2	1	6	6
Auxiliary Signal Groups		3	1,3						2,3			4,6
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	4	4	0	4	0	4	6	6	4	6	6
Maximum Green [s]	0	25	25	0	30	0	20	26	26	25	26	26
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	20	20	0	25	0	12	35	35	30	53	53
Vehicle Extension [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	0	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	1.5	1.5	0.0	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		No	No		No		No	No	No	No	No	No
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	17	17	69	21	21	4	34	54	24	54	79
g / C, Green / Cycle	0.15	0.15	0.62	0.19	0.19	0.03	0.31	0.49	0.22	0.49	0.72
(v / s)_i Volume / Saturation Flow Rate	0.13	0.16	0.26	0.17	0.23	0.03	0.09	0.21	0.19	0.28	0.21
s, saturation flow rate [veh/h]	3445	1863	2803	2741	1818	1774	3547	1583	3445	1863	2803
c, Capacity [veh/h]	518	280	1745	540	351	60	1094	785	742	913	2004
d1, Uniform Delay [s]	45.79	46.75	10.61	45.22	44.39	52.72	28.92	17.72	41.89	19.95	5.69
k, delay calibration	0.04	0.48	0.05	0.04	0.50	0.04	0.50	0.50	0.04	0.50	0.05
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
d2, Incremental Delay [s]	1.99	72.15	0.08	1.51	103.63	7.28	0.68	1.69	1.51	2.65	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.88	1.07	0.42	0.85	1.17	0.76	0.29	0.43	0.89	0.58	0.30
d, Delay for Lane Group [s/veh]	47.78	118.90	10.69	46.73	148.02	60.00	29.60	19.41	43.40	22.60	5.73
Lane Group LOS	D	F	B	D	F	E	C	B	D	C	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	6.21	13.21	4.30	6.29	19.59	1.38	3.31	5.68	8.77	9.99	2.23
50th-Percentile Queue Length [ft]	155.26	330.33	107.52	157.34	489.69	34.51	82.65	142.01	219.17	249.87	55.75
95th-Percentile Queue Length [veh]	10.30	19.78	7.70	10.41	29.09	2.48	5.95	9.59	13.62	15.18	4.01
95th-Percentile Queue Length [ft]	257.44	494.62	192.55	260.20	727.32	62.11	148.77	239.72	340.57	379.49	100.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	47.78	118.90	10.69	46.73	148.02	148.02	60.00	29.60	19.41	43.40	22.60	5.73
Movement LOS	D	F	B	D	F	F	E	C	B	D	C	A
d_A, Approach Delay [s/veh]	43.80			94.59			26.73			24.62		
Approach LOS	D			F			C			C		
d_I, Intersection Delay [s/veh]	43.41											
Intersection LOS	D											
Intersection V/C	0.891											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	16.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.772

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	691	759	981	0	0	1424
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	691	759	981	0	0	1424
Peak Hour Factor	0.9900	0.9900	0.9900	1.0000	1.0000	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	174	192	248	0	0	360
Total Analysis Volume [veh/h]	698	767	991	0	0	1438
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	30	30	43	0	0	42
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		No			No
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	23	23	43	44
g / C, Green / Cycle	0.31	0.31	0.58	0.59
(v / s)_i Volume / Saturation Flow Rate	0.20	0.27	0.28	0.41
s, saturation flow rate [veh/h]	3445	2803	3547	3547
c, Capacity [veh/h]	1064	866	2057	2105
d1, Uniform Delay [s]	22.41	24.60	9.15	10.40
k, delay calibration	0.04	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.26	1.26	0.81	1.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.66	0.89	0.48	0.68
d, Delay for Lane Group [s/veh]	22.66	25.86	9.96	12.22
Lane Group LOS	C	C	A	B
Critical Lane Group	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	5.07	6.22	4.25	7.27
50th-Percentile Queue Length [ft]	126.74	155.55	106.37	181.80
95th-Percentile Queue Length [veh]	8.76	10.31	7.64	11.69
95th-Percentile Queue Length [ft]	219.06	257.82	190.94	292.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	22.66	25.86	9.96	0.00	0.00	12.22
Movement LOS	C	C	A			B
d_A, Approach Delay [s/veh]	24.34		9.96		12.22	
Approach LOS	C		A		B	
d_I, Intersection Delay [s/veh]	16.21					
Intersection LOS	B					
Intersection V/C	0.772					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	4.5
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.523

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	525	1578	1007	0	0	0
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	525	1578	1007	0	0	0
Peak Hour Factor	0.9800	0.9800	0.9800	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	134	403	257	0	0	0
Total Analysis Volume [veh/h]	536	1610	1028	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2,6				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	4.10	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	0.00	2.10	
g_i, Effective Green Time [s]	9	37	24	
g / C, Green / Cycle	0.23	0.90	0.58	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.45	0.29	
s, saturation flow rate [veh/h]	3445	3547	3547	
c, Capacity [veh/h]	793	3208	2071	
d1, Uniform Delay [s]	14.34	0.34	4.98	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.02	0.12	0.19	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.68	0.50	0.50	
d, Delay for Lane Group [s/veh]	15.35	0.46	5.17	
Lane Group LOS	B	A	A	
Critical Lane Group	Yes	No	Yes	
50th-Percentile Queue Length [veh]	1.96	0.05	1.37	
50th-Percentile Queue Length [ft]	49.03	1.36	34.14	
95th-Percentile Queue Length [veh]	3.53	0.10	2.46	
95th-Percentile Queue Length [ft]	88.25	2.45	61.45	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.35	0.46	5.17	0.00	0.00	0.00
Movement LOS	B	A	A			
d_A, Approach Delay [s/veh]	4.18		5.17		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.50					
Intersection LOS	A					
Intersection V/C	0.523					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	67.6
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.985

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	380	0	980	234	423	702	546	83
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	0	0	0	380	0	980	234	423	702	546	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9100	1.0000	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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	0	0	0	104	0	269	64	116	193	150	23
Total Analysis Volume [veh/h]	0	0	0	0	418	0	1077	257	465	771	600	91
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lag	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	23	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		17	38	38	20	41	41	41
g / C, Green / Cycle		0.14	0.33	0.33	0.17	0.35	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate		0.12	0.30	0.16	0.26	0.26	0.28	0.31
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1734	1583
c, Capacity [veh/h]		494	1155	516	300	645	601	548
d1, Uniform Delay [s]		49.33	38.58	32.07	49.08	34.22	35.11	36.40
k, delay calibration		0.11	0.11	0.11	0.50	0.46	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		4.07	4.09	0.75	262.75	7.54	11.39	18.62
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.85	0.93	0.50	1.55	0.76	0.81	0.89
d, Delay for Lane Group [s/veh]		53.40	42.67	32.81	311.83	41.76	46.50	55.03
Lane Group LOS		D	D	C	F	D	D	E
Critical Lane Group		No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh]		6.27	15.52	6.00	30.71	13.63	14.47	15.81
50th-Percentile Queue Length [ft]		156.82	388.03	150.10	767.82	340.82	361.64	395.37
95th-Percentile Queue Length [veh]		10.38	21.98	10.02	47.50	19.69	20.70	22.34
95th-Percentile Queue Length [ft]		259.50	549.56	250.57	1187.42	492.20	517.58	558.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	53.40	0.00	42.67	32.81	311.83	43.49	52.12	55.03
Movement LOS					D		D	C	F	D	D	E
d_A, Approach Delay [s/veh]	0.00				43.78				111.47			
Approach LOS	A				D				F			
d_I, Intersection Delay [s/veh]	67.63											
Intersection LOS	E											
Intersection V/C	0.985											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	152	522	521	298	111	332	165	205
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	152	522	521	298	111	332	165	205
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	42	143	143	82	30	91	45	0
Total Analysis Volume [veh/h]	167	574	573	327	122	365	181	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	34	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	29	29	29	15	15	15	15
g / C, Green / Cycle	0.24	0.24	0.24	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.22	0.16	0.21	0.07	0.10	0.10	0.10
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1836	1583
c, Capacity [veh/h]	833	858	383	233	244	241	208
d1, Uniform Delay [s]	43.26	40.49	42.79	47.90	49.72	49.73	49.80
k, delay calibration	0.11	0.11	0.31	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	3.49	0.91	14.17	1.83	5.49	5.60	6.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

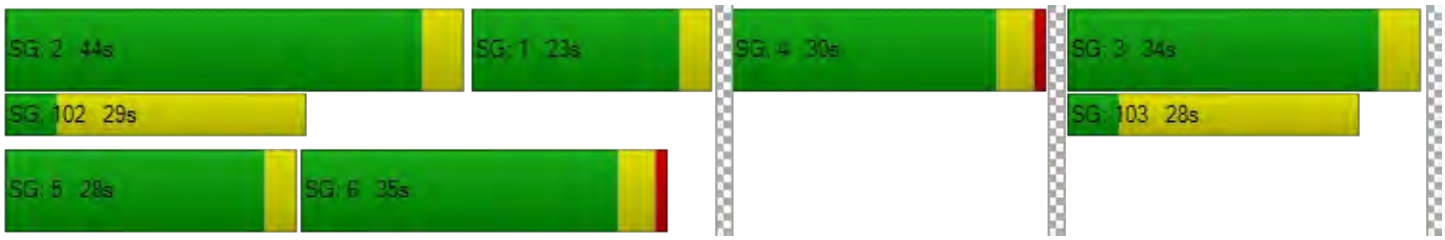
X, volume / capacity	0.89	0.67	0.85	0.52	0.78	0.79	0.80
d, Delay for Lane Group [s/veh]	46.75	41.40	56.95	49.73	55.21	55.33	56.62
Lane Group LOS	D	D	E	D	E	E	E
Critical Lane Group	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	10.77	7.61	10.56	3.47	5.84	5.77	5.12
50th-Percentile Queue Length [ft]	269.32	190.34	263.98	86.81	146.00	144.29	127.96
95th-Percentile Queue Length [veh]	16.16	12.14	15.89	6.25	9.80	9.71	8.83
95th-Percentile Queue Length [ft]	403.88	303.47	397.21	156.25	245.09	242.79	220.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	46.75	46.75	41.40	56.95	49.73	55.26	55.33	56.62
Movement LOS	D	D	D	E	D	E	E	E
d_A, Approach Delay [s/veh]	46.92				54.59			
Approach LOS	D				D			
d_I, Intersection Delay [s/veh]	67.63							
Intersection LOS	E							
Intersection V/C	0.985							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	29.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.628

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	161	895	118	173	848	14	58	20	48	253	10	188
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	161	895	118	173	848	14	58	20	48	253	10	188
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	246	32	48	233	4	16	5	13	70	3	52
Total Analysis Volume [veh/h]	177	984	130	190	932	15	64	22	53	278	11	207
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	88.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	15	53	0	21	59	0	0	36	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	Yes		No	Yes			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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	54	54	14	56	56	31	31	31
g / C, Green / Cycle	0.10	0.49	0.49	0.12	0.51	0.51	0.28	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.10	0.21	0.21	0.11	0.18	0.18	0.14	0.26	0.13
s, saturation flow rate [veh/h]	1774	3547	1754	1774	3547	1848	1007	1114	1583
c, Capacity [veh/h]	187	1755	868	220	1821	949	329	375	442
d1, Uniform Delay [s]	48.84	17.75	17.76	47.21	15.78	15.78	33.10	40.17	32.83
k, delay calibration	0.38	0.50	0.50	0.20	0.50	0.50	0.11	0.37	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	44.90	0.75	1.52	16.48	0.51	0.98	0.86	10.83	0.77
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.42	0.43	0.86	0.34	0.34	0.42	0.77	0.47
d, Delay for Lane Group [s/veh]	93.73	18.51	19.28	63.69	16.29	16.76	33.97	51.00	33.60
Lane Group LOS	F	B	B	E	B	B	C	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	7.14	6.11	6.23	6.08	4.65	4.97	3.16	8.70	4.65
50th-Percentile Queue Length [ft]	178.46	152.69	155.78	152.12	116.25	124.28	79.02	217.46	116.15
95th-Percentile Queue Length [veh]	11.52	10.16	10.32	10.13	8.19	8.63	5.69	13.54	8.18
95th-Percentile Queue Length [ft]	288.01	254.02	258.12	253.26	204.66	215.69	142.24	338.38	204.53

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	93.73	18.69	19.28	63.69	16.45	16.76	33.97	33.97	33.97	51.00	51.00	33.60
Movement LOS	F	B	B	E	B	B	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	29.04			24.35			33.97			43.74		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	29.90											
Intersection LOS	C											
Intersection V/C	0.628											

Sequence

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

Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	24.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.736

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	141	430	62	68	624	87	54	242	39	22	234	213
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	141	430	62	68	624	87	54	242	39	22	234	213
Peak Hour Factor	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440
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]	37	114	16	18	165	23	14	64	10	6	62	56
Total Analysis Volume [veh/h]	149	456	66	72	661	92	57	256	41	23	248	226
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	138
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	7	20	20	4	16	16	3	22	22	2	20
g / C, Green / Cycle	0.11	0.31	0.31	0.06	0.26	0.26	0.05	0.34	0.34	0.03	0.31
(v / s)_i Volume / Saturation Flow Rate	0.08	0.14	0.14	0.04	0.21	0.21	0.03	0.14	0.03	0.01	0.28
s, saturation flow rate [veh/h]	1774	1863	1782	1774	1863	1784	1774	1863	1583	1774	1718
c, Capacity [veh/h]	196	576	551	100	476	455	89	626	532	47	537
d1, Uniform Delay [s]	27.80	17.92	17.93	29.85	22.49	22.49	30.01	16.45	14.57	30.90	21.01
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.14
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
d2, Incremental Delay [s]	5.97	0.58	0.61	9.19	3.32	3.48	7.55	0.43	0.06	7.73	6.45
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.46	0.46	0.72	0.81	0.81	0.64	0.41	0.08	0.49	0.88
d, Delay for Lane Group [s/veh]	33.77	18.50	18.54	39.04	25.81	25.98	37.56	16.88	14.63	38.63	27.46
Lane Group LOS	C	B	B	D	C	C	D	B	B	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.44	3.03	2.91	1.30	5.48	5.27	1.01	2.73	0.39	0.44	7.10
50th-Percentile Queue Length [ft]	60.90	75.63	72.80	32.55	136.89	131.76	25.34	68.35	9.65	10.95	177.56
95th-Percentile Queue Length [veh]	4.38	5.45	5.24	2.34	9.31	9.04	1.82	4.92	0.70	0.79	11.47
95th-Percentile Queue Length [ft]	109.62	136.14	131.05	58.59	232.83	225.88	45.61	123.03	17.38	19.71	286.82

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	33.77	18.52	18.54	39.04	25.88	25.98	37.56	16.88	14.63	38.63	27.46	27.46
Movement LOS	C	B	B	D	C	C	D	B	B	D	C	C
d_A, Approach Delay [s/veh]	21.91			27.04			19.95			27.98		
Approach LOS	C			C			B			C		
d_I, Intersection Delay [s/veh]	24.70											
Intersection LOS	C											
Intersection V/C	0.736											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	43.1
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.496

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	78	305	262	535	418	220	131	397	19	407	498	767
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	78	305	262	535	418	220	131	397	19	407	498	767
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	20	79	68	139	109	57	34	103	5	106	130	200
Total Analysis Volume [veh/h]	81	318	273	557	435	229	136	414	20	424	519	799
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal group	8	8	0	7	7	0	5	2	0	1	6	6
Auxiliary Signal Groups												6,7
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	10	0	6	10	10
Maximum Green [s]	27	27	0	22	22	0	22	30	0	27	30	30
Amber [s]	3.2	3.2	0.0	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	4.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	33	33	0	31	31	0	11	31	0	25	45	45
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	4.0
Walk [s]	7	7	0	7	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	25	25	0	23	23	0	0	22	0	0	23	23
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.2	2.2	0.0	2.2	2.2	0.0	1.0	2.0	0.0	1.0	2.0	2.0
Minimum Recall		No			No		No	Yes		No	Yes	Yes
Maximum Recall		No			No		No	No		No	No	No
Pedestrian Recall		No			No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	0.00
g_i, Effective Green Time [s]	23	23	23	23	33	33	33	33	8	32	32	17	41	78
g / C, Green / Cycle	0.19	0.19	0.19	0.19	0.27	0.27	0.27	0.27	0.07	0.27	0.27	0.14	0.34	0.65
(v / s)_i Volume / Saturation Flow Rate	0.05	0.10	0.07	0.17	0.19	0.19	0.19	0.14	0.08	0.12	0.01	0.12	0.15	0.50
s, saturation flow rate [veh/h]	1774	1863	1695	1583	1774	1804	1695	1583	1774	3547	1583	3445	3547	1583
c, Capacity [veh/h]	338	354	323	301	482	490	461	431	119	954	426	484	1215	1028
d1, Uniform Delay [s]	41.22	43.84	42.52	47.53	39.19	39.18	39.16	37.18	55.99	36.31	32.49	50.53	30.37	14.87
k, delay calibration	0.04	0.04	0.04	0.19	0.18	0.17	0.17	0.04	0.50	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.14	0.48	0.29	16.22	2.89	2.83	2.96	0.38	127.67	1.44	0.21	2.02	1.10	5.76
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	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.54	0.39	0.91	0.69	0.69	0.69	0.53	1.15	0.43	0.05	0.88	0.43	0.78
d, Delay for Lane Group [s/veh]	41.36	44.32	42.80	63.76	42.08	42.00	42.12	37.56	183.66	37.75	32.69	52.55	31.47	20.64
Lane Group LOS	D	D	D	E	D	D	D	D	F	D	C	D	C	C
Critical Lane Group	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.06	5.19	3.33	9.31	9.19	9.32	8.76	5.77	7.79	5.23	0.46	6.36	5.97	15.83
50th-Percentile Queue Length [ft]	51.47	129.6	83.14	232.7	229.6	232.9	218.8	144.1	194.74	130.76	11.51	159.10	149.36	395.80
95th-Percentile Queue Length [veh]	3.71	8.92	5.99	14.31	14.16	14.33	13.61	9.70	12.92	8.98	0.83	10.50	9.98	22.36
95th-Percentile Queue Length [ft]	92.64	223.0	149.6	357.8	353.9	358.1	340.1	242.6	322.90	224.53	20.71	262.53	249.57	558.94

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.36	43.72	63.76	42.05	42.09	37.56	183.66	37.75	32.69	52.55	31.47	20.64
Movement LOS	D	D	E	D	D	D	F	D	C	D	C	C
d_A, Approach Delay [s/veh]	51.57			41.22			72.39			31.63		
Approach LOS	D			D			E			C		
d_I, Intersection Delay [s/veh]	43.13											
Intersection LOS	D											
Intersection V/C	0.496											

Sequence

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

Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	12.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.776

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	349	6	202	0	822	241	286	1457	0
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	0	0	349	6	202	0	822	241	286	1457	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.8100	0.8100	0.8100	1.0000	0.8100	0.8100	0.8100	0.8100	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	108	2	62	0	254	0	88	450	0
Total Analysis Volume [veh/h]	0	0	0	431	7	249	0	1015	0	353	1799	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		10	10	10	23	23	8	34
g / C, Green / Cycle		0.20	0.20	0.20	0.44	0.44	0.15	0.65
(v / s)_i Volume / Saturation Flow Rate		0.13	0.13	0.14	0.27	0.27	0.10	0.51
s, saturation flow rate [veh/h]		1774	1746	1583	1863	1863	3445	3547
c, Capacity [veh/h]		353	347	315	814	814	525	2292
d1, Uniform Delay [s]		19.60	19.61	19.66	11.52	11.52	21.19	6.72
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.23	2.28	2.63	0.79	0.79	1.51	0.62
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.67	0.67	0.68	0.62	0.62	0.67	0.79
d, Delay for Lane Group [s/veh]		21.83	21.89	22.29	12.31	12.31	22.70	7.34
Lane Group LOS		C	C	C	B	B	C	A
Critical Lane Group		No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]		2.65	2.62	2.44	3.92	3.92	1.99	4.40
50th-Percentile Queue Length [ft]		66.20	65.48	61.08	97.98	97.98	49.72	110.03
95th-Percentile Queue Length [veh]		4.77	4.71	4.40	7.05	7.05	3.58	7.84
95th-Percentile Queue Length [ft]		119.17	117.86	109.95	176.36	176.36	89.50	196.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	21.86	21.89	22.25	0.00	12.31	12.31	22.70	7.34	0.00
Movement LOS				C	C	C		B	B	C	A	
d_A, Approach Delay [s/veh]	0.00			22.00			12.31			9.86		
Approach LOS	A			C			B			A		
d_I, Intersection Delay [s/veh]	12.67											
Intersection LOS	B											
Intersection V/C	0.776											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	29.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.776

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	735	42	261	49	77	41	167	931	131	180	796	49
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	735	42	261	49	77	41	167	931	131	180	796	49
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	188	11	67	13	20	10	43	238	0	46	204	13
Total Analysis Volume [veh/h]	752	43	267	50	79	42	171	953	0	184	815	50
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	123
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	32	32	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	7	7	9	23	23	10	24	24
g / C, Green / Cycle	0.27	0.27	0.27	0.10	0.10	0.12	0.30	0.30	0.13	0.32	0.32
(v / s)_i Volume / Saturation Flow Rate	0.22	0.22	0.17	0.07	0.03	0.10	0.26	0.26	0.10	0.23	0.23
s, saturation flow rate [veh/h]	1774	1783	1583	1827	1583	1774	1863	1863	1774	1863	1825
c, Capacity [veh/h]	480	482	428	176	153	216	561	561	229	587	576
d1, Uniform Delay [s]	26.24	26.21	24.49	33.60	32.08	32.67	25.11	25.11	32.36	23.43	23.43
k, delay calibration	0.16	0.16	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	5.55	5.31	1.49	5.72	0.96	6.45	3.71	3.71	6.42	1.89	1.93
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

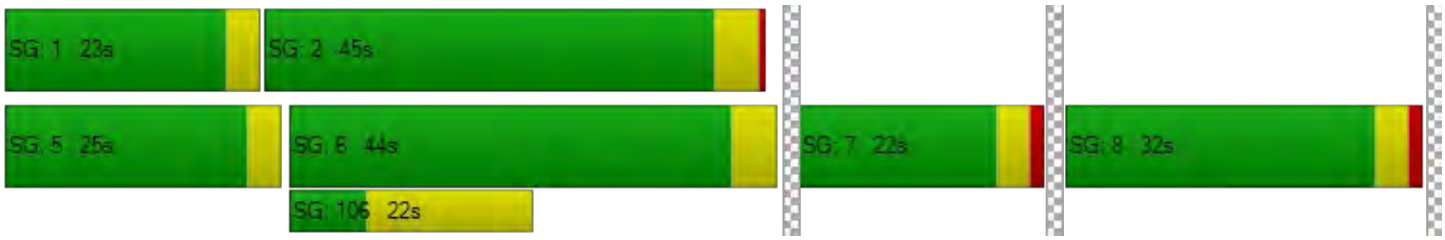
X, volume / capacity	0.83	0.82	0.62	0.73	0.27	0.79	0.85	0.85	0.80	0.74	0.74
d, Delay for Lane Group [s/veh]	31.79	31.51	25.99	39.32	33.04	39.12	28.82	28.82	38.78	25.32	25.36
Lane Group LOS	C	C	C	D	C	D	C	C	D	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	7.18	7.14	4.22	2.54	0.74	3.36	8.22	8.22	3.61	6.95	6.81
50th-Percentile Queue Length [ft]	179.58	178.62	105.42	63.44	18.56	84.09	205.40	205.40	90.13	173.63	170.31
95th-Percentile Queue Length [veh]	11.58	11.53	7.58	4.57	1.34	6.05	12.92	12.92	6.49	11.27	11.09
95th-Percentile Queue Length [ft]	289.46	288.22	189.62	114.20	33.41	151.36	322.93	322.93	162.24	281.68	277.32

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	31.66	31.51	25.99	39.32	39.32	33.04	39.12	28.82	28.82	38.78	25.34	25.36
Movement LOS	C	C	C	D	D	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	30.23			37.78			30.38			27.70		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	29.88											
Intersection LOS	C											
Intersection V/C	0.776											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.637

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	153	123	1154	84	58	878
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	153	123	1154	84	58	878
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	32	300	22	15	228
Total Analysis Volume [veh/h]	159	128	1198	87	60	912
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	23	69	69	5	78
g / C, Green / Cycle	0.21	0.63	0.63	0.05	0.71
(v / s)_i Volume / Saturation Flow Rate	0.19	0.38	0.06	0.04	0.29
s, saturation flow rate [veh/h]	1515	3192	1425	1597	3192
c, Capacity [veh/h]	312	2007	896	75	2273
d1, Uniform Delay [s]	42.75	12.14	8.07	51.90	6.39
k, delay calibration	0.24	0.50	0.50	0.06	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	20.35	1.32	0.22	9.67	0.53
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	0.92	0.60	0.10	0.80	0.40
d, Delay for Lane Group [s/veh]	63.09	13.45	8.29	61.57	6.92
Lane Group LOS	E	B	A	E	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	9.33	8.47	0.84	1.84	3.94
50th-Percentile Queue Length [ft]	233.28	211.87	20.93	45.93	98.61
95th-Percentile Queue Length [veh]	14.34	13.25	1.51	3.31	7.10
95th-Percentile Queue Length [ft]	358.53	331.23	37.67	82.67	177.49

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	63.09	63.09	13.45	8.29	61.57	6.92
Movement LOS	E	E	B	A	E	A
d_A, Approach Delay [s/veh]	63.09		13.11		10.29	
Approach LOS	E		B		B	
d_I, Intersection Delay [s/veh]	17.67					
Intersection LOS	B					
Intersection V/C	0.637					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	54.0
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.426

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	1143	110	0	970	50	0	0	75	0	0	24
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	1143	110	0	970	50	0	0	75	0	0	24
Peak Hour Factor	1.0000	0.9730	0.9730	1.0000	0.9730	0.9730	1.0000	1.0000	0.9730	1.0000	1.0000	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	294	28	0	0	0	0	0	19	0	0	0
Total Analysis Volume [veh/h]	0	1175	113	0	0	0	0	0	77	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	48	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	45	45		7	
g / C, Green / Cycle	0.37	0.37		0.06	
(v / s)_i Volume / Saturation Flow Rate	0.35	0.36		0.05	
s, saturation flow rate [veh/h]	1863	1807		1583	
c, Capacity [veh/h]	694	673		95	
d1, Uniform Delay [s]	36.09	36.69		55.72	
k, delay calibration	0.32	0.34		0.04	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	14.57	19.82		6.04	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

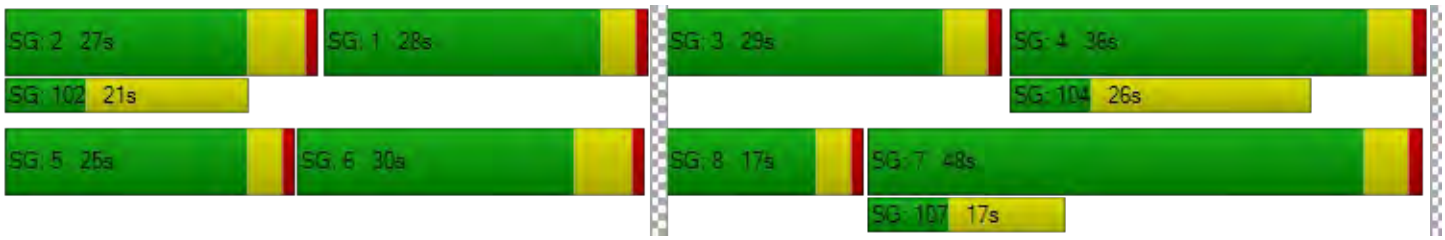
X, volume / capacity	0.93	0.96		0.81	
d, Delay for Lane Group [s/veh]	50.65	56.51		61.77	
Lane Group LOS	D	E		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	20.54	21.74		2.46	
50th-Percentile Queue Length [ft]	513.59	543.43		61.55	
95th-Percentile Queue Length [veh]	27.98	29.38		4.43	
95th-Percentile Queue Length [ft]	699.42	734.58		110.80	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	53.30	56.51	0.00	0.00	0.00	0.00	0.00	61.77	0.00	0.00	0.00
Movement LOS		D	E						E			
d_A, Approach Delay [s/veh]	53.58			0.00			61.77			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	54.04											
Intersection LOS	D											
Intersection V/C	0.426											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Juniper Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	72.8
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.917

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	154	621	726	213	795	155	225	568	137	293	452	187
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	154	621	726	213	795	155	225	568	137	293	452	187
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	162	0	55	207	40	59	148	0	76	118	49
Total Analysis Volume [veh/h]	160	647	0	222	828	161	234	592	0	305	471	195
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	3	0	4	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	8	8	0	4	10	0	4	10	0
Maximum Green [s]	25	25	0	30	30	0	20	40	0	20	40	0
Amber [s]	3.9	3.9	0.0	3.9	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	29	0	36	36	0	28	30	0	25	27	0
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	0	0	7	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	19	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.9	2.9	0.0	2.9	2.9	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
Maximum Recall		No			No		No	No		No	Yes	
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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	29	29	29	32	32	32	32	18	18	18	21	21	21
g / C, Green / Cycle	0.24	0.24	0.24	0.27	0.27	0.27	0.27	0.15	0.15	0.15	0.17	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.23	0.23	0.00	0.13	0.27	0.20	0.10	0.13	0.16	0.16	0.17	0.13	0.12
s, saturation flow rate [veh/h]	1828	1695	1583	1774	1863	1695	1583	1774	1863	1863	1774	3547	1583
c, Capacity [veh/h]	445	413	386	477	500	455	425	262	276	276	310	621	277
d1, Uniform Delay [s]	44.58	44.57	0.00	36.72	43.73	39.99	35.76	50.24	51.16	51.16	49.39	47.12	46.60
k, delay calibration	0.34	0.34	0.04	0.04	0.42	0.20	0.04	0.14	0.50	0.50	0.41	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	23.45	24.57	0.00	0.26	33.96	4.19	0.21	12.70	74.71	74.71	42.17	8.43	13.92
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

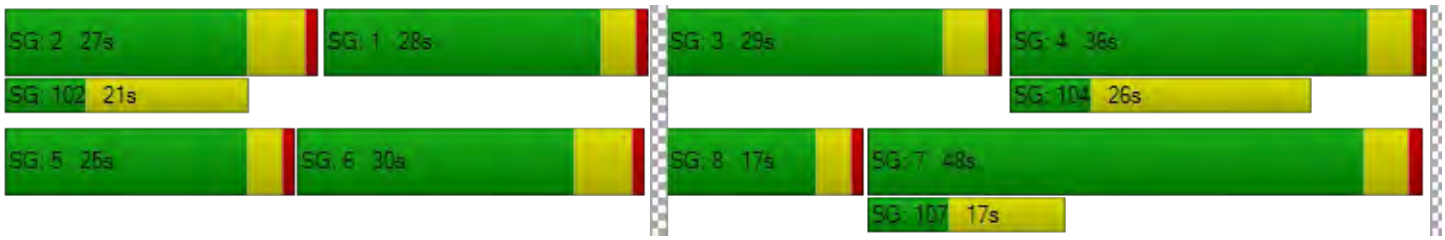
X, volume / capacity	0.94	0.94	0.00	0.47	0.99	0.73	0.38	0.89	1.07	1.07	0.98	0.76	0.70
d, Delay for Lane Group [s/veh]	68.03	69.15	0.00	36.98	77.69	44.18	35.96	62.95	125.87	125.87	91.56	55.55	60.52
Lane Group LOS	E	E	A	D	E	D	D	E	F	F	F	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	15.04	14.07	0.00	5.49	19.20	9.46	3.88	7.81	14.00	14.00	12.70	7.41	6.55
50th-Percentile Queue Length [ft]	375.93	351.66	0.00	137.3	480.0	236.5	97.00	195.26	349.97	349.97	317.62	185.30	163.67
95th-Percentile Queue Length [veh]	21.40	20.22	0.00	9.34	26.39	14.51	6.98	12.39	20.81	20.81	18.55	11.88	10.74
95th-Percentile Queue Length [ft]	534.92	505.43	0.00	233.4	659.7	362.6	174.5	309.85	520.35	520.35	463.76	296.92	268.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	68.03	68.70	0.00	36.98	64.19	35.96	62.95	125.87	125.87	91.56	55.55	60.52
Movement LOS	E	E	A	D	E	D	E	F	F	F	E	E
d_A, Approach Delay [s/veh]	68.57			55.45			108.04			67.86		
Approach LOS	E			E			F			E		
d_I, Intersection Delay [s/veh]	72.77											
Intersection LOS	E											
Intersection V/C	0.917											

Sequence

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



BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8090*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2186*	pc/h/ln
S	*58.7*	mph
D = v_p / S	*37.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8399*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1481*	pc/h/ln
S	*69.1*	mph
D = v_p / S	*21.4*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4209*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1119*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9370*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2452*	pc/h/ln
S	*51.8*	mph
D = v_p / S	*47.3*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/20156*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*10493*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1850*	pc/h/ln
S	*65.1*	mph
D = v_p / S	*28.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2282*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*607*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*8.7*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	Lillian Tsang
Agency/Company	Kittelson & Associates, Inc.
Date Performed	4/3/2016
Analysis Time Period	AM Peak Hour

Site Information

Freeway/Dir of Travel	I-280 Southbound
Weaving Segment Location	SR-1 On to Serramonte Off
Analysis Year	Cumulative No Project

Project Description Serramonte Terrace TIA

Inputs

Weaving configuration	One-Sided
Weaving number of lanes, N	5
Weaving segment length, L_S	700ft
Freeway free-flow speed, FFS	70 mph
Segment type	Freeway
Freeway minimum speed, S_{MIN}	15
Freeway maximum capacity, C_{IFL}	2400
Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	6796	0.97	1	0	1.5	1.2	0.995	1.00	7041
V_{RF}	994	0.97	1	0	1.5	1.2	0.995	1.00	1030
V_{FR}	1205	0.97	1	0	1.5	1.2	0.995	1.00	1248
V_{RR}	0	0.97	1	0	1.5	1.2	0.995	1.00	0
V_{NW}	7041							V =	9319
V_W	2278								
VR	0.244								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	2278 lc/h
Interchange density, ID	2.0 int/mi	Weaving lane changes, LC_W	2748 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	867 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	3615 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	986

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	9274 veh/h	Weaving intensity factor, W	0.825
Weaving segment capacity, c_w	9769 veh/h	Weaving segment speed, S	44.8 mph
Weaving segment v/c ratio	0.949	Average weaving speed, S_W	45.1 mph
Weaving segment density, D	41.6 pc/mi/ln	Average non-weaving speed, S_{NW}	44.7 mph
Level of Service, LOS	E	Maximum weaving length, L_{MAX}	4996 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9044*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2319*	pc/h/ln
S	*55.5*	mph
D = v_p / S	*41.8*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*10972*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1935*	pc/h/ln
S	*63.7*	mph
D = v_p / S	*30.4*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4521*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1202*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*4/3/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8667*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*4*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2317*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*55.5*	mph	S	mph
D = v_p / S	*41.7*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*E*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*4/3/20156*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9897*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1745*	pc/h/ln
S	*66.6*	mph
D = v_p / S	*26.2*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*4/4/2016*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative No Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2636*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*701*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*10.0*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	Lillian Tsang
Agency/Company	Kittelson & Associates, Inc.
Date Performed	03/28/2016
Analysis Time Period	PM Peak Hour

Site Information

Freeway/Dir of Travel	I-280 Southbound
Weaving Segment Location	SR-1 On to Serramonte Off
Analysis Year	Cumulative No Project

Project Description Serramonte Terrace TIA

Inputs

Weaving configuration	One-Sided	Segment type	Freeway
Weaving number of lanes, N	5	Freeway minimum speed, S_{MIN}	15
Weaving segment length, L_S	700ft	Freeway maximum capacity, C_{IFL}	2400
Freeway free-flow speed, FFS	70 mph	Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	7487	0.97	1	0	1.5	1.2	0.995	1.00	7757
V_{RF}	967	0.97	1	0	1.5	1.2	0.995	1.00	1002
V_{FR}	1450	0.97	1	0	1.5	1.2	0.995	1.00	1502
V_{RR}	0	0.97	1	0	1.5	1.2	0.995	1.00	0
V_{NW}	7757							V =	10261
V_W	2504								
VR	0.244								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	lc/h
Interchange density, ID	2.0 int/mi	Weaving lane changes, LC_W	lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	10211 veh/h	Weaving intensity factor, W	
Weaving segment capacity, c_w	9786 veh/h	Weaving segment speed, S	mph
Weaving segment v/c ratio	1.043	Average weaving speed, S_W	mph
Weaving segment density, D	pc/mi/ln	Average non-weaving speed, S_{NW}	mph
Level of Service, LOS	F	Maximum weaving length, L_{MAX}	4991 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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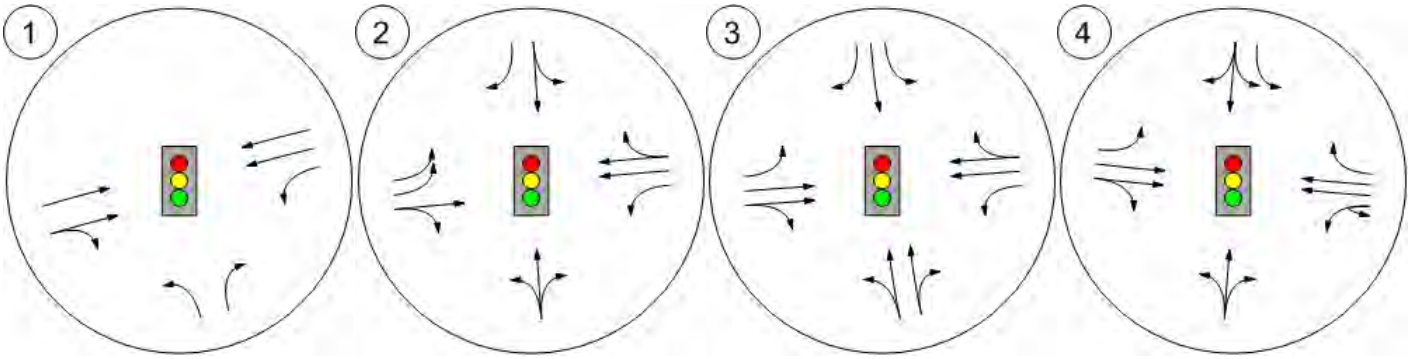
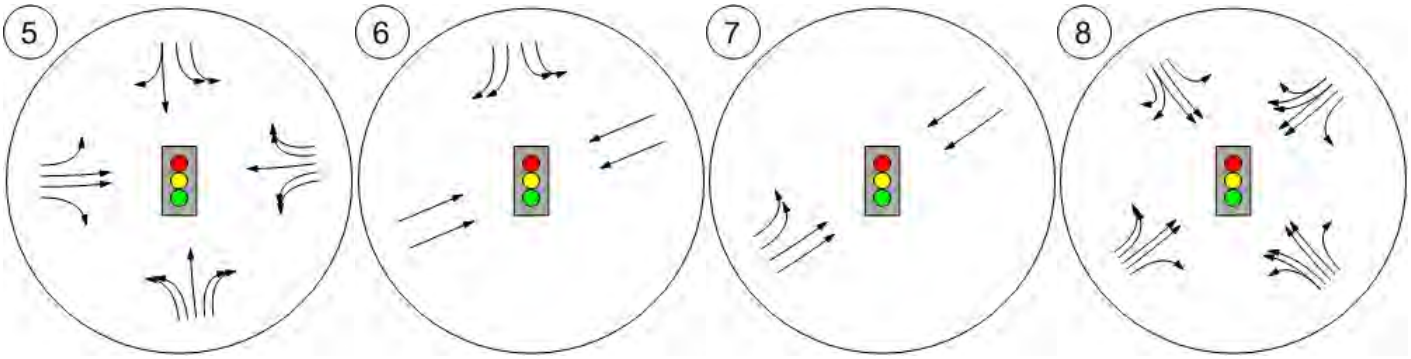
Appendix 9
Year 2035 Cumulative plus Project Conditions Intersection Lane Configurations

