Item No. 25
Town of Atherton

CITY COUNCIL STAFF REPORT – REGULAR AGENDA

TO: **HONORABLE MAYOR AND CITY COUNCIL**
GEORGE RODERICKS, CITY MANAGER

FROM: **MICHAEL KASHIWAGI, COMMUNITY SERVICES DIRECTOR**

FROM: **MARTY HANNEMAN, CITY ENGINEER**

DATE: **SEPTEMBER 20, 2017**

SUBJECT: **AUTHORIZE STAFF TO ISSUE A REQUEST FOR PROPOSAL FOR ADDITIONAL TRAFFIC STUDY ALONG THE ALAMEDA DE LAS PULGAS CORRIDOR BETWEEN VALPARAISO AVENUE AND WOODSIDE ROAD**

RECOMMENDATION

Authorize issuance of a Request for Proposal (RFP - Attached) to prepare additional traffic study analysis along the Alameda de las Pulgas corridor between Valparaiso Avenue and Woodside Road.

BACKGROUND

The City Council has previously expressed concern regarding traffic flow and operations along the entire length of the Alameda de las Pulgas corridor through the Town. Traffic analyses along a portion of the corridor have been recently completed by Los Lomitas Elementary School, but did not focus on the entire corridor through the Town or the traffic peak hours. To assess the impacts on the corridor through the Town with the potential of a new traffic signal at the Walsh Road and Alameda de las Pulgas intersection, additional data collection and analysis should be completed.

On April 10, 2017 Parisi Transportation Consulting submitted the final study (Attached to RFP) to the Las Lomitas Elementary School District (District) regarding Los Lomitas Elementary School on Alameda de las Pulgas. The focus of the study was to analyze the traffic conditions at intersections near the school during drop-off and pick-up periods and potential improvements during peak school hours.

During the scoping process in 2016 and upon Council direction (January 2016), the Town of

Atherton requested the District provide level of service (LOS) calculations at Alameda de las Pulgas intersections of Walsh Road and Atherton Avenue (existing and future), traffic signal warrant analysis at Alameda de las Pulgas and Atherton Avenue, roundabout analysis at Atherton Avenue, and corridor travel times on Alameda de las Pulgas (existing and future) be included. Further, the Council directed staff to incorporate whatever information was provided by the District as a result of their analysis in a future analysis to be done by the Town if needed.

ANALYSIS

The study conducted for Los Lomitas Elementary School focused only on school drop off and pick up times. The study focused on a Wednesday during the hours of 8:15 to 9:15 AM and 1:30 to 2:30 PM. The analysis concluded that a traffic signal meets Caltrans warrants No. 1 (8 hour) and No. 2 (4 hour) at Atherton Avenue and at a realigned Walsh Road/School Driveway intersection. Travel time delay for Alameda de las Pulgas were calculated at approximately one minute with the longest duration twenty minutes for the southbound direction.

The Alameda/Atherton Avenue intersection is forecast to operate at LOS "C" or better with a traffic signal or a roundabout du ng the school peak periods. The signal analysis did not assume any additional geometric changes at this intersection (e.g., new turn pockets) over what currently exists. The roundabout analysis assumed a single circulating lane within the roundabout, and single-lane approaches on both Alameda del las Puglas and Atherton Avenue. The intersection operations under both signal and roundabout control would provide a reduction in vehicular delay. The feasibility of constructing a roundabout at the intersection was not included in the study.

The District declined to expand their scope of work to incorporate the Town's requirements. The Town did not financially contribute to the District's study. The District released the final study to the Town in May 2017. As noted, the focus of the data is during drop-off and pick-up periods for the school. If the Town moves forward with the additional study contemplated by the attached RFP, the District Study will inform the Town's study.

Additional study of this corridor would provide the Town a comprehensive picture of the potential impacts and improvements needed along the Alameda de las Pulgas segment. Included would be queue analysis to determine potential for by-pass traffic using adjacent streets; determination of existing and future level of service at Alameda de las Pulgas and Atherton Avenue with an all-way stop, traffic signal, and roundabout; existing and future corridor travel times between Valparaiso Avenue and Woodside Road; and preliminary cost estimates for a traffic signal and roundabout at Alameda de las Pulgas and Atherton Avenue,

POLICY FOCUS

The project is consistent with the primary goal of advancing projects that promotes increased safety and levels of non-motorized activity throughout the Town.

FISCAL IMPACT

If approved by City Council, staff estimates this additional traffic study scope of work to cost approximately $20,000 with funding available in the approved FY2017/18 Capital Improvement Program (CIP) Traffic Safety Improvement Program - project No. 56064.

The data gathered by the District's study will inform the Town's study.

PUBLIC NOTICE

Public notification was achieved by posting the agenda, with this agenda item being listed, at least 72 hours prior to the meeting in print and electronically. Information about the project is also disseminated via the Town's electronic News Flash and Atherton Online. There are approximately 1,200 subscribers to the Town's electronic News Flash publications. Subscribers include residents as well as stakeholders – to include, but be not limited to, media outlets, school districts, Menlo Park Fire District, service provides (water, power, and sewer), and regional elected officials.

ATTACHMENT

- RFP for Traffic Study for the Alameda de las Pulgas Corridor

TOWN OF ATHERTON

Request for Proposals

For

Alameda de las Pulgas Corridor Traffic Study

City Clerk
91 Ashfield Road
Atherton, CA 94027

Proposals due by 11:00 am on Thursday October 26, 2017

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I. Overview

The Town of Atherton intends to retain a qualified professional engineering Consultant to provide transportation/traffic engineering services required to analyze the traffic on Alameda de las Pulgas (ADLP) corridor between Valparaiso Avenue and Woodside Road.

The study will focus on the ADLP corridor with a focus on queue analysis to determine potential for by-pass traffic using adjacent streets; determination of existing and future level of service at ADLP and Atherton Avenue with an all-way stop, traffic signal, and roundabout; existing and future corridor travel times between Valparaiso Avenue and Woodside Road; and preliminary cost estimates for a traffic signal and roundabout at ADLP and Atherton Avenue.

II. Background

The City Council has previously expressed concern regarding traffic flow and operations along the entire length of the ADLP corridor through the Town. Traffic analyses along a portion of the corridor have been completed by Los Lomitas Elementary School, but did not focus on the entire corridor through the Town. To assess the impacts on the corridor through the Town with the potential of a new traffic signal at the Walsh Road and ADLP intersection, additional data and analysis should be completed.

On April 10, 2017 Parisi Transportation Consulting submitted the final study (Attached) to the Las Lomitas Elementary School District (District) regarding Los Lomitas Elementary School on ADLP. The focus of the study was to analyze the traffic conditions at intersections near the school during drop-off and pick-up periods and potential improvements.

During the scoping process, the Town of Atherton requested the District provide level of service (LOS) calculations at ADLP intersections of Walsh Road and Atherton Avenue (existing and future), traffic signal warrant analysis at ADLP and Atherton Avenue, roundabout analysis at Atherton Avenue, and corridor travel times on ADLP(existing and future) be included.

The study conducted for Los Lomitas Elementary School focused on school drop off and pick up times. The study focused on a Wednesday during the hours of 8:15 to 9:15 AM and 1:30 to 2:30 PM. The analysis concluded that a traffic signal meets Caltrans MUTCD warrants No.1 (8 hour) and No. 2 (4 hour) at Atherton Avenue and at a realigned Walsh Road/School Driveway intersection. Travel time delay for ADLP were calculated at approximately one minute with the longest duration twenty minutes for the southbound direction.

The Alameda / Atherton Avenue intersection is forecast to operate at LOS “C” or better with a traffic signal or a roundabout during the school peak periods. The signal analysis did not assume any additional geometric changes at this intersection (e.g., new turn pockets) over what currently exists. The roundabout analysis assumed a single circulating lane within the roundabout, and single-lane approaches on both ADLP and Atherton Avenue. The intersection operations under both signal and roundabout control would provide

a reduction in vehicular delay.

III. Scope of Work

Reporting to and directed by the City Engineer, or his designee, the Consultant will be responsible for completing the study on the agreed upon schedule. Key Elements/Responsibilities include but are not limited to:

Project Management and Meetings

The Consultant shall attend a kickoff meeting with Town staff. The purpose of the meeting will be to finalize the scope of work and schedule, and to discuss any issues to be clarified prior to the start of work. Another meeting via conference call, will be held to discuss draft final report findings. The Consultant shall prepare agendas for the meetings, conduct the meetings and distribute minutes of the meetings.

Review/Collect Existing Conditions, Background Studies and Documentation

The Consultant shall perform field reviews and necessary traffic data collection at the project locations identified and develop any other roadway information necessary to complete the study. The Consultant shall work with the Town and public agencies as needed to obtain any existing studies and information related to the study.

The information shall be utilized by the Consultant to develop the study. It is noted that the Town does not have existing topographic information or base maps available, but does have limited utility, ROW, signing/striping and other various GIS layers.

The Consultant shall:

- Collect traffic counts during the 7 to 9 AM and 4 to 6 PM periods on either a Tuesday, Wednesday or Thursday with school in session at the approaches of ALDP and: Woodside Road, Stockbridge Ave, Atherton Ave., Walsh Rd., Camino al Lago, and Valparaiso Ave.
- Queue analysis at the study intersections, specifically a review of potential for by-pass traffic using adjacent streets.
- Calculate existing and future intersection LOS at ADLP and Atherton Avenue with an all-way stop, traffic signal and roundabout.
- Provide existing and future corridor travel times between Valparaiso Avenue to Woodside Road.
- Provide preliminary cost estimates for a traffic signal and roundabout at ADLP and Atherton Ave.

The final study shall be submitted in an editable electronic format (AutoCAD, Word, Excel, etc.) as well as hard copies with engineering signatures.

IV. Submittal and Review Process

1. Questions regarding the RFP shall be submitted in writing to Marty Hanneman, City Engineer, at mhanneman@ci.atherton.ca.us. Questions and responses will be posted on the Atherton Town website.
2. Late submittals will not be accepted.
3. Format and Delivery: Proposals should be short and concise. Proposals should not be more than 20 two sided pages in length. Submit three (3) letter-sized copies with one (1) unbound copy of the technical proposal to:

   City Clerk
   Town of Atherton
   91 Ashfield Road
   Atherton, CA 94027

   and e-mail a PDF copy to Marty Hanneman at mhanneman@ci.atherton.ca.us.

4. Submittals will not be returned.
5. One (1) copy of the **cost proposal** shall be submitted in a separate sealed envelope at the same time as the submittal of the technical proposal. The Town expects compensation to be on a time and materials basis with a not-to-exceed limit.
6. The Town reserves the right to accept or reject any or all proposals, or to alter the selection process in any lawful way, to postpone the selection process for its own convenience at any time, and to waive any non-substantive defects in this RFP or the proposals.
7. The Town reserves the right to negotiate with other qualified persons or firms, or to solicit additional statements of qualifications at any point in the project should it fail to negotiate a reasonable fee with the initially selected person or firm or should that firm fail to execute an Agreement with the Town.

V. Proposed Timeline

October 5, 2017	RFP available on Town of Atherton website
October 13, 2017, 11 am	Submission deadline for written questions
October 20, 2017	Responses to written questions available on Town website only
October 26, 2017, 11 am	**Technical Proposal and Cost Proposals due**
Week of October 30, 2017	Interviews with highest ranked proposers, if necessary
November 15, 2017	Recommendation for Award to City Council

VI. Proposal Content

The proposal letter should include the following:

1. FIRM OR PERSON INTRODUCTION: including information such as form of organization, length of time in business, office location(s), number of staff and a general summary of qualifications documenting the strengths of the firm or person, areas of expertise and licensing. Include name, email address and phone number for the firm's contact person.
2. APPROACH: the person or firm's project management practices, methodologies and processes.
3. PROJECT EXPERIENCE: listing specific experience that is related to the type of service required. Project experience should list the type of work provided with the client contact information for each project. If Sub-Consultants are proposed, include information on joint work, if any, and their roles in those projects.
4. WORK PLAN: detailed work plans with estimated hours by task by job title for the project.
5. KEY STAFF: including the identification of the Principal-in-Charge and key staff. This section should identify the qualifications and related experience of key staff assigned to the project; and include their resume showing experience in transportation/traffic studies. Include an organizational chart for this project.
6. REFERENCES: Provide client references, for all similar projects in the past five (5) years, that have working experience with the project team and companies proposed for assignment to this project. Furnish the name, title, address and telephone number of the person(s) at the client reference who is most knowledgeable about the work performed and can comment on the professional qualifications/expertise of the staff.
7. LITIGATION: a list of any current litigation to which the firm or person are parties by virtue of their professional service, in addition to a list of any such litigation from the past ten years.
8. DISCLOSURE: of any past, ongoing, or potential conflicts of interest that the firm or person may have as a result of performing the anticipated work.
9. PROPOSED CONSULTING SERVICES AGREEMENT: The Consultant may include a proposed agreement of their own in the proposal. The agreement must have been approved by another public agency in California within the last two years. The Town reserves the right to accept or reject any proposed agreement language, or to propose its own form of Agreement.
10. PROFESSIONAL FEES: Include standard hourly fees and charges. **One (1) copy of the cost proposal shall be submitted in a separate sealed envelope at the same time as submittal of the technical proposal.**

VII. Evaluation Criteria

The Project Manager is expected to be a key component of the proposal. The Project Manager will be the key point of contact with City staff and will be expected to drive the project to meet schedule and budgetary goals. The Project Manager would ideally satisfy the following criteria:

- At least 10-years' experience in transportation/traffic engineering studies.
- Knowledge of the local area's traffic issues.
- Substantial experience managing public projects

Proposals will be evaluated based on the following criteria:

Project Manager's Technical Experience - 30%
Understanding of Project Issues – 30%
Quality of Proposed Work Plan – 30%
Quality of References – 10%

Attachment: Parisi Transportation Consulting final study dated April 10, 2017

Memo

To: Eric Holm, Las Lomitas Elementary School District
From: Andrew Lee, PE, TE
CC: David Parisi, PE, TE
Date: Final Draft, April 10, 2017
Subject: Las Lomitas Elementary School Traffic Analysis

1. INTRODUCTION

This study provides an analysis of proposed traffic improvements at Las Lomitas Elementary School, which is located on Alameda de Las Pulgas in the Town of Atherton, San Mateo County, California. The Las Lomitas Elementary School Transportation Study prepared by Parisi Transportation Consulting (Dec. 2015) analyzed the traffic conditions at intersections near the school during school drop-off and pick-up periods. That study found that the existing arrangement of the drop-off and pick-up area, and school-related traffic demand, results in vehicular delay, congestion, and conflict between vehicles and pedestrians.

Based on the findings of the study, the Las Lomitas Elementary School District (District) proposed improvements that would reconfigure the school access, in addition to other Master Plan improvements.

The Town of Atherton is also considering improvements to the Alameda del las Pulgas / Atherton Avenue intersection. The Town requested the District analyze those improvements as part of this analysis.

This study assesses the potential traffic impacts of the proposed improvements in the following ways:

1. Analysis of existing and projected future intersection operations (Level of Service)
2. Analysis of whether traffic signals may be warranted, per the California Manual on Uniform Traffic Control Devices (CA MUTCD)
3. Estimates of the existing and projected future corridor travel time.

2. EXISTING LEVEL OF SERVICE

Traffic counts were collected in May 2014 and May 2015 at Alameda de las Pulgas's intersections with Atherton Avenue, Walsh Road, the Las Lomitas school driveway, Camino al Lago, Mills Avenue and Camino a los Cerros. Counts were collected on a typical Wednesday during the half hour before and after the morning and afternoon bells, respectively.

Table 1 presents the estimated vehicular delay and level of service (LOS) under existing conditions. An overview of intersection delay and level of service is provided in Appendix A.

