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TRANSPORTATION IMPACT ASSESSMENT FOR HIGHLAND ESTATES

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EXECUTIVE SUMMARY

This report presents the findings, conclusions, and recommendations of the transportation impact study conducted by Fehr & Peers for the Highland Estates project, an eleven-unit single family residential development proposed in unincorporated San Mateo County, California. The proposed project would subdivide an approximately 99-acre parcel into eleven lots, with the remaining 92.46-acre parcel to be designated as common open space. The residential units would range in size from 2,800 to 3,600 square feet.

STUDY APPROACH

This study analyzed traffic conditions at three existing intersections, as shown on Figure 3. The intersections, as well as the transit, bicycle, and pedestrian networks were analyzed under four scenarios:

1. Existing Conditions
2. Existing With Project Conditions
3. Cumulative (Year 2030) No Project Conditions
4. Cumulative (Year 2030) with Project Conditions

These scenarios were compared against each other using the significance criteria identified by governing documents to determine project impacts. Near-term conditions were qualitatively discussed to address the influence of the three San Francisco Public Utilities Commission (SFPUC) construction projects in the vicinity of the study area.

SUMMARY OF FINDINGS

The proposed project would generate 108 daily, 13 AM peak hour, and 15 PM peak hour total vehicle trips. This equates to approximately 0.5% of all vehicle trips on local streets in the study area, while it would represent about half of that under Cumulative (Year 2030) conditions.

The project's contribution to projected traffic growth at each study intersection between Existing and Cumulative conditions would be low, representing an average contribution of less than 1% of overall cumulative growth.

According to the significance criteria, the proposed project would have a ***less-than-significant*** impact on the study intersections and surrounding transportation network under Existing and Cumulative conditions.

1.INTRODUCTION

This report presents the findings, conclusions, and recommendations of the transportation impact study conducted for the eleven-unit Highland Estates residential development in unincorporated San Mateo County, California (County). The project site is located along Bunker Hill Drive and Polhemus Road, north of the Interstate 280 (I-280)/State Route 92 (SR92) interchange (see Figure 1).

PROJECT DESCRIPTION

The proposed project is a residential development that would consist of eleven single-family residential dwelling units ranging in size from 2,800 square feet to 3,600 square feet. All of the homes would be multi-leveled and would be built following the existing terrain of their parcels, on lots ranging in size from 0.21 to 1.64 acres. The proposed project would subdivide an approximately 99-acre parcel into eleven lots, with the remaining 92.46-acre parcel to be designated as common open space. Figure 1 shows the project location and study area, while Figure 2 shows the project site plan.

TRAFFIC OPERATIONS ANALYSIS SCENARIOS

This study evaluated transportation conditions for the following scenarios:

Existing Conditions – represents current conditions based on traffic counts and field observations conducted on August 28, 2008 when local schools were in session.

Near Term Conditions – represents conditions resulting from vehicle trips associated with San Francisco Public Utilities Commission (SFPUC) projects in the study area. Three major projects are commencing and may temporarily cause shifts in traffic patterns. Those projects are:

- New Crystal Springs Bypass Tunnel Project
- Lower Crystal Springs Bridge/Dam Improvements
- Crystal Springs Pipeline No.2 Replacement Project

Due to the temporary nature of the construction projects, they were not assumed as background growth. The influence of the projects on traffic patterns was qualitatively discussed, but adjustments were not made to Existing Conditions.

Existing With Project Conditions – represents Existing Conditions with the addition of project traffic.

Cumulative (Year 2030) No Project Conditions – represents long-term forecasted traffic conditions without the proposed project.

Cumulative (Year 2030) with Project Conditions – represents Cumulative No Project Conditions with the addition of project trips.

A set of study locations was identified through collaboration with County and Impact Sciences, Inc. staff. The resulting list of study intersections is presented below:

1. Polhemus Road/DeAnza Boulevard
2. Polhemus Road/SR92 Westbound Ramps
3. Polhemus Road/SR92 Eastbound Ramps

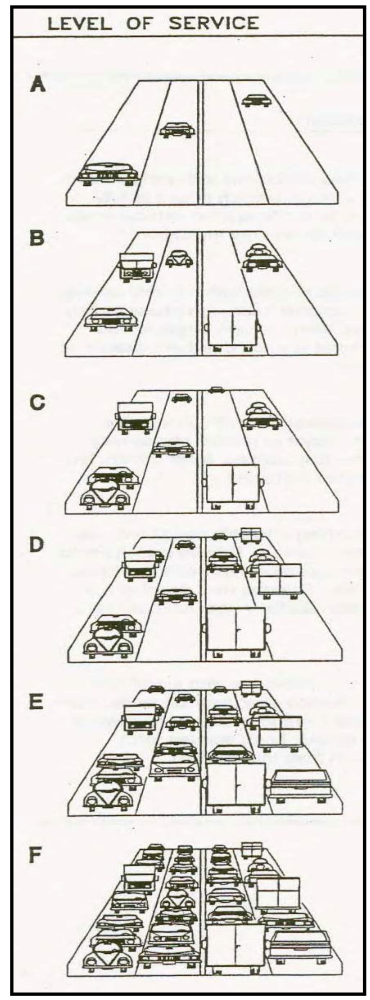
Existing traffic volume counts and field observations were performed on August 28, 2008. Schools in proximity to the study area were in session on this date. Existing lane configurations, traffic control and peak hour traffic counts are presented on Figure 3.

ANALYSIS METHODOLOGY AND LEVEL OF SERVICE CRITERIA

Intersections typically form the critical components of the roadway system. This analysis addresses the operational characteristics of the following three study intersections for the midweek AM (7:00 – 9:00) and PM (4:00 – 6:00) peak hours.[1]

1. Polhemus Road/DeAnza Boulevard
2. Polhemus Road/SR92 Westbound Ramps
3. Polhemus Road/SR92 Eastbound Ramps

To measure and describe the operations of the local roadway network, transportation engineers and planners use the Level of Service (LOS) methodology identified in the 2000 *Highway Capacity Manual* (*HCM2000*). LOS varies from LOS A (indicating free-flow traffic conditions with little or no delay at intersections) to LOS F (representing over-saturated conditions where traffic flows exceed design capacity, resulting in long queues and delays). See the illustration on this page.



Visual Representation of LOS
Source: 2007 Congestion Management Plan

Signalized Intersections

HCM2000 operations methodology was used for this analysis. At signalized intersections, the LOS rating is based on the weighted average control delay of all movements measured in seconds per vehicle. Control delay refers to the amount of time on average that a vehicle will be delayed at an intersection. Peak hour traffic volumes, lane configurations, and signal timing plans are used as inputs in the LOS calculations. Table 1A summarizes the relationships between the average control delay per vehicle and LOS for signalized intersections.

Unsignalized Intersections

The *HCM2000* methodology was used to analyze all-way stop-controlled intersections. Similar to signalized intersections, the LOS rating is based on the weighted average control delay of all movements. Table 1B summarizes the relationship between delay and LOS for unsignalized intersections.

[1] Intersection turning movement counts were conducted on August 28, 2008, while school was in session. Conducting traffic counts during while school is in session ensures that typical traffic conditions are captured.

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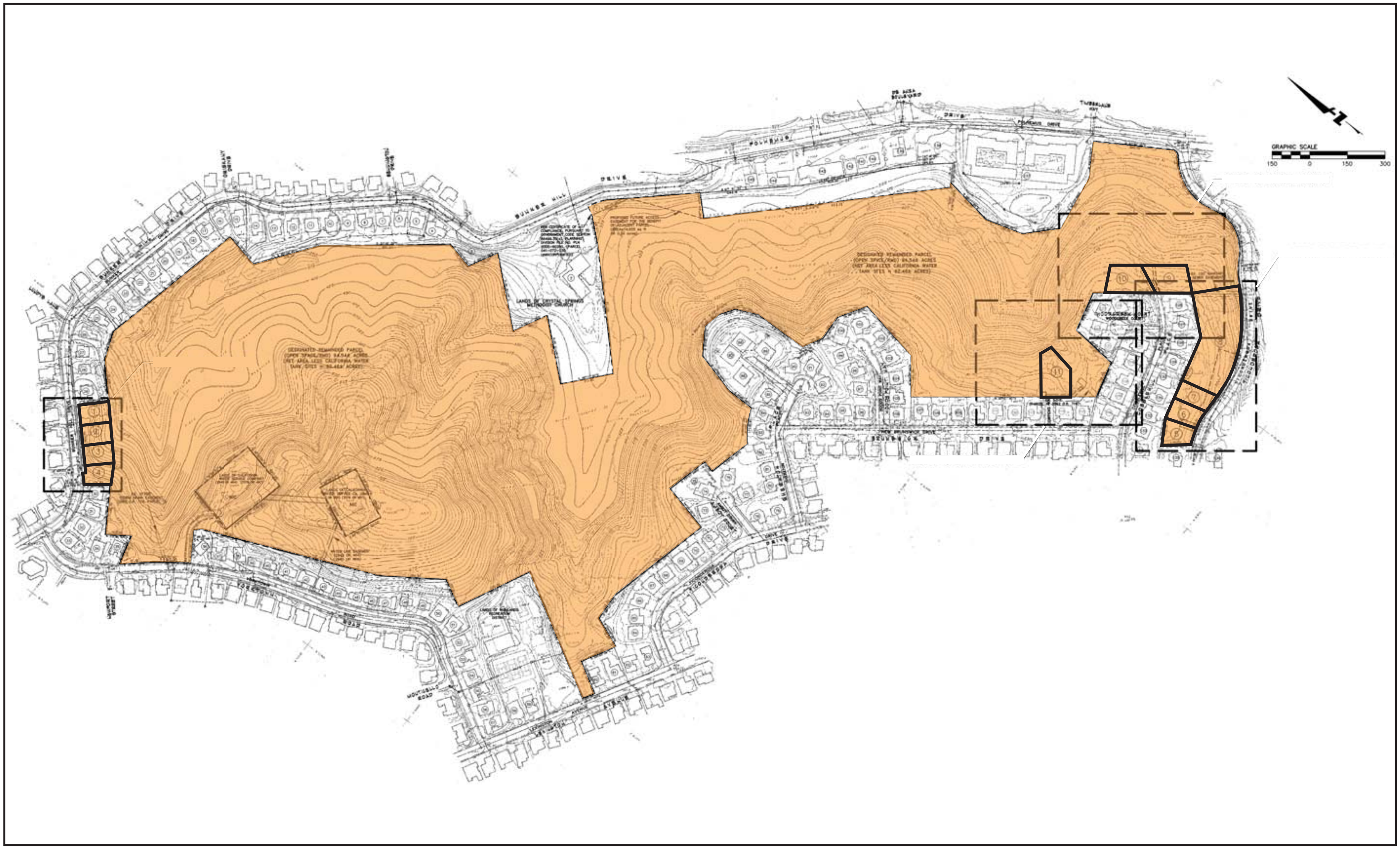
Highland Estates

PROJECT LOCATION AND STUDY AREA

FIGURE 1



Highland Estates

PROPOSED PROJECT SITE PLAN

FIGURE 2

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STUDY INTERSECTIONS, EXISTING LANE CONFIGURATIONS, AND TRAFFIC CONTROLS

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FIGURE 3

TABLE 1A SIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS USING AVERAGE CONTROL VEHICULAR DELAY

Level of Service	Description	Control Delay per Vehicle (Seconds)
A	Operations with very low delay occurring with favorable progression and/or short cycle length.	≤ 10.0
B	Operations with low delay occurring with good progression and/or short cycle lengths.	> 10.0 to 20.0
C	Operations with average delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures begin to appear.	> 20.0 to 35.0
D	Operations with longer delay due to a combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop and individual cycle failures are noticeable.	> 35.0 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	> 55.0 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to over-saturation, poor progression, or very long cycle lengths.	> 80.0

Source:Transportation Research Board *Highway Capacity Manual (HCM 2000)*, 2000.

TABLE 1B UNSIGNALIZED INTERSECTION LEVEL OF SERVICE DEFINITIONS USING AVERAGE CONTROL VEHICULAR DELAY

Level of Service	Description	Control Delay per Vehicle (Seconds)
A	Little or no delays.	0 to 10.0
B	Very light congestion; short traffic delays.	> 10.0 to 15.0
C	Light congestion; average traffic delays.	> 15.o to 25.0
D	Significant congestion on critical approaches, but intersection is functional. Moderate to lengthy traffic delays.	> 25.0 to 35.0
E	Severe congestion with some longstanding queues on critical approaches. Extremely long traffic delays	> 35.0 to 50.0
F	Extreme congestion, with very high delays and lengthy queues unacceptable to most drivers.	> 50.0

Source:Transportation Research Board *Highway Capacity Manual (HCM 2000)*, 2000.

REGULATORY FRAMEWORK

This study adheres to the requirements set forth in documents prepared by the County of San Mateo and other governing entities for the identified study locations. Relevant policy goals, guidelines, and objectives adopted by this jurisdiction are provided below.

San Mateo County General Plan

San Mateo County adopted the latest *San Mateo County General Plan* in November 1986. As of August 2008, no updates to the General Plan have been made. The Transportation Element of the *1986 San Mateo County General Plan* includes outlines of the following policies that address circulation and land use, roadways, transit services, rail service, and non-motorized transportation:

- Encourage the cities and Caltrans to develop an adequate circulation system, including bikeways, to serve new development east of Highway 101 and which, to the maximum extent feasible, does not adversely affect baylands or wetlands.
- In unincorporated areas, plan to provide:
    - Maximum freedom of movement and adequate access to various land uses;
    - Improved streets, sidewalks, and bikeways in developed areas;
    - Minimal through traffic in residential areas;
    - Routes for truck traffic which avoid residential areas and are structurally designed to accommodate trucks;
    - Access for emergency vehicles;
    - Bicycle and pedestrian travel;
    - Access by physically handicapped persons to public buildings, shopping areas, hospitals, offices, and schools;
    - Routes and turnouts for public transit;
    - Parking areas for ridesharing; and
    - Coordination of transportation improvement with adjacent jurisdictions.
- Encourage SamTrans to continue to work toward improving service levels on both local and mainline routes through reevaluation and expansion of routes, increased service to the Coastside, provision of more satellite parking facilities, and evaluation of smaller buses for local routes.
- Encourage the cities to develop local bikeway plans, obtain funding, and construct and maintain a system of local bikeways that is consistent with the County Bikeways Plan.
- Support the development of bicycle trails in rural and Coastal areas.
- Encourage the provision of safe and adequate pedestrian paths in new development connecting to activity centers, schools, transit stops, and shopping centers.

Countywide Transportation Plan 2010

The San Mateo Countywide Transportation Plan 2010, published in 2001, outlines the following policies, which address circulation and land use, transit, bikeways, and pedestrian ways:

Transit:

- Increase transit system capacity.
- Increase transit system performance (i.e. reliability, convenience, comfort, safety).
- Increase integration of transit system modes (i.e. connections, linkages, transfers, passes).

Bicycles:

- Increase the use of bicycles as a travel mode by developing a comprehensive bikeway system which effectively connects residential areas to employment centers, retail centers, transit stations, and institutions.
- Develop a bikeway system which is fully integrated with other transit modes (i.e. connections to Caltrain, bicycle lockers).
- Provide more incentives for integrating bicycle and transit modes.

Pedestrians:

- Encourage cities to promote land use patterns and developments that make walking a viable and inviting mode of travel.
- Encourage cities to identify locations where pedestrian movement is dangerous and make appropriate improvements.

City/County Association of Governments of San Mateo County (C/CAG)

The City/County Association of Governments of San Mateo County (C/CAG) serves as the countywide transportation planning body for the incorporated and unincorporated areas of San Mateo County. C/CAG acts as the County's Congestion Management Agency, and is responsible for preparing and enforcing the *Congestion Management Program*, which is a long-range development plan created to establish a procedure to alleviate or control anticipated increases in roadway congestion and to ensure that public and private partnerships are formed to implement comprehensive response strategies.

