REPORT TO MAYOR AND COUNCIL **NO: 09-312**

Council Meeting: December 15, 2009

SUBJECT: Palo Alto Medical Foundation Project Traffic Issues – Request for Action on Road Improvements

BACKGROUND

As part of the City Council's June 23, 2009 approval of a project to construct a medical clinic on Old San Francisco Road between Sunnyvale Avenue and Cezanne Drive, the City Council included a number of conditions related to traffic calming and traffic improvements. The Council directed staff to meet with residents and study neighborhood traffic calming for Carroll Street, South Bayview Avenue, Olive Avenue and Central Avenue including closure options for S. Bayview Avenue and Carroll Street. Staff was further directed to prepare a preliminary engineering feasibility analysis of providing a left turn from southbound Sunnyvale Avenue to eastbound Old San Francisco Road. Also, staff was requested to contact the Santa Clara Valley Transportation Authority (VTA) to review the re-routing of their buses, or possibly use a smaller community bus for their routes in this area. Staff was to return to the City Council with a status report or study results no later than December 2009. This report constitutes the requested status report and provides Council with several alternatives for consideration and direction to staff.

DISCUSSION

Traffic Calming and Street Closures

Staff has completed study of traffic calming and conducted neighborhood outreach. Staff prepared general information on traffic calming techniques and presented this to area residents and property owners at a community meeting held October 14, 2009. Staff also prepared and presented two different traffic calming schemes involving the application of various traffic calming devices on Carroll Street, S. Bayview Avenue, Central Avenue, and Olive Avenue. Staff's intent was to discuss with the community what types of traffic features - traffic calming, road closures, or a combination of the two - were favored approaches. Feedback at this meeting was mixed, with many citizens speaking in favor of road closures. It did not appear that there was consensus for any one approach.

Subsequent to the neighborhood meeting and prior to this Council hearing, a survey of residents and property owners was conducted by staff to gauge the

level of support for various traffic calming or road closure alternatives. A copy of the survey form is attached (Attachment A). One hundred twenty nine (129) surveys were mailed the first week of November to residents and property owners in the area bounded by Central Avenue, Olive Avenue, Carroll Street, and Old San Francisco Road. As of December 1, of the 129 mailed surveys, four were returned as undeliverable. Sixty-two (62) surveys were returned, for a return rate of 50%.

The poll demonstrated a lack of consensus on any one action. There is a higher demonstration of support for traffic calming on Olive Avenue. Of the eight treatments identified for four roadway segments and two "no project" alternatives, the following results were obtained:

1) Support for the installation of traffic calming devices:

- Olive Ave. from Sunnyvale Ave. to Central Ave. – 66% of surveys cast
- Carroll Street from Olive Avenue to Old San Francisco Road - 50%
- Bayview Street from Olive Avenue to Old San Francisco Road - 47%
- Central Avenue from Olive Avenue to Old San Francisco Road – 48%

Opposition to the installation of traffic calming devices on the above referenced streets - 19% of surveys cast.

2) Support for street closure at the following locations:

- Carroll Street south of Jarvis Court – 36%
- Bayview Street south of Kenney Court – 45%
- Central Avenue south of St. Martins – 24%

3) Support partial street closure at the following location:

- Southbound Central Avenue south of St. Martins –16%

4) Opposition to street closure at the above identified locations – 32%

Some residents of the area requested that a petition prepared and previously submitted to the City on the street closure issue be once again brought to the City Council's attention. This petition is attached (Attachment B).

Staff is requesting further specific direction on how to proceed with consideration of traffic calming and street closure in the area. The survey information is not intended to represent a ballot. It is general information from one limited set of citizens on opinions regarding traffic calming and road closures. As such, it is one data point for assisting the City in considering

traffic-related actions in the neighborhood in question. The survey represents the cross section of opinions of citizens in the immediately affected area.

The survey did not specifically identify opinions keyed to each street, but there was interest expressed at the community meeting in providing this information. Based on return addresses voluntarily provided, staff can offer some additional information on how opinions varied from street to street.

- Carroll Street – of 6 of 13 residences, opinions were generally split among traffic calming, street closure, or "do nothing" options for all streets.
- Bayview Avenue – of 7 of 13 residences, a majority supported traffic calming on Olive Avenue, and there was strong support for street closure of Carroll Street, Bayview Avenue, and Central Avenue, including unanimous support for closure of Bayview.
- Olive Avenue – of 14 of 36 residences, there was unanimous support for traffic calming on Olive Avenue, and strong support for traffic calming on all other streets. There was less than majority support for closure of any street, and 3 of 14 residents opposed street closures.
- Central Avenue – of 3 of 5 properties, there was unanimous support for traffic calming on Central. Closure of Central received some but not unanimous support, and one respondent opposed closing Central.
- "Interior streets", or those streets that were not candidates for roadway modification but lie within the subject area – Maxine Court, Kenney Court, Jarvis Court, Bishop Drive - of 14 of 42 residences, there was mixed, less-than-majority support or opposition to traffic calming on any street. There was mixed opinions supporting and opposing street closure, and no majority for any one action.

  Detailed tabulations are contained in Attachment C.

The survey of course does not capture opinions of the general community outside of the survey area regarding traffic calming or street closures in this area.

The medical clinic project applicant had the following financial conditions placed upon the project:

- The applicant/developer shall contribute up to $50,000 to the City that shall be used to design and construct neighborhood traffic calming measures, including street closure options, on nearby residential streets. These funds shall be deposited with the City prior to submittal of building permits. Any unexpended or uncommitted funds remaining after

three years from the date of deposit shall be refunded to the applicant/developer.

- If the City determines that full or partial street closures are necessary, the applicant/developer shall be responsible for the additional cost (up to $200,000) to design and construct the City-approved street modifications, including cul-de-sac construction if deemed necessary, on S. Bayview Avenue (between Kenney Court and Old San Francisco Road) and on Carroll Street (between Old San Francisco Road and Jarvis Court).

Sunnyvale Avenue/Old San Francisco Road Left Turn Study

A preliminary technical study has been completed on the feasibility of provision of a left turn lane from southbound Sunnyvale Avenue to eastbound Old San Francisco Road (Attachment D). The study assesses geometric and operational issues and concludes that provision of a left turn from Sunnyvale Avenue to Old San Francisco Road is feasible and operationally beneficial, and would reduce the potential for non-neighborhood cut-through traffic in the neighborhood north of the PAMF site. However, the study finds that it is likely that traffic growth in the area may cause the intersection of Sunnyvale Avenue and El Camino Real to congest, independent of the provision of the left turn. The study estimates the construction cost of the left turn and associated signalization to be approximately $580,000. With the addition of design costs, plus coordination and approval requirements of the California Department of Transportation, staff estimates the total cost of a project to be in the range of $750,000.

Santa Clara Valley Transportation Authority (VTA) Bus Re-Routing

As previously reported to Council, the VTA has completed an analysis of re-routing the southbound Line 55 bus off of Carroll Street and utilizing El Camino Real and Cezanne Drive instead. The analysis was requested by the City subsequent to the Palo Alto Medical Foundation project hearing.

The following is VTA's response regarding the possible rerouting of Line 55:

- Southbound buses would use Sunnyvale Avenue, left on El Camino, left on Cezanne back to Old San Francisco.

- This routing would be out-of-direction and inconvenience many through riders, including several hundred Fremont High School students who travel to school in this direction.

- It would add about three minutes to the southbound running time, and there is not enough time in the peak hours to accommodate the extra running time. VTA would have to reschedule some weekday trips to accommodate the extra running time, which would end up costing several hours of service each weekday. There would also be additional minor weekend costs. In a time of deleting transit services, it does not make sense for VTA to add additional service hours to this route.

- It's important for Line 55 to continue to serve Fair Oaks and Old San Francisco due to the high-density housing and the connection with Line 26. So it would be preferable to keep the routing as is for now.

- Serving Sunnyvale Avenue and making a left on Old San Francisco is clearly the best option long term. It will not save any schedule time but it will get buses off Carroll and keep the routing consistent both ways. VTA supports this option.

Ridership on Line 55 is such that a smaller community bus would not be adequate to handle the ridership.

EXISTING POLICY

Land Use and Transportation Element C3, Attain a transportation system that is effective, safe, pleasant and convenient.

Land Use and Transportation Element N1.5, Support a roadway system that protects internal residential areas from City-wide and regional traffic.

FISCAL IMPACT

The medical center project is conditioned to provide $50,000 in funding for traffic calming improvements, and up to $200,000 for street closures. This funding may be adequate for a smaller scale traffic calming project, and should be adequate to cover the cost of street closures. These improvements cannot be initiated until the medical center project seeks building permits and pays the required contributions.

Should the City Council elect to pursue design, Caltrans approval, and construction of a Sunnyvale Avenue to Old San Francisco Road left turn project, this will require funding in the estimated amount of $750,000.

PUBLIC CONTACT

Public contact was made by posting the Council agenda on the City's official-notice bulletin board outside City Hall, at the Sunnyvale Senior Center, Community Center and Department of Public Safety; and by making

the agenda and report available at the Sunnyvale Public Library, the Office of the City Clerk and on the City's Web site. Also, notices of the Council hearing were direct mailed to 125 residents and property owners in the area bounded by Olive Avenue, Carroll Street, Old San Francisco Road, and Central Avenue.

ALTERNATIVES

1. Refine and specify direction to staff regarding the construction, style and location of traffic calming and/or street closures, by either:

   a. Directing staff to design and implement a traffic calming project on one or more streets in the area bounded by Carroll Street, Olive Avenue, Central Avenue, and Old San Francisco Road at such time that funding is available from PAMF.

   b. Directing staff to design and implement street closures on Carroll Street, Bayview Avenue and Central Avenue at such time that funding is available from PAMF.

   c. Direct staff to design and implement a combination of traffic calming measures and street closures in the area bounded by Carroll Street, Olive Avenue, Central Avenue, and Old San Francisco Road at such time that funding is available from PAMF.

2. Provide staff direction on whether to pursue a capital project to construct a left turn lane from southbound Sunnyvale Avenue to eastbound Old San Francisco Road.

3. Direct staff to return to Council to include a project for budget review in the proposed FY 2010/11 budget to design and implement a southbound Sunnyvale Avenue-to-eastbound Old San Francisco Road left turn.

4. Direct staff to include a project for budget review in the proposed FY 2010/11 budget to design and implement a southbound Sunnyvale Avenue-to-eastbound Old San Francisco Road left turn, and defer consideration of traffic calming or street closures until the effectiveness of the construction of a left turn to Old San Francisco Road can be evaluated subsequent to construction.

5. Take no action at this time.

RECOMMENDATION

Staff recommends Alternative 4: That Council direct staff to include a project for budget review in the proposed FY 2010/11 budget to design and implement a southbound Sunnyvale Avenue-to-eastbound Old San Francisco Road left turn, and defer consideration of traffic calming or street closures until the effectiveness of the construction of a left turn to Old San Francisco Road can be evaluated subsequent to construction.

Including a project in the proposed FY 2010/11 budget will allow the Council to weigh this project against all other capital project priorities and available funding. Deferring traffic calming until after construction of a left turn will allow the City and the neighborhood to assess the effectiveness of the left turn in addressing neighborhood traffic issues.

Reviewed by:

Marvin A. Rose, Director of Public Works
Prepared by: Jack Witthaus, Transportation and Traffic Manager

Approved by:

Gary M. Luebbers, City Manager

Attachments:

A: Neighborhood Traffic Calming and Street Closures Survey Form
B: Traffic Calming/Street Closure Petition
C: Detailed Street by Street Survey Tally
D: Sunnyvale Avenue/Old San Francisco Road Left Turn Access Analysis (Appendices to the analysis report are available online at the following URL address: http://sunnyvale.ca.gov/City+Council/Council+Meetings)

Traffic Calming/Street Closure Poll
Olive Avenue, Carroll Street, Bayview Avenue, Central Avenue

This poll is being circulated to assist the City in determining whether to place traffic calming devices on streets in your neighborhood, or whether to close streets to through traffic in your neighborhood. This action is being considered because traffic volumes are anticipated to grow in your neighborhood, and the City wishes to deter non-neighborhood traffic from using neighborhood streets.

Please complete the poll and return to the City using the enclosed return mail envelope.

For the purposes of this poll, the following definitions are used:

Traffic Calming Devices: Devices that do not prohibit the movement of traffic, but rather are intended to slow the passage of traffic and discourage or deter non-neighborhood traffic. These devices could include, but not be limited to, speed humps, curb extensions (bulb outs), median islands, raised crosswalks, traffic circles, and roadway striping and signs. A sheet of examples is attached for reference.

Street Closure: Placement of bollards, planters, or curbing to physically prohibit the movement of through traffic. The configuration of these devices may allow the continued passage of emergency vehicles and service vehicles. An example of a possible street closure configuration is attached.

Partial Street Closure: Physical prohibition of traffic in one direction of travel.

You may vote for a combination of features on various streets.

I **SUPPORT** the installation of **traffic calming devices** on the following streets:

_____ Olive Avenue from Sunnyvale Avenue to Central Avenue

_____ Carroll Street from Olive Avenue to Old San Francisco Road

_____ Bayview Street from Olive Avenue to Old San Francisco Road

_____ Central Avenue from Olive Avenue to Old San Francisco Road

_____ I **OPPOSE** the installation of **traffic calming devices** on the above referenced streets

I **SUPPORT Street Closure** at the following locations:

_____ Carroll Street south of Jarvis Court

_____ Bayview Street south of Kenney Court

_____ Central Avenue south of St. Martins

I **SUPPORT partial street closure** at the following location:

_____ Southbound Central Avenue south of St. Martins

_____ I **OPPOSE street closure** at the above identified locations

EXAMPLES OF TRAFFIC CALMING MEASURES

Pavement marking and reduced lane width

Raised crosswalk (Flat topped speed hump)

Parabolic speed hump

Chokers/bulbouts

Traffic circle

EXAMPLE OF ROAD CLOSURE

ATTACHMENT B

Traffic Calming Request Form

This form is to enable neighborhoods to request the possible initiation of a traffic calming study in accordance with the City of Sunnyvale Traffic Calming Policy. Please fill out the form and Submit it to:

The City of Sunnyvale
DPW — Traffic Engineering
456 West Olive Avenue
Sunnyvale, CA 94088
Attn: Traffic Calming

1. Contact Information

Name: [redacted]

Address: [redacted]

Phone Number: [redacted]

Email: [redacted]

2. Please describe the location of the traffic concern. Attach a map or picture if necessary:

Carroll Street just south of Jarvis Court

3. Please describe the nature of the neighborhood problem you are concerned with (attach additional sheets if necessary):

Cut through traffic on Carroll Street between old San Francisco Road and Olive Avenue, due to proposed PAMF clinic and new Town Center

4. Please list possible solutions to the problem that you would like the City of Sunnyvale to consider:

Left turn from southbound Sunnyvale Avenue to old San Francisco Road. Close Carroll Street between Jarvis Court and PAMF driveway.

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The City of Sunnyvale
DPW — Traffic Engineering
456 West Olive Avenue
Sunnyvale, CA 94088
Attn: Traffic Calming

1. Contact Information

Name: [redacted]

Address: [redacted]

Phone Number: [redacted]

Email:

2. Please describe the location of the traffic concern. Attach a map or picture if necessary:

Cut through traffic @ Caroll + S. Bayview South of Olive.

3. Please describe the nature of the neighborhood problem you are concerned with (attach additional sheets if necessary):

7,000 + cars a day accessing the Palo alto Medical facility in ADDITION to the 'new downtown' traffic. Ours is a quite neighborhood.

4. Please list possible solutions to the problem that you would like the City of Sunnyvale to consider:

Permanently close Carroll + S. Bayview to vehicular traffic at Jarvis + Kenney Courts.

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This form is to enable neighborhoods to request the possible initiation of a traffic calming study in accordance with the City of Sunnyvale Traffic Calming Policy. Please fill out the form and Submit it to:

The City of Sunnyvale
DPW — Traffic Engineering
456 West Olive Avenue
Sunnyvale, CA 94088
Attn: Traffic Calming

1. Contact Information

Name: [redacted]

Address: [redacted]

Phone Number: [redacted]

Email: [redacted]

2. Please describe the location of the traffic concern. Attach a map or picture if necessary:

S Bayview Avenue just south of Kenney Ct intersection to divide PAMF property from neighborh

3. Please describe the nature of the neighborhood problem you are concerned with (attach additional sheets if necessary):

PAMF proposes to direct traffic into parking structures directly to the west and east and they propose to direct exiting traffic onto Bayview from the same driveways. No accomodations for pedestrians is made.

4. Please list possible solutions to the problem that you would like the City of Sunnyvale to consider:

Permanent vehicular Closure of S. Bayview Avenue at Kenney Court.

City of Sunnyvale – Petition for Neighborhood Traffic Calming Measures

THE UNDERSIGNED AGREE TO THE FOLLOWING:

1. All persons signin this petition do hereby certify that they reside within the impacted area, which is hereby defined as the street segments of:

   Carroll and S. Bayview between Old San Francisco Road and E. Olive Avenue from Sunnyvale Avenue to Fair Oaks

2. All persons signing this petition do hereby agree of the following problem in the defined impacted area:

   Cut through traffic on E. Olive, Central, Carroll and Bayview to access the PAMF clinic and the new downtown development. We're requesting the City take significant measures to lessen the impact of increased traffic from these two sources.