Table 1 Existing Conditions Level of Service, Wednesday Conditions

		AM School Peak Hour (8:15-9:15 AM)		PM School Peak Hour (1:30-2:30 PM)	
Intersection	**Control**	**Delay (s)**	**LOS**	**Delay (s)**	**LOS**
Alameda / Atherton Avenue	4-Way Stop	30.5	D	21.6	C
Alameda / Walsh Road	1-Way Stop	21.2	C	24.6	C
Alameda / Las Lomitas Driveway	1-Way Stop	33.0	D	20.9	C
Alameda / Camino al Lago	2-Way Stop	**50.9**	**F**	**59.3**	**F**
Alameda / Mills Avenue	2-Way Stop	44.4	E	22.1	C
Alameda / Camino a los Cerros	2-Way Stop	26.9	D	25.2	D

The Town of Atherton's General Plan does not present a delay or Level of Service threshold for intersection operations. However, LOS "E" is generally considered the threshold of capacity for roadway facilities (Appendix A). One intersection, Alameda de las Pulgas / Camino al Lago, exceeds LOS "E" during both school AM and PM peak hours. Alameda de las Pulgas / Mills Avenue is estimated to operate at LOS "E" during the AM peak hour, although the number of affected vehicles at the minor street approach is less than 15 vehicles per hour. The other four intersections in the study corridor operate at LOS "D" or better. The intersection delay worksheets are provided in Appendix B1.

3. PROPOSED IMPROVEMENTS

Student drop-off and pick-up currently occur in the school's side parking lot accessed via Camino al Lago. This intersection operates at LOS "F" and experiences extensive congestion and conflict between vehicular traffic and pedestrians (Table 1). School bus drop-off and pick-up currently occur in the main school parking lot fronting Alameda de las Pulgas. School buses enter the parking lot via Camino al Lago and exit via the school driveway onto Alameda de las Pulgas. The school driveway intersection is currently configured as "T" intersection approximately 80 feet south of Walsh Road.

As part of other campus Master Plan improvements, the District proposes to reconfigure the Las Lomitas school driveway to form a four-way intersection with Walsh Road / Alameda de las Pulgas. With the proposed improvements, student drop-off and pick-up would occur in the enlarged parking lot accessed from Alameda de las Pulgas via the new driveway. School bus loading would occur from the side parking lot on Camino al Lago. The proposed school improvements are illustrated in Figure 1.

The District proposes to install a new crosswalk at its proposed realignment driveway intersection. Parents and students walking to school would be directed to cross at the new intersection, rather than at the existing Alameda de las Puglas midblock pedestrian signal or other existing crosswalks. The school drop-off and pick-up vehicular traffic exiting the parking lot, which travels predominantly in the southbound direction, would use the signal time provided to the pedestrians crossing Alameda de las Pulgas to turn left out of the school parking lot. The following section analyzes the realigned Alameda / Walsh / Las Lomitas driveway intersection with stop sign control at the minor-approach and a traffic signal. A roundabout was not analyzed at this location given the limited public right of way on Alameda de las Pulgas.

As part of its own independent transportation planning, the Town of Atherton requested a study on the potential improvement from changing the existing four-way stop control at the Alameda de las Puglas / Atherton Avenue intersection to traffic signal control or roundabout control.

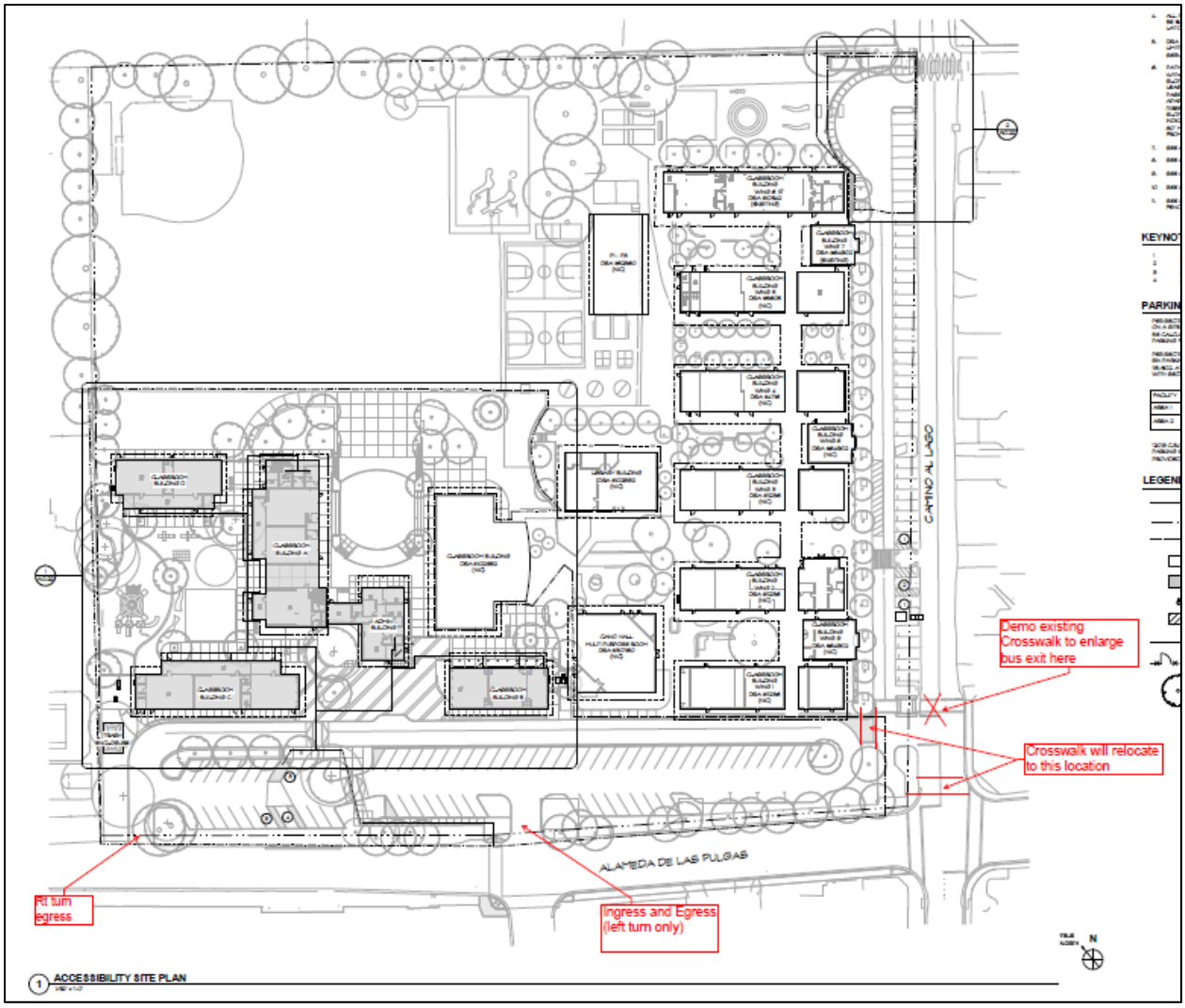


Figure 1 Proposed Campus Master Plan Improvements
Source: Las Lomitas Elementary School District, March 29, 2017

4. FUTURE LEVEL OF SERVICE

Table 2 presents the forecast intersection operations with the proposed improvements described in the previous section.

Table 2 Future Conditions Level of Service, Wednesday Conditions

Intersection	Control	AM School Peak Hour (8:15-9:15 AM)		PM School Peak Hour (1:30-2:30 PM)	
		Delay (s)	LOS	Delay (s)	LOS
Alameda / Atherton Avenue	4-Way Stop	30.4	D	21.6	C
	Signal	14.7	B	17.1	B
	Roundabout	15.8	C	10.7	B
Alameda / Walsh Road/ Las Lomitas ES Driveway (new)	2-Way Stop	**>120**	**F**	**>120**	**F**
	Signal	26.2	C	24.2	C
Alameda / Camino al Lago	2-Way Stop	26.6	D	20.6	C
Alameda / Mills Avenue	2-Way Stop	**44.4**	**E**	22.1	C
Alameda / Camino a los Cerros	2-Way Stop	26.9	D	25.2	D

1. *School driveway / Alameda operations.*
2. *Affected vehicles at the minor-street approach are less than 20 vehicles per hour.*

The Alameda / Atherton Avenue intersection is forecast to operate at LOS "C" or better with a traffic signal or a roundabout. The signal analysis did not assume any additional geometric changes at this intersection (e.g., new turn pockets) over what currently exists. The roundabout analysis assumed a single circulating lane within the roundabout, and single-lane approaches on both Alameda del las Puglas and Atherton Avenue. The intersection operations under both signal and roundabout control would provide a reduction in vehicular delay, with comparable operations in the AM school peak hour, and better operations with roundabout control during the PM school peak hour.

The Alameda / Las Lomitas driveway intersection is forecast to operate at level of service "F" with two-way stop control during peak school commute hours. The realigned intersection is forecast to operate at LOS "C" or better with a traffic signal operating with east-west split phasing.

The Alameda de las Pulgas / Camino al Lago intersection is forecast to experience a reduction in vehicular traffic delay, from an existing LOS "F" to LOS "D" or better; this is due to the diversion of parent vehicular drop-off and pick-up traffic to the new two-way school driveway. Alameda

de las Pulgas's intersections with Mills Avenue and Camino a los Cerros are expected to maintain their existing level of service.

The level of service worksheets and signal timing diagrams are presented in Appendix B2.

5. TRAFFIC SIGNAL WARRANTS

The California Manual on Uniform Traffic Control Devices (CA MUTCD) contains standards for when a traffic signal could potentially be an appropriate improvement; these are also known as "signal warrants". The signal warrants take into account the volume of intersecting traffic, crossing pedestrians, whether a location is near a school, and other factors.

Table 3 presents a summary of whether each intersection meets signal warrants. A summary of signal warrants is provided in Appendix C, including the worksheets for each warrant.

Table 3 Future Conditions Signal Warrants

Intersection	Signal Warrant Satisfied?
Alameda / Atherton Avenue	Yes – meets Warrant 1 (8 Hour)
Alameda / Walsh Road / Las Lomitas Driveway	Yes - Walsh Road approach meets Warrant 1 (8 Hour) & Warrant 2 (4-Hour) Yes - Las Lomitas Driveway approach meets Warrant 3 (Peak Hour) & Warrant 4 (Pedestrian Peak Hour)

The Alameda de las Pulgas intersection with Atherton Avenue currently services traffic volumes that satisfy CA MUTCD signal warrant standards across an eight-hour period of an average day (Appendix C, Warrant 1). Meeting the signal warrant indicates that the intersection handles a consistently high amount for traffic throughout the day, enough to justify a traffic signal.

The realigned school driveway / Walsh Road / Alameda intersection satisfies CA MUTCD signal warrants based on traffic counted from both minor approaches. The Walsh Road approach services traffic volumes that meet the eight-hour and four-hour warrants (Warrant 1 and 2). Like the Alameda / Atherton Avenue intersection, Walsh Road handles a consistently high amount for traffic throughout the day, enough to justify a traffic signal.

The school driveway is forecast to meet the peak hour warrant (Warrant 3) and peak hour pedestrian warrant (Warrant 4), meaning that it attracts and/or discharges a sufficiently large number of vehicles and pedestrians in a single hour to justify a traffic signal.

The CA MUTCD notes that "satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal."[1] The CA MUTCD also recommends that on local

[1] CA MUTCD 2014 Ed., p. 827

streets and highways, "the engineering study should include consideration of a roundabout (yield control). If a roundabout is determined to provide a viable and practical solution, it should be studied in lieu of, in addition to a traffic control signal."

The detailed signal warrant analysis is provided in Appendix D.

6. EXISTING AND FUTURE CORRIDOR TRAVEL TIMES

Vehicular travel times were measured along Alameda de las Pulgas, between Monterey Avenue and Callado Way in May 2016. Travel time samples were collected on a typical Tuesday and Wednesday during school drop-off and pick-up periods. The sampled travel times were used to calibrate an existing conditions model using SimTraffic traffic software. The calibration standard applied was a model travel time to within 20 percent of the observed average travel speed. The model calibration results are presented in Table 4, and the travel time worksheets are presented in Appendix E.

Table 4 Corridor Travel Time Calibration Summary

	AM School Drop-Period		PM School Pick-up Period	
	NB	SB	NB	SB
Monterey Avenue to Callado Way				
Surveyed Average Travel Time (s)	58	72	57	53
Modeled Average Travel Time (s)	65.6	73.1	62.7	60.5
% Variation	13%	2%	10%	14%

Upon developing a calibrated existing condition model from Monterey Avenue to Callado Way, the model extents were expanded to encompass Polhemus Avenue to capture the effects of the existing all-way-stop control at the Alameda de las Puglas / Atherton Avenue intersection.

Two future scenario models were developed based on the calibrated existing conditions model. Both scenarios reflect the proposed Las Lomitas Elementary School Master Plan improvements (Section 3: Proposed Improvements). Scenario 1 model analyzes a traffic signal at the Alameda de las Puglas / Atherton Avenue intersection, whereas the Scenario 2 model analyzes a single lane roundabout at the same intersection. Table 5 presents the modeled runtime of the expanded existing conditions model against the future scenario models.

Table 5 Existing and Future Corridor Travel Time Model Results, Monterey Avenue to Polhemus Avenue

Scenario	AM School Peak		PM School Peak	
	NB	SB	NB	SB
Existing Model Travel Time (s)	120.5	132.4	119.9	115.2
Scenario 1 Model Travel Time (s)	123.0	125.4	122.9	119.1
Scenario 2 Model Travel Time (s)	121.4	125.8	121.6	118.1

Scenario 1: Signal at Alameda de las Pulgas / Atherton Avenue + Las Lomitas Master Plan Improvements

Scenario 2: Roundabout at Alameda de las Pulgas / Atherton Avenue + Las Lomitas Master Plan Improvements

Under existing conditions, the estimated travel time along Alameda de las Pulgas between Monterey Avenue and Polhemus Avenue is approximately two minutes, inclusive of stop delay at Atherton Avenue and signal delay at the midblock traffic signal. The southbound direction experiences the most delay during the AM school peak at 132 seconds. The corridor runtimes under both future scenarios are forecasted to increase slightly (<5 seconds), although there is a projected improvement in the southbound direction of approximately seven seconds during the AM peak hour.

As previously observed in Section 4, the Alameda de las Pulgas / Atherton Avenue intersection will operate more efficiently with either a traffic signal or roundabout, compared to the existing all-way-stop control (Table 2).

At the Alameda de las Pulgas / Walsh Road / school driveway intersection, creating a signalized pedestrian crossing would greatly reduce the vehicular delay for vehicles turning out of the school drop-off / pickup zone (Table 2, LOS “F” to LOS “C”). The marginal increase in travel time along the corridor (<5 seconds) would be offset in improved pedestrian and vehicular safety. Parents and students walking to and from school would be provided a controlled crossing closer to the Las Lomitas campus. School drop-off and pick-up traffic would be afforded signal protection onto Alameda de las Pulgas, rather than trying to find a gap under the existing minor-street stop control.

7. CONCLUSIONS

The Alameda de las Pulgas / Atherton Avenue intersection handles vehicular traffic volumes that justify a traffic signal or roundabout based on CA MUTCD signal warrant criteria. The intersection is forecast to operate at LOS "C" or better with change from all-way stop control.

The proposed new Alameda de las Puglas / Walsh Road / Las Lomitas school driveway intersection is forecast to operate at LOS "C" or better with a traffic signal. The traffic volumes at the intersection would justify a traffic signal based on CA MUTCD signal warrant criteria. The vehicular delay at this intersection is projected to decrease from a Level of Service "F" condition (>120 seconds) to LOS "C" (<30 seconds).