San Mateo County Transportation Authority

The San Mateo County Transportation Authority (SMCTA) is an independent agency established in 1988 to administer a half-cent sales tax created by Measure A. "Measure A included a specific expenditure plan with a broad spectrum of projects and programs, including Caltrain upgrades and improvements, highway and street projects, 20% allocation for local streets and roads and paratransit service for people with disabilities. The Transportation Authority also has allocated funding for transportation systems management programs, aimed at reducing traffic through various means, including funding for a countywide bicycle map.

Whenever possible, the Authority staff has worked to use Measure A dollars as leverage to attract matching state and federal funds. These funding partnerships have led naturally to partnerships with city, county, state and federal staffs in designing and constructing projects."[2]

Caltrans

The California Department of Transportation (Caltrans) is responsible for the maintenance and operation of state routes and highways. Within the project study area, Caltrans' facilities include I-280 and SR92. Caltrans maintains a volume monitoring program and reviews local agencies' planning documents to assist in its forecasting of future volumes and congestion points. The *Guide for the Preparation of Traffic Impacts Studies* (January 2001), published by Caltrans, is intended to provide a consistent basis for evaluating traffic impacts to State facilities. According to this document, Caltrans strives to maintain service levels on State facilities at the transition between LOS C and LOS D. In cases where this LOS is not feasible, the lead agency should consult with Caltrans to establish an appropriate LOS threshold. If an existing state highway facility is operating worse than the appropriate target LOS, the existing MOE should be maintained.

As SR92 is a Caltrans facility, Caltrans has ultimate jurisdictional control over the SR92 westbound and eastbound ramps, which are two of the study intersections.

Metropolitan Transportation Commission

The Metropolitan Transportation Commission (MTC) serves as the transportation planning, coordinating, and financing agency for the nine-county San Francisco Bay Area. The MTC created and maintains the Metropolitan Transportation System (MTS), a multimodal system of highways, major arterials, transit services, rail lines, seaports, airports, and transfer hubs that are critical to regional transportation between the nine Bay Area counties. MTS facilities within the study area include I-280 and SR92. The MTS is incorporated into MTC's *2001 Regional Transportation Plan* (RTP), and is used as a guideline in prioritizing for planning and funding of facilities in the Bay Area. Facilities included in the MTS provide access to major Bay Area activity centers, supply convenient and efficient connections, and/or provide alternative routes or modes for congested areas or regions with limited facilities.

STANDARDS OF SIGNIFICANCE

Under the County CEQA Guidelines, development of the project site as proposed would have a significant impact to traffic and circulation if it were to result in:

- a noticeable change in vehicular traffic patterns or volumes (including bicycles)
- an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)
- an increase in traffic hazards OR substantial increase in hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)
- a failure to provide for alternative transportation amenities such as bike racks
- traffic which will adversely affect the traffic carrying capacity of any roadway

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[2] The San Mateo County Transportation Authority website: http://www.smcta.com/TAvision.asp

Level of Service Standards

For the proposed project, the impacts on the local and regional roadway system are described in terms of change in LOS and average intersection delay. The LOS standards established for San Mateo County vary by roadway segment, and in some cases, by intersection.

Per the C/CAG Policy on Traffic Impact Analysis (2006), a project is considered to have a significant impact if it meets one or more of the following criteria:

- If the project will cause an intersection currently in compliance with the adopted LOS standard to operate at a level of service that violates that standard.
- If the cumulative analysis indicates that the combination of the proposed project and future cumulative traffic demand will result in an intersection currently in compliance with the adopted LOS standard to operate at a level of service that violates that standard and the proposed project increases average control delay at the intersection by four (4) seconds or more.
- If the project will add any additional traffic to an intersection that is currently not in compliance with its adopted level of service standard as established in the CMP.

According to the *CMP*, adopting LOS standards based on geographic differences helps to prevent future congestion levels from getting worse than anticipated at the time the *CMP* was published. As none of the project study intersections are specifically included in the list of CMP intersections, the adopted LOS standard for similar facilities in the study area was implemented; LOS D.

Alternative Transportation Standards

Based on guidelines set forth in Appendix G – Environmental Checklist Form of the CEQA Guidelines, development of the project site would have a significant impact alternative mode circulation if it were to result in:

- Conflicts with adopted policies, plans, or programs supporting alternative transportation.

2.EXISTING CONDITIONS

This chapter provides a description of the existing transportation and circulation conditions within the vicinity of the proposed project site.

STUDY AREA

The project site is located in unincorporated San Mateo County, California, bordered by the communities of Hillsborough, Belmont, and the City of San Mateo. The Highlands, known for its scenic views of the Santa Cruz Mountains to the west and the San Francisco Bay to the east, is bordered on the west by I-280, on the south by SR92, on the east by Polhemus Road, and on the north by Crystal Springs Road. Built in the 1950s as a working class neighborhood, most of the homes in the Highlands were built by developer Joseph Eichler. Inspired by the architecture of Frank Lloyd Write, Eichler designed most of the homes in a Modernist style that is today known as "California Modern." Today there are approximately 800 homes within the Highlands neighborhood. In addition, San Mateo County Transit (SamTrans) runs two bus lines within the project study area, connecting the area with the nearby College of San Mateo, the Laurelwood Shopping Center, and the city of San Mateo.

ROADWAY NETWORK

This section describes the local roadway system near the project site. The Circulation Element of the *San Mateo County General Plan* classifies roadways within the County as Expressways, Freeways, and Arterials. The following street classifications (with definitions taken from the *San Mateo County General Plan*) are located within the project vicinity:

Freeways – Divided highways designed for long-distance travel. Normally characterized by large traffic volumes and high-speed travel, freeways have full control of access and are grade-separated at all intersections.

Arterials – Streets or highways that serve major activity centers and carry relatively high volumes of traffic, with average travel speeds of 25 to 45 miles per hour (MPH). Because of high traffic volumes, a primary function of arterial roadways is to minimize interruptions to traffic flow.

Local Streets – Roadways designed to serve only adjacent land uses and are intended to protect residents from through traffic impacts. New multi-family residential and commercial development should not have primary access on local streets, except where there is no feasible alternative.[3]

<u>Freeways</u>

Interstate 280 (I-280) is a major north-south freeway located west of the project site that extends between San Jose and San Francisco and varies between six and twelve lanes. The freeway intersects with SR92 southwest of the project site. Project access to I-280 would be obtained via Polhemus Road and SR92 to the south or via Bunker Hill Drive to the north.

State Route 92 (SR92) is an east-west freeway that extends from downtown Hayward (to the east) to Half Moon Bay (to the west). Within the project study area, this roadway is a divided four- to six-lane highway with interchanges at DeAnza Boulevard, Polhemus Road, and I-280. To the east, this highway includes the 7-mile San Mateo-Hayward Bridge, after which it becomes Jackson Street.

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[3] This roadway type was not identified in the County General Plan; because there are many local streets within the study area, Fehr & Peers included this roadway type and obtained the definition from the Circulation Element of the *(City of) San Mateo General Plan.*

Arterials

Polhemus Road is a two-lane north-south arterial roadway located on the eastern edge of the project site. South of SR92, this roadway curves eastward to become Ralston Avenue. North of its intersection with Bunker Hill Road, Polhemus Road becomes Crystal Springs Road, eventually curving eastward to terminate at El Camino Real in the City of San Mateo. This roadway has Class II bicycle lanes in each direction, and between DeAnza Boulevard and Bunker Hill Road, it has a shared center left turn lane as well as sidewalks on each side. The posted speed limit is 35 MPH.

Local Streets

Bunker Hill Drive is a winding two-lane arterial roadway that extends in a general east-west direction from Polhemus Drive to Skyline Boulevard, just west of I-280. This roadway serves the residential community directly north of the project site and provides a direct connection to I-280. There are intermittent sidewalks from Polhemus Road to Lexington Avenue and on-street parking in both directions, but no bicycle facilities. The posted speed limit is 30 MPH.

Ticonderoga Drive is a winding, two-lane east-west roadway that borders the southern edge of the project site. This roadway extends from Polhemus Road to Lexington Avenue, and serves the residential community directly west of the project site. Ticonderoga Drive as on-street parking in both directions, but it has no pedestrian or bicycle facilities. The posted speed limit is 25 MPH.

DeAnza Boulevard is a four-lane undivided roadway that runs in a general east-west direction from Polhemus Road to West Hillsdale Boulevard, intersecting with SR92. The eastern portion of this roadway becomes Glendora Boulevard. Primarily a residential collector street, DeAnza Boulevard has no median, but it does have sidewalks and Class II bicycle lanes in both directions east of SR92. On-street parking is allowed on the southern side. The posted speed limit is 30 MPH.

INTERSECTION LEVELS OF SERVICE

Weekday morning and evening peak hour intersection turning movement counts were compiled during the AM (7:00 AM to 9:00 AM) and PM (4:00 PM to 6:00 PM) peak periods at the three study intersections. Counts used in this analysis were collected on August 28, 2008 while school was in session. The two ramp-terminal study intersections are signal controlled, while the Polhemus Road/DeAnza Boulevard intersection is all-way stop-controlled.

The peak hour intersection turning movement counts indicate that the AM peak hour generally occurs between 7:30 and 8:30, while the PM peak hour generally occurs between 5:00 and 6:00 PM near the study area, although individual intersections may vary slightly.

Figure 4 presents existing AM and PM peak hour traffic volumes.

Levels of service were calculated at each study intersection for the weekday AM and PM peak hour (see Appendix A for detailed LOS calculations). Table 2 lists the resulting LOS and corresponding delay at each study intersection. As shown in Table 2, all of the study intersections operate acceptably during both peak hours.

TABLE 2
INTERSECTION LEVEL OF SERVICE – EXISTING CONDITIONS

Intersection	Control[1]	AM Peak Hour		PM Peak Hour	
		Delay [2]	LOS [3]	Delay [2]	LOS [3]
1. Polhemus Road/DeAnza Boulevard	AWSC	11	B	12	B
2. Polhemus Road/SR92 Westbound Ramps	Signal	29	C	12	B
3. Polhemus Road/SR92 Eastbound Ramp	Signal	19	B	19	B

1 Signal = Signalized intersection
AWSC = All-Way Stop-Controlled intersection
2 Delay reported in seconds per vehicle calculated using the methodology defined in the 2000 *Highway Capacity Manual*. For signalized and all-way stop-controlled intersections, total average intersection delay is reported.
3 LOS = Level of Service

Source: Fehr & Peers, 2008

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Highland Estates

PEAK HOUR TURNING MOVEMENT VOLUMES- EXISTING CONDITIONS

FIGURE 4

TRANSIT NETWORK

Transit service in San Mateo County is provided by Bay Area Rapid Transit (BART), Caltrain, and the San Mateo County Transit District (SamTrans). BART provides heavy rail public transit service to cities in the east, north, and south bays. The BART system consists of five rail lines, with average weekday and weekend headways of fifteen and twenty minutes, respectively. The BART station nearest the project site is located on North Rollins Road in the City of Millbrae, approximately nine miles from the project site.

Caltrain is a commuter rail that operates on the Peninsula as well as in the Santa Clara Valley, with its northern and southern termini located in San Francisco and Gilroy, respectively. Caltrain is currently operated under contract by Amtrak and is funded jointly by the City and County of San Francisco, SamTrans, and the Santa Clara Valley Transportation Authority through the Peninsula Corridor Joint Powers Board. A mix of local, limited, and express trains operate out of San Francisco and San Jose on an approximately half-hourly basis during the week (with more-frequent service during commute hours) and less frequently at night and on weekends and holidays. The Caltrain station nearest the project site is located near the intersection of SR92/Concar Drive, approximately four miles from the proposed project site.

SamTrans is a fixed-route bus service providing service to the cities of Daly City, South San Francisco, San Bruno, Pacifica, Millbrae, Burlingame, San Mateo, Foster City, Belmont, San Carlos, Redwood City, North Fair Oaks, and other parts of unincorporated San Mateo County. Intercity and express service is also provided between San Mateo County cities and San Francisco to the north, and Menlo Park and Palo Alto to the south. Service is also provided during special events, such as the annual Bay to Breakers race in San Francisco. In general, SamTrans operates seven days a week, with some stops at BART and Caltrain stations.

Transit routes that serve the project vicinity are illustrated on Figure 5, and are described below:

SamTrans Route 53 provides bus service between the City of San Mateo and the Highlands Recreation Area on Bunker Hill, with stops at the College of San Mateo, Crystal Springs Shopping Center, and near the Laurelwood Shopping Center. Near the project site, Route 53 travels on Bunker Hill Drive, Polhemus Road, and DeAnza Boulevard. Project-adjacent bus stops are located at the intersections of Newport Street/Monticello Road and Timberlane Way/Kings Lane, approximately 250 feet and 700 feet from the project site, respectively. This route runs on school days only from 7:15 AM to 8:00 AM and from 1:00 PM to 3:20 PM.

Source: http://www.samtrans.com/bikes.html

SamTrans Route 58 provides bus service between the City of San Mateo and the Highlands area, with stops at the Laurelwood Shopping Center, the College of San Mateo, the Crystal Springs Shopping Center, and the Highlands Recreation Center. Near the project site, Route 58 travels on Ticonderoga Drive, Lexington Avenue, Bunker Hill Drive, Polhemus Road, and DeAnza Boulevard. Project-adjacent bus stops are located at the intersections of Ticonderoga Drive/Allegheny Way, Yorktown Road/Bunker Hill Drive, Polhemus Road/Tower Road, and Polhemus Road/DeAnza Boulevard are approximately 170 feet, 370 feet, 800 feet, and 960 feet from the project site, respectively. Route 58 runs on school days only from 7:10 AM to 7:30 AM and from 1:00 PM to 3:20 PM.

Source: http://www.samtrans.com/rwguide.html

Redi-Wheels and *RediCoast* provide paratransit services throughout San Mateo County. Paratransit service within San Mateo County is a reservation-based bus transit system designed for older and/or disabled individuals who cannot independently use regular bus service either some or all of the time. Redi-Wheels serves the portion of the County east of I-280 along with the towns of Woodside and Portola Valley, while RediCoast serves the remaining areas.

Redi-Wheels operates seven days a week (including holidays) from 5:30 AM to midnight, and up to 24 hours a day in some areas.

BICYCLE AND PEDESTRIAN NETWORK

The County's bikeway system consists primarily of on-street designated bike routes without lane striping (Class III facility) and some on-street bike lanes (Class II facility) within the study area. Overall, the County's bicycle route network is well-connected in the study area, providing facilities throughout the County and through the hills and coastal regions to the west. Primary bicycling routes include Old County Road, Alameda De Las Pulgas and San Mateo Drive in the north-south direction. Crystal Springs Road, Hillsdale and Ralston Drive, form the primary east-west routes.

The *San Mateo County Bicycle Route Plan (2000)* addresses issues related to safety, access, quality of life, and the effective implementation of bikeways within the County. It outlines a general set of policies, goals, and objectives designed to reinforce existing general, bicycle, and regional plans for al the cities within the County.

The *San Mateo County Bicycle Route Plan* includes the following goals:

> <u>Planning</u>: Develop a process to plan, design, implement, and maintain bicycle infrastructure in San Mateo County.
>
> <u>Community Involvement</u>: Encourage public participation through local coordination with County staff.
>
> <u>Opportunities</u>: Build upon the existing bikeway system and programs in San Mateo County.
>
> <u>Facility Design</u>*:* Develop a countywide bicycle system that meets the needs of commuter and recreational users, helps reduce vehicle trips, and links residential neighborhoods with local and regional destinations.
>
> <u>Multi-Modal Integration:</u> Maximize multi-modal connections to the bicycle system.
>
> <u>Safety and Education:</u> Improve bicycle safety conditions in San Mateo County.
>
> <u>Phasing</u>: Develop detailed and ranked improvements in the Comprehensive Bicycle Route Plan.
>
> <u>Support Facilities and Programs</u>: Develop a coordinated strategy to develop support facilities and programs in San Mateo County.
>
> <u>Funding</u>: Maximize the amount of state and federal funding for bicycle improvements that can be received by San Mateo County.
>
> <u>Implementation and Maintenance</u>: Anticipate impacts of future developments along existing and proposed bicycle improvements.