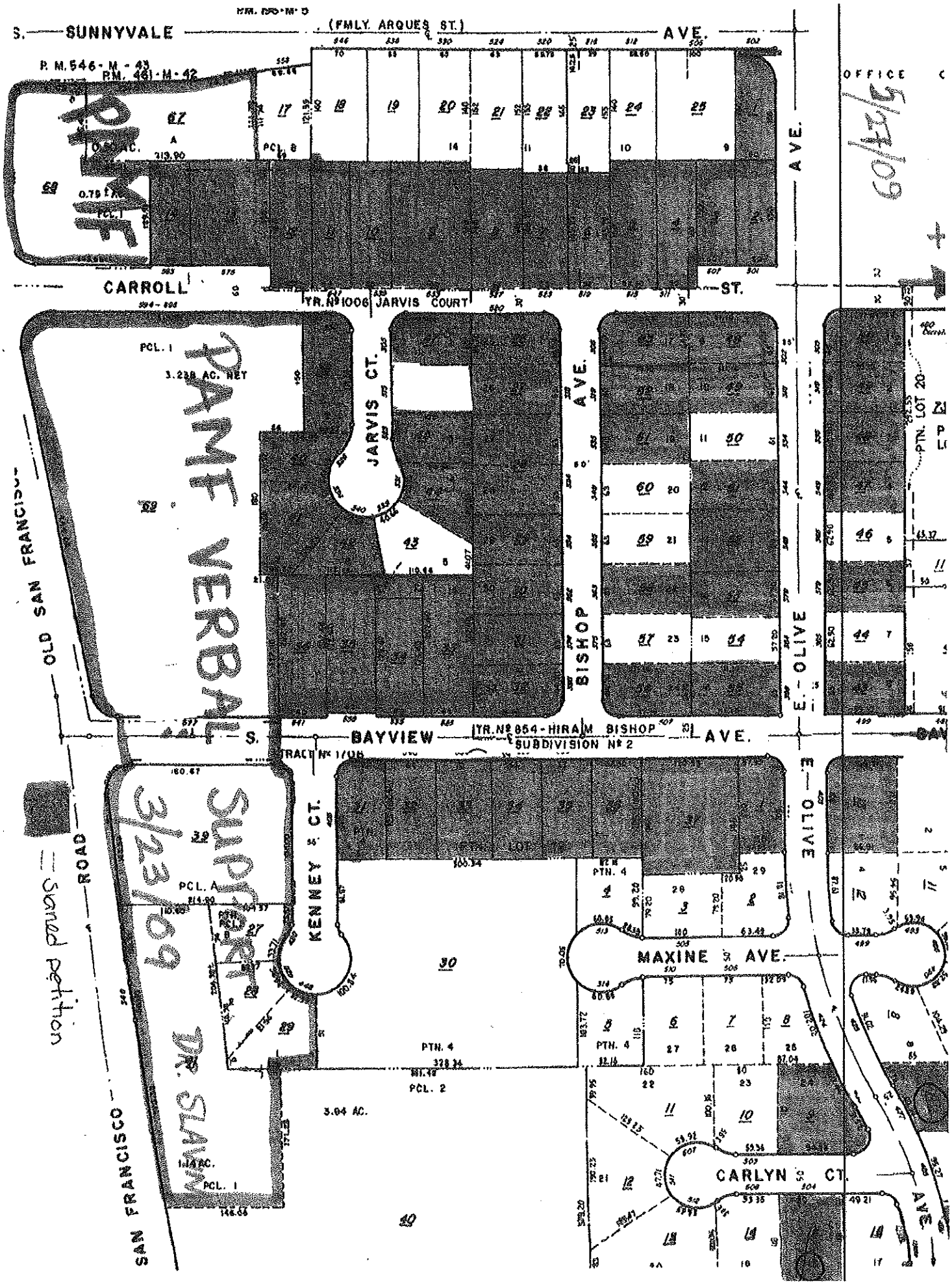
3. All persons signing this petition do hereby agree that the following contact person(s) represent the neighborhood as facilitator(s) between the residents and the City of Sunnyvale Staff in matters pertaining to items 1 and 2 above:

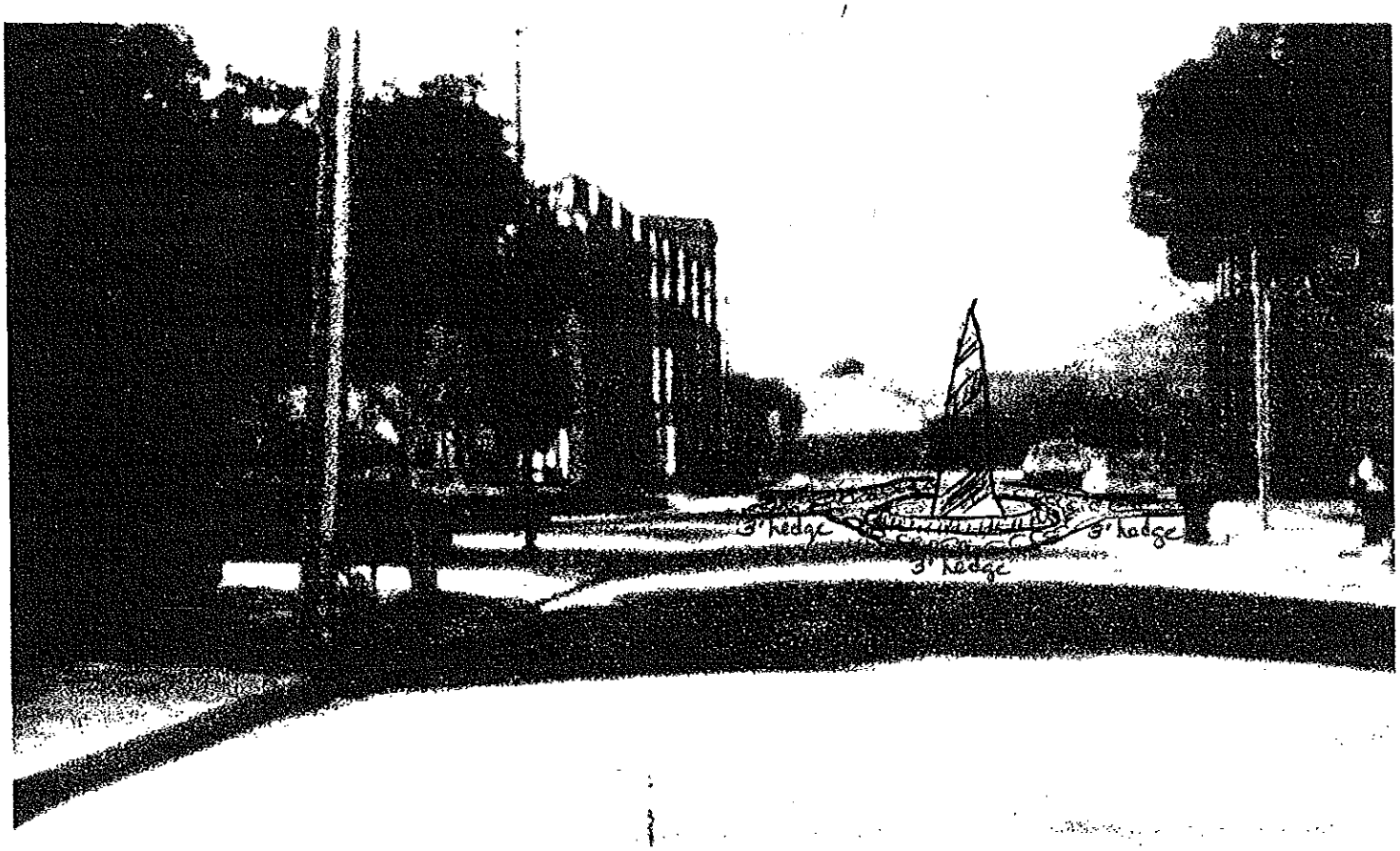
   Kevin Shives, 450 E. Olive Ave, 408.803.8025

Only One Signature Per Address

Petition for Neighborhood Traffic Calming Measures

Signature Pages of Petition
with **72** Signatures
removed for confidentiality purposes.


S. SUNNYVALE (FMLY. ARQUES ST.) AVE.
P.M. 546-M-43
P.M. 461-M-42
OFFICE
DRAFT
CARROLL ST.
TR. Nº 1006 JARVIS COURT
JARVIS CT.
BISHOP AVE.
E. OLIVE
PTN. LOT 20
PAME VERBAT
OLD SAN FRANCISCO ROAD
S. BAYVIEW AVE.
TR. Nº 854 - HIRAM BISHOP SUBDIVISION Nº 2
TRACT Nº 1708
KENNEY CT.
SUPPORT 3/23/09
DR. SAWA
MAXINE AVE.
CARLYN CT.
SAN FRANCISCO
= signed petition



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ATTACHMENT C

CARROLL STREET – 6 of 13 residences

S**UPPORT** the installation of **traffic calming devices** on the following streets:

3 Olive Avenue from Sunnyvale Avenue to Central Avenue

3 Carroll Street from Olive Avenue to Old San Francisco Road

1 Bayview Street from Olive Avenue to Old San Francisco Road

1 Central Avenue from Olive Avenue to Old San Francisco Road

2 **OPPOSE** the installation of **traffic calming devices** on the above referenced streets

SUPPORT Street Closure at the following locations:

__3___ Carroll Street south of Jarvis Court

__4___ Bayview Street south of Kenney Court

___2__ Central Avenue south of St. Martins

SUPPORT partial street closure at the following location:

____2_ Southbound Central Avenue south of St. Martins

__2___ **OPPOSE street closure** at the above identified locations

OLIVE AVENUE – 14 of 36 residences

SUPPORT the installation of **traffic calming devices** on the following streets:

14_____ Olive Avenue from Sunnyvale Avenue to Central Avenue

__10___ Carroll Street from Olive Avenue to Old San Francisco Road

____9_ Bayview Street from Olive Avenue to Old San Francisco Road

_10____ Central Avenue from Olive Avenue to Old San Francisco Road

_0____ **OPPOSE** the installation of **traffic calming devices** on the above referenced streets

SUPPORT Street Closure at the following locations:

___5__ Carroll Street south of Jarvis Court

___7__ Bayview Street south of Kenney Court

____5_ Central Avenue south of St. Martins

SUPPORT partial street closure at the following location:

__0___ Southbound Central Avenue south of St. Martins

__3___ **OPPOSE street closure** at the above identified locations

BAYVIEW AVENUE – 7 of 13 residences

SUPPORT the installation of **traffic calming devices** on the following streets:

__4___ Olive Avenue from Sunnyvale Avenue to Central Avenue

___1__ Carroll Street from Olive Avenue to Old San Francisco Road

____1_ Bayview Street from Olive Avenue to Old San Francisco Road

__1___ Central Avenue from Olive Avenue to Old San Francisco Road

___1__ **OPPOSE** the installation of **traffic calming devices** on the above referenced streets

SUPPORT Street Closure at the following locations:

__6___ Carroll Street south of Jarvis Court

___7__ Bayview Street south of Kenney Court

__6___ Central Avenue south of St. Martins

SUPPORT partial street closure at the following location:

___1__ Southbound Central Avenue south of St. Martins

___0__ **OPPOSE street closure** at the above identified locations

CENTRAL AVENUE – 3 of 6 properties

SUPPORT the installation of **traffic calming devices** on the following streets:

2_____ Olive Avenue from Sunnyvale Avenue to Central Avenue

_1____ Carroll Street from Olive Avenue to Old San Francisco Road

__1___ Bayview Street from Olive Avenue to Old San Francisco Road

___3__ Central Avenue from Olive Avenue to Old San Francisco Road

___0__ **OPPOSE** the installation of **traffic calming devices** on the above referenced streets

SUPPORT Street Closure at the following locations:

__0___ Carroll Street south of Jarvis Court

_0____ Bayview Street south of Kenney Court

____1_ Central Avenue south of St. Martins

SUPPORT partial street closure at the following location:

___2__ Southbound Central Avenue south of St. Martins

___1__ **OPPOSE street closure** at the above identified locations

INTERIOR STREETS – MAXINE COURT, JARVIS COURT, KENNEY COURT, BISHOP AVENUE – 14 of 42 residences

SUPPORT the installation of **traffic calming devices** on the following streets:

_6____ Olive Avenue from Sunnyvale Avenue to Central Avenue

__6___ Carroll Street from Olive Avenue to Old San Francisco Road

___6__ Bayview Street from Olive Avenue to Old San Francisco Road

__4___ Central Avenue from Olive Avenue to Old San Francisco Road

___5__ **OPPOSE** the installation of **traffic calming devices** on the above referenced streets

SUPPORT Street Closure at the following locations:

__5___ Carroll Street south of Jarvis Court

___7__ Bayview Street south of Kenney Court

____1_ Central Avenue south of St. Martins

SUPPORT partial street closure at the following location:

__3___ Southbound Central Avenue south of St. Martins

___5__ **OPPOSE street closure** at the above identified locations

FEHR & PEERS
TRANSPORTATION CONSULTANTS

MEMORANDUM

Date: December 4, 2009

To: Jack Witthaus, Manager of Division of Transportation & Traffic, City of Sunnyvale
Heba El-Guendy, Senior Transportation Engineer, City of Sunnyvale

From: Franziska Church/Robert Eckols

Subject: ***Sunnyvale Avenue/Old San Francisco Road Left-Turn Access Analysis, Sunnyvale, California***

SJ09-1129

Fehr & Peers has developed a conceptual intersection design and completed an operational analysis to accommodate southbound to eastbound left-turns from Sunnyvale Avenue to Old San Francisco Road in Sunnyvale, California. Providing this left-turn access will reduce the amount of medical clinic traffic and cut-through traffic on the neighborhood streets to the north of the medical clinic site. The conceptual design and operational analysis results are presented in this memorandum.

BACKGROUND AND PROJECT PURPOSE

In December 2008, Fehr & Peers completed the Transportation Impact Analysis (TIA) for the recently approved Palo Alto Medical Foundation (PAMF) Medical Clinic Environmental Impact Report (EIR). The proposed project is an expansion of the clinic located at 201/301/401 Old San Francisco Road east of the Sunnyvale Avenue/Old San Francisco Road intersection in Sunnyvale, California. The TIA analyzed the potentially significant adverse impacts of the proposed expansion on the surrounding transportation system.

The Sunnyvale Avenue/Old San Francisco Road intersection currently allows only right turns from northbound Sunnyvale Avenue to eastbound Old San Francisco Road and from westbound Old San Francisco Road to northbound Sunnyvale Avenue. No left turn movements are allowed at the intersection. Due to the intersection's right-in only configuration, southbound traffic traveling to the medical clinic via Sunnyvale Avenue could access the site using Olive Avenue (a residential collector road) and the local streets of Carroll Street and Bayview Avenue. Vehicles could also access the site using El Camino Real, Cezanne Drive, and Old San Francisco Road. However, this route is approximately half a mile longer; therefore most vehicles would use the shorter route through the neighborhood.

Similarly, the right-out only configuration at the Sunnyvale Avenue/Old San Francisco Road intersection encourages some medical clinic traffic to use the local streets rather than Cezanne Drive and El Camino Real to travel south on Sunnyvale Avenue. However, the travel distance for the neighborhood route versus the El Camino Real route is about the same and the right-out only configuration is not as attractive diversion for outbound traffic as is the right-in only configuration is for inbound traffic.

The turning movement restrictions at the Sunnyvale Avenue/Old San Francisco Road intersection not only encourages medical clinic traffic to use the alternative parallel local streets, but also encourages some diversion of traffic by vehicles traveling to and from north Sunnyvale Avenue with destinations to the east.

The TIA identified no significant impacts to the local streets due to the proposed medical clinic expansion; however, there was concern on behalf of the neighborhood regarding the increase in

traffic on the local streets that serve the medical clinic. The City of Sunnyvale decided to consider reconfiguring and signalizing the Sunnyvale Avenue/Old San Francisco Road intersection to allow left-turns from southbound Sunnyvale Avenue to eastbound Old San Francisco Road and alleviate some of the vehicle traffic currently using the neighborhood streets surrounding the medical clinic.

A conceptual signal plan was prepared to determine the physical feasibility of the reconfiguration and signalization of the Sunnyvale Avenue/Old San Francisco Road intersection. Operational analyses were conducted to determine whether the intersection would operate acceptably, especially since it is located in close proximity to the Sunnyvale Avenue/El Camino Real intersection. Queuing at the intersection was another concern since the two intersections are closely spaced.

ANALYSIS LOCATIONS AND SCENARIOS

The following five intersections were selected for analysis in consultation with City staff:

1. El Camino Real and Sunnyvale Avenue
2. Sunnyvale Avenue and Old San Francisco Road
3. Old San Francisco Road and Carroll Street
4. Old San Francisco Road and Bayview Avenue
5. Old San Francisco Road and Central Avenue

All intersections are under jurisdiction of the City of Sunnyvale, with the exception of the El Camino Real/Sunnyvale Avenue intersection. This intersection is located on a State facility (Caltrans operates State Route 82), and the signal timings are maintained by Caltrans. Figure 1 shows the location of the study intersections and the surrounding roadway system.

Operations of the study intersections were evaluated during the morning, (7:00 am to 9:00 am) and evening, (4:00 pm to 6:00 pm) peak periods for the following scenarios:

Scenario 1: *Existing Conditions*. Existing volumes obtained from the December 2008 PAMF TIA, representing peak one-hour traffic conditions during the morning and evening commute periods in May of 2007.

Scenario 2: *Existing Plus Project Conditions*. Existing peak-hour volumes plus traffic volumes from full buildout (166,195 s.f.) of the proposed medical clinic as presented in the PAMF TIA. Under this scenario the Sunnyvale Avenue/Old San Francisco Road intersection is analyzed assuming reconfiguration and signalization to allow for southbound left turns. The existing and medical clinic expansion volumes were adjusted to account for the diversion of traffic from the neighborhood streets to the new southbound left-turn lane at the Sunnyvale Avenue/Old San Francisco Road intersection.

Scenario 3: *Cumulative Conditions (Year 2020)*. Cumulative volumes obtained from the PAMF TIA representing year 2020 conditions with the proposed expansion of the medical clinic and other anticipated growth and development. Under this scenario the Sunnyvale Avenue/Old San Francisco Road intersection is analyzed under its current right-in/right-out configuration.

Scenario 4: *Cumulative Plus Project Conditions (Year 2020)*. Under this scenario the Sunnyvale Avenue/Old San Francisco Road intersection is analyzed

assuming reconfiguration and signalization to allow for southbound left turns. Scenario 3 volumes are adjusted to account for the diversion of traffic from the neighborhood streets to the new southbound left-turn lane at the Sunnyvale Avenue/Old San Francisco Road intersection.

Scenario 5: Sensitivity Analysis. Under this scenario Existing Plus Project (Scenario 2) volumes are uniformly grown by a growth factor to determine the percent growth in traffic the El Camino Real/Sunnyvale Avenue intersection could accommodate before reaching capacity and failing operationally.

EXISTING CONDITIONS

This section presents the intersection lane configurations and operations analysis results for Existing Conditions. Figure 2 shows aerials with the current configurations of the El Camino Real/Sunnyvale Avenue and Sunnyvale Avenue/Old San Francisco Road intersections. The Sunnyvale Avenue/Old San Francisco Road intersection is located about 150 feet north of the El Camino Real/Sunnyvale Avenue intersection.

The Synchro/SimTraffic analysis software was used because it addresses corridor operations and the interaction of closely-spaced intersections, which include the following:

- Queue spillback from turn lanes that block traffic in adjacent through lanes
- Queues from one intersection that extend back and affect operations at adjacent intersections
- Queues from bottleneck locations such as lane drops that affect the operation/flow of the roadway facility

In addition, intersection analysis using Synchro/SimTraffic considers additional variables (e.g. pedestrian counts and heavy vehicle percentages) as calculation inputs that are not necessarily accounted for in TRAFFIX.

Field observations and data collected (including signal timing sheets for the El Camino Real intersection obtained from Caltrans) were used to calibrate the Synchro/SimTraffic model, adjusting parameters as needed to match existing conditions as closely as possible.

The operations of roadway facilities are described with the term Level of Service (LOS). LOS is a qualitative description of traffic flow based on such factors as speed, travel time, delay, and freedom to maneuver. Six levels are defined from LOS A, as the best operating conditions, to LOS F, or the worst operating conditions. LOS E represents “at-capacity” operations. When volumes exceed capacity, stop-and-go conditions result, and operations are designated as LOS F.

Existing intersection levels of service are shown in Table 1 and the corresponding LOS calculation sheets are included in Attachment A. The results using TRAFFIX, the analysis software used in the PAMF EIR, are presented for informational purposes. The Synchro results are not expected to be the same as the results calculated using the TRAFFIX analysis software as TRAFFIX evaluates intersections in isolation. Both methods use delay calculations based on the 2000 *Highway Capacity Manual*.

The acceptable LOS for City intersections is LOS D or better for signalized intersections. For regional facilities (such as El Camino Real) the acceptable service level is LOS E or better for signalized locations. As shown in Table 1, all of the study intersections operate at an acceptable level of service during both peak periods. The LOS results for the TRAFFIX and Synchro results

are the same, although the delays calculated by Synchro are slightly higher (worse) than those calculated by TRAFFIX.

TABLE 1
EXISTING INTERSECTION LEVELS OF SERVICE

Intersection	Traffic Control	Peak Hour	TRAFFIX[3]		Synchro	
			Delay (sec/veh)[1]	LOS[2]	Delay (sec/veh)[1]	LOS[2]
1. El Camino Real and Sunnyvale Avenue*	Signal	AM	24.1	C	24.6	C
		PM	36.4	D+	41.5	D
2. Sunnyvale Avenue/Old San Francisco Road	Side-Street Stop Controlled	AM	10.7	B	11.3	B
		PM	11.6	B	11.4	B
3. Old San Francisco Road and Carroll Street	Side-Street Stop Controlled	AM	10.1	B	11.6	B
		PM	11.3	B	13.2	B
4. Old San Francisco Road and Bayview Avenue	Side-Street Stop Controlled	AM	10.2	B	11.7	B
		PM	12.3	B	14.3	B
6. Old San Francisco Road and Central Avenue	Side-Street Stop Controlled	AM	14.1	B	21.9	C
		PM	13.1	B	15.7	C

Notes:
[1] Whole intersection weighted average control delay expressed in seconds per vehicle for signalized and all-way stop controlled intersections. Worst movement delay presented for the side-street stop controlled intersections. LOS calculations conducted using the TRAFFIX and Synchro analysis software package.
[2] LOS - Level of Service.
[3] TRAFFIX results as calculated for the Palo Alto Medical Foundation Clinic EIR.
* Regionally significant facility (Intersection LOS standard is E).
Source: Fehr & Peers, November 2009.