Lane Configuration and Traffic Control

WB Hwy 1 Ramps / Clarinad EB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

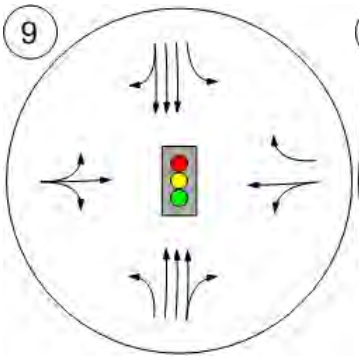


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

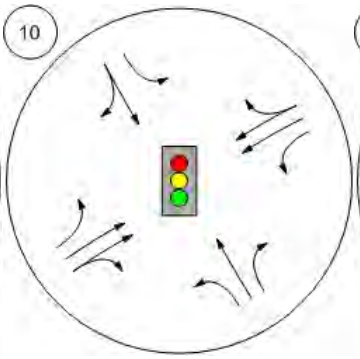


Lane Configuration and Traffic Control

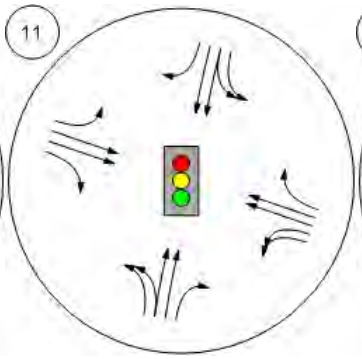
Gellert Blvd / Serramonte Pla



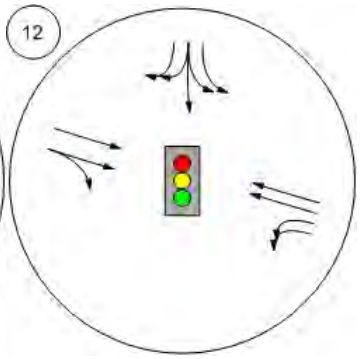
Callan Blvd / Hickey Blvd



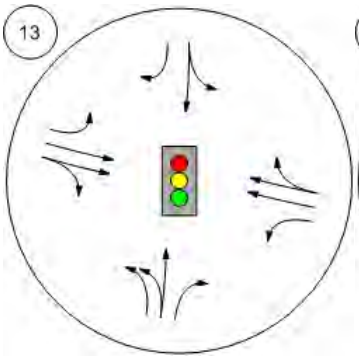
Gellert Blvd / Hickey Blvd



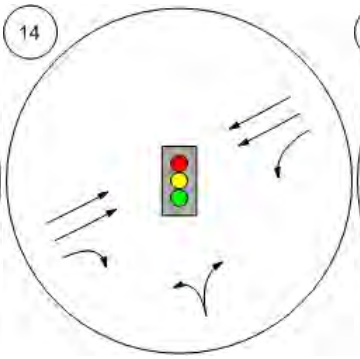
I-280 SB Ramps / Hickey Blv



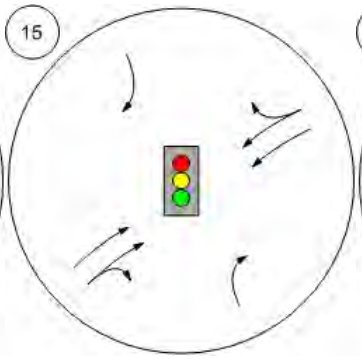
I-280 NB Ramps / Hickey Blv



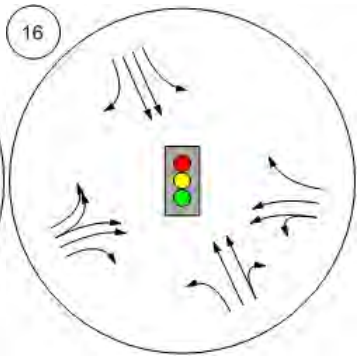
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd



Junipero Serra Blvd / Hickey



Appendix 10
Year 2035 Cumulative plus Project Conditions Level-of-Service Worksheets

19898 Daly City Serramonte Views TIA

Vistro File: K:\...\19898_Vistro_20170104.vistro
Scenario 8: Cumulative 2035 AM + Project

Report File: K:\...\CumAM_wProj_LOS_Summary.pdf
1/4/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	WB Hwy 1 Ramps / Clarinada Ave.	Signalized	HCM 2010	WB Left	0.589	11.6	B
2	EB Hwy 1 Ramps / Serramonte Blvd	Signalized	HCM 2010	WB Left	0.841	40.0	D
3	Callan Blvd / Serramonte Blvd	Signalized	HCM 2010	WB Left	0.644	18.1	B
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	WB Left	0.400	22.1	C
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	SB Left	0.507	14.6	B
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	NEB Thru	0.835	8.4	A
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.699	1.9	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	NEB Right	0.983	60.0	E
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	WB Left	0.310	24.1	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.580	18.2	B
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.737	28.7	C
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.527	9.0	A
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.779	29.3	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.348	11.1	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.427	54.3	D
16	Junipero Serra Blvd / Hickey Blvd	Signalized	HCM 2010	SEB Left	0.925	67.0	E

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

Intersection Level Of Service Report
Intersection 1: WB Hwy 1 Ramps / Clarinada Ave.

Control Type:	Signalized	Delay (sec / veh):	11.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.589

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	411	320	120	142	107	23
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.60	3.60	1.90	1.50	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	5	0	9	4
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]	411	320	125	142	116	27
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	112	87	34	39	32	7
Total Analysis Volume [veh/h]	447	348	136	154	126	29
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Protected	Permissive
Signal group	2	0	4	0	3	8
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	4	0	4	0	4	4
Maximum Green [s]	28	0	27	0	8	39
Amber [s]	3.5	0.0	3.5	0.0	3.5	3.5
All red [s]	0.5	0.0	0.5	0.0	0.5	0.5
Split [s]	32	0	31	0	12	43
Vehicle Extension [s]	3.0	0.0	3.0	0.0	3.0	3.0
Walk [s]	5	0	5	0	0	0
Pedestrian Clearance [s]	23	0	22	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
Minimum Recall	No		No		No	No
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	6.0	0.0	6.0	6.0
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	C	C	L	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	11	11	5	5	3	12
g / C, Green / Cycle	0.36	0.36	0.16	0.16	0.09	0.39
(v / s)_i Volume / Saturation Flow Rate	0.25	0.22	0.07	0.10	0.07	0.01
s, saturation flow rate [veh/h]	1781	1559	1865	1585	1810	3618
c, Capacity [veh/h]	636	556	308	262	166	1395
d1, Uniform Delay [s]	8.58	8.27	11.67	11.99	13.78	5.91
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.44	1.16	0.99	2.09	7.00	0.01
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.70	0.63	0.44	0.59	0.76	0.02
d, Delay for Lane Group [s/veh]	10.01	9.43	12.67	14.08	20.77	5.92
Lane Group LOS	B	A	B	B	C	A
Critical Lane Group	Yes	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh]	1.83	1.36	0.71	0.88	0.99	0.04
50th-Percentile Queue Length [ft]	45.82	34.12	17.87	22.11	24.73	0.91
95th-Percentile Queue Length [veh]	3.30	2.46	1.29	1.59	1.78	0.07
95th-Percentile Queue Length [ft]	82.47	61.42	32.16	39.80	44.52	1.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.01	9.43	12.67	14.08	20.77	5.92
Movement LOS	B	A	B	B	C	A
d_A, Approach Delay [s/veh]	9.76		13.42		17.99	
Approach LOS	A		B		B	
d_I, Intersection Delay [s/veh]	11.64					
Intersection LOS	B					
Intersection V/C	0.589					

Sequence

Ring 1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Intersection Level Of Service Report
Intersection 2: EB Hwy 1 Ramps / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	40.0
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.841

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	2	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	29	98	90	310	94	134	466	292	50	132	182	226
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	1.10	1.10	4.30	4.10	1.30	3.00	4.00	3.80	9.00	1.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	14	0	0	0	0	0	0	7	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	29	98	90	324	94	134	466	292	50	132	189	226
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
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	0.0000
Total 15-Minute Volume [veh/h]	8	28	26	94	27	39	135	85	15	38	55	0
Total Analysis Volume [veh/h]	34	114	105	377	109	156	542	340	58	153	220	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	105
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	4	0	0	4	0	4	4	0	4	4	0
Maximum Green [s]	0	30	0	0	35	0	35	35	0	35	30	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	3.5	3.5	0.0	3.0	3.5	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	27	0	0	29	0	9	32	0	17	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	11	0	0	31	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	1.5	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.50	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.50	2.00	2.00
g_i, Effective Green Time [s]	15	28	28	17	23	10	15	15
g / C, Green / Cycle	0.17	0.30	0.30	0.19	0.25	0.11	0.16	0.16
(v / s)_i Volume / Saturation Flow Rate	0.14	0.28	0.10	0.16	0.22	0.09	0.06	0.06
s, saturation flow rate [veh/h]	1759	1754	1551	3469	1798	1743	1743	1743
c, Capacity [veh/h]	296	535	473	663	445	191	280	280
d1, Uniform Delay [s]	36.91	30.54	24.55	35.44	33.27	39.71	34.39	34.39
k, delay calibration	0.11	0.25	0.11	0.11	0.14	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.91	12.89	0.40	2.55	8.49	7.48	0.90	0.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

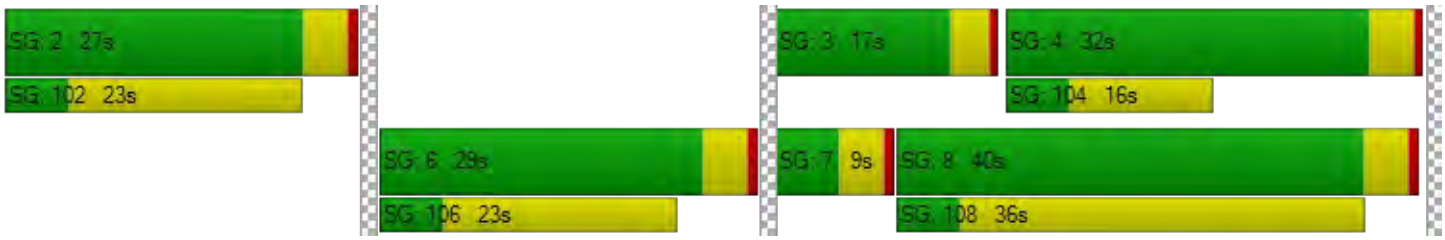
X, volume / capacity	0.85	0.91	0.33	0.82	0.90	0.80	0.39	0.39
d, Delay for Lane Group [s/veh]	43.82	43.44	24.95	37.99	41.76	47.19	35.29	35.29
Lane Group LOS	D	D	C	D	D	D	D	D
Critical Lane Group	Yes	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	5.94	11.81	2.61	5.89	9.32	3.70	2.23	2.23
50th-Percentile Queue Length [ft]	148.49	295.29	65.15	147.20	232.99	92.38	55.70	55.70
95th-Percentile Queue Length [veh]	9.94	17.45	4.69	9.87	14.33	6.65	4.01	4.01
95th-Percentile Queue Length [ft]	248.41	436.20	117.27	246.68	358.16	166.29	100.26	100.26

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	43.82	43.82	43.82	43.44	43.44	24.95	37.99	41.76	41.76	47.19	35.29	35.29
Movement LOS	D	D	D	D	D	C	D	D	D	D	D	D
d_A, Approach Delay [s/veh]	43.82			38.95			39.59			40.17		
Approach LOS	D			D			D			D		
d_I, Intersection Delay [s/veh]	39.98											
Intersection LOS	D											
Intersection V/C	0.841											

Sequence

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



Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	18.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.644

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	180	205	78	139	233	201	156	427	111	35	140	103
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 [%]	1.80	1.30	1.30	16.40	4.80	7.70	8.70	0.40	0.00	0.00	1.70	22.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	1	5	0	0	0	14	0	7	7	13
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]	180	205	79	144	233	201	156	441	111	42	147	116
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]	48	55	21	39	63	54	42	119	30	11	40	31
Total Analysis Volume [veh/h]	194	220	85	155	251	216	168	474	119	45	158	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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	4	0	4	4	0	4	4	0	4	4	0
Maximum Green [s]	4	35	0	12	32	0	6	32	0	5	31	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	3.5	3.5	0.0	3.5	3.5	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	19	39	0	16	36	0	10	36	0	9	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	30	0	0	22	0	0	26	0	0	25	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	Yes	Yes		No	Yes		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	12	23	15	15	6	11	11	2	7	7
g / C, Green / Cycle	0.48	0.25	0.48	0.32	0.32	0.13	0.23	0.23	0.04	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.17	0.19	0.17	0.14	0.14	0.10	0.16	0.16	0.02	0.08	0.08
s, saturation flow rate [veh/h]	1109	1627	938	1813	1500	1665	1892	1763	1810	1868	1606
c, Capacity [veh/h]	762	405	478	574	475	209	427	398	69	258	222
d1, Uniform Delay [s]	7.06	16.55	10.64	12.92	13.00	20.26	17.05	17.06	22.61	19.23	19.33
k, delay calibration	0.50	0.11	0.11	0.11	0.11	0.19	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	0.80	2.87	0.39	0.53	0.68	11.59	2.28	2.47	9.98	2.00	2.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

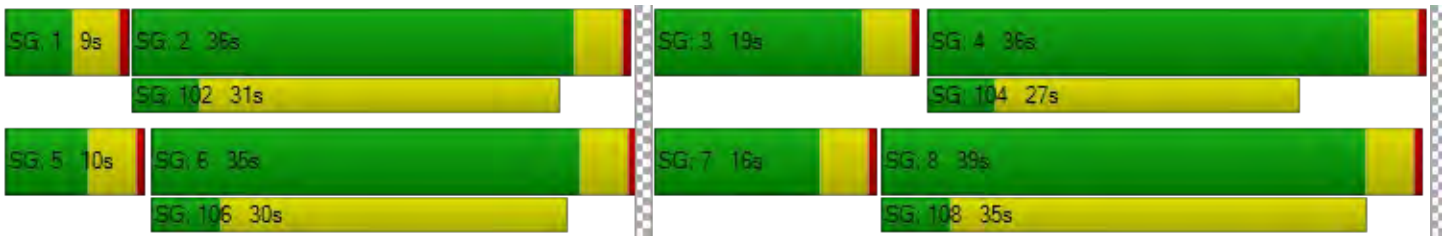
X, volume / capacity	0.25	0.75	0.32	0.44	0.45	0.80	0.72	0.72	0.65	0.57	0.61
d, Delay for Lane Group [s/veh]	7.87	19.42	11.03	13.44	13.68	31.84	19.32	19.53	32.59	21.23	22.04
Lane Group LOS	A	B	B	B	B	C	B	B	C	C	C
Critical Lane Group	No	Yes	Yes	No	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.02	2.96	1.09	1.87	1.64	2.29	2.95	2.78	0.64	1.51	1.42
50th-Percentile Queue Length [ft]	25.48	74.06	27.25	46.85	41.02	57.25	73.83	69.56	16.09	37.64	35.55
95th-Percentile Queue Length [veh]	1.83	5.33	1.96	3.37	2.95	4.12	5.32	5.01	1.16	2.71	2.56
95th-Percentile Queue Length [ft]	45.86	133.30	49.04	84.34	73.83	103.06	132.90	125.21	28.97	67.75	63.99

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	7.87	19.42	19.42	11.03	13.44	13.68	31.84	19.40	19.53	32.59	21.28	22.04
Movement LOS	A	B	B	B	B	B	C	B	B	C	C	C
d_A, Approach Delay [s/veh]	14.93			12.92			22.16			23.12		
Approach LOS	B			B			C			C		
d_I, Intersection Delay [s/veh]	18.07											
Intersection LOS	B											
Intersection V/C	0.644											

Sequence

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



Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	22.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.400

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	285.00	100.00	100.00	200.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	73	0	66	89	576	0	44	0	240	164
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	0.00	0.00	0.00	11.50	2.00	0.00	0.00	5.90	0.00	0.00	2.00	11.90	4.70
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	11	118	0	5	0	0	0	20	0	53	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	27	11	118	73	5	66	89	576	20	44	53	240	164
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	7	3	30	18	1	17	22	144	5	11	13	60	41
Total Analysis Volume [veh/h]	27	11	118	73	5	66	89	576	20	44	53	240	164
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	92
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permi	Prote	Permi	Overl
Signal group	0	8	0	4	4	0	1	6	0	0	5	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	4	8	0	0	4	8	8
Maximum Green [s]	0	30	0	30	30	0	20	40	0	0	20	40	40
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.6	0.0	0.0	3.0	3.6	3.6
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0	1.0
Split [s]	0	18	0	18	18	0	12	26	0	0	12	26	26
Vehicle Extension [s]	0.0	2.5	0.0	2.5	2.5	0.0	2.0	3.0	0.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	7	7	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	20	0	20	20	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.6	0.0	0.0	2.0	2.6	2.6
Minimum Recall		No			No		No	No			No	No	No
Maximum Recall		No			No		No	No			No	No	No
Pedestrian Recall		No			No		No	No			No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.60	4.60	4.00	4.60	4.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.60	2.60	2.00	2.60	0.00
g_i, Effective Green Time [s]	10	7	7	8	52	52	6	50	73
g / C, Green / Cycle	0.11	0.07	0.07	0.09	0.56	0.56	0.07	0.55	0.79
(v / s)_i Volume / Saturation Flow Rate	0.09	0.04	0.05	0.06	0.17	0.17	0.05	0.07	0.11
s, saturation flow rate [veh/h]	1664	1623	1605	1440	1794	1773	1790	3233	1543
c, Capacity [veh/h]	189	122	120	175	1007	995	125	1759	1223
d1, Uniform Delay [s]	39.95	41.24	41.33	42.75	10.64	10.65	42.15	10.35	2.21
k, delay calibration	0.11	0.08	0.08	0.10	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	9.16	3.25	3.68	2.21	0.75	0.77	9.72	0.16	0.23
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.83	0.58	0.61	0.51	0.30	0.30	0.77	0.14	0.13
d, Delay for Lane Group [s/veh]	49.11	44.49	45.01	44.96	11.40	11.41	51.87	10.51	2.44
Lane Group LOS	D	D	D	D	B	B	D	B	A
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	Yes
50th-Percentile Queue Length [veh]	3.89	1.65	1.72	2.10	3.20	3.17	2.48	1.17	0.52
50th-Percentile Queue Length [ft]	97.26	41.17	43.00	52.44	79.90	79.13	62.09	29.34	12.93
95th-Percentile Queue Length [veh]	7.00	2.96	3.10	3.78	5.75	5.70	4.47	2.11	0.93
95th-Percentile Queue Length [ft]	175.06	74.10	77.39	94.40	143.83	142.43	111.76	52.82	23.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	49.11	49.11	49.11	44.49	45.01	45.01	44.96	11.41	11.41	51.87	51.87	10.51	2.44
Movement LOS	D	D	D	D	D	D	D	B	B	D	D	B	A
d_A, Approach Delay [s/veh]	49.11			44.75			15.76			15.87			
Approach LOS	D			D			B			B			
d_I, Intersection Delay [s/veh]	22.11												
Intersection LOS	C												
Intersection V/C	0.400												

Sequence

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

Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	14.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.507

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	183	116	193	57	84	12	32	415	209	294	222	62
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 [%]	10.20	0.00	2.60	1.80	6.40	8.30	0.00	4.60	7.70	1.10	7.10	2.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	15	0	0	0	0	0	0	76	42	0	39	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]	198	116	193	57	84	12	32	491	251	294	261	62
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]	53	31	52	15	23	3	9	132	67	79	70	17
Total Analysis Volume [veh/h]	213	125	208	61	90	13	34	528	270	316	281	67
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	3	3	3	4	4	0	5	2	2	1	6	6
Auxiliary Signal Groups			1,3						2,3			4,6
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	4	4	4	4	0	4	6	6	4	6	6
Maximum Green [s]	25	25	25	30	30	0	20	26	26	25	26	26
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.5	0.5	0.5	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0	0	0	0	0	29	29
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	7	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	18	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	1.5	1.5	1.5	1.5	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		Yes	Yes		No		No	Yes	Yes	No	Yes	Yes
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	8	8	26	5	5	8	10	23	7	9	17
g / C, Green / Cycle	0.18	0.18	0.60	0.11	0.11	0.17	0.23	0.51	0.15	0.21	0.39
(v / s)_i Volume / Saturation Flow Rate	0.07	0.07	0.07	0.02	0.06	0.02	0.15	0.18	0.09	0.16	0.02
s, saturation flow rate [veh/h]	3189	1900	2786	2747	1747	1810	3459	1500	3476	1774	2800
c, Capacity [veh/h]	592	353	1658	330	181	310	809	767	515	373	1101
d1, Uniform Delay [s]	15.79	15.77	3.94	20.02	18.96	15.55	15.39	6.46	17.74	16.45	8.38
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.04	0.11	0.11	0.04	0.11	0.04
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
d2, Incremental Delay [s]	0.14	0.22	0.01	0.10	1.04	0.06	0.90	0.27	0.45	3.08	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.36	0.35	0.13	0.18	0.57	0.11	0.65	0.35	0.61	0.75	0.06
d, Delay for Lane Group [s/veh]	15.92	15.99	3.95	20.12	20.00	15.60	16.29	6.73	18.18	19.54	8.39
Lane Group LOS	B	B	A	C	B	B	B	A	B	B	A
Critical Lane Group	Yes	No	No	No	Yes	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.83	0.98	0.24	0.27	0.94	0.26	2.14	1.09	1.35	2.60	0.16
50th-Percentile Queue Length [ft]	20.66	24.44	5.94	6.86	23.53	6.46	53.57	27.32	33.84	65.12	3.96
95th-Percentile Queue Length [veh]	1.49	1.76	0.43	0.49	1.69	0.47	3.86	1.97	2.44	4.69	0.28
95th-Percentile Queue Length [ft]	37.18	43.99	10.70	12.34	42.35	11.63	96.43	49.17	60.91	117.21	7.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.92	15.99	3.95	20.12	20.00	20.00	15.60	16.29	6.73	18.18	19.54	8.39
Movement LOS	B	B	A	C	B	B	B	B	A	B	B	A
d_A, Approach Delay [s/veh]	11.38			20.04			13.16			17.77		
Approach LOS	B			C			B			B		
d_I, Intersection Delay [s/veh]	14.62											
Intersection LOS	B											
Intersection V/C	0.507											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	8.4
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.835

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	993	212	293	0	0	693
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.80	0.80	5.70	2.00	2.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	17	21	0	0	76
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]	993	229	314	0	0	769
Peak Hour Factor	0.8500	0.8500	0.8500	1.0000	1.0000	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	292	67	92	0	0	226
Total Analysis Volume [veh/h]	1168	269	369	0	0	905
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	13	13	9	10
g / C, Green / Cycle	0.43	0.43	0.30	0.33
(v / s)_i Volume / Saturation Flow Rate	0.34	0.09	0.11	0.26
s, saturation flow rate [veh/h]	3486	2836	3423	3512
c, Capacity [veh/h]	1507	1226	1031	1171
d1, Uniform Delay [s]	7.55	5.54	8.52	9.32
k, delay calibration	0.04	0.04	0.04	0.04
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.33	0.03	0.08	0.42
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.78	0.22	0.36	0.77
d, Delay for Lane Group [s/veh]	7.88	5.58	8.60	9.74
Lane Group LOS	A	A	A	A
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh]	1.83	0.30	0.66	1.81
50th-Percentile Queue Length [ft]	45.78	7.59	16.49	45.25
95th-Percentile Queue Length [veh]	3.30	0.55	1.19	3.26
95th-Percentile Queue Length [ft]	82.40	13.67	29.68	81.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	7.88	5.58	8.60	0.00	0.00	9.74
Movement LOS	A	A	A			A
d_A, Approach Delay [s/veh]	7.45		8.60		9.74	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	8.37					
Intersection LOS	A					
Intersection V/C	0.835					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	1.9
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.699

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	111	1593	290	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.40	1.90	7.70	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	53	23	21	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]	164	1616	311	0	0	0
Peak Hour Factor	0.8400	0.8400	0.8400	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	49	481	93	0	0	0
Total Analysis Volume [veh/h]	195	1924	370	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	3.90	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	1.90	2.10	
g_i, Effective Green Time [s]	4	23	15	
g / C, Green / Cycle	0.15	0.85	0.57	
(v / s)_i Volume / Saturation Flow Rate	0.06	0.54	0.11	
s, saturation flow rate [veh/h]	3432	3550	3359	
c, Capacity [veh/h]	504	3034	1914	
d1, Uniform Delay [s]	10.35	0.62	2.79	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.49	0.22	0.05	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.39	0.63	0.19	
d, Delay for Lane Group [s/veh]	10.83	0.84	2.84	
Lane Group LOS	B	A	A	
Critical Lane Group	No	Yes	No	
50th-Percentile Queue Length [veh]	0.39	0.09	0.08	
50th-Percentile Queue Length [ft]	9.81	2.34	1.92	
95th-Percentile Queue Length [veh]	0.71	0.17	0.14	
95th-Percentile Queue Length [ft]	17.67	4.21	3.45	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.83	0.84	2.84	0.00	0.00	0.00
Movement LOS	B	A	A			
d_A, Approach Delay [s/veh]	1.76		2.84		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.92					
Intersection LOS	A					
Intersection V/C	0.699					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	60.0
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.983

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	160	0	869	548	178	168	198	65
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	11	12	0	7	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]	0	0	0	0	160	0	880	560	178	175	198	65
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9050	1.0000	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
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	0	0	0	44	0	243	155	49	48	55	18
Total Analysis Volume [veh/h]	0	0	0	0	177	0	972	619	197	193	219	72
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lead	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	28	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		9	40	40	15	46	46	46
g / C, Green / Cycle		0.07	0.33	0.33	0.13	0.38	0.38	0.38
(v / s)_i Volume / Saturation Flow Rate		0.05	0.27	0.39	0.11	0.09	0.10	0.10
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1608	1583
c, Capacity [veh/h]		246	1171	523	226	710	613	604
d1, Uniform Delay [s]		55.09	37.46	40.59	51.88	25.62	25.65	25.66
k, delay calibration		0.11	0.11	0.50	0.22	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		3.96	1.59	101.13	17.88	0.18	0.21	0.22
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.72	0.83	1.18	0.87	0.25	0.25	0.25
d, Delay for Lane Group [s/veh]		59.06	39.05	141.73	69.76	25.80	25.87	25.87
Lane Group LOS		E	D	F	E	C	C	C
Critical Lane Group		No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh]		2.78	13.41	30.00	6.99	3.54	3.10	3.06
50th-Percentile Queue Length [ft]		69.55	335.19	750.10	174.75	88.40	77.51	76.42
95th-Percentile Queue Length [veh]		5.01	19.41	43.33	11.33	6.36	5.58	5.50
95th-Percentile Queue Length [ft]		125.19	485.32	1083.14	283.15	159.12	139.52	137.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	59.06	0.00	39.05	141.73	69.76	25.81	25.87	25.87
Movement LOS					E		D	F	E	C	C	C
d_A, Approach Delay [s/veh]	0.00				77.00				38.55			
Approach LOS	A				E				D			
d_I, Intersection Delay [s/veh]	59.99											
Intersection LOS	E											
Intersection V/C	0.983											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	90	540	375	344	172	396	41	39
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	12	0	0	0	0	0	3	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	102	540	375	344	172	396	44	39
Peak Hour Factor	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	28	149	104	95	48	109	12	0
Total Analysis Volume [veh/h]	113	597	414	380	190	438	49	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	39	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	30	30	30	20	20	20	20
g / C, Green / Cycle	0.25	0.25	0.25	0.17	0.17	0.17	0.17
(v / s)_i Volume / Saturation Flow Rate	0.21	0.12	0.24	0.11	0.09	0.14	0.03
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1863	1583
c, Capacity [veh/h]	853	878	392	295	309	309	263
d1, Uniform Delay [s]	43.21	38.84	45.14	47.19	46.37	49.21	43.48
k, delay calibration	0.11	0.11	0.43	0.11	0.11	0.21	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.20	0.39	35.13	2.36	1.53	13.03	0.34
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

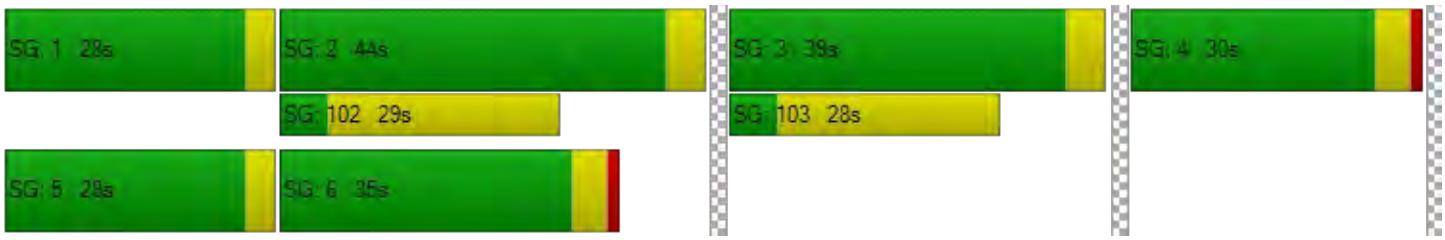
X, volume / capacity	0.83	0.47	0.97	0.64	0.55	0.87	0.19
d, Delay for Lane Group [s/veh]	45.41	39.23	80.27	49.55	47.90	62.24	43.82
Lane Group LOS	D	D	F	D	D	E	D
Critical Lane Group	No	No	Yes	No	No	Yes	No
50th-Percentile Queue Length [veh]	10.29	5.30	15.03	5.55	4.85	8.99	1.30
50th-Percentile Queue Length [ft]	257.13	132.55	375.86	138.76	121.14	224.87	32.44
95th-Percentile Queue Length [veh]	15.54	9.08	21.39	9.41	8.46	13.91	2.34
95th-Percentile Queue Length [ft]	388.62	226.96	534.84	235.35	211.39	347.83	58.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	45.41	45.41	39.23	80.27	49.55	56.67	62.24	43.82
Movement LOS	D	D	D	F	D	E	E	D
d_A, Approach Delay [s/veh]	52.52				53.74			
Approach LOS	D				D			
d_I, Intersection Delay [s/veh]	59.99							
Intersection LOS	E							
Intersection V/C	0.983							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	24.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.310

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	48	356	71	73	295	6	8	3	10	113	1	62
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	5.00	4.20	4.10	6.80	0.00	0.00	0.00	0.00	1.80	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	11	0	9	33	0	0	0	0	0	0	4
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]	48	367	71	82	328	6	8	3	10	113	1	66
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	13	101	20	23	90	2	2	1	3	31	0	18
Total Analysis Volume [veh/h]	53	403	78	90	360	7	9	3	11	124	1	73
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	26	39	0	24	39	0	0	29	0	0	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	35	35	21	35	35	25	25	25
g / C, Green / Cycle	0.24	0.37	0.37	0.22	0.37	0.37	0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.10	0.05	0.07	0.07	0.03	0.13	0.05
s, saturation flow rate [veh/h]	1810	3445	1666	1738	3387	1762	793	943	1615
c, Capacity [veh/h]	429	1280	619	375	1259	655	261	324	425
d1, Uniform Delay [s]	28.50	20.68	20.75	30.81	20.20	20.20	27.00	30.88	27.01
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.59	0.47	1.01	1.51	0.34	0.65	0.66	3.46	0.88
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

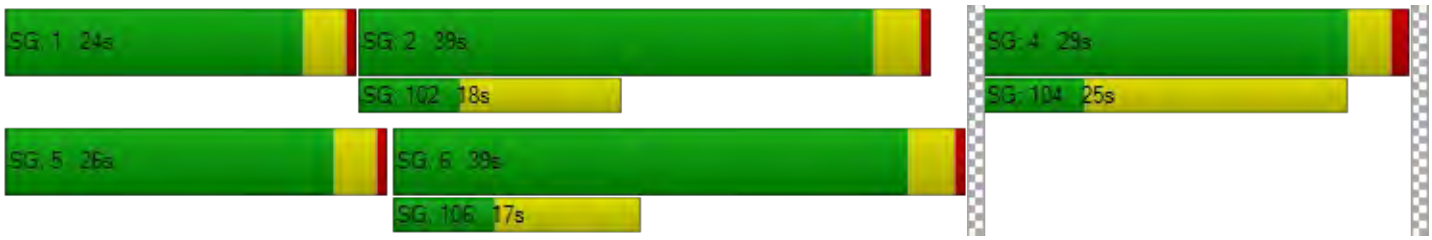
X, volume / capacity	0.12	0.25	0.26	0.24	0.19	0.19	0.09	0.39	0.17
d, Delay for Lane Group [s/veh]	29.09	21.15	21.77	32.32	20.53	20.86	27.66	34.34	27.89
Lane Group LOS	C	C	C	C	C	C	C	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	1.01	2.51	2.60	1.85	1.84	1.98	0.43	2.79	1.37
50th-Percentile Queue Length [ft]	25.31	62.65	65.07	46.19	45.92	49.43	10.85	69.75	34.24
95th-Percentile Queue Length [veh]	1.82	4.51	4.68	3.33	3.31	3.56	0.78	5.02	2.47
95th-Percentile Queue Length [ft]	45.56	112.77	117.12	83.14	82.65	88.97	19.54	125.55	61.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.09	21.28	21.77	32.32	20.64	20.86	27.66	27.66	27.66	34.34	34.34	27.89
Movement LOS	C	C	C	C	C	C	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	22.13			22.94			27.66			31.96		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.15											
Intersection LOS	C											
Intersection V/C	0.310											

Sequence

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



Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	18.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.580

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	119	506	88	20	350	48	79	303	47	89	187	72
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	1.70	2.90	15.00	3.80	4.80	0.00	0.70	0.00	5.60	0.60	1.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	0	0	0	0	0	0	7
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]	120	506	88	20	350	48	79	303	47	89	187	79
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	32	135	23	5	93	13	21	81	13	24	50	21
Total Analysis Volume [veh/h]	128	538	94	21	372	51	84	322	50	95	199	84
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	4	11	11	1	8	8	3	10	10	3	10
g / C, Green / Cycle	0.10	0.25	0.25	0.03	0.18	0.18	0.07	0.23	0.23	0.08	0.23
(v / s)_i Volume / Saturation Flow Rate	0.07	0.17	0.17	0.01	0.12	0.12	0.05	0.17	0.03	0.06	0.16
s, saturation flow rate [veh/h]	1810	1868	1773	1573	1830	1755	1810	1887	1615	1714	1795
c, Capacity [veh/h]	177	474	450	42	334	320	136	430	368	138	419
d1, Uniform Delay [s]	18.64	14.33	14.34	20.44	16.10	16.13	19.08	15.30	13.09	19.04	14.85
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	5.52	1.75	1.85	9.06	2.06	2.22	4.49	2.64	0.17	5.97	1.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.72	0.68	0.68	0.50	0.64	0.65	0.62	0.75	0.14	0.69	0.68
d, Delay for Lane Group [s/veh]	24.17	16.08	16.19	29.49	18.17	18.35	23.57	17.93	13.26	25.01	16.77
Lane Group LOS	C	B	B	C	B	B	C	B	B	C	B
Critical Lane Group	Yes	No	No	No	No	Yes	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.34	2.54	2.43	0.29	1.83	1.79	0.87	2.72	0.34	1.03	2.29
50th-Percentile Queue Length [ft]	33.41	63.56	60.81	7.18	45.71	44.73	21.84	68.09	8.43	25.65	57.14
95th-Percentile Queue Length [veh]	2.41	4.58	4.38	0.52	3.29	3.22	1.57	4.90	0.61	1.85	4.11
95th-Percentile Queue Length [ft]	60.14	114.40	109.45	12.93	82.29	80.52	39.32	122.56	15.17	46.18	102.86