The signal at the Alameda de las Puglas / Walsh Road / Las Lomitas school driveway would more efficiently combine pedestrian crossings with outbound school drop-off / pick-up traffic turning left onto southbound Alameda de las Pulgas. This improvement would require deactivating the midblock pedestrian signal and directing the majority of pedestrians to cross at the new signal, rather than at the marked crosswalks at Camino al Lago and Mills Avenue. Consolidating the pedestrian crossings would alleviate the congestion occurring between Camino al Lago and Mills Avenue, and reduce the instances of pedestrian conflict with vehicular traffic.

With the combination of improvements from Atherton Avenue through Mills Avenue, the overall travel time along the Alameda de las Pulgas corridor is projected to increase by less than five seconds during the AM and PM school peak hours.

Appendix A: Intersection Level of Service Definition

Signalized intersection level of service is defined in terms of the average vehicle delay experienced by all motorists traveling through an intersection. Vehicle delay is used to quantify several intangible factors, including driver discomfort, frustration, and lost travel time. Specifically, level of service criteria are stated in terms of average delay per vehicle during a specified time period. Vehicle delay is a complex measure based on many variables, including signal phasing (i.e., progression of movements through the intersection), signal cycle length, and traffic volumes with respect to intersection capacity. Table A1 shows level of service criteria for signalized intersections.

Table A1 Level of Service Definitions for Signalized Intersections

Level of Service	Average Control Delay Per Vehicle (in Seconds)	Description
A	≤ 10	Free flow
B	>1 0 – 20	Stable flow (slight delays)
C	> 20 – 35	Stable flow (slight delays)
D	> 35 – 55	Approaching unstable flow (tolerable delay, occasionally wait through more than one signal cycle before proceeding)
E	> 55 – 80	Unstable flow (intolerable delay)
F	> 80	Forced flow (jammed)

Source: Transportation Research Board, 2000.

Unsignalized intersection level of service criteria can be further reduced into two intersection types: all-way stop-controlled and two-way stop-controlled. All-way stop-controlled intersection level of service is expressed in terms of the average vehicle delay of all of the movements, much like that of a signalized intersection. Two-way stop-controlled intersection level of service is defined in terms of the average vehicle delay of an individual movement(s). This is because the performance of a two-way stop-controlled intersection is more closely reflected in terms of its individual movements, rather than its performance overall.

With this in mind, total average vehicle delay (i.e., average delay of all movements) for a two-way stop-controlled intersection should be viewed with discretion. Table A2 shows level of service criteria for unsignalized intersections (both all-way and two-way, stop-controlled).

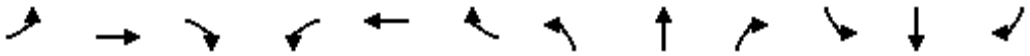
Table A2 Level of Service Definitions for Unsignalized Intersections

Level of Service	Average Control Delay Per Vehicle (in Seconds)
A	≤ 10
B	>1 0 – 15
C	> 15 – 25
D	> 25 – 35
E	> 35 – 50
F	> 50

Source: Transportation Research Board, 2000.

Appendix B: Level of Service Worksheets

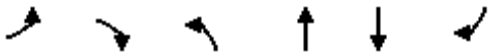
Appendix B1, Existing Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	8	2	152	12	88	14	267	103	133	537	7
Future Volume (vph)	24	8	2	152	12	88	14	267	103	133	537	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	9	2	165	13	96	15	290	112	145	584	8

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	37	178	96	15	402	145	592
Volume Left (vph)	26	165	0	15	0	145	0
Volume Right (vph)	2	0	96	0	112	0	8
Hadj (s)	0.14	0.22	-0.57	0.53	-0.16	0.53	0.02
Departure Headway (s)	7.5	6.9	3.2	6.9	6.2	6.4	5.9
Degree Utilization, x	0.08	0.34	0.09	0.03	0.69	0.26	0.97
Capacity (veh/h)	441	494	1121	516	572	547	592
Control Delay (s)	11.1	13.5	6.5	8.9	20.3	10.5	53.0
Approach Delay (s)	11.1	11.1		19.9		44.7	
Approach LOS	B	B		C		E	

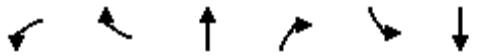
Intersection Summary				
Delay	30.5			
Level of Service	D			
Intersection Capacity Utilization	53.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	43	60	36	353	658	49
Future Volume (Veh/h)	43	60	36	353	658	49
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	47	65	39	384	715	53
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1204	742	768			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1204	742	768			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	76	84	95			
cM capacity (veh/h)	194	416	846			

Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	112	39	384	768
Volume Left	47	39	0	0
Volume Right	65	0	0	53
cSH	463	846	1700	1700
Volume to Capacity	0.24	0.05	0.23	0.45
Queue Length 95th (ft)	23	4	0	0
Control Delay (s)	21.2	9.5	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	21.2	0.9		0.0
Approach LOS	C			

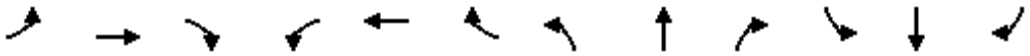
Intersection Summary			
Average Delay	2.1		
Intersection Capacity Utilization	48.0%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	106	50	340	0	0	718
Future Volume (Veh/h)	106	50	340	0	0	718
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	119	56	382	0	0	807
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1189	382			382	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1189	382			382	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	43	92			100	
cM capacity (veh/h)	208	665			1176	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	119	56	382	807
Volume Left	119	0	0	0
Volume Right	0	56	0	0
cSH	208	665	1700	1176
Volume to Capacity	0.57	0.08	0.22	0.00
Queue Length 95th (ft)	78	7	0	0
Control Delay (s)	43.3	10.9	0.0	0.0
Lane LOS	E	B		
Approach Delay (s)	33.0		0.0	0.0
Approach LOS	D			

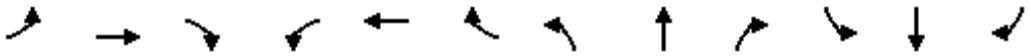
Intersection Summary			
Average Delay	4.2		
Intersection Capacity Utilization	50.3%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	8	32	0	11	3	326	203	46	772	6
Future Volume (Veh/h)	3	0	8	32	0	11	3	326	203	46	772	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	0	9	36	0	12	3	366	228	52	867	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1358	1574	870	1466	1464	480	874			594		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1358	1574	870	1466	1464	480	874			594		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	97	100	97	64	100	98	100			95		
cM capacity (veh/h)	118	104	351	99	121	586	772			982		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	48	3	594	52	874
Volume Left	3	36	3	0	52	0
Volume Right	9	12	0	228	0	7
cSH	235	125	772	1700	982	1700
Volume to Capacity	0.05	0.38	0.00	0.35	0.05	0.51
Queue Length 95th (ft)	4	40	0	0	4	0
Control Delay (s)	21.2	50.9	9.7	0.0	8.9	0.0
Lane LOS	C	F	A		A	
Approach Delay (s)	21.2	50.9	0.0		0.5	
Approach LOS	C	F				

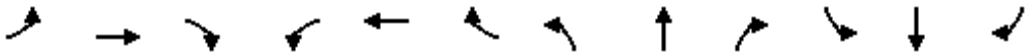
Intersection Summary				
Average Delay	2.0			
Intersection Capacity Utilization	53.4%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	4	7	2	5	4	508	1	5	805	2
Future Volume (Veh/h)	2	0	4	7	2	5	4	508	1	5	805	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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)	3	0	5	9	3	6	5	635	1	6	1006	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1672	1666	1008	1668	1666	636	1009			636		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1672	1666	1008	1668	1666	636	1009			636		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	96	100	98	88	97	99	99			99		
cM capacity (veh/h)	73	95	292	74	95	478	687			947		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	8	18	5	636	6	1009
Volume Left	3	9	5	0	6	0
Volume Right	5	6	0	1	0	3
cSH	137	109	687	1700	947	1700
Volume to Capacity	0.06	0.16	0.01	0.37	0.01	0.59
Queue Length 95th (ft)	5	14	1	0	0	0
Control Delay (s)	32.9	44.4	10.3	0.0	8.8	0.0
Lane LOS	D	E	B		A	
Approach Delay (s)	32.9	44.4	0.1		0.1	
Approach LOS	D	E				

Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	52.5%	ICU Level of Service		A
Analysis Period (min)	15			



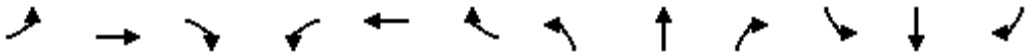
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	2	11	6	0	12	6	497	4	9	751	14
Future Volume (Veh/h)	4	2	11	6	0	12	6	497	4	9	751	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	5	2	14	7	0	15	7	614	5	11	927	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1600	1590	936	1594	1596	616	944			619		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1600	1590	936	1594	1596	616	944			619		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	94	98	96	91	100	97	99			99		
cM capacity (veh/h)	81	105	322	80	104	490	727			961		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	22	7	619	11	944
Volume Left	5	7	7	0	11	0
Volume Right	14	15	0	5	0	17
cSH	169	186	727	1700	961	1700
Volume to Capacity	0.12	0.12	0.01	0.36	0.01	0.56
Queue Length 95th (ft)	10	10	1	0	1	0
Control Delay (s)	29.2	26.9	10.0	0.0	8.8	0.0
Lane LOS	D	D	B		A	
Approach Delay (s)	29.2	26.9	0.1		0.1	
Approach LOS	D	D				

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	50.4%	ICU Level of Service		A
Analysis Period (min)	15			

HCM Unsignalized Intersection Capacity Analysis
1: Alameda Del Las Pulgas & Atherton Ave

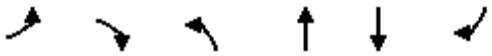
04/07/2017



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	16	28	93	18	93	23	419	83	88	359	7
Future Volume (vph)	2	16	28	93	18	93	23	419	83	88	359	7
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	2	18	31	102	20	102	25	460	91	97	395	8

Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	51	122	102	25	551	97	403
Volume Left (vph)	2	102	0	25	0	97	0
Volume Right (vph)	31	0	102	0	91	0	8
Hadj (s)	-0.32	0.20	-0.57	0.53	-0.08	0.53	0.02
Departure Headway (s)	6.6	6.8	3.2	6.3	5.7	6.3	5.8
Degree Utilization, x	0.09	0.23	0.09	0.04	0.87	0.17	0.65
Capacity (veh/h)	490	486	1121	554	626	548	595
Control Delay (s)	10.2	11.8	6.5	8.4	33.2	9.4	17.8
Approach Delay (s)	10.2	9.4		32.1		16.2	
Approach LOS	B	A		D		C	

Intersection Summary				
Delay	21.6			
Level of Service	C			
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			



Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Volume (veh/h)	45	51	52	485	450	37
Future Volume (Veh/h)	45	51	52	485	450	37
Sign Control	Stop			Free	Free	
Grade	0%			0%	0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	56	63	64	599	556	46
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)		2				
Median type				None	None	
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1306	579	602			
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1306	579	602			
tC, single (s)	6.4	6.2	4.1			
tC, 2 stage (s)						
tF (s)	3.5	3.3	2.2			
p0 queue free %	66	88	93			
cM capacity (veh/h)	165	515	975			

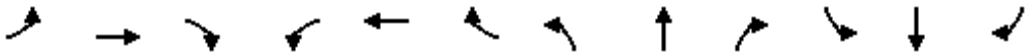
Direction, Lane #	EB 1	NB 1	NB 2	SB 1
Volume Total	119	64	599	602
Volume Left	56	64	0	0
Volume Right	63	0	0	46
cSH	350	975	1700	1700
Volume to Capacity	0.34	0.07	0.35	0.35
Queue Length 95th (ft)	37	5	0	0
Control Delay (s)	24.6	8.9	0.0	0.0
Lane LOS	C	A		
Approach Delay (s)	24.6	0.9		0.0
Approach LOS	C			

Intersection Summary			
Average Delay	2.5		
Intersection Capacity Utilization	42.6%	ICU Level of Service	A
Analysis Period (min)	15		

Movement	WBL	WBR	NBT	NBR	SBL	SBT
Lane Configurations						
Traffic Volume (veh/h)	34	13	512	0	0	497
Future Volume (Veh/h)	34	13	512	0	0	497
Sign Control	Stop		Free			Free
Grade	0%		0%			0%
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	38	15	575	0	0	558
Pedestrians						
Lane Width (ft)						
Walking Speed (ft/s)						
Percent Blockage						
Right turn flare (veh)						
Median type			None			None
Median storage veh)						
Upstream signal (ft)						
pX, platoon unblocked						
vC, conflicting volume	1133	575			575	
vC1, stage 1 conf vol						
vC2, stage 2 conf vol						
vCu, unblocked vol	1133	575			575	
tC, single (s)	6.4	6.2			4.1	
tC, 2 stage (s)						
tF (s)	3.5	3.3			2.2	
p0 queue free %	83	97			100	
cM capacity (veh/h)	224	518			998	

Direction, Lane #	WB 1	WB 2	NB 1	SB 1
Volume Total	38	15	575	558
Volume Left	38	0	0	0
Volume Right	0	15	0	0
cSH	224	518	1700	1700
Volume to Capacity	0.17	0.03	0.34	0.33
Queue Length 95th (ft)	15	2	0	0
Control Delay (s)	24.3	12.2	0.0	0.0
Lane LOS	C	B		
Approach Delay (s)	20.9		0.0	0.0
Approach LOS	C			

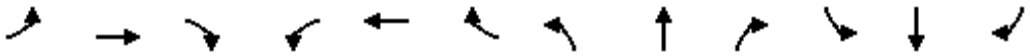
Intersection Summary			
Average Delay	0.9		
Intersection Capacity Utilization	36.9%	ICU Level of Service	A
Analysis Period (min)	15		



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	23	37	3	16	10	481	103	37	487	4
Future Volume (Veh/h)	3	1	23	37	3	16	10	481	103	37	487	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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)	4	1	29	46	4	20	13	601	129	46	609	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1352	1460	612	1422	1398	666	614			730		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1352	1460	612	1422	1398	666	614			730		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	96	99	94	54	97	96	99			95		
cM capacity (veh/h)	113	121	493	101	132	460	965			874		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	34	70	13	730	46	614
Volume Left	4	46	13	0	46	0
Volume Right	29	20	0	129	0	5
cSH	332	132	965	1700	874	1700
Volume to Capacity	0.10	0.53	0.01	0.43	0.05	0.36
Queue Length 95th (ft)	8	64	1	0	4	0
Control Delay (s)	17.1	59.3	8.8	0.0	9.3	0.0
Lane LOS	C	F	A		A	
Approach Delay (s)	17.1	59.3	0.2		0.7	
Approach LOS	C	F				

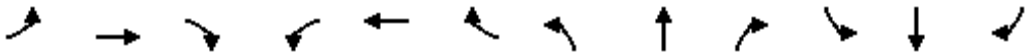
Intersection Summary				
Average Delay	3.5			
Intersection Capacity Utilization	48.1%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	12	3	0	7	10	584	10	6	538	2
Future Volume (Veh/h)	3	0	12	3	0	7	10	584	10	6	538	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	4	0	15	4	0	9	12	712	12	7	656	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1416	1419	657	1427	1414	718	658			724		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1416	1419	657	1427	1414	718	658			724		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	96	100	97	96	100	98	99			99		
cM capacity (veh/h)	111	134	465	107	135	429	930			879		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	19	13	12	724	7	658
Volume Left	4	4	12	0	7	0
Volume Right	15	9	0	12	0	2
cSH	278	223	930	1700	879	1700
Volume to Capacity	0.07	0.06	0.01	0.43	0.01	0.39
Queue Length 95th (ft)	5	5	1	0	1	0
Control Delay (s)	18.9	22.1	8.9	0.0	9.1	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	18.9	22.1	0.1		0.1	
Approach LOS	C	C				