PRELIMINARY DESIGN

Fehr & Peers developed a preliminary design for the southbound left-turn lane at the Sunnyvale Avenue/Old San Francisco Road, the transition between Old San Francisco Road and El Camino Real on Sunnyvale Avenue, and the lane configuration modifications to the north leg of the El Camino Real/Sunnyvale Avenue intersection to accommodate the medical clinic expansion mitigation measures. We used the SimTraffic simulation software package to guide the design layout and to develop storage pocket lengths for the southbound left-turn pockets.

The following parameters were incorporated into the design:

- Signalization of the Sunnyvale Avenue/Old San Francisco Road left-turn movement.
- Two left-turn lanes for the southbound to eastbound movement of Sunnyvale Avenue at El Camino Real (ECR) that extend beyond the location of the proposed new left-turn movement to Old San Francisco Road. This improvement was identified as a mitigation measure in the PAMF EIR and therefore incorporated into the design.
- Elimination of the channelizing island at the north-west corner of the ECR/Sunnyvale intersection to allow converting the second southbound lane from a right-turn lane to a shared through/right-turn lane (recommended mitigation measure in the PAMF EIR). This modification also reduces the radius of the north-west intersection corner.

- Elimination of the channelizing island at the north-east corner of the ECR/Sunnyvale intersection and tightening the corner radius to eliminate the free westbound right turn from El Camino Real onto northbound Sunnyvale (to reduce associated vehicular turning speeds).

- Reduction of the radius of the southeast corner of the Old San Francisco Road/Sunnyvale Avenue intersection and providing a crosswalk across Old San Francisco Road.

The preliminary design is presented on Figure 3 and is included in project scenarios 2, 4 and 5 analyzed as part of this memorandum.

Based on the SimTraffic queue analysis the southbound left-turn pocket length at the Sunnyvale Avenue/Old San Francisco Road was designed with a storage capacity of 150 feet. Based on the analysis, this pocket length can accommodate the 95th percentile queues estimated for this movement under Cumulative 2020 With Project Conditions (the highest growth scenario analyzed as part of this memorandum). Similarly, the southbound pocket length for the left-turn lanes at the El Camino Real/Sunnyvale Avenue intersections were designed to accommodate the estimated volumes under Cumulative 2020 With Project Conditions. The outer left-turn lane was designed to accommodate 125 foot storage length, and the inner left-turn lane has a storage length of 330 feet. Table 4 summarizes the queue lengths calculated for the southbound movements at the Sunnyvale Avenue intersections with El Camino Real and Old San Francisco Road.

TABLE 4
SUNNYVALE AVENUE/OLD SAN FRANCISCO ROAD LEFT-TURN ACCESS INTERSECTION QUEUE[1] SUMMARY

Intersection	Peak Hour	Approach[2]	Existing	Existing Plus Project	Existing Plus Project Including Growth Factor	Cumulative 2020 No Project	Cumulative 2020 With Project
1. El Camino Real and Sunnyvale Ave	AM	SBR	0	150	150	0	150
		SBT	100	125	125	150	150
		SBL	125	75	75	150	125
	PM	SBR	0	150	150	0	175
		SBT	175	150	150	175	175
		SBL	150	150	150	225	175
2. Sunnyvale Ave and Old San Francisco Rd*	AM	SBR	-	-	-	-	-
		SBT	50	50	75	500	250
		SBL	-	100	125	-	125
	PM	SBR	-	-	-	-	-
		SBT	500	200	375	525	425
		SBL	-	125	225	-	125

Notes:
1. 95th percentile queue reported in feet rounded to the next 25 feet (assuming 25 feet per vehicle).
2. SBR = southbound right, SBT = southbound through, SBL = southbound left

Source: Fehr & Peers, October 2009.

Unrelated to the preliminary design of the Sunnyvale Avenue/Old San Francisco Road intersection, is the conversion of the side-street stop control to all-way stop control at the Old San Francisco Road/Bayview Avenue intersection. This modification was recommended as part of the mitigation measures included in the PAMF EIR; and therefore was also included under all project scenarios analyzed for this memorandum.

VOLUME ESTIMATES

The southbound left-turn volumes at the Sunnyvale Avenue/Old San Francisco Road intersection redistributed neighborhood cut-through traffic and vehicle trips related to the medical clinic that would shift from Carroll Street, Bayview Avenue, and Central Avenue to the new left-turn lane. The following sections describe how these volumes were estimated.

Neighborhood Cut-Through Traffic

The amount of neighborhood cut-through traffic that would divert from Carroll Street, Bayview Avenue, and Central Avenue to the southbound Sunnyvale Avenue/Old San Francisco Road left-turn lane was estimated based on two primary factors:

1. The relationship of the eastbound right-turn and southbound through volumes at the Olive Avenue intersections with Carroll Street, Bayview Avenue, and Central Avenue with the southbound left-turn volumes at the Old San Francisco Road intersections.

2. The number of southbound left-turn and eastbound through vehicles at the Sunnyvale Avenue/Olive Avenue intersection.[1]

Based on the these factors, approximately 35 percent of vehicles that travel eastbound on Olive Avenue from the southbound left-turn and eastbound through movements at the Sunnyvale Avenue/Olive Avenue intersection were assumed to be neighborhood cut-through traffic that would divert to the new left-turn at the Sunnyvale Avenue/Old San Francisco Road intersection. Of these eastbound trips on Olive Avenue approximately 60 percent would be diverted from Carroll Street, 30 percent from Bayview Avenue, and 10 percent from Central Avenue.

These diversion percentages for Carroll Street, Bayview Avenue, and Central Avenue were derived based on comparison of eastbound right-turn volumes at Olive Avenue under Existing Conditions and consideration that Old San Francisco Road is a more desirable through-route than Olive Avenue. All intersections on Olive Avenue are all-way stop controlled, whereas most intersection on Old San Francisco Road are side-street stop controlled[2]; therefore, more of the neighborhood cut-through traffic would turn from Olive Avenue onto the local streets at the first opportunity to reach Old San Francisco Road).

The estimated amount of diverted cut-through traffic was subtracted from the southbound left-turn movement at the Old San Francisco Road intersections with Carroll Street, Bayview Avenue, and Central Avenue and added to the eastbound through movements at these intersections and the proposed southbound left-turn at the Sunnyvale Avenue/Old San Francisco Road intersection.

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[1] The Sunnyvale Avenue/Olive Avenue intersection was not included in the analysis because it will experience reduced turning movement volumes and improved LOS under the design proposal.

[2] Bayview Avenue is assumed to be all-way stop controlled with the implementation of the new southbound left-turn lane at Sunnyvale Avenue/Old San Francisco Road

Medical Office Building Traffic

The amount of medical clinic traffic that would divert from Carroll Street and Bayview Avenue as a result of the southbound Sunnyvale Avenue/Old San Francisco Road left-turn lane was estimated based the number of trips projected to use the eastbound right-turn lane at the Olive Avenue/Carroll Street and Olive Avenue/Bayview Avenue intersections. Though most of the medical clinic traffic is expected to use the new left-turn at Sunnyvale Avenue/Old San Francisco Road, some vehicles would continue to access the medical clinic from Olive Avenue. Therefore, 80 percent of the eastbound right-turn movements at Olive Avenue resulting from medical clinic vehicle traffic were diverted to Sunnyvale Avenue and Old San Francisco Road. The diverted medical clinic traffic was added to the southbound left-turn movement at Sunnyvale Avenue/Old San Francisco Road intersection and the eastbound left-turn and through movements at the Old San Francisco Road intersections with Carroll Street and Bayview Avenue.

EXISTING PLUS PROJECT

Intersection operations were evaluated with the modified lane configurations and added signalization per Figure 3 and traffic volumes comprising existing volumes, traffic from the medical clinic expansion, and traffic diverted to the southbound left turn lane. The results for the Existing Plus Project conditions are presented in Table 4 attached to the end of this memorandum. The corresponding LOS calculation sheets are included in Attachment A. The intersection of Sunnyvale Avenue/Old San Francisco Road is projected to operate at LOS A, a good operating level with the left-turn lane and signalization and completion of the medical clinic expansion.

The per vehicle delays will increase by eight to ten seconds at the intersection of Sunnyvale Avenue and El Camino Real but the intersection will operate at the same (acceptable) service levels as under Existing Conditions. As outlined above the southbound approach to the El Camino Real/Sunnyvale Avenue intersection was modified from Existing Conditions to include two left-turn lanes, one through lane, and one shared through-right turn lane. Due to this modification the vehicle delay for the southbound left-turn movement will improve from 54.8 seconds to 34.6 seconds during the AM peak period and improve from 95.5 seconds to 47.5 seconds during the PM peak period. Thus the addition of the signal and southbound left-turn access at the Sunnyvale Avenue/Old San Francisco Road intersection does not negatively impact operations at the intersection of El Camino Real and Sunnyvale Avenue.

The delays at the other study intersections will change slightly – increasing or decreasing by one or two seconds caused be reduced traffic due to the diversion or increased traffic caused by the added medical clinic space.

CUMULATIVE WITH AND WITHOUT PROJECT

Intersection operations were also evaluated under future conditions using the Cumulative 2020 Conditions volumes from the PAMF EIR both with and without the proposed intersection modifications. The volumes for Cumulative 2020 No Project conditions include existing volumes multiplied by a growth factor plus traffic from approved but not yet constructed and pending developments in the area and the addition of traffic from full buildout (166,195 s.f.) of the proposed medical clinic. The Cumulative 2020 volumes were developed a part of the PAMF EIR[3]. The results are also presented in Table 4 attached to the end of this memorandum. The corresponding LOS calculation sheets are included in Attachment A.

[3] For the purpose of this analysis Cumulative Plus Project Conditions volumes from the PAMF EIR represent Cumulative 2020 No Project volumes.

Under both the No Project and Project scenario, the intersection of Sunnyvale Avenue/Old San Francisco Road is projected to operate at LOS A, a good operating level with the left-turn lane and signalization.

All of the intersections are projected to continue to operate acceptably during the AM peak hour under 2020 Cumulative No Project and 2020 Cumulative With Project conditions. The projected increases in traffic volumes will cause the following three intersections to operate at unacceptable level of service during the PM peak hour under No Project Conditions:

- El Camino Real/Sunnyvale Avenue (LOS F)
- Old San Francisco Road/Bayview Avenue (LOS F)
- Old San Francisco Road/Central Avenue (LOS F)

Under With Project Conditions the El Camino Real/Sunnyvale Avenue and Old San Francisco Road/Central Avenue intersections are projected to operate at unacceptable operations. The Old San Francisco Road/Bayview Avenue intersection is projected to improve operations between the No Project and With Project scenarios since the intersections was assumed to be all way stop controlled under the Cumulative 2020 With Project scenario to reflect the recommended mitigation measure for this intersection from the PAMF EIR. The Old San Francisco Road/Central Avenue intersection was not identified to operate at unacceptable LOS in the PAMF EIR. The difference in analysis software packages used (TRAFFIX versus Synchro/SimTraffic) and the addition of variables such as pedestrian counts result in LOS F operation in this analysis. The peak-hour signal warrants from the *Manual on Uniform Traffic Control Devices* (MUTCD, 2003) were used to evaluate if a signal is warranted at this location. Based on this evaluation a the signal warrant is not met for this location and no further improvements are required.

As compared to the Cumulative 2020 No Project Conditions, the Cumulative 2020 With Project per vehicle delays will increase by approximately five seconds in the AM peak period and decrease by approximately 20 seconds during the PM peak period at the intersection of Sunnyvale Avenue and El Camino Real. As outlined above the southbound approach to the El Camino Real/Sunnyvale Avenue intersection was modified from Existing Conditions to include two left-turn lanes, one through lane, and one shared through-right turn lane. Due to this modification the vehicle delay for the southbound left-turn movement will improve from 62.1 seconds to 37.2 seconds during the AM peak period and improve from calculated delays of nearly 600 seconds to 115.0 seconds during the PM peak period. Thus the addition of the signal and southbound left-turn access at the Sunnyvale Avenue/Old San Francisco Road intersection does not negatively impact operations at the intersection of El Camino Real and Sunnyvale Avenue.

The El Camino Real/Sunnyvale Avenue intersection is projected to operate at LOS F with delays greater than 100 seconds. LOS F represents operations when traffic volumes exceed intersection capacity. When intersections approach capacity, traffic will divert to less congested routes and discretionary trips are either made at other less-congested times of the day or combined with other trips. Plus the projected LOS F operations at the study intersections are based on traffic projections that include a growth factor and traffic from approved and pending developments, some of which may or may not be built by the year 2020. A sensitivity analysis was conducted to test the amount of growth the El Camino Real/Sunnyvale Avenue intersection could accommodate before reaching LOS F conditions. The results for the sensitivity analysis are presented in the following section.

SENSITIVITY ANALYSIS

The goal of the sensitivity analysis is to determine the percent growth in traffic that the El Camino Real/Sunnyvale Avenue intersection could accommodate before reaching capacity and failing

operationally. The analysis assumed uniform growth for all movements at the intersection. Table 4 attached to the end of the memorandum summarizes the results for the sensitivity analysis. The corresponding LOS calculation sheets are included in Attachment A.

Based on this analysis the volumes at the El Camino Real/Sunnyvale Avenue intersection could grow by an additional 20 percent and continue to operate at acceptable LOS E or better. The intersection is projected to operate at LOS C (34.6 seconds of delay) and LOS E (78.6 seconds of delay) for the AM and PM peak hours, respectively..

It should be noted, that even though the El Camino Real/Sunnyvale Avenue intersections is projected to operate at unacceptable LOS under Cumulative 2020 With Project Conditions, the analysis results are based on operating conditions during the peak two hours of traffic flow occurring in the morning and evening periods. Thus, the intersection should operate at better LOS for the remaining 22 hours of the day. This also holds true for the signalization and southbound left-turn access at the Sunnyvale Avenue/Old San Francisco Road, where the new access will not only provide better access and less neighborhood cut-through traffic during the peak hours, but throughout the entire day.

ALTERNATIVE DESIGN CONSIDERATIONS

As part of the design and signalization of the Sunnyvale Avenue/Old San Francisco Road intersection we also considered allowing full access at the intersection. Full access would not only include the addition of the southbound left-turn lane, but also the addition of a left-turn lane from westbound Old San Francisco Road to southbound Sunnyvale Avenue. Such a configuration could divert additional neighborhood cut-through traffic to the Sunnyvale Avenue/Old San Francisco Road intersection. A full access configuration was also proposed by the members of the neighborhood. However, operationally such a configuration would not work at this location due to close proximity (spacing) of the new left-turn movement to the El Camino Real/Sunnyvale Avenue intersection and the roadway width of Sunnyvale Avenue north of the Old San Francisco Road intersection.

The close proximity (150 feet) to the El Camino Real/Sunnyvale intersection would likely result in two scenarios depending on how the signal coordination between the Sunnyvale Avenue/Old San Francisco Road and El Camino Real/Sunnyvale Avenue intersections would be set up:

- The southbound lanes at the El Camino Real intersection would already be at or near capacity when the westbound left-turn from Old San Francisco Road had a green light, thus limiting the number of left-turns that would be able to make the movement during the green light. This inefficiency in operations would likely divert traffic back through the neighborhood streets.

- The southbound left-turn lanes would have added capacity to accommodate the westbound left-turns, but once the westbound left-turns went and filled up the southbound storage capacity at the El Camino Real intersection, then the southbound queue would spill back into and well beyond the Sunnyvale Avenue/Old San Francisco Road intersection. Since, Sunnyvale Avenue is only one lane in each direction north of the Old San Francisco Road intersection, the queue spillback from this location would be substantial and result in added neighborhood cut-through traffic to avoid the southbound queues on Sunnyvale Avenue.

For these reasons, the addition of the southbound left-turn lane at the Sunnyvale/Old San Francisco Road intersection was considered as the only viable option to improve access to and from the medical clinic and to reduce cut-through traffic on Carroll Street and Bayview Avenue.

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COST ESTIMATE

The preliminary construction cost estimate of the proposed conceptual design is presented in Table 3. In compliance with Caltrans requirement, El Camino Real/Sunnyvale Avenue will require new traffic signal system for the entire intersection, shown as item 1 of the table. Without a finalized site plan of the design, landscaping of the area after construction is excluded in the cost estimate. The preliminary cost estimate of the construction is approximately $583,500.

TABLE 3
EXISTING INTERSECTION LEVELS OF SERVICE

Item No.	Description	Quantity	Unit Cost	Item Cost
1	Lump Sum Traffic Signal System (ECR/Sunnyvale)	1	$255,000	$255,000
2	Lump Sum Traffic Signal System (OSF/Sunnyvale)	1	$135,000	$135,000
3	Relocate Sign	5	$250	$1,250
4	Install Roadside Sign	2	$350	$700
5	Install Mast Arm Mounted Sign	1	$300	$300
6	Install Pavement Legend - Paint (SF)	570	$4.50	$2,565
7	Remove Pavement Legend (SF)	240	$2.00	$480
8	Install Stripe - Paint (LF)	2300	$3.00	$6,900
9	Remove Stripe (LF)	2300	$2.50	$5,750
10	6" Type G Curb & Gutter (LF)	550	$35.00	$19,250
11	Sidewalk (SF)	4200	$7.00	$29,400
12[1]	Sidewalk Removal (SF)	8000	$2.10	$16,800
13	Pedestrian Ramp (Wheelchair)	5	$2,000	$10,000
14[2]	PCC 6" (SF)	4350	$5.50	$23,925
			SUB-TOTAL:	$507,320
			15% Contingency:	$76,098
			TOTAL COST:	**$583,418**

Note:

1. Cost includes both sidewalk and all median island removals.
2. Cost does not include landscaping for the concrete fill-in area.

Source: Fehr & Peers, December 2009.

CALTRANS PROCESS

As shown in Figure 3, the proposed design includes the following substantive modifications to the El Camino Real/Sunnyvale Avenue intersection:

- Restriping of the north leg to two left-turn lanes, one through lane, and one shared through-right turn lane (per mitigations outlined in the PAMF EIR);
- Elimination of the channelizing islands on the north-west and north-east corners of the El Camino Real/Sunnyvale Avenue intersection;
- Signal upgrades for the entire intersection to update the signals to current standards, and
- Coordination of the Sunnyvale Avenue/Old San Francisco Road intersection with the El Camino Real intersection due to its close proximity to that intersection. For this analysis Fehr & Peers obtained from Caltrans the signal timing sheets for the El Camino Real intersection. The signal timings for the El Camino Real intersection were not changed in any of the analysis scenarios. Rather the new intersection at Old San Francisco Road was coordinated with El Camino Real assuming the existing timings.

Since Caltrans controls intersections on State facilities, including El Camino Real, the City of Sunnyvale will be required to follow Caltrans' process and guidelines if the City decides to move forward with the proposed design.

The initial steps required to start the Caltrans process will be to send the design, project purpose report, proposed signal timings, and other documentation to initiate the conversations with Caltrans about the proposed project.

Later in the process the City will be required to file an Encroachment Permit with Caltrans, which along with the required form will require submittal of plans, specifications, and estimates. Caltrans will review these documents and generally will respond within 4 to 6 weeks, though this might take longer. After receiving Caltrans' comments the City will resubmit any plans to Caltrans in response to their comments. Usually, jurisdictions will submit their plans to Caltrans two to three times before receiving final approval. One way to help move this process along more smoothly and quickly is to involve Caltrans early in the process to address some basic comments early on. At some point in the process Caltrans will likely request the timing plans for the new intersection at Old San Francisco Road to determine how they interact with the existing timings at the El Camino Real intersection.