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.17	16.12	16.19	29.49	18.24	18.35	23.57	17.93	13.26	25.01	16.77	16.77
Movement LOS	C	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	17.49			18.79			18.46			18.84		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	18.24											
Intersection LOS	B											
Intersection V/C	0.580											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	28.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.737

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	48	181	501	206	116	61	59	580	37	323	339	309
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 [%]	1.60	3.10	0.80	7.70	2.80	11.70	4.60	1.10	11.10	0.70	5.20	4.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	6	0	28	5	0	0	0	0	0	0	5
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]	48	187	501	234	121	61	59	580	37	323	339	314
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	13	50	133	62	32	16	16	154	10	86	90	84
Total Analysis Volume [veh/h]	51	199	533	249	129	65	63	617	39	344	361	334
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal group	8	8	8	7	7	0	5	2	0	1	6	6
Auxiliary Signal Groups			1,8									6,7
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	0	6	10	0	6	10	10
Maximum Green [s]	27	27	27	22	22	0	22	30	0	27	30	30
Amber [s]	3.2	3.2	3.2	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	4.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	25	25	25	31	31	0	9	34	0	20	45	45
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	4.0
Walk [s]	7	7	7	7	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	25	25	25	23	23	0	0	22	0	0	23	23
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.2	2.2	2.2	2.2	2.2	0.0	1.0	2.0	0.0	1.0	2.0	2.0
Minimum Recall		No	No		No		No	Yes		No	Yes	Yes
Maximum Recall		No	No		No		No	No		No	No	No
Pedestrian Recall		No	No		No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	3.00	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	0.00	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	0.00
g_i, Effective Green Time [s]	22	22	22	63	16	16	16	16	5	40	40	17	52	72
g / C, Green / Cycle	0.20	0.20	0.20	0.57	0.14	0.14	0.14	0.14	0.05	0.36	0.36	0.15	0.47	0.65
(v / s)_i Volume / Saturation Flow Rate	0.03	0.07	0.05	0.33	0.09	0.09	0.08	0.04	0.04	0.17	0.03	0.10	0.10	0.22
s, saturation flow rate [veh/h]	1781	1843	1677	1602	1337	1460	1682	1446	1730	3578	1454	3490	3439	1541
c, Capacity [veh/h]	350	363	330	916	232	275	242	208	81	1306	530	539	1626	1009
d1, Uniform Delay [s]	36.53	37.95	37.24	15.13	46.45	43.72	43.67	42.22	51.88	26.81	22.80	43.61	17.08	8.37
k, delay calibration	0.04	0.04	0.04	0.50	0.04	0.04	0.04	0.04	0.11	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.07	0.20	0.14	2.70	0.72	0.43	0.68	0.32	14.78	1.23	0.27	0.47	0.32	0.88
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	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

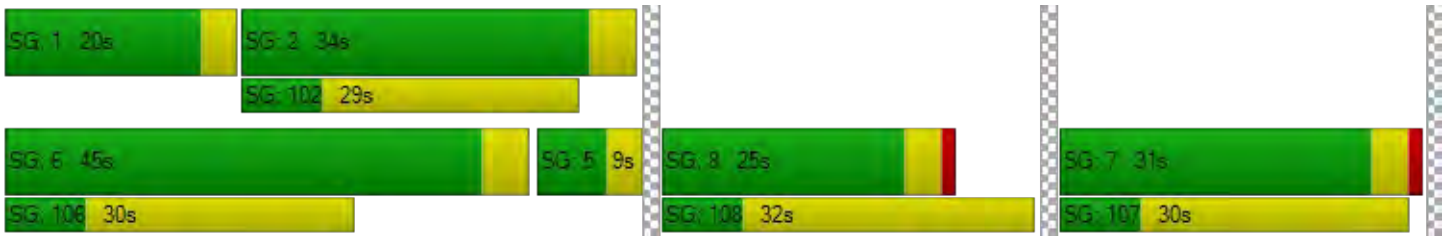
X, volume / capacity	0.15	0.33	0.24	0.58	0.54	0.45	0.53	0.31	0.78	0.47	0.07	0.64	0.22	0.33
d, Delay for Lane Group [s/veh]	36.60	38.15	37.38	17.83	47.17	44.16	44.35	42.53	66.66	28.04	23.07	44.08	17.40	9.25
Lane Group LOS	D	D	D	B	D	D	D	D	E	C	C	D	B	A
Critical Lane Group	No	No	No	Yes	No	No	No	No	No	Yes	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	1.14	2.80	1.81	8.82	3.32	3.19	3.30	1.60	2.05	6.39	0.70	4.41	2.74	3.52
50th-Percentile Queue Length [ft]	28.59	69.96	45.22	220.6	82.98	79.66	82.39	40.04	51.18	159.74	17.57	110.35	68.56	87.91
95th-Percentile Queue Length [veh]	2.06	5.04	3.26	13.70	5.97	5.74	5.93	2.88	3.68	10.54	1.26	7.86	4.94	6.33
95th-Percentile Queue Length [ft]	51.47	125.9	81.40	342.4	149.3	143.3	148.3	72.06	92.12	263.38	31.62	196.49	123.40	158.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	36.60	37.84	17.83	45.66	44.35	42.53	66.66	28.04	23.07	44.08	17.40	9.25
Movement LOS	D	D	B	D	D	D	E	C	C	D	B	A
d_A, Approach Delay [s/veh]	24.14			44.82			31.15			23.61		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	28.72											
Intersection LOS	C											
Intersection V/C	0.737											

Sequence

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



Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.527

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	357	2	180	0	816	512	111	813	0
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	3.10	0.00	0.60	2.00	1.10	2.40	0.70	3.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	3	25	0	5	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]	0	0	0	357	2	180	0	819	537	111	818	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9400	0.9400	0.9400	1.0000	0.9400	0.9400	0.9400	0.9400	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	95	1	48	0	218	0	30	218	0
Total Analysis Volume [veh/h]	0	0	0	380	2	191	0	871	0	118	870	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		6	6	6	11	11	3	17
g / C, Green / Cycle		0.20	0.20	0.20	0.34	0.34	0.10	0.54
(v / s)_i Volume / Saturation Flow Rate		0.11	0.11	0.11	0.23	0.23	0.03	0.25
s, saturation flow rate [veh/h]		1755	1797	1605	1879	1879	3490	3512
c, Capacity [veh/h]		359	367	328	637	637	361	1885
d1, Uniform Delay [s]		11.28	11.28	11.28	9.02	9.02	13.19	4.52
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.28	1.25	1.41	1.31	1.31	0.52	0.18
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.54	0.54	0.54	0.68	0.68	0.33	0.46
d, Delay for Lane Group [s/veh]		12.56	12.53	12.69	10.33	10.33	13.71	4.70
Lane Group LOS		B	B	B	B	B	B	A
Critical Lane Group		No	No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]		1.02	1.05	0.95	1.89	1.89	0.33	0.73
50th-Percentile Queue Length [ft]		25.62	26.16	23.80	47.16	47.16	8.26	18.25
95th-Percentile Queue Length [veh]		1.84	1.88	1.71	3.40	3.40	0.59	1.31
95th-Percentile Queue Length [ft]		46.12	47.10	42.84	84.89	84.89	14.87	32.84

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	12.54	12.53	12.69	0.00	10.33	10.33	13.71	4.70	0.00
Movement LOS				B	B	B		B	B	B	A	
d_A, Approach Delay [s/veh]	0.00			12.59			10.33			5.77		
Approach LOS	A			B			B			A		
d_I, Intersection Delay [s/veh]	9.01											
Intersection LOS	A											
Intersection V/C	0.527											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	29.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.779

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	496	34	338	84	139	80	121	747	277	100	350	33
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 [%]	5.00	0.00	2.50	0.00	2.90	0.00	1.70	2.00	0.70	0.00	1.80	9.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	2	0	0	0	0	0	0	3	0	0	3	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	498	34	338	84	139	80	121	750	277	100	353	33
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	137	9	93	23	38	22	33	206	0	27	97	9
Total Analysis Volume [veh/h]	547	37	371	92	153	88	133	824	0	110	388	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	135
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	42	42	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	12	12	7	20	20	6	19	19
g / C, Green / Cycle	0.28	0.28	0.28	0.16	0.16	0.10	0.27	0.27	0.08	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.17	0.16	0.24	0.14	0.05	0.07	0.22	0.22	0.06	0.11	0.12
s, saturation flow rate [veh/h]	1723	1820	1576	1812	1615	1779	1863	1863	1810	1866	1811
c, Capacity [veh/h]	482	509	441	299	267	173	496	496	146	478	463
d1, Uniform Delay [s]	23.09	23.07	25.21	29.96	27.40	32.74	25.72	25.72	33.47	23.26	23.28
k, delay calibration	0.11	0.11	0.17	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	1.16	1.08	6.85	5.59	0.72	6.96	3.69	3.69	7.72	0.66	0.69
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

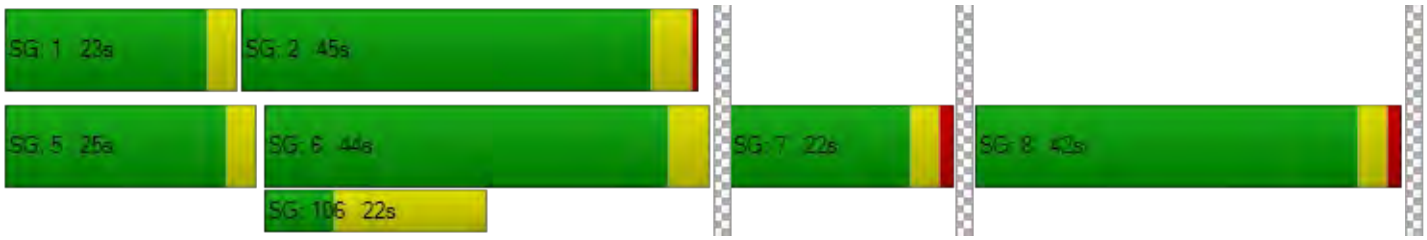
X, volume / capacity	0.59	0.59	0.84	0.82	0.33	0.77	0.83	0.83	0.76	0.45	0.45
d, Delay for Lane Group [s/veh]	24.25	24.15	32.06	35.55	28.12	39.70	29.41	29.41	41.19	23.92	23.97
Lane Group LOS	C	C	C	D	C	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	4.23	4.43	6.63	4.52	1.38	2.59	6.98	6.98	2.19	3.10	3.03
50th-Percentile Queue Length [ft]	105.72	110.70	165.83	112.90	34.60	64.78	174.41	174.41	54.78	77.56	75.86
95th-Percentile Queue Length [veh]	7.60	7.88	10.86	8.00	2.49	4.66	11.31	11.31	3.94	5.58	5.46
95th-Percentile Queue Length [ft]	190.03	196.97	271.43	200.03	62.29	116.61	282.70	282.70	98.61	139.60	136.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	24.20	24.15	32.06	35.55	35.55	28.12	39.70	29.41	29.41	41.19	23.94	23.97
Movement LOS	C	C	C	D	D	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	27.25			33.58			30.84			27.50		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	29.29											
Intersection LOS	C											
Intersection V/C	0.779											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	11.1
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.348

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	30	28	687	247	81	470
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.90	4.50	2.60	0.40	0.00	3.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	3	0	0	3
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]	30	28	690	247	81	473
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]	8	8	185	66	22	127
Total Analysis Volume [veh/h]	32	30	742	266	87	509
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	6	85	85	6	95
g / C, Green / Cycle	0.05	0.78	0.78	0.05	0.87
(v / s)_i Volume / Saturation Flow Rate	0.04	0.23	0.18	0.05	0.16
s, saturation flow rate [veh/h]	1473	3173	1448	1629	3137
c, Capacity [veh/h]	77	2458	1121	90	2717
d1, Uniform Delay [s]	51.58	3.64	3.42	51.87	1.18
k, delay calibration	0.08	0.50	0.50	0.26	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.69	0.32	0.50	60.61	0.15
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	0.81	0.30	0.24	0.97	0.19
d, Delay for Lane Group [s/veh]	65.27	3.96	3.92	112.48	1.33
Lane Group LOS	E	A	A	F	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.98	2.04	1.45	3.90	0.42
50th-Percentile Queue Length [ft]	49.50	50.91	36.33	97.47	10.53
95th-Percentile Queue Length [veh]	3.56	3.67	2.62	7.02	0.76
95th-Percentile Queue Length [ft]	89.10	91.64	65.39	175.44	18.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.27	65.27	3.96	3.92	112.48	1.33
Movement LOS	E	E	A	A	F	A
d_A, Approach Delay [s/veh]	65.27		3.95		17.56	
Approach LOS	E		A		B	
d_I, Intersection Delay [s/veh]	11.10					
Intersection LOS	B					
Intersection V/C	0.348					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	54.3
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.427

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	989	50	0	539	33	0	0	131	0	0	29
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	2.60	0.00	2.00	2.00	6.10	2.00	2.00	0.00	2.00	2.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	0	0	3	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]	0	992	50	0	542	33	0	0	131	0	0	29
Peak Hour Factor	1.0000	0.9100	0.9100	1.0000	0.9100	0.9100	1.0000	1.0000	0.9100	1.0000	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	273	14	0	0	0	0	0	36	0	0	0
Total Analysis Volume [veh/h]	0	1090	55	0	0	0	0	0	144	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	44	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	37	37		12	
g / C, Green / Cycle	0.33	0.33		0.11	
(v / s)_i Volume / Saturation Flow Rate	0.31	0.31		0.09	
s, saturation flow rate [veh/h]	1852	1821		1615	
c, Capacity [veh/h]	615	605		170	
d1, Uniform Delay [s]	35.53	35.80		48.37	
k, delay calibration	0.30	0.31		0.18	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	15.77	18.64		17.03	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

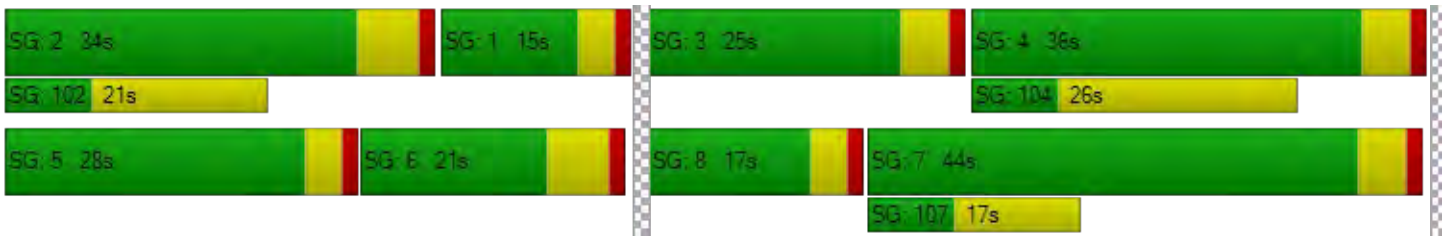
X, volume / capacity	0.93	0.95		0.85	
d, Delay for Lane Group [s/veh]	51.30	54.44		65.41	
Lane Group LOS	D	D		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	17.21	17.76		4.67	
50th-Percentile Queue Length [ft]	430.33	444.05		116.85	
95th-Percentile Queue Length [veh]	24.02	24.67		8.22	
95th-Percentile Queue Length [ft]	600.43	616.84		205.50	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	52.79	54.44	0.00	0.00	0.00	0.00	0.00	65.41	0.00	0.00	0.00
Movement LOS		D	D						E			
d_A, Approach Delay [s/veh]	52.87			0.00			65.41			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	54.27											
Intersection LOS	D											
Intersection V/C	0.427											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Junipero Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	67.0
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.925

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	80	309	462	273	680	161	108	606	144	444	663	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 [%]	27.00	2.50	5.80	1.90	2.20	0.90	1.00	2.00	0.60	1.50	0.80	2.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	4	0	2	2	2	8	0	7	5	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]	80	310	466	273	682	163	110	614	144	451	668	126
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	22	87	0	77	192	46	31	172	0	127	188	35
Total Analysis Volume [veh/h]	90	348	0	307	766	183	124	690	0	507	751	142
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

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	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	8	0	4	10	0	4	10	0
Maximum Green [s]	0	25	0	0	30	0	20	40	0	20	40	0
Amber [s]	0.0	3.9	0.0	0.0	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	25	0	0	36	0	15	21	0	28	34	0
Vehicle Extension [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
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	2.0	4.0	0.0	2.0	4.0	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	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	16	16	16	28	28	28	28	9	23	23	24	37	37
g / C, Green / Cycle	0.14	0.14	0.14	0.25	0.25	0.25	0.25	0.08	0.21	0.21	0.22	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate	0.13	0.12	0.00	0.17	0.23	0.20	0.11	0.07	0.19	0.19	0.28	0.21	0.09
s, saturation flow rate [veh/h]	1818	1687	1526	1776	1859	1692	1601	1792	1863	1863	1783	3589	1576
c, Capacity [veh/h]	262	243	220	449	470	428	405	153	383	383	388	1212	532
d1, Uniform Delay [s]	46.13	46.09	0.00	37.19	39.89	38.51	34.73	49.51	42.66	42.66	43.11	30.56	26.56
k, delay calibration	0.10	0.10	0.04	0.04	0.17	0.10	0.04	0.12	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	7.98	8.01	0.00	0.69	9.93	3.03	0.29	10.66	26.61	26.61	155.87	2.38	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	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

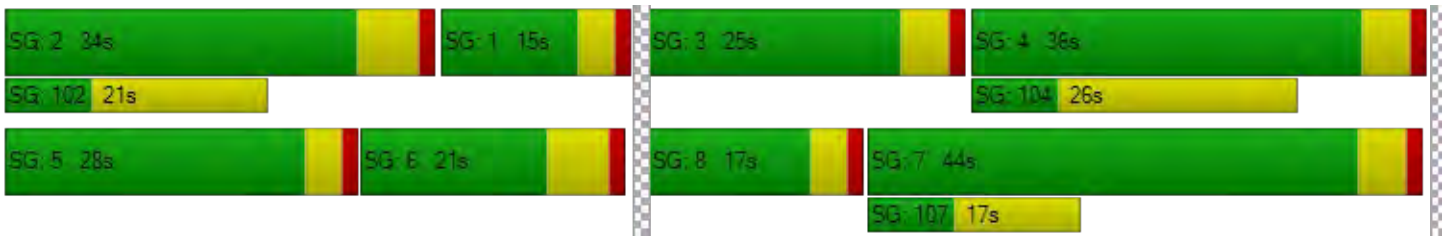
X, volume / capacity	0.87	0.86	0.00	0.68	0.91	0.80	0.45	0.81	0.90	0.90	1.31	0.62	0.27
d, Delay for Lane Group [s/veh]	54.11	54.10	0.00	37.88	49.82	41.53	35.02	60.17	69.27	69.27	198.98	32.94	27.78
Lane Group LOS	D	D	A	D	D	D	D	E	E	E	F	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	6.65	6.13	0.00	7.50	12.32	8.87	4.16	3.80	11.90	11.90	27.21	8.64	2.89
50th-Percentile Queue Length [ft]	166.23	153.37	0.00	187.4	308.0	221.7	103.9	94.93	297.39	297.39	680.36	215.91	72.19
95th-Percentile Queue Length [veh]	10.88	10.20	0.00	11.99	18.08	13.75	7.49	6.83	17.55	17.55	40.88	13.46	5.20
95th-Percentile Queue Length [ft]	271.96	254.92	0.00	299.7	451.9	343.8	187.1	170.87	438.80	438.80	1021.94	336.40	129.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	54.11	54.10	0.00	37.88	46.14	35.02	60.17	69.27	69.27	198.98	32.94	27.78
Movement LOS	D	D	A	D	D	D	E	E	E	F	C	C
d_A, Approach Delay [s/veh]	54.10			42.50			67.88			92.55		
Approach LOS	D			D			E			F		
d_I, Intersection Delay [s/veh]	67.02											
Intersection LOS	E											
Intersection V/C	0.925											

Sequence

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



19898 Daly City Serramonte Views TIA

Vistro File: K:\...\19898_Vistro_20170104.vistro
Scenario 9: Cumulative 2035 PM + Project

Report File: K:\...\CumPM_wProj_LOS_Summary.pdf
1/4/2017

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SB Hwy 1 Ramps / Clarinada Ave.	Signalized	HCM 2010	EB Right	0.731	16.2	B
2	NB Hwy 1 Ramps / Serramonte Blvd	Signalized	HCM 2010	WB Left	0.675	22.2	C
3	Callan Blvd / Serramonte Blvd	Signalized	HCM 2010	WB Left	0.726	28.9	C
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	EB Left	0.673	34.1	C
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	SB Thru	0.908	43.5	D
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	SB Right	0.798	16.6	B
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.541	4.7	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	SWB Left	0.999	69.5	E
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	NB Left	0.638	30.2	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.742	25.3	C
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.505	43.3	D
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.779	12.8	B
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	SB Thru	0.779	30.3	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	NB Left	0.637	17.7	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.427	54.1	D
16	Juniper Serra Blvd / Hickey Blvd	Signalized	HCM 2010	NWB Thru	0.926	75.0	E

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

Intersection Level Of Service Report
Intersection 1: SB Hwy 1 Ramps / Clarinada Ave.

Control Type:	Signalized	Delay (sec / veh):	16.2
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.731

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	517	322	58	102	367	106
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	7	0	5	7
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]	517	322	65	102	372	113
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	135	84	17	27	97	29
Total Analysis Volume [veh/h]	539	335	68	106	388	118
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permissive	Permissive	Permissive	Permissive	Protected	Permissive
Signal group	2	0	4	0	3	8
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	Lead	-
Minimum Green [s]	4	0	4	0	4	4
Maximum Green [s]	30	0	30	0	20	55
Amber [s]	3.5	0.0	3.5	0.0	3.5	3.5
All red [s]	0.5	0.0	0.5	0.0	0.5	0.5
Split [s]	35	0	31	0	24	55
Vehicle Extension [s]	3.0	0.0	3.0	0.0	3.0	3.0
Walk [s]	5	0	5	0	0	0
Pedestrian Clearance [s]	23	0	22	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
Minimum Recall	No		No		No	No
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	6.0	0.0	6.0	6.0
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	C	C	L	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	17	17	5	5	12	21
g / C, Green / Cycle	0.37	0.37	0.10	0.10	0.26	0.46
(v / s)_i Volume / Saturation Flow Rate	0.30	0.21	0.04	0.07	0.22	0.03
s, saturation flow rate [veh/h]	1774	1583	1863	1583	1774	3547
c, Capacity [veh/h]	661	590	196	167	470	1618
d1, Uniform Delay [s]	13.19	11.65	19.37	20.01	16.12	7.13
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.53	0.86	1.05	3.99	3.72	0.02
d3, Initial Queue Delay [s]	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
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

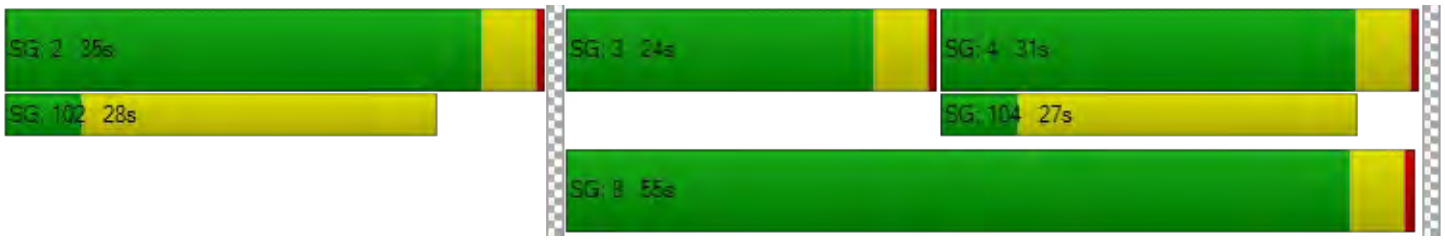
X, volume / capacity	0.82	0.57	0.35	0.64	0.83	0.07
d, Delay for Lane Group [s/veh]	15.73	12.51	20.42	23.99	19.84	7.15
Lane Group LOS	B	B	C	C	B	A
Critical Lane Group	Yes	No	No	Yes	Yes	No
50th-Percentile Queue Length [veh]	4.51	2.36	0.67	1.17	3.77	0.26
50th-Percentile Queue Length [ft]	112.63	58.97	16.72	29.22	94.14	6.42
95th-Percentile Queue Length [veh]	7.99	4.25	1.20	2.10	6.78	0.46
95th-Percentile Queue Length [ft]	199.65	106.15	30.09	52.59	169.44	11.55

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.73	12.51	20.42	23.99	19.84	7.15
Movement LOS	B	B	C	C	B	A
d_A, Approach Delay [s/veh]	14.50		22.60		16.88	
Approach LOS	B		C		B	
d_I, Intersection Delay [s/veh]	16.18					
Intersection LOS	B					
Intersection V/C	0.731					

Sequence

Ring 1	-	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-
Ring 2	-	-	-	8	-	-	-	-	-	-	-	-	-	-	-	-
Ring 3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ring 4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-



Intersection Level Of Service Report
Intersection 2: NB Hwy 1 Ramps / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	22.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.675

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	2	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	13	37	57	60	79	295	352	226	41	78	318	301
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	15	0	0	0	2	0	0	7	16
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]	13	37	57	75	79	295	352	228	41	78	325	317
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
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	0.0000
Total 15-Minute Volume [veh/h]	4	11	17	22	23	87	104	67	12	23	96	0
Total Analysis Volume [veh/h]	15	44	67	88	93	347	414	268	48	92	382	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	2	0	0	6	0	7	4	0	3	8	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	0	4	0	0	4	0	4	4	0	4	4	0
Maximum Green [s]	0	25	0	0	25	0	20	60	0	30	40	0
Amber [s]	0.0	3.5	0.0	0.0	3.5	0.0	3.5	3.5	0.0	3.5	3.5	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	27	0	0	31	0	12	38	0	14	40	0
Vehicle Extension [s]	0.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	18	0	0	18	0	0	11	0	0	31	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	5	14	14	9	13	4	8	8
g / C, Green / Cycle	0.10	0.27	0.27	0.17	0.26	0.07	0.15	0.15
(v / s)_i Volume / Saturation Flow Rate	0.07	0.10	0.22	0.12	0.17	0.05	0.10	0.10
s, saturation flow rate [veh/h]	1694	1819	1583	3445	1814	1774	1863	1863
c, Capacity [veh/h]	167	491	428	595	465	123	285	285
d1, Uniform Delay [s]	22.99	15.49	17.86	20.37	17.53	23.91	20.93	20.93
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	6.75	0.46	3.74	1.48	1.75	8.67	2.72	2.72
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

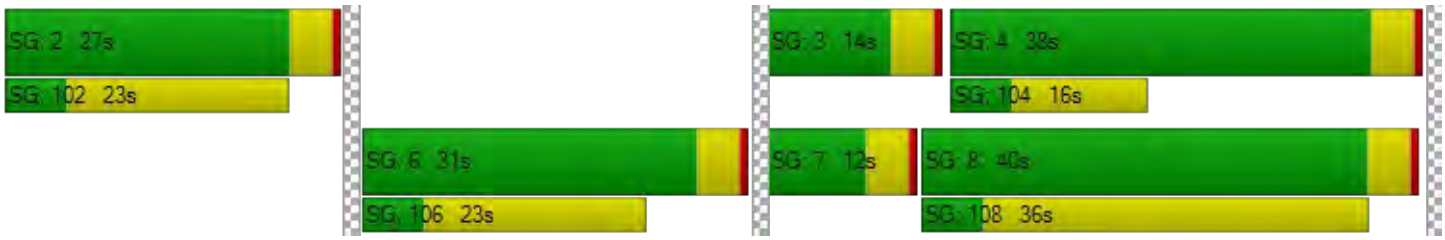
X, volume / capacity	0.75	0.37	0.81	0.70	0.68	0.75	0.67	0.67
d, Delay for Lane Group [s/veh]	29.74	15.95	21.61	21.85	19.29	32.58	23.64	23.64
Lane Group LOS	C	B	C	C	B	C	C	C
Critical Lane Group	Yes	No	Yes	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	1.70	1.61	3.87	2.27	3.25	1.33	2.21	2.21
50th-Percentile Queue Length [ft]	42.49	40.26	96.65	56.63	81.18	33.14	55.35	55.35
95th-Percentile Queue Length [veh]	3.06	2.90	6.96	4.08	5.85	2.39	3.99	3.99
95th-Percentile Queue Length [ft]	76.48	72.47	173.97	101.94	146.13	59.65	99.63	99.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.74	29.74	29.74	15.95	15.95	21.61	21.85	19.29	19.29	32.58	23.64	23.64
Movement LOS	C	C	C	B	B	C	C	B	B	C	C	C
d_A, Approach Delay [s/veh]	29.74			19.67			20.74			25.38		
Approach LOS	C			B			C			C		
d_I, Intersection Delay [s/veh]	22.23											
Intersection LOS	C											
Intersection V/C	0.675											

Sequence

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



Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	28.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.726

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	109	246	117	194	231	166	102	362	67	198	451	302
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	6	7	0	0	0	17	0	7	23	12
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]	109	246	123	201	231	166	102	379	67	205	474	314
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	28	64	32	52	60	43	27	99	17	53	123	82
Total Analysis Volume [veh/h]	114	256	128	209	241	173	106	395	70	214	494	327
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	100
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	8	0	7	4	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	4	4	0	4	4	0	4	4	0	4	4	0
Maximum Green [s]	4	35	0	15	40	0	10	35	0	10	30	0
Amber [s]	3.5	3.5	0.0	3.5	3.5	0.0	3.5	3.5	0.0	3.5	3.5	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0	0.5	0.5	0.0
Split [s]	18	39	0	15	36	0	12	35	0	11	34	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	5	0	0	5	0	0	5	0	0	5	0
Pedestrian Clearance [s]	0	30	0	0	22	0	0	26	0	0	25	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Minimum Recall	Yes	Yes		No	Yes		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	6.0	0.0	6.0	0.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	L	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	0.00	2.00	0.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
g_i, Effective Green Time [s]	36	17	36	28	28	6	16	16	10	20	20
g / C, Green / Cycle	0.48	0.24	0.48	0.37	0.37	0.08	0.22	0.22	0.14	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.14	0.20	0.21	0.13	0.11	0.06	0.13	0.13	0.12	0.24	0.24
s, saturation flow rate [veh/h]	1267	1582	995	1863	1583	1774	1863	1767	1774	1863	1618
c, Capacity [veh/h]	695	374	321	697	592	137	409	388	240	518	450
d1, Uniform Delay [s]	10.96	26.91	23.21	16.62	16.24	33.44	25.77	25.80	31.38	25.18	25.19
k, delay calibration	0.50	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.30	0.14	0.14
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
d2, Incremental Delay [s]	0.91	5.33	2.23	0.29	0.27	8.97	1.31	1.41	24.32	5.16	5.90
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

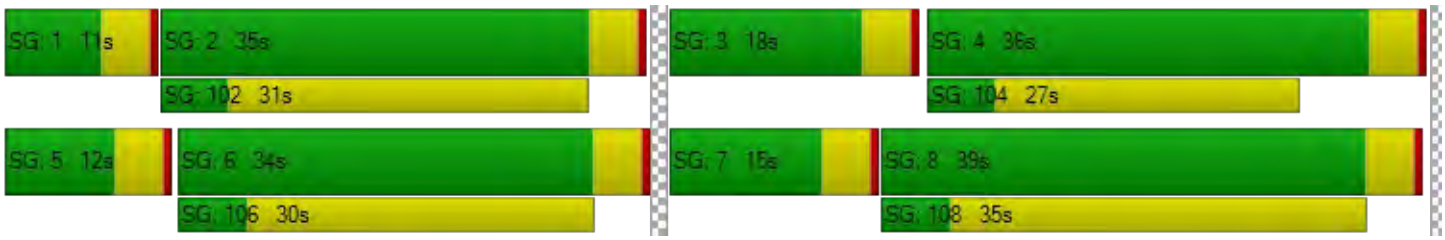
X, volume / capacity	0.26	0.85	0.65	0.35	0.29	0.77	0.58	0.59	0.89	0.85	0.85
d, Delay for Lane Group [s/veh]	11.87	32.24	25.44	16.91	16.51	42.40	27.07	27.21	55.70	30.34	31.09
Lane Group LOS	B	C	C	B	B	D	C	C	E	C	C
Critical Lane Group	No	Yes	Yes	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	1.73	5.60	1.63	2.81	1.97	2.14	3.71	3.57	5.23	7.58	6.68
50th-Percentile Queue Length [ft]	43.19	139.88	40.87	70.20	49.36	53.62	92.87	89.21	130.64	189.43	166.99
95th-Percentile Queue Length [veh]	3.11	9.47	2.94	5.05	3.55	3.86	6.69	6.42	8.97	12.09	10.92
95th-Percentile Queue Length [ft]	77.74	236.86	73.56	126.35	88.86	96.52	167.16	160.58	224.37	302.29	272.96

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.87	26.87	32.24	25.44	16.91	16.51	42.40	27.13	27.21	55.70	30.42	31.09
Movement LOS	B	C	C	C	B	B	D	C	C	E	C	C
d_A, Approach Delay [s/veh]	24.82			19.66			29.97			35.86		
Approach LOS	C			B			C			D		
d_I, Intersection Delay [s/veh]	28.91											
Intersection LOS	C											
Intersection V/C	0.726											

Sequence

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



Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	34.1
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.673

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	1	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	285.00	100.00	100.00	200.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	321	0	286	222	400	0	53	0	578	425
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	42	12	53	0	14	0	0	0	30	0	124	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	42	12	53	321	14	286	222	400	30	53	124	578	425
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	0.9500	0.950	1.000	0.950	0.950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	11	3	14	84	4	75	58	105	8	14	31	152	112
Total Analysis Volume [veh/h]	44	13	56	338	14	301	234	421	32	56	124	608	447
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	115
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permi	Prote	Permi	Overl
Signal group	0	8	0	4	4	0	1	6	0	0	5	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	Lead	-	-
Minimum Green [s]	0	6	0	6	6	0	4	8	0	0	4	8	8
Maximum Green [s]	0	30	0	30	30	0	20	40	0	0	20	40	40
Amber [s]	0.0	3.0	0.0	3.0	3.0	0.0	3.0	3.6	0.0	0.0	3.0	3.6	3.6
All red [s]	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	0.0	1.0	1.0	1.0
Split [s]	0	31	0	31	31	0	23	13	0	0	40	30	30
Vehicle Extension [s]	0.0	2.5	0.0	2.5	2.5	0.0	2.0	3.0	0.0	0.0	3.0	3.0	3.0
Walk [s]	0	7	0	7	7	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	20	0	20	20	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.6	0.0	0.0	2.0	2.6	2.6
Minimum Recall		No			No		No	No			No	No	No
Maximum Recall		No			No		No	No			No	No	No
Pedestrian Recall		No			No		No	No			No	No	No
Detector Location [ft]	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.60	4.60	4.00	4.60	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.60	2.60	2.00	2.60	0.00
g_i, Effective Green Time [s]	10	28	28	17	47	47	14	44	90
g / C, Green / Cycle	0.09	0.24	0.24	0.15	0.41	0.41	0.12	0.38	0.78
(v / s)_i Volume / Saturation Flow Rate	0.07	0.19	0.21	0.13	0.12	0.12	0.10	0.17	0.28
s, saturation flow rate [veh/h]	1579	1774	1583	1774	1863	1817	1774	3547	1583
c, Capacity [veh/h]	180	428	382	263	758	739	214	1345	1239
d1, Uniform Delay [s]	51.61	40.93	41.82	48.12	23.09	23.10	49.56	26.78	3.80
k, delay calibration	0.08	0.08	0.08	0.25	0.50	0.50	0.11	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	2.64	2.45	4.35	19.45	1.03	1.05	8.60	1.10	0.82
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

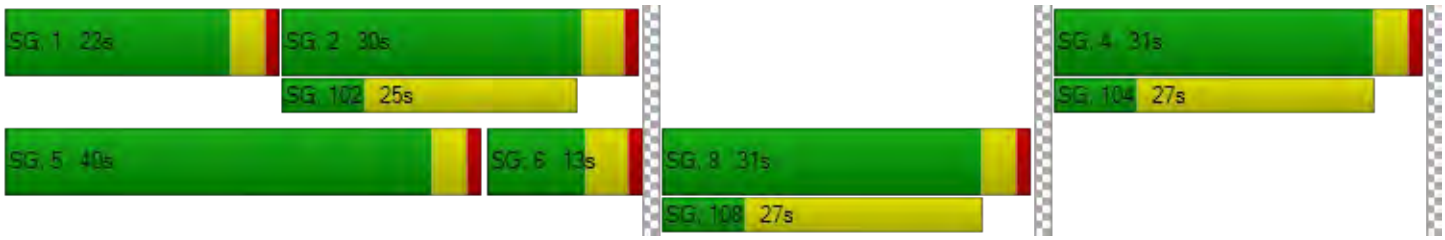
X, volume / capacity	0.63	0.79	0.86	0.89	0.30	0.30	0.84	0.45	0.36
d, Delay for Lane Group [s/veh]	54.25	43.38	46.16	67.57	24.12	24.15	58.16	27.88	4.62
Lane Group LOS	D	D	D	E	C	C	E	C	A
Critical Lane Group	Yes	No	Yes	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	3.33	9.22	9.34	7.99	4.41	4.31	5.57	6.42	2.81
50th-Percentile Queue Length [ft]	83.33	230.44	233.48	199.66	110.17	107.85	139.17	160.39	70.34
95th-Percentile Queue Length [veh]	6.00	14.20	14.35	12.62	7.85	7.72	9.44	10.57	5.06
95th-Percentile Queue Length [ft]	149.99	354.92	358.78	315.53	196.23	193.01	235.90	264.23	126.61

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	54.25	54.25	54.25	43.47	46.16	46.16	67.57	24.13	24.15	58.16	58.16	27.88	4.62
Movement LOS	D	D	D	D	D	D	E	C	C	E	E	C	A
d_A, Approach Delay [s/veh]	54.25			44.75			38.93			23.87			
Approach LOS	D			D			D			C			
d_I, Intersection Delay [s/veh]	34.13												
Intersection LOS	C												
Intersection V/C	0.673												