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	41.3%	ICU Level of Service		A
Analysis Period (min)	15			

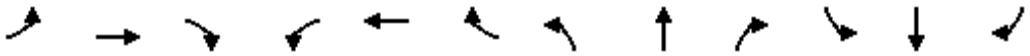


Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	11	7	1	11	9	596	14	10	531	11
Future Volume (Veh/h)	6	0	11	7	1	11	9	596	14	10	531	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	7	0	13	8	1	13	11	710	17	12	632	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1408	1412	638	1410	1410	718	645			727		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1408	1412	638	1410	1410	718	645			727		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	94	100	97	93	99	97	99			99		
cM capacity (veh/h)	110	135	476	111	135	429	940			876		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	22	11	727	12	645
Volume Left	7	8	11	0	12	0
Volume Right	13	13	0	17	0	13
cSH	220	200	940	1700	876	1700
Volume to Capacity	0.09	0.11	0.01	0.43	0.01	0.38
Queue Length 95th (ft)	7	9	1	0	1	0
Control Delay (s)	23.0	25.2	8.9	0.0	9.2	0.0
Lane LOS	C	D	A		A	
Approach Delay (s)	23.0	25.2	0.1		0.2	
Approach LOS	C	D				

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	42.2%	ICU Level of Service		A
Analysis Period (min)	15			

Appendix B2, Future Conditions



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Sign Control		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	24	8	2	152	12	88	14	267	103	133	537	7
Future Volume (vph)	24	8	2	152	12	88	14	267	103	133	537	7
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Hourly flow rate (vph)	26	9	2	165	13	96	15	290	112	145	584	8

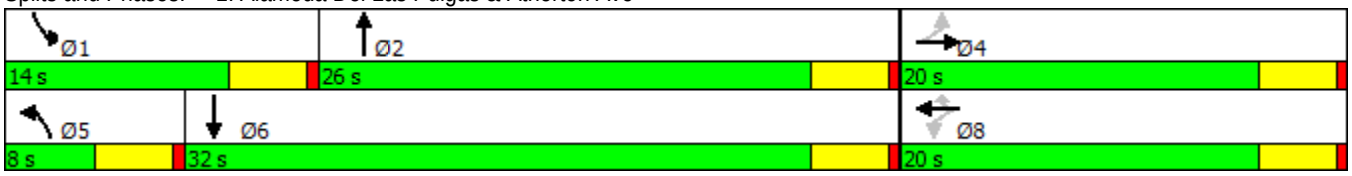
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	37	178	96	15	402	145	592
Volume Left (vph)	26	165	0	15	0	145	0
Volume Right (vph)	2	0	96	0	112	0	8
Hadj (s)	0.14	0.22	-0.57	0.53	-0.16	0.53	0.02
Departure Headway (s)	7.5	6.9	3.2	6.9	6.2	6.4	5.9
Degree Utilization, x	0.08	0.34	0.09	0.03	0.69	0.26	0.97
Capacity (veh/h)	441	494	1121	516	572	547	592
Control Delay (s)	11.1	13.5	6.5	8.9	20.3	10.5	53.0
Approach Delay (s)	11.1	11.1		19.9		44.7	
Approach LOS	B	B		C		E	

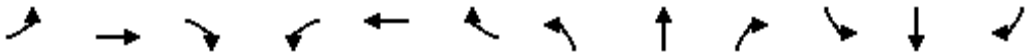
Intersection Summary				
Delay	30.5			
Level of Service	D			
Intersection Capacity Utilization	53.4%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	24	8	152	12	88	14	267	133	537
Future Volume (vph)	24	8	152	12	88	14	267	133	537
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	12.0	12.0	20.0	20.0	20.0	8.0	20.0	8.0	20.0
Total Split (s)	20.0	20.0	20.0	20.0	20.0	8.0	26.0	14.0	32.0
Total Split (%)	33.3%	33.3%	33.3%	33.3%	33.3%	13.3%	43.3%	23.3%	53.3%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)		11.2		11.5	11.5	4.4	21.4	8.8	29.8
Actuated g/C Ratio		0.24		0.25	0.25	0.10	0.46	0.19	0.65
v/c Ratio		0.11		0.54	0.19	0.09	0.47	0.43	0.49
Control Delay		16.2		24.1	1.8	26.2	15.1	24.7	9.7
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		16.2		24.1	1.8	26.2	15.1	24.7	9.7
LOS		B		C	A	C	B	C	A
Approach Delay		16.2		16.3			15.5		12.6
Approach LOS		B		B			B		B

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 46.2	
Natural Cycle: 60	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.54	
Intersection Signal Delay: 14.2	Intersection LOS: B
Intersection Capacity Utilization 53.4%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Alameda Del Las Pulgas & Atherton Ave





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	24	8	2	152	12	88	14	267	103	133	537	7
Future Volume (vph)	24	8	2	152	12	88	14	267	103	133	537	7
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	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.99			1.00	0.85	1.00	0.96		1.00	1.00	
Flt Protected		0.97			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1786			1780	1583	1770	1785		1770	1859	
Flt Permitted		0.75			0.71	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1381			1331	1583	1770	1785		1770	1859	
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	26	9	2	165	13	96	15	290	112	145	584	8
RTOR Reduction (vph)	0	2	0	0	0	78	0	21	0	0	1	0
Lane Group Flow (vph)	0	35	0	0	178	18	15	381	0	145	591	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		9.2			9.2	9.2	0.6	22.3		6.7	28.4	
Effective Green, g (s)		9.2			9.2	9.2	0.6	22.3		6.7	28.4	
Actuated g/C Ratio		0.18			0.18	0.18	0.01	0.44		0.13	0.57	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		253			243	290	21	792		236	1051	
v/s Ratio Prot							0.01	0.21		c0.08	c0.32	
v/s Ratio Perm		0.03			c0.13	0.01						
v/c Ratio		0.14			0.73	0.06	0.71	0.48		0.61	0.56	
Uniform Delay, d1		17.2			19.3	16.9	24.7	9.9		20.5	6.9	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.3			10.8	0.1	75.0	0.5		4.7	0.7	
Delay (s)		17.4			30.2	17.0	99.7	10.3		25.2	7.6	
Level of Service		B			C	B	F	B		C	A	
Approach Delay (s)		17.4			25.6			13.5			11.1	
Approach LOS		B			C			B			B	

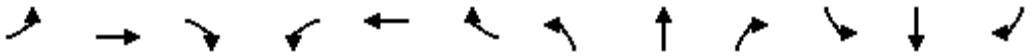
Intersection Summary			
HCM 2000 Control Delay	14.7	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	50.2	Sum of lost time (s)	12.0
Intersection Capacity Utilization	53.4%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	15.8
Intersection LOS	C

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	37	274	417	737
Demand Flow Rate, veh/h	38	279	425	752
Vehicles Circulating, veh/h	912	338	184	196
Vehicles Exiting, veh/h	36	271	766	421
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	9.3	8.7	9.3	22.4
Approach LOS	A	A	A	C

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	38	279	425	752
Cap Entry Lane, veh/h	454	806	940	929
Entry HV Adj Factor	0.969	0.981	0.982	0.980
Flow Entry, veh/h	37	274	417	737
Cap Entry, veh/h	440	791	923	911
V/C Ratio	0.084	0.346	0.452	0.810
Control Delay, s/veh	9.3	8.7	9.3	22.4
LOS	A	A	A	C
95th %tile Queue, veh	0	2	2	9



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	43	0	60	135	0	60	36	304	178	40	618	49
Future Volume (Veh/h)	43	0	60	135	0	60	36	304	178	40	618	49
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	48	0	67	152	0	67	40	342	200	45	694	55
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1300	1434	722	1340	1361	442	749			542		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1300	1434	722	1340	1361	442	749			542		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	58	100	84	0	100	89	95			96		
cM capacity (veh/h)	115	122	427	102	135	615	860			1027		

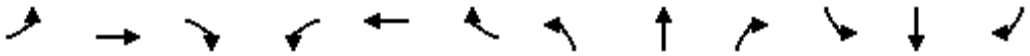
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	115	152	67	40	542	45	749
Volume Left	48	152	0	40	0	45	0
Volume Right	67	0	67	0	200	0	55
cSH	275	102	615	860	1700	1027	1700
Volume to Capacity	0.42	1.49	0.11	0.05	0.32	0.04	0.44
Queue Length 95th (ft)	49	282	9	4	0	3	0
Control Delay (s)	32.6	339.8	11.6	9.4	0.0	8.7	0.0
Lane LOS	D	F	B	A		A	
Approach Delay (s)	32.6	239.4		0.6		0.5	
Approach LOS	D	F					

Intersection Summary				
Average Delay	33.3			
Intersection Capacity Utilization	56.7%	ICU Level of Service		B
Analysis Period (min)	15			

Lane Group	EBL	EBR	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	43	60	135	0	36	304	40	618
Future Volume (vph)	43	60	135	0	36	304	40	618
Turn Type	Split	Perm	Split	NA	Prot	NA	Prot	NA
Protected Phases	4		8	8	5	2	1	6
Permitted Phases		4						
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	8.0	24.0	24.0	8.0	20.0	8.0	20.0
Total Split (s)	10.0	10.0	24.0	24.0	9.0	59.0	11.0	61.0
Total Split (%)	9.6%	9.6%	23.1%	23.1%	8.7%	56.7%	10.6%	58.7%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	Ped	Ped	None	Max	None	Max
Act Effct Green (s)	5.9	5.9	20.1	20.1	5.0	56.2	6.6	57.4
Actuated g/C Ratio	0.06	0.06	0.20	0.20	0.05	0.57	0.07	0.58
v/c Ratio	0.45	0.18	0.42	0.09	0.44	0.53	0.38	0.70
Control Delay	60.9	1.0	40.0	0.2	63.4	15.6	55.6	20.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	60.9	1.0	40.0	0.2	63.4	15.6	55.6	20.2
LOS	E	A	D	A	E	B	E	C
Approach Delay				27.9		18.9		22.2
Approach LOS				C		B		C

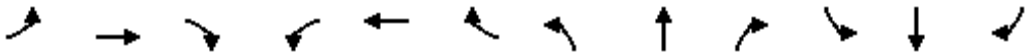
Intersection Summary	
Cycle Length: 104	
Actuated Cycle Length: 98.4	
Natural Cycle: 80	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.70	
Intersection Signal Delay: 22.1	Intersection LOS: C
Intersection Capacity Utilization 56.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Alameda Del Las Pulgas & Walsh Rd/Las Lomitas DW (new)



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	43	0	60	135	0	60	36	304	178	40	618	49
Future Volume (vph)	43	0	60	135	0	60	36	304	178	40	618	49
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	
Lane Util. Factor	1.00		0.95	1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00		0.85	1.00	0.85		1.00	0.94		1.00	0.99	
Flt Protected	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770		1504	1770	1583		1770	1760		1770	1842	
Flt Permitted	0.95		1.00	0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770		1504	1770	1583		1770	1760		1770	1842	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	48	0	67	152	0	67	40	342	200	45	694	55
RTOR Reduction (vph)	0	0	64	0	54	0	0	19	0	0	3	0
Lane Group Flow (vph)	48	0	3	152	13	0	40	523	0	45	746	0
Confl. Peds. (#/hr)	30											
Turn Type	Split		Perm	Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases			4									
Actuated Green, G (s)	4.6		4.6	20.1	20.1		2.8	56.2		4.0	57.4	
Effective Green, g (s)	4.6		4.6	20.1	20.1		2.8	56.2		4.0	57.4	
Actuated g/C Ratio	0.05		0.05	0.20	0.20		0.03	0.56		0.04	0.57	
Clearance Time (s)	4.0		4.0	4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0		3.0	3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	80		68	352	315		49	980		70	1047	
v/s Ratio Prot	c0.03			c0.09	0.01		0.02	0.30		c0.03	c0.41	
v/s Ratio Perm			0.00									
v/c Ratio	0.60		0.04	0.43	0.04		0.82	0.53		0.64	0.71	
Uniform Delay, d1	47.2		46.0	35.4	32.6		48.8	14.1		47.7	15.8	
Progression Factor	1.00		1.00	1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	11.5		0.3	0.9	0.1		64.0	2.1		18.4	4.1	
Delay (s)	58.8		46.3	36.2	32.7		112.8	16.2		66.2	19.9	
Level of Service	E		D	D	C		F	B		E	B	
Approach Delay (s)		51.5			35.2			22.8			22.5	
Approach LOS		D			D			C			C	

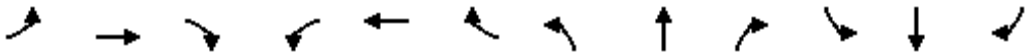
Intersection Summary			
HCM 2000 Control Delay	26.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.65		
Actuated Cycle Length (s)	100.9	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	8	7	0	11	3	504	25	6	800	6
Future Volume (Veh/h)	3	0	8	7	0	11	3	504	25	6	800	6
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	3	0	9	8	0	12	3	566	28	7	899	7
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1500	1516	902	1508	1506	580	906			594		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1500	1516	902	1508	1506	580	906			594		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	97	100	97	92	100	98	100			99		
cM capacity (veh/h)	97	118	336	96	120	514	751			982		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	12	20	3	594	7	906
Volume Left	3	8	3	0	7	0
Volume Right	9	12	0	28	0	7
cSH	208	187	751	1700	982	1700
Volume to Capacity	0.06	0.11	0.00	0.35	0.01	0.53
Queue Length 95th (ft)	5	9	0	0	1	0
Control Delay (s)	23.4	26.6	9.8	0.0	8.7	0.0
Lane LOS	C	D	A		A	
Approach Delay (s)	23.4	26.6	0.0		0.1	
Approach LOS	C	D				

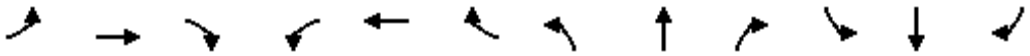
Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	52.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	2	0	4	7	2	5	4	508	1	5	805	2
Future Volume (Veh/h)	2	0	4	7	2	5	4	508	1	5	805	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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)	3	0	5	9	3	6	5	635	1	6	1006	3
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1672	1666	1008	1668	1666	636	1009			636		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1672	1666	1008	1668	1666	636	1009			636		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	96	100	98	88	97	99	99			99		
cM capacity (veh/h)	73	95	292	74	95	478	687			947		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	8	18	5	636	6	1009
Volume Left	3	9	5	0	6	0
Volume Right	5	6	0	1	0	3
cSH	137	109	687	1700	947	1700
Volume to Capacity	0.06	0.16	0.01	0.37	0.01	0.59
Queue Length 95th (ft)	5	14	1	0	0	0
Control Delay (s)	32.9	44.4	10.3	0.0	8.8	0.0
Lane LOS	D	E	B		A	
Approach Delay (s)	32.9	44.4	0.1		0.1	
Approach LOS	D	E				

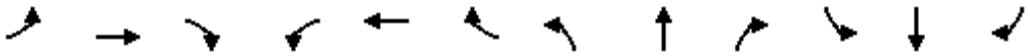
Intersection Summary				
Average Delay	0.7			
Intersection Capacity Utilization	52.5%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	4	2	11	6	0	12	6	497	4	9	751	14
Future Volume (Veh/h)	4	2	11	6	0	12	6	497	4	9	751	14
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81	0.81
Hourly flow rate (vph)	5	2	14	7	0	15	7	614	5	11	927	17
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1600	1590	936	1594	1596	616	944			619		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1600	1590	936	1594	1596	616	944			619		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	94	98	96	91	100	97	99			99		
cM capacity (veh/h)	81	105	322	80	104	490	727			961		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	21	22	7	619	11	944
Volume Left	5	7	7	0	11	0
Volume Right	14	15	0	5	0	17
cSH	169	186	727	1700	961	1700
Volume to Capacity	0.12	0.12	0.01	0.36	0.01	0.56
Queue Length 95th (ft)	10	10	1	0	1	0
Control Delay (s)	29.2	26.9	10.0	0.0	8.8	0.0
Lane LOS	D	D	B		A	
Approach Delay (s)	29.2	26.9	0.1		0.1	
Approach LOS	D	D				