Though the outline above by no means outlines the exact process that Caltrans will require for implementation of the proposed design, it does provide general information on the time commitment required by the City. Please note that these are general guidelines and that the process could take longer or shorter depending on aspects that we are not aware or cannot control.

CONCLUSIONS

The Sunnyvale Avenue/Old San Francisco Road intersection can physically accommodate the new southbound left-turn lane (with signalization) and the Sunnyvale Avenue/El Camino Real intersection can physically accommodate the proposed mitigation measures presented in the Palo Alto Medical Foundation (PAMF) Medical Clinic Environmental Impact Report (EIR). The two closely-spaced signalized intersections on Sunnyvale Avenue would operate acceptably with traffic generated by the medical clinic expansion and with diverted traffic due to the new left-turn lane. Some poor intersection operations are projected under future (Cumulative 2020) conditions however these poor operations are due to the overall traffic volumes increases, not due to the

intersections modifications. The sensitivity analysis showed that Existing Plus Project volumes could increase by 20 percent and acceptable intersection operations would be maintained at the intersection of El Camino Real / Sunnyvale Avenue.

Table 4

Sunnyvale Ave/Old San Francisco Road Left-Turn Access

Intersection Levels of Service Summary

Intersection	Peak Hour	Existing					Existing Plus Project			Existing Plus Project Sensitivity (20% Growth Factor)			Cumulative 2020 No Project					Cumulative 2020 With Project		
			TRAFFIX		Synchro			Synchro			Synchro			TRAFFIX		Synchro			Synchro	
		Control[1]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Control[1]	Delay[2]	LOS[3]	Control[1]	Delay[2]	LOS[3]	Control[1]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Control[1]	Delay[2]	LOS[3]
1. El Camino Real and Sunnyvale Ave*	AM	Signal	24.1	C	24.6	C	Signal	32.7	C	Signal	34.6	C	Signal	30.7	C	39.3	D	Signal	44.7	D
	PM		36.4	D+	41.5	D		47.6	D		78.6	E		**85.9**	**F**	**157.5**	**F**		**138.6**	**F**
2. Sunnyvale Ave and Old San Francisco Rd	AM	SSS	10.7	B	11.3	B	Signal	6.6	A	Signal	69.9	A	SSS	N/A	N/A	12	B	Signal	7.1	A
	PM		11.6	B	11.4	B		6.0	A		6.3	A				13	B		6.7	A
3. Old San Francisco Rd and Carroll St	AM	SSS	10.1	B	11.6	B	SSS	12.8	B	SSS	14.3	B	SSS	13.4	B	15.4	C	SSS	15.6	C
	PM		11.3	B	13.2	B		15.5	C		18.5	C		19.4	C	25.4	D		22	C
4. Old San Francisco Rd and Bayview Ave	AM	SSS	10.2	B	11.7	B	AWS	8.8	A	AWS	9.5	A	SSS	17.9	C	22.1	C	AWS	10.3	B
	PM		12.3	B	14.3	B		12.5	B		16.3	C		**149.1**	**F**	**270.9**	**F**		28	D
5. Old San Francisco Rd and Central Ave	AM	SSS	14.1	B	21.9	C	SSS	19.9	C	SSS	27.7	D	SSS	29.5	D	42.6	E	SSS	45.5	E
	PM		13.1	B	15.7	C		17.5	C		22.2	C		37.3	E	**54.3**	**F**		**56.9**	**F**

Notes:

1. SSS = Side-street stop control, AWS = All-way stop control.

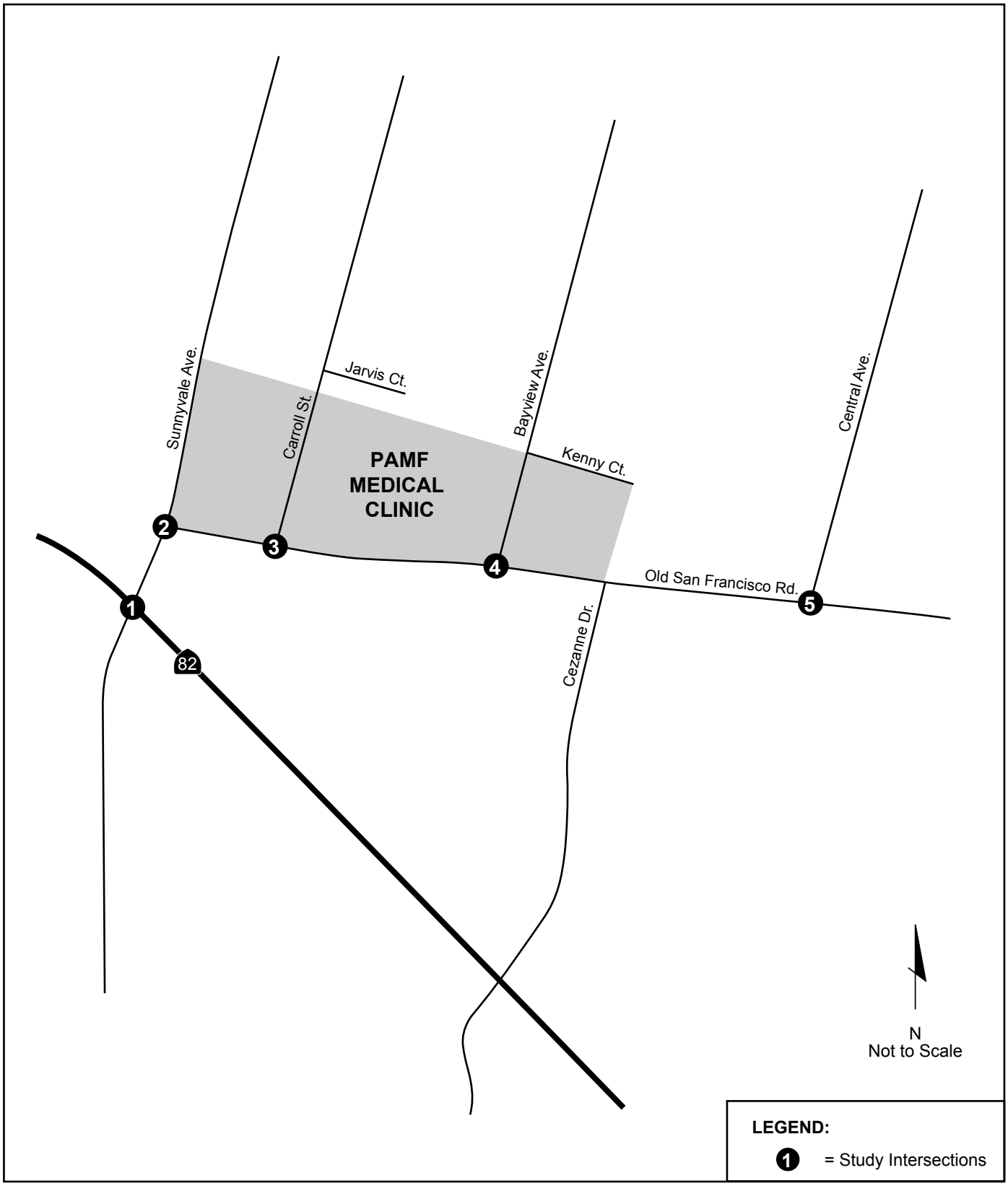
2. Average control delay per vehicle for stop controlled intersections using the method described in the 2000 Highway Capacity Manual. LOS calculations conducted using specified analysis software package.

3. LOS = Level of Service.

* Regionally significant facility (Intersection LOS standard is E).

Unacceptable intersection operations are noted in **bold** text.

Source: Fehr & Peers, November 2009.



Sunnyvale OSF

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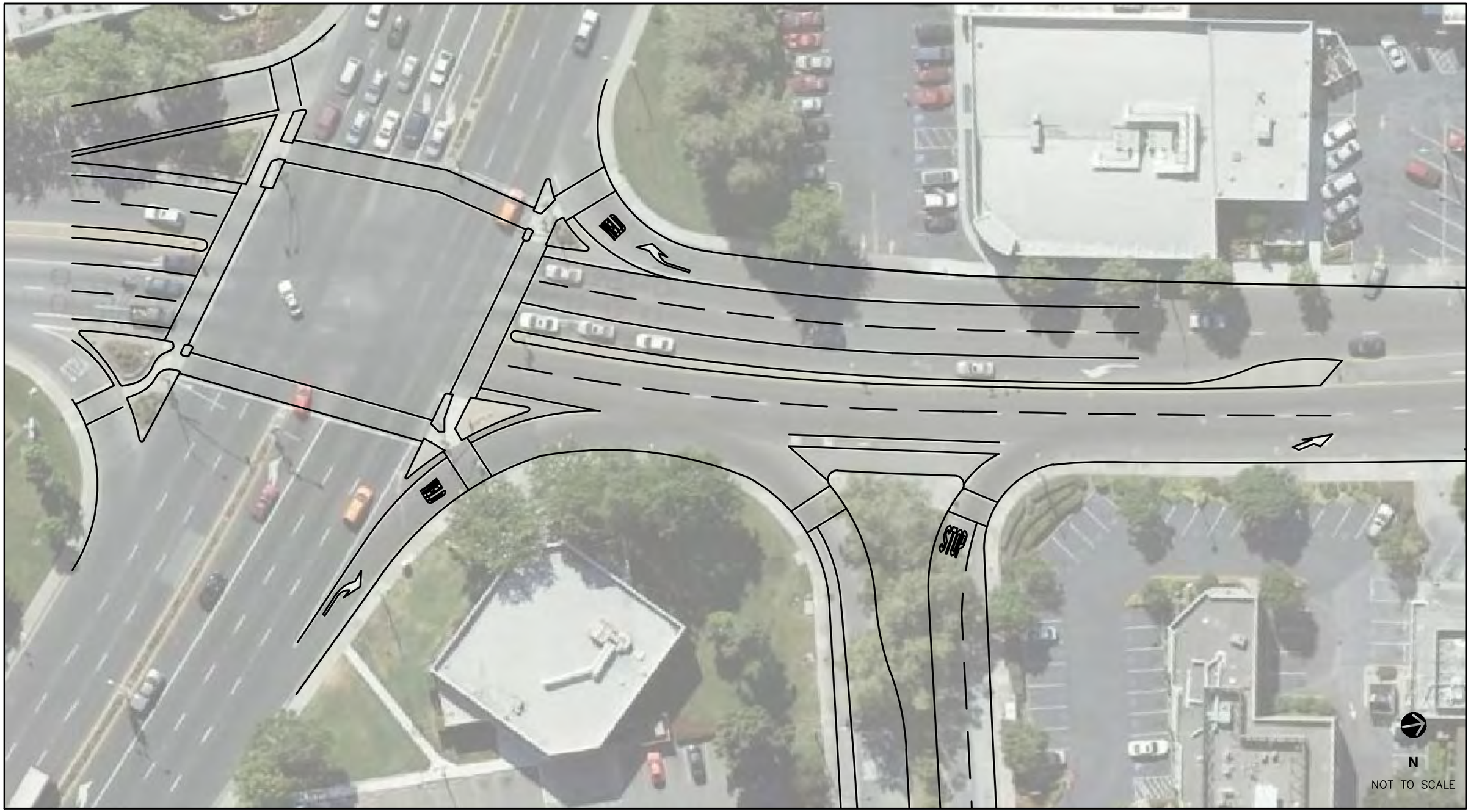
STUDY LOCATIONS

November 2009
SJ09-1129

FIGURE 1



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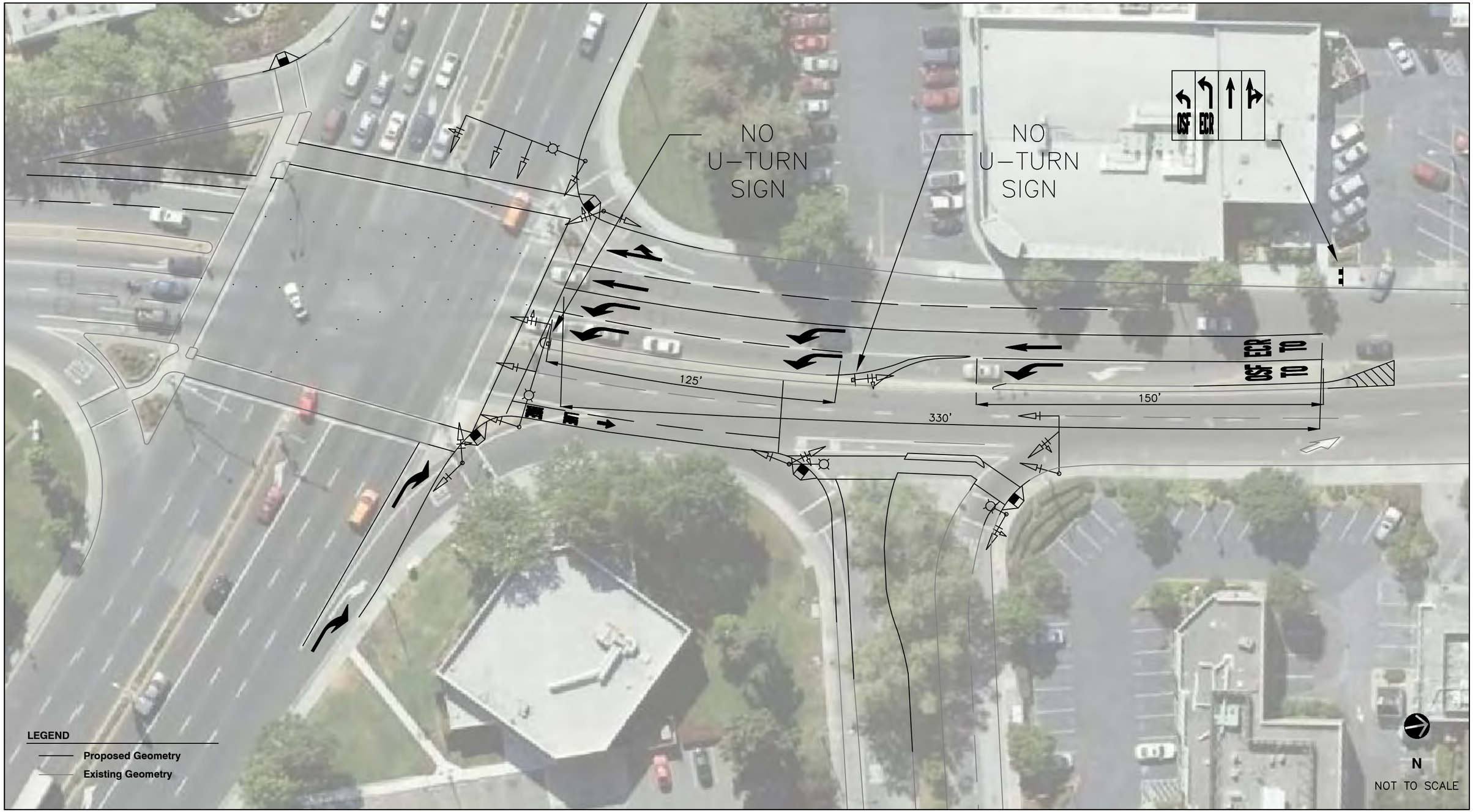
Dec 01, 2009
SJ09-1129

Existing Configuration of Sunnyvale Avenue / Old San Francisco Road Intersection

Figure 2



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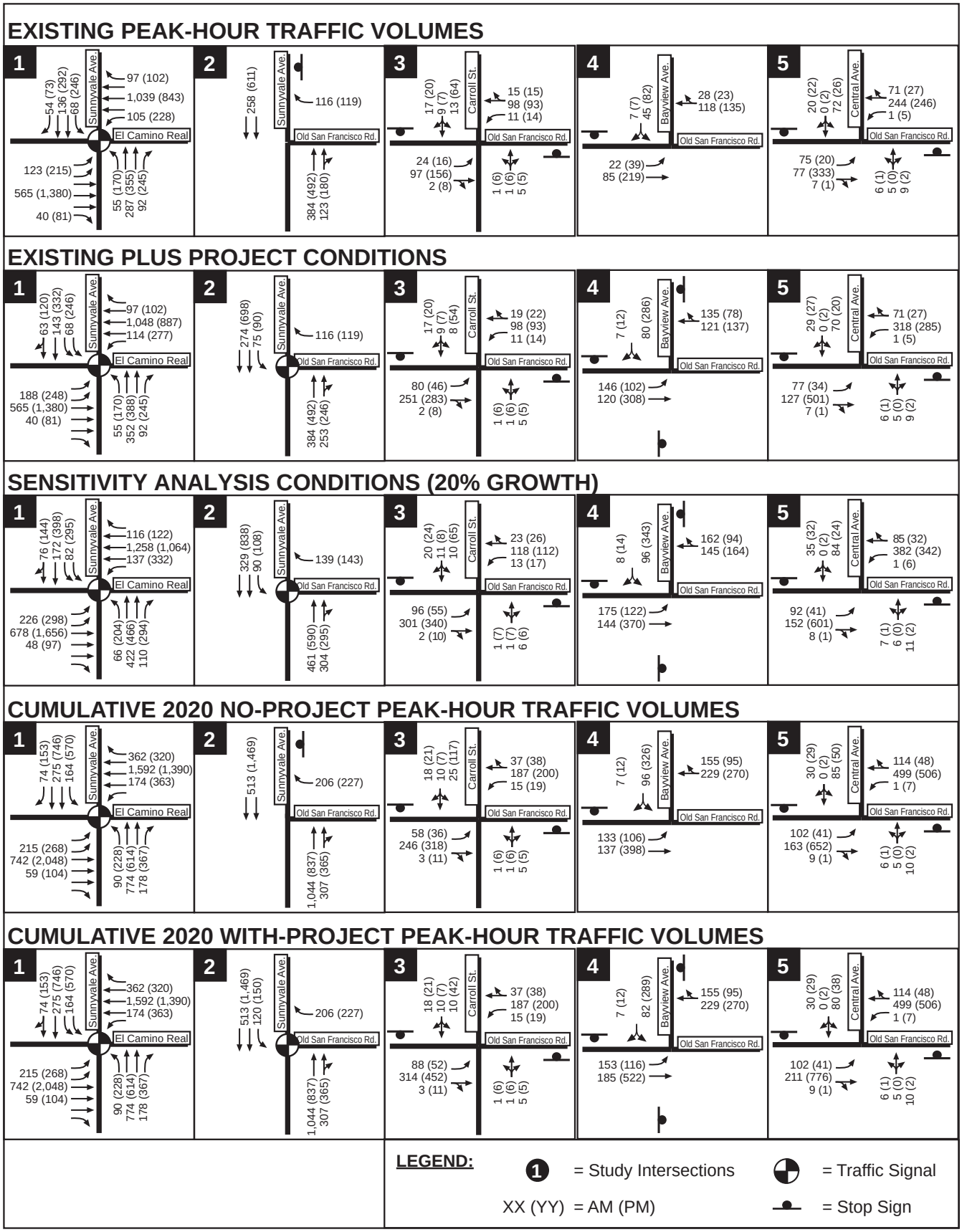
Dec 04, 2009
SJ09-1129

Proposed Configuration of Sunnyvale Avenue / Old San Francisco Road Intersection

Figure 3



Sunnyvale OSF

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LANE GEOMETRIES, TRAFFIC CONTROL, AND PEAK-HOUR TRAFFIC VOLUMES

November 2009
SJ09-1129

FIGURE 4

ATTACHMENT A

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	132	651	113	1117	104	59	309	99	73	146	58
v/c Ratio	0.30	0.24	0.67	0.43	0.13	0.50	0.61	0.34	0.56	0.28	0.21
Control Delay	41.4	14.5	62.4	18.0	8.2	58.8	44.9	12.7	60.3	37.4	10.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	41.4	14.5	62.4	18.0	8.2	58.8	44.9	12.7	60.3	37.4	10.5
Queue Length 50th (ft)	39	73	71	155	11	37	101	7	46	44	0
Queue Length 95th (ft)	68	145	123	262	52	77	124	46	89	63	31
Internal Link Dist (ft)		645		1007			830			143	
Turn Bay Length (ft)	400		260		100	160		50			
Base Capacity (vph)	446	2743	301	2592	819	248	885	452	248	892	434
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.30	0.24	0.38	0.43	0.13	0.24	0.35	0.22	0.29	0.16	0.13