As shown on Figure 6, per the County's Bicycle Route Plan, there are dedicated bicycle lanes or routes on key roadways within the study area. Class II bicycle lanes exist in both directions on Polhemus Road, extending from Crystal Springs Road in the north to just south of SR92. Class II bicycle facilities also exist on DeAnza Boulevard from SR92 to Glendora Drive. A bicycle lane is provided only on the north side of the roadway between SR92 and Sugarloaf Drive; after Sugarloaf Drive, lanes exist on both sides of the roadway. Class III bicycle routes are provided on Skyline Boulevard and Crystal Springs Road. Both of these roadways have shoulders wide enough to accommodate bicycle traffic in both directions.

The bicycle map included in the City of San Mateo's *General Plan* indicates that a bicycle lane has been proposed for the portion of DeAnza Boulevard between its intersections with Polhemus Road and SR92. A Class I Bicycle Path has also been proposed for the residential area directly east of Polhemus Road; the off-street path would wind through the hills north of DeAnza Boulevard, then loop around through Laurelwood Park before terminating at Ralston Avenue.

Pedestrian facilities within the study area consist of sidewalks, crosswalks, outdoor pedestrian seating, and pedestrian signal push button and curb ramps.

Sidewalks are generally provided on both sides of the streets in the study area with the exception of a few locations. The provided sidewalks and the signalized intersections generally provide adequate access between the local neighborhoods and pedestrian activity areas.

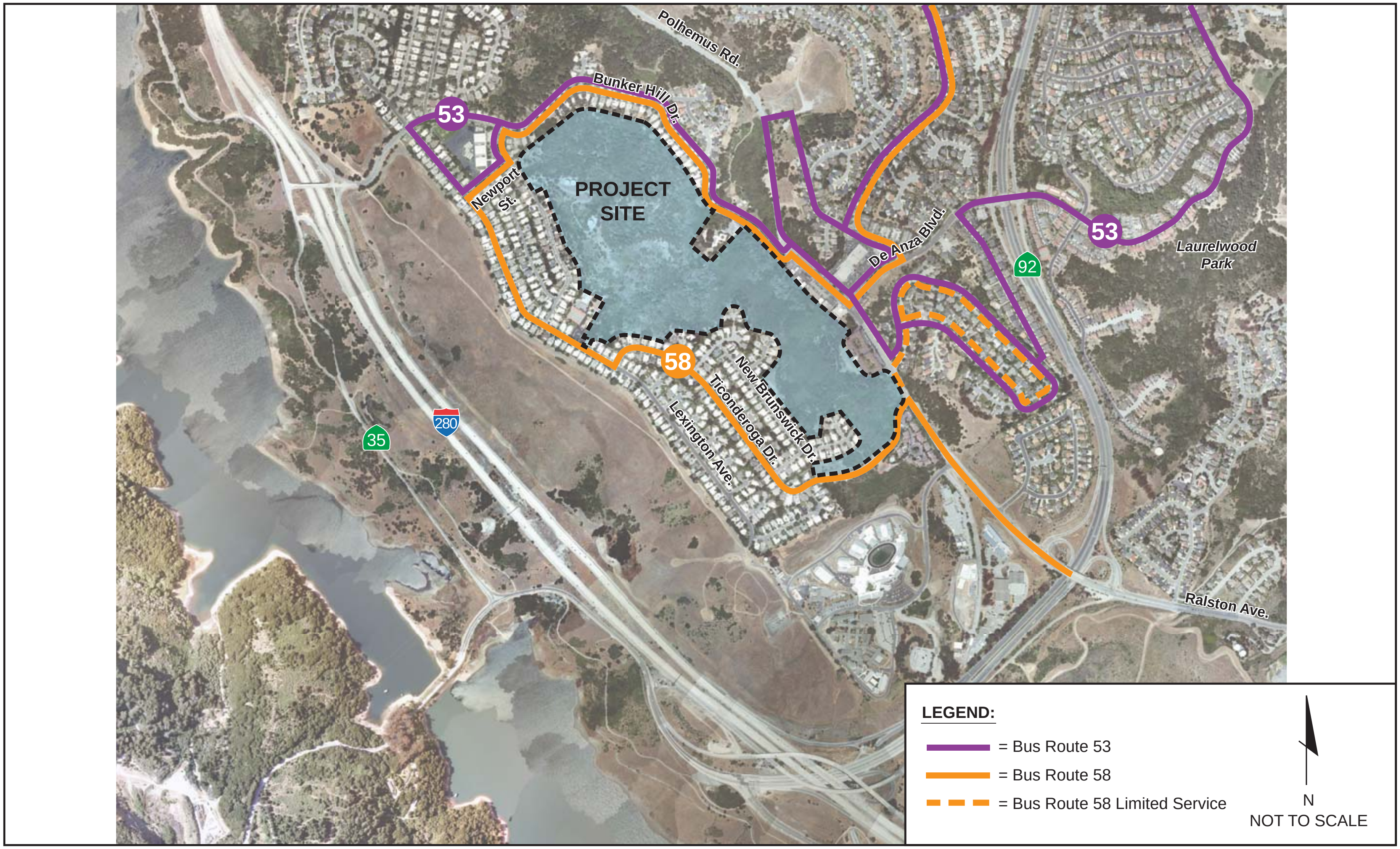
Pedestrian facilities on Polhemus Road consist of intermittent sidewalks on both sides of the road. At the southwestern corner of the Polhemus Road/DeAnza Boulevard intersection, the sidewalk gives way to a six-foot wide gravel path, which continues along the western side of Polhemus Road for approximately 200 feet. In between the signalized intersections, the existing gravel path connects to a paved sidewalk; however, no curb ramp is provided (see photo below). Intermittent sidewalks also exist on both sides of DeAnza Boulevard and Bunker Hill Drive, while no pedestrian facilities are provided on Ticonderoga Drive.

Crosswalks are provided on certain legs of each study intersection; however, at the intersections of Polhemus Road/SR92 Eastbound and Westbound Ramps, they are not well-marked. In addition, the distance between pedestrian crossing locations in this area is fairly substantial, making it difficult for pedestrians to cross at desired locations without doing so illegally. At the signalized study intersections, pedestrian facilities include crosswalks, sidewalks, pedestrian push buttons, pedestrian signal heads, and curb ramps.

Bicycle lanes on Polhemus Road.

Sidewalk with no curb ramp on SR92 Overpass, between the signalized study intersections

Pedestrian seating on northeast corner of Polhemus Road/DeAnza Boulevard



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TRANSIT NETWORK

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FIGURE 5

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BICYCLE NETWORK

FIGURE 6

NEAR TERM CONDITIONS

No major development projects that would influence travel patterns within the study area are planned within the time the proposed project would be constructed. The SFPUC has three utility projects scheduled in and around the project study area that may temporarily influence travel patterns due to construction. The construction projects are temporary and will have no permanent implications to travel behavior. Per the SFPUC Peninsula Projects Traffic Management Plan (revised May 14, 2008), under concurrent construction conditions, all study roadways should continue to operate without significant increase in traffic. The projects are described below.

New Crystal Springs Bypass Tunnel

The New Crystal Springs Bypass Tunnel is being constructed to provide redundancy to the existing Crystal Springs Bypass Pipeline. This pipeline is a critical link in the transmission system, transmitting water from the East Bay to the Peninsula and City of San Francisco. The pipeline is located below a hillside along Polhemus Road in the unincorporated area of San Mateo County. The soils in this area are subject to failure in a major seismic event.[4]

This construction will require closing the eastbound traffic lane on Polhemus Road for a duration of 18 months. It is anticipated about 3 peak hour truck trips will be generated from the construction site. This will divert traffic away from the study area while construction is occuring

Lower Crystal Springs Dam/Bridge Improvements

The purpose of this project is to make necessary improvements to the Lower Crystal Springs Dam so that it can safely pass the Probable Maximum Flood event, thereby allowing the ability to restore the maximum operating elevation of the reservoir. This requires reconstructions of the spill gates and the bridge crossing the dam.[4] The dam is located along Skyline Boulevard, just south of Crystal Springs Road. Skyline Boulevard runs parallel to I-280.

The County has developed a traffic detour plan for the construction closure and traffic may divert through the study area during construction closures. At the height of construction, 50 peak hour truck trips will be produced at the construction location during the peak hours. The temporary increases in traffic in the study area is not expected to strain the study intersections beyond acceptable operations. The planned start of construction is in 2009 with completion expected in 2012.

Crystal Springs Pipeline No. 2 Replacement

Crystal Springs Pipeline No. 2 extends from a point near the Crystal Springs Pump Station (CSPS) in unincorporated San Mateo County to the University Mound Reservoir in San Francisco. The purpose of the project is to improve seismic reliability of the pipeline.[4] Various improvements will be made along the length of the pipeline, which may require temporary construction-related road closures.

Construction is planned to be intermittent between 2009 and 2011. It is anticipated, during construction hours only, the work will require closing one travel lane and converting the other lane to a reversible lane with a flag person. It is expected that about 10 to 15 peak hour truck trips will be generated during construction.

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[4] Description from SFPUC website - http://sfwater.org/Project.cfm/PRJ_ID/124 - and the Traffic Management Plan (TMP) SFPUC Peninsula Projects (May 14, 2008)

3.EXISTING WITH PROJECT CONDITIONS

This chapter describes the vehicle, pedestrian, bicycle, and transit impacts the proposed project is expected to have in the study area. The amount of new traffic associated with the proposed project was estimated using a three-step process: 1) trip generation; 2) trip distribution; and 3) trip assignment. In the first step, the amount of traffic generated by the project was estimated for the AM and PM peak hours. In the second step, the geographic distribution of project-related traffic was predicted based on existing travel patterns and knowledge of the study area. In the final step, project trips were assigned specific routes on the roadway network to reach their final destinations. The results of the three-step process are described in the following sections.

PROJECT TRIP GENERATION

Project trip generation is the number of trips generated by the proposed project. As the existing site is undeveloped and therefore currently generates no vehicle trips, all trips generated by the proposed project are considered new trips to the area.

Trip generation rates used to analyze the proposed project were obtained from the 7th Edition of *Trip Generation,* published by the Institute of Transportation Engineers (ITE). The average trip generation rates published for single-family dwellings were used. As shown in Table 3, the proposed project would generate 108 daily trips, 13 AM peak hour trips, and 15 PM peak hour trips.

TABLE 3
VEHICLE TRIP GENERATION – HIGHLAND ESTATES

Land Use	Size	Unit	Daily Trips	AM Peak Hour Trips				PM Peak Hour Trips			
				Rate[1]	Total	In	Out	Rate	Total	In	Out
Single Family Residential	11	DU[2]	108	0.75	8	2	6	1.01	11	7	4

Notes:
[1]The trip generation rates used were obtained from *Trip Generation*, 7th Edition (ITE).
[2]DU = Dwelling Units
Source: Fehr & Peers, 2008.

TRIP DISTRIBUTION AND ASSIGNMENT

Trip distribution and assignment involves assigning project-generated vehicle trips to general regional destinations and origins using specific travel routes. The assigned travel routes provide the vehicle turning movement data needed to identify the project's impacts on vehicle LOS at the study intersections. Project-related trips were geographically assigned based on distribution percentages determined from existing traffic volume data and travel patterns. Figure 7 shows the trip distribution and the resulting peak hour traffic volumes at each study intersection.

INTERSECTION LEVEL OF SERVICE

Level of service was calculated at each study intersection for the weekday AM and PM peak hours with the addition of project-generated traffic. Table 4 below lists the resulting LOS and the corresponding delay at each study intersection. As shown in the table, intersection delay and level of service would not be exacerbated by the addition of project-related traffic. LOS at each study intersection would continue to operate acceptably during both peak hours under the Existing Plus Project scenario.

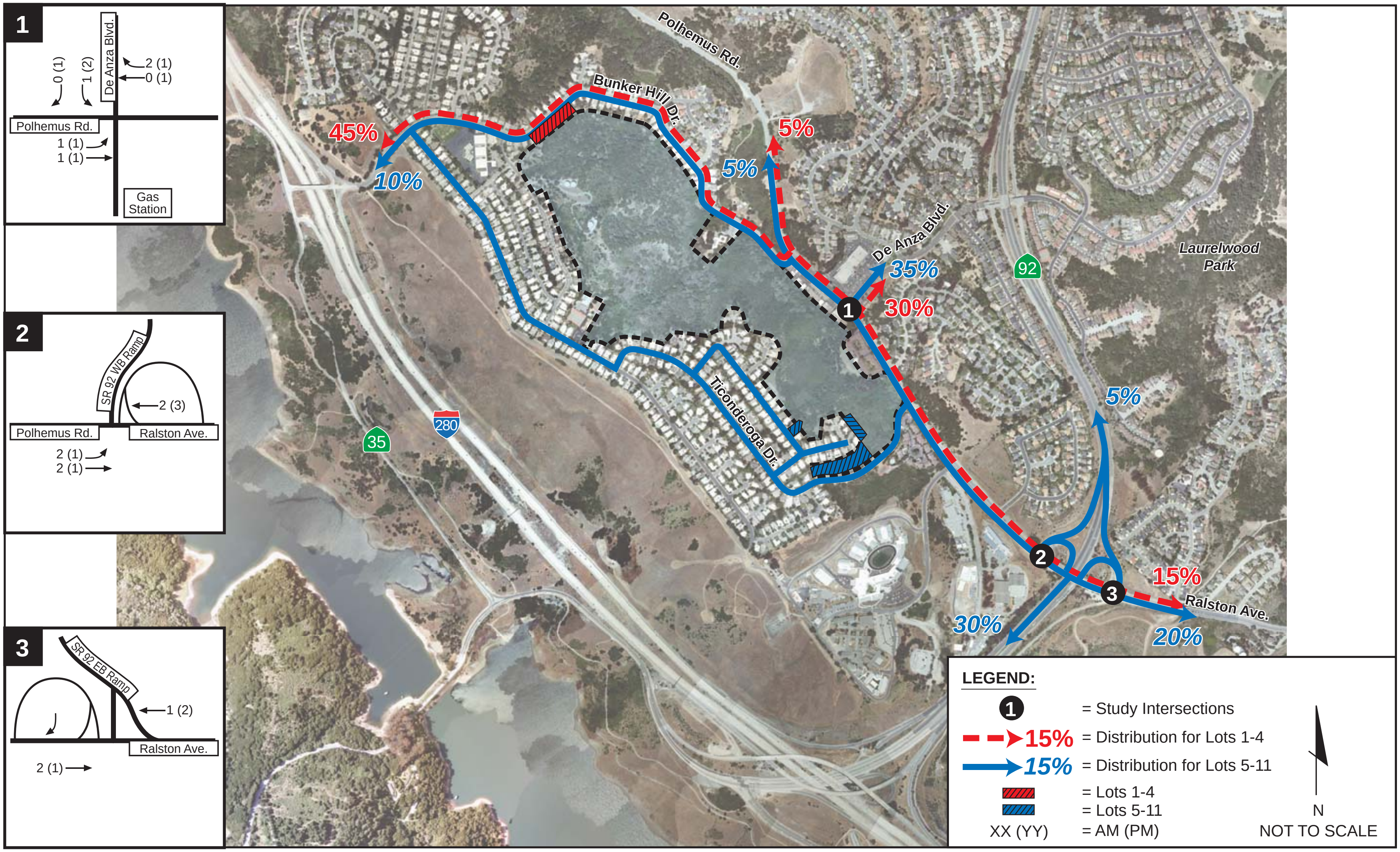
TABLE 4
INTERSECTION LEVEL OF SERVICE – EXISTING WITH PROJECT CONDITIONS

Intersection	Control[1]	Delay/LOS (Seconds/Vehicle)[3]							
		Existing Conditions				Existing With Project Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay[2]	LOS	Delay[2]	LOS	Delay[2]	LOS	Delay[2]	LOS
1. Polhemus Road/DeAnza Boulevard	AWSC	11	B	12	B	11	B	12	B
2. Polhemus Road/SR92 Westbound Ramps	Signal	29	C	12	B	29	C	12	B
3. Polhemus Road/SR92 Eastbound Ramp	Signal	19	B	19	B	19	B	19	B

Note: **Bold** indicates unacceptable operations (LOS D or worse).
[1] Signal = Signalized intersection AWSC = All-Way Stop-Controlled intersection
[2] Delay reported in seconds per vehicle calculated using the methodology defined in the 2000 *Highway Capacity Manual*. For signalized and all-way stop-controlled intersections, total average intersection delay is reported..
[3] LOS = Level of Service
Source: Fehr & Peers Associates, 2008

IMPACT ASSESSMENT

Due to the minimal amount of traffic introduced by the proposed project, intersection delay at the study intersections would not be exacerbated. According to the significance criteria, this is considered a ***less-than-significant*** impact.