Intersection Summary				
Average Delay	0.8			
Intersection Capacity Utilization	50.4%	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		Stop			Stop			Stop			Stop	
Traffic Volume (vph)	2	16	28	93	18	93	23	419	83	88	359	7
Future Volume (vph)	2	16	28	93	18	93	23	419	83	88	359	7
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Hourly flow rate (vph)	2	18	31	102	20	102	25	460	91	97	395	8

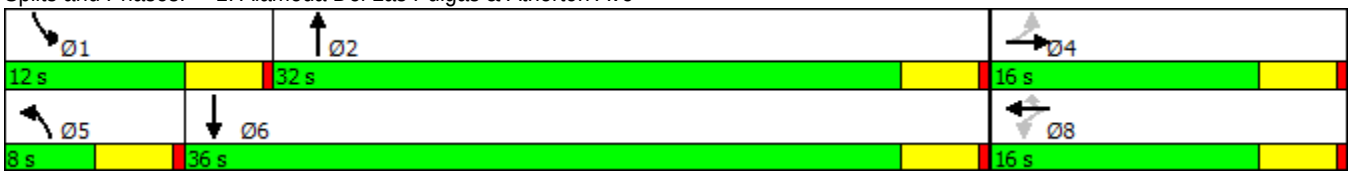
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total (vph)	51	122	102	25	551	97	403
Volume Left (vph)	2	102	0	25	0	97	0
Volume Right (vph)	31	0	102	0	91	0	8
Hadj (s)	-0.32	0.20	-0.57	0.53	-0.08	0.53	0.02
Departure Headway (s)	6.6	6.8	3.2	6.3	5.7	6.3	5.8
Degree Utilization, x	0.09	0.23	0.09	0.04	0.87	0.17	0.65
Capacity (veh/h)	490	486	1121	554	626	548	595
Control Delay (s)	10.2	11.8	6.5	8.4	33.2	9.4	17.8
Approach Delay (s)	10.2	9.4		32.1		16.2	
Approach LOS	B	A		D		C	

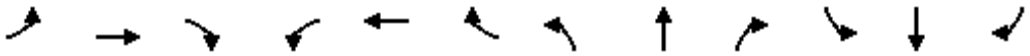
Intersection Summary				
Delay	21.6			
Level of Service	C			
Intersection Capacity Utilization	54.7%	ICU Level of Service	A	
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	WBR	NBL	NBT	SBL	SBT
Lane Configurations									
Traffic Volume (vph)	2	16	93	18	93	23	419	88	359
Future Volume (vph)	2	16	93	18	93	23	419	88	359
Turn Type	Perm	NA	Perm	NA	Perm	Prot	NA	Prot	NA
Protected Phases		4		8		5	2	1	6
Permitted Phases	4		8		8				
Detector Phase	4	4	8	8	8	5	2	1	6
Switch Phase									
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	12.0	12.0	12.0	12.0	12.0	8.0	20.0	8.0	20.0
Total Split (s)	16.0	16.0	16.0	16.0	16.0	8.0	32.0	12.0	36.0
Total Split (%)	26.7%	26.7%	26.7%	26.7%	26.7%	13.3%	53.3%	20.0%	60.0%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)		4.0		4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag						Lead	Lag	Lead	Lag
Lead-Lag Optimize?						Yes	Yes	Yes	Yes
Recall Mode	None	None	None	None	None	None	Min	None	Min
Act Effct Green (s)		9.5		9.6	9.6	4.4	25.6	7.7	30.3
Actuated g/C Ratio		0.21		0.21	0.21	0.10	0.57	0.17	0.67
v/c Ratio		0.13		0.43	0.25	0.14	0.53	0.32	0.32
Control Delay		12.2		24.3	7.1	27.3	12.6	24.5	6.3
Queue Delay		0.0		0.0	0.0	0.0	0.0	0.0	0.0
Total Delay		12.2		24.3	7.1	27.3	12.6	24.5	6.3
LOS		B		C	A	C	B	C	A
Approach Delay		12.2		16.4			13.3		9.9
Approach LOS		B		B			B		A

Intersection Summary	
Cycle Length: 60	
Actuated Cycle Length: 45.2	
Natural Cycle: 50	
Control Type: Actuated-Uncoordinated	
Maximum v/c Ratio: 0.53	
Intersection Signal Delay: 12.5	Intersection LOS: B
Intersection Capacity Utilization 54.7%	ICU Level of Service A
Analysis Period (min) 15	

Splits and Phases: 1: Alameda Del Las Pulgas & Atherton Ave





Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	2	16	28	93	18	93	23	419	83	88	359	7
Future Volume (vph)	2	16	28	93	18	93	23	419	83	88	359	7
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	
Lane Util. Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Frt		0.92			1.00	0.85	1.00	0.98		1.00	1.00	
Flt Protected		1.00			0.96	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (prot)		1707			1788	1583	1770	1817		1770	1857	
Flt Permitted		0.99			0.73	1.00	0.95	1.00		0.95	1.00	
Satd. Flow (perm)		1687			1352	1583	1770	1817		1770	1857	
Peak-hour factor, PHF	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
Adj. Flow (vph)	2	18	31	102	20	102	25	460	91	97	395	8
RTOR Reduction (vph)	0	26	0	0	0	86	0	11	0	0	1	0
Lane Group Flow (vph)	0	25	0	0	122	16	25	540	0	97	402	0
Turn Type	Perm	NA		Perm	NA	Perm	Prot	NA		Prot	NA	
Protected Phases		4			8		5	2		1	6	
Permitted Phases	4			8		8						
Actuated Green, G (s)		7.6			7.6	7.6	0.6	25.5		4.0	28.9	
Effective Green, g (s)		7.6			7.6	7.6	0.6	25.5		4.0	28.9	
Actuated g/C Ratio		0.15			0.15	0.15	0.01	0.52		0.08	0.59	
Clearance Time (s)		4.0			4.0	4.0	4.0	4.0		4.0	4.0	
Vehicle Extension (s)		3.0			3.0	3.0	3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)		261			209	245	21	943		144	1093	
v/s Ratio Prot							0.01	c0.30		c0.05	c0.22	
v/s Ratio Perm		0.01			c0.09	0.01						
v/c Ratio		0.10			0.58	0.06	1.19	0.57		0.67	0.37	
Uniform Delay, d1		17.8			19.3	17.7	24.2	8.1		21.9	5.3	
Progression Factor		1.00			1.00	1.00	1.00	1.00		1.00	1.00	
Incremental Delay, d2		0.2			4.1	0.1	261.4	0.8		11.8	0.2	
Delay (s)		18.0			23.4	17.8	285.6	8.9		33.7	5.5	
Level of Service		B			C	B	F	A		C	A	
Approach Delay (s)		18.0			20.9			20.9			11.0	
Approach LOS		B			C			C			B	

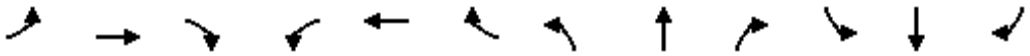
Intersection Summary			
HCM 2000 Control Delay	17.1	HCM 2000 Level of Service	B
HCM 2000 Volume to Capacity ratio	0.56		
Actuated Cycle Length (s)	49.1	Sum of lost time (s)	12.0
Intersection Capacity Utilization	54.7%	ICU Level of Service	A
Analysis Period (min)	15		

c Critical Lane Group

Intersection	
Intersection Delay, s/veh	10.7
Intersection LOS	B

Approach	EB	WB	NB	SB
Entry Lanes	1	1	1	1
Conflicting Circle Lanes	1	1	1	1
Adj Approach Flow, veh/h	51	224	576	500
Demand Flow Rate, veh/h	52	228	588	510
Vehicles Circulating, veh/h	606	496	119	149
Vehicles Exiting, veh/h	53	210	539	575
Follow-Up Headway, s	3.186	3.186	3.186	3.186
Ped Vol Crossing Leg, #/h	0	0	0	0
Ped Cap Adj	1.000	1.000	1.000	1.000
Approach Delay, s/veh	7.0	9.6	11.6	10.5
Approach LOS	A	A	B	B

Lane	Left	Left	Left	Left
Designated Moves	LTR	LTR	LTR	LTR
Assumed Moves	LTR	LTR	LTR	LTR
RT Channelized				
Lane Util	1.000	1.000	1.000	1.000
Critical Headway, s	5.193	5.193	5.193	5.193
Entry Flow, veh/h	52	228	588	510
Cap Entry Lane, veh/h	616	688	1003	974
Entry HV Adj Factor	0.974	0.981	0.979	0.981
Flow Entry, veh/h	51	224	576	500
Cap Entry, veh/h	600	675	982	955
V/C Ratio	0.084	0.331	0.586	0.524
Control Delay, s/veh	7.0	9.6	11.6	10.5
LOS	A	A	B	B
95th %tile Queue, veh	0	1	4	3



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	45	0	51	71	0	13	52	462	132	32	418	37
Future Volume (Veh/h)	45	0	51	71	0	13	52	462	132	32	418	37
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Hourly flow rate (vph)	51	0	57	80	0	15	58	519	148	36	470	42
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)			2									
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1213	1346	491	1280	1293	593	512			667		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1213	1346	491	1280	1293	593	512			667		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	64	100	90	33	100	97	94			96		
cM capacity (veh/h)	143	137	578	120	148	506	1053			923		

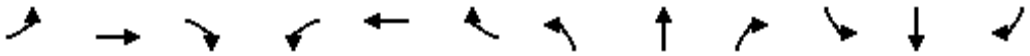
Direction, Lane #	EB 1	WB 1	WB 2	NB 1	NB 2	SB 1	SB 2
Volume Total	108	80	15	58	667	36	512
Volume Left	51	80	0	58	0	36	0
Volume Right	57	0	15	0	148	0	42
cSH	303	120	506	1053	1700	923	1700
Volume to Capacity	0.36	0.67	0.03	0.06	0.39	0.04	0.30
Queue Length 95th (ft)	39	88	2	4	0	3	0
Control Delay (s)	26.8	81.5	12.3	8.6	0.0	9.1	0.0
Lane LOS	D	F	B	A		A	
Approach Delay (s)	26.8	70.5		0.7		0.6	
Approach LOS	D	F					

Intersection Summary				
Average Delay	7.1			
Intersection Capacity Utilization	56.3%	ICU Level of Service		B
Analysis Period (min)	15			

Lane Group	EBL	EBT	WBL	WBT	NBL	NBT	SBL	SBT
Lane Configurations								
Traffic Volume (vph)	45	0	71	0	52	462	32	418
Future Volume (vph)	45	0	71	0	52	462	32	418
Turn Type	Split	NA	Split	NA	Prot	NA	Prot	NA
Protected Phases	4	4	8	8	5	2	1	6
Permitted Phases								
Detector Phase	4	4	8	8	5	2	1	6
Switch Phase								
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Minimum Split (s)	8.0	8.0	24.0	24.0	8.0	20.0	8.0	20.0
Total Split (s)	11.0	11.0	24.0	24.0	13.0	59.0	10.0	56.0
Total Split (%)	10.6%	10.6%	23.1%	23.1%	12.5%	56.7%	9.6%	53.8%
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag					Lead	Lag	Lead	Lag
Lead-Lag Optimize?					Yes	Yes	Yes	Yes
Recall Mode	None	None	Ped	Ped	None	Max	None	Max
Act Effct Green (s)	6.7	6.7	20.2	20.2	7.9	57.1	5.9	53.2
Actuated g/C Ratio	0.07	0.07	0.20	0.20	0.08	0.57	0.06	0.53
v/c Ratio	0.43	0.11	0.22	0.02	0.41	0.64	0.34	0.52
Control Delay	58.1	0.4	37.4	0.1	54.5	19.0	56.3	18.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	58.1	0.4	37.4	0.1	54.5	19.0	56.3	18.8
LOS	E	A	D	A	D	B	E	B
Approach Delay		27.6		31.5		21.9		21.3
Approach LOS		C		C		C		C

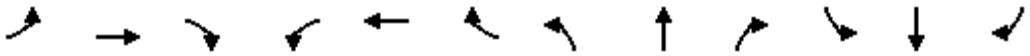
Intersection Summary	
Cycle Length: 104	
Actuated Cycle Length: 99.5	
Natural Cycle: 70	
Control Type: Semi Act-Uncoord	
Maximum v/c Ratio: 0.64	
Intersection Signal Delay: 22.7	Intersection LOS: C
Intersection Capacity Utilization 56.3%	ICU Level of Service B
Analysis Period (min) 15	

Splits and Phases: 2: Alameda Del Las Pulgas & Walsh Rd/Las Lomitas DW



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (vph)	45	0	51	71	0	13	52	462	132	32	418	37
Future Volume (vph)	45	0	51	71	0	13	52	462	132	32	418	37
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	
Lane Util. Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Flpb, ped/bikes	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Frt	1.00	0.85		1.00	0.85		1.00	0.97		1.00	0.99	
Flt Protected	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (prot)	1770	1583		1770	1583		1770	1801		1770	1840	
Flt Permitted	0.95	1.00		0.95	1.00		0.95	1.00		0.95	1.00	
Satd. Flow (perm)	1770	1583		1770	1583		1770	1801		1770	1840	
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	51	0	57	80	0	15	58	519	148	36	470	42
RTOR Reduction (vph)	0	54	0	0	12	0	0	9	0	0	3	0
Lane Group Flow (vph)	51	3	0	80	3	0	58	658	0	36	509	0
Confl. Peds. (#/hr)	30											
Turn Type	Split	NA		Split	NA		Prot	NA		Prot	NA	
Protected Phases	4	4		8	8		5	2		1	6	
Permitted Phases												
Actuated Green, G (s)	5.4	5.4		20.2	20.2		6.6	57.1		3.4	53.9	
Effective Green, g (s)	5.4	5.4		20.2	20.2		6.6	57.1		3.4	53.9	
Actuated g/C Ratio	0.05	0.05		0.20	0.20		0.06	0.56		0.03	0.53	
Clearance Time (s)	4.0	4.0		4.0	4.0		4.0	4.0		4.0	4.0	
Vehicle Extension (s)	3.0	3.0		3.0	3.0		3.0	3.0		3.0	3.0	
Lane Grp Cap (vph)	93	83		350	313		114	1007		58	971	
v/s Ratio Prot	c0.03	0.00		c0.05	0.00		c0.03	c0.37		0.02	0.28	
v/s Ratio Perm												
v/c Ratio	0.55	0.04		0.23	0.01		0.51	0.65		0.62	0.52	
Uniform Delay, d1	47.2	45.9		34.4	32.9		46.2	15.6		48.7	15.7	
Progression Factor	1.00	1.00		1.00	1.00		1.00	1.00		1.00	1.00	
Incremental Delay, d2	6.5	0.2		0.3	0.0		3.5	3.3		18.8	2.0	
Delay (s)	53.6	46.1		34.7	32.9		49.7	18.9		67.6	17.8	
Level of Service	D	D		C	C		D	B		E	B	
Approach Delay (s)		49.6			34.5			21.4			21.0	
Approach LOS		D			C			C			C	