Intersection Summary

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5026		1770	5085	1542	1770	3539	1548	1770	3539	1548
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5026		1770	5085	1542	1770	3539	1548	1770	3539	1548
Volume (vph)	123	565	40	105	1039	97	55	287	92	68	136	54
Peak-hour factor, PHF	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Adj. Flow (vph)	132	608	43	113	1117	104	59	309	99	73	146	58
RTOR Reduction (vph)	0	5	0	0	0	33	0	0	75	0	0	49
Lane Group Flow (vph)	132	646	0	113	1117	71	59	309	24	73	146	9
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			4
Actuated Green, G (s)	14.0	53.9		10.5	50.4	50.4	6.7	15.2	15.2	7.4	15.9	15.9
Effective Green, g (s)	13.0	53.9		9.5	50.4	50.4	5.7	14.2	14.2	6.4	14.9	14.9
Actuated g/C Ratio	0.13	0.54		0.10	0.50	0.50	0.06	0.14	0.14	0.06	0.15	0.15
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	446	2709		168	2563	777	101	503	220	113	527	231
v/s Ratio Prot	c0.04	0.13		c0.06	c0.22		0.03	c0.09		c0.04	0.04	
v/s Ratio Perm						0.05			0.02			0.01
v/c Ratio	0.30	0.24		0.67	0.44	0.09	0.58	0.61	0.11	0.65	0.28	0.04
Uniform Delay, d1	39.4	12.2		43.7	15.8	12.9	46.0	40.3	37.4	45.7	37.8	36.4
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.1	0.2		8.1	0.5	0.2	5.4	2.2	0.2	9.1	0.3	0.1
Delay (s)	39.5	12.4		51.8	16.3	13.1	51.4	42.6	37.6	54.8	38.1	36.5
Level of Service	D	B		D	B	B	D	D	D	D	D	D
Approach Delay (s)		17.0			19.1			42.6			42.1	
Approach LOS		B			B			D			D	

Intersection Summary			
HCM Average Control Delay	24.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	53.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	0	116	0	384	123	0	258	0
Peak Hour Factor	0.92	0.92	0.92	0.80	0.92	0.80	0.92	0.80	0.80	0.80	0.80	0.92
Hourly flow rate (vph)	0	0	0	0	0	145	0	480	154	0	322	0
Pedestrians					30							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					3							
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								223				
pX, platoon unblocked	0.92	0.92		0.92	0.92	0.92				0.92		
vC, conflicting volume	562	832	81	668	909	347	322			510		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	442	734	81	556	818	208	322			385		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	80	100			100		
cM capacity (veh/h)	361	311	963	365	278	718	1234			1053		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	145	320	314	81	81	81	81
Volume Left	0	0	0	0	0	0	0
Volume Right	145	0	154	0	0	0	0
cSH	718	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.20	0.19	0.18	0.05	0.05	0.05	0.05
Queue Length 95th (ft)	19	0	0	0	0	0	0
Control Delay (s)	11.3	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.3	0.0		0.0			
Approach LOS	B						

Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	29.1%	ICU Level of Service	A	
Analysis Period (min)	15			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	24	97	2	11	98	15	1	1	5	13	9	17
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	30	121	2	14	122	19	1	1	6	16	11	21
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	171			154			419	411	182	408	403	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	171			154			419	411	182	408	403	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			99			100	100	99	97	98	97
cM capacity (veh/h)	1371			1391			465	488	818	490	494	808

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	30	124	14	141	9	49
Volume Left	30	0	14	0	1	16
Volume Right	0	2	0	19	6	21
cSH	1371	1700	1391	1700	679	593
Volume to Capacity	0.02	0.07	0.01	0.08	0.01	0.08
Queue Length 95th (ft)	2	0	1	0	1	7
Control Delay (s)	7.7	0.0	7.6	0.0	10.4	11.6
Lane LOS	A		A		B	B
Approach Delay (s)	1.5		0.7		10.4	11.6
Approach LOS					B	B

Intersection Summary			
Average Delay	2.7		
Intersection Capacity Utilization	28.5%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	22	85	118	28	45	7
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	28	106	148	35	56	9
Pedestrians			30		30	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			4.0		4.0	
Percent Blockage			3		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	212				386	195
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	212				386	195
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	98				90	99
cM capacity (veh/h)	1324				574	825

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	28	106	182	65
Volume Left	28	0	0	56
Volume Right	0	0	35	9
cSH	1324	1700	1700	599
Volume to Capacity	0.02	0.06	0.11	0.11
Queue Length 95th (ft)	2	0	0	9
Control Delay (s)	7.8	0.0	0.0	11.7
Lane LOS	A			B
Approach Delay (s)	1.6		0.0	11.7
Approach LOS				B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	28.2%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	75	77	7	1	244	71	6	5	9	72	0	20
Peak Hour Factor	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80	0.80
Hourly flow rate (vph)	94	96	9	1	305	89	8	6	11	90	0	25
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	424			135			681	744	161	710	704	409
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	424			135			681	744	161	710	704	409
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	92			100			97	98	99	69	100	96
cM capacity (veh/h)	1107			1413			299	298	841	289	314	610

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	94	105	1	394	25	115
Volume Left	94	0	1	0	8	90
Volume Right	0	9	0	89	11	25
cSH	1107	1700	1413	1700	421	327
Volume to Capacity	0.08	0.06	0.00	0.23	0.06	0.35
Queue Length 95th (ft)	7	0	0	0	5	38
Control Delay (s)	8.6	0.0	7.5	0.0	14.1	21.9
Lane LOS	A		A		B	C
Approach Delay (s)	4.0		0.0		14.1	21.9
Approach LOS					B	C

Intersection Summary			
Average Delay	5.0		
Intersection Capacity Utilization	44.9%	ICU Level of Service	A
Analysis Period (min)	15		

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	219	1491	233	860	104	173	362	250	251	298	74
v/c Ratio	0.55	0.71	0.86	0.37	0.14	0.82	0.70	0.70	0.96	0.48	0.22
Control Delay	55.6	32.8	76.3	22.9	8.1	80.7	55.4	28.8	97.5	46.9	10.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.6	32.8	76.3	22.9	8.1	80.7	55.4	28.8	97.5	46.9	10.4
Queue Length 50th (ft)	83	333	178	152	11	132	144	71	195	113	0
Queue Length 95th (ft)	125	#576	253	224	51	206	174	146	#358	145	39
Internal Link Dist (ft)		645		1018			830			158	
Turn Bay Length (ft)	400		260		100	160		50			
Base Capacity (vph)	401	2114	413	2319	744	266	826	479	266	826	417
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.55	0.71	0.56	0.37	0.14	0.65	0.44	0.52	0.94	0.36	0.18

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0		4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91		1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00		1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	0.99		1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5035		1770	5085	1538	1770	3539	1545	1770	3539	1545
Flt Permitted	0.95	1.00		0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5035		1770	5085	1538	1770	3539	1545	1770	3539	1545
Volume (vph)	215	1380	81	228	843	102	170	355	245	246	292	73
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	219	1408	83	233	860	104	173	362	250	251	298	74
RTOR Reduction (vph)	0	4	0	0	0	43	0	0	131	0	0	61
Lane Group Flow (vph)	219	1487	0	233	860	61	173	362	119	251	298	13
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot			Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases						2			8			4
Actuated Green, G (s)	15.1	50.2		19.5	54.6	54.6	15.2	18.6	18.6	18.7	22.1	22.1
Effective Green, g (s)	14.1	50.2		18.5	54.6	54.6	14.2	17.6	17.6	17.7	21.1	21.1
Actuated g/C Ratio	0.12	0.42		0.15	0.46	0.46	0.12	0.15	0.15	0.15	0.18	0.18
Clearance Time (s)	3.0	4.0		3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	2.0	4.0		2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	403	2106		273	2314	700	209	519	227	261	622	272
v/s Ratio Prot	0.06	c0.30		c0.13	0.17		0.10	c0.10		c0.14	c0.08	
v/s Ratio Perm						0.04			0.08			0.01
v/c Ratio	0.54	0.71		0.85	0.37	0.09	0.83	0.70	0.52	0.96	0.48	0.05
Uniform Delay, d1	49.9	28.8		49.4	21.4	18.6	51.7	48.7	47.3	50.8	44.5	41.1
Progression Factor	1.00	1.00		1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	0.8	2.0		21.2	0.5	0.2	21.8	4.1	2.2	44.7	0.6	0.1
Delay (s)	50.7	30.8		70.6	21.9	18.8	73.5	52.7	49.5	95.5	45.1	41.2
Level of Service	D	C		E	C	B	E	D	D	F	D	D
Approach Delay (s)		33.4			31.1			56.3			64.9	
Approach LOS		C			C			E			E	

Intersection Summary			
HCM Average Control Delay	41.5	HCM Level of Service	D
HCM Volume to Capacity ratio	0.79		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	20.0
Intersection Capacity Utilization	82.0%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	0	119	0	492	180	0	611	0
Peak Hour Factor	0.92	0.92	0.92	0.93	0.92	0.93	0.92	0.93	0.93	0.93	0.93	0.92
Hourly flow rate (vph)	0	0	0	0	0	128	0	529	194	0	657	0
Pedestrians					30							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					3							
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								238				
pX, platoon unblocked	0.91	0.91		0.91	0.91	0.91				0.91		
vC, conflicting volume	922	1216	164	820	1313	391	657			559		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	810	1135	164	698	1242	225	657			410		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	81	100			100		
cM capacity (veh/h)	196	178	851	284	153	688	926			1012		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	128	353	370	164	164	164	164
Volume Left	0	0	0	0	0	0	0
Volume Right	128	0	194	0	0	0	0
cSH	688	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.19	0.21	0.22	0.10	0.10	0.10	0.10
Queue Length 95th (ft)	17	0	0	0	0	0	0
Control Delay (s)	11.4	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	B						
Approach Delay (s)	11.4	0.0		0.0			
Approach LOS	B						

Intersection Summary			
Average Delay	1.0		
Intersection Capacity Utilization	34.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	16	156	8	14	93	15	6	6	5	64	7	20
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.90	0.93
Hourly flow rate (vph)	17	168	9	15	100	16	6	6	5	69	8	22
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	146			206			422	413	232	409	409	168
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	146			206			422	413	232	409	409	168
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	99			99			99	99	99	86	98	97
cM capacity (veh/h)	1400			1331			469	492	767	488	494	833

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	17	176	15	116	18	98
Volume Left	17	0	15	0	6	69
Volume Right	0	9	0	16	5	22
cSH	1400	1700	1331	1700	539	538
Volume to Capacity	0.01	0.10	0.01	0.07	0.03	0.18
Queue Length 95th (ft)	1	0	1	0	3	17
Control Delay (s)	7.6	0.0	7.7	0.0	11.9	13.2
Lane LOS	A		A		B	B
Approach Delay (s)	0.7		0.9		11.9	13.2
Approach LOS					B	B

Intersection Summary			
Average Delay	4.0		
Intersection Capacity Utilization	31.5%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	39	219	135	23	82	7
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	42	235	145	25	88	8
Pedestrians			30		30	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			4.0		4.0	
Percent Blockage			3		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	200				537	188
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	200				537	188
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	97				81	99
cM capacity (veh/h)	1338				465	833

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	42	235	170	96
Volume Left	42	0	0	88
Volume Right	0	0	25	8
cSH	1338	1700	1700	482
Volume to Capacity	0.03	0.14	0.10	0.20
Queue Length 95th (ft)	2	0	0	18
Control Delay (s)	7.8	0.0	0.0	14.3
Lane LOS	A			B
Approach Delay (s)	1.2		0.0	14.3
Approach LOS				B

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	30.0%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	20	333	1	5	246	27	1	0	2	26	2	22
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Hourly flow rate (vph)	22	358	1	5	265	29	1	0	2	28	2	24
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	324			389			762	766	419	753	752	339
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	324			389			762	766	419	753	752	339
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	98			100			100	100	100	90	99	96
cM capacity (veh/h)	1205			1140			278	309	603	292	315	669

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	22	359	5	294	3	54
Volume Left	22	0	5	0	1	28
Volume Right	0	1	0	29	2	24
cSH	1205	1700	1140	1700	434	390
Volume to Capacity	0.02	0.21	0.00	0.17	0.01	0.14
Queue Length 95th (ft)	1	0	0	0	1	12
Control Delay (s)	8.0	0.0	8.2	0.0	13.4	15.7
Lane LOS	A		A		B	C
Approach Delay (s)	0.5		0.1		13.4	15.7
Approach LOS					B	C

Intersection Summary			
Average Delay	1.5		
Intersection Capacity Utilization	34.8%	ICU Level of Service	A
Analysis Period (min)	15		

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	192	577	41	116	1069	99	56	359	94	69	210
v/c Ratio	0.63	0.36	0.08	0.68	0.66	0.18	0.10	0.41	0.21	0.11	0.48
Control Delay	53.4	27.7	12.8	62.5	31.6	10.9	29.3	33.0	11.9	35.9	30.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	53.4	27.7	12.8	62.5	31.6	10.9	29.3	33.0	11.9	35.9	30.9
Queue Length 50th (ft)	62	104	5	73	213	14	24	100	11	19	47
Queue Length 95th (ft)	95	140	30	125	262	51	69	143	51	40	69
Internal Link Dist (ft)		3192			4323			4778			143
Turn Bay Length (ft)	400		50	260		100	160		50	150	
Base Capacity (vph)	446	1585	500	301	1627	539	562	885	441	624	887
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	139
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.43	0.36	0.08	0.39	0.66	0.18	0.10	0.41	0.21	0.11	0.28

Intersection Summary

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5085	1542	1770	5085	1542	1770	3539	1548	3433	3355	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5085	1542	1770	5085	1542	1770	3539	1548	3433	3355	
Volume (vph)	188	565	40	114	1048	97	55	352	92	68	143	63
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	192	577	41	116	1069	99	56	359	94	69	146	64
RTOR Reduction (vph)	0	0	20	0	0	45	0	0	54	0	57	0
Lane Group Flow (vph)	192	577	21	116	1069	54	56	359	40	69	153	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			
Actuated Green, G (s)	9.8	31.2	31.2	10.7	32.1	32.1	32.7	26.0	26.0	19.1	12.4	
Effective Green, g (s)	8.8	31.2	31.2	9.7	32.1	32.1	31.7	25.0	25.0	18.1	11.4	
Actuated g/C Ratio	0.09	0.31	0.31	0.10	0.32	0.32	0.32	0.25	0.25	0.18	0.11	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	302	1587	481	172	1632	495	561	885	387	621	382	
v/s Ratio Prot	0.06	0.11		c0.07	c0.21		0.03	c0.10		c0.02	c0.05	
v/s Ratio Perm			0.01			0.03			0.03			
v/c Ratio	0.64	0.36	0.04	0.67	0.66	0.11	0.10	0.41	0.10	0.11	0.40	
Uniform Delay, d1	44.1	26.7	24.0	43.6	29.2	23.9	24.1	31.3	28.9	34.2	41.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.2	0.6	0.2	7.9	2.1	0.4	0.4	0.3	0.1	0.4	0.7	
Delay (s)	47.3	27.3	24.2	51.6	31.3	24.3	24.4	31.6	29.0	34.6	41.8	
Level of Service	D	C	C	D	C	C	C	C	C	C	D	
Approach Delay (s)		31.9			32.6			30.3			40.0	
Approach LOS		C			C			C			D	

Intersection Summary			
HCM Average Control Delay	32.7	HCM Level of Service	C
HCM Volume to Capacity ratio	0.49		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	66.4%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	118	650	77	280
v/c Ratio	0.16	0.26	0.24	0.06
Control Delay	0.5	0.5	38.5	0.0
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	0.5	0.8	38.5	0.0
Queue Length 50th (ft)	0	4	42	0
Queue Length 95th (ft)	0	0	89	0
Internal Link Dist (ft)		143		306
Turn Bay Length (ft)			75	
Base Capacity (vph)	719	2455	322	5045
Starvation Cap Reductn	0	1134	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.16	0.49	0.24	0.06

Intersection Summary

2: Old San Francisco & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)						4.0		4.0		4.0	4.0	
Lane Util. Factor						1.00		0.95		1.00	0.91	
Frpb, ped/bikes						1.00		0.97		1.00	1.00	
Flpb, ped/bikes						1.00		1.00		1.00	1.00	
Frt						0.86		0.94		1.00	1.00	
Flt Protected						1.00		1.00		0.95	1.00	
Satd. Flow (prot)						1611		3235		1770	5085	
Flt Permitted						1.00		1.00		0.95	1.00	
Satd. Flow (perm)						1611		3235		1770	5085	
Volume (vph)	0	0	0	0	0	116	0	384	253	75	274	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	0	118	0	392	258	77	280	0
RTOR Reduction (vph)	0	0	0	0	0	97	0	78	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	21	0	572	0	77	280	0
Confl. Peds. (#/hr)									30			
Turn Type						Over				Prot		
Protected Phases						7		8		7	1 2 3 4	
Permitted Phases								1 2				
Actuated Green, G (s)						19.1		70.9		19.1	100.0	
Effective Green, g (s)						18.1		69.9		18.1	100.0	
Actuated g/C Ratio						0.18		0.70		0.18	1.00	
Clearance Time (s)						3.0		3.0		3.0		
Vehicle Extension (s)						2.0		3.0		2.0		
Lane Grp Cap (vph)						292		2391		320	5085	
v/s Ratio Prot						0.01		c0.06		c0.04	0.06	
v/s Ratio Perm								0.12				
v/c Ratio						0.07		0.24		0.24	0.06	
Uniform Delay, d1						34.0		5.4		35.1	0.0	
Progression Factor						1.00		0.13		1.00	1.00	
Incremental Delay, d2						0.5		0.0		1.8	0.0	
Delay (s)						34.5		0.7		36.8	0.0	
Level of Service						C		A		D	A	
Approach Delay (s)		0.0			34.5			0.7			7.9	
Approach LOS		A			C			A			A	

Intersection Summary			
HCM Average Control Delay	6.6	HCM Level of Service	A
HCM Volume to Capacity ratio	0.24		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	36.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

3: Old San Francisco & Carroll St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	80	251	2	11	98	19	1	1	5	8	9	17
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	82	256	2	11	100	19	1	1	5	8	9	17
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		290										
pX, platoon unblocked												
vC, conflicting volume	149			288			625	622	317	617	614	170
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	149			288			625	622	317	617	614	170
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	94			99			100	100	99	98	97	98
cM capacity (veh/h)	1396			1242			331	357	688	346	361	831

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	82	258	11	119	7	35
Volume Left	82	0	11	0	1	8
Volume Right	0	2	0	19	5	17
cSH	1396	1700	1242	1700	535	496
Volume to Capacity	0.06	0.15	0.01	0.07	0.01	0.07
Queue Length 95th (ft)	5	0	1	0	1	6
Control Delay (s)	7.7	0.0	7.9	0.0	11.8	12.8
Lane LOS	A		A		B	B
Approach Delay (s)	1.9		0.7		11.8	12.8
Approach LOS					B	B

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	30.1%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	146	120	121	135	80	7
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	149	122	123	138	82	7

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total (vph)	149	122	261	89
Volume Left (vph)	149	0	0	82
Volume Right (vph)	0	0	138	7
Hadj (s)	0.53	0.03	-0.28	0.17
Departure Headway (s)	5.5	5.0	4.3	5.3
Degree Utilization, x	0.23	0.17	0.31	0.13
Capacity (veh/h)	643	702	813	631
Control Delay (s)	8.9	7.8	9.2	9.0
Approach Delay (s)	8.4		9.2	9.0
Approach LOS	A		A	A

Intersection Summary			
Delay	8.8		
HCM Level of Service	A		
Intersection Capacity Utilization	39.0%	ICU Level of Service	A
Analysis Period (min)	15		