Sequence

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



Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	43.5
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.908

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	442	290	711	446	344	55	45	309	324	640	510	582
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	30	0	0	0	0	0	0	26	27	0	94	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]	472	290	711	446	344	55	45	335	351	640	604	582
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
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]	122	75	183	115	89	14	12	86	90	165	156	150
Total Analysis Volume [veh/h]	487	299	733	460	355	57	46	345	362	660	623	600
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	13.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	0	3	3	0	4	0	5	2	2	1	6	6
Auxiliary Signal Groups		3	1,3						2,3			4,6
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	4	4	0	4	0	4	6	6	4	6	6
Maximum Green [s]	0	25	25	0	30	0	20	26	26	25	26	26
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	20	20	0	25	0	12	35	35	30	53	53
Vehicle Extension [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	0	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	1.5	1.5	0.0	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		No	No		No		No	No	No	No	No	No
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	17	17	69	21	21	4	34	54	24	54	79
g / C, Green / Cycle	0.15	0.15	0.62	0.19	0.19	0.03	0.31	0.49	0.22	0.49	0.72
(v / s)_i Volume / Saturation Flow Rate	0.14	0.16	0.26	0.17	0.23	0.03	0.10	0.23	0.19	0.33	0.21
s, saturation flow rate [veh/h]	3445	1863	2803	2741	1818	1774	3547	1583	3445	1863	2803
c, Capacity [veh/h]	518	280	1745	540	351	60	1094	785	742	913	2004
d1, Uniform Delay [s]	46.27	46.75	10.61	45.22	44.39	52.72	29.16	18.13	41.89	21.51	5.69
k, delay calibration	0.04	0.48	0.05	0.04	0.50	0.04	0.50	0.50	0.04	0.50	0.05
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
d2, Incremental Delay [s]	3.87	72.15	0.08	1.51	103.63	7.28	0.76	1.95	1.51	4.13	0.04
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.94	1.07	0.42	0.85	1.17	0.76	0.32	0.46	0.89	0.68	0.30
d, Delay for Lane Group [s/veh]	50.14	118.90	10.69	46.73	148.02	60.00	29.92	20.08	43.40	25.64	5.73
Lane Group LOS	D	F	B	D	F	E	C	C	D	C	A
Critical Lane Group	No	No	Yes	No	Yes	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	6.83	13.21	4.30	6.29	19.59	1.38	3.61	6.31	8.77	12.95	2.23
50th-Percentile Queue Length [ft]	170.66	330.33	107.52	157.34	489.69	34.51	90.19	157.85	219.17	323.82	55.75
95th-Percentile Queue Length [veh]	11.11	19.78	7.70	10.41	29.09	2.48	6.49	10.44	13.62	18.86	4.01
95th-Percentile Queue Length [ft]	277.78	494.62	192.55	260.20	727.32	62.11	162.34	260.88	340.57	471.38	100.36

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	50.14	118.90	10.69	46.73	148.02	148.02	60.00	29.92	20.08	43.40	25.64	5.73
Movement LOS	D	F	B	D	F	F	E	C	C	D	C	A
d_A, Approach Delay [s/veh]	44.64			94.59			27.02			25.52		
Approach LOS	D			F			C			C		
d_I, Intersection Delay [s/veh]	43.50											
Intersection LOS	D											
Intersection V/C	0.908											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	16.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.798

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	691	759	981	0	0	1424
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	43	51	0	0	26
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]	691	802	1032	0	0	1450
Peak Hour Factor	0.9900	0.9900	0.9900	1.0000	1.0000	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	174	203	261	0	0	366
Total Analysis Volume [veh/h]	698	810	1042	0	0	1465
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	30	30	43	0	0	42
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		No			No
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	24	24	42	43
g / C, Green / Cycle	0.32	0.32	0.57	0.58
(v / s)_i Volume / Saturation Flow Rate	0.20	0.29	0.29	0.41
s, saturation flow rate [veh/h]	3445	2803	3547	3547
c, Capacity [veh/h]	1109	902	2011	2059
d1, Uniform Delay [s]	21.57	24.19	9.93	11.22
k, delay calibration	0.04	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.22	1.36	0.96	2.12
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.63	0.90	0.52	0.71
d, Delay for Lane Group [s/veh]	21.79	25.55	10.89	13.35
Lane Group LOS	C	C	B	B
Critical Lane Group	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	4.95	6.56	4.79	7.90
50th-Percentile Queue Length [ft]	123.64	164.08	119.66	197.61
95th-Percentile Queue Length [veh]	8.59	10.76	8.37	12.52
95th-Percentile Queue Length [ft]	214.82	269.12	209.36	312.88

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.79	25.55	10.89	0.00	0.00	13.35
Movement LOS	C	C	B			B
d_A, Approach Delay [s/veh]	23.81		10.89		13.35	
Approach LOS	C		B		B	
d_I, Intersection Delay [s/veh]	16.64					
Intersection LOS	B					
Intersection V/C	0.798					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	4.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.541

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	525	1578	1007	0	0	0
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	10	16	51	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]	535	1594	1058	0	0	0
Peak Hour Factor	0.9800	0.9800	0.9800	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	136	407	270	0	0	0
Total Analysis Volume [veh/h]	546	1627	1080	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2,6				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	4.10	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	0.00	2.10	
g_i, Effective Green Time [s]	10	38	25	
g / C, Green / Cycle	0.23	0.91	0.59	
(v / s)_i Volume / Saturation Flow Rate	0.16	0.46	0.30	
s, saturation flow rate [veh/h]	3445	3547	3547	
c, Capacity [veh/h]	796	3217	2085	
d1, Uniform Delay [s]	14.75	0.33	5.13	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	1.06	0.12	0.20	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.69	0.51	0.52	
d, Delay for Lane Group [s/veh]	15.81	0.46	5.33	
Lane Group LOS	B	A	A	
Critical Lane Group	Yes	No	Yes	
50th-Percentile Queue Length [veh]	2.08	0.06	1.53	
50th-Percentile Queue Length [ft]	52.06	1.38	38.26	
95th-Percentile Queue Length [veh]	3.75	0.10	2.76	
95th-Percentile Queue Length [ft]	93.70	2.49	68.88	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	15.81	0.46	5.33	0.00	0.00	0.00
Movement LOS	B	A	A			
d_A, Approach Delay [s/veh]	4.31		5.33		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.65					
Intersection LOS	A					
Intersection V/C	0.541					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	69.5
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.999

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	380	0	980	234	423	702	546	83
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	9	7	0	14	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]	0	0	0	0	380	0	989	241	423	716	546	83
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9100	1.0000	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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	0	0	0	104	0	272	66	116	197	150	23
Total Analysis Volume [veh/h]	0	0	0	0	418	0	1087	265	465	787	600	91
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lag	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	23	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		17	39	39	20	41	41	41
g / C, Green / Cycle		0.14	0.33	0.33	0.17	0.34	0.34	0.34
(v / s)_i Volume / Saturation Flow Rate		0.12	0.31	0.17	0.26	0.26	0.28	0.31
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1739	1583
c, Capacity [veh/h]		493	1155	516	295	641	598	545
d1, Uniform Delay [s]		50.17	39.38	32.80	50.05	35.14	36.06	37.51
k, delay calibration		0.11	0.11	0.11	0.50	0.48	0.50	0.50
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		4.12	4.59	0.79	274.02	8.33	12.19	20.97
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.85	0.94	0.51	1.57	0.77	0.82	0.90
d, Delay for Lane Group [s/veh]		54.29	43.97	33.59	324.07	43.47	48.25	58.48
Lane Group LOS		D	D	C	F	D	D	E
Critical Lane Group		No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh]		6.39	16.08	6.35	31.30	14.19	15.06	16.72
50th-Percentile Queue Length [ft]		159.68	402.09	158.66	782.59	354.69	376.40	417.95
95th-Percentile Queue Length [veh]		10.53	22.66	10.48	48.47	20.37	21.42	23.42
95th-Percentile Queue Length [ft]		263.30	566.52	261.95	1211.87	509.13	535.48	585.59

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	54.29	0.00	43.97	33.59	324.07	45.26	55.10	58.48
Movement LOS					D		D	C	F	D	E	E
d_A, Approach Delay [s/veh]	0.00				44.85				115.64			
Approach LOS	A				D				F			
d_I, Intersection Delay [s/veh]	69.53											
Intersection LOS	E											
Intersection V/C	0.999											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	152	522	521	298	111	332	165	205
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	26	0	0	0	0	0	11	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	178	522	521	298	111	332	176	205
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	49	143	143	82	30	91	48	0
Total Analysis Volume [veh/h]	196	574	573	327	122	365	193	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	34	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	29	29	29	16	16	16	16
g / C, Green / Cycle	0.24	0.24	0.24	0.13	0.13	0.13	0.13
(v / s)_i Volume / Saturation Flow Rate	0.22	0.16	0.21	0.07	0.11	0.11	0.11
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1823	1583
c, Capacity [veh/h]	843	868	387	237	248	243	211
d1, Uniform Delay [s]	44.12	40.87	43.18	48.44	50.42	50.43	50.50
k, delay calibration	0.11	0.11	0.32	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	4.39	0.87	13.65	1.74	5.58	5.75	6.91
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

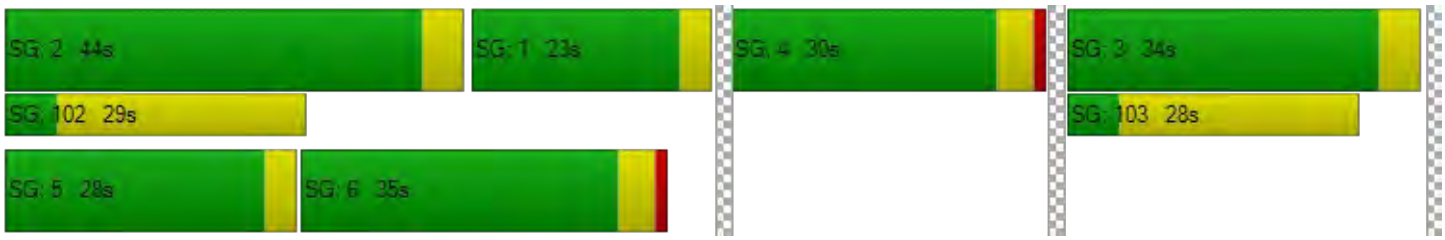
X, volume / capacity	0.91	0.66	0.84	0.52	0.79	0.79	0.80
d, Delay for Lane Group [s/veh]	48.51	41.73	56.83	50.17	56.00	56.18	57.41
Lane Group LOS	D	D	E	D	E	E	E
Critical Lane Group	Yes	No	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	11.56	7.72	10.65	3.52	6.09	5.98	5.33
50th-Percentile Queue Length [ft]	288.99	192.93	266.24	88.00	152.25	149.57	133.22
95th-Percentile Queue Length [veh]	17.14	12.27	16.00	6.34	10.14	9.99	9.11
95th-Percentile Queue Length [ft]	428.38	306.82	400.04	158.39	253.42	249.86	227.86

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	48.51	48.51	41.73	56.83	50.17	56.08	56.18	57.41
Movement LOS	D	D	D	E	D	E	E	E
d_A, Approach Delay [s/veh]	47.81				55.35			
Approach LOS	D				E			
d_I, Intersection Delay [s/veh]	69.53							
Intersection LOS	E							
Intersection V/C	0.999							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	30.2
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.638

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	161	895	118	173	848	14	58	20	48	253	10	188
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	19	0	8	19	0	0	0	0	0	0	11
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]	161	914	118	181	867	14	58	20	48	253	10	199
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	44	251	32	50	238	4	16	5	13	70	3	55
Total Analysis Volume [veh/h]	177	1004	130	199	953	15	64	22	53	278	11	219
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	88.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	15	53	0	21	59	0	0	36	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	Yes		No	Yes			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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	54	54	14	56	56	31	31	31
g / C, Green / Cycle	0.10	0.49	0.49	0.13	0.51	0.51	0.28	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.10	0.21	0.21	0.11	0.18	0.18	0.14	0.26	0.14
s, saturation flow rate [veh/h]	1774	3547	1756	1774	3547	1848	1007	1114	1583
c, Capacity [veh/h]	187	1737	860	229	1821	949	329	376	442
d1, Uniform Delay [s]	48.84	18.19	18.19	46.95	15.86	15.86	33.10	40.16	33.11
k, delay calibration	0.38	0.50	0.50	0.22	0.50	0.50	0.11	0.37	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	44.90	0.80	1.61	18.07	0.53	1.02	0.86	10.81	0.86
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.44	0.44	0.87	0.35	0.35	0.42	0.77	0.50
d, Delay for Lane Group [s/veh]	93.73	18.99	19.81	65.02	16.39	16.87	33.96	50.98	33.97
Lane Group LOS	F	B	B	E	B	B	C	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	7.14	6.32	6.46	6.46	4.78	5.11	3.16	8.70	4.96
50th-Percentile Queue Length [ft]	178.46	158.09	161.48	161.58	119.43	127.71	79.01	217.41	124.06
95th-Percentile Queue Length [veh]	11.52	10.45	10.63	10.63	8.36	8.81	5.69	13.53	8.62
95th-Percentile Queue Length [ft]	288.01	261.20	265.68	265.81	209.04	220.37	142.22	338.32	215.40

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	93.73	19.19	19.81	65.02	16.55	16.87	33.96	33.96	33.96	50.98	50.98	33.97
Movement LOS	F	B	B	E	B	B	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	29.32			24.82			33.96			43.64		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	30.17											
Intersection LOS	C											
Intersection V/C	0.638											

Sequence

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

Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	25.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.742

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	141	430	62	68	624	87	54	242	39	22	234	213
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	4	0	0	0	0	0	0	2	0	0	3	4
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]	145	430	62	68	624	87	54	244	39	22	237	217
Peak Hour Factor	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440
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]	38	114	16	18	165	23	14	65	10	6	63	57
Total Analysis Volume [veh/h]	154	456	66	72	661	92	57	258	41	23	251	230
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	138
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	7	20	20	4	17	17	3	22	22	2	21
g / C, Green / Cycle	0.11	0.31	0.31	0.06	0.25	0.25	0.05	0.34	0.34	0.03	0.32
(v / s)_i Volume / Saturation Flow Rate	0.09	0.14	0.14	0.04	0.21	0.21	0.03	0.14	0.03	0.01	0.28
s, saturation flow rate [veh/h]	1774	1863	1782	1774	1863	1784	1774	1863	1583	1774	1718
c, Capacity [veh/h]	202	581	556	99	474	454	88	631	537	47	542
d1, Uniform Delay [s]	28.21	18.11	18.12	30.45	22.97	22.98	30.60	16.63	14.71	31.49	21.33
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.16
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
d2, Incremental Delay [s]	5.92	0.57	0.60	9.56	3.40	3.56	7.78	0.43	0.06	7.81	7.20
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.76	0.46	0.46	0.72	0.81	0.81	0.65	0.41	0.08	0.49	0.89
d, Delay for Lane Group [s/veh]	34.13	18.68	18.72	40.01	26.37	26.54	38.37	17.06	14.77	39.30	28.53
Lane Group LOS	C	B	B	D	C	C	D	B	B	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.56	3.08	2.96	1.33	5.61	5.40	1.04	2.81	0.39	0.45	7.47
50th-Percentile Queue Length [ft]	64.02	77.02	74.12	33.36	140.33	135.07	25.92	70.22	9.83	11.16	186.65
95th-Percentile Queue Length [veh]	4.61	5.55	5.34	2.40	9.50	9.21	1.87	5.06	0.71	0.80	11.95
95th-Percentile Queue Length [ft]	115.24	138.63	133.41	60.04	237.47	230.37	46.65	126.39	17.69	20.08	298.67

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	34.13	18.69	18.72	40.01	26.44	26.54	38.37	17.06	14.77	39.30	28.53	28.53
Movement LOS	C	B	B	D	C	C	D	B	B	D	C	C
d_A, Approach Delay [s/veh]	22.21			27.64			20.21			29.02		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	25.26											
Intersection LOS	C											
Intersection V/C	0.742											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	43.3
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.505

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	78	305	262	535	418	220	131	397	19	407	498	767
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	7	0	14	5	0	0	0	0	0	0	12
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]	78	312	262	549	423	220	131	397	19	407	498	779
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	20	81	68	143	110	57	34	103	5	106	130	203
Total Analysis Volume [veh/h]	81	325	273	572	441	229	136	414	20	424	519	811
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Overlap
Signal group	8	8	0	7	7	0	5	2	0	1	6	6
Auxiliary Signal Groups												6,7
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	10	0	6	10	10
Maximum Green [s]	27	27	0	22	22	0	22	30	0	27	30	30
Amber [s]	3.2	3.2	0.0	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	4.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	33	33	0	31	31	0	11	31	0	25	45	45
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	4.0
Walk [s]	7	7	0	7	7	0	0	7	0	0	7	7
Pedestrian Clearance [s]	25	25	0	23	23	0	0	22	0	0	23	23
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	2.2	2.2	0.0	2.2	2.2	0.0	1.0	2.0	0.0	1.0	2.0	2.0
Minimum Recall		No			No		No	Yes		No	Yes	Yes
Maximum Recall		No			No		No	No		No	No	No
Pedestrian Recall		No			No		No	No		No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	6.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	0.00
g_i, Effective Green Time [s]	23	23	23	23	33	33	33	33	8	32	32	17	41	78
g / C, Green / Cycle	0.19	0.19	0.19	0.19	0.27	0.27	0.27	0.27	0.07	0.27	0.27	0.14	0.34	0.65
(v / s)_i Volume / Saturation Flow Rate	0.05	0.11	0.08	0.17	0.19	0.19	0.19	0.14	0.08	0.12	0.01	0.12	0.15	0.51
s, saturation flow rate [veh/h]	1774	1863	1695	1583	1774	1803	1695	1583	1774	3547	1583	3445	3547	1583
c, Capacity [veh/h]	338	355	323	301	482	490	461	430	119	954	426	484	1215	1028
d1, Uniform Delay [s]	41.22	43.96	42.57	47.53	39.39	39.38	39.36	37.19	55.99	36.31	32.49	50.53	30.37	15.11
k, delay calibration	0.04	0.04	0.04	0.19	0.19	0.19	0.19	0.04	0.50	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.13	0.50	0.30	16.20	3.32	3.24	3.39	0.38	127.67	1.44	0.21	2.02	1.10	6.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.55	0.40	0.91	0.71	0.71	0.71	0.53	1.15	0.43	0.05	0.88	0.43	0.79
d, Delay for Lane Group [s/veh]	41.35	44.47	42.87	63.73	42.71	42.62	42.75	37.57	183.66	37.76	32.69	52.55	31.47	21.24
Lane Group LOS	D	D	D	E	D	D	D	D	F	D	C	D	C	C
Critical Lane Group	No	No	No	Yes	No	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.06	5.33	3.39	9.31	9.48	9.61	9.03	5.77	7.79	5.23	0.46	6.36	5.97	16.38
50th-Percentile Queue Length [ft]	51.46	133.3	84.73	232.6	236.9	240.2	225.7	144.1	194.74	130.76	11.51	159.10	149.36	409.43
95th-Percentile Queue Length [veh]	3.71	9.12	6.10	14.31	14.53	14.69	13.96	9.70	12.92	8.98	0.83	10.50	9.98	23.01
95th-Percentile Queue Length [ft]	92.63	228.0	152.5	357.7	363.2	367.3	348.8	242.6	322.90	224.53	20.71	262.53	249.57	575.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	41.35	43.83	63.73	42.67	42.71	37.57	183.66	37.76	32.69	52.55	31.47	21.24
Movement LOS	D	D	E	D	D	D	F	D	C	D	C	C
d_A, Approach Delay [s/veh]	51.53			41.75			72.39			31.84		
Approach LOS	D			D			E			C		
d_I, Intersection Delay [s/veh]	43.33											
Intersection LOS	D											
Intersection V/C	0.505											

Sequence

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

Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	12.8
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.779

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	349	6	202	0	822	241	286	1457	0
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	1	13	0	12	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]	0	0	0	349	6	202	0	823	254	286	1469	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.8100	0.8100	0.8100	1.0000	0.8100	0.8100	0.8100	0.8100	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	108	2	62	0	254	0	88	453	0
Total Analysis Volume [veh/h]	0	0	0	431	7	249	0	1016	0	353	1814	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		11	11	11	23	23	8	35
g / C, Green / Cycle		0.20	0.20	0.20	0.44	0.44	0.15	0.65
(v / s)_i Volume / Saturation Flow Rate		0.13	0.13	0.14	0.27	0.27	0.10	0.51
s, saturation flow rate [veh/h]		1774	1746	1583	1863	1863	3445	3547
c, Capacity [veh/h]		353	348	315	819	819	525	2298
d1, Uniform Delay [s]		19.84	19.85	19.89	11.57	11.57	21.44	6.80
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.22	2.28	2.62	0.77	0.77	1.50	0.63
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.67	0.67	0.68	0.62	0.62	0.67	0.79
d, Delay for Lane Group [s/veh]		22.06	22.12	22.52	12.34	12.34	22.94	7.43
Lane Group LOS		C	C	C	B	B	C	A
Critical Lane Group		No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]		2.68	2.65	2.48	3.96	3.96	2.02	4.53
50th-Percentile Queue Length [ft]		67.10	66.36	61.90	98.99	98.99	50.39	113.34
95th-Percentile Queue Length [veh]		4.83	4.78	4.46	7.13	7.13	3.63	8.03
95th-Percentile Queue Length [ft]		120.77	119.44	111.41	178.19	178.19	90.70	200.63

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	22.09	22.12	22.48	0.00	12.34	12.34	22.94	7.43	0.00
Movement LOS				C	C	C		B	B	C	A	
d_A, Approach Delay [s/veh]	0.00			22.23			12.34			9.95		
Approach LOS	A			C			B			A		
d_I, Intersection Delay [s/veh]	12.76											
Intersection LOS	B											
Intersection V/C	0.779											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	30.3
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.779

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	735	42	261	49	77	41	167	931	131	180	796	49
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	11	0	0	0	0	0	0	1	0	0	1	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]	746	42	261	49	77	41	167	932	131	180	797	49
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	191	11	67	13	20	10	43	238	0	46	204	13
Total Analysis Volume [veh/h]	764	43	267	50	79	42	171	954	0	184	816	50
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	123
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	32	32	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	7	7	9	23	23	10	24	24
g / C, Green / Cycle	0.27	0.27	0.27	0.10	0.10	0.12	0.30	0.30	0.13	0.31	0.31
(v / s)_i Volume / Saturation Flow Rate	0.23	0.23	0.17	0.07	0.03	0.10	0.26	0.26	0.10	0.23	0.23
s, saturation flow rate [veh/h]	1774	1783	1583	1827	1583	1774	1863	1863	1774	1863	1825
c, Capacity [veh/h]	484	487	432	176	153	215	561	561	229	587	575
d1, Uniform Delay [s]	26.43	26.39	24.56	33.94	32.40	33.00	25.38	25.38	32.69	23.68	23.69
k, delay calibration	0.18	0.17	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	6.02	5.76	1.44	5.78	0.97	6.50	3.75	3.75	6.47	1.91	1.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

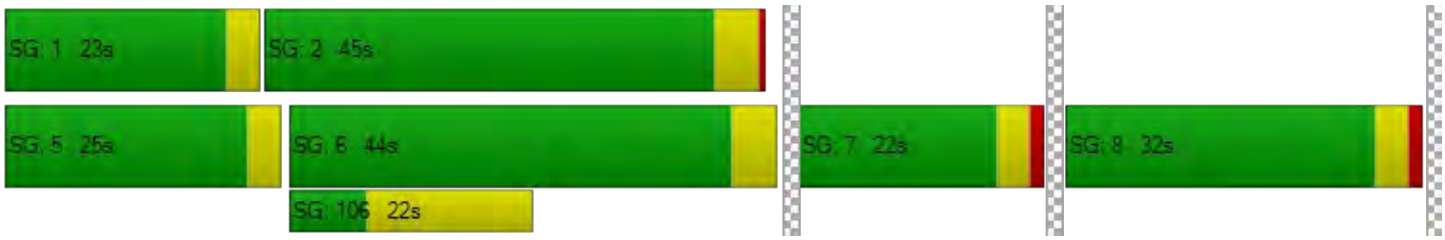
X, volume / capacity	0.83	0.83	0.62	0.73	0.28	0.79	0.85	0.85	0.80	0.75	0.75
d, Delay for Lane Group [s/veh]	32.45	32.15	26.00	39.72	33.37	39.50	29.13	29.13	39.17	25.59	25.63
Lane Group LOS	C	C	C	D	C	D	C	C	D	C	C
Critical Lane Group	Yes	No	No	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	7.43	7.39	4.24	2.57	0.75	3.40	8.33	8.33	3.65	7.04	6.91
50th-Percentile Queue Length [ft]	185.73	184.72	106.08	64.16	18.77	85.03	208.21	208.21	91.15	176.05	172.68
95th-Percentile Queue Length [veh]	11.90	11.85	7.62	4.62	1.35	6.12	13.06	13.06	6.56	11.39	11.22
95th-Percentile Queue Length [ft]	297.48	296.17	190.54	115.48	33.79	153.05	326.53	326.53	164.07	284.85	280.43

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	32.31	32.15	26.00	39.72	39.72	33.37	39.50	29.13	29.13	39.17	25.61	25.63
Movement LOS	C	C	C	D	D	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	30.73			38.16			30.70			27.99		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	30.25											
Intersection LOS	C											
Intersection V/C	0.779											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.637

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	153	123	1154	84	58	878
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	1	0	0	1
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]	153	123	1155	84	58	879
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	32	300	22	15	228
Total Analysis Volume [veh/h]	159	128	1199	87	60	913
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	23	69	69	5	78
g / C, Green / Cycle	0.21	0.63	0.63	0.05	0.71
(v / s)_i Volume / Saturation Flow Rate	0.19	0.38	0.06	0.04	0.29
s, saturation flow rate [veh/h]	1515	3192	1425	1597	3192
c, Capacity [veh/h]	312	2007	896	75	2273
d1, Uniform Delay [s]	42.75	12.14	8.07	51.90	6.39
k, delay calibration	0.24	0.50	0.50	0.06	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	20.35	1.32	0.22	9.67	0.53
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	0.92	0.60	0.10	0.80	0.40
d, Delay for Lane Group [s/veh]	63.09	13.46	8.29	61.57	6.92
Lane Group LOS	E	B	A	E	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	9.33	8.49	0.84	1.84	3.95
50th-Percentile Queue Length [ft]	233.28	212.16	20.93	45.93	98.76
95th-Percentile Queue Length [veh]	14.34	13.26	1.51	3.31	7.11
95th-Percentile Queue Length [ft]	358.53	331.60	37.67	82.67	177.77

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	63.09	63.09	13.46	8.29	61.57	6.92
Movement LOS	E	E	B	A	E	A
d_A, Approach Delay [s/veh]	63.09		13.11		10.29	
Approach LOS	E		B		B	
d_I, Intersection Delay [s/veh]	17.67					
Intersection LOS	B					
Intersection V/C	0.637					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	54.1
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.427

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	1143	110	0	970	50	0	0	75	0	0	24
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	1	0	0	1	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]	0	1144	110	0	971	50	0	0	75	0	0	24
Peak Hour Factor	1.0000	0.9730	0.9730	1.0000	0.9730	0.9730	1.0000	1.0000	0.9730	1.0000	1.0000	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	294	28	0	0	0	0	0	19	0	0	0
Total Analysis Volume [veh/h]	0	1176	113	0	0	0	0	0	77	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	48	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	45	45		7	
g / C, Green / Cycle	0.37	0.37		0.06	
(v / s)_i Volume / Saturation Flow Rate	0.35	0.36		0.05	
s, saturation flow rate [veh/h]	1863	1807		1583	
c, Capacity [veh/h]	695	674		95	
d1, Uniform Delay [s]	36.08	36.68		55.72	
k, delay calibration	0.32	0.34		0.04	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	14.59	19.85		6.04	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

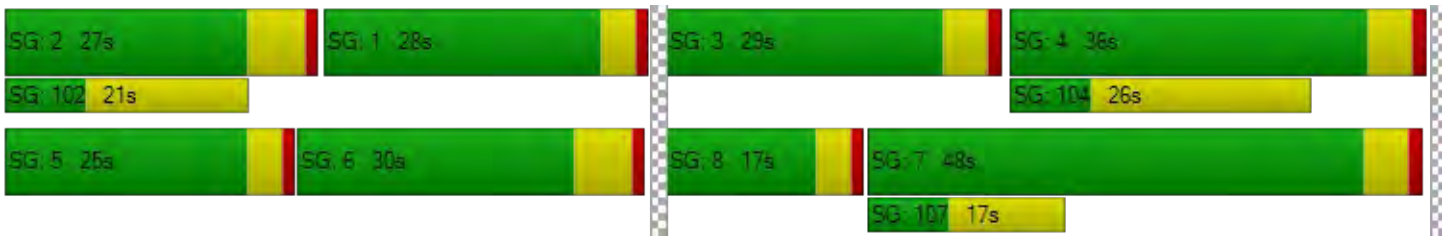
X, volume / capacity	0.93	0.96		0.81	
d, Delay for Lane Group [s/veh]	50.67	56.53		61.77	
Lane Group LOS	D	E		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	20.56	21.76		2.46	
50th-Percentile Queue Length [ft]	514.10	543.98		61.55	
95th-Percentile Queue Length [veh]	28.00	29.41		4.43	
95th-Percentile Queue Length [ft]	700.02	735.23		110.80	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	53.32	56.53	0.00	0.00	0.00	0.00	0.00	61.77	0.00	0.00	0.00
Movement LOS		D	E						E			
d_A, Approach Delay [s/veh]	53.60			0.00			61.77			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	54.06											
Intersection LOS	D											
Intersection V/C	0.427											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Juniper Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	75.0
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.926

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	154	621	726	213	795	155	225	568	137	293	452	187
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	8	0	0	1	1	18	0	5	2	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	154	621	734	213	795	156	226	586	137	298	454	187
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	162	0	55	207	41	59	153	0	78	118	49
Total Analysis Volume [veh/h]	160	647	0	222	828	163	235	610	0	310	473	195
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	3	0	4	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	8	8	0	4	10	0	4	10	0
Maximum Green [s]	25	25	0	30	30	0	20	40	0	20	40	0
Amber [s]	3.9	3.9	0.0	3.9	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	29	0	36	36	0	28	30	0	25	27	0
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	0	0	7	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	19	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.9	2.9	0.0	2.9	2.9	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
Maximum Recall		No			No		No	No		No	Yes	
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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	29	29	29	32	32	32	32	18	18	18	21	21	21
g / C, Green / Cycle	0.24	0.24	0.24	0.27	0.27	0.27	0.27	0.15	0.15	0.15	0.17	0.18	0.18
(v / s)_i Volume / Saturation Flow Rate	0.23	0.23	0.00	0.13	0.27	0.20	0.10	0.13	0.16	0.16	0.17	0.13	0.12
s, saturation flow rate [veh/h]	1828	1695	1583	1774	1863	1695	1583	1774	1863	1863	1774	3547	1583
c, Capacity [veh/h]	445	413	385	476	500	455	425	263	277	277	310	621	277
d1, Uniform Delay [s]	44.59	44.58	0.00	36.76	43.78	40.03	35.85	50.21	51.13	51.13	49.56	47.16	46.61
k, delay calibration	0.34	0.34	0.04	0.04	0.42	0.20	0.04	0.14	0.50	0.50	0.42	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	23.57	24.70	0.00	0.27	34.38	4.24	0.21	12.88	84.00	84.00	46.79	8.58	13.95
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

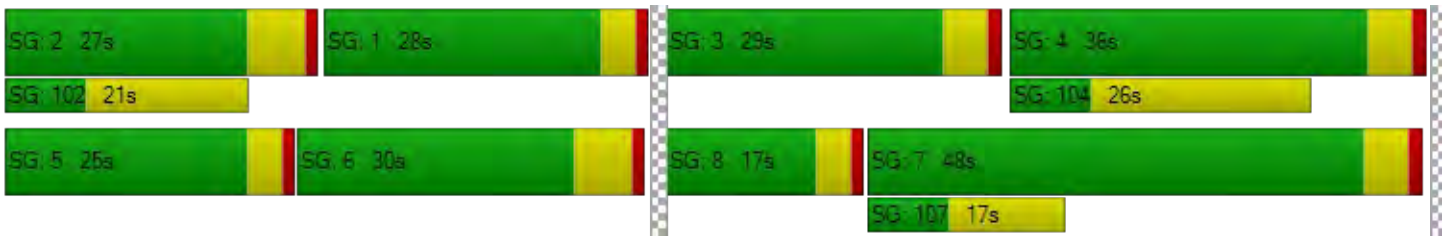
X, volume / capacity	0.94	0.94	0.00	0.47	0.99	0.73	0.38	0.89	1.10	1.10	1.00	0.76	0.70
d, Delay for Lane Group [s/veh]	68.16	69.29	0.00	37.02	78.16	44.27	36.06	63.10	135.13	135.13	96.35	55.74	60.56
Lane Group LOS	E	E	A	D	E	D	D	E	F	F	F	E	E
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	15.05	14.08	0.00	5.50	19.26	9.47	3.94	7.86	14.76	14.76	13.28	7.46	6.55
50th-Percentile Queue Length [ft]	376.33	352.04	0.00	137.4	481.6	236.8	98.41	196.40	368.96	368.96	332.07	186.44	163.71
95th-Percentile Queue Length [veh]	21.42	20.24	0.00	9.34	26.46	14.52	7.09	12.45	22.03	22.03	19.26	11.94	10.74
95th-Percentile Queue Length [ft]	535.41	505.90	0.00	233.5	661.5	363.0	177.1	311.32	550.87	550.87	481.49	298.41	268.62

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	68.16	68.84	0.00	37.02	64.51	36.06	63.10	135.13	135.13	96.35	55.74	60.56
Movement LOS	E	E	A	D	E	D	E	F	F	F	E	E
d_A, Approach Delay [s/veh]	68.70			55.66			115.10			69.57		
Approach LOS	E			E			F			E		
d_I, Intersection Delay [s/veh]	75.01											
Intersection LOS	E											
Intersection V/C	0.926											

Sequence

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



BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8092*	veh/h	Peak-Hour Factor, PHF	*0.93*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2186*	pc/h/ln
S	*58.7*	mph
D = v_p / S	*37.2*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8452*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1490*	pc/h/ln
S	*69.0*	mph
D = v_p / S	*21.6*	pc/mi/ln
LOS	*C*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4223*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1122*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*16.0*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9395*	veh/h	Peak-Hour Factor, PHF	*0.96*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2459*	pc/h/ln
S	*51.6*	mph
D = v_p / S	*47.6*	pc/mi/ln
LOS	*F*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*10510*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1853*	pc/h/ln
S	*65.1*	mph
D = v_p / S	*28.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*AM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2291*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*609*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*8.7*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	Lillian Tsang
Agency/Company	Kittelson & Associates, Inc.
Date Performed	01/20/2017
Analysis Time Period	AM Peak Hour

Site Information

Freeway/Dir of Travel	I-280 Southbound
Weaving Segment Location	SR-1 On to Serramonte Off
Analysis Year	Cumulative Plus Project

Project Description Serramonte Terrace TIA

Inputs

Weaving configuration	One-Sided
Weaving number of lanes, N	5
Weaving segment length, L_S	700ft
Freeway free-flow speed, FFS	70 mph
Segment type	Freeway
Freeway minimum speed, S_{MIN}	15
Freeway maximum capacity, C_{IFL}	2400
Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	6796	0.97	1	0	1.5	1.2	0.995	1.00	7041
V_{RF}	994	0.97	1	0	1.5	1.2	0.995	1.00	1030
V_{FR}	1222	0.97	1	0	1.5	1.2	0.995	1.00	1266
V_{RR}	0	0.97	1	0	1.5	1.2	0.995	1.00	0
V_{NW}	7041							V =	9337
V_W	2296								
VR	0.246								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	2296 lc/h
Interchange density, ID	2.0 int/mi	Weaving lane changes, LC_W	2766 lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	867 lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	3633 lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	986

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	9291 veh/h	Weaving intensity factor, W	0.829
Weaving segment capacity, c_w	9711 veh/h	Weaving segment speed, S	44.6 mph
Weaving segment v/c ratio	0.957	Average weaving speed, S_W	45.1 mph
Weaving segment density, D	41.8 pc/mi/ln	Average non-weaving speed, S_{NW}	44.5 mph
Level of Service, LOS	E	Maximum weaving length, L_{MAX}	5011 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9055*	veh/h	Peak-Hour Factor, PHF	*0.98*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2321*	pc/h/ln
S	*55.4*	mph
D = v_p / S	*41.9*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*10998*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*6*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1939*	pc/h/ln
S	*63.7*	mph
D = v_p / S	*30.5*	pc/mi/ln
LOS	*D*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Northbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*4536*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1206*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*17.2*	pc/mi/ln
LOS	*B*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Hickey Blvd*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*8680*	veh/h	Peak-Hour Factor, PHF	*0.94*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*2320*	pc/h/ln
S	*55.4*	mph
D = v_p / S	*41.8*	pc/mi/ln
LOS	*E*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9940*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*6*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1753*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*66.5*	mph	S	mph
D = v_p / S	*26.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*I-280 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*North of SR-1*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*9940*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*1*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.995*

Speed Inputs			Calc Speed Adj and FFS		
Lane Width		ft			
Rt-Side Lat. Clearance		ft	f_{LW}		mph
Number of Lanes, N	*6*		f_{LC}		mph
Total Ramp Density, TRD		ramps/mi	TRD Adjustment		mph
FFS (measured)	*70.0*	mph	FFS	*70.0*	mph
Base free-flow Speed, BFFS		mph			