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PEAK HOUR PROJECT TRIP GENERATION AND DISTRIBUTION

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FIGURE 7

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PEAK HOUR TURNING MOVEMENT VOLUMES-
EXISTING WITH PROJECT CONDITIONS

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FIGURE 8

Transit Impacts

The assessment of project-related transit impacts evaluates two primary factors: whether the project would increase demand for transit services beyond the existing supply, and whether the project would generally be consistent with the County policy of encouraging transit ridership and non-motorized forms of transportation. According to the 2000 Census,[5] 10% of San Mateo County residents ride public transit to work. Given the relatively low-density land use patterns in unincorporated San Mateo County, and the relatively low number of residential units in the proposed project, the proposed project is not likely to generate transit ridership demand beyond what the existing transit system can accommodate.

Given the location of the proposed project near two bus routes with nearby stops, the project is consistent with the County's policy of encouraging transit ridership as well as non-motorized forms of transportation. The bus stop nearest the eastern portion of the project site is located on Polhemus Road, approximately ¼-mile from Lots 5 – 11, while the bus stop nearest the western portion of the project site is located on Newport Street adjacent to Highland Elementary School, less than ¼-mile from Lots 1 through 4. The low number of residential units that comprise the proposed project, along with the separation between the clusters of proposed units, contribute to the expectation that the project would have a ***less-than-significant*** impact on the existing transit system.

Bicycle and Pedestrian Impacts

Class II bicycle lanes are currently provided on Polhemus Road adjacent to the project's northern border, as well as on portions of DeAnza Boulevard. It is not clear from the site plan whether additional provisions would be afforded to bicyclists within and around the project site; however, existing bicycle facilities are expected to sufficiently accommodate bicycle traffic into and out of the project site. In addition, the proposed project would not interfere with existing or proposed bicycle facilities, and would not contradict the goals set forth in the *2010 Countywide Transportation Plan*. Therefore, the project's impacts to existing bicycle facilities are considered a ***less-than-significant*** impact

Due to the generally suburban location of the proposed project, it is likely that the project would generate a lower portion of pedestrian traffic than if it were located in a more densely developed, pedestrian-oriented environment. Existing pedestrian facilities surrounding Lots 1 through 4 on the project site, which include sidewalks in both directions, are expected to adequately accommodate expected increases in pedestrian traffic and provide accessible routes to transit stops. Adjacent to Lots 5 through 11 on the project site, no sidewalks exist in either direction of Ticonderoga Drive, while intermittent sidewalks exist on the south side of Polhemus Road toward SR92. Even if the proposed project included pedestrian facilities along the project frontage, an accessible route to transit facilities would not be available to residences. The number of dwelling units proposed by the project in this location would not generate a sizeable transit demand, but it should be noted that an accessible path is not available. The project's impacts on pedestrian facilities are therefore expected to be a ***less-than-significant*** impact

[5] Table 5-1 San Mateo County Employed Residents (Mode of Transportation to Work)" *Congestion Management Plan*, C/CAG, 2007.

4.CUMULATIVE (YEAR 2030) CONDITIONS

In addition to evaluating the potential project-generated impacts to existing traffic operations, this analysis examined the potential cumulative impacts to the study intersections. Cumulative Conditions (Year 2030) turning movement forecasts for the study intersections were developed using a combination of background growth projections, the C/CAG travel demand model, and engineering judgment. The Cumulative (Year 2030) No Project scenario includes only background growth, while the Cumulative (Year 2030) With Project scenario includes project traffic as well as background growth.

To determine the appropriate level of background growth, Fehr & Peers evaluated traffic volume growth forecasted by the C/CAG travel demand model; however, the model was not appropriate for detailed forecasting in this area as required by intersection level analysis. Therefore, projected growth in traffic volumes was evaluated from a global perspective, then area-specific roadway growth and land use development trends were considered. This process yielded a 2% annual growth rate for all turning movements. This is a conservatively high assumption compared to the historical and future annual growth reported by the Association of Bay Area Governments (ABAG). Bay area growth in the past has ranged up to a 1.85% increase in population per year. Future projections, as reported by ABAG Projections 2007, identify an increase of approximately 50% in the next 25 years in employment and employed residents in the Bay Area, and more specifically, San Mateo County.

Cumulative (Year 2030) No Project conditions turning movement forecasts are presented on Figure 9.

Project trips were applied to Cumulative No Project conditions consistent with the process for Existing With Project conditions. Cumulative (Year 2030) With Project conditions turning movement forecasts are presented in Figure 10.

INTERSECTION LEVEL OF SERVICE

Level of service was calculated at each study intersection for the midweek AM and PM peak hour under Cumulative No Project and Cumulative with Project conditions. Table 5 presents the resulting LOS and the corresponding delay at each study intersection under both scenarios.

Cumulative (Year 2030) No Project Conditions

As shown in Table 5, the intersection of Polhemus Road/DeAnza Boulevard operates acceptably during both the AM and PM peak hours. The Polhemus Road/SR92 ramp intersections will operate acceptably during the PM peak hour, but will operate unacceptably during the AM peak hour with average intersection delays of over 80 seconds.

Cumulative (Year 2030) With Project Conditions

Under Cumulative (Year 2030) With Project Conditions, intersection delay and LOS vary slightly from No Project conditions. As shown in Table 5, average intersection delay remains the same at most locations during the AM and PM peak hours; however, note that LOS changes slightly from LOS B to LOS C at the Polhemus Road/DeAnza Boulevard intersection during the PM peak hour due to an increase of a half-second in delay.. Please refer to Appendix A for the detailed LOS calculation worksheets for more information.

Table 6 presents the proposed project's share of total growth and total volume for the year 2030. As shown in the table, the project's contribution to projected traffic growth at each study intersection would be very low, representing an average contribution of less than 1% of overall cumulative growth.

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PEAK HOUR TURNING MOVEMENT VOLUMES-
CUMULATIVE (YEAR 2030) NO PROJECT CONDITIONS

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FIGURE 9

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PEAK HOUR TURNING MOVEMENT VOLUMES-CUMULATIVE (YEAR 2030) WITH PROJECT

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FIGURE 10

TABLE 5
INTERSECTION LEVEL OF SERVICE – CUMULATIVE (YEAR 2030) CONDITIONS

Intersection	Control[1]	Existing Conditions				Cumulative (Year 2030) No Project Conditions				Cumulative (Year 2030) With Project Conditions			
		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
		Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]	Delay[2]	LOS[3]
1. Polhemus Road/ DeAnza Boulevard	AWSC	11	B	12	B	14	B	16	C	14	B	16	C
2. Polhemus Road/SR92 Westbound Ramps	Signal[4]	29	C	12	B	**> 80**	**F**	9	A	**> 80**	**F**	9	B
3. Polhemus Road/SR92 Eastbound Ramp	Signal[4]	19	B	19	B	**> 80**	**F**	41	D	**> 80**	**F**	41	D

Note: **Bold** indicates unacceptable operations (LOS E or worse).

1 Signal = Signalized intersection
AWSC = All-Way Stop-Controlled intersection

2 Delay reported in seconds per vehicle calculated using the methodology defined in the 2000 *Highway Capacity Manual*. For signalized and all-way stop-controlled intersections, total average intersection delay is reported.

3 LOS = Level of Service

4 Intersection signal timing was optimized under Cumulative Conditions. This can potentially yield better operations under Cumulative Conditions than Existing Conditions despite traffic volume increases.

Source: Fehr & Peers Associates, 2008

TABLE 6
PROJECT PERCENTAGE OF CUMULATIVE TRAFFIC VOLUME INCREASE

Intersection	Existing Volume		Cumulative No Project Forecasts		Cumulative With Project Forecasts		Total Growth[1]		Project Traffic		Project % of Total Growth		Project % of Total Volume	
	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM	AM	PM
1. Polhemus Road/DeAnza Boulevard	877	968	1,330	1,470	1,335	1,477	458	509	5	7	1.1%	1.4%	0.4%	0.5%
2. Polhemus Road/SR92 Westbound Ramps	2,266	1,584	3,510	2,450	3,516	2,455	1,250	871	6	5	0.5%	0.6%	0.2%	0.2%
3. Polhemus Road/SR92 Eastbound Ramps	2,826	2,656	4,620	4,100	4,624	4,104	1,798	1,448	4	4	0.2%	0.3%	0%	0%

Note: Total intersection volumes for all turning movements reported,

1 Total growth represents the difference between Existing and Cumulative (With Project) volumes.

Source: Fehr & Peers, 2008.

IMPACT ASSESSMENT

Roadway Network

The proposed project would generate 108 daily, 13 AM peak hour, and 15 PM peak hour total vehicle trips. Under Existing With Project conditions, project-related traffic would not substantially exacerbate vehicle delays at the project study intersections. Under Cumulative (Year 2030) conditions, project-generated trips are expected to contribute to cumulatively-significant intersection impacts, but would account for approximately 0.5% and 0.75% of total AM and PM peak hour growth.

Project related traffic would increase the intersection delay less than 4 seconds. According to the significance criteria, the project would therefore have a *less-than-significant* impact on the roadway network and intersection operations.

Transit Network

Given the location of the proposed project near two bus routes with nearby stops, the project is consistent with the County's policy of encouraging transit ridership as well as non-motorized forms of transportation. The low numbers of residential units that comprise the proposed project, along with the separation between the clusters of proposed units, contribute to the expectation that the existing transit network would adequately accommodate any increases in transit demand generated by the project.

According to the significance criteria, the project would therefore have a *less-than-significant* impact on the existing transit network.

Bicycle and Pedestrian Network

Due to the generally suburban location of the proposed project, project generated pedestrian and bicycle trips would be lower than if it were located in a more densely developed, pedestrian-oriented environment. Additionally, the low number of expected pedestrian and bicycle trips would be adequately accommodated by existing facilities. However, the project applicant should ensure that any bicycle and pedestrian facilities included in the project are consistent with adjacent facilities.

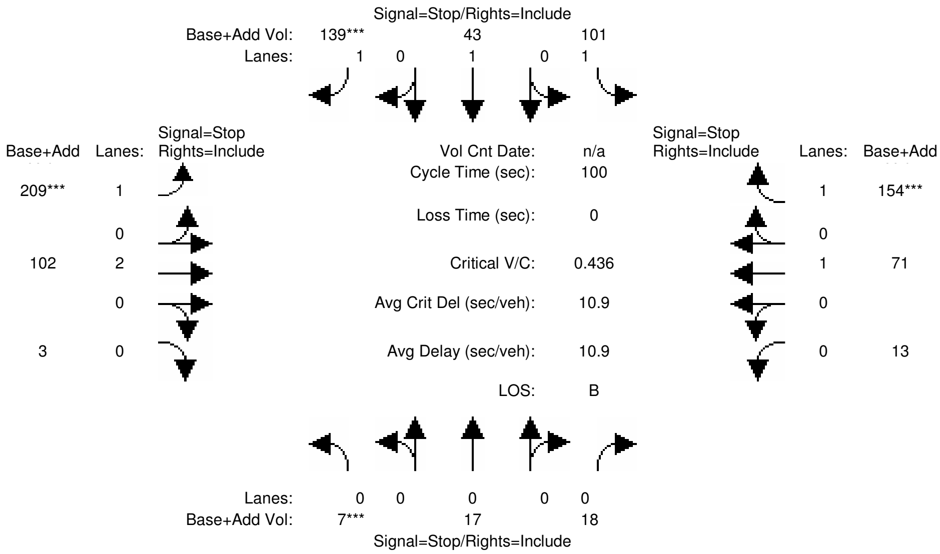
According to the significance criteria, the project would have a *less-than-significant* impact on the bicycle and pedestrian network.

APPENDIX A:
TECHNICAL APPENDIX

Highland Estates

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing AM

Intersection #1: Polhemus/DeAnza



Street Name:	DeAnza Boulevard						Polhemus Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:8-9												
Base Vol:	7	17	18	101	43	139	209	102	3	13	71	154
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	7	17	18	101	43	139	209	102	3	13	71	154
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	7	17	18	101	43	139	209	102	3	13	71	154
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	8	19	20	111	47	153	230	112	3	14	78	169
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	19	20	111	47	153	230	112	3	14	78	169
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	8	19	20	111	47	153	230	112	3	14	78	169
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.17	0.40	0.43	1.00	1.00	1.00	1.00	1.94	0.06	0.15	0.85	1.00
Final Sat.:	87	212	224	518	556	626	527	1099	32	88	482	652
Capacity Analysis Module:												
Vol/Sat:	0.09	0.09	0.09	0.21	0.08	0.24	0.44	0.10	0.10	0.16	0.16	0.26
Crit Moves:	****					****	****					****
Delay/Veh:	9.9	9.9	9.9	11.1	9.4	9.8	14.1	9.5	9.5	9.8	9.8	9.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.9	9.9	9.9	11.1	9.4	9.8	14.1	9.5	9.5	9.8	9.8	9.7
LOS by Move:	A	A	A	B	A	A	B	A	A	A	A	A
ApproachDel:		9.9			10.2			12.6			9.7	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.9			10.2			12.6			9.7	
LOS by Appr:		A			B			B			A	
AllWayAvgQ:	0.1	0.1	0.1	0.2	0.1	0.3	0.7	0.1	0.1	0.2	0.2	0.3

Note: Queue reported is the number of cars per lane.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	
Frt	1.00	1.00	1.00	0.85	0.97	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	3539	3539	1583	3369	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	3539	3539	1583	3369	
Volume (vph)	160	184	348	1356	177	45
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	180	207	391	1524	199	51
RTOR Reduction (vph)	0	0	0	0	31	0
Lane Group Flow (vph)	180	207	391	1524	219	0
Turn Type	Prot			Free		
Protected Phases	1	6	2		8	
Permitted Phases				Free		
Actuated Green, G (s)	8.0	63.0	52.0	76.0	5.5	
Effective Green, g (s)	7.0	63.0	52.0	76.0	5.0	
Actuated g/C Ratio	0.09	0.83	0.68	1.00	0.07	
Clearance Time (s)	3.0	4.0	4.0		3.5	
Vehicle Extension (s)	2.0	3.0	3.0		2.0	
Lane Grp Cap (vph)	163	2934	2421	1583	222	
v/s Ratio Prot	0.10	0.06	0.11		0.07	
v/s Ratio Perm				c0.96		
v/c Ratio	1.10	0.07	0.16	0.96	0.99	
Uniform Delay, d1	34.5	1.2	4.3	0.0	35.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	101.2	0.0	0.1	15.3	56.1	
Delay (s)	135.7	1.2	4.4	15.3	91.6	
Level of Service	F	A	A	B	F	
Approach Delay (s)		63.8	13.1		91.6	
Approach LOS		E	B		F	