5: Old San Francisco & Central Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	77	127	7	1	318	71	6	5	9	70	0	29
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	79	130	7	1	324	72	6	5	9	71	0	30
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	427			167			706	749	193	721	717	421
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	427			167			706	749	193	721	717	421
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			100			98	98	99	75	100	95
cM capacity (veh/h)	1104			1376			288	300	806	289	314	601

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	79	137	1	397	20	101
Volume Left	79	0	1	0	6	71
Volume Right	0	7	0	72	9	30
cSH	1104	1700	1376	1700	411	341
Volume to Capacity	0.07	0.08	0.00	0.23	0.05	0.30
Queue Length 95th (ft)	6	0	0	0	4	30
Control Delay (s)	8.5	0.0	7.6	0.0	14.2	19.9
Lane LOS	A		A		B	C
Approach Delay (s)	3.1		0.0		14.2	19.9
Approach LOS					B	C

Intersection Summary			
Average Delay	4.1		
Intersection Capacity Utilization	48.9%	ICU Level of Service	A
Analysis Period (min)	15		

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	253	1408	83	283	905	104	173	396	250	251	461
v/c Ratio	0.73	0.96	0.18	0.90	0.49	0.17	0.45	0.48	0.53	0.44	0.72
Control Delay	64.9	58.0	27.0	77.2	30.4	10.0	47.3	42.0	21.7	48.4	48.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.2	3.7
Total Delay	64.9	58.0	27.0	77.2	30.4	10.0	47.3	42.0	21.7	50.6	52.1
Queue Length 50th (ft)	98	390	37	216	195	15	118	140	71	92	164
Queue Length 95th (ft)	142	#552	83	301	238	53	206	190	157	136	208
Internal Link Dist (ft)		3175			4464			5535			143
Turn Bay Length (ft)	400		50	260		100	160		50	150	
Base Capacity (vph)	401	1468	458	413	1865	611	387	826	469	569	818
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	197	263
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.63	0.96	0.18	0.69	0.49	0.17	0.45	0.48	0.53	0.67	0.83

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5085	1538	1770	5085	1538	1770	3539	1545	3433	3377	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5085	1538	1770	5085	1538	1770	3539	1545	3433	3377	
Volume (vph)	248	1380	81	277	887	102	170	388	245	246	332	120
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	253	1408	83	283	905	104	173	396	250	251	339	122
RTOR Reduction (vph)	0	0	14	0	0	47	0	0	108	0	32	0
Lane Group Flow (vph)	253	1408	69	283	905	57	173	396	142	251	429	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			
Actuated Green, G (s)	13.1	34.7	34.7	22.4	44.0	44.0	27.2	29.0	29.0	20.9	22.7	
Effective Green, g (s)	12.1	34.7	34.7	21.4	44.0	44.0	26.2	28.0	28.0	19.9	21.7	
Actuated g/C Ratio	0.10	0.29	0.29	0.18	0.37	0.37	0.22	0.23	0.23	0.17	0.18	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	346	1470	445	316	1865	564	386	826	361	569	611	
v/s Ratio Prot	0.07	c0.28		c0.16	0.18		0.10	c0.11		0.07	c0.13	
v/s Ratio Perm			0.05			0.04			0.09			
v/c Ratio	0.73	0.96	0.16	0.90	0.49	0.10	0.45	0.48	0.39	0.44	0.70	
Uniform Delay, d1	52.4	41.9	31.8	48.2	29.3	25.0	40.6	39.7	38.8	45.0	46.1	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	6.7	15.4	0.7	25.4	0.9	0.4	3.7	0.4	0.7	2.5	3.6	
Delay (s)	59.1	57.3	32.5	73.6	30.2	25.4	44.4	40.1	39.5	47.5	49.8	
Level of Service	E	E	C	E	C	C	D	D	D	D	D	
Approach Delay (s)		56.4			39.3			40.9			49.0	
Approach LOS		E			D			D			D	

Intersection Summary			
HCM Average Control Delay	47.6	HCM Level of Service	D
HCM Volume to Capacity ratio	0.75		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	88.9%	ICU Level of Service	E
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	121	753	92	712
v/c Ratio	0.19	0.29	0.31	0.14
Control Delay	0.7	0.6	48.4	0.1
Queue Delay	0.0	0.4	0.0	0.0
Total Delay	0.7	1.0	48.4	0.1
Queue Length 50th (ft)	0	8	64	0
Queue Length 95th (ft)	0	0	117	0
Internal Link Dist (ft)		143		306
Turn Bay Length (ft)			75	
Base Capacity (vph)	631	2567	294	5046
Starvation Cap Reductn	0	1178	0	0
Spillback Cap Reductn	0	0	0	784
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.19	0.54	0.31	0.17

Intersection Summary

2: Old San Francisco & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)						4.0		4.0		4.0	4.0	
Lane Util. Factor						1.00		0.95		1.00	0.91	
Frpb, ped/bikes						1.00		0.97		1.00	1.00	
Flpb, ped/bikes						1.00		1.00		1.00	1.00	
Frt						0.86		0.95		1.00	1.00	
Flt Protected						1.00		1.00		0.95	1.00	
Satd. Flow (prot)						1611		3272		1770	5085	
Flt Permitted						1.00		1.00		0.95	1.00	
Satd. Flow (perm)						1611		3272		1770	5085	
Volume (vph)	0	0	0	0	0	119	0	492	246	90	698	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	0	121	0	502	251	92	712	0
RTOR Reduction (vph)	0	0	0	0	0	101	0	64	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	20	0	689	0	92	712	0
Confl. Peds. (#/hr)									30			
Turn Type						Over				Prot		
Protected Phases						7		8			7 1 2 3 4	
Permitted Phases								1 2				
Actuated Green, G (s)						20.9		89.1		20.9	120.0	
Effective Green, g (s)						19.9		88.1		19.9	120.0	
Actuated g/C Ratio						0.17		0.73		0.17	1.00	
Clearance Time (s)						3.0		3.0		3.0		
Vehicle Extension (s)						2.0		3.0		2.0		
Lane Grp Cap (vph)						267		2511		294	5085	
v/s Ratio Prot						0.01		c0.06		c0.05	c0.14	
v/s Ratio Perm								0.15				
v/c Ratio						0.08		0.27		0.31	0.14	
Uniform Delay, d1						42.3		5.3		44.0	0.0	
Progression Factor						1.00		0.14		1.00	1.00	
Incremental Delay, d2						0.5		0.1		2.8	0.0	
Delay (s)						42.8		0.8		46.8	0.0	
Level of Service						D		A		D	A	
Approach Delay (s)		0.0			42.8			0.8			5.4	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	6.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.27		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	4.0
Intersection Capacity Utilization	37.5%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

3: Old San Francisco & Carroll St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	46	283	8	14	93	22	6	6	5	54	7	20
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	47	289	8	14	95	22	6	6	5	55	7	20
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		290										
pX, platoon unblocked												
vC, conflicting volume	147			327			594	593	353	586	586	166
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	147			327			594	593	353	586	586	166
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			98	98	99	85	98	98
cM capacity (veh/h)	1399			1202			354	380	657	366	384	835

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	47	297	14	117	17	83
Volume Left	47	0	14	0	6	55
Volume Right	0	8	0	22	5	20
cSH	1399	1700	1202	1700	421	427
Volume to Capacity	0.03	0.17	0.01	0.07	0.04	0.19
Queue Length 95th (ft)	3	0	1	0	3	18
Control Delay (s)	7.7	0.0	8.0	0.0	13.9	15.5
Lane LOS	A		A		B	C
Approach Delay (s)	1.0		0.9		13.9	15.5
Approach LOS					B	C

Intersection Summary			
Average Delay	3.5		
Intersection Capacity Utilization	33.8%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	102	308	137	78	286	12
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	104	314	140	80	292	12

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total (vph)	104	314	219	304
Volume Left (vph)	104	0	0	292
Volume Right (vph)	0	0	80	12
Hadj (s)	0.53	0.03	-0.18	0.20
Departure Headway (s)	6.3	5.8	5.4	5.7
Degree Utilization, x	0.18	0.50	0.33	0.48
Capacity (veh/h)	550	604	632	592
Control Delay (s)	9.5	13.3	11.0	13.9
Approach Delay (s)	12.3		11.0	13.9
Approach LOS	B		B	B

Intersection Summary			
Delay	12.5		
HCM Level of Service	B		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

5: Old San Francisco & Central Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	34	501	1	5	285	27	1	0	2	20	2	27
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	35	511	1	5	291	28	1	0	2	20	2	28
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	348			542			971	970	572	957	956	365
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	348			542			971	970	572	957	956	365
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			99			99	100	100	90	99	96
cM capacity (veh/h)	1180			1001			197	233	494	210	237	647

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	35	512	5	318	3	50
Volume Left	35	0	5	0	1	20
Volume Right	0	1	0	28	2	28
cSH	1180	1700	1001	1700	329	337
Volume to Capacity	0.03	0.30	0.01	0.19	0.01	0.15
Queue Length 95th (ft)	2	0	0	0	1	13
Control Delay (s)	8.1	0.0	8.6	0.0	16.1	17.5
Lane LOS	A		A		C	C
Approach Delay (s)	0.5		0.1		16.1	17.5
Approach LOS					C	C

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	231	692	49	140	1284	118	67	431	112	84	254
v/c Ratio	0.68	0.44	0.10	0.72	0.79	0.22	0.13	0.49	0.25	0.14	0.54
Control Delay	53.8	29.0	14.4	62.4	35.2	13.2	31.0	34.3	14.5	37.1	33.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Total Delay	53.8	29.0	14.4	62.4	35.2	13.2	31.0	34.3	14.5	37.1	33.2
Queue Length 50th (ft)	74	128	9	88	271	23	30	123	20	23	61
Queue Length 95th (ft)	110	170	37	144	327	65	80	172	64	46	84
Internal Link Dist (ft)		3192			4323			4778			143
Turn Bay Length (ft)	400		50	260		100	160		50	150	
Base Capacity (vph)	446	1568	496	301	1627	538	528	885	440	588	889
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	134
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.52	0.44	0.10	0.47	0.79	0.22	0.13	0.49	0.25	0.14	0.34

Intersection Summary

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.95	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5085	1542	1770	5085	1542	1770	3539	1548	3433	3353	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5085	1542	1770	5085	1542	1770	3539	1548	3433	3353	
Volume (vph)	226	678	48	137	1258	116	66	422	110	82	172	76
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	231	692	49	140	1284	118	67	431	112	84	176	78
RTOR Reduction (vph)	0	0	20	0	0	45	0	0	53	0	59	0
Lane Group Flow (vph)	231	692	29	140	1284	73	67	431	59	84	195	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			
Actuated Green, G (s)	10.9	30.9	30.9	12.0	32.0	32.0	30.8	26.0	26.0	18.1	13.3	
Effective Green, g (s)	9.9	30.9	30.9	11.0	32.0	32.0	29.8	25.0	25.0	17.1	12.3	
Actuated g/C Ratio	0.10	0.31	0.31	0.11	0.32	0.32	0.30	0.25	0.25	0.17	0.12	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	340	1571	476	195	1627	493	527	885	387	587	412	
v/s Ratio Prot	0.07	0.14		c0.08	c0.25		0.04	c0.12		c0.02	c0.06	
v/s Ratio Perm			0.02			0.05			0.04			
v/c Ratio	0.68	0.44	0.06	0.72	0.79	0.15	0.13	0.49	0.15	0.14	0.47	
Uniform Delay, d1	43.5	27.6	24.3	43.0	30.9	24.3	25.6	32.0	29.2	35.2	40.8	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	4.2	0.9	0.2	10.0	4.0	0.6	0.5	0.4	0.2	0.5	0.9	
Delay (s)	47.7	28.5	24.6	53.0	34.9	24.9	26.1	32.4	29.4	35.7	41.7	
Level of Service	D	C	C	D	C	C	C	C	C	D	D	
Approach Delay (s)		32.9			35.8			31.2			40.2	
Approach LOS		C			D			C			D	

Intersection Summary			
HCM Average Control Delay	34.6	HCM Level of Service	C
HCM Volume to Capacity ratio	0.59		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	71.9%	ICU Level of Service	C
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	142	780	92	336
v/c Ratio	0.22	0.31	0.30	0.07
Control Delay	0.8	0.6	40.5	0.0
Queue Delay	0.0	0.3	0.0	0.0
Total Delay	0.8	1.0	40.5	0.0
Queue Length 50th (ft)	0	6	52	0
Queue Length 95th (ft)	0	0	103	0
Internal Link Dist (ft)		143		306
Turn Bay Length (ft)			75	
Base Capacity (vph)	655	2498	303	5053
Starvation Cap Reductn	0	1027	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.22	0.53	0.30	0.07

Intersection Summary

2: Old San Francisco & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)						4.0		4.0		4.0	4.0	
Lane Util. Factor						1.00		0.95		1.00	0.91	
Frpb, ped/bikes						1.00		0.97		1.00	1.00	
Flpb, ped/bikes						1.00		1.00		1.00	1.00	
Frt						0.86		0.94		1.00	1.00	
Flt Protected						1.00		1.00		0.95	1.00	
Satd. Flow (prot)						1611		3235		1770	5085	
Flt Permitted						1.00		1.00		0.95	1.00	
Satd. Flow (perm)						1611		3235		1770	5085	
Volume (vph)	0	0	0	0	0	139	0	461	304	90	329	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	0	142	0	470	310	92	336	0
RTOR Reduction (vph)	0	0	0	0	0	118	0	90	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	24	0	690	0	92	336	0
Confl. Peds. (#/hr)									30			
Turn Type						Over				Prot		
Protected Phases						7		8			7 1 2 3 4	
Permitted Phases								1 2				
Actuated Green, G (s)						18.1		71.9		18.1	100.0	
Effective Green, g (s)						17.1		70.9		17.1	100.0	
Actuated g/C Ratio						0.17		0.71		0.17	1.00	
Clearance Time (s)						3.0		3.0		3.0		
Vehicle Extension (s)						2.0		3.0		2.0		
Lane Grp Cap (vph)						275		2423		303	5085	
v/s Ratio Prot						0.02		c0.07		c0.05	0.07	
v/s Ratio Perm								0.14				
v/c Ratio						0.09		0.28		0.30	0.07	
Uniform Delay, d1						34.9		5.3		36.2	0.0	
Progression Factor						1.00		0.16		1.00	1.00	
Incremental Delay, d2						0.6		0.1		2.6	0.0	
Delay (s)						35.5		0.9		38.8	0.0	
Level of Service						D		A		D	A	
Approach Delay (s)		0.0			35.5			0.9			8.3	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	6.9	HCM Level of Service	A
HCM Volume to Capacity ratio	0.29		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	39.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

3: Old San Francisco & Carroll St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	96	301	2	13	118	23	1	1	6	10	11	20
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	98	307	2	13	120	23	1	1	6	10	11	20
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		290										
pX, platoon unblocked												
vC, conflicting volume	174			339			737	734	368	728	724	192
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	174			339			737	734	368	728	724	192
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			100	100	99	96	96	97
cM capacity (veh/h)	1368			1189			272	303	644	287	307	808

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	98	309	13	144	8	42
Volume Left	98	0	13	0	1	10
Volume Right	0	2	0	23	6	20
cSH	1368	1700	1189	1700	491	430
Volume to Capacity	0.07	0.18	0.01	0.08	0.02	0.10
Queue Length 95th (ft)	6	0	1	0	1	8
Control Delay (s)	7.8	0.0	8.1	0.0	12.5	14.3
Lane LOS	A		A		B	B
Approach Delay (s)	1.9		0.7		12.5	14.3
Approach LOS					B	B

Intersection Summary			
Average Delay	2.6		
Intersection Capacity Utilization	39.7%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	175	144	145	162	96	8
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	179	147	148	165	98	8

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total (vph)	179	147	313	106
Volume Left (vph)	179	0	0	98
Volume Right (vph)	0	0	165	8
Hadj (s)	0.53	0.03	-0.28	0.17
Departure Headway (s)	5.6	5.1	4.4	5.5
Degree Utilization, x	0.28	0.21	0.38	0.16
Capacity (veh/h)	618	685	790	598
Control Delay (s)	9.5	8.2	10.1	9.5
Approach Delay (s)	9.0		10.1	9.5
Approach LOS	A		B	A

Intersection Summary			
Delay	9.5		
HCM Level of Service	A		
Intersection Capacity Utilization	44.5%	ICU Level of Service	A
Analysis Period (min)	15		

5: Old San Francisco & Central Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	92	152	8	1	382	85	7	6	11	84	0	35
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	94	155	8	1	390	87	7	6	11	86	0	36
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	507			193			834	886	219	852	846	493
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	507			193			834	886	219	852	846	493
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	91			100			97	98	99	63	100	93
cM capacity (veh/h)	1032			1346			229	245	780	230	258	547

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	94	163	1	477	24	121
Volume Left	94	0	1	0	7	86
Volume Right	0	8	0	87	11	36
cSH	1032	1700	1346	1700	347	277
Volume to Capacity	0.09	0.10	0.00	0.28	0.07	0.44
Queue Length 95th (ft)	7	0	0	0	6	53
Control Delay (s)	8.8	0.0	7.7	0.0	16.2	27.7
Lane LOS	A		A		C	D
Approach Delay (s)	3.2		0.0		16.2	27.7
Approach LOS					C	D

Intersection Summary			
Average Delay	5.2		
Intersection Capacity Utilization	55.1%	ICU Level of Service	B
Analysis Period (min)	15		

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	304	1690	99	339	1086	124	208	476	300	301	553
v/c Ratio	0.80	1.23	0.23	0.93	0.58	0.20	0.64	0.58	0.64	0.56	0.76
Control Delay	68.8	147.6	30.0	78.7	32.1	12.3	57.1	44.0	28.7	51.6	48.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.4	44.0
Total Delay	68.8	147.6	30.0	78.7	32.1	12.3	57.1	44.0	28.7	57.0	92.1
Queue Length 50th (ft)	119	~607	49	254	246	25	155	172	112	113	195
Queue Length 95th (ft)	#178	#719	98	#401	293	68	#276	230	212	160	255
Internal Link Dist (ft)		3175			4464			5535			143
Turn Bay Length (ft)	400		50	260		100	160		50	150	
Base Capacity (vph)	401	1375	430	413	1865	611	323	826	468	538	818
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	175	304
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.76	1.23	0.23	0.82	0.58	0.20	0.64	0.58	0.64	0.83	1.08

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	0.99	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.96	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5085	1538	1770	5085	1538	1770	3539	1545	3433	3376	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5085	1538	1770	5085	1538	1770	3539	1545	3433	3376	
Volume (vph)	298	1656	97	332	1064	122	204	466	294	295	398	144
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	304	1690	99	339	1086	124	208	476	300	301	406	147
RTOR Reduction (vph)	0	0	14	0	0	47	0	0	107	0	32	0
Lane Group Flow (vph)	304	1690	85	339	1086	77	208	476	193	301	521	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			
Actuated Green, G (s)	14.2	32.5	32.5	25.7	44.0	44.0	22.9	29.0	29.0	19.8	25.9	
Effective Green, g (s)	13.2	32.5	32.5	24.7	44.0	44.0	21.9	28.0	28.0	18.8	24.9	
Actuated g/C Ratio	0.11	0.27	0.27	0.21	0.37	0.37	0.18	0.23	0.23	0.16	0.21	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	378	1377	417	364	1865	564	323	826	361	538	701	
v/s Ratio Prot	0.09	c0.33		c0.19	0.21		c0.12	0.13		0.09	c0.15	
v/s Ratio Perm			0.06			0.05			0.12			
v/c Ratio	0.80	1.23	0.20	0.93	0.58	0.14	0.64	0.58	0.53	0.56	0.74	
Uniform Delay, d1	52.1	43.8	33.8	46.8	30.6	25.3	45.4	40.7	40.3	46.8	44.6	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	11.1	108.9	1.1	29.8	1.3	0.5	9.5	1.0	1.5	4.1	4.3	
Delay (s)	63.3	152.7	34.9	76.6	31.9	25.8	55.0	41.7	41.8	50.9	48.8	
Level of Service	E	F	C	E	C	C	D	D	D	D	D	
Approach Delay (s)		134.1			41.2			44.5			49.6	
Approach LOS		F			D			D			D	