LOS and Performance Measures			Design (N)	
Operational (LOS)			Design (N)	
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*1753*	pc/h/ln	Design LOS	
			v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	pc/h/ln
S	*66.5*	mph	S	mph
D = v_p / S	*26.4*	pc/mi/ln	D = v_p / S	pc/mi/ln
LOS	*D*		Required Number of Lanes, N	

Glossary		Factor Location	
N - Number of lanes	S - Speed	E_R - Exhibits 11-10, 11-12	f_{LW} - Exhibit 11-8
V - Hourly volume	D - Density	E_T - Exhibits 11-10, 11-11, 11-13	f_{LC} - Exhibit 11-9
v_p - Flow rate	FFS - Free-flow speed	f_p - Page 11-18	TRD - Page 11-11
LOS - Level of service	BFFS - Base free-flow speed	LOS, S, FFS, v_p - Exhibits 11-2, 11-3	
DDHV - Directional design hour volume			

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BASIC FREEWAY SEGMENTS WORKSHEET

General Information		Site Information	
Analyst	*Lillian Tsang*	Highway/Direction of Travel	*SR-1 Southbound*
Agency or Company	*Kittelson & Associates, Inc.*	From/To	*South of Serramonte Blvd*
Date Performed	*01/20/2017*	Jurisdiction	*Caltrans*
Analysis Time Period	*PM Peak Hour*	Analysis Year	*Cumulative Plus Project*

Project Description *Serramonte Terrace TIA*

☑ Oper.(LOS) ☐ Des.(N) ☐ Planning Data

Flow Inputs

Volume, V	*2641*	veh/h	Peak-Hour Factor, PHF	*0.95*
AADT		veh/day	%Trucks and Buses, P_T	*2*
Peak-Hr Prop. of AADT, K			%RVs, P_R	*0*
Peak-Hr Direction Prop, D			General Terrain:	*Level*
DDHV = AADT x K x D		veh/h	Grade % Length Up/Down %	*mi*

Calculate Flow Adjustments

f_p	*1.00*	E_R	*1.2*
E_T	*1.5*	$f_{HV} = 1/[1+P_T(E_T - 1) + P_R(E_R - 1)]$	*0.990*

Speed Inputs

Lane Width		ft
Rt-Side Lat. Clearance		ft
Number of Lanes, N	*4*	
Total Ramp Density, TRD		ramps/mi
FFS (measured)	*70.0*	mph
Base free-flow Speed, BFFS		mph

Calc Speed Adj and FFS

f_{LW}		mph
f_{LC}		mph
TRD Adjustment		mph
FFS	*70.0*	mph

LOS and Performance Measures

Operational (LOS)

v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)	*702*	pc/h/ln
S	*70.0*	mph
D = v_p / S	*10.0*	pc/mi/ln
LOS	*A*	

Design (N)

Design (N)

Design LOS		
v_p = (V or DDHV) / (PHF x N x f_{HV} x f_p)		pc/h/ln
S		mph
D = v_p / S		pc/mi/ln
Required Number of Lanes, N		

Glossary

N - Number of lanes
V - Hourly volume
v_p - Flow rate
LOS - Level of service
S - Speed
D - Density
FFS - Free-flow speed
BFFS - Base free-flow speed
DDHV - Directional design hour volume

Factor Location

E_R - Exhibits 11-10, 11-12
E_T - Exhibits 11-10, 11-11, 11-13
f_p - Page 11-18
LOS, S, FFS, v_p - Exhibits 11-2, 11-3
f_{LW} - Exhibit 11-8
f_{LC} - Exhibit 11-9
TRD - Page 11-11

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FREEWAY WEAVING WORKSHEET

General Information

Analyst	
Agency/Company	Kittelson & Associates, Inc.
Date Performed	01/20/2017
Analysis Time Period	PM Peak Hour

Site Information

Freeway/Dir of Travel	I-280 Southbound
Weaving Segment Location	SR-1 On to Serramonte Off
Analysis Year	Cumulative Plus Project

Project Description Serramonte Terrace TIA

Inputs

Weaving configuration	One-Sided
Weaving number of lanes, N	5
Weaving segment length, L_S	700ft
Freeway free-flow speed, FFS	70 mph
Segment type	Freeway
Freeway minimum speed, S_{MIN}	15
Freeway maximum capacity, C_{IFL}	2400
Terrain type	Level

Conversions to pc/h Under Base Conditions

	V (veh/h)	PHF	Truck (%)	RV (%)	E_T	E_R	f_{HV}	f_p	v (pc/h)
V_{FF}	7487	0.97	1	0	1.5	1.2	0.995	1.00	7757
V_{RF}	967	0.97	1	0	1.5	1.2	0.995	1.00	1002
V_{FR}	1493	0.97	1	0	1.5	1.2	0.995	1.00	1547
V_{RR}	0	0.97	1	0	1.5	1.2	0.995	1.00	0
V_{NW}	7757							V =	10306
V_W	2549								
VR	0.247								

Configuration Characteristics

Minimum maneuver lanes, N_{WL}	2 lc	Minimum weaving lane changes, LC_{MIN}	lc/h
Interchange density, ID	2.0 int/mi	Weaving lane changes, LC_W	lc/h
Minimum RF lane changes, LC_{RF}	1 lc/pc	Non-weaving lane changes, LC_{NW}	lc/h
Minimum FR lane changes, LC_{FR}	1 lc/pc	Total lane changes, LC_{ALL}	lc/h
Minimum RR lane changes, LC_{RR}	lc/pc	Non-weaving vehicle index, I_{NW}	

Weaving Segment Speed, Density, Level of Service, and Capacity

Weaving segment flow rate, v	10255 veh/h	Weaving intensity factor, W	
Weaving segment capacity, c_w	9655 veh/h	Weaving segment speed, S	mph
Weaving segment v/c ratio	1.062	Average weaving speed, S_W	mph
Weaving segment density, D	pc/mi/ln	Average non-weaving speed, S_{NW}	mph
Level of Service, LOS	F	Maximum weaving length, L_{MAX}	5026 ft

Notes

a. Weaving segments longer than the calculated maximum length should be treated as isolated merge and diverge areas using the procedures of Chapter 13, "Freeway Merge and Diverge Segments".
b. For volumes that exceed the weaving segment capacity, the level of service is "F".

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Appendix 11
Year 2016 Existing plus Construction Conditions Level-of-Service Worksheets

19898 Dally City Serramonte Terrace TIA

Vistro File: K:\...\19898_Vistro_20161005.vistro Scenario 14: Existing 2016 AM + Construction

Report File: K:\...\ExAM_wConst.pdf 10/5/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	WB Hwy 1 Ramps / Clarinada Ave.	All-way stop	HCM 2010	NB Left		13.4	B
2	EB Hwy 1 Ramps / Serramonte Blvd	All-way stop	HCM 2010	EB Left		40.0	E
3	Callan Blvd / Serramonte Blvd	All-way stop	HCM 2010	SB Thru		14.5	B
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	EB Left	0.226	9.0	A
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	WB Thru	0.467	12.3	B
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	NEB Thru	0.760	7.1	A
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.658	1.7	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	SWB Left	0.743	27.0	C
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	WB Left	0.322	24.6	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.573	17.7	B
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.667	30.0	C
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.521	9.1	A
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	WB Left	0.757	27.0	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	SWB Left	0.323	11.3	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.391	52.4	D
16	Junipero Serra Blvd / Hickey Blvd	Signalized	HCM 2010	SEB Left	0.697	43.3	D

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

Intersection Level Of Service Report
Intersection 1: WB Hwy 1 Ramps / Clarinada Ave.

Control Type:	All-way stop	Delay (sec / veh):	13.4
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	315	248	105	137	67	76
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	1.60	3.60	1.90	1.50	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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
Total Hourly Volume [veh/h]	315	248	105	137	67	76
Peak Hour Factor	0.9200	0.9200	0.9200	0.9200	0.9200	0.9200
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	86	67	29	37	18	21
Total Analysis Volume [veh/h]	342	270	114	149	73	83
Pedestrian Volume [ped/h]	0		0		0	

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.98	1.84	0.81	0.99	0.53	0.26	0.26
95th-Percentile Queue Length [ft]	99.39	46.09	20.27	24.78	13.22	6.50	6.50
Approach Delay [s/veh]	15.06		11.05		10.83		
Approach LOS	C		B		B		
Intersection Delay [s/veh]	13.39						
Intersection LOS	B						

Intersection Level Of Service Report
Intersection 2: EB Hwy 1 Ramps / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	40.0
Analysis Method:	HCM 2010	Level Of Service:	E
Analysis Period:	15 minutes		

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	29	98	90	181	94	97	395	199	50	132	89	202
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	1.10	1.10	4.30	4.10	1.30	3.00	4.00	3.80	9.00	1.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	29	98	90	181	94	97	395	199	50	132	89	202
Peak Hour Factor	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600	0.8600
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	0.0000
Total 15-Minute Volume [veh/h]	8	28	26	53	27	28	115	58	15	38	26	0
Total Analysis Volume [veh/h]	34	114	105	210	109	113	459	231	58	153	103	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	3.43	6.12	0.90	14.72	4.06	1.78	0.96
95th-Percentile Queue Length [ft]	85.74	152.99	22.49	367.94	101.41	44.42	23.96
Approach Delay [s/veh]	21.06	27.08		62.08		16.04	
Approach LOS	C	D		F		C	
Intersection Delay [s/veh]	40.01						
Intersection LOS	E						

Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	14.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	163	223	76	140	230	130	92	282	107	26	115	79
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 [%]	1.80	1.30	1.30	16.40	4.80	7.70	8.70	0.40	0.00	0.00	1.70	22.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	163	223	76	140	230	130	92	282	107	26	115	79
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]	44	60	20	38	62	35	25	76	29	7	31	21
Total Analysis Volume [veh/h]	175	240	82	151	247	140	99	303	115	28	124	85
Pedestrian Volume [ped/h]	0			0			0			0		

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.60	2.30	1.46	2.79	1.05	0.84	2.15	1.99	0.18	0.77	0.72
95th-Percentile Queue Length [ft]	64.93	57.47	36.38	69.82	26.14	20.94	53.87	49.87	4.62	19.16	17.99
Approach Delay [s/veh]	15.20		15.13			14.79			11.26		
Approach LOS	C		C			B			B		
Intersection Delay [s/veh]	14.54										
Intersection LOS	B										

Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	9.0
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.226

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	175.00	100.00	100.00	100.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	52	0	52	71	390	0	44	0	196	107
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	0.00	0.00	100.00	11.50	2.00	0.00	0.00	5.90	0.00	0.00	100.0	11.90	4.70
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	27	0	0	0	0	0	0	0	27	0	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	27	52	0	52	71	390	0	44	27	196	107
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	7	13	0	13	18	98	0	11	7	49	27
Total Analysis Volume [veh/h]	0	0	27	52	0	52	71	390	0	44	27	196	107
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	65
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Protecte	Permiss	Permiss	Permi	Permi	Permi	Overl
Signal group	0	8	0	4	0	0	1	6	0	0	0	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	-	-	-
Minimum Green [s]	0	5	0	6	0	0	4	8	0	0	0	8	8
Maximum Green [s]	0	30	0	30	0	0	20	40	0	0	0	40	40
Amber [s]	0.0	3.0	0.0	3.0	0.0	0.0	3.0	3.6	0.0	0.0	0.0	3.6	3.6
All red [s]	0.0	1.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0
Split [s]	0	18	0	18	0	0	12	38	0	0	0	26	26
Vehicle Extension [s]	0.0	3.0	0.0	2.5	0.0	0.0	2.0	3.0	0.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	7	0	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	20	0	20	0	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	0.0	0.0	2.0	2.6	0.0	0.0	0.0	2.6	2.6
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	0.0
Detector Length [ft]	0.0	6.0	0.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.60	4.60	4.60	4.60	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.60	2.60	2.60	2.60	0.00
g_i, Effective Green Time [s]	9	9	9	3	48	48	41	41	54
g / C, Green / Cycle	0.13	0.13	0.13	0.05	0.74	0.74	0.62	0.62	0.83
(v / s)_i Volume / Saturation Flow Rate	0.02	0.02	0.05	0.04	0.11	0.11	0.11	0.10	0.07
s, saturation flow rate [veh/h]	1615	1260	1693	1810	1794	1794	1077	1545	1543
c, Capacity [veh/h]	267	173	296	91	1321	1321	761	965	1275
d1, Uniform Delay [s]	24.94	29.98	25.75	30.50	2.53	2.53	5.20	5.08	1.05
k, delay calibration	0.11	0.08	0.08	0.04	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.16	0.30	0.35	5.22	0.24	0.24	0.44	0.34	0.13
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

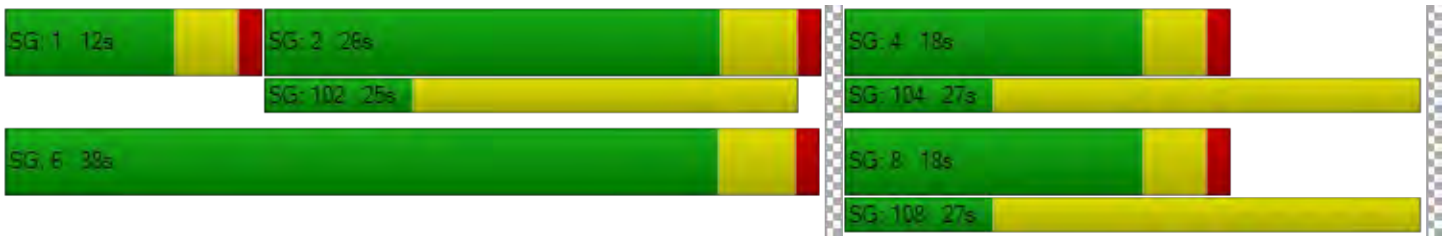
X, volume / capacity	0.10	0.15	0.26	0.78	0.15	0.15	0.16	0.15	0.08
d, Delay for Lane Group [s/veh]	25.11	30.28	26.10	35.72	2.77	2.77	5.64	5.42	1.18
Lane Group LOS	C	C	C	D	A	A	A	A	A
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.36	0.40	1.07	1.19	0.50	0.50	0.59	0.73	0.07
50th-Percentile Queue Length [ft]	9.08	9.98	26.74	29.66	12.51	12.51	14.75	18.36	1.86
95th-Percentile Queue Length [veh]	0.65	0.72	1.93	2.14	0.90	0.90	1.06	1.32	0.13
95th-Percentile Queue Length [ft]	16.35	17.97	48.14	53.39	22.51	22.51	26.55	33.05	3.35

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	25.11	25.11	25.11	30.28	0.00	26.10	35.72	2.77	2.77	5.64	5.64	5.47	1.18
Movement LOS	C	C	C	C		C	D	A	A	A	A	A	A
d_A, Approach Delay [s/veh]	25.11			27.16			7.84			4.27			
Approach LOS	C			C			A			A			
d_I, Intersection Delay [s/veh]	9.02												
Intersection LOS	A												
Intersection V/C	0.226												

Sequence

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



Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	12.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.467

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	137	81	190	56	78	12	32	263	155	264	170	94
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 [%]	25.00	0.00	2.60	1.80	6.40	8.30	0.00	4.60	21.40	1.10	7.10	2.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	0	0	0	0	0	0	0	27	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]	164	81	190	56	78	12	32	263	182	264	170	94
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]	44	22	51	15	21	3	9	71	49	71	46	25
Total Analysis Volume [veh/h]	176	87	204	60	84	13	34	283	196	284	183	101
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	3	3	3	4	4	0	5	2	2	1	6	6
Auxiliary Signal Groups			1,3						2,3			4,6
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	4	4	4	4	4	0	4	6	6	4	6	6
Maximum Green [s]	25	25	25	30	30	0	20	26	26	25	26	26
Amber [s]	3.0	3.0	3.0	3.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.5	0.5	0.5	0.5	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	0	0	0	0	0	0	0	0	0	29	29
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	7	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	18	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	1.5	1.5	1.5	1.5	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		Yes	Yes		No		No	Yes	Yes	No	Yes	Yes
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	7	7	24	5	5	5	6	6	17	5	6	14
g / C, Green / Cycle	0.18	0.18	0.63	0.12	0.12	0.12	0.15	0.16	0.45	0.15	0.16	0.37
(v / s)_i Volume / Saturation Flow Rate	0.08	0.08	0.07	0.02	0.04	0.03	0.02	0.08	0.15	0.08	0.10	0.04
s, saturation flow rate [veh/h]	1448	1862	2786	1414	1677	1556	1810	3459	1330	3476	1774	2800
c, Capacity [veh/h]	258	332	1768	293	333	187	274	562	599	517	283	1046
d1, Uniform Delay [s]	13.72	13.72	2.70	16.54	15.08	14.98	13.73	14.29	6.63	14.76	14.73	7.62
k, delay calibration	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.11	0.11	0.04	0.11	0.04
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
d2, Incremental Delay [s]	0.45	0.35	0.01	0.06	0.12	0.30	0.07	0.70	0.32	0.34	2.46	0.01
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.45	0.45	0.12	0.12	0.21	0.28	0.12	0.50	0.33	0.55	0.65	0.10
d, Delay for Lane Group [s/veh]	14.17	14.07	2.71	16.60	15.19	15.27	13.80	14.99	6.94	15.10	17.19	7.63
Lane Group LOS	B	B	A	B	B	B	B	B	A	B	B	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	0.74	0.94	0.10	0.24	0.47	0.35	0.21	0.95	0.70	0.94	1.38	0.19
50th-Percentile Queue Length [ft]	18.42	23.45	2.54	6.01	11.71	8.73	5.26	23.71	17.55	23.58	34.61	4.76
95th-Percentile Queue Length [veh]	1.33	1.69	0.18	0.43	0.84	0.63	0.38	1.71	1.26	1.70	2.49	0.34
95th-Percentile Queue Length [ft]	33.15	42.22	4.57	10.82	21.08	15.71	9.47	42.67	31.60	42.45	62.30	8.57

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	14.14	14.07	2.71	16.27	15.23	15.27	13.80	14.99	6.94	15.10	17.19	7.63
Movement LOS	B	B	A	B	B	B	B	B	A	B	B	A
d_A, Approach Delay [s/veh]	9.13			15.53			11.84			14.45		
Approach LOS	A			B			B			B		
d_I, Intersection Delay [s/veh]	12.31											
Intersection LOS	B											
Intersection V/C	0.467											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	7.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.760

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	987	237	212	0	0	528
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	0.80	0.80	5.70	2.00	2.00	3.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	987	237	212	0	0	528
Peak Hour Factor	0.8500	0.8500	0.8500	1.0000	1.0000	0.8500
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	290	70	62	0	0	155
Total Analysis Volume [veh/h]	1161	279	249	0	0	621
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Free Running
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	0	0	0	0	0	0
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		Yes			Yes
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	12	12	7	8
g / C, Green / Cycle	0.44	0.44	0.25	0.29
(v / s)_i Volume / Saturation Flow Rate	0.33	0.10	0.07	0.18
s, saturation flow rate [veh/h]	3486	2836	3423	3512
c, Capacity [veh/h]	1547	1258	869	1020
d1, Uniform Delay [s]	6.37	4.71	8.24	8.39
k, delay calibration	0.04	0.04	0.04	0.04
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.28	0.03	0.07	0.22
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.22	0.29	0.61
d, Delay for Lane Group [s/veh]	6.65	4.74	8.30	8.61
Lane Group LOS	A	A	A	A
Critical Lane Group	Yes	No	No	Yes
50th-Percentile Queue Length [veh]	1.24	0.21	0.38	0.98
50th-Percentile Queue Length [ft]	30.92	5.37	9.55	24.41
95th-Percentile Queue Length [veh]	2.23	0.39	0.69	1.76
95th-Percentile Queue Length [ft]	55.65	9.67	17.18	43.95

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	6.65	4.74	8.30	0.00	0.00	8.61
Movement LOS	A	A	A			A
d_A, Approach Delay [s/veh]	6.28		8.30		8.61	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	7.13					
Intersection LOS	A					
Intersection V/C	0.760					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	1.7
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.658

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	124	1402	209	0	0	0
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.40	1.90	7.70	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	124	1402	209	0	0	0
Peak Hour Factor	0.8400	0.8400	0.8400	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	37	417	62	0	0	0
Total Analysis Volume [veh/h]	148	1669	249	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	3.90	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	1.90	2.10	
g_i, Effective Green Time [s]	3	17	10	
g / C, Green / Cycle	0.14	0.81	0.50	
(v / s)_i Volume / Saturation Flow Rate	0.04	0.47	0.07	
s, saturation flow rate [veh/h]	3432	3550	3359	
c, Capacity [veh/h]	496	2895	1665	
d1, Uniform Delay [s]	8.08	0.68	2.90	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.33	0.18	0.04	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.30	0.58	0.15	
d, Delay for Lane Group [s/veh]	8.41	0.86	2.94	
Lane Group LOS	A	A	A	
Critical Lane Group	No	Yes	No	
50th-Percentile Queue Length [veh]	0.19	0.07	0.02	
50th-Percentile Queue Length [ft]	4.69	1.84	0.42	
95th-Percentile Queue Length [veh]	0.34	0.13	0.03	
95th-Percentile Queue Length [ft]	8.45	3.31	0.76	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	8.41	0.86	2.94	0.00	0.00	0.00
Movement LOS	A	A	A			
d_A, Approach Delay [s/veh]	1.48		2.94		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	1.65					
Intersection LOS	A					
Intersection V/C	0.658					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.743

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	159	0	795	432	117	140	217	44
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	0	0	0	159	0	795	432	117	140	217	44
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9050	1.0000	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
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	0	0	0	44	0	220	119	32	39	60	12
Total Analysis Volume [veh/h]	0	0	0	0	176	0	878	477	129	155	240	49
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lead	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	28	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		6	28	28	7	28	28	28
g / C, Green / Cycle		0.08	0.36	0.36	0.09	0.37	0.37	0.37
(v / s)_i Volume / Saturation Flow Rate		0.05	0.25	0.30	0.07	0.08	0.09	0.09
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1583	1583
c, Capacity [veh/h]		275	1274	569	167	680	578	578
d1, Uniform Delay [s]		34.32	21.00	22.61	34.06	16.90	17.05	17.05
k, delay calibration		0.11	0.11	0.15	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.46	0.67	4.61	7.47	0.17	0.22	0.22
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.64	0.69	0.84	0.77	0.23	0.25	0.25
d, Delay for Lane Group [s/veh]		36.78	21.67	27.22	41.53	17.07	17.28	17.28
Lane Group LOS		D	C	C	D	B	B	B
Critical Lane Group		No	No	Yes	Yes	No	No	No
50th-Percentile Queue Length [veh]		1.65	6.41	8.09	2.63	1.83	1.73	1.73
50th-Percentile Queue Length [ft]		41.15	160.28	202.24	65.81	45.83	43.26	43.26
95th-Percentile Queue Length [veh]		2.96	10.56	12.75	4.74	3.30	3.11	3.11
95th-Percentile Queue Length [ft]		74.08	264.10	318.86	118.46	82.50	77.86	77.86

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	36.78	0.00	21.67	27.22	41.53	17.07	17.28	17.28
Movement LOS					D		C	C	D	B	B	B
d_A, Approach Delay [s/veh]	0.00				25.14				22.68			
Approach LOS	A				C				C			
d_I, Intersection Delay [s/veh]	27.03											
Intersection LOS	C											
Intersection V/C	0.743											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	44	419	277	178	130	287	34	39
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	44	419	277	178	130	287	34	39
Peak Hour Factor	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050	0.9050
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	12	116	77	49	36	79	9	0
Total Analysis Volume [veh/h]	49	463	306	197	144	317	38	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	39	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	16	16	16	11	11	11	11
g / C, Green / Cycle	0.20	0.20	0.20	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.15	0.09	0.12	0.08	0.07	0.10	0.02
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1863	1583
c, Capacity [veh/h]	701	721	322	250	262	262	223
d1, Uniform Delay [s]	28.68	26.72	27.88	30.90	30.41	31.69	29.09
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.49	0.40	1.88	2.09	1.31	4.05	0.36
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

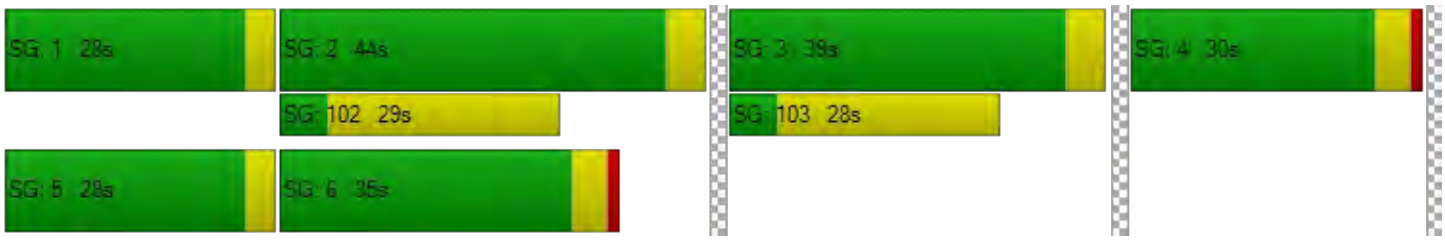
X, volume / capacity	0.73	0.42	0.61	0.58	0.47	0.74	0.17
d, Delay for Lane Group [s/veh]	30.16	27.12	29.77	33.00	31.71	35.74	29.45
Lane Group LOS	C	C	C	C	C	D	C
Critical Lane Group	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	4.39	2.40	3.34	2.56	2.13	3.63	0.62
50th-Percentile Queue Length [ft]	109.65	60.04	83.55	64.12	53.30	90.86	15.58
95th-Percentile Queue Length [veh]	7.82	4.32	6.02	4.62	3.84	6.54	1.12
95th-Percentile Queue Length [ft]	195.52	108.07	150.39	115.41	95.93	163.54	28.04

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.16	30.16	27.12	29.77	33.00	34.17	35.74	29.45
Movement LOS	C	C	C	C	C	C	D	C
d_A, Approach Delay [s/veh]	29.17				33.48			
Approach LOS	C				C			
d_I, Intersection Delay [s/veh]	27.03							
Intersection LOS	C							
Intersection V/C	0.743							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	24.6
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.322

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	49	281	71	73	234	5	7	3	11	114	1	62
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	13.30	4.20	4.10	16.50	0.00	0.00	0.00	0.00	1.80	0.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	27	0	0	27	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]	49	308	71	73	261	5	7	3	11	114	1	62
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	13	85	20	20	72	1	2	1	3	31	0	17
Total Analysis Volume [veh/h]	54	338	78	80	287	5	8	3	12	125	1	68
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fixed time
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	26	39	0	24	39	0	0	29	0	0	29	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	No		No	No			No			No	
Maximum Recall	No	No		No	No			No			No	
Pedestrian Recall	No	No		No	No			No			No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	23	35	35	21	35	35	25	25	25
g / C, Green / Cycle	0.24	0.37	0.37	0.22	0.37	0.37	0.26	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.03	0.09	0.09	0.05	0.06	0.06	0.03	0.15	0.04
s, saturation flow rate [veh/h]	1810	3193	1525	1738	3105	1617	696	815	1615
c, Capacity [veh/h]	429	1186	567	375	1154	601	234	290	425
d1, Uniform Delay [s]	28.52	20.54	20.63	30.62	19.99	20.00	27.24	31.70	26.92
k, delay calibration	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.60	0.46	1.02	1.30	0.31	0.60	0.83	4.68	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
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

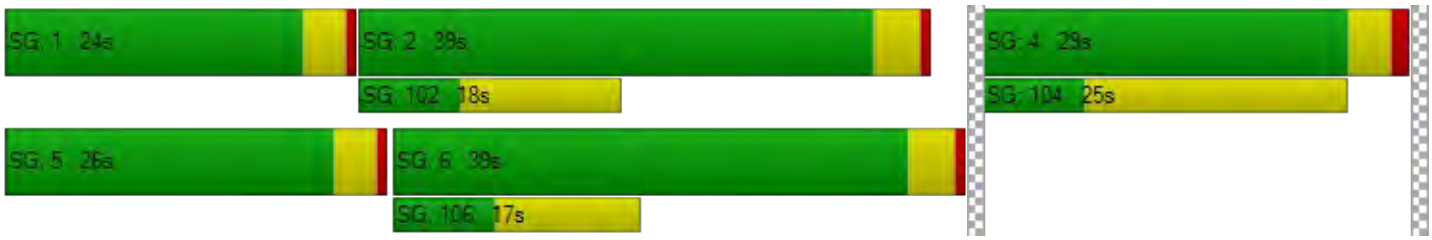
X, volume / capacity	0.13	0.23	0.24	0.21	0.17	0.17	0.10	0.43	0.16
d, Delay for Lane Group [s/veh]	29.12	21.01	21.65	31.92	20.30	20.60	28.07	36.39	27.73
Lane Group LOS	C	C	C	C	C	C	C	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	1.03	2.16	2.25	1.63	1.45	1.56	0.44	2.94	1.27
50th-Percentile Queue Length [ft]	25.81	53.97	56.14	40.72	36.23	39.12	11.01	73.58	31.77
95th-Percentile Queue Length [veh]	1.86	3.89	4.04	2.93	2.61	2.82	0.79	5.30	2.29
95th-Percentile Queue Length [ft]	46.46	97.15	101.06	73.29	65.22	70.42	19.81	132.44	57.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	29.12	21.12	21.65	31.92	20.40	20.60	28.07	28.07	28.07	36.39	36.39	27.73
Movement LOS	C	C	C	C	C	C	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	22.13			22.88			28.07			33.35		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.58											
Intersection LOS	C											
Intersection V/C	0.322											

Sequence

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



Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	17.7
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.573

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	119	476	119	20	238	63	77	287	47	89	179	66
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	1.70	2.90	15.00	3.80	4.80	0.00	0.70	0.00	5.60	0.60	1.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	119	476	119	20	238	63	77	287	47	89	179	66
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	32	127	32	5	63	17	20	76	13	24	48	18
Total Analysis Volume [veh/h]	127	506	127	21	253	67	82	305	50	95	190	70
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	140
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	4	10	10	1	7	7	3	9	9	3	9
g / C, Green / Cycle	0.10	0.25	0.25	0.03	0.18	0.18	0.07	0.22	0.22	0.08	0.22
(v / s)_i Volume / Saturation Flow Rate	0.07	0.18	0.18	0.01	0.09	0.09	0.05	0.16	0.03	0.06	0.14
s, saturation flow rate [veh/h]	1810	1868	1741	1573	1830	1702	1810	1887	1615	1714	1803
c, Capacity [veh/h]	175	467	435	42	330	306	136	413	354	140	407
d1, Uniform Delay [s]	18.16	14.11	14.11	19.87	15.28	15.32	18.55	15.06	13.03	18.48	14.50
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	5.62	1.91	2.07	9.03	1.16	1.32	4.29	2.60	0.18	5.71	1.68
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.73	0.70	0.70	0.50	0.50	0.51	0.61	0.74	0.14	0.68	0.64
d, Delay for Lane Group [s/veh]	23.78	16.02	16.19	28.90	16.43	16.64	22.84	17.66	13.21	24.19	16.18
Lane Group LOS	C	B	B	C	B	B	C	B	B	C	B
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.29	2.51	2.37	0.28	1.27	1.23	0.82	2.50	0.33	0.99	2.01
50th-Percentile Queue Length [ft]	32.32	62.79	59.20	7.02	31.82	30.84	20.59	62.62	8.27	24.72	50.23
95th-Percentile Queue Length [veh]	2.33	4.52	4.26	0.51	2.29	2.22	1.48	4.51	0.60	1.78	3.62
95th-Percentile Queue Length [ft]	58.18	113.03	106.56	12.63	57.27	55.52	37.07	112.71	14.88	44.50	90.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.78	16.08	16.19	28.90	16.51	16.64	22.84	17.66	13.21	24.19	16.18	16.18
Movement LOS	C	B	B	C	B	B	C	B	B	C	B	B
d_A, Approach Delay [s/veh]	17.39			17.30			18.12			18.33		
Approach LOS	B			B			B			B		
d_I, Intersection Delay [s/veh]	17.72											
Intersection LOS	B											
Intersection V/C	0.573											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	30.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.667

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	62	163	493	142	108	60	65	536	45	300	229	252
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 [%]	1.60	3.10	0.80	22.50	2.80	11.70	4.60	1.10	11.10	0.70	5.20	14.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	27	0	0	0	0	0	0	0	27
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]	62	163	493	169	108	60	65	536	45	300	229	279
Peak Hour Factor	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400	0.9400
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]	16	43	131	45	29	16	17	143	12	80	61	74
Total Analysis Volume [veh/h]	66	173	524	180	115	64	69	570	48	319	244	297
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	8	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups			1,8									
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	6	6	6	0	6	10	0	6	10	0
Maximum Green [s]	27	27	27	22	22	0	22	30	0	27	30	0
Amber [s]	3.2	3.2	3.2	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	1.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	25	25	25	31	31	0	9	34	0	20	45	0
Vehicle Extension [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Walk [s]	7	7	7	7	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	25	25	25	23	23	0	0	22	0	0	23	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.2	2.2	2.2	2.2	2.2	0.0	1.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall		No	No		No		No	Yes		No	Yes	
Maximum Recall		No	No		No		No	No		No	No	
Pedestrian Recall		No	No		No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	3.00	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	0.00	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	2.00
g_i, Effective Green Time [s]	21	21	21	58	11	11	11	11	6	45	45	17	57	57
g / C, Green / Cycle	0.19	0.19	0.19	0.52	0.10	0.10	0.10	0.10	0.05	0.41	0.41	0.15	0.52	0.52
(v / s)_i Volume / Saturation Flow Rate	0.04	0.05	0.05	0.33	0.06	0.07	0.07	0.04	0.04	0.16	0.03	0.09	0.07	0.21
s, saturation flow rate [veh/h]	1781	1843	1677	1602	1175	1483	1682	1446	1730	3578	1454	3490	3439	1417
c, Capacity [veh/h]	342	354	322	837	161	212	167	143	88	1482	602	539	1781	734
d1, Uniform Delay [s]	37.27	37.89	37.58	18.65	49.45	47.88	47.88	46.71	51.62	22.46	19.53	43.27	13.76	16.17
k, delay calibration	0.04	0.04	0.04	0.50	0.04	0.04	0.04	0.04	0.16	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.10	0.15	0.14	3.53	0.73	0.71	1.84	0.81	19.67	0.76	0.26	0.39	0.16	1.66
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	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

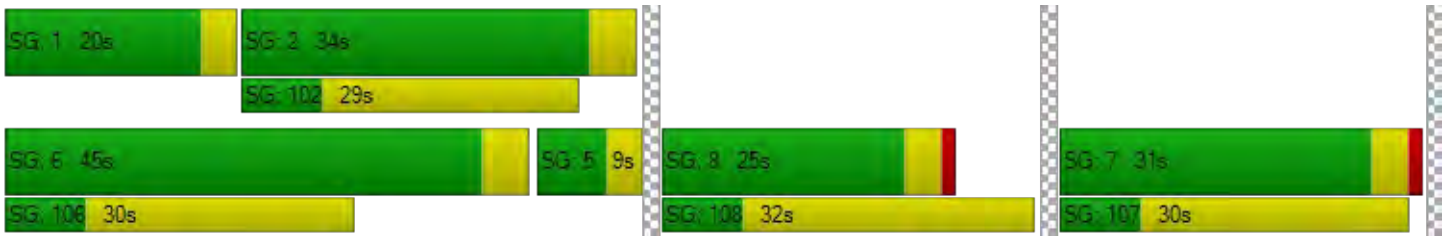
X, volume / capacity	0.19	0.28	0.23	0.63	0.45	0.51	0.68	0.45	0.79	0.38	0.08	0.59	0.14	0.40
d, Delay for Lane Group [s/veh]	37.37	38.05	37.72	22.18	50.18	48.60	49.72	47.52	71.30	23.22	19.79	43.65	13.92	17.83
Lane Group LOS	D	D	D	C	D	D	D	D	E	C	B	D	B	B
Critical Lane Group	No	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	1.50	2.26	1.74	9.92	1.98	2.92	3.09	1.68	2.36	5.25	0.79	4.06	1.60	4.80
50th-Percentile Queue Length [ft]	37.57	56.42	43.40	248.1	49.51	73.03	77.29	42.05	58.92	131.37	19.75	101.44	39.95	119.92
95th-Percentile Queue Length [veh]	2.71	4.06	3.12	15.09	3.57	5.26	5.57	3.03	4.24	9.01	1.42	7.30	2.88	8.39
95th-Percentile Queue Length [ft]	67.63	101.5	78.12	377.2	89.13	131.4	139.1	75.68	106.06	225.35	35.55	182.59	71.91	209.72

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	37.37	37.90	22.18	49.23	49.71	47.52	71.30	23.22	19.79	43.65	13.92	17.83
Movement LOS	D	D	C	D	D	D	E	C	B	D	B	B
d_A, Approach Delay [s/veh]	27.06			49.08			27.81			26.30		
Approach LOS	C			D			C			C		
d_I, Intersection Delay [s/veh]	29.97											
Intersection LOS	C											
Intersection V/C	0.667											

Sequence

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



Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	9.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.521

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	322	2	162	0	791	421	152	640	0
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	3.10	0.00	0.60	2.00	1.10	8.25	0.70	6.90	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	27	0	27	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]	0	0	0	322	2	162	0	791	448	152	667	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.9400	0.9400	0.9400	1.0000	0.9400	0.9400	0.9400	0.9400	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	86	1	43	0	210	0	40	177	0
Total Analysis Volume [veh/h]	0	0	0	343	2	172	0	841	0	162	710	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		6	6	6	10	10	4	17
g / C, Green / Cycle		0.19	0.19	0.19	0.33	0.33	0.12	0.55
(v / s)_i Volume / Saturation Flow Rate		0.10	0.10	0.10	0.22	0.22	0.05	0.21
s, saturation flow rate [veh/h]		1755	1797	1605	1879	1879	3490	3384
c, Capacity [veh/h]		331	339	303	621	621	426	1857
d1, Uniform Delay [s]		11.43	11.43	11.43	9.02	9.02	12.63	4.03
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.32	1.29	1.44	1.30	1.30	0.56	0.13
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.53	0.53	0.53	0.68	0.68	0.38	0.38
d, Delay for Lane Group [s/veh]		12.74	12.71	12.87	10.31	10.31	13.19	4.16
Lane Group LOS		B	B	B	B	B	B	A
Critical Lane Group		No	No	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]		0.93	0.95	0.86	1.80	1.80	0.43	0.49
50th-Percentile Queue Length [ft]		23.25	23.74	21.53	45.00	45.00	10.83	12.32
95th-Percentile Queue Length [veh]		1.67	1.71	1.55	3.24	3.24	0.78	0.89
95th-Percentile Queue Length [ft]		41.85	42.72	38.76	81.01	81.01	19.49	22.17