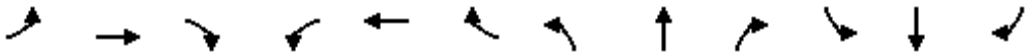
Intersection Summary			
HCM 2000 Control Delay	24.2	HCM 2000 Level of Service	C
HCM 2000 Volume to Capacity ratio	0.55		
Actuated Cycle Length (s)	102.1	Sum of lost time (s)	16.0
Intersection Capacity Utilization	56.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	1	23	5	3	48	10	581	3	5	531	4
Future Volume (Veh/h)	3	1	23	5	3	48	10	581	3	5	531	4
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
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)	4	1	29	6	4	60	13	726	4	6	664	5
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1492	1434	666	1460	1435	728	669			730		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1492	1434	666	1460	1435	728	669			730		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	95	99	94	94	97	86	99			99		
cM capacity (veh/h)	84	131	459	98	131	423	921			874		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	34	70	13	730	6	669
Volume Left	4	6	13	0	6	0
Volume Right	29	60	0	4	0	5
cSH	287	300	921	1700	874	1700
Volume to Capacity	0.12	0.23	0.01	0.43	0.01	0.39
Queue Length 95th (ft)	10	22	1	0	1	0
Control Delay (s)	19.2	20.6	9.0	0.0	9.1	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	19.2	20.6	0.2		0.1	
Approach LOS	C	C				

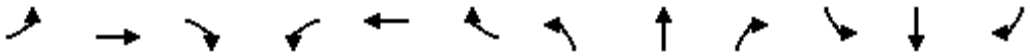
Intersection Summary				
Average Delay	1.5			
Intersection Capacity Utilization	41.7%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	3	0	12	3	0	7	10	584	10	6	538	2
Future Volume (Veh/h)	3	0	12	3	0	7	10	584	10	6	538	2
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82	0.82
Hourly flow rate (vph)	4	0	15	4	0	9	12	712	12	7	656	2
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1416	1419	657	1427	1414	718	658			724		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1416	1419	657	1427	1414	718	658			724		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	96	100	97	96	100	98	99			99		
cM capacity (veh/h)	111	134	465	107	135	429	930			879		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	19	13	12	724	7	658
Volume Left	4	4	12	0	7	0
Volume Right	15	9	0	12	0	2
cSH	278	223	930	1700	879	1700
Volume to Capacity	0.07	0.06	0.01	0.43	0.01	0.39
Queue Length 95th (ft)	5	5	1	0	1	0
Control Delay (s)	18.9	22.1	8.9	0.0	9.1	0.0
Lane LOS	C	C	A		A	
Approach Delay (s)	18.9	22.1	0.1		0.1	
Approach LOS	C	C				

Intersection Summary				
Average Delay	0.6			
Intersection Capacity Utilization	41.3%	ICU Level of Service		A
Analysis Period (min)	15			



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	6	0	11	7	1	11	9	596	14	10	531	11
Future Volume (Veh/h)	6	0	11	7	1	11	9	596	14	10	531	11
Sign Control		Stop			Stop			Free			Free	
Grade		0%			0%			0%			0%	
Peak Hour Factor	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84	0.84
Hourly flow rate (vph)	7	0	13	8	1	13	11	710	17	12	632	13
Pedestrians												
Lane Width (ft)												
Walking Speed (ft/s)												
Percent Blockage												
Right turn flare (veh)												
Median type								None			None	
Median storage veh)												
Upstream signal (ft)												
pX, platoon unblocked												
vC, conflicting volume	1408	1412	638	1410	1410	718	645			727		
vC1, stage 1 conf vol												
vC2, stage 2 conf vol												
vCu, unblocked vol	1408	1412	638	1410	1410	718	645			727		
tC, single (s)	7.1	6.5	6.2	7.1	6.5	6.2	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 %	94	100	97	93	99	97	99			99		
cM capacity (veh/h)	110	135	476	111	135	429	940			876		

Direction, Lane #	EB 1	WB 1	NB 1	NB 2	SB 1	SB 2
Volume Total	20	22	11	727	12	645
Volume Left	7	8	11	0	12	0
Volume Right	13	13	0	17	0	13
cSH	220	200	940	1700	876	1700
Volume to Capacity	0.09	0.11	0.01	0.43	0.01	0.38
Queue Length 95th (ft)	7	9	1	0	1	0
Control Delay (s)	23.0	25.2	8.9	0.0	9.2	0.0
Lane LOS	C	D	A		A	
Approach Delay (s)	23.0	25.2	0.1		0.2	
Approach LOS	C	D				

Intersection Summary				
Average Delay	0.9			
Intersection Capacity Utilization	42.2%	ICU Level of Service		A
Analysis Period (min)	15			

Appendix C: Signal Warrant Overview

According to the California Manual on Uniform Traffic Control Devices (CA MUTCD), traffic control signal needs studies, or "signal warrants", are engineering studies of "traffic conditions, pedestrian characteristics, and physical characteristics of the location… to determine whether installation of a traffic control signal is justified at a particular location." (§4C.01)The following list is a summary of the types of traffic signal warrants.

- Warrant 1, Eight-Hour Vehicular Volume
- Warrant 2, Four-Hour Vehicular Volume
- Warrant 3, Peak Hour
- Warrant 4, Pedestrian Volume
- Warrant 5, School Crossing
- Warrant 6, Coordinated Signal System
- Warrant 7, Crash Experience
- Warrant 8, Roadway Network
- Warrant 9, Intersection Near a Grade Crossing

Warrant 1, Eight Hour Vehicular Volume sets traffic volume criteria to be satisfied across the highest eight hours of traffic throughout the day. This warrant is intended to be applied where traffic volumes are generally high throughout the day.

Warrant 2, Four Hour Vehicular Volume sets traffic volume criteria to be satisfied across the highest four hours of traffic throughout the day. This warrant is intended to be applied where traffic volumes are highly peaked, typically during the morning and evening commute hours. Warrant 2 traffic volume criteria are higher than the Warrant 1, but need to be satisfied across fewer hours.

Warrant 3, Peak Hour Vehicular Volume sets traffic volume criteria to be satisfied across the highest single hour of traffic in a given day. This warrant is intended to be applied in areas where a facility would attract or discharge large numbers of vehicles over a short time, like office complexes and factories. Warrant 3 traffic volume criteria are the highest among Warrants 1 through 3, but need to be satisfied across only a single hour.

Warrant 4 Pedestrian Volume considers the volume of pedestrians against the volume of vehicles on the major street. The warrant is intended to measure whether pedestrians experience excessive delay in crossing the street.

Warrant 5, School Crossing considers the volume of schoolchildren (defined as elementary through high school students) against the number of gaps in traffic on the major street. The warrant is intended to measure whether schoolchildren are afforded adequate opportunities to cross the street.

Warrants 6 through 9 do not apply to the study location and were not evaluated. The CA MUTCD has further detail on these signal warrants.

The criteria for Warrants 1 through 5 are presented on the following pages.

Appendix C1: Warrant 1, Eight Hour Vehicle Volume

WARRANT 1 - Eight Hour Vehicular Volume SATISFIED YES ☐ NO ☐
(Condition A or Condition B or combination of A and B must be satisfied)

Condition A - Minimum Vehicle Volume 100% SATISFIED YES ☐ NO ☐
80% SATISFIED YES ☐ NO ☐

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Hour
	U	R	U	R	
	1		2 or More		
Both Approaches Major Street	500 (400)	350 (280)	600 (480)	420 (336)	
Highest Approach Minor Street	150 (120)	105 (84)	200 (160)	140 (112)	

Condition B - Interruption of Continuous Traffic 100% SATISFIED YES ☐ NO ☐
80% SATISFIED YES ☐ NO ☐

APPROACH LANES	MINIMUM REQUIREMENTS (80% SHOWN IN BRACKETS)				Hour
	U	R	U	R	
	1		2 or More		
Both Approaches Major Street	750 (600)	525 (420)	900 (720)	630 (504)	
Highest Approach Minor Street	75 (60)	53 (42)	100 (80)	70 (56)	

Combination of Conditions A & B SATISFIED YES ☐ NO ☐

REQUIREMENT	CONDITION	✓	FULFILLED
TWO CONDITIONS SATISFIED 80%	A. MINIMUM VEHICULAR VOLUME		Yes ☐ No ☐
	AND, B. INTERRUPTION OF CONTINUOUS TRAFFIC		
AND, AN ADEQUATE TRIAL OF OTHER ALTERNATIVES THAT COULD CAUSE LESS DELAY AND INCONVENIENCE TO TRAFFIC HAS FAILED TO SOLVE THE TRAFFIC PROBLEMS			Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Source: CA MUTCD, 2014 Edition. p. 841

Appendix C2: Warrant 2, Four Hour Vehicle Volume

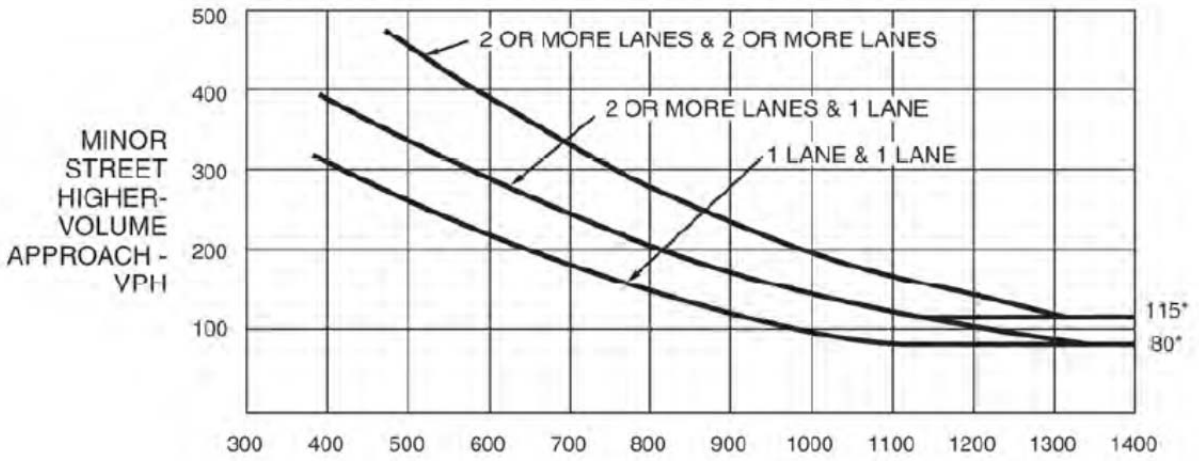
WARRANT 2 - Four Hour Vehicular Volume **SATISFIED* YES ☐ NO ☐**

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	One	2 or More	Hour			
Both Approaches - Major Street						
Higher Approach - Minor Street						

*All plotted points fall above the applicable curve in Figure 4C-1. (URBAN AREAS)	Yes ☐ No ☐
OR, All plotted points fall above the applicable curve in Figure 4C-2. (RURAL AREAS)	Yes ☐ No ☐

Figure 4C-1. Warrant 2, Four-Hour Vehicular Volume



*Note: 115 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 80 vph applies as the lower threshold volume for a minor-street approach with one lane.

Source: CA MUTCD, 2014 Edition. p. 836, 842

Appendix C3: Warrant 3, Peak Hour Vehicle Volume

WARRANT 3 - Peak Hour **SATISFIED YES ☐ NO ☐**
(Part A or Part B must be satisfied)

PART A **SATISFIED YES ☐ NO ☐**
(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced by traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; AND	Yes ☐ No ☐
2. The volume on the same minor street approach (one direction only) equals or exceeds 100 vph for one moving lane of traffic or 150 vph for two moving lanes; AND	Yes ☐ No ☐
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes ☐ No ☐

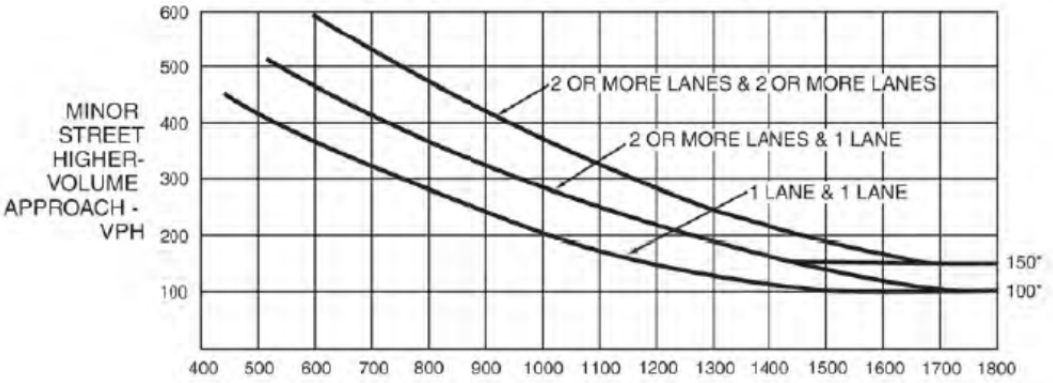
PART B **SATISFIED YES ☐ NO ☐**

APPROACH LANES	One	2 or More	Hour
Both Approaches - Major Street			
Higher Approach - Minor Street			

The plotted point falls above the applicable curve in Figure 4C-3. (URBAN AREAS)	Yes ☐ No ☐
OR, The plotted point falls above the applicable curve in Figure 4C-4. (RURAL AREAS)	Yes ☐ No ☐

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

Figure 4C-3. Warrant 3, Peak Hour



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

Source: CA MUTCD, 2014 Edition. p. 837, 842

Appendix C4: Warrant 4, Pedestrian Crossing

WARRANT 4 - Pedestrian Volume
(Parts 1 and 2 Must Be Satisfied)

SATISFIED YES ☐ NO ☐

Part 1 (Parts A or B must be satisfied)

	Hours - - ->				
A.	Vehicles per hour for any 4 hours				
	Pedestrians per hour for any 4 hours				

Figure 4C-5 or Figure 4C-6
SATISFIED YES ☐ NO ☐

	Hours - - ->				
B.	Vehicles per hour for any 1 hour				
	Pedestrians per hour for any 1 hour				

Figure 4C-7 or Figure 4C-8
SATISFIED YES ☐ NO ☐

Part 2 **SATISFIED YES ☐ NO ☐**

AND, The distance to the nearest traffic signal along the major street is greater than 300 ft	Yes ☐	No ☐
OR, The proposed traffic signal will not restrict progressive traffic flow along the major street.	Yes ☐	No ☐

Figure 4C-7. Warrant 4, Pedestrian Peak Hour

*Note: 133 pph applies as the lower threshold volume.

Source: CA MUTCD, 2014 Edition. p. 839, 843

Appendix D: Signal Warrant Detailed Results

Table A3 summarizes the signal warrants tested at each location and whether they satisfy each warrant. The detailed signal warrant analyses are presented in the remainder of Appendix D.

Table A3 Signal Warrant Analysis Scenarios

#	Intersection	Warrants Tested	Signal Warrant Satisfied?
Existing Conditions			
1	Alameda de las Pulgas / Atherton Avenue	Warrant 1 (8 Hour) Warrant 2 (4 Hour)	Yes – meets Warrant 1 (8 Hour) & Warrant 2 (4-Hour)
2	Alameda de las Pulgas / Walsh Road	Warrant 1 (8 Hour) Warrant 2 (4 Hour)	Yes – meets Warrant 1 (8 Hour) & Warrant 2 (4-Hour)
Future Conditions			
2	Alameda de las Pulgas / Walsh Road / Las Lomitas Elementary School Driveway	Warrant 3 (Peak Hour) Warrant 4 (Pedestrian Peak Hour)	Yes - Las Lomitas Driveway approach meets Warrant 3 (Peak Hour) & Warrant 4 (Pedestrian)

Appendix D1: Signal Warrant Analysis, Alameda de Las Pulgas / Atherton Avenue

Twenty-four hour counts were collected at the intersection of Alameda de Las Pulgas / Atherton Avenue on March 22, 2016. Table A4 presents the signal warrant analysis for the eight-hour criterion (Warrant 1) and four-hour criterion (Warrant 2). Warrant 1 would be satisfied if either Condition A or Condition B minimum requirements are met, or if both Condition A and Condition B requirements are met at 80 percent of the minimum volumes. The results show that existing traffic volumes satisfy both Warrant 1 and Warrant 2.