Intersection Summary			
HCM Average Control Delay	78.6	HCM Level of Service	E
HCM Volume to Capacity ratio	0.92		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	99.2%	ICU Level of Service	F
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	146	903	110	855
v/c Ratio	0.26	0.35	0.40	0.17
Control Delay	1.1	0.8	50.8	0.1
Queue Delay	0.0	0.5	0.0	0.0
Total Delay	1.1	1.3	50.8	0.1
Queue Length 50th (ft)	0	12	78	0
Queue Length 95th (ft)	0	0	137	0
Internal Link Dist (ft)		143		306
Turn Bay Length (ft)			75	
Base Capacity (vph)	563	2595	278	5031
Starvation Cap Reductn	0	1137	0	0
Spillback Cap Reductn	0	0	0	1056
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.26	0.62	0.40	0.22

Intersection Summary

2: Old San Francisco & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)						4.0		4.0		4.0	4.0	
Lane Util. Factor						1.00		0.95		1.00	0.91	
Frpb, ped/bikes						1.00		0.97		1.00	1.00	
Flpb, ped/bikes						1.00		1.00		1.00	1.00	
Frt						0.86		0.95		1.00	1.00	
Flt Protected						1.00		1.00		0.95	1.00	
Satd. Flow (prot)						1611		3272		1770	5085	
Flt Permitted						1.00		1.00		0.95	1.00	
Satd. Flow (perm)						1611		3272		1770	5085	
Volume (vph)	0	0	0	0	0	143	0	590	295	108	838	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	0	146	0	602	301	110	855	0
RTOR Reduction (vph)	0	0	0	0	0	123	0	62	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	23	0	841	0	110	855	0
Confl. Peds. (#/hr)									30			
Turn Type						Over				Prot		
Protected Phases						7		8		7	1 2 3 4	
Permitted Phases								1 2				
Actuated Green, G (s)						19.8		90.2		19.8	120.0	
Effective Green, g (s)						18.8		89.2		18.8	120.0	
Actuated g/C Ratio						0.16		0.74		0.16	1.00	
Clearance Time (s)						3.0		3.0		3.0		
Vehicle Extension (s)						2.0		3.0		2.0		
Lane Grp Cap (vph)						252		2541		277	5085	
v/s Ratio Prot						0.01		c0.08		c0.06	0.17	
v/s Ratio Perm								0.18				
v/c Ratio						0.09		0.33		0.40	0.17	
Uniform Delay, d1						43.3		5.2		45.5	0.0	
Progression Factor						1.00		0.17		1.00	1.00	
Incremental Delay, d2						0.7		0.1		4.2	0.0	
Delay (s)						44.0		0.9		49.7	0.0	
Level of Service						D		A		D	A	
Approach Delay (s)		0.0			44.0			0.9			5.7	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	6.3	HCM Level of Service	A
HCM Volume to Capacity ratio	0.34		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	42.2%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

3: Old San Francisco & Carroll St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	55	340	10	17	112	26	7	7	6	65	8	24
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	56	347	10	17	114	27	7	7	6	66	8	24
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		290										
pX, platoon unblocked												
vC, conflicting volume	171			387			702	700	412	691	692	188
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	171			387			702	700	412	691	692	188
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			98	98	99	78	98	97
cM capacity (veh/h)	1371			1142			294	326	608	306	330	812

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	56	357	17	141	20	99
Volume Left	56	0	17	0	7	66
Volume Right	0	10	0	27	6	24
cSH	1371	1700	1142	1700	363	364
Volume to Capacity	0.04	0.21	0.02	0.08	0.06	0.27
Queue Length 95th (ft)	3	0	1	0	4	27
Control Delay (s)	7.7	0.0	8.2	0.0	15.5	18.5
Lane LOS	A		A		C	C
Approach Delay (s)	1.1		0.9		15.5	18.5
Approach LOS					C	C

Intersection Summary			
Average Delay	3.9		
Intersection Capacity Utilization	44.3%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	122	370	164	94	343	14
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	124	378	167	96	350	14

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total (vph)	124	378	263	364
Volume Left (vph)	124	0	0	350
Volume Right (vph)	0	0	96	14
Hadj (s)	0.53	0.03	-0.18	0.20
Departure Headway (s)	6.7	6.2	5.8	6.1
Degree Utilization, x	0.23	0.65	0.43	0.61
Capacity (veh/h)	521	562	584	563
Control Delay (s)	10.4	18.5	13.1	18.3
Approach Delay (s)	16.5		13.1	18.3
Approach LOS	C		B	C

Intersection Summary			
Delay	16.3		
HCM Level of Service	C		
Intersection Capacity Utilization	52.0%	ICU Level of Service	A
Analysis Period (min)	15		

5: Old San Francisco & Central Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	41	601	1	6	342	32	1	0	2	24	2	32
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	42	613	1	6	349	33	1	0	2	24	2	33
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	412			644			1152	1151	674	1137	1136	425
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	412			644			1152	1151	674	1137	1136	425
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			99	100	100	84	99	95
cM capacity (veh/h)	1119			917			145	180	432	158	184	598

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	42	614	6	382	3	59
Volume Left	42	0	6	0	1	24
Volume Right	0	1	0	33	2	33
cSH	1119	1700	917	1700	260	268
Volume to Capacity	0.04	0.36	0.01	0.22	0.01	0.22
Queue Length 95th (ft)	3	0	1	0	1	21
Control Delay (s)	8.3	0.0	9.0	0.0	19.0	22.2
Lane LOS	A		A		C	C
Approach Delay (s)	0.5		0.1		19.0	22.2
Approach LOS					C	C

Intersection Summary			
Average Delay	1.6		
Intersection Capacity Utilization	51.5%	ICU Level of Service	A
Analysis Period (min)	15		

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	219	757	60	178	1624	369	92	790	182	167	281	76
v/c Ratio	0.49	0.42	0.11	0.79	0.91	0.57	0.62	0.92	0.43	0.81	0.27	0.15
Control Delay	44.6	27.0	15.3	65.6	41.1	19.0	61.4	53.6	23.9	70.5	28.6	7.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	44.6	27.0	15.3	65.6	41.1	19.0	61.4	53.6	23.9	70.5	28.6	7.4
Queue Length 50th (ft)	68	138	12	111	369	105	58	256	62	104	72	0
Queue Length 95th (ft)	105	190	44	177	#491	206	105	#363	127	#190	111	34
Internal Link Dist (ft)		3133			4378			5428			143	
Turn Bay Length (ft)	400		50	260		100	160		50			
Base Capacity (vph)	446	1792	564	301	1779	646	248	885	434	248	1035	507
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.42	0.11	0.59	0.91	0.57	0.37	0.89	0.42	0.67	0.27	0.15

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1542	1770	5085	1542	1770	3539	1548	1770	3539	1548
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1542	1770	5085	1542	1770	3539	1548	1770	3539	1548
Volume (vph)	215	742	59	174	1592	362	90	774	178	164	275	74
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	219	757	60	178	1624	369	92	790	182	167	281	76
RTOR Reduction (vph)	0	0	21	0	0	108	0	0	47	0	0	54
Lane Group Flow (vph)	219	757	39	178	1624	261	92	790	135	167	281	22
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	14.0	34.6	34.6	13.7	34.3	34.3	8.4	26.0	26.0	12.7	30.3	30.3
Effective Green, g (s)	13.0	34.6	34.6	12.7	34.3	34.3	7.4	25.0	25.0	11.7	29.3	29.3
Actuated g/C Ratio	0.13	0.35	0.35	0.13	0.34	0.34	0.07	0.25	0.25	0.12	0.29	0.29
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	446	1759	534	225	1744	529	131	885	387	207	1037	454
v/s Ratio Prot	0.06	c0.15		0.10	c0.32		0.05	c0.22		c0.09	0.08	
v/s Ratio Perm			0.03			0.17			0.09			0.01
v/c Ratio	0.49	0.43	0.07	0.79	0.93	0.49	0.70	0.89	0.35	0.81	0.27	0.05
Uniform Delay, d1	40.4	25.1	21.9	42.4	31.7	26.0	45.2	36.2	30.8	43.0	27.1	25.4
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
Incremental Delay, d2	0.3	0.8	0.3	16.0	10.4	3.3	13.0	11.3	0.5	19.1	0.1	0.0
Delay (s)	40.7	25.9	22.2	58.4	42.2	29.3	58.2	47.5	31.4	62.1	27.3	25.4
Level of Service	D	C	C	E	D	C	E	D	C	E	C	C
Approach Delay (s)		28.8			41.3			45.7			38.1	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	39.2	HCM Level of Service	D
HCM Volume to Capacity ratio	0.80		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	81.5%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	0	206	0	1044	307	0	513	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	0	0	0	210	0	1065	313	0	523	0
Pedestrians					30							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					3							
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								223				
pX, platoon unblocked	0.78	0.78		0.78	0.78	0.78				0.78		
vC, conflicting volume	1056	1619	131	1383	1775	719	523			1095		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	797	1514	131	1213	1714	368	523			847		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	56	100			100		
cM capacity (veh/h)	120	91	894	103	68	481	1039			601		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	210	710	668	131	131	131	131
Volume Left	0	0	0	0	0	0	0
Volume Right	210	0	313	0	0	0	0
cSH	481	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.44	0.42	0.39	0.08	0.08	0.08	0.08
Queue Length 95th (ft)	55	0	0	0	0	0	0
Control Delay (s)	18.2	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	18.2	0.0		0.0			
Approach LOS	C						

Intersection Summary			
Average Delay	1.8		
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

3: Old San Francisco & Carroll St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	58	246	3	15	187	37	1	1	5	25	10	18
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	59	251	3	15	191	38	1	1	5	26	10	18
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	259			284			676	690	313	675	673	270
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	259			284			676	690	313	675	673	270
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	95			99			100	100	99	92	97	97
cM capacity (veh/h)	1273			1246			306	330	692	318	337	731

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	59	254	15	229	7	54
Volume Left	59	0	15	0	1	26
Volume Right	0	3	0	38	5	18
cSH	1273	1700	1246	1700	517	399
Volume to Capacity	0.05	0.15	0.01	0.13	0.01	0.14
Queue Length 95th (ft)	4	0	1	0	1	12
Control Delay (s)	8.0	0.0	7.9	0.0	12.1	15.4
Lane LOS	A		A		B	C
Approach Delay (s)	1.5		0.5		12.1	15.4
Approach LOS					B	C

Intersection Summary			
Average Delay	2.4		
Intersection Capacity Utilization	38.2%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	133	137	229	155	96	7
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	136	140	234	158	98	7
Pedestrians			30		30	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			4.0		4.0	
Percent Blockage			3		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	422				784	343
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	422				784	343
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	88				68	99
cM capacity (veh/h)	1109				302	682

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	136	140	392	105
Volume Left	136	0	0	98
Volume Right	0	0	158	7
cSH	1109	1700	1700	314
Volume to Capacity	0.12	0.08	0.23	0.33
Queue Length 95th (ft)	10	0	0	36
Control Delay (s)	8.7	0.0	0.0	22.1
Lane LOS	A			C
Approach Delay (s)	4.3		0.0	22.1
Approach LOS				C

Intersection Summary			
Average Delay	4.5		
Intersection Capacity Utilization	45.7%	ICU Level of Service	A
Analysis Period (min)	15		

5: Old San Francisco & Central Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	102	163	9	1	499	114	6	5	10	85	0	30
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	104	166	9	1	509	116	6	5	10	87	0	31
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	656			206			981	1067	231	1017	1013	627
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	656			206			981	1067	231	1017	1013	627
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			100			97	97	99	50	100	93
cM capacity (veh/h)	908			1332			178	187	768	174	201	459

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	104	176	1	626	21	117
Volume Left	104	0	1	0	6	87
Volume Right	0	9	0	116	10	31
cSH	908	1700	1332	1700	286	208
Volume to Capacity	0.11	0.10	0.00	0.37	0.07	0.56
Queue Length 95th (ft)	10	0	0	0	6	76
Control Delay (s)	9.5	0.0	7.7	0.0	18.6	42.6
Lane LOS	A		A		C	E
Approach Delay (s)	3.5		0.0		18.6	42.6
Approach LOS					C	E

Intersection Summary			
Average Delay	6.1		
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	273	2090	106	370	1418	327	233	627	374	582	761	156
v/c Ratio	0.68	1.49	0.24	0.95	0.74	0.48	0.92	0.80	0.84	2.19	0.94	0.33
Control Delay	60.3	257.0	31.6	81.5	35.3	18.0	90.4	52.6	45.8	572.3	65.7	7.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.3	257.0	31.6	81.5	35.3	18.0	90.4	52.6	45.8	572.3	65.7	7.8
Queue Length 50th (ft)	106	~858	55	279	350	102	179	239	183	~724	305	0
Queue Length 95th (ft)	153	#954	106	#455	408	190	#324	308	#338	#945	#421	54
Internal Link Dist (ft)		3213			4392			4425			158	
Turn Bay Length (ft)	400		50	260		100	160		50			
Base Capacity (vph)	401	1403	436	413	1926	675	266	826	462	266	826	480
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.49	0.24	0.90	0.74	0.48	0.88	0.76	0.81	2.19	0.92	0.33

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	1.00	0.95	1.00
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	0.98
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (prot)	3433	5085	1538	1770	5085	1538	1770	3539	1545	1770	3539	1545
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00
Satd. Flow (perm)	3433	5085	1538	1770	5085	1538	1770	3539	1545	1770	3539	1545
Volume (vph)	268	2048	104	363	1390	320	228	614	367	570	746	153
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	273	2090	106	370	1418	327	233	627	374	582	761	156
RTOR Reduction (vph)	0	0	12	0	0	93	0	0	104	0	0	120
Lane Group Flow (vph)	273	2090	94	370	1418	234	233	627	270	582	761	36
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		Perm
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			4
Actuated Green, G (s)	15.0	33.1	33.1	27.3	45.4	45.4	18.1	27.6	27.6	19.0	28.5	28.5
Effective Green, g (s)	14.0	33.1	33.1	26.3	45.4	45.4	17.1	26.6	26.6	18.0	27.5	27.5
Actuated g/C Ratio	0.12	0.28	0.28	0.22	0.38	0.38	0.14	0.22	0.22	0.15	0.23	0.23
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	3.0
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	3.0
Lane Grp Cap (vph)	401	1403	424	388	1924	582	252	784	342	266	811	354
v/s Ratio Prot	0.08	c0.41		c0.21	0.28		0.13	0.18		c0.33	c0.22	
v/s Ratio Perm			0.06			0.15			0.18			0.02
v/c Ratio	0.68	1.49	0.22	0.95	0.74	0.40	0.92	0.80	0.79	2.19	0.94	0.10
Uniform Delay, d1	50.9	43.5	33.5	46.2	32.2	27.4	50.8	44.2	44.1	51.0	45.4	36.5
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
Incremental Delay, d2	3.8	224.2	1.2	33.4	2.6	2.1	36.3	5.7	11.8	546.8	18.1	0.1
Delay (s)	54.6	267.6	34.7	79.6	34.7	29.4	87.1	49.9	55.9	597.8	63.6	36.6
Level of Service	D	F	C	E	C	C	F	D	E	F	E	D
Approach Delay (s)		234.1			41.8			58.7			268.2	
Approach LOS		F			D			E			F	

Intersection Summary			
HCM Average Control Delay	155.9	HCM Level of Service	F
HCM Volume to Capacity ratio	1.29		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	123.6%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Volume (veh/h)	0	0	0	0	0	227	0	837	365	0	1469	0
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	0	0	0	0	0	232	0	854	372	0	1499	0
Pedestrians					30							
Lane Width (ft)					12.0							
Walking Speed (ft/s)					4.0							
Percent Blockage					3							
Right turn flare (veh)												
Median type		None			None							
Median storage veh)												
Upstream signal (ft)								238				
pX, platoon unblocked	0.83	0.83		0.83	0.83	0.83				0.83		
vC, conflicting volume	1926	2383	375	1445	2569	643	1499			884		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1911	2459	375	1335	2683	373	1499			662		
tC, single (s)	7.5	6.5	6.9	7.5	6.5	6.9	4.1			4.1		
tC, 2 stage (s)												
tF (s)	3.5	4.0	3.3	3.5	4.0	3.3	2.2			2.2		
p0 queue free %	100	100	100	100	100	54	100			100		
cM capacity (veh/h)	18	25	623	89	18	508	443			750		

Direction, Lane #	WB 1	NB 1	NB 2	SB 1	SB 2	SB 3	SB 4
Volume Total	232	569	657	375	375	375	375
Volume Left	0	0	0	0	0	0	0
Volume Right	232	0	372	0	0	0	0
cSH	508	1700	1700	1700	1700	1700	1700
Volume to Capacity	0.46	0.33	0.39	0.22	0.22	0.22	0.22
Queue Length 95th (ft)	59	0	0	0	0	0	0
Control Delay (s)	17.9	0.0	0.0	0.0	0.0	0.0	0.0
Lane LOS	C						
Approach Delay (s)	17.9	0.0		0.0			
Approach LOS	C						

Intersection Summary			
Average Delay	1.4		
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

3: Old San Francisco & Carroll St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	36	318	11	19	200	38	6	6	5	117	7	21
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	37	324	11	19	204	39	6	6	5	119	7	21
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	273			366			731	745	390	728	731	283
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			366			731	745	390	728	731	283
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	97			98			98	98	99	59	98	97
cM capacity (veh/h)	1258			1163			284	311	626	292	316	718

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	37	336	19	243	17	148
Volume Left	37	0	19	0	6	119
Volume Right	0	11	0	39	5	21
cSH	1258	1700	1163	1700	351	321
Volume to Capacity	0.03	0.20	0.02	0.14	0.05	0.46
Queue Length 95th (ft)	2	0	1	0	4	58
Control Delay (s)	7.9	0.0	8.1	0.0	15.8	25.4
Lane LOS	A		A		C	D
Approach Delay (s)	0.8		0.6		15.8	25.4
Approach LOS					C	D

Intersection Summary			
Average Delay	5.6		
Intersection Capacity Utilization	46.0%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Free	Free		Stop	
Grade		0%	0%		0%	
Volume (veh/h)	106	398	270	95	326	12
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	108	406	276	97	333	12
Pedestrians			30		30	
Lane Width (ft)			12.0		12.0	
Walking Speed (ft/s)			4.0		4.0	
Percent Blockage			3		3	
Right turn flare (veh)						
Median type					None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	402				1006	354
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	402				1006	354
tC, single (s)	4.1				6.4	6.2
tC, 2 stage (s)						
tF (s)	2.2				3.5	3.3
p0 queue free %	90				0	98
cM capacity (veh/h)	1127				230	673

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total	108	406	372	345
Volume Left	108	0	0	333
Volume Right	0	0	97	12
cSH	1127	1700	1700	235
Volume to Capacity	0.10	0.24	0.22	1.47
Queue Length 95th (ft)	8	0	0	504
Control Delay (s)	8.5	0.0	0.0	270.9
Lane LOS	A			F
Approach Delay (s)	1.8		0.0	270.9
Approach LOS				F

Intersection Summary			
Average Delay	76.6		
Intersection Capacity Utilization	55.4%	ICU Level of Service	B
Analysis Period (min)	15		

5: Old San Francisco & Central Ave

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	41	652	1	7	506	48	1	0	2	50	2	29
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	42	665	1	7	516	49	1	0	2	51	2	30
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	595			696			1371	1389	726	1366	1365	601
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	595			696			1371	1389	726	1366	1365	601
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			99	100	99	53	98	94
cM capacity (veh/h)	956			877			101	128	404	109	133	476