Intersection Summary			
HCM Average Control Delay	28.5	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	76.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	34.9%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	61	300	1539	354	571	165
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	65	319	1637	377	607	176
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	65	319	1637	377	607	176
Turn Type	Prot			Free		Free
Protected Phases	1	6	2		4	
Permitted Phases				Free		Free
Actuated Green, G (s)	6.9	67.7	57.8	96.5	21.3	96.5
Effective Green, g (s)	5.9	67.7	57.8	96.5	20.8	96.5
Actuated g/C Ratio	0.06	0.70	0.60	1.00	0.22	1.00
Clearance Time (s)	3.0	4.0	4.0		3.5	
Vehicle Extension (s)	2.0	4.5	4.0		2.2	
Lane Grp Cap (vph)	108	2483	2120	1583	740	1583
v/s Ratio Prot	c0.04	0.09	c0.46		c0.18	
v/s Ratio Perm				0.24		0.11
v/c Ratio	0.60	0.13	0.77	0.24	0.82	0.11
Uniform Delay, d1	44.2	4.7	14.4	0.0	36.1	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	0.1	2.8	0.4	7.0	0.1
Delay (s)	50.5	4.8	17.2	0.4	43.1	0.1
Level of Service	D	A	B	A	D	A
Approach Delay (s)		12.6	14.1		33.4	
Approach LOS		B	B		C	

Intersection Summary			
HCM Average Control Delay	18.7	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Highland Estates

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Existing PM

Intersection #1: Polhemus/DeAnza

Signal=Stop/Rights=Include

Base+Add Vol: 96 39 177***
Lanes: 1 0 1 0 1

Westbound side: Signal=Stop, Rights=Include
Base+Add / Lanes: 147*** 1; 0; 174 2; 0; 7 0

Vol Cnt Date: n/a
Cycle Time (sec): 100
Loss Time (sec): 0
Critical V/C: 0.400
Avg Crit Del (sec/veh): 11.6
Avg Delay (sec/veh): 11.6
LOS: B

Signal=Stop
Rights=Include
Lanes / Base+Add: 1 113; 0; 1 147; 0; 0 18***

Lanes: 0 0 0 0 0
Base+Add Vol: 5*** 12 33
Signal=Stop/Rights=Include

Street Name:	DeAnza Boulevard						Polhemus Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:5-6												
Base Vol:	5	12	33	177	39	96	147	174	7	18	147	113
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	5	12	33	177	39	96	147	174	7	18	147	113
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	5	12	33	177	39	96	147	174	7	18	147	113
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88	0.88
PHF Volume:	6	14	38	201	44	109	167	198	8	20	167	128
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	6	14	38	201	44	109	167	198	8	20	167	128
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	6	14	38	201	44	109	167	198	8	20	167	128
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.10	0.24	0.66	1.00	1.00	1.00	1.00	1.92	0.08	0.11	0.89	1.00
Final Sat.:	51	122	336	503	537	602	496	1023	41	60	488	618
Capacity Analysis Module:												
Vol/Sat:	0.11	0.11	0.11	0.40	0.08	0.18	0.34	0.19	0.19	0.34	0.34	0.21
Crit Moves:	****			****			****			****		
Delay/Veh:	10.3	10.3	10.3	13.8	9.6	9.6	13.1	10.7	10.6	12.1	12.1	9.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	10.3	10.3	10.3	13.8	9.6	9.6	13.1	10.7	10.6	12.1	12.1	9.6
LOS by Move:	B	B	B	B	A	A	B	B	B	B	B	A
ApproachDel:		10.3			12.0			11.8			11.1	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		10.3			12.0			11.8			11.1	
LOS by Appr:		B			B			B			B	
AllWayAvgQ:	0.1	0.1	0.1	0.6	0.1	0.2	0.5	0.2	0.2	0.5	0.5	0.2

Note: Queue reported is the number of cars per lane.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	
Frt	1.00	1.00	1.00	0.85	0.99	
Flt Protected	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (prot)	1770	3539	3539	1583	3423	
Flt Permitted	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (perm)	1770	3539	3539	1583	3423	
Volume (vph)	132	276	288	620	260	14
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	138	288	300	646	271	15
RTOR Reduction (vph)	0	0	0	0	6	0
Lane Group Flow (vph)	138	288	300	646	280	0
Turn Type	Prot			Free		
Protected Phases	1	6	2		8	
Permitted Phases				Free		
Actuated Green, G (s)	9.5	57.3	43.8	75.0	10.2	
Effective Green, g (s)	9.5	57.3	43.8	75.0	9.7	
Actuated g/C Ratio	0.13	0.76	0.58	1.00	0.13	
Clearance Time (s)	4.0	4.0	4.0		3.5	
Vehicle Extension (s)	3.0	3.0	3.0		2.0	
Lane Grp Cap (vph)	224	2704	2067	1583	443	
v/s Ratio Prot	c0.08	0.08	0.08		c0.08	
v/s Ratio Perm				c0.41		
v/c Ratio	0.62	0.11	0.15	0.41	0.63	
Uniform Delay, d1	31.0	2.3	7.1	0.0	31.0	
Progression Factor	1.00	1.00	2.25	1.00	1.00	
Incremental Delay, d2	5.0	0.1	0.1	0.7	2.2	
Delay (s)	36.0	2.4	16.1	0.7	33.1	
Level of Service	D	A	B	A	C	
Approach Delay (s)		13.2	5.6		33.1	
Approach LOS		B	A		C	

Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.5%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

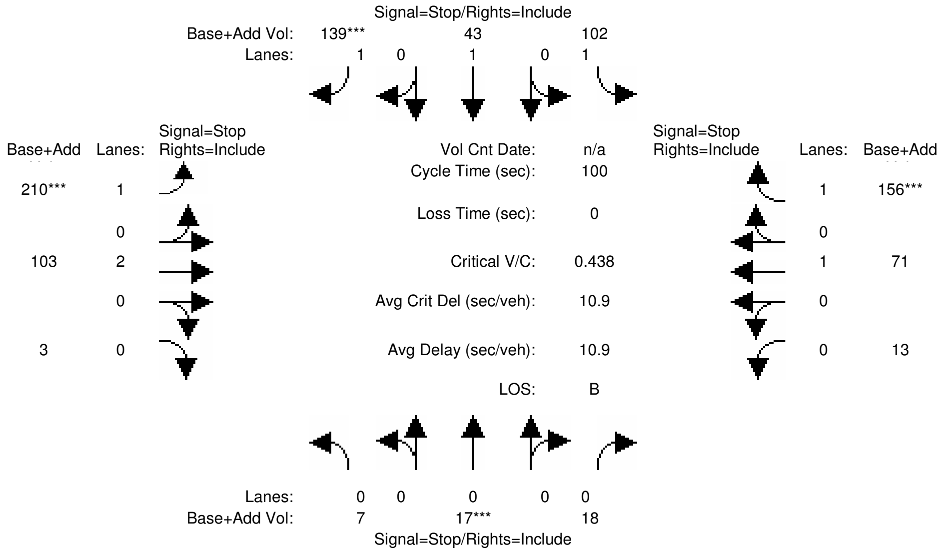
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.97		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3539	1583				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3539	1583				3433		1583
Volume (vph)	70	466	0	0	805	259	0	0	0	953	0	103
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	73	485	0	0	839	270	0	0	0	993	0	107
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	73	485	0	0	839	270	0	0	0	993	0	107
Turn Type	Prot					Free				Prot		Free
Protected Phases	1	6			2					8		
Permitted Phases						Free						Free
Actuated Green, G (s)	6.2	40.3			30.1	75.0				26.7		75.0
Effective Green, g (s)	6.2	40.3			30.1	75.0				26.7		75.0
Actuated g/C Ratio	0.08	0.54			0.40	1.00				0.36		1.00
Clearance Time (s)	4.0	4.0			4.0					4.0		
Vehicle Extension (s)	3.0	4.5			4.0					3.0		
Lane Grp Cap (vph)	146	1902			1420	1583				1222		1583
v/s Ratio Prot	c0.04	0.14			c0.24					c0.29		
v/s Ratio Perm						0.17						0.07
v/c Ratio	0.50	0.25			0.59	0.17				0.81		0.07
Uniform Delay, d1	32.9	9.3			17.6	0.0				21.9		0.0
Progression Factor	0.81	1.65			1.00	1.00				1.00		1.00
Incremental Delay, d2	2.6	0.3			1.8	0.2				4.2		0.1
Delay (s)	29.3	15.6			19.4	0.2				26.1		0.1
Level of Service	C	B			B	A				C		A
Approach Delay (s)		17.4			14.8			0.0			23.6	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.3%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Highland Estates

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Project AM

Intersection #1: Polhemus/DeAnza



Street Name:	DeAnza Boulevard						Polhemus Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:8-9												
Base Vol:	7	17	18	101	43	139	209	102	3	13	71	154
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	7	17	18	101	43	139	209	102	3	13	71	154
Added Vol:	0	0	0	1	0	0	1	1	0	0	0	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	7	17	18	102	43	139	210	103	3	13	71	156
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91
PHF Volume:	8	19	20	112	47	153	231	113	3	14	78	171
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	8	19	20	112	47	153	231	113	3	14	78	171
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	8	19	20	112	47	153	231	113	3	14	78	171
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.17	0.40	0.43	1.00	1.00	1.00	1.00	1.94	0.06	0.15	0.85	1.00
Final Sat.:	87	212	224	517	555	624	526	1097	32	88	481	650
Capacity Analysis Module:												
Vol/Sat:	0.09	0.09	0.09	0.22	0.09	0.24	0.44	0.10	0.10	0.16	0.16	0.26
Crit Moves:		****				****	****					****
Delay/Veh:	9.9	9.9	9.9	11.1	9.4	9.8	14.2	9.5	9.5	9.9	9.9	9.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	9.9	9.9	9.9	11.1	9.4	9.8	14.2	9.5	9.5	9.9	9.9	9.7
LOS by Move:	A	A	A	B	A	A	B	A	A	A	A	A
ApproachDel:		9.9			10.2			12.6			9.8	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		9.9			10.2			12.6			9.8	
LOS by Appr:		A			B			B			A	
AllWayAvgQ:	0.1	0.1	0.1	0.2	0.1	0.3	0.7	0.1	0.1	0.2	0.2	0.3

Note: Queue reported is the number of cars per lane.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	
Frt	1.00	1.00	1.00	0.85	0.97	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	3539	3539	1583	3369	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	3539	3539	1583	3369	
Volume (vph)	162	186	350	1356	177	45
Peak-hour factor, PHF	0.89	0.89	0.89	0.89	0.89	0.89
Adj. Flow (vph)	182	209	393	1524	199	51
RTOR Reduction (vph)	0	0	0	0	31	0
Lane Group Flow (vph)	182	209	393	1524	219	0
Turn Type	Prot			Free		
Protected Phases	1	6	2		8	
Permitted Phases				Free		
Actuated Green, G (s)	8.0	63.0	52.0	76.0	5.5	
Effective Green, g (s)	7.0	63.0	52.0	76.0	5.0	
Actuated g/C Ratio	0.09	0.83	0.68	1.00	0.07	
Clearance Time (s)	3.0	4.0	4.0		3.5	
Vehicle Extension (s)	2.0	3.0	3.0		2.0	
Lane Grp Cap (vph)	163	2934	2421	1583	222	
v/s Ratio Prot	0.10	0.06	0.11		0.07	
v/s Ratio Perm				c0.96		
v/c Ratio	1.12	0.07	0.16	0.96	0.99	
Uniform Delay, d1	34.5	1.2	4.3	0.0	35.5	
Progression Factor	1.00	1.00	1.00	1.00	1.00	
Incremental Delay, d2	105.2	0.0	0.1	15.3	56.1	
Delay (s)	139.7	1.2	4.4	15.3	91.6	
Level of Service	F	A	A	B	F	
Approach Delay (s)		65.7	13.1		91.6	
Approach LOS		E	B		F	

Intersection Summary			
HCM Average Control Delay	28.8	HCM Level of Service	C
HCM Volume to Capacity ratio	0.96		
Actuated Cycle Length (s)	76.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	35.1%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	61	302	1540	354	571	166
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	65	321	1638	377	607	177
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	65	321	1638	377	607	177
Turn Type	Prot			Free		Free
Protected Phases	1	6	2		4	
Permitted Phases				Free		Free
Actuated Green, G (s)	6.9	67.7	57.8	96.5	21.3	96.5
Effective Green, g (s)	5.9	67.7	57.8	96.5	20.8	96.5
Actuated g/C Ratio	0.06	0.70	0.60	1.00	0.22	1.00
Clearance Time (s)	3.0	4.0	4.0		3.5	
Vehicle Extension (s)	2.0	4.5	4.0		2.2	
Lane Grp Cap (vph)	108	2483	2120	1583	740	1583
v/s Ratio Prot	c0.04	0.09	c0.46		c0.18	
v/s Ratio Perm				0.24		0.11
v/c Ratio	0.60	0.13	0.77	0.24	0.82	0.11
Uniform Delay, d1	44.2	4.7	14.4	0.0	36.1	0.0
Progression Factor	1.00	1.00	1.00	1.00	1.00	1.00
Incremental Delay, d2	6.3	0.1	2.8	0.4	7.0	0.1
Delay (s)	50.5	4.8	17.3	0.4	43.1	0.1
Level of Service	D	A	B	A	D	A
Approach Delay (s)		12.5	14.1		33.4	
Approach LOS		B	B		C	

Intersection Summary			
HCM Average Control Delay	18.6	HCM Level of Service	B
HCM Volume to Capacity ratio	0.77		
Actuated Cycle Length (s)	96.5	Sum of lost time (s)	12.0
Intersection Capacity Utilization	72.2%	ICU Level of Service	C
Analysis Period (min)	15		
c Critical Lane Group			

Highland Estates

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Project PM

Intersection #1: Polhemus/DeAnza

Signal=Stop/Rights=Include

Base+Add Vol: 97 39 179***
Lanes: 1 0 1 0 1

Base+Add	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Base+Add
148***	1		Vol Cnt Date:	n/a		1	114
			Cycle Time (sec):	100			
	0		Loss Time (sec):	0		0	
175	2		Critical V/C:	0.405		1	148
	0		Avg Crit Del (sec/veh):	11.6		0	
7	0		Avg Delay (sec/veh):	11.6		0	18***
			LOS:	B			