Table A4: Warrant 1 & 2, Alameda de Las Pulgas / Atherton Avenue

Hour Starting	ADLP (Major) 2-way Total	Atherton WB (Minor)	Warrant 1		Warrant 2 Four Hour
			Condition A Satisfied?	Condition B Satisfied?	
06:00 AM	985	310	Yes	Yes	
07:00 AM	1100	360	Yes	Yes	Yes
08:00 AM	994	203	Yes	Yes	
01:00 PM	962	247	Yes	Yes	
2:00 PM	1092	369	Yes	Yes	Yes
3:00 PM	1061	479	Yes	Yes	Yes
4:00 PM	1149	611	Yes	Yes	Yes
5:00 PM	979	379	Yes	Yes	
Warrant Satisfied?			**Yes**		**Yes**

Appendix D2: Signal Warrant Analysis, Alameda de Las Pulgas / Walsh Road

Twenty-four hour counts were collected at Alameda de Las Pulgas / Walsh Road for three continuous days spanning March 15 – 17, 2016. The intersections were tested for Warrant 1 Eight Hour and Warrant 2 Four Hour across each of the three days. Table A5 summarizes the signal warrant results, which shows that both warrants were satisfied for all three days.

Table A5: Warrant 1 and 2 Findings Summary, Alameda de Las Pulgas / Walsh Road

Date	Warrant 1 Eight Hour		Warrant 2 Four Hour
	Condition A Satisfied?	Condition B Satisfied?	
Tues, March 15, 2016	Yes	Yes	Yes
Weds, March 16, 2016	Yes	Yes	Yes
Thurs, March 17, 2016	Yes	Yes	Yes

Warrant 1 Eight Hour Vehicular Volumes

Tables A6 through A8 present the Warrant 1, Eight-Hour volumes and results.

Table A6: Warrant 1, Alameda de Las Pulgas / Walsh Road, Tuesday, March 15, 2016

Hour Starting	ADLP (Major) 2-way Total	Walsh EB (Minor)	Condition A Satisfied?	Condition B Satisfied?
07:00 AM	1070	89	No	Yes
09:00 AM	1057	88	No	Yes
10:00 AM	899	87	No	Yes
12:00 PM	1004	86	No	Yes
01:00 PM	1004	92	No	Yes
02:00 PM	1096	88	No	Yes
03:00 PM	1259	98	No	Yes
04:00 PM	1189	108	No	Yes
Warrant Satisfied?			Yes	

Table A7: Warrant 1, Alameda de Las Pulgas / Walsh Road, Wednesday, March 16, 2016

Hour Starting	ADLP (Major) 2-way Total	Walsh EB (Minor)	Condition A Satisfied?	Condition B Satisfied?
07:00 AM	1113	91	No	Yes
09:00 AM	1131	91	No	Yes
11:00 AM	913	89	No	Yes
12:00 PM	1025	96	No	Yes
01:00 PM	975	87	No	Yes
02:00 PM	1162	88	No	Yes
03:00 PM	1248	102	No	Yes
04:00 PM	1245	128	No	Yes
Warrant Satisfied?			**Yes**	

Table A8: Warrant 1, Alameda de Las Pulgas / Walsh Road Thursday, March 17, 2016

Hour Starting	ADLP (Major) 2-way Total	Walsh EB (Minor)	Condition A Satisfied?	Condition B Satisfied?
07:00 AM	1132	95	No	Yes
08:00 AM	1338	92	No	Yes
09:00 AM	1021	100	No	Yes
11:00 AM	977	101	No	Yes
12:00 PM	1027	104	No	Yes
02:00 PM	1121	96	No	Yes
03:00 PM	1169	113	No	Yes
04:00 PM	1167	97	No	Yes
Warrant Satisfied?			**Yes**	

Warrant 2 Four Hour Vehicular Volumes

Tables A9 through A11 present the Warrant 2, Four-Hour volumes and results.

Table A9: Warrant 2, Alameda de Las Pulgas / Walsh Road
Tuesday, March 15, 2016

Hour Starting	ADLP (Major) 2-way Total	Walsh EB (Minor)	Condition Satisfied?
07:15 AM	1308	104	Yes
02:30 PM	1162	97	Yes
03:30 PM	1237	94	Yes
04:30 PM	1212	114	Yes
		Warrant Satisfied?	**Yes**

Table A10: Warrant 2, Alameda de Las Pulgas / Walsh Road
Wednesday, March 16, 2016

Hour Starting	ADLP (Major) 2-way Total	Walsh EB (Minor)	Condition Satisfied?
07:30 AM	1393	103	Yes
08:30 AM	1322	87	Yes
03:00 PM	1248	102	Yes
04:00 PM	1245	128	Yes
		Warrant Satisfied?	**Yes**

Table A11: Warrant 2: Alameda de Las Pulgas / Walsh Road
Thursday, March 17, 2016

Hour Starting	ADLP (Major) 2-way Total	Walsh EB (Minor)	Condition Satisfied?
07:30 AM	1368	109	Yes
08:30 AM	1183	86	Yes
02:45 PM	1212	112	Yes
03:45 PM	1120	109	Yes
		Warrant Satisfied?	**Yes**

Appendix D3: Signal Warrant Analysis, Alameda de Las Pulgas at Walsh Road / New Las Lomitas Driveway

Peak hour volumes were modeled at the proposed realigned intersection of Alameda de Las Pulgas at Walsh Road and the Las Lomitas Elementary School Driveway. The volumes were estimated from the current driveway counts and counts taken at Camino al Lago, which currently services the majority of parent drop-off and pick-up traffic. Table A12 presents the Warrant 3 Peak Hour volumes and results.

Part A or B must be satisfied to meet the conditions of Warrant 3. Under future conditions, the Alameda de Las Pulgas / Walsh Road / Las Lomitas Driveway intersection would satisfy the peak hour signal warrant (Warrant 3) during both the AM and PM school peak hours.

Table A12: Warrant 3, Alameda de Las Pulgas / Walsh Road / New Las Lomitas Driveway Future Wednesday Conditions

Warrant 3	**ALDP / Las Lomitas Driveway / Walsh Road**	
Part A	**AM Peak Hour**	**PM Peak Hour**
1. Minor Street Total Delay > 4-Vehicle Hours[1]	Yes	Yes
2. Minor Street Volume > 100 (School Driveway)	Yes - 195	Yes – 148
3. Total Entering Volume > 650	Yes – 1,225	Yes–1,133
Part A Conditions Met?	**Yes**	**Yes**
Part B	**AM Peak Hour**	**PM Peak Hour**
Minor Street Volume (1-way), (School Driveway)	195	148
Major Street Volume (2-way)	1225	1133
Part B Conditions Met? (1 lane & 1 lane)	**Yes**	**No**

1. See report Table 4.Minor street average delay>120s x 195 entering vehicles = 390 minutes delay.

Appendix D4: Signal Warrant Analysis, Alameda de Las Pulgas pedestrian crossings

Pedestrian counts were collected at the five crosswalks located at Alameda de las Pulgas's intersection with Camino al Lago, Mills Avenue, and the midblock pedestrian signal in May 2014 and May 2015.

The District's proposed improvement would consolidate school pedestrian crossings to the new signal at the Alameda / Walsh Road / school driveway intersection. A signal warrant analysis was conducted for the pedestrian volumes to confirm whether a consolidated crosswalk would satisfy the pedestrian signal warrant. Table A13 presents the Warrant 4 Peak Hour volumes and results.

Table A13: Warrant 4 (One Hour),
Pedestrian Crossings near Las Lomitas Elementary School, Wednesday, May 2015

Warrant 4	**ALDP / Midblock Camino al Lago & Mills Avenue signal**	
Part A	**AM Peak Hour**	**PM Peak Hour**
1. Major Street Vehicles Per Hour	1353	1145
2. Pedestrians Crossing Major Street Per Hour	80	228
Part A Conditions Met?	**No**	**Yes**

As shown in Table A13, the combined pedestrian crossings near Las Lomitas would satisfy Warrant 4 peak hour volume criteria if the crossings could be consolidated to a single crosswalk.

Appendix E: Travel Time Survey Results

Travel time surveys taken in the vicinity of Las Lomitas Elementary School during the expected peak times for school-related traffic activity. The travel time surveys were taken from Monterey Avenue to Callado Way in the northbound and southbound directions. Travel time surveys occurred during the following dates and times.

- Tuesday, March 15, 2016:
  - 8:30-9:30 AM
  - 3:00-4:00 PM
- Wednesday March 16, 2016:
  - 8:30-9:30 AM
  - 1:30-2:30 PM

The morning survey times were selected to capture the hour bounding 9AM for all weekdays. For non-Wednesday days, the hour bounding 3:30 PM was selected since it is closer to typical afternoon commute peak times (4-6 PM). On Wednesday, the hour bounding 2:05 PM was expected to exhibit peak school-related traffic activity.