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	12.73	12.71	12.87	0.00	10.31	10.31	13.19	4.16	0.00
Movement LOS				B	B	B		B	B	B	A	
d_A, Approach Delay [s/veh]	0.00			12.77			10.31			5.83		
Approach LOS	A			B			B			A		
d_I, Intersection Delay [s/veh]	9.13											
Intersection LOS	A											
Intersection V/C	0.521											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	27.0
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.757

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	337	41	319	84	136	113	117	701	268	101	329	33
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 [%]	12.09	0.00	2.50	0.00	2.90	0.00	1.70	2.00	0.70	0.00	1.80	9.10
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	27	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]	364	41	319	84	136	113	117	701	268	101	329	33
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	100	11	88	23	37	31	32	193	0	28	90	9
Total Analysis Volume [veh/h]	400	45	351	92	149	124	129	770	0	111	362	36
Presence of On-Street Parking	No		No	No		No	No		No	No		No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	135
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	42	42	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	18	18	18	11	11	6	17	17	6	17	17
g / C, Green / Cycle	0.27	0.27	0.27	0.17	0.17	0.10	0.25	0.25	0.08	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate	0.13	0.13	0.22	0.13	0.08	0.07	0.21	0.21	0.06	0.11	0.11
s, saturation flow rate [veh/h]	1614	1826	1576	1812	1615	1779	1863	1863	1810	1866	1808
c, Capacity [veh/h]	435	492	424	303	270	170	474	474	148	463	449
d1, Uniform Delay [s]	20.94	20.93	23.45	27.31	25.65	30.11	23.91	23.91	30.67	21.64	21.65
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	0.83	0.73	4.36	4.74	1.22	6.78	3.40	3.40	7.43	0.64	0.67
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

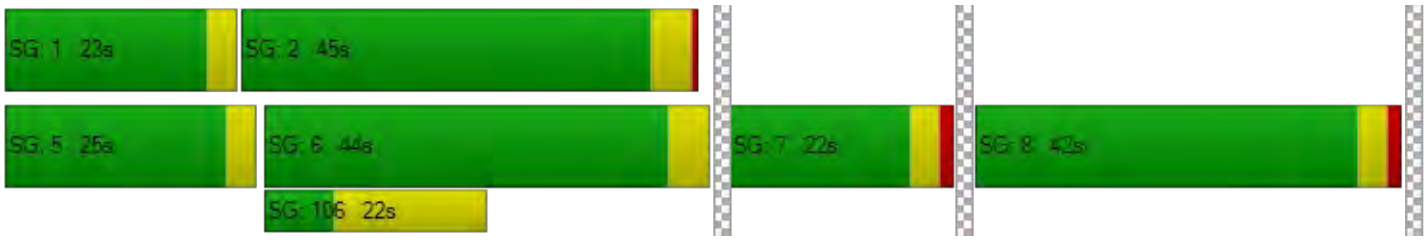
X, volume / capacity	0.48	0.48	0.83	0.80	0.46	0.76	0.81	0.81	0.75	0.43	0.44
d, Delay for Lane Group [s/veh]	21.76	21.65	27.80	32.05	26.86	36.90	27.31	27.31	38.10	22.28	22.33
Lane Group LOS	C	C	C	C	C	D	C	C	D	C	C
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	2.73	3.06	5.45	3.97	1.82	2.30	5.89	5.89	2.02	2.64	2.58
50th-Percentile Queue Length [ft]	68.14	76.43	136.19	99.31	45.44	57.42	147.14	147.14	50.41	66.02	64.54
95th-Percentile Queue Length [veh]	4.91	5.50	9.28	7.15	3.27	4.13	9.86	9.86	3.63	4.75	4.65
95th-Percentile Queue Length [ft]	122.65	137.57	231.88	178.76	81.80	103.35	246.60	246.60	90.74	118.84	116.18

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	21.71	21.65	27.80	32.05	32.05	26.86	36.90	27.31	27.31	38.10	22.30	22.33
Movement LOS	C	C	C	C	C	C	D	C	C	D	C	C
d_A, Approach Delay [s/veh]	24.39			30.29			28.68			25.75		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	27.00											
Intersection LOS	C											
Intersection V/C	0.757											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	11.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.323

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Northeastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	35	22	621	248	80	445
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Heavy Vehicles Percentage [%]	2.90	4.50	2.60	0.40	0.00	3.80
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	35	22	621	248	80	445
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]	9	6	167	67	22	120
Total Analysis Volume [veh/h]	38	24	668	267	86	478
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	6	85	85	6	95
g / C, Green / Cycle	0.05	0.78	0.78	0.05	0.87
(v / s)_i Volume / Saturation Flow Rate	0.04	0.21	0.18	0.05	0.15
s, saturation flow rate [veh/h]	1489	3173	1448	1629	3137
c, Capacity [veh/h]	77	2459	1122	90	2718
d1, Uniform Delay [s]	51.60	3.52	3.41	51.84	1.16
k, delay calibration	0.08	0.50	0.50	0.25	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	13.45	0.27	0.50	57.01	0.14
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	0.81	0.27	0.24	0.96	0.18
d, Delay for Lane Group [s/veh]	65.05	3.80	3.91	108.84	1.30
Lane Group LOS	E	A	A	F	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	1.98	1.77	1.46	3.78	0.39
50th-Percentile Queue Length [ft]	49.40	44.32	36.39	94.50	9.69
95th-Percentile Queue Length [veh]	3.56	3.19	2.62	6.80	0.70
95th-Percentile Queue Length [ft]	88.92	79.78	65.51	170.09	17.44

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	65.05	65.05	3.80	3.91	108.84	1.30
Movement LOS	E	E	A	A	F	A
d_A, Approach Delay [s/veh]	65.05		3.83		17.70	
Approach LOS	E		A		B	
d_I, Intersection Delay [s/veh]	11.27					
Intersection LOS	B					
Intersection V/C	0.323					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	52.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.391

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	876	50	0	503	33	0	0	131	0	0	29
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	2.60	0.00	2.00	2.00	6.10	2.00	2.00	0.00	2.00	2.00	0.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	876	50	0	503	33	0	0	131	0	0	29
Peak Hour Factor	1.0000	0.9100	0.9100	1.0000	0.9100	0.9100	1.0000	1.0000	0.9100	1.0000	1.0000	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	241	14	0	0	0	0	0	36	0	0	0
Total Analysis Volume [veh/h]	0	963	55	0	0	0	0	0	144	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	44	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	33	33		12	
g / C, Green / Cycle	0.30	0.30		0.11	
(v / s)_i Volume / Saturation Flow Rate	0.27	0.28		0.09	
s, saturation flow rate [veh/h]	1852	1817		1615	
c, Capacity [veh/h]	556	545		170	
d1, Uniform Delay [s]	37.18	37.46		48.37	
k, delay calibration	0.22	0.23		0.18	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	11.93	14.59		17.03	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

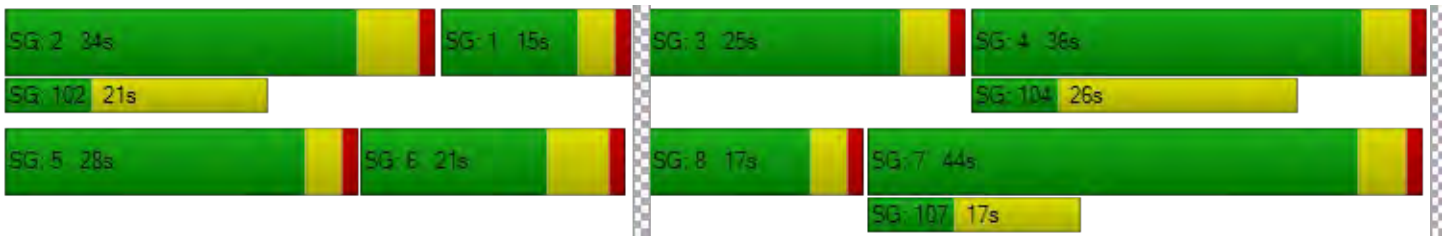
X, volume / capacity	0.92	0.93		0.85	
d, Delay for Lane Group [s/veh]	49.12	52.05		65.41	
Lane Group LOS	D	D		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	14.84	15.30		4.67	
50th-Percentile Queue Length [ft]	370.98	382.57		116.85	
95th-Percentile Queue Length [veh]	21.16	21.72		8.22	
95th-Percentile Queue Length [ft]	528.92	542.95		205.50	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	50.50	52.05	0.00	0.00	0.00	0.00	0.00	65.41	0.00	0.00	0.00
Movement LOS		D	D						E			
d_A, Approach Delay [s/veh]	50.58			0.00			65.41			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	52.42											
Intersection LOS	D											
Intersection V/C	0.391											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Junipero Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	43.3
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.697

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	135	282	325	257	627	116	103	352	162	271	513	122
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 [%]	27.00	2.50	5.80	1.90	2.20	0.90	1.00	2.00	0.60	1.50	0.80	2.50
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	135	282	325	257	627	116	103	352	162	271	513	122
Peak Hour Factor	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900	0.8900
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	38	79	0	72	176	33	29	99	0	76	144	34
Total Analysis Volume [veh/h]	152	317	0	289	704	130	116	396	0	304	576	137
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	103.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

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	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	6	0	0	8	0	4	10	0	4	10	0
Maximum Green [s]	0	25	0	0	30	0	20	40	0	20	40	0
Amber [s]	0.0	3.9	0.0	0.0	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	0.0	1.0	0.0	0.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	0	25	0	0	36	0	15	21	0	28	34	0
Vehicle Extension [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
Walk [s]	0	0	0	0	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	2.9	0.0	2.0	4.0	0.0	2.0	4.0	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	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	17	17	17	26	26	26	26	9	27	27	21	39	39
g / C, Green / Cycle	0.15	0.15	0.15	0.23	0.23	0.23	0.23	0.08	0.25	0.25	0.19	0.35	0.35
(v / s)_i Volume / Saturation Flow Rate	0.14	0.13	0.00	0.16	0.21	0.19	0.08	0.06	0.11	0.11	0.17	0.16	0.09
s, saturation flow rate [veh/h]	1797	1687	1526	1776	1859	1692	1601	1792	1863	1863	1783	3589	1576
c, Capacity [veh/h]	277	260	235	413	433	394	373	145	458	458	334	1266	556
d1, Uniform Delay [s]	45.61	45.55	0.00	38.73	41.00	39.85	35.29	49.78	35.05	35.05	43.84	27.48	25.27
k, delay calibration	0.13	0.12	0.04	0.04	0.12	0.06	0.04	0.09	0.50	0.50	0.24	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	10.18	9.93	0.00	0.81	7.70	2.28	0.21	7.87	2.95	2.95	18.23	1.18	1.06
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

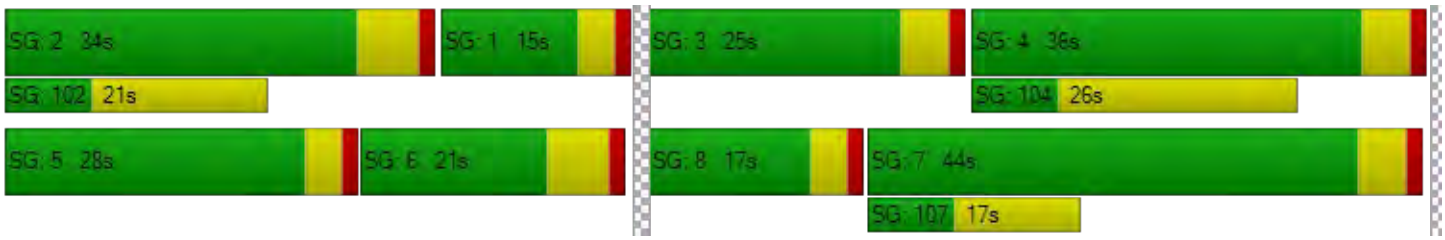
X, volume / capacity	0.88	0.87	0.00	0.70	0.90	0.80	0.35	0.80	0.43	0.43	0.91	0.45	0.25
d, Delay for Lane Group [s/veh]	55.79	55.49	0.00	39.53	48.70	42.13	35.50	57.65	38.00	38.00	62.07	28.66	26.33
Lane Group LOS	E	E	A	D	D	D	D	E	D	D	E	C	C
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	7.24	6.72	0.00	7.20	11.05	8.23	2.93	3.45	4.84	4.84	9.75	6.00	2.70
50th-Percentile Queue Length [ft]	181.06	168.05	0.00	179.9	276.1	205.6	73.36	86.18	120.99	120.99	243.66	149.93	67.38
95th-Percentile Queue Length [veh]	11.66	10.97	0.00	11.60	16.50	12.93	5.28	6.21	8.45	8.45	14.87	10.01	4.85
95th-Percentile Queue Length [ft]	291.40	274.34	0.00	289.9	412.4	323.2	132.0	155.13	211.18	211.18	371.66	250.33	121.28

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	55.79	55.58	0.00	39.53	45.76	35.50	57.65	38.00	38.00	62.07	28.66	26.33
Movement LOS	E	E	A	D	D	D	E	D	D	E	C	C
d_A, Approach Delay [s/veh]	55.65			42.97			42.45			38.33		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	43.28											
Intersection LOS	D											
Intersection V/C	0.697											

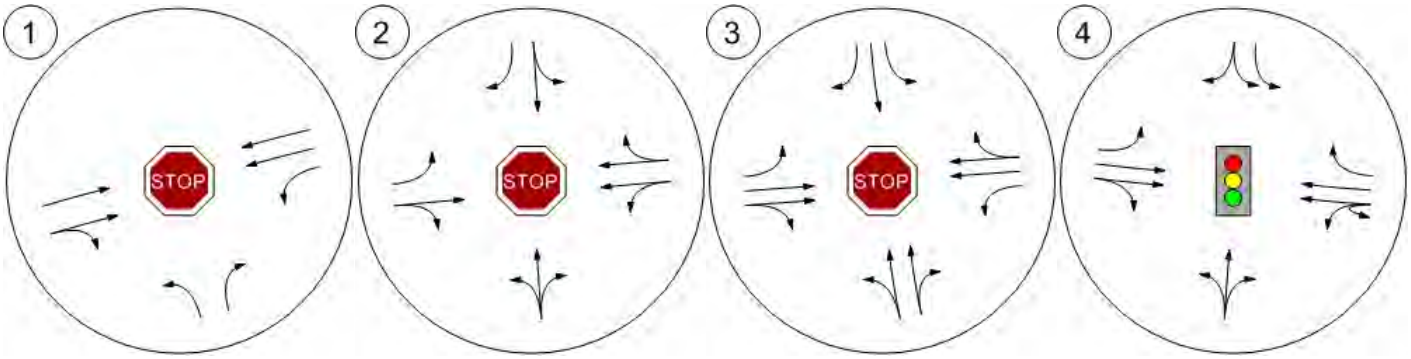
Sequence

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

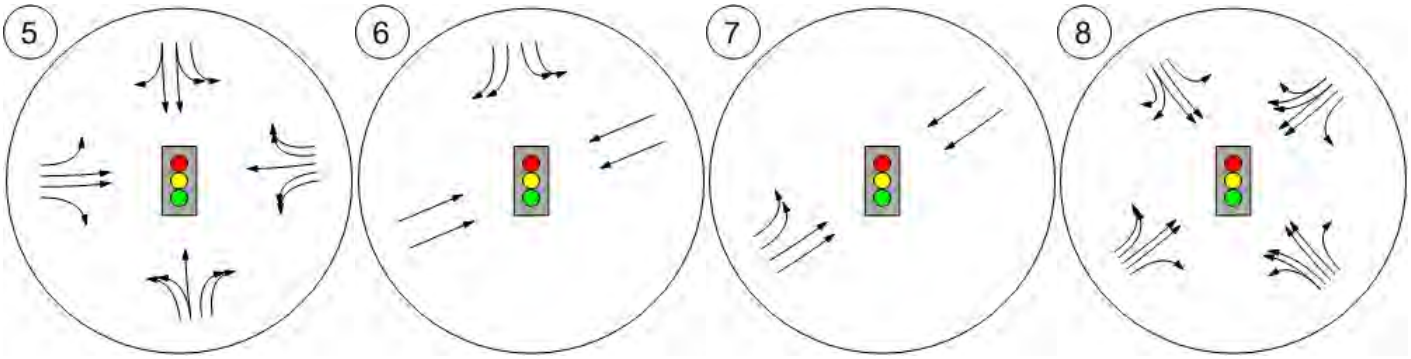


Lane Configuration and Traffic Control

WB Hwy 1 Ramps / Clarinad EB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

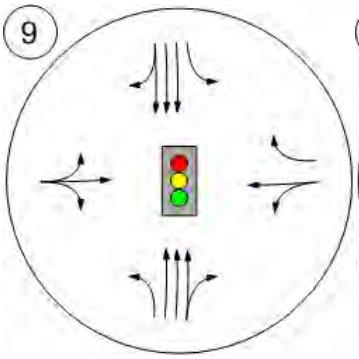


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

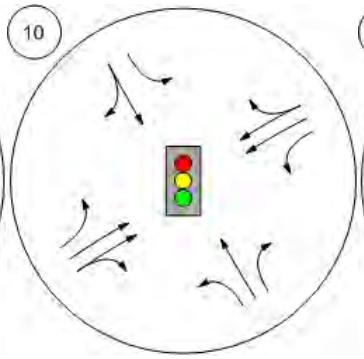


Lane Configuration and Traffic Control

Gellert Blvd / Serramonte Pla



Callan Blvd / Hickey Blvd



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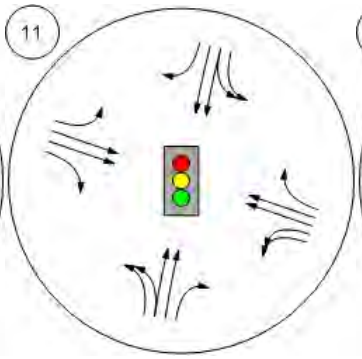
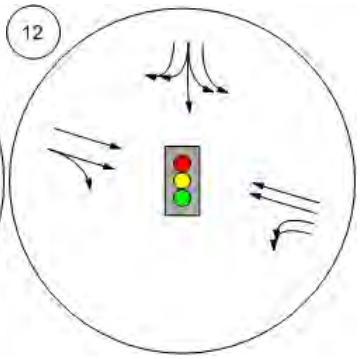
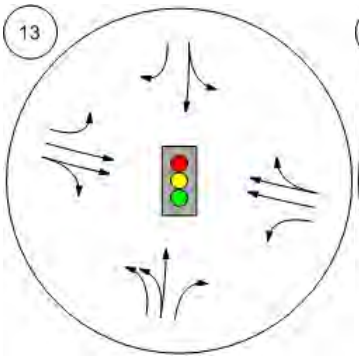


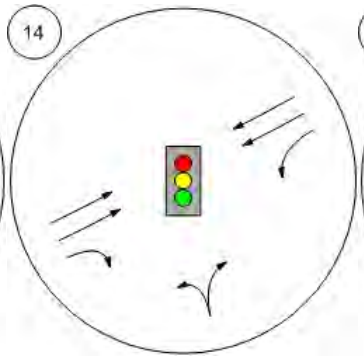
I-280 SB Ramps / Hickey Blv



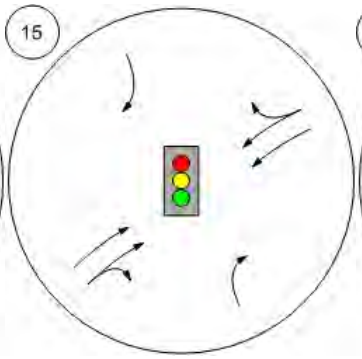
I-280 NB Ramps / Hickey Blv



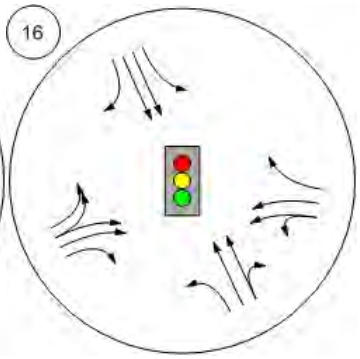
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd

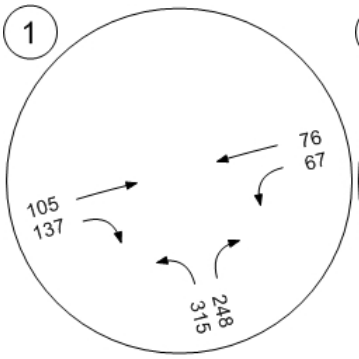


Junipero Serra Blvd / Hickey

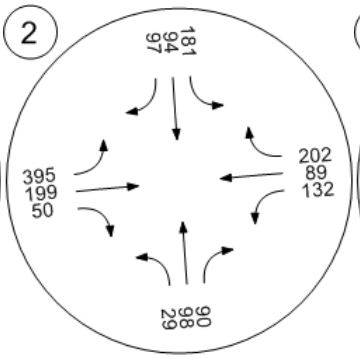


Traffic Volume - Future Total Volume

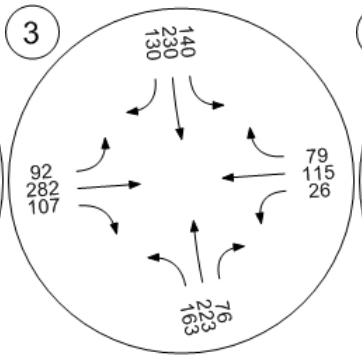
WB Hwy 1 Ramps / Clarinad



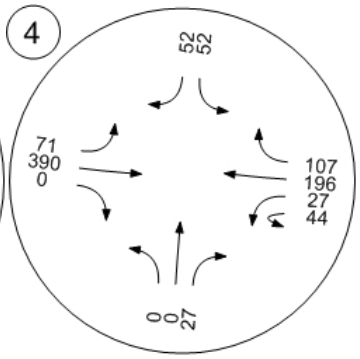
EB Hwy 1 Ramps / Serramon



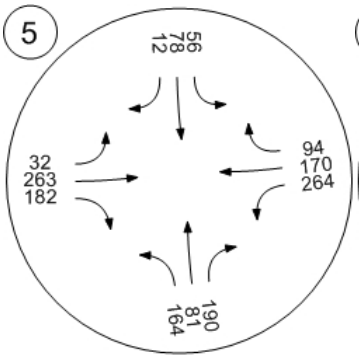
Callan Blvd / Serramonte Blv



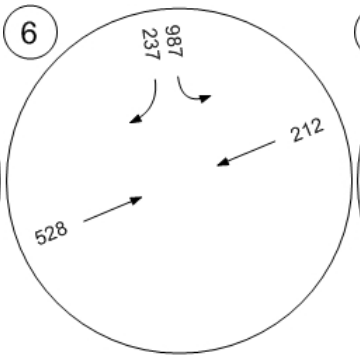
Serramonte Shopping Center



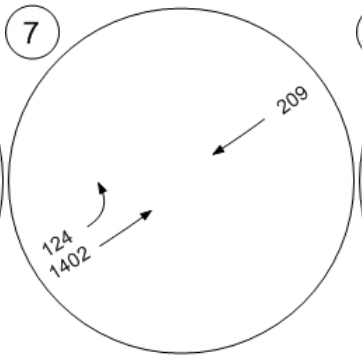
Gellert Blvd / Serramonte Blv

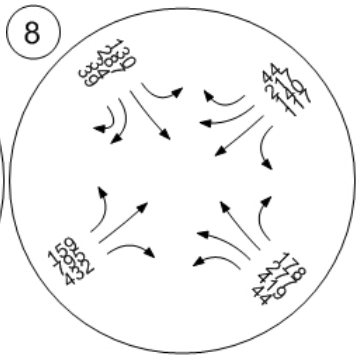


I-280 SB Off-Ramp / Serramo



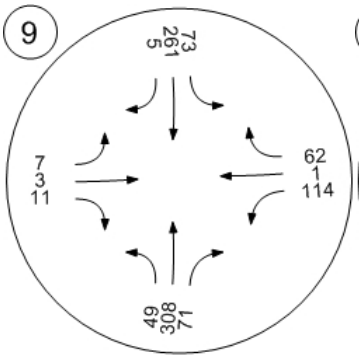
I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram



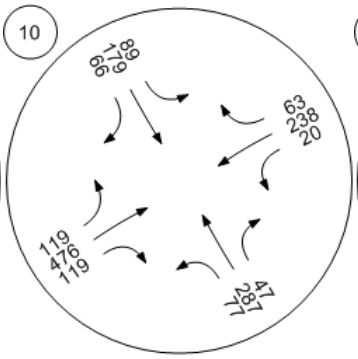


Traffic Volume - Future Total Volume

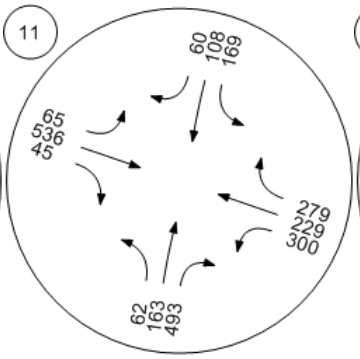
Gellert Blvd / Serramonte Pla



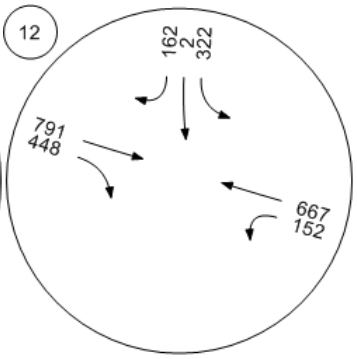
Callan Blvd / Hickey Blvd



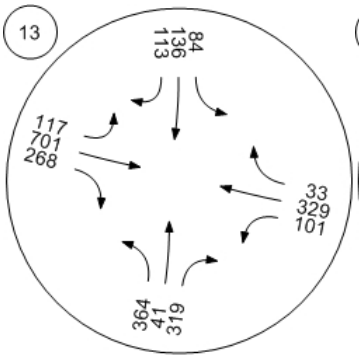
Gellert Blvd / Hickey Blvd



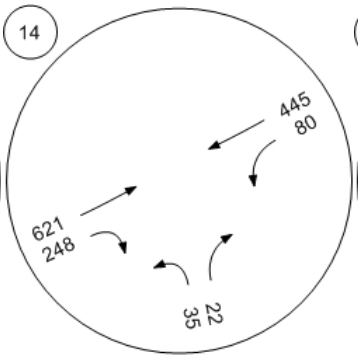
I-280 SB Ramps / Hickey Blv



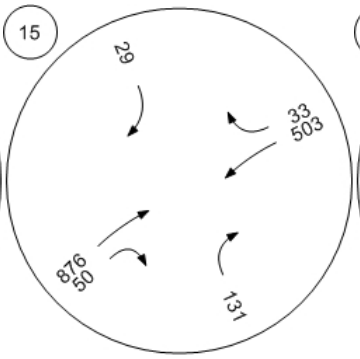
I-280 NB Ramps / Hickey Blv



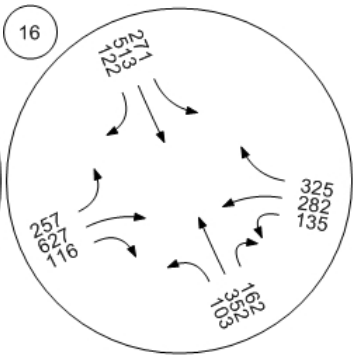
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd



Junipero Serra Blvd / Hickey



19898 Daly City Serramonte Terrace TIA

Vistro File: K:\...\19898_Vistro_20161005.vistro
Scenario 15: Adjusted Existing 2016 PM + Construction

Report File: K:\...\ExPM_wConst.pdf
10/5/2016

Intersection Analysis Summary

ID	Intersection Name	Control Type	Method	Worst Mvmt	V/C	Delay (s/veh)	LOS
1	SB Hwy 1 Ramps / Clarinada Ave.	All-way stop	HCM 2010	NB Left		23.9	C
2	NB Hwy 1 Ramps / Serramonte Blvd	All-way stop	HCM 2010	EB Left		15.7	C
3	Callan Blvd / Serramonte Blvd	All-way stop	HCM 2010	SB Thru		14.0	B
4	Serramonte Shopping Center Entrance / Serramonte Blvd	Signalized	HCM 2010	EB Left	0.563	14.5	B
5	Gellert Blvd / Serramonte Blvd	Signalized	HCM 2010	NB Left	0.753	52.6	D
6	I-280 SB Off-Ramp / Serramonte Blvd	Signalized	HCM 2010	SB Right	0.703	16.0	B
7	I-280 NB On-Ramp (west) / Serramonte Blvd	Signalized	HCM 2010	NEB Left	0.482	4.1	A
8	Junipero Serra Blvd / Serramonte Blvd	Signalized	HCM 2010	SWB Left	0.710	28.4	C
9	Gellert Blvd / Serramonte Plaza Entrace	Signalized	HCM 2010	NB Left	0.603	32.5	C
10	Callan Blvd / Hickey Blvd	Signalized	HCM 2010	NWB Left	0.697	22.5	C
11	Gellert Blvd / Hickey Blvd	Signalized	HCM 2010	EB Left	0.927	53.2	D
12	I-280 SB Ramps / Hickey Blvd	Signalized	HCM 2010	SB Right	0.712	10.6	B
13	I-280 NB Ramps / Hickey Blvd	Signalized	HCM 2010	EB Left	0.710	24.7	C
14	Kaiser / Hickey Blvd	Signalized	HCM 2010	NB Left	0.559	17.3	B
15	Longford Dr / Hickey Blvd	Signalized	HCM 2010	NWB Right	0.352	51.8	D
16	Juniper Serra Blvd / Hickey Blvd	Signalized	HCM 2010	SEB Left	0.750	51.4	D

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

Intersection Level Of Service Report
Intersection 1: SB Hwy 1 Ramps / Clarinada Ave.

Control Type:	All-way stop	Delay (sec / veh):	23.9
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Approach	Northbound		Eastbound		Westbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	1	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	175.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	SR 1 Southbound		Clarinada Ave		Clarinada Ave	
Base Volume Input [veh/h]	458	256	47	82	226	98
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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
Total Hourly Volume [veh/h]	458	256	47	82	226	98
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	119	67	12	21	59	26
Total Analysis Volume [veh/h]	477	267	49	85	235	102
Pedestrian Volume [ped/h]	0		0		0	

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	9.87	1.96	0.35	0.59	2.75	0.34	0.34
95th-Percentile Queue Length [ft]	246.80	48.92	8.80	14.79	68.77	8.42	8.42
Approach Delay [s/veh]	29.90		11.23		15.66		
Approach LOS	D		B		C		
Intersection Delay [s/veh]	23.89						
Intersection LOS	C						

Intersection Level Of Service Report
Intersection 2: NB Hwy 1 Ramps / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	15.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes		

Intersection Setup

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	80.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Jefferson High			SR 1 Southbound			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	13	37	57	19	79	273	221	153	41	78	165	143
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	4	10	0	0	30	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]	13	37	57	19	79	273	225	163	41	78	195	143
Peak Hour Factor	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500	0.8500
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	0.0000
Total 15-Minute Volume [veh/h]	4	11	17	6	23	80	66	48	12	23	57	0
Total Analysis Volume [veh/h]	15	44	67	22	93	321	265	192	48	92	229	0
Pedestrian Volume [ped/h]	0			0			0			0		

Intersection Settings

Lanes

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	1.02	0.90	3.68	3.28	2.35	1.47	1.39
95th-Percentile Queue Length [ft]	25.56	22.42	92.00	81.94	58.81	36.81	34.84
Approach Delay [s/veh]	12.94	16.34		17.13		13.75	
Approach LOS	B	C		C		B	
Intersection Delay [s/veh]	15.72						
Intersection LOS	C						

Intersection Level Of Service Report
Intersection 3: Callan Blvd / Serramonte Blvd

Control Type:	All-way stop	Delay (sec / veh):	14.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes		

Intersection Setup

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	1	1	0	0	1	0	0	1	0	0
Pocket Length [ft]	100.00	100.00	125.00	165.00	100.00	100.00	160.00	100.00	100.00	160.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Callan Blvd			Callan Blvd			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	91	231	121	124	243	104	56	247	79	151	205	222
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	6	0	0	0	0	0	0	8	2	0	24	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]	97	231	121	124	243	104	56	255	81	151	229	222
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	25	60	32	32	63	27	15	66	21	39	60	58
Total Analysis Volume [veh/h]	101	241	126	129	253	108	58	266	84	157	239	231
Pedestrian Volume [ped/h]	0			0			0			0		

Movement, Approach, & Intersection Results

95th-Percentile Queue Length [veh]	2.07	1.85	1.09	2.76	0.72	0.41	1.53	1.45	1.46	2.50	2.17
95th-Percentile Queue Length [ft]	51.87	46.29	27.13	69.06	18.00	10.30	38.29	36.13	36.55	62.59	54.16
Approach Delay [s/veh]	13.17		14.45			12.95			15.03		
Approach LOS	B		B			B			C		
Intersection Delay [s/veh]	14.02										
Intersection LOS	B										

Intersection Level Of Service Report
Intersection 4: Serramonte Shopping Center Entrance / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	14.5
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.563

Intersection Setup

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Approach	Northbound			Southbound			Eastbound			Westbound			
Lane Configuration													
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	U-tu	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0	1	0	0	0	0	0	1
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00	175.00	100.00	100.00	100.0	100.0	100.0	215.0
Speed [mph]	30.00			30.00			30.00			30.00			
Grade [%]	0.00			0.00			0.00			0.00			
Crosswalk	Yes			Yes			Yes			Yes			

Volumes

Name	Project Access			Se Sh			Serramonte Blvd			Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	248	0	221	195	284	0	53	0	345	317
Base Volume Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Heavy Vehicles Percentage [%]	2.00	2.00	100.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	100.0	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	27	0	0	5	2	6	0	0	27	19	0
Diverted Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pass-by Trips [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Existing Site Adjustment Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	0	0	27	248	0	226	197	290	0	53	27	364	317
Peak Hour Factor	0.9500	0.9500	0.9500	0.9500	1.0000	0.9500	0.9500	0.9500	0.9500	0.950	0.950	0.950	0.950
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.000	1.000	1.000	1.000
Total 15-Minute Volume [veh/h]	0	0	7	65	0	59	52	76	0	14	7	96	83
Total Analysis Volume [veh/h]	0	0	28	261	0	238	207	305	0	56	28	383	334
Presence of On-Street Parking	No		No	No		No	No		No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0			0			0			0			
Bicycle Volume [bicycles/h]	0			0			0			0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	50
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	45.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Permiss	Split	Protecte	Permiss	Permiss	Permi	Permi	Permi	Overl
Signal group	0	8	0	4	0	0	1	6	0	0	0	2	2
Auxiliary Signal Groups													2,4
Lead / Lag	-	-	-	Lag	-	-	Lead	-	-	-	-	-	-
Minimum Green [s]	0	6	0	6	0	0	4	8	0	0	0	8	8
Maximum Green [s]	0	30	0	30	0	0	20	40	0	0	0	40	40
Amber [s]	0.0	3.0	0.0	3.0	0.0	0.0	3.0	3.6	0.0	0.0	0.0	3.6	3.6
All red [s]	0.0	1.0	0.0	1.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	1.0	1.0
Split [s]	0	18	0	18	0	0	12	32	0	0	0	20	20
Vehicle Extension [s]	0.0	2.5	0.0	2.5	0.0	0.0	2.0	3.0	0.0	0.0	0.0	3.0	3.0
Walk [s]	0	7	0	7	0	0	0	0	0	0	0	7	7
Pedestrian Clearance [s]	0	20	0	20	0	0	0	0	0	0	0	18	18
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	2.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	2.0	0.0	2.0	0.0	0.0	2.0	2.6	0.0	0.0	0.0	2.6	2.6
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	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	0.0	0.0	6.0	6.0	0.0	0.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	L	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.60	4.60	4.60	4.60	4.00
l1_p, Permitted Start-Up Lost Time [s]	2.00	2.00	2.00	0.00	0.00	0.00	2.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.60	2.60	2.60	2.60	0.00
g_i, Effective Green Time [s]	17	17	17	7	24	24	13	13	35
g / C, Green / Cycle	0.34	0.34	0.34	0.14	0.49	0.49	0.26	0.26	0.70
(v / s)_i Volume / Saturation Flow Rate	0.02	0.12	0.20	0.12	0.08	0.08	0.15	0.15	0.21
s, saturation flow rate [veh/h]	1583	1377	1680	1774	1863	1863	1503	1695	1583
c, Capacity [veh/h]	609	371	663	256	910	910	496	448	1101
d1, Uniform Delay [s]	11.11	19.82	13.42	20.71	7.12	7.12	15.58	15.85	2.94
k, delay calibration	0.08	0.08	0.08	0.12	0.50	0.50	0.50	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.02	0.62	0.44	6.39	0.40	0.40	2.86	4.83	0.71
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