Lanes: 0 0 0 0 0
Base+Add Vol: 5*** 12 33
Signal=Stop/Rights=Include

```
Street Name:          DeAnza Boulevard                 Polhemus Road
Approach:      North Bound      South Bound       East Bound       West Bound
Movement:     L  -  T  -  R   L  -  T  -  R    L  -  T  -  R    L  -  T  -  R
------------|---------------||---------------||---------------||---------------|
Min. Green:     0     0     0     0     0     0     0     0     0     0     0     0
------------|---------------||---------------||---------------||---------------|
Volume Module:5-6
Base Vol:       5    12    33   177    39    96   147   174     7    18   147   113
Growth Adj:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Initial Bse:    5    12    33   177    39    96   147   174     7    18   147   113
Added Vol:      0     0     0     2     0     1     1     1     0     0     1     1
PasserByVol:    0     0     0     0     0     0     0     0     0     0     0     0
Initial Fut:    5    12    33   179    39    97   148   175     7    18   148   114
User Adj:    1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
PHF Adj:     0.88  0.88  0.88  0.88  0.88  0.88  0.88  0.88  0.88  0.88  0.88  0.88
PHF Volume:     6    14    38   203    44   110   168   199     8    20   168   130
Reduct Vol:     0     0     0     0     0     0     0     0     0     0     0     0
Reduced Vol:    6    14    38   203    44   110   168   199     8    20   168   130
PCE Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
MLF Adj:     1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
FinalVolume:    6    14    38   203    44   110   168   199     8    20   168   130
------------|---------------||---------------||---------------||---------------|
Saturation Flow Module:
Adjustment:  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
Lanes:       0.10  0.24  0.66  1.00  1.00  1.00  1.00  1.92  0.08  0.11  0.89  1.00
Final Sat.:    51   122   335   503   537   600   494  1020    41    59   487   616
------------|---------------||---------------||---------------||---------------|
Capacity Analysis Module:
Vol/Sat:     0.11  0.11  0.11  0.40  0.08  0.18  0.34  0.19  0.19  0.35  0.35  0.21
Crit Moves:  ****              ****              ****              ****
Delay/Veh:   10.3  10.3  10.3  14.0   9.7   9.6  13.2  10.7  10.7  12.1  12.1   9.7
Delay Adj:   1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00  1.00
AdjDel/Veh:  10.3  10.3  10.3  14.0   9.7   9.6  13.2  10.7  10.7  12.1  12.1   9.7
LOS by Move:    B     B     B     B     A     A     B     B     B     B     B     A
ApproachDel:       10.3              12.1              11.8              11.1
Delay Adj:         1.00              1.00              1.00              1.00
ApprAdjDel:        10.3              12.1              11.8              11.1
LOS by Appr:          B                 B                 B                 B
AllWayAvgQ:   0.1   0.1   0.1   0.6   0.1   0.2   0.5   0.2   0.2   0.5   0.5   0.2
Note: Queue reported is the number of cars per lane.
```


Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	
Frt	1.00	1.00	1.00	0.85	0.99	
Flt Protected	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (prot)	1770	3539	3539	1583	3423	
Flt Permitted	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (perm)	1770	3539	3539	1583	3423	
Volume (vph)	133	277	291	620	260	14
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	139	289	303	646	271	15
RTOR Reduction (vph)	0	0	0	0	6	0
Lane Group Flow (vph)	139	289	303	646	280	0
Turn Type	Prot			Free		
Protected Phases	1	6	2		8	
Permitted Phases				Free		
Actuated Green, G (s)	9.6	57.3	43.7	75.0	10.2	
Effective Green, g (s)	9.6	57.3	43.7	75.0	9.7	
Actuated g/C Ratio	0.13	0.76	0.58	1.00	0.13	
Clearance Time (s)	4.0	4.0	4.0		3.5	
Vehicle Extension (s)	3.0	3.0	3.0		2.0	
Lane Grp Cap (vph)	227	2704	2062	1583	443	
v/s Ratio Prot	c0.08	0.08	0.09		c0.08	
v/s Ratio Perm				c0.41		
v/c Ratio	0.61	0.11	0.15	0.41	0.63	
Uniform Delay, d1	30.9	2.3	7.1	0.0	31.0	
Progression Factor	1.00	1.00	2.24	1.00	1.00	
Incremental Delay, d2	4.8	0.1	0.1	0.7	2.2	
Delay (s)	35.8	2.4	16.2	0.7	33.1	
Level of Service	D	A	B	A	C	
Approach Delay (s)		13.2	5.6		33.1	
Approach LOS		B	A		C	

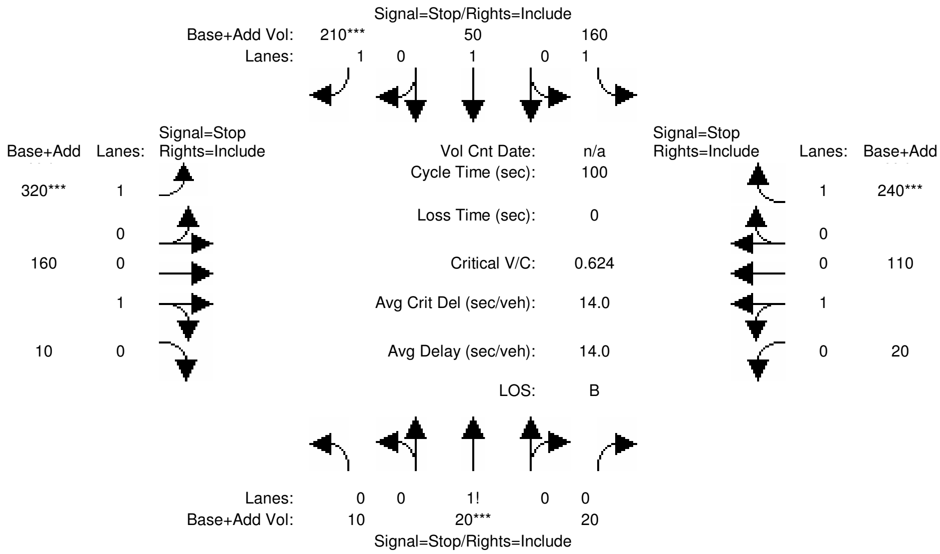
Intersection Summary			
HCM Average Control Delay	12.3	HCM Level of Service	B
HCM Volume to Capacity ratio	0.47		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	8.0
Intersection Capacity Utilization	33.6%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.97		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3539	1583				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3539	1583				3433		1583
Volume (vph)	70	467	0	0	808	259	0	0	0	953	0	105
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	73	486	0	0	842	270	0	0	0	993	0	109
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	73	486	0	0	842	270	0	0	0	993	0	109
Turn Type	Prot					Free				Prot		Free
Protected Phases	1	6			2					8		
Permitted Phases						Free						Free
Actuated Green, G (s)	6.2	40.3			30.1	75.0				26.7		75.0
Effective Green, g (s)	6.2	40.3			30.1	75.0				26.7		75.0
Actuated g/C Ratio	0.08	0.54			0.40	1.00				0.36		1.00
Clearance Time (s)	4.0	4.0			4.0					4.0		
Vehicle Extension (s)	3.0	4.5			4.0					3.0		
Lane Grp Cap (vph)	146	1902			1420	1583				1222		1583
v/s Ratio Prot	c0.04	0.14			c0.24					c0.29		
v/s Ratio Perm						0.17						0.07
v/c Ratio	0.50	0.26			0.59	0.17				0.81		0.07
Uniform Delay, d1	32.9	9.3			17.6	0.0				21.9		0.0
Progression Factor	0.81	1.65			1.00	1.00				1.00		1.00
Incremental Delay, d2	2.6	0.3			1.8	0.2				4.2		0.1
Delay (s)	29.3	15.6			19.5	0.2				26.1		0.1
Level of Service	C	B			B	A				C		A
Approach Delay (s)		17.4			14.8			0.0			23.5	
Approach LOS		B			B			A			C	

Intersection Summary			
HCM Average Control Delay	18.8	HCM Level of Service	B
HCM Volume to Capacity ratio	0.68		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	63.4%	ICU Level of Service	B
Analysis Period (min)	15		
c Critical Lane Group			

Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative Without Project AM

Intersection #1: Polhemus/DeAnza



Street Name:	DeAnza Boulevard						Polhemus Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	20	20	160	50	210	320	160	10	20	110	240
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	20	20	160	50	210	320	160	10	20	110	240
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	20	20	160	50	210	320	160	10	20	110	240
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	20	20	160	50	210	320	160	10	20	110	240
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	20	20	160	50	210	320	160	10	20	110	240
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	10	20	20	160	50	210	320	160	10	20	110	240
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.20	0.40	0.40	1.00	1.00	1.00	1.00	0.94	0.06	0.15	0.85	1.00
Final Sat.:	90	181	181	475	506	565	513	519	32	80	439	587
Capacity Analysis Module:												
Vol/Sat:	0.11	0.11	0.11	0.34	0.10	0.37	0.62	0.31	0.31	0.25	0.25	0.41
Crit Moves:		****				****	****					****
Delay/Veh:	11.1	11.1	11.1	13.5	10.2	12.1	19.9	11.8	11.8	11.5	11.5	12.4
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.1	11.1	11.1	13.5	10.2	12.1	19.9	11.8	11.8	11.5	11.5	12.4
LOS by Move:	B	B	B	B	B	B	C	B	B	B	B	B
ApproachDel:		11.1			12.4			17.1			12.1	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		11.1			12.4			17.1			12.1	
LOS by Appr:		B			B			C			B	
AllWayAvgQ:	0.1	0.1	0.1	0.5	0.1	0.5	1.5	0.4	0.4	0.3	0.3	0.6

Note: Queue reported is the number of cars per lane.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	
Frt	1.00	1.00	1.00	0.85	0.97	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	3539	3539	1583	3368	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	3539	3539	1583	3368	
Volume (vph)	250	280	540	2100	270	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	272	304	587	2283	293	76
RTOR Reduction (vph)	0	0	0	0	35	0
Lane Group Flow (vph)	272	304	587	2283	334	0
Turn Type	Prot			Free		
Protected Phases	1	6	2		8	
Permitted Phases				Free		
Actuated Green, G (s)	15.2	56.1	37.9	75.0	11.4	
Effective Green, g (s)	14.2	56.1	37.9	75.0	10.9	
Actuated g/C Ratio	0.19	0.75	0.51	1.00	0.15	
Clearance Time (s)	3.0	4.0	4.0		3.5	
Vehicle Extension (s)	2.0	3.0	3.0		2.0	
Lane Grp Cap (vph)	335	2647	1788	1583	489	
v/s Ratio Prot	0.15	0.09	0.17		0.10	
v/s Ratio Perm				c1.44		
v/c Ratio	0.81	0.11	0.33	1.44	0.68	
Uniform Delay, d1	29.1	2.6	11.0	37.5	30.4	
Progression Factor	1.00	1.00	0.91	1.00	1.00	
Incremental Delay, d2	13.2	0.1	0.0	199.3	3.1	
Delay (s)	42.3	2.7	10.0	236.8	33.5	
Level of Service	D	A	B	F	C	
Approach Delay (s)		21.4	190.4		33.5	
Approach LOS		C	F		C	

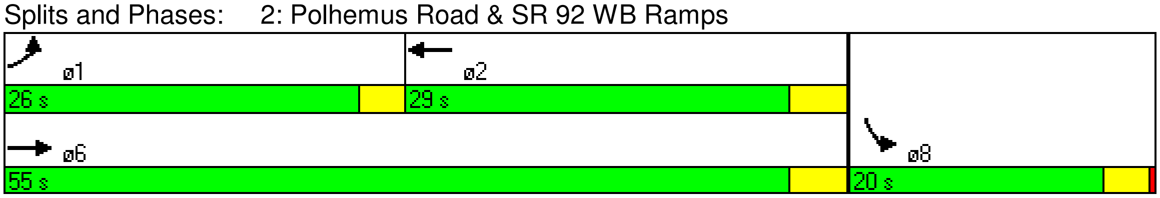
Intersection Summary			
HCM Average Control Delay	149.7	HCM Level of Service	F
HCM Volume to Capacity ratio	1.44		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	48.7%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Phase Number	1	2	6	8
Movement	EBL	WBT	EBT	SBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None
Maximum Split (s)	26	29	55	20
Maximum Split (%)	34.7%	38.7%	73.3%	26.7%
Minimum Split (s)	7	28	14	7.5
Yellow Time (s)	3	4	4	3
All-Red Time (s)	0	0	0	0.5
Minimum Initial (s)	4	10	10	4
Vehicle Extension (s)	2	3	3	2
Minimum Gap (s)	1	2	2	1.5
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7		
Flash Dont Walk (s)		17		
Dual Entry	No	Yes	Yes	No
Inhibit Max	No	No	No	No
Start Time (s)	57	8	57	37
End Time (s)	8	37	37	57
Yield/Force Off (s)	5	33	33	53.5
Yield/Force Off 170(s)	5	16	33	53.5
Local Start Time (s)	24	50	24	4
Local Yield (s)	47	0	0	20.5
Local Yield 170(s)	47	58	0	20.5

Intersection Summary	
Cycle Length	75
Control Type	Actuated-Coordinated
Natural Cycle	60

Offset: 33 (44%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Splits and Phases: 2: Polhemus Road & SR 92 WB Ramps



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	90	460	2420	550	880	220
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	96	489	2574	585	936	234
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	96	489	2574	585	936	234
Turn Type	Prot			Free		Free
Protected Phases	1	6	2		8	
Permitted Phases				Free		Free
Actuated Green, G (s)	8.0	106.0	95.0	150.0	36.5	150.0
Effective Green, g (s)	7.0	106.0	95.0	150.0	36.0	150.0
Actuated g/C Ratio	0.05	0.71	0.63	1.00	0.24	1.00
Clearance Time (s)	3.0	4.0	4.0		3.5	
Vehicle Extension (s)	2.0	4.5	4.0		2.2	
Lane Grp Cap (vph)	83	2501	2241	1583	824	1583
v/s Ratio Prot	c0.05	0.14	c0.73		c0.27	
v/s Ratio Perm				0.37		0.15
v/c Ratio	1.16	0.20	1.15	0.37	1.14	0.15
Uniform Delay, d1	71.5	7.5	27.5	0.0	57.0	0.0
Progression Factor	1.02	0.56	1.00	1.00	1.00	1.00
Incremental Delay, d2	143.7	0.2	72.6	0.7	75.9	0.2
Delay (s)	216.4	4.4	100.1	0.7	132.9	0.2
Level of Service	F	A	F	A	F	A
Approach Delay (s)		39.2	81.7		106.3	
Approach LOS		D	F		F	

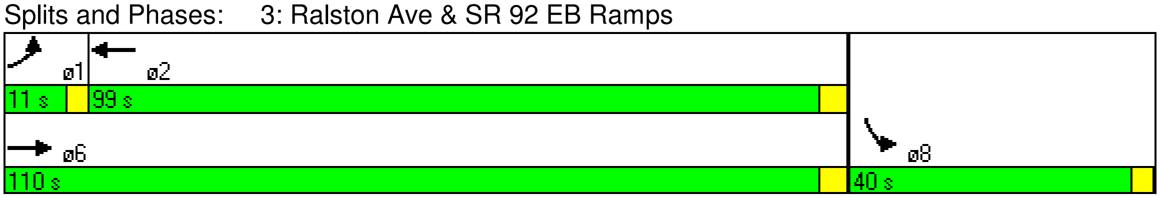
Intersection Summary			
HCM Average Control Delay	82.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Phase Number	1	2	6	8
Movement	EBL	WBT	EBT	SBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None
Maximum Split (s)	11	99	110	40
Maximum Split (%)	7.3%	66.0%	73.3%	26.7%
Minimum Split (s)	7	26	19	27.5
Yellow Time (s)	3	4	4	3
All-Red Time (s)	0	0	0	0.5
Minimum Initial (s)	4	15	15	6
Vehicle Extension (s)	2	4	4.5	2.2
Minimum Gap (s)	1	3	3	1.5
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7		7
Flash Dont Walk (s)		15		17
Dual Entry	No	Yes	Yes	No
Inhibit Max	No	No	No	No
Start Time (s)	44	55	44	4
End Time (s)	55	4	4	44
Yield/Force Off (s)	52	0	0	40.5
Yield/Force Off 170(s)	52	135	0	23.5
Local Start Time (s)	44	55	44	4
Local Yield (s)	52	0	0	40.5
Local Yield 170(s)	52	135	0	23.5

Intersection Summary	
Cycle Length	150
Control Type	Actuated-Coordinated
Natural Cycle	150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Splits and Phases: 3: Ralston Ave & SR 92 EB Ramps



Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative Without Project PM

Intersection #1: Polhemus/DeAnza

Signal=Stop/Rights=Include
Base+Add Vol: 160 40 270***
Lanes: 1 0 1 0 1

Base+Add	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Base+Add
			Vol Cnt Date:	n/a			
230	1		Cycle Time (sec):	100		1	170
	0		Loss Time (sec):	0		0	
270***	0		Critical V/C:	0.583		0	230***
	1		Avg Crit Del (sec/veh):	15.6		1	
10	0		Avg Delay (sec/veh):	15.6		0	20
			LOS:	C			

Lanes: 0 0 1! 0 0
Base+Add Vol: 10*** 20 40
Signal=Stop/Rights=Include

Street Name:	DeAnza Boulevard						Polhemus Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	20	40	270	40	160	230	270	10	20	230	170
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	20	40	270	40	160	230	270	10	20	230	170
Added Vol:	0	0	0	0	0	0	0	0	0	0	0	0
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	20	40	270	40	160	230	270	10	20	230	170
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	20	40	270	40	160	230	270	10	20	230	170
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	20	40	270	40	160	230	270	10	20	230	170
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	10	20	40	270	40	160	230	270	10	20	230	170
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.14	0.29	0.57	1.00	1.00	1.00	1.00	0.96	0.04	0.08	0.92	1.00
Final Sat.:	63	126	251	463	491	544	481	499	18	40	459	552
Capacity Analysis Module:												
Vol/Sat:	0.16	0.16	0.16	0.58	0.08	0.29	0.48	0.54	0.54	0.50	0.50	0.31
Crit Moves:	****			****				****			****	
Delay/Veh:	11.9	11.9	11.9	19.8	10.4	11.6	16.3	16.9	16.9	16.3	16.3	11.6
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.9	11.9	11.9	19.8	10.4	11.6	16.3	16.9	16.9	16.3	16.3	11.6
LOS by Move:	B	B	B	C	B	B	C	C	C	C	C	B
ApproachDel:		11.9			16.2			16.6			14.4	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		11.9			16.2			16.6			14.4	
LOS by Appr:		B			C			C			B	
AllWayAvgQ:	0.2	0.2	0.2	1.2	0.1	0.4	0.8	1.1	1.1	0.9	0.9	0.4

Note: Queue reported is the number of cars per lane.