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	42	666	7	565	3	83
Volume Left	42	0	7	0	1	51
Volume Right	0	1	0	49	2	30
cSH	956	1700	877	1700	201	151
Volume to Capacity	0.04	0.39	0.01	0.33	0.02	0.55
Queue Length 95th (ft)	3	0	1	0	1	69
Control Delay (s)	8.9	0.0	9.1	0.0	23.1	54.3
Lane LOS	A		A		C	F
Approach Delay (s)	0.5		0.1		23.1	54.3
Approach LOS					C	F

Intersection Summary			
Average Delay	3.7		
Intersection Capacity Utilization	52.9%	ICU Level of Service	A
Analysis Period (min)	15		

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	219	757	60	178	1624	369	92	790	182	167	357
v/c Ratio	0.65	0.51	0.13	0.79	1.00	0.61	0.20	0.89	0.42	0.28	0.63
Control Delay	52.5	31.2	16.0	65.6	56.5	20.4	33.7	50.2	23.6	38.4	40.0
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5
Total Delay	52.5	31.2	16.0	65.6	56.5	20.4	33.7	50.2	23.6	38.4	40.5
Queue Length 50th (ft)	70	148	13	111	376	107	45	256	62	47	103
Queue Length 95th (ft)	105	190	44	177	#491	206	103	#363	127	82	133
Internal Link Dist (ft)		3192			4323			4778			143
Turn Bay Length (ft)	400		50	260		100	160		50	150	
Base Capacity (vph)	446	1477	471	301	1627	605	469	885	434	591	877
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	208
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.49	0.51	0.13	0.59	1.00	0.61	0.20	0.89	0.42	0.28	0.53

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5085	1542	1770	5085	1542	1770	3539	1548	3433	3410	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5085	1542	1770	5085	1542	1770	3539	1548	3433	3410	
Volume (vph)	215	742	59	174	1592	362	90	774	178	164	275	74
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	219	757	60	178	1624	369	92	790	182	167	281	76
RTOR Reduction (vph)	0	0	23	0	0	112	0	0	47	0	28	0
Lane Group Flow (vph)	219	757	37	178	1624	257	92	790	135	167	329	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			
Actuated Green, G (s)	10.8	29.1	29.1	13.7	32.0	32.0	27.5	26.0	26.0	18.2	16.7	
Effective Green, g (s)	9.8	29.1	29.1	12.7	32.0	32.0	26.5	25.0	25.0	17.2	15.7	
Actuated g/C Ratio	0.10	0.29	0.29	0.13	0.32	0.32	0.26	0.25	0.25	0.17	0.16	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	336	1480	449	225	1627	493	469	885	387	590	535	
v/s Ratio Prot	0.06	0.15		c0.10	c0.32		0.05	c0.22		0.05	c0.10	
v/s Ratio Perm			0.02			0.17			0.09			
v/c Ratio	0.65	0.51	0.08	0.79	1.00	0.52	0.20	0.89	0.35	0.28	0.62	
Uniform Delay, d1	43.5	29.5	25.8	42.4	34.0	27.8	28.5	36.2	30.8	36.0	39.3	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	3.4	1.3	0.4	16.0	21.9	3.9	0.9	11.3	0.5	1.2	2.1	
Delay (s)	46.9	30.8	26.1	58.4	55.9	31.7	29.4	47.5	31.4	37.2	41.4	
Level of Service	D	C	C	E	E	C	C	D	C	D	D	
Approach Delay (s)		33.9			52.0			43.2			40.1	
Approach LOS		C			D			D			D	

Intersection Summary			
HCM Average Control Delay	44.8	HCM Level of Service	D
HCM Volume to Capacity ratio	0.87		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	16.0
Intersection Capacity Utilization	79.4%	ICU Level of Service	D
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	210	1378	122	523
v/c Ratio	0.51	0.54	0.40	0.10
Control Delay	15.4	1.7	42.5	0.0
Queue Delay	0.0	0.9	0.0	0.0
Total Delay	15.4	2.5	42.5	0.0
Queue Length 50th (ft)	25	21	70	0
Queue Length 95th (ft)	97	m25	131	0
Internal Link Dist (ft)		143		306
Turn Bay Length (ft)			75	
Base Capacity (vph)	414	2547	305	5051
Starvation Cap Reductn	0	789	0	0
Spillback Cap Reductn	0	0	0	100
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.78	0.40	0.11

Intersection Summary
m Volume for 95th percentile queue is metered by upstream signal.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)						4.0		4.0		4.0	4.0	
Lane Util. Factor						1.00		0.95		1.00	0.91	
Frpb, ped/bikes						1.00		0.98		1.00	1.00	
Flpb, ped/bikes						1.00		1.00		1.00	1.00	
Frt						0.86		0.97		1.00	1.00	
Flt Protected						1.00		1.00		0.95	1.00	
Satd. Flow (prot)						1611		3364		1770	5085	
Flt Permitted						1.00		1.00		0.95	1.00	
Satd. Flow (perm)						1611		3364		1770	5085	
Volume (vph)	0	0	0	0	0	206	0	1044	307	120	513	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	0	210	0	1065	313	122	523	0
RTOR Reduction (vph)	0	0	0	0	0	137	0	36	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	73	0	1342	0	122	523	0
Confl. Peds. (#/hr)									30			
Turn Type						Over				Prot		
Protected Phases						7		8			7 1 2 3 4	
Permitted Phases								1 2				
Actuated Green, G (s)						18.2		71.8		18.2	100.0	
Effective Green, g (s)						17.2		70.8		17.2	100.0	
Actuated g/C Ratio						0.17		0.71		0.17	1.00	
Clearance Time (s)						3.0		3.0		3.0		
Vehicle Extension (s)						2.0		3.0		2.0		
Lane Grp Cap (vph)						277		2516		304	5085	
v/s Ratio Prot						0.05		c0.13		c0.07	c0.10	
v/s Ratio Perm								0.27				
v/c Ratio						0.26		0.53		0.40	0.10	
Uniform Delay, d1						35.9		6.8		36.8	0.0	
Progression Factor						1.00		0.26		1.00	1.00	
Incremental Delay, d2						2.3		0.1		3.9	0.0	
Delay (s)						38.2		1.9		40.7	0.0	
Level of Service						D		A		D	A	
Approach Delay (s)		0.0			38.2			1.9			7.7	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	7.0	HCM Level of Service	A
HCM Volume to Capacity ratio	0.51		
Actuated Cycle Length (s)	100.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	58.7%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	88	314	3	15	187	37	1	1	5	10	10	18
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	90	320	3	15	191	38	1	1	5	10	10	18
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		290										
pX, platoon unblocked												
vC, conflicting volume	259			353			806	821	382	806	803	270
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	259			353			806	821	382	806	803	270
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	93			99			100	100	99	96	96	97
cM capacity (veh/h)	1273			1175			244	270	632	255	276	731

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	90	323	15	229	7	39
Volume Left	90	0	15	0	1	10
Volume Right	0	3	0	38	5	18
cSH	1273	1700	1175	1700	446	380
Volume to Capacity	0.07	0.19	0.01	0.13	0.02	0.10
Queue Length 95th (ft)	6	0	1	0	1	8
Control Delay (s)	8.0	0.0	8.1	0.0	13.2	15.6
Lane LOS	A		A		B	C
Approach Delay (s)	1.7		0.5		13.2	15.6
Approach LOS					B	C

Intersection Summary			
Average Delay	2.2		
Intersection Capacity Utilization	40.3%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	153	185	229	155	82	7
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	156	189	234	158	84	7

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total (vph)	156	189	392	91
Volume Left (vph)	156	0	0	84
Volume Right (vph)	0	0	158	7
Hadj (s)	0.53	0.03	-0.21	0.17
Departure Headway (s)	5.6	5.1	4.5	5.7
Degree Utilization, x	0.24	0.27	0.49	0.14
Capacity (veh/h)	626	683	786	571
Control Delay (s)	9.2	8.8	11.6	9.6
Approach Delay (s)	9.0		11.6	9.6
Approach LOS	A		B	A

Intersection Summary			
Delay	10.3		
HCM Level of Service	B		
Intersection Capacity Utilization	46.1%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	102	211	9	1	499	114	6	5	10	80	0	30
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	104	215	9	1	509	116	6	5	10	82	0	31
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	656			254			1030	1116	280	1066	1062	627
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	656			254			1030	1116	280	1066	1062	627
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	89			100			96	97	99	49	100	93
cM capacity (veh/h)	908			1278			165	175	721	161	188	459

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	104	224	1	626	21	112
Volume Left	104	0	1	0	6	82
Volume Right	0	9	0	116	10	31
cSH	908	1700	1278	1700	266	196
Volume to Capacity	0.11	0.13	0.00	0.37	0.08	0.57
Queue Length 95th (ft)	10	0	0	0	7	78
Control Delay (s)	9.5	0.0	7.8	0.0	19.7	45.5
Lane LOS	A		A		C	E
Approach Delay (s)	3.0		0.0		19.7	45.5
Approach LOS					C	E

Intersection Summary			
Average Delay	6.0		
Intersection Capacity Utilization	63.0%	ICU Level of Service	B
Analysis Period (min)	15		

1: El Camino Real & Sunnyvale Avenue

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	273	2090	106	370	1418	327	233	627	374	582	917
v/c Ratio	0.72	1.59	0.26	0.95	0.76	0.50	0.84	0.76	0.81	1.09	1.12
Control Delay	62.6	301.6	32.0	81.5	36.6	18.3	76.1	49.7	42.6	112.2	112.5
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	168.6	194.3
Total Delay	62.6	301.6	32.0	81.5	36.6	18.3	76.1	49.7	42.6	280.8	306.8
Queue Length 50th (ft)	106	~858	55	279	350	102	179	239	183	~269	~426
Queue Length 95th (ft)	153	#954	106	#455	408	190	#324	308	#338	#383	#560
Internal Link Dist (ft)		3175			4464			5535			143
Turn Bay Length (ft)	400		50	260		100	160		50	150	
Base Capacity (vph)	401	1313	410	413	1865	658	276	826	462	534	816
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	140	229
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.68	1.59	0.26	0.90	0.76	0.50	0.84	0.76	0.81	1.48	1.56

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

1: El Camino Real & Sunnyvale Avenue

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	0.97	0.91	1.00	1.00	0.91	1.00	1.00	0.95	1.00	0.97	0.95	
Frpb, ped/bikes	1.00	1.00	0.97	1.00	1.00	0.97	1.00	1.00	0.98	1.00	1.00	
Flpb, ped/bikes	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Frt	1.00	1.00	0.85	1.00	1.00	0.85	1.00	1.00	0.85	1.00	0.97	
Flt Protected	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (prot)	3433	5085	1538	1770	5085	1538	1770	3539	1545	3433	3435	
Flt Permitted	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	1.00	0.95	1.00	
Satd. Flow (perm)	3433	5085	1538	1770	5085	1538	1770	3539	1545	3433	3435	
Volume (vph)	268	2048	104	363	1390	320	228	614	367	570	746	153
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	273	2090	106	370	1418	327	233	627	374	582	761	156
RTOR Reduction (vph)	0	0	13	0	0	94	0	0	102	0	15	0
Lane Group Flow (vph)	273	2090	93	370	1418	233	233	627	272	582	902	0
Confl. Peds. (#/hr)			10			10			10			10
Turn Type	Prot		Perm	Prot		Perm	Prot		Perm	Prot		
Protected Phases	1	6		5	2		3	8		7	4	
Permitted Phases			6			2			8			
Actuated Green, G (s)	14.3	31.0	31.0	27.3	44.0	44.0	19.7	29.0	29.0	19.7	29.0	
Effective Green, g (s)	13.3	31.0	31.0	26.3	44.0	44.0	18.7	28.0	28.0	18.7	28.0	
Actuated g/C Ratio	0.11	0.26	0.26	0.22	0.37	0.37	0.16	0.23	0.23	0.16	0.23	
Clearance Time (s)	3.0	4.0	4.0	3.0	4.0	4.0	3.0	3.0	3.0	3.0	3.0	
Vehicle Extension (s)	2.0	4.0	4.0	2.0	4.0	4.0	2.0	3.0	3.0	2.0	3.0	
Lane Grp Cap (vph)	380	1314	397	388	1865	564	276	826	361	535	802	
v/s Ratio Prot	0.08	c0.41		c0.21	0.28		0.13	c0.18		0.17	c0.26	
v/s Ratio Perm			0.06			0.15			0.18			
v/c Ratio	0.72	1.59	0.24	0.95	0.76	0.41	0.84	0.76	0.75	1.09	1.13	
Uniform Delay, d1	51.5	44.5	35.1	46.2	33.4	28.4	49.2	42.9	42.8	50.6	46.0	
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	5.3	269.4	1.4	33.4	3.0	2.2	25.8	4.0	8.6	64.4	71.7	
Delay (s)	56.9	313.9	36.5	79.6	36.3	30.6	75.1	46.9	51.4	115.0	117.7	
Level of Service	E	F	D	E	D	C	E	D	D	F	F	
Approach Delay (s)		273.6			43.0			53.6			116.7	
Approach LOS		F			D			D			F	

Intersection Summary			
HCM Average Control Delay	137.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.13		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	113.4%	ICU Level of Service	H
Analysis Period (min)	15		

c Critical Lane Group

2: Old San Francisco & Sunnyvale Avenue

Lane Group	WBR	NBT	SBL	SBT
Lane Group Flow (vph)	232	1226	153	1499
v/c Ratio	0.51	0.47	0.55	0.29
Control Delay	9.4	1.2	55.7	0.1
Queue Delay	0.0	0.5	0.0	0.1
Total Delay	9.4	1.7	55.7	0.2
Queue Length 50th (ft)	0	22	112	0
Queue Length 95th (ft)	65	0	183	0
Internal Link Dist (ft)		143		306
Turn Bay Length (ft)			75	
Base Capacity (vph)	454	2603	276	5080
Starvation Cap Reductn	0	823	0	0
Spillback Cap Reductn	0	0	0	1806
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.51	0.69	0.55	0.46

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)						4.0		4.0		4.0	4.0	
Lane Util. Factor						1.00		0.95		1.00	0.91	
Frpb, ped/bikes						1.00		0.98		1.00	1.00	
Flpb, ped/bikes						1.00		1.00		1.00	1.00	
Frt						0.86		0.95		1.00	1.00	
Flt Protected						1.00		1.00		0.95	1.00	
Satd. Flow (prot)						1611		3295		1770	5085	
Flt Permitted						1.00		1.00		0.95	1.00	
Satd. Flow (perm)						1611		3295		1770	5085	
Volume (vph)	0	0	0	0	0	227	0	837	365	150	1469	0
Peak-hour factor, PHF	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Adj. Flow (vph)	0	0	0	0	0	232	0	854	372	153	1499	0
RTOR Reduction (vph)	0	0	0	0	0	196	0	48	0	0	0	0
Lane Group Flow (vph)	0	0	0	0	0	36	0	1178	0	153	1499	0
Confl. Peds. (#/hr)									30			
Turn Type						Over				Prot		
Protected Phases						7		8		7	1 2 3 4	
Permitted Phases								1 2				
Actuated Green, G (s)						19.7		90.3		19.7	120.0	
Effective Green, g (s)						18.7		89.3		18.7	120.0	
Actuated g/C Ratio						0.16		0.74		0.16	1.00	
Clearance Time (s)						3.0		3.0		3.0		
Vehicle Extension (s)						2.0		3.0		2.0		
Lane Grp Cap (vph)						251		2562		276	5085	
v/s Ratio Prot						0.02		c0.11		c0.09	0.29	
v/s Ratio Perm								0.25				
v/c Ratio						0.14		0.46		0.55	0.29	
Uniform Delay, d1						43.7		6.0		46.8	0.0	
Progression Factor						1.00		0.20		1.00	1.00	
Incremental Delay, d2						1.2		0.1		7.8	0.0	
Delay (s)						44.9		1.3		54.6	0.0	
Level of Service						D		A		D	A	
Approach Delay (s)		0.0			44.9			1.3			5.1	
Approach LOS		A			D			A			A	

Intersection Summary			
HCM Average Control Delay	6.5	HCM Level of Service	A
HCM Volume to Capacity ratio	0.48		
Actuated Cycle Length (s)	120.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	56.4%	ICU Level of Service	B
Analysis Period (min)	15		

c Critical Lane Group

3: Old San Francisco & Carroll St

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	52	452	11	19	200	38	6	6	5	42	7	21
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	53	461	11	19	204	39	6	6	5	43	7	21
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)		290										
pX, platoon unblocked												
vC, conflicting volume	273			502			901	915	527	898	901	283
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	273			502			901	915	527	898	901	283
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			98			97	97	99	81	97	97
cM capacity (veh/h)	1258			1035			215	244	524	221	248	718

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	53	472	19	243	17	71
Volume Left	53	0	19	0	6	43
Volume Right	0	11	0	39	5	21
cSH	1258	1700	1035	1700	274	283
Volume to Capacity	0.04	0.28	0.02	0.14	0.06	0.25
Queue Length 95th (ft)	3	0	1	0	5	24
Control Delay (s)	8.0	0.0	8.5	0.0	19.0	22.0
Lane LOS	A		A		C	C
Approach Delay (s)	0.8		0.6		19.0	22.0
Approach LOS					C	C

Intersection Summary			
Average Delay	2.8		
Intersection Capacity Utilization	49.0%	ICU Level of Service	A
Analysis Period (min)	15		

4: Old San Francisco & Bayview Avenue

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Sign Control		Stop	Stop		Stop	
Volume (vph)	116	522	270	95	289	12
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	118	533	276	97	295	12

Direction, Lane #	EB 1	EB 2	WB 1	SB 1
Volume Total (vph)	118	533	372	307
Volume Left (vph)	118	0	0	295
Volume Right (vph)	0	0	97	12
Hadj (s)	0.53	0.03	-0.12	0.20
Departure Headway (s)	6.7	6.2	6.0	6.7
Degree Utilization, x	0.22	0.92	0.62	0.57
Capacity (veh/h)	520	563	573	516
Control Delay (s)	10.5	44.3	18.3	18.2
Approach Delay (s)	38.2		18.3	18.2
Approach LOS	E		C	C

Intersection Summary			
Delay	28.0		
HCM Level of Service	D		
Intersection Capacity Utilization	53.9%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Free			Free			Stop			Stop	
Grade		0%			0%			0%			0%	
Volume (veh/h)	41	776	1	7	506	48	1	0	2	38	2	29
Peak Hour Factor	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98	0.98
Hourly flow rate (vph)	42	792	1	7	516	49	1	0	2	39	2	30
Pedestrians		30			30			30			30	
Lane Width (ft)		12.0			12.0			12.0			12.0	
Walking Speed (ft/s)		4.0			4.0			4.0			4.0	
Percent Blockage		3			3			3			3	
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	595			823			1497	1516	852	1493	1492	601
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	595			823			1497	1516	852	1493	1492	601
tC, single (s)	4.1			4.1			7.1	6.5	6.2	7.1	6.5	6.2
tC, 2 stage (s)												
tF (s)	2.2			2.2			3.5	4.0	3.3	3.5	4.0	3.3
p0 queue free %	96			99			99	100	99	56	98	94
cM capacity (veh/h)	956			787			82	108	341	89	111	476

Direction, Lane #	EB 1	EB 2	WB 1	WB 2	NB 1	SB 1
Volume Total	42	793	7	565	3	70
Volume Left	42	0	7	0	1	39
Volume Right	0	1	0	49	2	30
cSH	956	1700	787	1700	166	136
Volume to Capacity	0.04	0.47	0.01	0.33	0.02	0.52
Queue Length 95th (ft)	3	0	1	0	1	62
Control Delay (s)	8.9	0.0	9.6	0.0	27.1	56.9
Lane LOS	A		A		D	F
Approach Delay (s)	0.4		0.1		27.1	56.9
Approach LOS					D	F

Intersection Summary			
Average Delay	3.1		
Intersection Capacity Utilization	58.9%	ICU Level of Service	B
Analysis Period (min)	15		