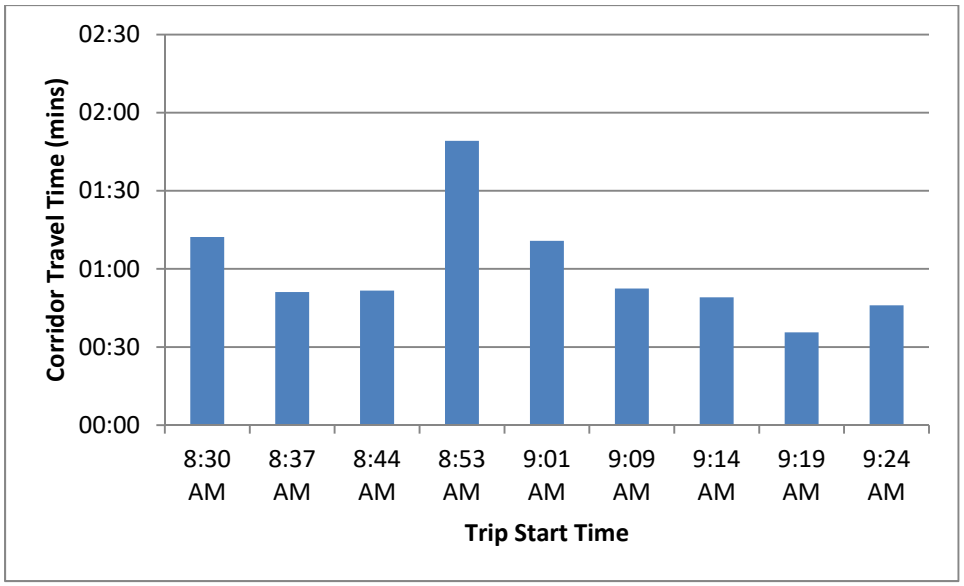


Figure A1: Corridor travel time, Tuesday AM, NB direction

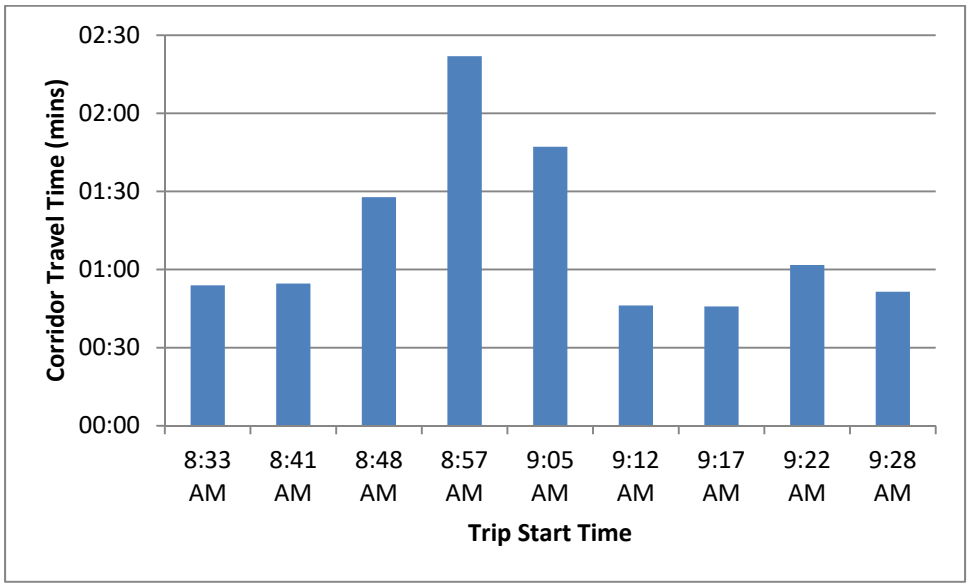


Figure A2: Corridor travel time, Tuesday AM, SB direction

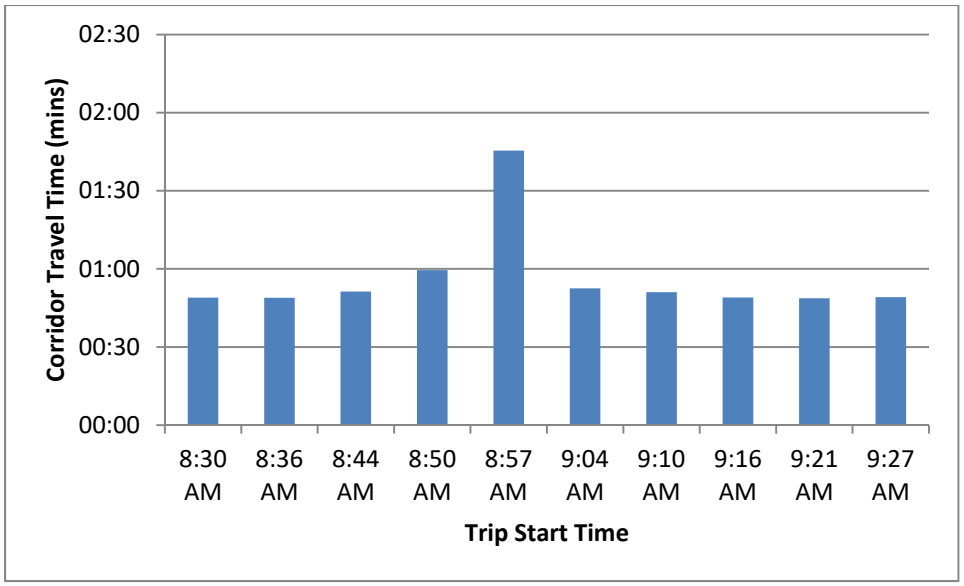


Figure A3: Corridor travel time, Wednesday AM, NB direction

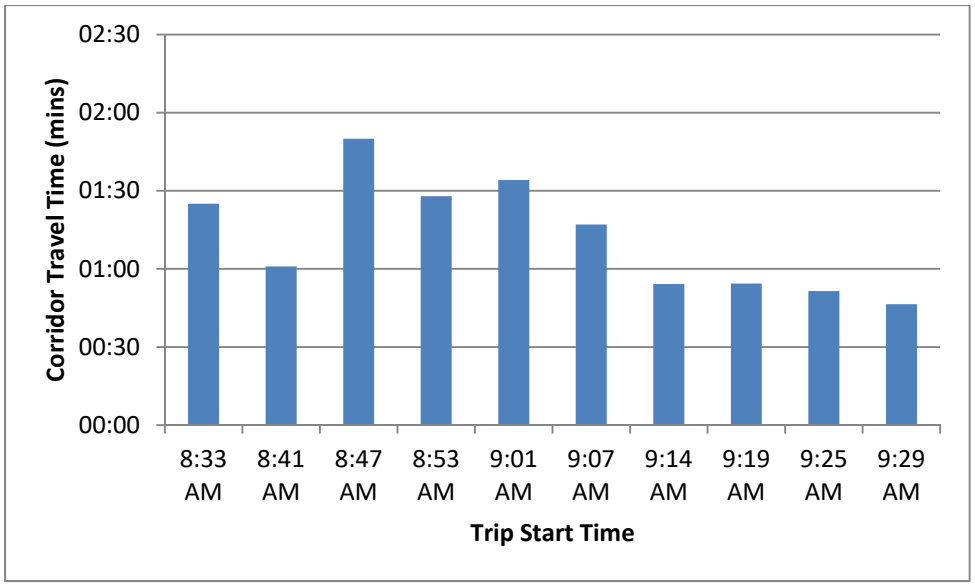


Figure A4: Corridor travel time, Wednesday AM, SB direction

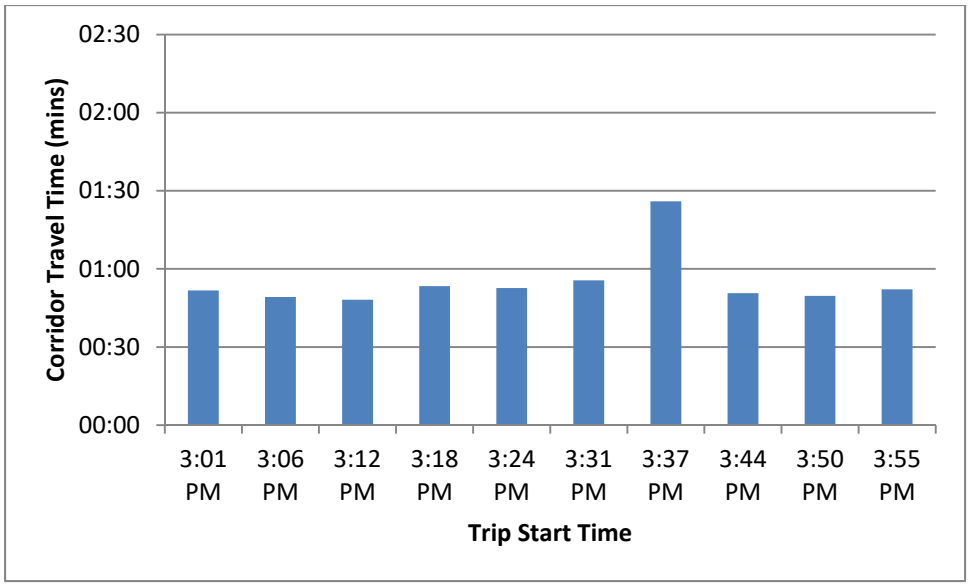


Figure A5: Corridor travel time, Tuesday PM, NB direction

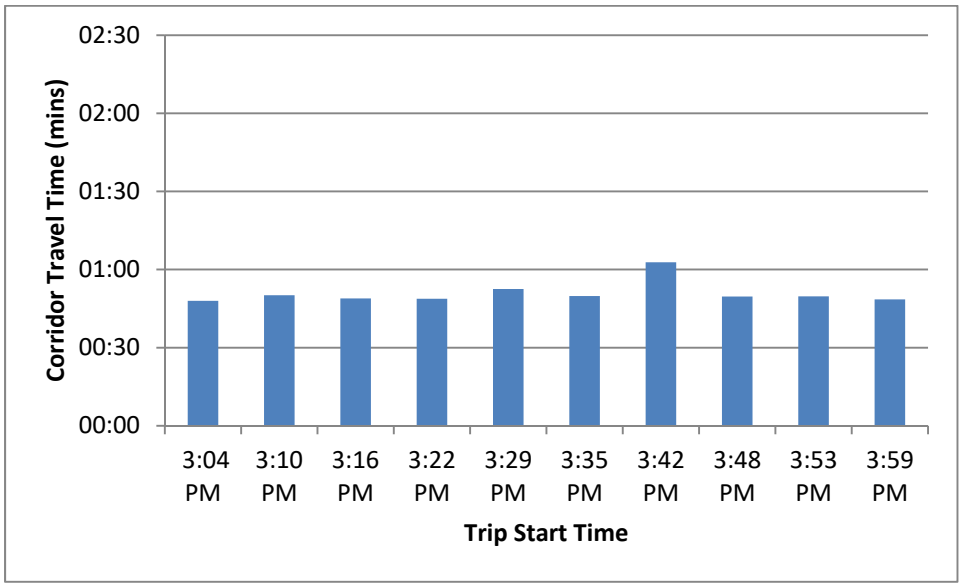


Figure A6: Corridor travel time, Tuesday PM, SB direction

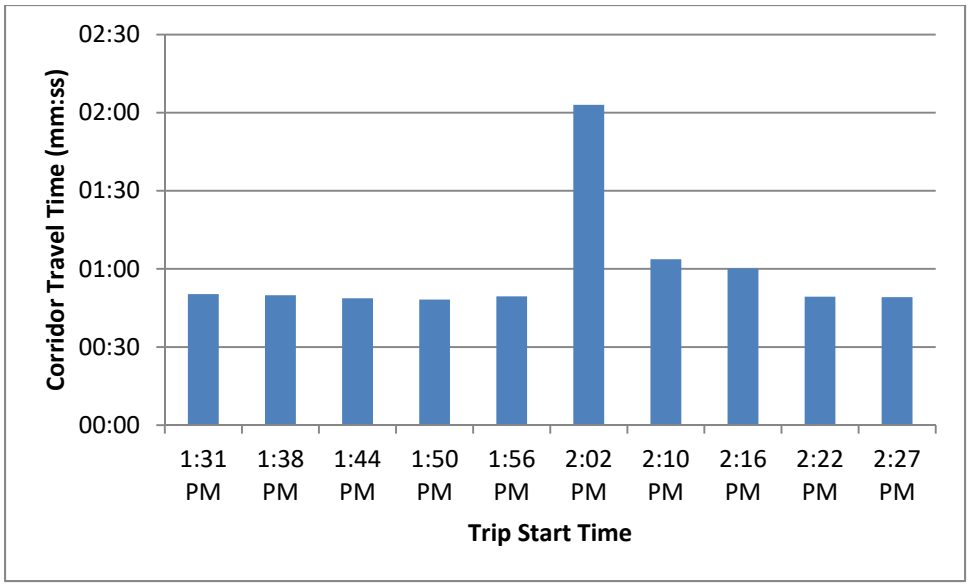


Figure A7: Corridor travel time, Wednesday PM, NB direction

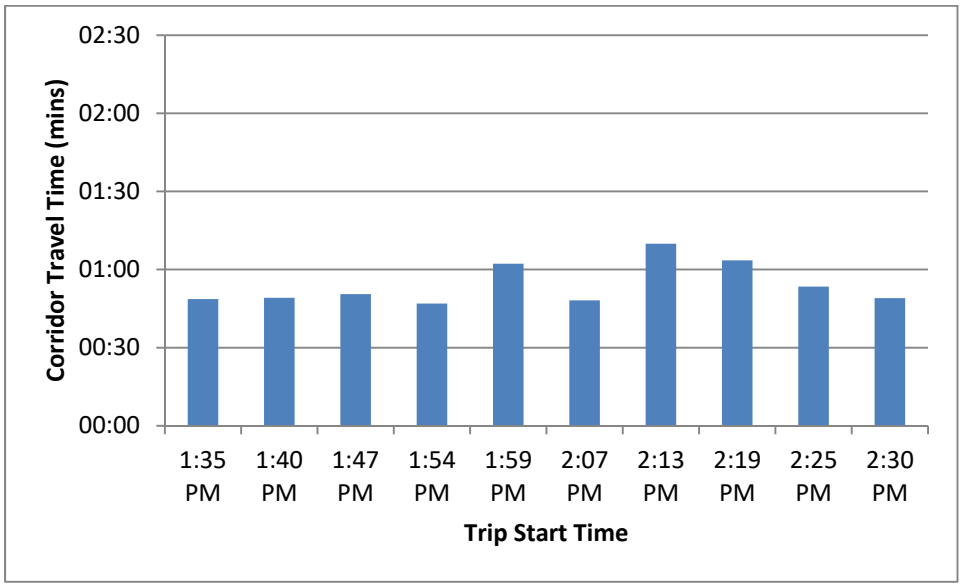


Figure A8: Corridor travel time, Wednesday PM, SB direction

Appendix F: SimTraffic Travel Time Worksheets

Arterial Level of Service: NB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Monterey Ave	25	0.2	8.3	0.1	30
Camino A Los Cerros	5	0.5	13.3	0.1	29
Mills Ave	4	3.5	10.7	0.1	21
Midblock Xwalk	22	7.5	11.5	0.0	9
Camino Al Lago	3	3.4	6.5	0.0	15
Las Lomitas DW1	7	1.3	4.8	0.0	22
Walsh Rd	2	0.3	3.8	0.0	28
Callado Way	6	0.5	15.0	0.1	32
Atherton Ave	1	11.1	25.8	0.1	21
Polhemus	28	3.6	29.1	0.2	31
Total		32.0	128.9	0.9	25

Calibration segment

Arterial Level of Service: SB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Polhemus	28	0.4	9.8	0.1	34
Atherton Ave	1	15.2	40.5	0.2	22
Callado Way	6	3.5	18.8	0.1	28
Walsh Rd	2	4.0	17.5	0.1	27
Las Lomitas DW1	7	2.7	6.2	0.0	17
Camino Al Lago	3	5.0	8.8	0.0	12
Midblock Xwalk	22	8.4	11.9	0.0	8
Mills Ave	4	2.4	5.8	0.0	19
Camino A Los Cerros	5	1.1	8.3	0.1	26
	25	1.2	14.6	0.1	27
Total		43.9	142.2	0.9	23

Note: All travel times indicated are for the segment preceding the listed intersection.

Arterial Level of Service: NB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Monterey Ave	6	0.4	13.6	0.1	30
Camino A Los Cerros	5	0.5	13.4	0.1	29
Mills Ave	4	0.4	7.6	0.1	29
Camino Al Lago	3	1.4	8.4	0.1	25
Las Lomitas DW (new)	2	15.6	22.7	0.1	9
Callado Way	22	2.2	16.4	0.1	29
Atherton Ave	1	10.1	25.2	0.1	21
Pohlemus	25	2.8	29.3	0.3	31
Total		33.5	136.5	0.9	24

Expanded study corridor

Arterial Level of Service: SB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pohlemus	25	0.3	7.7	0.1	35
Atherton Ave	1	7.8	33.5	0.3	27
Callado Way	22	2.4	17.9	0.1	30
Walsh Rd	2	21.1	34.5	0.1	14
Camino Al Lago	3	2.3	9.6	0.1	22
Mills Ave	4	0.6	7.6	0.1	27
Camino A Los Cerros	5	0.7	7.8	0.1	28
Monterey Ave	6	1.1	14.5	0.1	27
Total		36.4	132.9	0.9	24

Note: All travel times indicated are for the segment preceding the listed intersection.

Arterial Level of Service: NB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Monterey Ave	6	0.4	13.5	0.1	30
Camino A Los Cerros	5	0.5	13.4	0.1	29
Mills Ave	4	0.4	7.6	0.1	29
Camino Al Lago	3	1.1	8.1	0.1	26
Las Lomitas DW (new)	2	16.7	23.8	0.1	9
Callado Way	22	2.5	16.6	0.1	29
Atherton Ave	1	5.8	20.2	0.1	27
Pohlemus	25	1.1	31.7	0.3	28
Total		28.4	134.8	0.9	25

Expanded study corridor

Arterial Level of Service: SB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pohlemus	25	0.3	7.7	0.1	35
Atherton Ave	1	10.2	35.2	0.3	26
Callado Way	22	1.1	20.7	0.1	26
Walsh Rd	2	17.3	30.6	0.1	16
Camino Al Lago	3	2.1	9.3	0.1	23
Mills Ave	4	0.6	7.6	0.1	27
Camino A Los Cerros	5	0.7	7.8	0.1	28
Monterey Ave	6	1.1	14.6	0.1	27
Total		33.5	133.5	0.9	24

Note: All travel times indicated are for the segment preceding the listed intersection.

Arterial Level of Service: NB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Monterey Ave	25	0.3	8.5	0.1	30
Camino A Los Cerros	5	0.7	13.5	0.1	29
Mills Ave	4	2.6	9.7	0.1	22
Midblock Xwalk	22	6.6	10.6	0.0	10
Camino Al Lago	3	1.7	5.3	0.0	18
Las Lomitas DW1	7	0.8	4.5	0.0	24
Walsh Rd	2	0.4	3.9	0.0	28
Callado Way	6	0.9	15.2	0.1	32
Atherton Ave	1	13.4	28.3	0.1	19
Polhemus	28	3.6	28.9	0.2	31
Total		31.1	128.4	0.9	25

Calibration segment

Arterial Level of Service: SB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Polhemus	28	0.2	9.3	0.1	35
Atherton Ave	1	10.7	36.0	0.2	25
Callado Way	6	3.3	18.7	0.1	28
Walsh Rd	2	1.1	14.6	0.1	33
Las Lomitas DW1	7	0.5	3.9	0.0	27
Camino Al Lago	3	1.4	5.2	0.0	21
Midblock Xwalk	22	5.3	9.5	0.0	10
Mills Ave	4	1.3	4.9	0.0	22
Camino A Los Cerros	5	0.8	8.0	0.1	27
	25	1.0	14.4	0.1	27
Total		25.7	124.6	0.9	26

Note: All travel times indicated are for the segment preceding the listed intersection.

Arterial Level of Service: NB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Monterey Ave	6	0.5	13.6	0.1	30
Camino A Los Cerros	5	0.7	13.5	0.1	29
Mills Ave	4	0.6	7.6	0.1	28
Camino Al Lago	3	1.1	8.1	0.1	26
Las Lomitas DW (new)	2	15.4	22.3	0.1	10
Callado Way	22	2.6	16.8	0.1	28
Atherton Ave	1	10.2	25.3	0.1	21
Pohlemus	25	3.4	29.3	0.3	31
Total		34.3	136.4	0.9	24

Expanded study corridor

Arterial Level of Service: SB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pohlemus	25	0.2	7.4	0.1	35
Atherton Ave	1	5.4	31.1	0.3	29
Callado Way	22	1.7	17.3	0.1	31
Walsh Rd	2	15.3	28.5	0.1	17
Camino Al Lago	3	1.9	9.1	0.1	23
Mills Ave	4	0.5	7.4	0.1	28
Camino A Los Cerros	5	0.7	7.8	0.1	28
Monterey Ave	6	0.9	14.3	0.1	27
Total		26.7	123.0	0.9	26

Note: All travel times indicated are for the segment preceding the listed intersection.

Arterial Level of Service: NB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Monterey Ave	6	0.4	13.6	0.1	30
Camino A Los Cerros	5	0.7	13.5	0.1	29
Mills Ave	4	0.6	7.6	0.1	28
Camino Al Lago	3	1.1	8.1	0.1	26
Las Lomitas DW (new)	2	15.5	22.4	0.1	10
Callado Way	22	2.6	16.8	0.1	28
Atherton Ave	1	7.2	21.7	0.1	25
Pohlemus	25	1.3	31.5	0.3	29
Total		29.3	135.1	0.9	25

Expanded study corridor

Arterial Level of Service: SB Alameda Del Las Pulgas

Cross Street	Node	Delay (s/veh)	Travel time (s)	Dist (mi)	Arterial Speed
Pohlemus	25	0.2	7.4	0.1	35
Atherton Ave	1	6.1	31.3	0.3	29
Callado Way	22	0.7	20.3	0.1	26
Walsh Rd	2	14.9	28.1	0.1	17
Camino Al Lago	3	1.8	9.1	0.1	24
Mills Ave	4	0.4	7.3	0.1	28
Camino A Los Cerros	5	0.7	7.8	0.1	28
Monterey Ave	6	0.9	14.2	0.1	27
Total		25.7	125.5	0.9	25

Note: All travel times indicated are for the segment preceding the listed intersection.