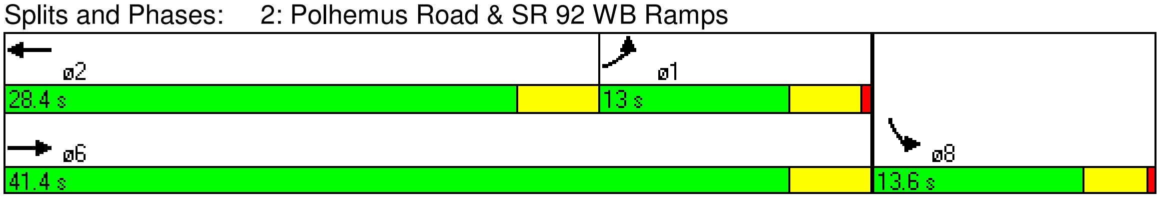
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	
Frt	1.00	1.00	1.00	0.85	0.99	
Flt Protected	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (prot)	1770	3539	3539	1583	3425	
Flt Permitted	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (perm)	1770	3539	3539	1583	3425	
Volume (vph)	200	430	440	960	400	20
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	208	448	458	1000	417	21
RTOR Reduction (vph)	0	0	0	0	7	0
Lane Group Flow (vph)	208	448	458	1000	431	0
Turn Type	Prot			Free		
Protected Phases	1	6	2		8	
Permitted Phases				Free		
Actuated Green, G (s)	10.9	37.9	23.0	55.0	9.6	
Effective Green, g (s)	10.9	37.9	23.0	55.0	9.1	
Actuated g/C Ratio	0.20	0.69	0.42	1.00	0.17	
Clearance Time (s)	4.0	4.0	4.0		3.5	
Vehicle Extension (s)	3.0	3.0	3.0		2.0	
Lane Grp Cap (vph)	351	2439	1480	1583	567	
v/s Ratio Prot	0.12	0.13	0.13		0.13	
v/s Ratio Perm				c0.63		
v/c Ratio	0.59	0.18	0.31	0.63	0.76	
Uniform Delay, d1	20.0	3.0	10.7	0.0	21.9	
Progression Factor	1.00	1.00	0.87	1.00	1.00	
Incremental Delay, d2	2.7	0.2	0.3	0.9	5.4	
Delay (s)	22.7	3.2	9.6	0.9	27.3	
Level of Service	C	A	A	A	C	
Approach Delay (s)		9.4	3.7		27.3	
Approach LOS		A	A		C	

Intersection Summary			
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	45.3%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Phase Number	1	2	6	8
Movement	EBL	WBT	EBT	SBL
Lead/Lag	Lag	Lead		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None
Maximum Split (s)	13	28.4	41.4	13.6
Maximum Split (%)	23.6%	51.6%	75.3%	24.7%
Minimum Split (s)	8	28	14	7.5
Yellow Time (s)	3.5	4	4	3
All-Red Time (s)	0.5	0	0	0.5
Minimum Initial (s)	4	10	10	4
Vehicle Extension (s)	3	3	3	2
Minimum Gap (s)	3	2	2	1.5
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7		
Flash Dont Walk (s)		17		
Dual Entry	No	Yes	Yes	No
Inhibit Max	Yes	No	No	No
Start Time (s)	16	42.6	42.6	29
End Time (s)	29	16	29	42.6
Yield/Force Off (s)	25	12	25	39.1
Yield/Force Off 170(s)	25	50	25	39.1
Local Start Time (s)	4	30.6	30.6	17
Local Yield (s)	13	0	13	27.1
Local Yield 170(s)	13	38	13	27.1

Intersection Summary	
Cycle Length	55
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 12 (22%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow	

Splits and Phases: 2: Polhemus Road & SR 92 WB Ramps



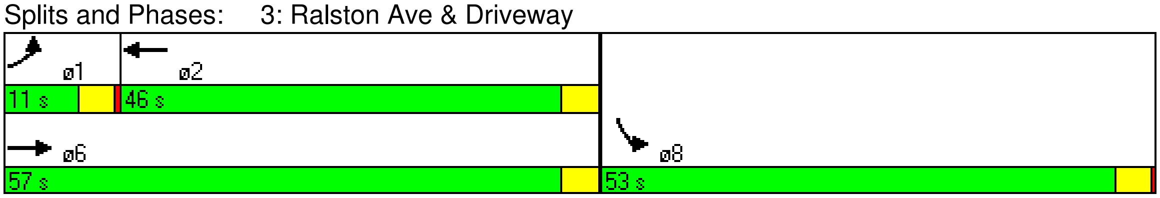
Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.97		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3539	1583				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3539	1583				3433		1583
Volume (vph)	110	720	0	0	1240	400	0	0	0	1470	0	160
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	115	750	0	0	1292	417	0	0	0	1531	0	167
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	115	750	0	0	1292	417	0	0	0	1531	0	167
Turn Type	Prot					Free				Prot		Free
Protected Phases	1	6			2					8		
Permitted Phases						Free						Free
Actuated Green, G (s)	7.0	53.0			42.0	110.0				49.0		110.0
Effective Green, g (s)	7.0	53.0			42.0	110.0				49.0		110.0
Actuated g/C Ratio	0.06	0.48			0.38	1.00				0.45		1.00
Clearance Time (s)	4.0	4.0			4.0					4.0		
Vehicle Extension (s)	3.0	4.5			4.0					3.0		
Lane Grp Cap (vph)	113	1705			1351	1583				1529		1583
v/s Ratio Prot	c0.06	0.21			c0.37					c0.45		
v/s Ratio Perm						0.26						0.11
v/c Ratio	1.02	0.44			0.96	0.26				1.00		0.11
Uniform Delay, d1	51.5	18.7			33.1	0.0				30.5		0.0
Progression Factor	0.92	0.84			1.00	1.00				1.00		1.00
Incremental Delay, d2	85.2	0.7			16.1	0.4				23.3		0.1
Delay (s)	132.6	16.4			49.2	0.4				53.8		0.1
Level of Service	F	B			D	A				D		A
Approach Delay (s)		31.9			37.3			0.0			48.5	
Approach LOS		C			D			A			D	

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.3%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Phase Number	1	2	6	8
Movement	EBL	WBT	EBT	SBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None
Maximum Split (s)	11	46	57	53
Maximum Split (%)	10.0%	41.8%	51.8%	48.2%
Minimum Split (s)	8	26	19	8
Yellow Time (s)	3.5	4	4	3.5
All-Red Time (s)	0.5	0	0	0.5
Minimum Initial (s)	4	15	15	4
Vehicle Extension (s)	3	4	4.5	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7		
Flash Dont Walk (s)		15		
Dual Entry	No	Yes	Yes	Yes
Inhibit Max	Yes	No	No	Yes
Start Time (s)	57	68	57	4
End Time (s)	68	4	4	57
Yield/Force Off (s)	64	0	0	53
Yield/Force Off 170(s)	64	95	0	53
Local Start Time (s)	57	68	57	4
Local Yield (s)	64	0	0	53
Local Yield 170(s)	64	95	0	53

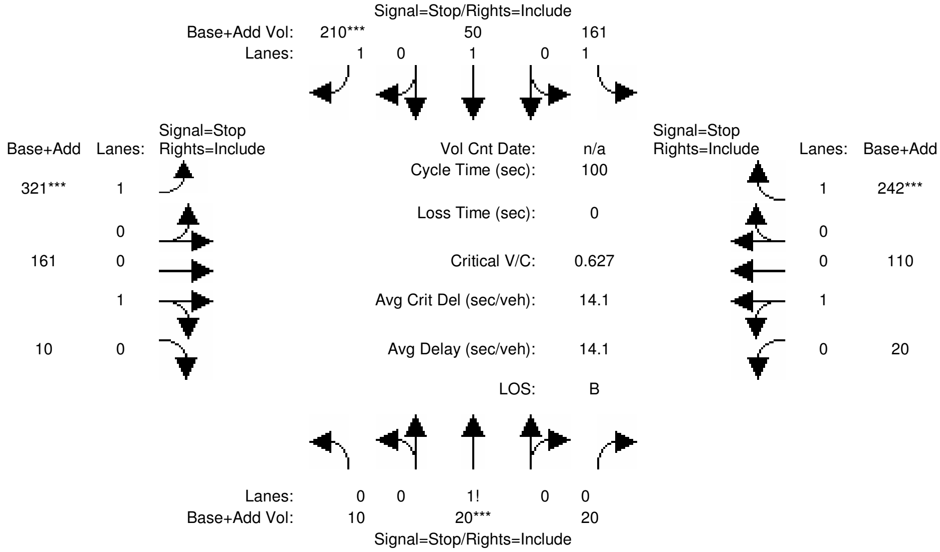
Intersection Summary	
Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow	

Splits and Phases: 3: Ralston Ave & Driveway



Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative Plus Project AM

Intersection #1: Polhemus/DeAnza



Street Name:	DeAnza Boulevard						Polhemus Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	20	20	160	50	210	320	160	10	20	110	240
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	20	20	160	50	210	320	160	10	20	110	240
Added Vol:	0	0	0	1	0	0	1	1	0	0	0	2
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	20	20	161	50	210	321	161	10	20	110	242
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	20	20	161	50	210	321	161	10	20	110	242
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	20	20	161	50	210	321	161	10	20	110	242
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	10	20	20	161	50	210	321	161	10	20	110	242
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.20	0.40	0.40	1.00	1.00	1.00	1.00	0.94	0.06	0.15	0.85	1.00
Final Sat.:	90	181	181	474	505	564	512	518	32	80	439	586
Capacity Analysis Module:												
Vol/Sat:	0.11	0.11	0.11	0.34	0.10	0.37	0.63	0.31	0.31	0.25	0.25	0.41
Crit Moves:		****				****	****					****
Delay/Veh:	11.1	11.1	11.1	13.5	10.2	12.2	20.0	11.8	11.8	11.5	11.5	12.5
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.1	11.1	11.1	13.5	10.2	12.2	20.0	11.8	11.8	11.5	11.5	12.5
LOS by Move:	B	B	B	B	B	B	C	B	B	B	B	B
ApproachDel:		11.1			12.5			17.2			12.1	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		11.1			12.5			17.2			12.1	
LOS by Appr:		B			B			C			B	
AllWayAvgQ:	0.1	0.1	0.1	0.5	0.1	0.5	1.5	0.4	0.4	0.3	0.3	0.6

Note: Queue reported is the number of cars per lane.

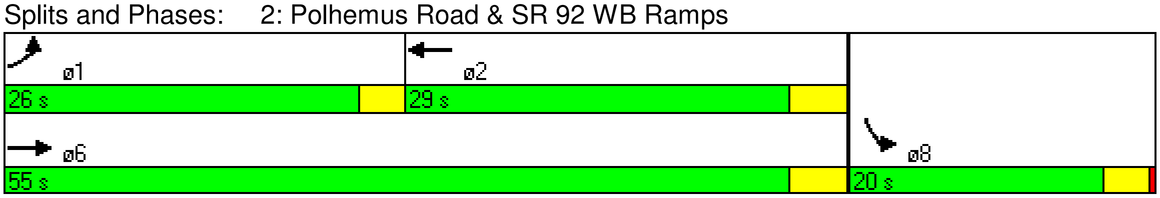
Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	
Frt	1.00	1.00	1.00	0.85	0.97	
Flt Protected	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (prot)	1770	3539	3539	1583	3368	
Flt Permitted	0.95	1.00	1.00	1.00	0.96	
Satd. Flow (perm)	1770	3539	3539	1583	3368	
Volume (vph)	252	282	542	2100	270	70
Peak-hour factor, PHF	0.92	0.92	0.92	0.92	0.92	0.92
Adj. Flow (vph)	274	307	589	2283	293	76
RTOR Reduction (vph)	0	0	0	0	35	0
Lane Group Flow (vph)	274	307	589	2283	334	0
Turn Type	Prot			Free		
Protected Phases	1	6	2		8	
Permitted Phases				Free		
Actuated Green, G (s)	15.3	56.1	37.8	75.0	11.4	
Effective Green, g (s)	14.3	56.1	37.8	75.0	10.9	
Actuated g/C Ratio	0.19	0.75	0.50	1.00	0.15	
Clearance Time (s)	3.0	4.0	4.0		3.5	
Vehicle Extension (s)	2.0	3.0	3.0		2.0	
Lane Grp Cap (vph)	337	2647	1784	1583	489	
v/s Ratio Prot	0.15	0.09	0.17		0.10	
v/s Ratio Perm				c1.44		
v/c Ratio	0.81	0.12	0.33	1.44	0.68	
Uniform Delay, d1	29.1	2.6	11.1	37.5	30.4	
Progression Factor	1.00	1.00	0.91	1.00	1.00	
Incremental Delay, d2	13.2	0.1	0.0	199.3	3.1	
Delay (s)	42.3	2.7	10.1	236.8	33.5	
Level of Service	D	A	B	F	C	
Approach Delay (s)		21.4	190.3		33.5	
Approach LOS		C	F		C	

Intersection Summary			
HCM Average Control Delay	149.5	HCM Level of Service	F
HCM Volume to Capacity ratio	1.44		
Actuated Cycle Length (s)	75.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	48.8%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Phase Number	1	2	6	8
Movement	EBL	WBT	EBT	SBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None
Maximum Split (s)	26	29	55	20
Maximum Split (%)	34.7%	38.7%	73.3%	26.7%
Minimum Split (s)	7	28	14	7.5
Yellow Time (s)	3	4	4	3
All-Red Time (s)	0	0	0	0.5
Minimum Initial (s)	4	10	10	4
Vehicle Extension (s)	2	3	3	2
Minimum Gap (s)	1	2	2	1.5
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7		
Flash Dont Walk (s)		17		
Dual Entry	No	Yes	Yes	No
Inhibit Max	No	No	No	No
Start Time (s)	57	8	57	37
End Time (s)	8	37	37	57
Yield/Force Off (s)	5	33	33	53.5
Yield/Force Off 170(s)	5	16	33	53.5
Local Start Time (s)	24	50	24	4
Local Yield (s)	47	0	0	20.5
Local Yield 170(s)	47	58	0	20.5