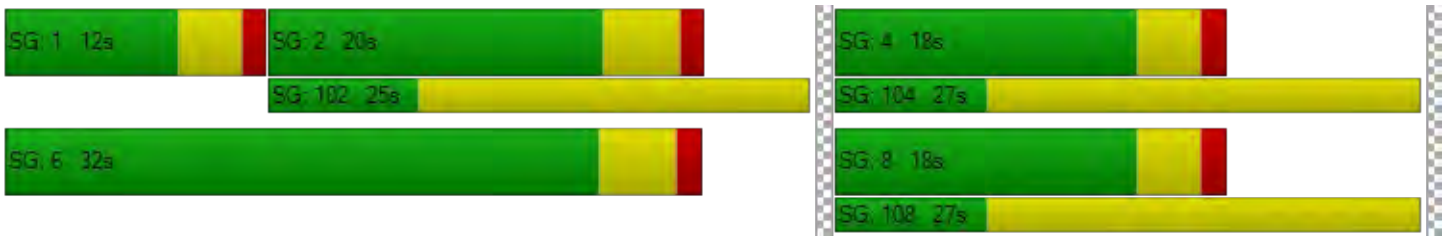
X, volume / capacity	0.05	0.44	0.50	0.81	0.17	0.17	0.44	0.55	0.30
d, Delay for Lane Group [s/veh]	11.13	20.44	13.86	27.11	7.52	7.52	18.43	20.68	3.65
Lane Group LOS	B	C	B	C	A	A	B	C	A
Critical Lane Group	No	No	Yes	Yes	No	No	Yes	No	No
50th-Percentile Queue Length [veh]	0.18	1.69	2.65	2.56	0.80	0.80	2.27	2.73	0.79
50th-Percentile Queue Length [ft]	4.57	42.37	66.33	64.10	20.11	20.11	56.70	68.18	19.67
95th-Percentile Queue Length [veh]	0.33	3.05	4.78	4.62	1.45	1.45	4.08	4.91	1.42
95th-Percentile Queue Length [ft]	8.22	76.27	119.39	115.38	36.19	36.19	102.06	122.73	35.41

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	11.13	11.13	11.13	19.88	0.00	13.86	27.11	7.52	7.52	18.43	18.43	19.88	3.65
Movement LOS	B	B	B	B		B	C	A	A	B	B	B	A
d_A, Approach Delay [s/veh]	11.13			16.04			15.44			12.96			
Approach LOS	B			B			B			B			
d_I, Intersection Delay [s/veh]	14.46												
Intersection LOS	B												
Intersection V/C	0.563												

Sequence

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



Intersection Level Of Service Report
Intersection 5: Gellert Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	52.6
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.753

Intersection Setup

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	0	0	1	1	0	0	1	0	0
Pocket Length [ft]	210.00	100.00	100.00	100.00	100.00	150.00	130.00	100.00	100.00	320.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Serramonte Center			Serramonte Blvd			Serramonte Blvd		
Base Volume Input [veh/h]	340	249	620	392	291	55	45	299	221	534	311	467
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 [%]	9.20	2.00	2.00	2.00	2.00	2.00	2.00	2.00	12.70	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	29	0	0	0	0	0	0	3	31	0	17	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]	369	249	620	392	291	55	45	302	252	534	328	467
Peak Hour Factor	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700	0.9700
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]	95	64	160	101	75	14	12	78	65	138	85	120
Total Analysis Volume [veh/h]	380	257	639	404	300	57	46	311	260	551	338	481
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	13.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Overlap	Permiss	Permiss	Permiss	Protecte	Permiss	Overlap	Protecte	Permiss	Overlap
Signal group	0	3	3	0	4	0	5	2	2	1	6	6
Auxiliary Signal Groups		3	1,3						2,3			4,6
Lead / Lag	-	-	-	-	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	0	4	4	0	4	0	4	6	6	4	6	6
Maximum Green [s]	0	25	25	0	30	0	20	26	26	25	26	26
Amber [s]	0.0	3.0	3.0	0.0	3.0	0.0	3.0	3.6	3.6	3.0	3.6	3.6
All red [s]	0.0	0.5	0.5	0.0	0.5	0.0	0.5	0.5	0.5	0.5	0.5	0.5
Split [s]	0	20	20	0	25	0	12	35	35	30	53	53
Vehicle Extension [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	3.0	3.0	2.0	3.0	3.0
Walk [s]	0	0	0	0	7	0	0	7	7	0	0	0
Pedestrian Clearance [s]	0	0	0	0	18	0	0	20	20	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	2.0	0.0	2.0	0.0	2.0	2.0	2.0	2.0	2.0	2.0
I2, Clearance Lost Time [s]	0.0	1.5	1.5	0.0	1.5	0.0	1.5	2.1	2.1	1.5	2.1	2.1
Minimum Recall		No	No		No		No	No	No	No	No	No
Maximum Recall		No	No		No		No	No	No	No	No	No
Pedestrian Recall		No	No		No		No	No	No	No	No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	6.0	0.0	6.0	6.0	6.0	6.0	6.0	6.0
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	C	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	3.50	3.50	3.50	3.50	3.50	3.50	3.50	4.10	3.50	3.50	4.10	4.10
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	2.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.50	1.50	0.00	1.50	1.50	1.50	1.50	2.10	0.00	1.50	2.10	0.00
g_i, Effective Green Time [s]	17	17	65	21	21	21	4	37	58	20	54	79
g / C, Green / Cycle	0.15	0.15	0.59	0.19	0.19	0.19	0.03	0.34	0.52	0.19	0.49	0.72
(v / s)_i Volume / Saturation Flow Rate	0.19	0.18	0.23	0.17	0.17	0.17	0.03	0.09	0.18	0.16	0.18	0.17
s, saturation flow rate [veh/h]	1657	1843	2802	1412	1364	1637	1774	3547	1433	3445	1863	2803
c, Capacity [veh/h]	249	277	1663	310	319	316	60	1198	753	641	913	2004
d1, Uniform Delay [s]	46.75	46.75	11.79	45.28	44.61	43.33	52.72	26.46	15.15	43.38	17.49	5.40
k, delay calibration	0.50	0.50	0.04	0.33	0.35	0.35	0.04	0.50	0.50	0.04	0.50	0.04
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
d2, Incremental Delay [s]	135.68	115.52	0.05	11.43	10.71	23.05	7.28	0.53	1.26	1.35	1.16	0.02
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	1.24	1.19	0.38	0.77	0.75	0.90	0.76	0.26	0.35	0.86	0.37	0.24
d, Delay for Lane Group [s/veh]	182.44	162.28	11.85	56.71	55.32	66.38	60.00	26.98	16.41	44.73	18.65	5.42
Lane Group LOS	F	F	B	E	E	E	E	C	B	D	B	A
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	Yes	No	No
50th-Percentile Queue Length [veh]	16.15	16.41	3.95	7.40	7.27	9.50	1.38	3.05	3.96	7.33	5.55	1.69
50th-Percentile Queue Length [ft]	403.71	410.13	98.86	184.97	181.76	237.50	34.51	76.25	99.10	183.31	138.64	42.35
95th-Percentile Queue Length [veh]	24.93	24.92	7.12	11.86	11.69	14.55	2.48	5.49	7.14	11.77	9.41	3.05
95th-Percentile Queue Length [ft]	623.29	623.00	177.95	296.50	292.31	363.87	62.11	137.24	178.38	294.33	235.19	76.23

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	178.98	162.28	11.85	56.19	63.69	66.38	60.00	26.98	16.41	44.73	18.65	5.42
Movement LOS	F	F	B	E	E	E	E	C	B	D	B	A
d_A, Approach Delay [s/veh]	91.80			59.88			24.99			24.49		
Approach LOS	F			E			C			C		
d_I, Intersection Delay [s/veh]	52.61											
Intersection LOS	D											
Intersection V/C	0.753											

Sequence

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

Intersection Level Of Service Report
Intersection 6: I-280 SB Off-Ramp / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	16.0
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.703

Intersection Setup

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Approach	Southbound		Westbound		Northeastbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	0	0	0
Pocket Length [ft]	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	I-280 SB OFF		Serramonte Blvd		Serramonte Blvd	
Base Volume Input [veh/h]	675	710	609	0	0	1270
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	17	0	0	3
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]	675	710	626	0	0	1273
Peak Hour Factor	0.9900	0.9900	0.9900	1.0000	1.0000	0.9900
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	170	179	158	0	0	321
Total Analysis Volume [veh/h]	682	717	632	0	0	1286
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	75
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Permissive	Permissive
Signal group	4	4	6	0	0	2
Auxiliary Signal Groups						
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	6	6	8	0	0	8
Maximum Green [s]	26	26	38	0	0	38
Amber [s]	3.2	3.2	3.6	0.0	0.0	3.6
All red [s]	0.5	0.5	1.0	0.0	0.0	0.0
Split [s]	30	30	43	0	0	42
Vehicle Extension [s]	2.0	2.0	2.0	0.0	0.0	2.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	2.0
I2, Clearance Lost Time [s]	1.7	1.7	2.6	0.0	0.0	1.6
Minimum Recall	No		No			No
Maximum Recall	No		No			No
Pedestrian Recall	No		No			No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	0.0	0.0	6.0
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	C	C
L, Total Lost Time per Cycle [s]	3.70	3.70	4.60	3.60
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	1.70	1.70	2.60	1.60
g_i, Effective Green Time [s]	22	22	45	46
g / C, Green / Cycle	0.29	0.29	0.60	0.61
(v / s)_i Volume / Saturation Flow Rate	0.20	0.26	0.18	0.36
s, saturation flow rate [veh/h]	3445	2803	3547	3547
c, Capacity [veh/h]	1009	821	2115	2163
d1, Uniform Delay [s]	23.36	25.17	7.42	8.95
k, delay calibration	0.04	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.30	1.19	0.36	1.21
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.68	0.87	0.30	0.59
d, Delay for Lane Group [s/veh]	23.65	26.37	7.79	10.16
Lane Group LOS	C	C	A	B
Critical Lane Group	No	Yes	No	Yes
50th-Percentile Queue Length [veh]	5.08	5.84	2.23	5.65
50th-Percentile Queue Length [ft]	126.89	145.99	55.72	141.30
95th-Percentile Queue Length [veh]	8.77	9.80	4.01	9.55
95th-Percentile Queue Length [ft]	219.25	245.07	100.29	238.78

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.65	26.37	7.79	0.00	0.00	10.16
Movement LOS	C	C	A			B
d_A, Approach Delay [s/veh]	25.04		7.79		10.16	
Approach LOS	C		A		B	
d_I, Intersection Delay [s/veh]	15.99					
Intersection LOS	B					
Intersection V/C	0.703					

Sequence

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

Intersection Level Of Service Report
Intersection 7: I-280 NB On-Ramp (west) / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	4.1
Analysis Method:	HCM 2010	Level Of Service:	A
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.482

Intersection Setup

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Approach	Northeastbound		Southwestbound		Southeastbound	
Lane Configuration						
Turning Movement	Left	Thru	Thru	Right	Left	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	2	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Serramonte Blvd		Serramonte Blvd		I-280 NB ON	
Base Volume Input [veh/h]	602	1331	635	0	0	0
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	3	17	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]	602	1334	652	0	0	0
Peak Hour Factor	0.9800	0.9800	0.9800	1.0000	1.0000	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	154	340	166	0	0	0
Total Analysis Volume [veh/h]	614	1361	665	0	0	0
Presence of On-Street Parking	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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	60
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Protected	Overlap	Permissive	Permissive	Permissive	Permissive
Signal group	5	2	6	0	0	0
Auxiliary Signal Groups		2,6				
Lead / Lag	Lead	-	-	-	-	-
Minimum Green [s]	5	5	5	0	0	0
Maximum Green [s]	20	25	30	0	0	0
Amber [s]	3.0	3.9	3.6	0.0	0.0	0.0
All red [s]	0.5	0.0	0.5	0.0	0.0	0.0
Split [s]	24	29	34	0	0	0
Vehicle Extension [s]	3.0	3.0	3.0	0.0	0.0	0.0
Walk [s]	0	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	2.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	1.5	1.9	2.1	0.0	0.0	0.0
Minimum Recall	No	No	No			
Maximum Recall	No	No	No			
Pedestrian Recall	No	No	No			
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	6.0	0.0	0.0	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	C	C	
L, Total Lost Time per Cycle [s]	3.50	4.10	4.10	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	
l2, Clearance Lost Time [s]	1.50	0.00	2.10	
g_i, Effective Green Time [s]	9	28	15	
g / C, Green / Cycle	0.28	0.88	0.49	
(v / s)_i Volume / Saturation Flow Rate	0.18	0.38	0.19	
s, saturation flow rate [veh/h]	3445	3547	3547	
c, Capacity [veh/h]	952	3113	1721	
d1, Uniform Delay [s]	10.16	0.39	5.20	
k, delay calibration	0.11	0.11	0.11	
I, Upstream Filtering Factor	1.00	1.00	1.00	
d2, Incremental Delay [s]	0.74	0.10	0.14	
d3, Initial Queue Delay [s]	0.00	0.00	0.00	
Rp, platoon ratio	1.00	1.00	1.00	
PF, progression factor	1.00	1.00	1.00	

Lane Group Results

X, volume / capacity	0.65	0.44	0.39	
d, Delay for Lane Group [s/veh]	10.90	0.48	5.34	
Lane Group LOS	B	A	A	
Critical Lane Group	Yes	Yes	No	
50th-Percentile Queue Length [veh]	1.41	0.04	0.71	
50th-Percentile Queue Length [ft]	35.22	1.05	17.81	
95th-Percentile Queue Length [veh]	2.54	0.08	1.28	
95th-Percentile Queue Length [ft]	63.39	1.89	32.06	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	10.90	0.48	5.34	0.00	0.00	0.00
Movement LOS	B	A	A			
d_A, Approach Delay [s/veh]	3.72		5.34		0.00	
Approach LOS	A		A		A	
d_I, Intersection Delay [s/veh]	4.13					
Intersection LOS	A					
Intersection V/C	0.482					

Sequence

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

Intersection Level Of Service Report
Intersection 8: Junipero Serra Blvd / Serramonte Blvd

Control Type:	Signalized	Delay (sec / veh):	28.4
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

Intersection Setup

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Approach	Eastbound				Northeastbound				Southwestbound			
Lane Configuration												
Turning Movement	Left	Left	Right	Right	Left	Left	Thru	Right	Left	Thru	Right	Right2
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00				30.00				30.00			
Grade [%]	0.00				0.00				0.00			
Crosswalk	Yes				Yes				Yes			

Volumes

Name	I-280 NB ON				Serramonte Blvd				Serramonte Blvd			
Base Volume Input [veh/h]	0	0	0	0	374	0	699	263	185	417	408	60
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	1	2	0	12	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]	0	0	0	0	374	0	700	265	185	429	408	60
Peak Hour Factor	1.0000	1.0000	1.0000	1.0000	0.9100	1.0000	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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	0	0	0	103	0	192	73	51	118	112	16
Total Analysis Volume [veh/h]	0	0	0	0	411	0	769	291	203	471	448	66
Presence of On-Street Parking					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
Pedestrian Volume [ped/h]	0				0				0			
Bicycle Volume [bicycles/h]	0				0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss
Signal group	0	0	0	0	5	0	2	0	1	6	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	Lead	-	-	-	Lag	-	-	-
Minimum Green [s]	0	0	0	0	5	0	5	0	5	5	0	0
Maximum Green [s]	0	0	0	0	25	0	40	0	20	30	0	0
Amber [s]	0.0	0.0	0.0	0.0	3.0	0.0	4.0	0.0	3.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	0	0	28	0	44	0	23	35	0	0
Vehicle Extension [s]	0.0	0.0	0.0	0.0	3.0	0.0	3.0	0.0	3.0	3.0	0.0	0.0
Walk [s]	0	0	0	0	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	0	0	0	0	24	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	0.0	2.0	0.0	2.0	0.0	2.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	0.0	1.0	0.0	2.0	0.0	1.0	2.6	0.0	0.0
Minimum Recall					No		No		No	No		
Maximum Recall					No		No		No	No		
Pedestrian Recall					No		No		No	No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group		L	C	R	L	C	C	R
L, Total Lost Time per Cycle [s]		3.00	4.00	4.00	3.00	4.60	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
l2, Clearance Lost Time [s]		1.00	2.00	2.00	1.00	2.60	2.60	2.60
g_i, Effective Green Time [s]		11	20	20	10	18	18	18
g / C, Green / Cycle		0.16	0.27	0.27	0.14	0.25	0.25	0.25
(v / s)_i Volume / Saturation Flow Rate		0.12	0.22	0.18	0.11	0.19	0.19	0.19
s, saturation flow rate [veh/h]		3445	3547	1583	1774	1863	1672	1583
c, Capacity [veh/h]		544	965	431	252	462	415	393
d1, Uniform Delay [s]		29.15	24.49	23.50	30.07	25.31	25.34	25.35
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		2.17	1.55	1.85	5.94	2.78	3.15	3.35
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.76	0.80	0.68	0.80	0.77	0.78	0.78
d, Delay for Lane Group [s/veh]		31.32	26.04	25.35	36.01	28.09	28.49	28.71
Lane Group LOS		C	C	C	D	C	C	C
Critical Lane Group		No	Yes	No	Yes	No	No	No
50th-Percentile Queue Length [veh]		3.43	5.95	4.39	3.70	5.74	5.23	4.98
50th-Percentile Queue Length [ft]		85.71	148.86	109.87	92.38	143.49	130.63	124.59
95th-Percentile Queue Length [veh]		6.17	9.96	7.83	6.65	9.67	8.97	8.64
95th-Percentile Queue Length [ft]		154.28	248.90	195.82	166.29	241.72	224.35	216.12

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	0.00	31.32	0.00	26.04	25.35	36.01	28.18	28.62	28.71
Movement LOS					C		C	C	D	C	C	C
d_A, Approach Delay [s/veh]	0.00				27.38				29.71			
Approach LOS	A				C				C			
d_I, Intersection Delay [s/veh]	28.36											
Intersection LOS	C											
Intersection V/C	0.710											

Intersection Setup

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Approach	Northwestbound				Southeastbound			
Lane Configuration								
Turning Movement	Left2	Left	Thru	Right	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 Pocket	2	0	0	1	1	0	0	1
Pocket Length [ft]	335.00	100.00	100.00	100.00	350.00	100.00	100.00	325.00
Speed [mph]	30.00				30.00			
Grade [%]	0.00				0.00			
Crosswalk	Yes				Yes			

Volumes

Name	Junipero Serra Blvd				Junipero Serra Blvd			
Base Volume Input [veh/h]	117	380	501	116	104	328	126	205
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	5	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
Right-Turn on Red Volume [veh/h]	0	0	0	0	0	0	0	0
Total Hourly Volume [veh/h]	122	380	501	116	104	328	126	205
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	34	104	138	32	29	90	35	0
Total Analysis Volume [veh/h]	134	418	551	127	114	360	138	0
Presence of On-Street Parking	No			No	No			No
On-Street Parking Maneuver Rate [/h]	0	0	0	0	0	0	0	0
Local Bus Stopping Rate [/h]	0	0	0	0	0	0	0	0
Pedestrian Volume [ped/h]	0				0			
Bicycle Volume [bicycles/h]	0				0			

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	90
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	130.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Split	Split
Signal group	0	0	3	0	0	4	0	0
Auxiliary Signal Groups								
Lead / Lag	-	-	-	-	-	-	-	-
Minimum Green [s]	0	0	5	0	0	5	0	0
Maximum Green [s]	0	0	30	0	0	25	0	0
Amber [s]	0.0	0.0	4.0	0.0	0.0	3.6	0.0	0.0
All red [s]	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0
Split [s]	0	0	34	0	0	30	0	0
Vehicle Extension [s]	0.0	0.0	3.0	0.0	0.0	3.0	0.0	0.0
Walk [s]	0	0	5	0	0	0	0	0
Pedestrian Clearance [s]	0	0	23	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	2.0	0.0	0.0	2.6	0.0	0.0
Minimum Recall			No			No		
Maximum Recall			No			No		
Pedestrian Recall			No			No		
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	6.0	0.0	0.0	6.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

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	C	R
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.60	4.60	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
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.60	2.60	2.60	2.60
g_i, Effective Green Time [s]	16	16	16	10	10	10	10
g / C, Green / Cycle	0.23	0.23	0.23	0.14	0.14	0.14	0.14
(v / s)_i Volume / Saturation Flow Rate	0.16	0.16	0.08	0.06	0.09	0.10	0.09
s, saturation flow rate [veh/h]	3445	3547	1583	1774	1863	1863	1583
c, Capacity [veh/h]	779	802	358	255	268	268	228
d1, Uniform Delay [s]	25.81	25.66	23.56	28.35	29.25	29.48	29.06
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	1.20	1.06	0.60	1.22	2.62	3.23	2.58
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

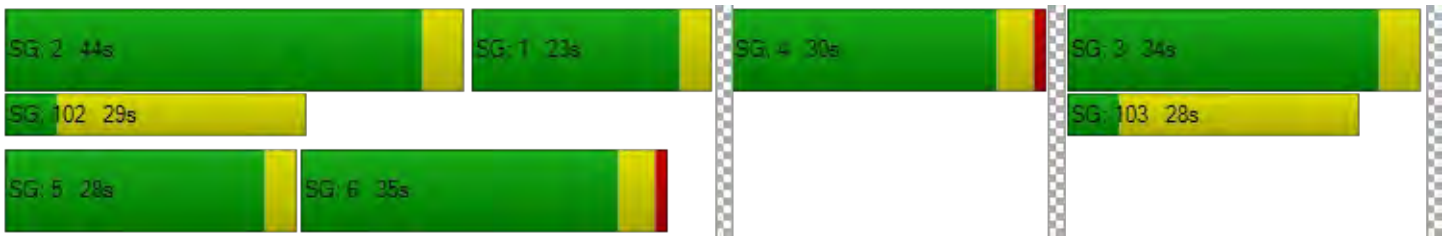
X, volume / capacity	0.71	0.69	0.35	0.45	0.65	0.69	0.61
d, Delay for Lane Group [s/veh]	27.01	26.72	24.16	29.57	31.88	32.70	31.64
Lane Group LOS	C	C	C	C	C	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	4.28	4.23	1.80	1.82	2.93	3.20	2.32
50th-Percentile Queue Length [ft]	106.95	105.86	45.05	45.62	73.19	79.88	58.01
95th-Percentile Queue Length [veh]	7.67	7.61	3.24	3.28	5.27	5.75	4.18
95th-Percentile Queue Length [ft]	191.75	190.22	81.08	82.12	131.74	143.78	104.42

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	27.01	27.01	26.72	24.16	29.57	32.30	32.70	31.64
Movement LOS	C	C	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	26.58				31.65			
Approach LOS	C				C			
d_I, Intersection Delay [s/veh]	28.36							
Intersection LOS	C							
Intersection V/C	0.710							

Sequence

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



Intersection Level Of Service Report
Intersection 9: Gellert Blvd / Serramonte Plaza Entrace

Control Type:	Signalized	Delay (sec / veh):	32.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.603

Intersection Setup

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	0	1	0	0	0	0	0	0	0	0
Pocket Length [ft]	240.00	100.00	100.00	210.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd						Serramonte Plaza		
Base Volume Input [veh/h]	162	646	118	172	573	13	57	21	49	267	11	187
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	5.93	2.00	2.00	6.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	28	0	1	30	0	0	0	0	0	0	1
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]	162	674	118	173	603	13	57	21	49	267	11	188
Peak Hour Factor	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100	0.9100
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]	45	185	32	48	166	4	16	6	13	73	3	52
Total Analysis Volume [veh/h]	178	741	130	190	663	14	63	23	54	293	12	207
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	88.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	5	2	0	1	6	0	0	4	0	0	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	-	-	-	-	-	-
Minimum Green [s]	5	5	0	5	5	0	0	5	0	0	5	0
Maximum Green [s]	22	35	0	20	35	0	0	25	0	0	25	0
Amber [s]	3.0	3.2	0.0	3.0	3.2	0.0	0.0	3.0	0.0	0.0	3.0	0.0
All red [s]	0.5	0.5	0.0	0.5	0.5	0.0	0.0	1.0	0.0	0.0	1.0	0.0
Split [s]	15	53	0	21	59	0	0	36	0	0	36	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	0.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	11	0	0	10	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	0.0	2.0	0.0
I2, Clearance Lost Time [s]	1.5	1.7	0.0	1.5	1.7	0.0	0.0	2.0	0.0	0.0	2.0	0.0
Minimum Recall	No	Yes		No	Yes			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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	0.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	C	C	R
L, Total Lost Time per Cycle [s]	3.50	3.70	3.70	3.50	3.70	3.70	4.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	2.00	2.00	0.00
l2, Clearance Lost Time [s]	1.50	1.70	1.70	1.50	1.70	1.70	2.00	2.00	2.00
g_i, Effective Green Time [s]	12	53	53	14	55	55	32	32	32
g / C, Green / Cycle	0.10	0.48	0.48	0.12	0.50	0.50	0.29	0.29	0.29
(v / s)_i Volume / Saturation Flow Rate	0.10	0.17	0.17	0.11	0.13	0.13	0.14	0.27	0.13
s, saturation flow rate [veh/h]	1774	3415	1660	1774	3397	1765	1007	1114	1583
c, Capacity [veh/h]	187	1654	804	220	1709	888	339	387	459
d1, Uniform Delay [s]	48.87	17.62	17.64	47.21	15.61	15.62	32.20	39.91	31.89
k, delay calibration	0.38	0.50	0.50	0.20	0.50	0.50	0.11	0.41	0.11
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	46.26	0.59	1.23	16.48	0.37	0.71	0.80	12.56	0.70
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.95	0.35	0.36	0.86	0.26	0.26	0.41	0.79	0.45
d, Delay for Lane Group [s/veh]	95.13	18.21	18.87	63.69	15.98	16.33	33.00	52.47	32.59
Lane Group LOS	F	B	B	E	B	B	C	D	C
Critical Lane Group	No	No	Yes	Yes	No	No	No	Yes	No
50th-Percentile Queue Length [veh]	7.24	4.68	4.72	6.08	3.24	3.46	3.13	9.36	4.56
50th-Percentile Queue Length [ft]	181.00	117.00	118.12	152.12	80.92	86.39	78.30	233.92	114.11
95th-Percentile Queue Length [veh]	11.65	8.23	8.29	10.13	5.83	6.22	5.64	14.37	8.07
95th-Percentile Queue Length [ft]	291.32	205.70	207.23	253.26	145.66	155.50	140.93	359.34	201.70

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	95.13	18.35	18.87	63.69	16.10	16.33	33.00	33.00	33.00	52.47	52.47	32.59
Movement LOS	F	B	B	E	B	B	C	C	C	D	D	C
d_A, Approach Delay [s/veh]	31.44			26.53			33.00			44.43		
Approach LOS	C			C			C			D		
d_I, Intersection Delay [s/veh]	32.46											
Intersection LOS	C											
Intersection V/C	0.603											

Sequence

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

Intersection Level Of Service Report
Intersection 10: Callan Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	22.5
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.697

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
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 Pocket	1	0	0	1	0	0	1	0	1	1	0	0
Pocket Length [ft]	105.00	100.00	100.00	110.00	100.00	100.00	130.00	100.00	95.00	365.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Callan Blvd			Callan Blvd		
Base Volume Input [veh/h]	128	340	86	67	517	88	70	227	39	52	229	181
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	0	0	0	0	2	0	3	0	1	1	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]	129	340	86	67	517	90	70	230	39	53	230	181
Peak Hour Factor	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440	0.9440
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	90	23	18	137	24	19	61	10	14	61	48
Total Analysis Volume [veh/h]	137	360	91	71	548	95	74	244	41	56	244	192
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	138
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	1	6	0	5	2	0	3	8	0	7	4	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	30	30	0	30	30	0	30	30	0	30	30	0
Amber [s]	3.0	3.9	0.0	3.0	3.9	0.0	3.0	3.6	0.0	3.0	3.6	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	34	35	0	34	35	0	34	35	0	34	35	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	7	0	0	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	0	14	0	0	13	0	0	18	0	0	18	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.9	0.0	2.0	2.9	0.0	2.0	2.6	0.0	2.0	2.6	0.0
Minimum Recall	No	No		No	No		No	No		No	No	
Maximum Recall	No	No		No	No		No	No		No	No	
Pedestrian Recall	No	No		No	No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	L	C	C	L	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	4.90	4.90	4.00	4.90	4.90	4.00	4.60	4.60	4.00	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
l2, Clearance Lost Time [s]	2.00	2.90	2.90	2.00	2.90	2.90	2.00	2.60	2.60	2.00	2.60
g_i, Effective Green Time [s]	6	15	15	3	13	13	3	17	17	3	17
g / C, Green / Cycle	0.10	0.27	0.27	0.06	0.23	0.23	0.06	0.30	0.30	0.05	0.29
(v / s)_i Volume / Saturation Flow Rate	0.08	0.12	0.13	0.04	0.18	0.18	0.04	0.13	0.03	0.03	0.25
s, saturation flow rate [veh/h]	1774	1863	1735	1774	1863	1768	1774	1863	1583	1774	1728
c, Capacity [veh/h]	184	512	477	106	431	409	109	566	481	93	510
d1, Uniform Delay [s]	24.67	17.01	17.04	26.08	20.33	20.35	26.05	15.79	14.09	26.28	18.83
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	5.91	0.63	0.69	7.04	2.85	3.04	7.28	0.52	0.08	6.21	4.23
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.75	0.45	0.46	0.67	0.76	0.77	0.68	0.43	0.09	0.60	0.86
d, Delay for Lane Group [s/veh]	30.58	17.64	17.72	33.12	23.18	23.39	33.34	16.31	14.16	32.48	23.06
Lane Group LOS	C	B	B	C	C	C	C	B	B	C	C
Critical Lane Group	Yes	No	No	No	No	Yes	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]	1.96	2.34	2.22	1.08	4.01	3.84	1.13	2.34	0.35	0.85	5.37
50th-Percentile Queue Length [ft]	49.02	58.58	55.42	27.12	100.25	96.10	28.35	58.45	8.71	21.31	134.17
95th-Percentile Queue Length [veh]	3.53	4.22	3.99	1.95	7.22	6.92	2.04	4.21	0.63	1.53	9.17
95th-Percentile Queue Length [ft]	88.24	105.44	99.76	48.81	180.46	172.97	51.02	105.20	15.67	38.35	229.16

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	30.58	17.67	17.72	33.12	23.26	23.39	33.34	16.31	14.16	32.48	23.06	23.06
Movement LOS	C	B	B	C	C	C	C	B	B	C	C	C
d_A, Approach Delay [s/veh]	20.68			24.26			19.57			24.13		
Approach LOS	C			C			B			C		
d_I, Intersection Delay [s/veh]	22.47											
Intersection LOS	C											
Intersection V/C	0.697											

Sequence

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

Intersection Level Of Service Report
Intersection 11: Gellert Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	53.2
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.927

Intersection Setup

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	1	0	0	1	0	1	2	0	0
Pocket Length [ft]	150.00	100.00	140.00	170.00	100.00	100.00	115.00	100.00	140.00	200.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Gellert Blvd			Gellert Blvd			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	84	237	288	419	299	181	126	309	50	461	430	585
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	8.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	6.37
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	1	1	0	29	1	0	0	0	1	0	1	27
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]	85	238	288	448	300	181	126	309	51	461	431	612
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
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]	22	62	75	117	78	47	33	80	13	120	112	159
Total Analysis Volume [veh/h]	89	248	300	467	313	189	131	322	53	480	449	638
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	51.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	6	6	0	6	10	0	6	10	0
Maximum Green [s]	27	27	0	22	22	0	22	30	0	27	30	0
Amber [s]	3.2	3.2	0.0	3.2	3.2	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	33	33	0	31	31	0	11	31	0	25	45	0
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Walk [s]	7	7	0	7	7	0	0	7	0	0	7	0
Pedestrian Clearance [s]	25	25	0	23	23	0	0	22	0	0	23	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.2	2.2	0.0	2.2	2.2	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]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	L	C	C	R	L	C	C	R	L	C	R	L	C	R
L, Total Lost Time per Cycle [s]	4.20	4.20	4.20	4.20	4.20	4.20	4.20	4.20	3.00	4.00	4.00	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	1.00	2.00	2.00	1.00	2.00	2.00
g_i, Effective Green Time [s]	25	25	25	25	21	21	21	21	8	40	40	19	51	51
g / C, Green / Cycle	0.21	0.21	0.21	0.21	0.17	0.17	0.17	0.17	0.07	0.34	0.34	0.16	0.43	0.43
(v / s)_i Volume / Saturation Flow Rate	0.05	0.08	0.06	0.19	0.15	0.15	0.15	0.12	0.07	0.09	0.03	0.14	0.13	0.42
s, saturation flow rate [veh/h]	1774	1863	1695	1583	1675	1792	1695	1583	1774	3547	1583	3445	3547	1518
c, Capacity [veh/h]	365	383	348	325	289	309	292	273	120	1196	534	539	1510	646
d1, Uniform Delay [s]	39.88	40.98	40.43	46.73	48.40	48.40	48.40	46.66	55.93	28.99	27.27	49.61	22.65	34.13
k, delay calibration	0.04	0.04	0.04	0.26	0.09	0.09	0.09	0.04	0.49	0.50	0.50	0.04	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	0.13	0.22	0.18	21.20	6.68	6.28	6.61	1.18	106.28	0.55	0.37	2.10	0.50	32.35
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	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity	0.24	0.37	0.31	0.92	0.88	0.88	0.88	0.69	1.09	0.27	0.10	0.89	0.30	0.99
d, Delay for Lane Group [s/veh]	40.01	41.20	40.61	67.93	55.08	54.68	55.01	47.83	162.21	29.54	27.64	51.71	23.16	66.47
Lane Group LOS	D	D	D	E	E	D	E	D	F	C	C	D	C	E
Critical Lane Group	No	No	No	Yes	Yes	No	No	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	2.22	3.62	2.71	10.65	7.90	8.42	7.99	5.39	7.20	3.50	1.11	7.20	4.28	23.69
50th-Percentile Queue Length [ft]	55.58	90.59	67.75	266.1	197.5	210.4	199.7	134.7	180.03	87.38	27.72	179.88	107.07	592.28
95th-Percentile Queue Length [veh]	4.00	6.52	4.88	16.00	12.51	13.17	12.62	9.20	11.92	6.29	2.00	11.59	7.68	31.67
95th-Percentile Queue Length [ft]	100.0	163.0	121.9	399.9	312.7	329.3	315.5	229.9	298.07	157.28	49.90	289.86	191.92	791.85

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	40.01	40.95	67.93	54.90	54.95	47.83	162.21	29.54	27.64	51.71	23.16	66.47
Movement LOS	D	D	E	D	D	D	F	C	C	D	C	E
d_A, Approach Delay [s/veh]	53.52			53.54			63.69			49.54		
Approach LOS	D			D			E			D		
d_I, Intersection Delay [s/veh]	53.23											
Intersection LOS	D											
Intersection V/C	0.927											

Sequence

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

Intersection Level Of Service Report
Intersection 12: I-280 SB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	10.6
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.712

Intersection Setup

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	0	1	0	0	1	2	0	0
Pocket Length [ft]	100.00	100.00	100.00	435.00	100.00	230.00	100.00	100.00	250.00	400.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 SB ON			I-280 SB OFF			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	0	0	0	185	6	233	0	778	152	320	1231	0
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	16.60	2.00	4.13	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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	29	0	28	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]	0	0	0	185	6	233	0	778	181	320	1259	0
Peak Hour Factor	1.0000	1.0000	1.0000	0.8100	0.8100	0.8100	1.0000	0.8100	0.8100	0.8100	0.8100	1.0000
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	0	0	0	57	2	72	0	240	0	99	389	0
Total Analysis Volume [veh/h]	0	0	0	228	7	288	0	960	0	395	1554	0
Presence of On-Street Parking				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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	95
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	9.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Split	Split	Split	Permiss	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	0	0	0	4	4	0	0	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	Lead	-	-	-	-	-	Lead	-	-
Minimum Green [s]	0	0	0	5	5	0	0	5	0	5	5	0
Maximum Green [s]	0	0	0	25	25	0	0	38	0	20	38	0
Amber [s]	0.0	0.0	0.0	3.2	3.2	0.0	0.0	4.0	0.0	3.0	4.0	0.0
All red [s]	0.0	0.0	0.0	1.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Split [s]	0	0	0	30	30	0	0	42	0	23	42	0
Vehicle Extension [s]	0.0	0.0	0.0	3.0	3.0	0.0	0.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	18	0
I1, Start-Up Lost Time [s]	0.0	0.0	0.0	2.0	2.0	0.0	0.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	0.0	0.0	0.0	2.2	2.2	0.0	0.0	2.0	0.0	1.0	2.0	0.0
Minimum Recall					No			No		No	No	
Maximum Recall					No			No		No	No	
Pedestrian Recall					No			No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	0.0	0.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	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	C	C	L	C
L, Total Lost Time per Cycle [s]		4.20	4.20	4.20	4.00	4.00	3.00	4.00
l1_p, Permitted Start-Up Lost Time [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]		2.20	2.20	2.20	2.00	2.00	1.00	2.00
g_i, Effective Green Time [s]		7	7	7	15	15	7	25
g / C, Green / Cycle		0.18	0.18	0.18	0.36	0.36	0.18	0.62
(v / s)_i Volume / Saturation Flow Rate		0.10	0.10	0.10	0.26	0.26	0.11	0.45
s, saturation flow rate [veh/h]		1774	1637	1583	1863	1863	3445	3474
c, Capacity [veh/h]		315	291	281	676	676	625	2150
d1, Uniform Delay [s]		15.21	15.21	15.21	11.01	11.01	15.24	5.29
k, delay calibration		0.11	0.11	0.11	0.11	0.11	0.11	0.11
I, Upstream Filtering Factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]		1.76	1.90	1.97	1.39	1.39	1.06	0.47
d3, Initial Queue Delay [s]		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio		1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor		1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

X, volume / capacity		0.59	0.59	0.59	0.71	0.71	0.63	0.72
d, Delay for Lane Group [s/veh]		16.97	17.11	17.18	12.40	12.40	16.30	5.76
Lane Group LOS		B	B	B	B	B	B	A
Critical Lane Group		No	No	Yes	No	No	No	Yes
50th-Percentile Queue Length [veh]		1.46	1.36	1.32	2.99	2.99	1.49	2.07
50th-Percentile Queue Length [ft]		36.48	33.97	32.99	74.80	74.80	37.17	51.66
95th-Percentile Queue Length [veh]		2.63	2.45	2.38	5.39	5.39	2.68	3.72
95th-Percentile Queue Length [ft]		65.66	61.14	59.38	134.64	134.64	66.90	93.00