Intersection Summary	
Cycle Length	75
Control Type	Actuated-Coordinated
Natural Cycle	60
Offset: 33 (44%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow	

Splits and Phases: 2: Polhemus Road & SR 92 WB Ramps



Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	1.00
Frt	1.00	1.00	1.00	0.85	1.00	0.85
Flt Protected	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (prot)	1770	3539	3539	1583	3433	1583
Flt Permitted	0.95	1.00	1.00	1.00	0.95	1.00
Satd. Flow (perm)	1770	3539	3539	1583	3433	1583
Volume (vph)	90	462	2421	550	880	221
Peak-hour factor, PHF	0.94	0.94	0.94	0.94	0.94	0.94
Adj. Flow (vph)	96	491	2576	585	936	235
RTOR Reduction (vph)	0	0	0	0	0	0
Lane Group Flow (vph)	96	491	2576	585	936	235
Turn Type	Prot			Free		Free
Protected Phases	1	6	2		8	
Permitted Phases				Free		Free
Actuated Green, G (s)	8.0	106.0	95.0	150.0	36.5	150.0
Effective Green, g (s)	7.0	106.0	95.0	150.0	36.0	150.0
Actuated g/C Ratio	0.05	0.71	0.63	1.00	0.24	1.00
Clearance Time (s)	3.0	4.0	4.0		3.5	
Vehicle Extension (s)	2.0	4.5	4.0		2.2	
Lane Grp Cap (vph)	83	2501	2241	1583	824	1583
v/s Ratio Prot	c0.05	0.14	c0.73		c0.27	
v/s Ratio Perm				0.37		0.15
v/c Ratio	1.16	0.20	1.15	0.37	1.14	0.15
Uniform Delay, d1	71.5	7.5	27.5	0.0	57.0	0.0
Progression Factor	1.02	0.56	1.00	1.00	1.00	1.00
Incremental Delay, d2	143.7	0.2	73.0	0.7	75.9	0.2
Delay (s)	216.6	4.4	100.5	0.7	132.9	0.2
Level of Service	F	A	F	A	F	A
Approach Delay (s)		39.1	82.0		106.3	
Approach LOS		D	F		F	

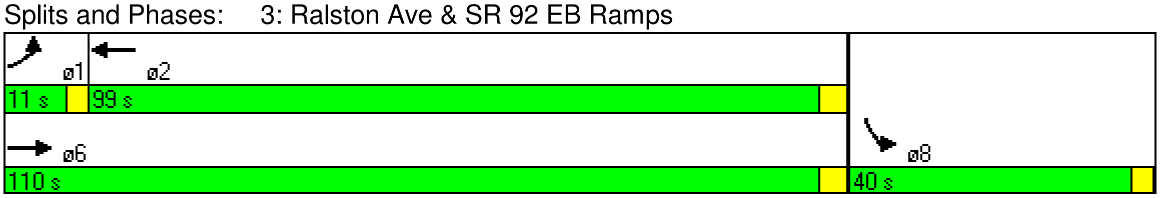
Intersection Summary			
HCM Average Control Delay	82.6	HCM Level of Service	F
HCM Volume to Capacity ratio	1.15		
Actuated Cycle Length (s)	150.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	106.6%	ICU Level of Service	G
Analysis Period (min)	15		
c Critical Lane Group			

Phase Number	1	2	6	8
Movement	EBL	WBT	EBT	SBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None
Maximum Split (s)	11	99	110	40
Maximum Split (%)	7.3%	66.0%	73.3%	26.7%
Minimum Split (s)	7	26	19	27.5
Yellow Time (s)	3	4	4	3
All-Red Time (s)	0	0	0	0.5
Minimum Initial (s)	4	15	15	6
Vehicle Extension (s)	2	4	4.5	2.2
Minimum Gap (s)	1	3	3	1.5
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7		7
Flash Dont Walk (s)		15		17
Dual Entry	No	Yes	Yes	No
Inhibit Max	No	No	No	No
Start Time (s)	44	55	44	4
End Time (s)	55	4	4	44
Yield/Force Off (s)	52	0	0	40.5
Yield/Force Off 170(s)	52	135	0	23.5
Local Start Time (s)	44	55	44	4
Local Yield (s)	52	0	0	40.5
Local Yield 170(s)	52	135	0	23.5

Intersection Summary	
Cycle Length	150
Control Type	Actuated-Coordinated
Natural Cycle	150

Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Splits and Phases: 3: Ralston Ave & SR 92 EB Ramps



Level Of Service Computation Report
2000 HCM 4-Way Stop (Future Volume Alternative)
Cumulative Plus Project PM

Intersection #1: Polhemus/DeAnza

Signal=Stop/Rights=Include
Base+Add Vol: 161 40 272***
Lanes: 1 0 1 0 1

Base+Add	Lanes:	Signal=Stop Rights=Include			Signal=Stop Rights=Include	Lanes:	Base+Add
			Vol Cnt Date:	n/a			
			Cycle Time (sec):	100			
231	1					1	171
			Loss Time (sec):	0			
	0					0	
271***	0		Critical V/C:	0.588		0	231***
	1		Avg Crit Del (sec/veh):	15.7		1	
10	0		Avg Delay (sec/veh):	15.7		0	20
			LOS:	C			

Lanes: 0 0 1! 0 0
Base+Add Vol: 10*** 20 40
Signal=Stop/Rights=Include

Street Name:	DeAnza Boulevard						Polhemus Road					
Approach:	North Bound			South Bound			East Bound			West Bound		
Movement:	L	T	R	L	T	R	L	T	R	L	T	R
Min. Green:	0	0	0	0	0	0	0	0	0	0	0	0
Volume Module:												
Base Vol:	10	20	40	270	40	160	230	270	10	20	230	170
Growth Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Initial Bse:	10	20	40	270	40	160	230	270	10	20	230	170
Added Vol:	0	0	0	2	0	1	1	1	0	0	1	1
PasserByVol:	0	0	0	0	0	0	0	0	0	0	0	0
Initial Fut:	10	20	40	272	40	161	231	271	10	20	231	171
User Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
PHF Volume:	10	20	40	272	40	161	231	271	10	20	231	171
Reduct Vol:	0	0	0	0	0	0	0	0	0	0	0	0
Reduced Vol:	10	20	40	272	40	161	231	271	10	20	231	171
PCE Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
MLF Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FinalVolume:	10	20	40	272	40	161	231	271	10	20	231	171
Saturation Flow Module:												
Adjustment:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Lanes:	0.14	0.29	0.57	1.00	1.00	1.00	1.00	0.96	0.04	0.08	0.92	1.00
Final Sat.:	63	125	250	463	490	543	480	498	18	40	458	551
Capacity Analysis Module:												
Vol/Sat:	0.16	0.16	0.16	0.59	0.08	0.30	0.48	0.54	0.54	0.50	0.50	0.31
Crit Moves:	****			****				****			****	
Delay/Veh:	11.9	11.9	11.9	20.0	10.4	11.6	16.4	17.0	17.0	16.4	16.4	11.7
Delay Adj:	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
AdjDel/Veh:	11.9	11.9	11.9	20.0	10.4	11.6	16.4	17.0	17.0	16.4	16.4	11.7
LOS by Move:	B	B	B	C	B	B	C	C	C	C	C	B
ApproachDel:		11.9			16.3			16.8			14.5	
Delay Adj:		1.00			1.00			1.00			1.00	
ApprAdjDel:		11.9			16.3			16.8			14.5	
LOS by Appr:		B			C			C			B	
AllWayAvgQ:	0.2	0.2	0.2	1.2	0.1	0.4	0.9	1.1	1.1	0.9	0.9	0.4

Note: Queue reported is the number of cars per lane.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0	4.0	4.0	4.0	
Lane Util. Factor	1.00	0.95	0.95	1.00	0.97	
Frt	1.00	1.00	1.00	0.85	0.99	
Flt Protected	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (prot)	1770	3539	3539	1583	3425	
Flt Permitted	0.95	1.00	1.00	1.00	0.95	
Satd. Flow (perm)	1770	3539	3539	1583	3425	
Volume (vph)	201	430	444	960	400	20
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	209	448	462	1000	417	21
RTOR Reduction (vph)	0	0	0	0	7	0
Lane Group Flow (vph)	209	448	462	1000	431	0
Turn Type	Prot			Free		
Protected Phases	1	6	2		8	
Permitted Phases				Free		
Actuated Green, G (s)	11.0	37.9	22.9	55.0	9.6	
Effective Green, g (s)	11.0	37.9	22.9	55.0	9.1	
Actuated g/C Ratio	0.20	0.69	0.42	1.00	0.17	
Clearance Time (s)	4.0	4.0	4.0		3.5	
Vehicle Extension (s)	3.0	3.0	3.0		2.0	
Lane Grp Cap (vph)	354	2439	1474	1583	567	
v/s Ratio Prot	0.12	0.13	0.13		0.13	
v/s Ratio Perm				c0.63		
v/c Ratio	0.59	0.18	0.31	0.63	0.76	
Uniform Delay, d1	20.0	3.0	10.8	0.0	21.9	
Progression Factor	1.00	1.00	0.87	1.00	1.00	
Incremental Delay, d2	2.6	0.2	0.3	0.9	5.4	
Delay (s)	22.6	3.2	9.6	0.9	27.3	
Level of Service	C	A	A	A	C	
Approach Delay (s)		9.4	3.7		27.3	
Approach LOS		A	A		C	

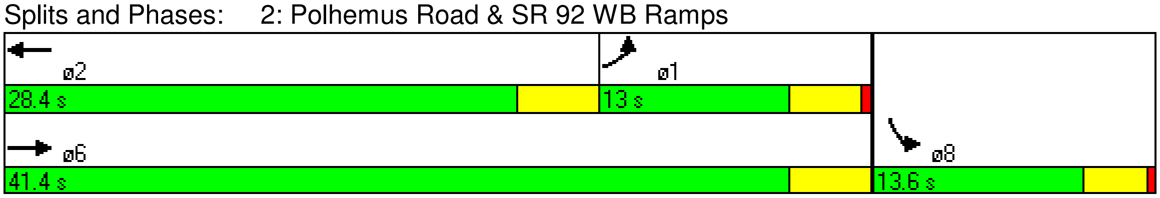
Intersection Summary			
HCM Average Control Delay	9.2	HCM Level of Service	A
HCM Volume to Capacity ratio	0.63		
Actuated Cycle Length (s)	55.0	Sum of lost time (s)	0.0
Intersection Capacity Utilization	45.4%	ICU Level of Service	A
Analysis Period (min)	15		
c Critical Lane Group			

Phase Number	1	2	6	8
Movement	EBL	WBT	EBT	SBL
Lead/Lag	Lag	Lead		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None
Maximum Split (s)	13	28.4	41.4	13.6
Maximum Split (%)	23.6%	51.6%	75.3%	24.7%
Minimum Split (s)	8	28	14	7.5
Yellow Time (s)	3.5	4	4	3
All-Red Time (s)	0.5	0	0	0.5
Minimum Initial (s)	4	10	10	4
Vehicle Extension (s)	3	3	3	2
Minimum Gap (s)	3	2	2	1.5
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7		
Flash Dont Walk (s)		17		
Dual Entry	No	Yes	Yes	No
Inhibit Max	Yes	No	No	No
Start Time (s)	16	42.6	42.6	29
End Time (s)	29	16	29	42.6
Yield/Force Off (s)	25	12	25	39.1
Yield/Force Off 170(s)	25	50	25	39.1
Local Start Time (s)	4	30.6	30.6	17
Local Yield (s)	13	0	13	27.1
Local Yield 170(s)	13	38	13	27.1

Intersection Summary	
Cycle Length	55
Control Type	Actuated-Coordinated
Natural Cycle	60

Offset: 12 (22%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow

Splits and Phases: 2: Polhemus Road & SR 92 WB Ramps



Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900	1900
Total Lost time (s)	4.0	4.0			4.0	4.0				4.0		4.0
Lane Util. Factor	1.00	0.95			0.95	1.00				0.97		1.00
Frt	1.00	1.00			1.00	0.85				1.00		0.85
Flt Protected	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (prot)	1770	3539			3539	1583				3433		1583
Flt Permitted	0.95	1.00			1.00	1.00				0.95		1.00
Satd. Flow (perm)	1770	3539			3539	1583				3433		1583
Volume (vph)	110	720	0	0	1242	400	0	0	0	1470	0	162
Peak-hour factor, PHF	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96	0.96
Adj. Flow (vph)	115	750	0	0	1294	417	0	0	0	1531	0	169
RTOR Reduction (vph)	0	0	0	0	0	0	0	0	0	0	0	0
Lane Group Flow (vph)	115	750	0	0	1294	417	0	0	0	1531	0	169
Turn Type	Prot					Free				Prot		Free
Protected Phases	1	6			2					8		
Permitted Phases						Free						Free
Actuated Green, G (s)	7.0	53.0			42.0	110.0				49.0		110.0
Effective Green, g (s)	7.0	53.0			42.0	110.0				49.0		110.0
Actuated g/C Ratio	0.06	0.48			0.38	1.00				0.45		1.00
Clearance Time (s)	4.0	4.0			4.0					4.0		
Vehicle Extension (s)	3.0	4.5			4.0					3.0		
Lane Grp Cap (vph)	113	1705			1351	1583				1529		1583
v/s Ratio Prot	c0.06	0.21			c0.37					c0.45		
v/s Ratio Perm						0.26						0.11
v/c Ratio	1.02	0.44			0.96	0.26				1.00		0.11
Uniform Delay, d1	51.5	18.7			33.1	0.0				30.5		0.0
Progression Factor	0.92	0.84			1.00	1.00				1.00		1.00
Incremental Delay, d2	85.2	0.7			16.3	0.4				23.3		0.1
Delay (s)	132.5	16.5			49.4	0.4				53.8		0.1
Level of Service	F	B			D	A				D		A
Approach Delay (s)		31.9			37.5			0.0			48.5	
Approach LOS		C			D			A			D	

Intersection Summary			
HCM Average Control Delay	40.7	HCM Level of Service	D
HCM Volume to Capacity ratio	0.98		
Actuated Cycle Length (s)	110.0	Sum of lost time (s)	12.0
Intersection Capacity Utilization	92.4%	ICU Level of Service	F
Analysis Period (min)	15		
c Critical Lane Group			

Phase Number	1	2	6	8
Movement	EBL	WBT	EBT	SBL
Lead/Lag	Lead	Lag		
Lead-Lag Optimize	Yes	Yes		
Recall Mode	None	C-Min	C-Min	None
Maximum Split (s)	11	46	57	53
Maximum Split (%)	10.0%	41.8%	51.8%	48.2%
Minimum Split (s)	8	26	19	8
Yellow Time (s)	3.5	4	4	3.5
All-Red Time (s)	0.5	0	0	0.5
Minimum Initial (s)	4	15	15	4
Vehicle Extension (s)	3	4	4.5	3
Minimum Gap (s)	3	3	3	3
Time Before Reduce (s)	0	0	0	0
Time To Reduce (s)	0	0	0	0
Walk Time (s)		7		
Flash Dont Walk (s)		15		
Dual Entry	No	Yes	Yes	Yes
Inhibit Max	Yes	No	No	Yes
Start Time (s)	57	68	57	4
End Time (s)	68	4	4	57
Yield/Force Off (s)	64	0	0	53
Yield/Force Off 170(s)	64	95	0	53
Local Start Time (s)	57	68	57	4
Local Yield (s)	64	0	0	53
Local Yield 170(s)	64	95	0	53

Intersection Summary	
Cycle Length	110
Control Type	Actuated-Coordinated
Natural Cycle	110
Offset: 0 (0%), Referenced to phase 2:WBT and 6:EBT, Start of Yellow	

Splits and Phases: 3: Ralston Ave & Driveway