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	0.00	0.00	17.00	17.11	17.15	0.00	12.40	12.40	16.30	5.76	0.00
Movement LOS				B	B	B		B	B	B	A	
d_A, Approach Delay [s/veh]	0.00			17.08			12.40			7.90		
Approach LOS	A			B			B			A		
d_I, Intersection Delay [s/veh]	10.56											
Intersection LOS	B											
Intersection V/C	0.712											

Sequence

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

Intersection Level Of Service Report
Intersection 13: I-280 NB Ramps / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	24.7
Analysis Method:	HCM 2010	Level Of Service:	C
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.710

Intersection Setup

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Approach	Northbound			Southbound			Eastbound			Westbound		
Lane Configuration												
Turning Movement	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right	Left	Thru	Right
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	1	0	1	0	0	0	1	0	1	1	0	0
Pocket Length [ft]	420.00	100.00	610.00	100.00	100.00	100.00	150.00	100.00	285.00	175.00	100.00	100.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	I-280 NB			Imperial Way			Hickey Blvd			Hickey Blvd		
Base Volume Input [veh/h]	576	63	261	49	77	63	152	720	150	179	724	49
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 [%]	6.50	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	28	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]	604	63	261	49	77	63	152	720	150	179	724	49
Peak Hour Factor	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770	0.9770
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	155	16	67	13	20	16	39	184	0	46	185	13
Total Analysis Volume [veh/h]	618	64	267	50	79	64	156	737	0	183	741	50
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	123
Coordination Type	Time of Day Pattern Isolated
Actuation Type	Fully actuated
Offset [s]	0.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	8	8	0	7	7	0	5	2	0	1	6	0
Auxiliary Signal Groups												
Lead / Lag	Lag	-	-	Lag	-	-	Lead	-	-	Lead	-	-
Minimum Green [s]	5	5	0	5	5	0	5	5	0	5	5	0
Maximum Green [s]	28	28	0	18	18	0	22	40	0	20	40	0
Amber [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	4.0	0.0	3.0	4.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0
Split [s]	32	32	0	22	22	0	25	45	0	23	44	0
Vehicle Extension [s]	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0	3.0	3.0	0.0
Walk [s]	0	0	0	0	0	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	0	0	0	0	0	0	0	15	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	1.0	2.5	0.0	1.0	2.0	0.0
Minimum Recall		No			No		No	No		No	No	
Maximum Recall		No			No		No	No		No	No	
Pedestrian Recall		No			No		No	No		No	No	
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	0.0	6.0	6.0	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	C	R	L	C	C	L	C	C
L, Total Lost Time per Cycle [s]	4.00	4.00	4.00	4.00	4.00	3.00	4.50	4.50	3.00	4.00	4.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	2.00	2.00	2.00	2.00	1.00	2.50	2.50	1.00	2.00	2.00
g_i, Effective Green Time [s]	16	16	16	6	6	7	15	15	8	17	17
g / C, Green / Cycle	0.26	0.26	0.26	0.10	0.10	0.12	0.25	0.25	0.13	0.28	0.28
(v / s)_i Volume / Saturation Flow Rate	0.20	0.19	0.17	0.07	0.04	0.09	0.20	0.20	0.10	0.21	0.21
s, saturation flow rate [veh/h]	1699	1790	1583	1827	1583	1774	1863	1863	1774	1863	1822
c, Capacity [veh/h]	438	461	408	190	164	205	468	468	237	516	504
d1, Uniform Delay [s]	20.91	20.87	20.21	26.34	25.51	26.13	21.31	21.31	25.52	20.29	20.29
k, delay calibration	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11
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
d2, Incremental Delay [s]	2.78	2.56	1.79	4.24	1.50	5.69	3.00	3.00	5.33	2.54	2.59
d3, Initial Queue Delay [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

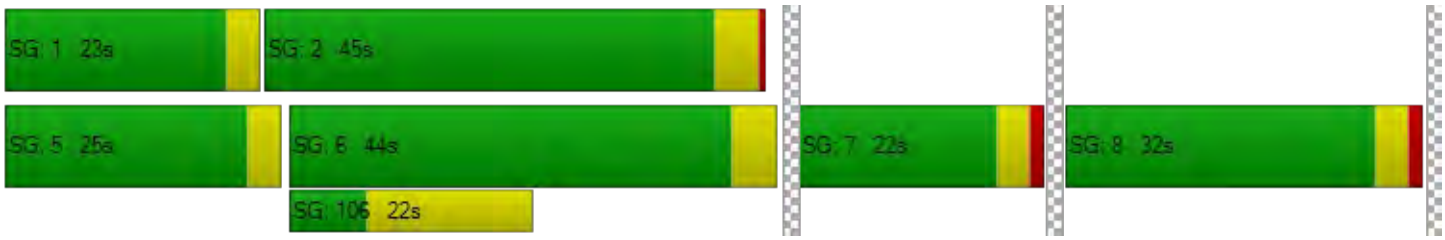
X, volume / capacity	0.76	0.76	0.65	0.68	0.39	0.76	0.79	0.79	0.77	0.78	0.78
d, Delay for Lane Group [s/veh]	23.68	23.42	22.00	30.58	27.01	31.83	24.31	24.31	30.86	22.83	22.89
Lane Group LOS	C	C	C	C	C	C	C	C	C	C	C
Critical Lane Group	Yes	No	No	Yes	No	Yes	No	No	No	No	Yes
50th-Percentile Queue Length [veh]	4.34	4.50	3.30	1.92	0.88	2.38	4.87	4.87	2.74	5.10	5.00
50th-Percentile Queue Length [ft]	108.41	112.46	82.44	48.01	22.10	59.55	121.66	121.66	68.61	127.62	125.00
95th-Percentile Queue Length [veh]	7.75	7.98	5.94	3.46	1.59	4.29	8.48	8.48	4.94	8.81	8.67
95th-Percentile Queue Length [ft]	193.78	199.41	148.39	86.42	39.78	107.19	212.11	212.11	123.49	220.26	216.68

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	23.56	23.42	22.00	30.58	30.58	27.01	31.83	24.31	24.31	30.86	22.86	22.89
Movement LOS	C	C	C	C	C	C	C	C	C	C	C	C
d_A, Approach Delay [s/veh]	23.11			29.40			25.62			24.36		
Approach LOS	C			C			C			C		
d_I, Intersection Delay [s/veh]	24.66											
Intersection LOS	C											
Intersection V/C	0.710											

Sequence

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



Intersection Level Of Service Report
Intersection 14: Kaiser / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	17.3
Analysis Method:	HCM 2010	Level Of Service:	B
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.559

Intersection Setup

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Approach	Northbound		Eastbound		Southwestbound	
Lane Configuration						
Turning Movement	Left	Right	Thru	Right	Left	Thru
Lane Width [ft]	12.00	12.00	12.00	12.00	12.00	12.00
No. of Lanes in Pocket	0	0	0	1	1	0
Pocket Length [ft]	100.00	100.00	100.00	200.00	150.00	100.00
Speed [mph]	30.00		30.00		30.00	
Grade [%]	0.00		0.00		0.00	
Crosswalk	Yes		Yes		Yes	

Volumes

Name	Kaiser		Hickey Blvd		Hickey Blvd	
Base Volume Input [veh/h]	153	123	937	91	52	805
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
Growth Rate	1.00	1.00	1.00	1.00	1.00	1.00
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]	153	123	937	91	52	805
Peak Hour Factor	0.9630	0.9630	0.9630	0.9630	0.9630	0.9630
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	40	32	243	24	13	209
Total Analysis Volume [veh/h]	159	128	973	94	54	836
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
Pedestrian Volume [ped/h]	0		0		0	
Bicycle Volume [bicycles/h]	0		0		0	

Intersection Settings

Located in CBD	Yes
Signal Coordination Group	-
Cycle Length [s]	110
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	9.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Split	Split	Permissive	Permissive	Protected	Permissive
Signal group	8	0	2	0	1	6
Auxiliary Signal Groups						
Lead / Lag	Lag	-	-	-	Lead	-
Minimum Green [s]	6	0	10	0	4	10
Maximum Green [s]	31	0	40	0	20	40
Amber [s]	3.0	0.0	4.0	0.0	3.0	4.0
All red [s]	1.0	0.0	1.0	0.0	1.0	1.0
Split [s]	32	0	68	0	10	78
Vehicle Extension [s]	2.5	0.0	3.1	0.0	2.0	3.1
Walk [s]	7	0	0	0	0	0
Pedestrian Clearance [s]	25	0	0	0	0	0
I1, Start-Up Lost Time [s]	2.0	0.0	2.0	0.0	2.0	2.0
I2, Clearance Lost Time [s]	2.0	0.0	3.0	0.0	2.0	3.0
Minimum Recall	No		Yes		No	Yes
Maximum Recall	No		No		No	No
Pedestrian Recall	No		No		No	No
Detector Location [ft]	0.0	0.0	0.0	0.0	0.0	0.0
Detector Length [ft]	6.0	0.0	0.0	0.0	6.0	6.0
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	C	C	R	L	C
L, Total Lost Time per Cycle [s]	4.00	5.00	5.00	4.00	5.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.00	3.00	3.00	2.00	3.00
g_i, Effective Green Time [s]	23	70	70	5	78
g / C, Green / Cycle	0.21	0.63	0.63	0.04	0.71
(v / s)_i Volume / Saturation Flow Rate	0.19	0.30	0.07	0.03	0.26
s, saturation flow rate [veh/h]	1515	3192	1425	1597	3192
c, Capacity [veh/h]	312	2022	903	67	2273
d1, Uniform Delay [s]	42.75	10.63	7.91	52.21	6.18
k, delay calibration	0.24	0.50	0.50	0.04	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	20.35	0.82	0.23	7.95	0.46
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	0.92	0.48	0.10	0.80	0.37
d, Delay for Lane Group [s/veh]	63.09	11.45	8.14	60.17	6.64
Lane Group LOS	E	B	A	E	A
Critical Lane Group	Yes	Yes	No	Yes	No
50th-Percentile Queue Length [veh]	9.33	6.05	0.89	1.62	3.50
50th-Percentile Queue Length [ft]	233.28	151.17	22.36	40.59	87.40
95th-Percentile Queue Length [veh]	14.34	10.08	1.61	2.92	6.29
95th-Percentile Queue Length [ft]	358.53	251.99	40.25	73.06	157.31

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	63.09	63.09	11.45	8.14	60.17	6.64
Movement LOS	E	E	B	A	E	A
d_A, Approach Delay [s/veh]	63.09		11.16		9.89	
Approach LOS	E		B		A	
d_I, Intersection Delay [s/veh]	17.30					
Intersection LOS	B					
Intersection V/C	0.559					

Sequence

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

Intersection Level Of Service Report
Intersection 15: Longford Dr / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	51.8
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.352

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
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 Pocket	0	0	0	0	0	0	0	0	0	0	0	0
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
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Longford Dr			Longford Dr		
Base Volume Input [veh/h]	0	888	110	0	857	50	0	0	75	0	0	24
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
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]	0	888	110	0	857	50	0	0	75	0	0	24
Peak Hour Factor	1.0000	0.9730	0.9730	1.0000	0.9730	0.9730	1.0000	1.0000	0.9730	1.0000	1.0000	0.9730
Other Adjustment Factor	1.0000	1.0000	1.0000	1.0000	0.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000
Total 15-Minute Volume [veh/h]	0	228	28	0	0	0	0	0	19	0	0	0
Total Analysis Volume [veh/h]	0	913	113	0	0	0	0	0	77	0	0	0
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	6.00

Phasing & Timing

Control Type	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss	Permiss
Signal group	0	7	0	0	0	0	0	0	8	0	0	0
Auxiliary Signal Groups												
Lead / Lag	-	-	-	-	-	-	-	-	-	-	-	-
Minimum Green [s]	0	6	0	0	0	0	0	0	6	0	0	0
Maximum Green [s]	0	30	0	0	0	0	0	0	25	0	0	0
Amber [s]	0.0	3.9	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.0	0.0
All red [s]	0.0	1.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Split [s]	0	48	0	0	0	0	0	0	17	0	0	0
Vehicle Extension [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Walk [s]	0	7	0	0	0	0	0	0	0	0	0	0
Pedestrian Clearance [s]	0	10	0	0	0	0	0	0	0	0	0	0
I1, Start-Up Lost Time [s]	0.0	2.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
I2, Clearance Lost Time [s]	0.0	2.9	0.0	0.0	0.0	0.0	0.0	0.0	2.0	0.0	0.0	0.0
Minimum Recall		No							No			
Maximum Recall		No							No			
Pedestrian Recall		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	6.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C		R	
L, Total Lost Time per Cycle [s]	4.90	4.90		4.00	
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00		0.00	
l2, Clearance Lost Time [s]	2.90	2.90		2.00	
g_i, Effective Green Time [s]	37	37		7	
g / C, Green / Cycle	0.30	0.30		0.06	
(v / s)_i Volume / Saturation Flow Rate	0.28	0.29		0.05	
s, saturation flow rate [veh/h]	1863	1793		1583	
c, Capacity [veh/h]	568	547		96	
d1, Uniform Delay [s]	40.03	40.63		55.69	
k, delay calibration	0.17	0.19		0.04	
I, Upstream Filtering Factor	1.00	1.00		1.00	
d2, Incremental Delay [s]	8.39	13.08		5.78	
d3, Initial Queue Delay [s]	0.00	0.00		0.00	
Rp, platoon ratio	1.00	1.00		1.00	
PF, progression factor	1.00	1.00		1.00	

Lane Group Results

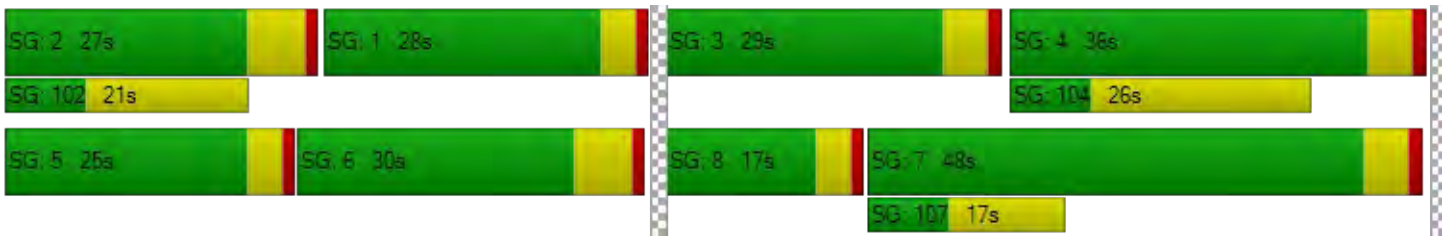
X, volume / capacity	0.90	0.94		0.80	
d, Delay for Lane Group [s/veh]	48.42	53.71		61.47	
Lane Group LOS	D	D		E	
Critical Lane Group	No	Yes		Yes	
50th-Percentile Queue Length [veh]	15.69	16.57		2.46	
50th-Percentile Queue Length [ft]	392.28	414.24		61.41	
95th-Percentile Queue Length [veh]	22.19	23.25		4.42	
95th-Percentile Queue Length [ft]	554.69	581.13		110.54	

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	0.00	50.74	53.71	0.00	0.00	0.00	0.00	0.00	61.47	0.00	0.00	0.00
Movement LOS		D	D						E			
d_A, Approach Delay [s/veh]	51.06			0.00			61.47			0.00		
Approach LOS	D			A			E			A		
d_I, Intersection Delay [s/veh]	51.79											
Intersection LOS	D											
Intersection V/C	0.352											

Sequence

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



Intersection Level Of Service Report
Intersection 16: Juniper Serra Blvd / Hickey Blvd

Control Type:	Signalized	Delay (sec / veh):	51.4
Analysis Method:	HCM 2010	Level Of Service:	D
Analysis Period:	15 minutes	Volume to Capacity (v/c):	0.750

Intersection Setup

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Approach	Westbound			Northeastbound			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 Pocket	0	0	1	1	0	0	1	0	0	1	0	1
Pocket Length [ft]	100.00	100.00	250.00	120.00	100.00	100.00	275.00	100.00	100.00	550.00	100.00	150.00
Speed [mph]	30.00			30.00			30.00			30.00		
Grade [%]	0.00			0.00			0.00			0.00		
Crosswalk	Yes			Yes			Yes			Yes		

Volumes

Name	Hickey Blvd			Hickey Blvd			Junipero Serra Blvd			Junipero Serra Blvd		
Base Volume Input [veh/h]	165	555	484	209	610	90	184	443	128	240	369	182
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 Rate	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
In-Process Volume [veh/h]	0	0	0	0	0	0	0	0	0	0	0	0
Site-Generated Trips [veh/h]	0	0	2	0	0	0	0	3	0	1	1	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]	165	555	486	209	610	90	184	446	128	241	370	182
Peak Hour Factor	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600	0.9600
Other Adjustment Factor	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	1.0000	1.0000	1.0000
Total 15-Minute Volume [veh/h]	43	145	0	54	159	23	48	116	0	63	96	47
Total Analysis Volume [veh/h]	172	578	0	218	635	94	192	465	0	251	385	190
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
Pedestrian Volume [ped/h]	0			0			0			0		
Bicycle Volume [bicycles/h]	0			0			0			0		

Intersection Settings

Located in CBD	No
Signal Coordination Group	-
Cycle Length [s]	120
Coordination Type	Time of Day Pattern Coordinated
Actuation Type	Fully actuated
Offset [s]	8.0
Offset Reference	LeadGreen
Permissive Mode	SingleBand
Lost time [s]	12.00

Phasing & Timing

Control Type	Split	Split	Split	Split	Split	Split	Protecte	Permiss	Permiss	Protecte	Permiss	Permiss
Signal group	3	3	0	4	4	0	1	6	0	5	2	0
Auxiliary Signal Groups												
Lead / Lag	Lead	-	-	Lead	-	-	Lag	-	-	Lead	-	-
Minimum Green [s]	6	6	0	8	8	0	4	10	0	4	10	0
Maximum Green [s]	25	25	0	30	30	0	20	40	0	20	40	0
Amber [s]	3.9	3.9	0.0	3.9	3.9	0.0	3.0	5.0	0.0	3.0	5.0	0.0
All red [s]	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0	1.0	1.0	0.0
Split [s]	29	29	0	36	36	0	28	30	0	25	27	0
Vehicle Extension [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
Walk [s]	0	0	0	7	7	0	0	0	0	0	7	0
Pedestrian Clearance [s]	0	0	0	19	19	0	0	0	0	0	14	0
I1, Start-Up Lost Time [s]	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0	2.0	2.0	0.0
I2, Clearance Lost Time [s]	2.9	2.9	0.0	2.9	2.9	0.0	2.0	4.0	0.0	2.0	4.0	0.0
Minimum Recall		No			No		No	Yes		No	Yes	
Maximum Recall		No			No		No	No		No	Yes	
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]	6.0	6.0	0.0	6.0	6.0	0.0	0.0	6.0	0.0	6.0	6.0	0.0
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Exclusive Pedestrian Phase

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

Lane Group Calculations

Lane Group	C	C	R	L	C	C	R	L	C	C	L	C	R
L, Total Lost Time per Cycle [s]	4.90	4.90	4.90	4.90	4.90	4.90	4.90	4.00	6.00	6.00	4.00	6.00	6.00
l1_p, Permitted Start-Up Lost Time [s]	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
l2, Clearance Lost Time [s]	2.90	2.90	2.90	2.90	2.90	2.90	2.90	2.00	4.00	4.00	2.00	4.00	4.00
g_i, Effective Green Time [s]	28	28	28	26	26	26	26	15	28	28	19	32	32
g / C, Green / Cycle	0.23	0.23	0.23	0.22	0.22	0.22	0.22	0.12	0.23	0.23	0.16	0.26	0.26
(v / s)_i Volume / Saturation Flow Rate	0.21	0.21	0.00	0.12	0.20	0.16	0.06	0.11	0.12	0.12	0.14	0.11	0.12
s, saturation flow rate [veh/h]	1822	1695	1583	1774	1863	1695	1583	1774	1863	1863	1774	3547	1583
c, Capacity [veh/h]	421	391	365	383	402	366	342	221	432	432	278	937	418
d1, Uniform Delay [s]	45.17	45.15	0.00	42.11	45.90	43.97	39.27	51.64	40.50	40.50	49.74	36.48	36.95
k, delay calibration	0.24	0.23	0.04	0.04	0.13	0.04	0.04	0.04	0.50	0.50	0.26	0.50	0.50
I, Upstream Filtering Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
d2, Incremental Delay [s]	16.53	17.28	0.00	0.50	9.10	1.12	0.16	4.10	4.76	4.76	21.01	1.33	3.53
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	0.00
Rp, platoon ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PF, progression factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Lane Group Results

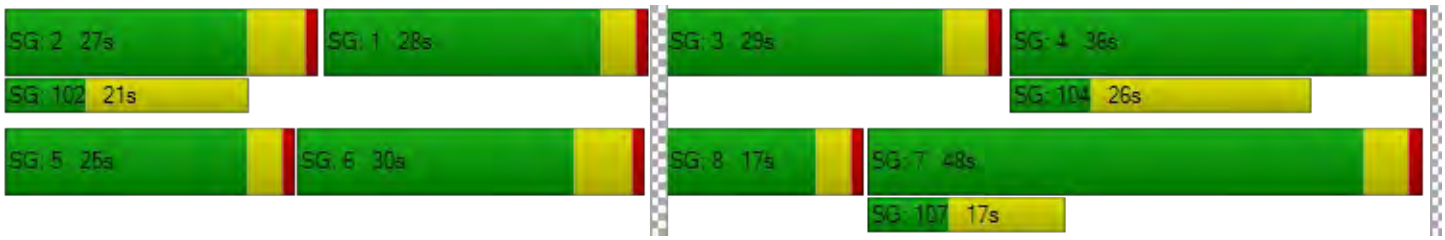
X, volume / capacity	0.92	0.92	0.00	0.57	0.91	0.74	0.28	0.87	0.54	0.54	0.90	0.41	0.45
d, Delay for Lane Group [s/veh]	61.70	62.43	0.00	42.61	55.00	45.09	39.43	55.74	45.26	45.26	70.74	37.81	40.48
Lane Group LOS	E	E	A	D	D	D	D	E	D	D	E	D	D
Critical Lane Group	Yes	No	No	No	Yes	No	No	No	Yes	No	Yes	No	No
50th-Percentile Queue Length [veh]	13.19	12.33	0.00	5.84	11.54	7.63	2.34	5.92	6.61	6.61	9.00	4.85	5.08
50th-Percentile Queue Length [ft]	329.66	308.28	0.00	145.9	288.5	190.7	58.54	147.98	165.14	165.14	225.08	121.13	127.03
95th-Percentile Queue Length [veh]	19.14	18.09	0.00	9.80	17.11	12.16	4.21	9.91	10.82	10.82	13.92	8.46	8.78
95th-Percentile Queue Length [ft]	478.54	452.26	0.00	245.0	427.7	303.9	105.3	247.73	270.51	270.51	348.11	211.38	219.45

Movement, Approach, & Intersection Results

d_M, Delay for Movement [s/veh]	61.70	62.16	0.00	42.61	50.77	39.43	55.74	45.26	45.26	70.74	37.81	40.48
Movement LOS	E	E	A	D	D	D	E	D	D	E	D	D
d_A, Approach Delay [s/veh]	62.05			47.76			48.32			48.43		
Approach LOS	E			D			D			D		
d_I, Intersection Delay [s/veh]	51.42											
Intersection LOS	D											
Intersection V/C	0.750											

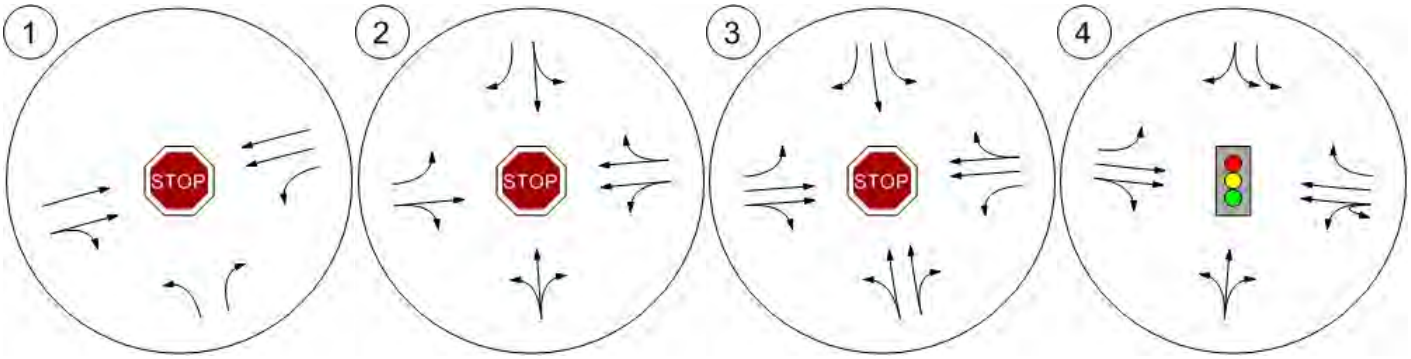
Sequence

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

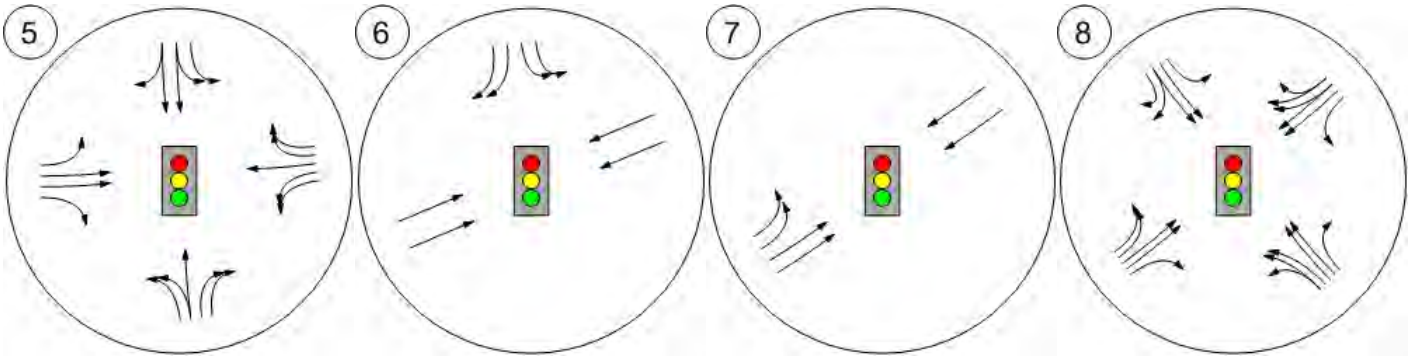


Lane Configuration and Traffic Control

SB Hwy 1 Ramps / Clarinada NB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

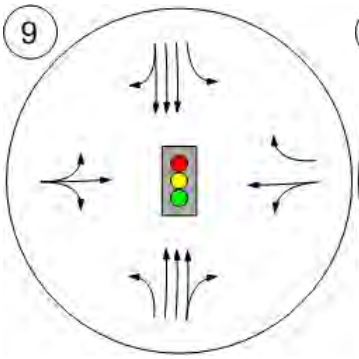


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

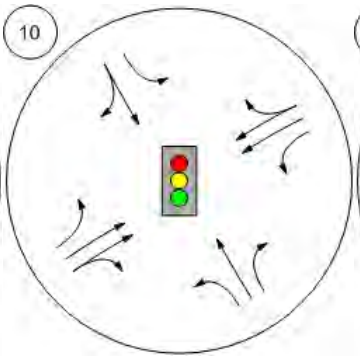


Lane Configuration and Traffic Control

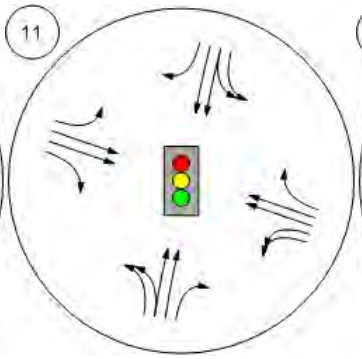
Gellert Blvd / Serramonte Pla



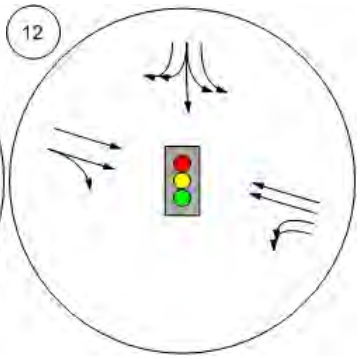
Callan Blvd / Hickey Blvd



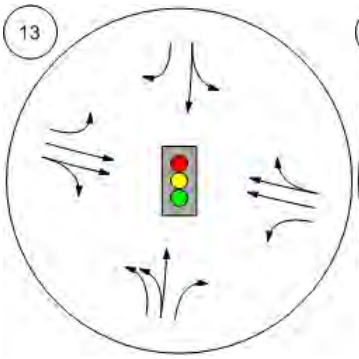
Gellert Blvd / Hickey Blvd



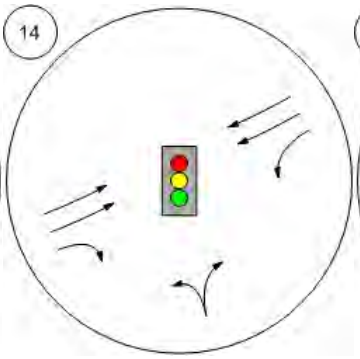
I-280 SB Ramps / Hickey Blv



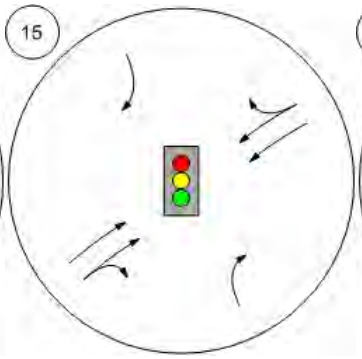
I-280 NB Ramps / Hickey Blv



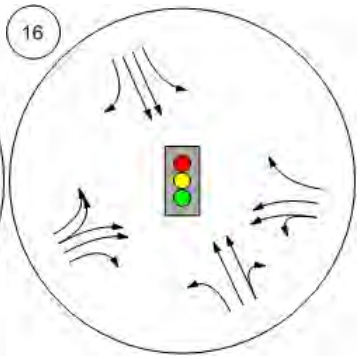
Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd

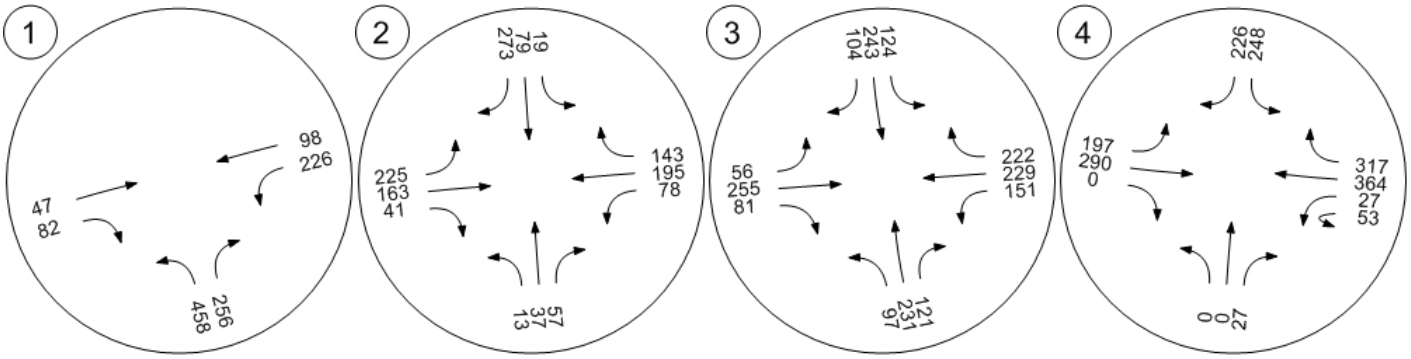


Juniper Serra Blvd / Hickey B

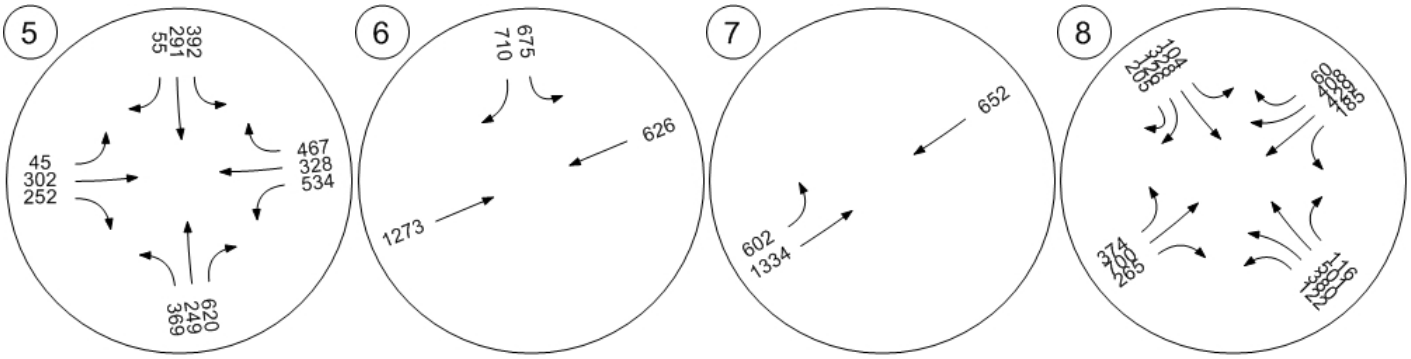


Traffic Volume - Future Total Volume

SB Hwy 1 Ramps / Clarinada NB Hwy 1 Ramps / Serramon Callan Blvd / Serramonte Blv Serramonte Shopping Center

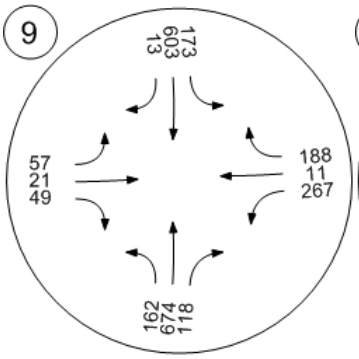


Gellert Blvd / Serramonte Blv I-280 SB Off-Ramp / Serramo I-280 NB On-Ramp (west) / S Junipero Serra Blvd / Serram

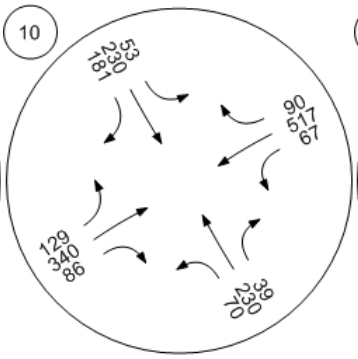


Traffic Volume - Future Total Volume

Gellert Blvd / Serramonte Pla



Callan Blvd / Hickey Blvd



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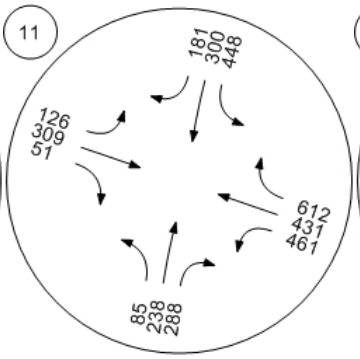
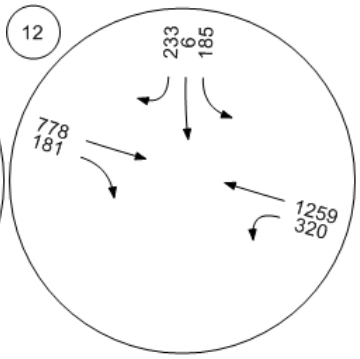
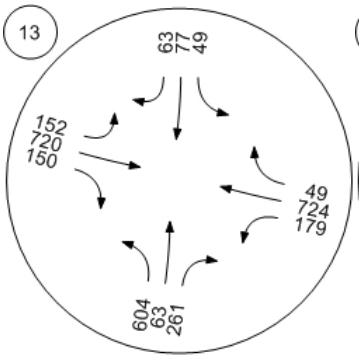


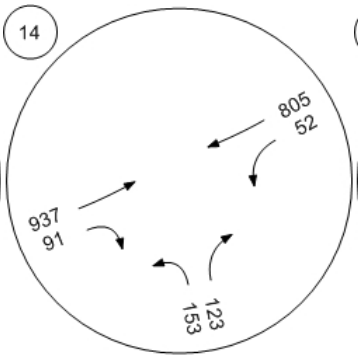
I-280 SB Ramps / Hickey Blv



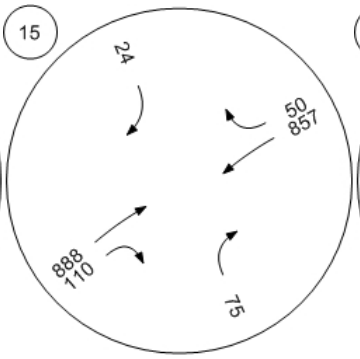
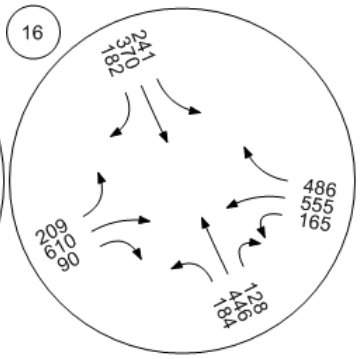
I-280 NB Ramps / Hickey Blv



Kaiser / Hickey Blvd



Longford Dr / Hickey Blvd



Juniper Serra Blvd / Hickey B