Preliminary Planning Study
Route 35 from I-280 to Sneath Lane

June 23, 2016

Prepared for

San Mateo County Transportation Authority
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1. Introduction

The San Mateo County Transportation Authority (SMCTA) is proposing to reduce traffic congestion on SR-35 (also known as "Skyline Boulevard") approximately between Sneath Lane and I-280. Within the project area, exist two intersections (at Sneath Lane and San Bruno Avenue West) which are among the four most congested intersections within the City of San Bruno.[1] Based on the San Mateo County Congestion Management Program (CMP)(2015) put together by the City/County Association of Governments of San Mateo County (C/CAG), SR-35 running through these two intersections operate at LOS F during peak AM/PM hours. LOS F is defined by drivers who experience reduced speeds and significant delays along roadway corridor.[2] Intersection improvements including widening the proposed project corridor have been identified as an Implementing Policy in the 2025 San Bruno General Plan in order to relieve current traffic delays and restore intersections to an acceptable level of service described in the City/County of San Mateo CMP.

The study examines five project alternatives and one no project alternative. All of the alternatives are variations of widening the road, whether by one or two lanes. The five alternatives proposed for the Project are summarized as follows:

- No Project Alternative
- Alternative 1 – Addition of one 12' lane (NB) utilizing retaining walls
- Alternative 1A – Addition of one 12' lane (NB) utilizing cut slopes
- Alternative 2 – Addition of two 12' lanes (NB/SB) utilizing retaining walls
- Alternative 2A – Addition of two 12' lanes (NB/SB) utilizing cut slopes
- Alternative 3 – Widening to four lanes at the approach/departure of San Bruno Avenue, with signal phasing improvements at Sneath Lane
- Alternative 4 – Alt. 2 with signal phasing improvements at Sneath Lane
- Alternative 5 – Widening to four lanes between San Bruno Ave and Sneath Lane, with signal phasing improvements at Sneath Lane

The summary of capital costs is detailed in Cost Estimate, Section 5 of the report. There is no current funding for the Project.

[1] Dyett and Bhatia. *San Bruno General Plan*. 2009.
https://sanbruno.ca.gov/civicax/filebank/blobdload.aspx?BlobID=24024

[2] City/County Association of Government of San Mateo. *Final San Mateo County Congestion Management Program*. 2015.

2. Background

In 1988, the County of San Mateo passed Measure A to improve transit and relieve traffic congestion. It was a 20-year half-cent sales tax dedicated to local transportation projects. With the passage of Measure A, the SMCTA was created to administer the funds that were collected from this half-cent sales tax. The SMCTA is governed by a board of directors comprised of elected officials representing all geographic areas of the county. In 2004, Measure A was reauthorized to extend the measure for an additional 25 years until 2033. As part of plan for Measure A, SMCTA is required to develop a Strategic Plan and update the Strategic Plan every five years.[3]

In the most current strategic plan (2014-2019), Measure A has allotted a portion of the total funds to supplemental roadways. Skyline Boulevard (SR-35) Widening (I-280 to Sneath Lane in the City of San Bruno) project was identified as a listed project for Measure A funding. The project would reduce congestion and improve safety on roadways.

In 1986, Caltrans District 4 performed a project study titled, "Route Concept Report, Route 35". The purpose of the report was to develop concept for the projected travel demand over a 20 year planning period (1985-2005). Analysis in the report concludes with the following recommendations to achieve the proposed concept: widening and reconstruction of the two lane highway to a four lane highway and construction of a bicycle trail along the entire stretch. The report predicted operation levels of LOS D with the assumption that public transportation improvements would be implemented.[4]

Through Caltrans 1986 study and San Mateo's Congestion Management Plan, the increased traffic along the project segment is evident. The proposed project will relieve traffic congestion by reducing peak hour travel times.

SR-35, commonly known as Skyline Boulevard, is a north-south route that extends from Highway 17 in Santa Clara County to State Route 1 in San Francisco. The Project is located along SR-35 in San Mateo County between Sneath Lane to I-280 in the City of San Bruno, California. The project area is approximately 1.5 miles long. The existing roadway is primarily a two lane highway with one lane in each direction in the north/south direction. This segment of SR-35 serves as an access route to residential neighborhoods located to the east, and serves as a commuter access route to both Route 280 and Route 1.

The project study area and surrounding area are shown on Attachment A. To the east of the project area is primarily low density housing with an open space buffer. The west side of the project contains existing popular hiking San Andreas

[3] *Final San Mateo County Congestion Management Program*. See footnote [2].
[4] Caltrans District 4, *Route Concept Report, Route 3*. 1986.

Regional Trail within the San Francisco Public Utilities Commission's Peninsula Watershed.

3. Purpose and Need

Purpose:

The purpose of the project is to accomplish the following:

- Reduce delay for existing and future traffic congestion on SR-35
- Improve traffic operation specifically at the Sneath Lane/SR-35 and San Bruno Avenue/SR-35 intersections
- Enhance safety by improving traffic operations

Need:

SR-35 follows the ridge line of the coastal hills, running roughly parallel to both Highway 1 and I-280. It's location adjacent to the populated I-280 and well-traveled Highway 1, make SR-35 a popular route for weekday commuters and weekend travelers as an alternative from the two adjacent routes. Two of the recognized points of congestion are the two intersections within the segment at Sneath Lane and San Bruno Avenue. Per the *Preliminary Traffic Analysis for State Route 35 Widening (I-280 to Sneath Lane)* dated June 9, 2016 prepared by Hexagon Transportation Consultants, both intersections will operate at poor levels of service (LOS E or F) during peak hours in the 2030 forecast year. The memorandum shows the need for existing and future traffic mitigation measures. The traffic analysis indicates that existing traffic volumes include long southbound delays during the AM peak hour and northbound delays during the PM peak hour from commuter traffic.

These predicted traffic volumes are also reflective of the City of San Bruno 2025 General Plan that was adopted by the City in 2009. This document identifies that these two intersections need improvements and concluded that both would underperform with the projected 2030 traffic volumes.

On April 14, 2015, the San Bruno City Council adopted the *San Bruno Housing Element (2015-2023)*. The Housing Element reviews the City of San Bruno's housing needs, available land, and constraints in order to come up with initiatives to facilitate on-going provisions to provide affordable and market-rate housing in the City. The Association of Bay Area Governments (ABAG) made projections for housing need from 2010-2040. Since San Bruno is a rapidly growing city, ABAG predicted a 29% increase in housing units during this time. The Housing Element concludes that the City's quantified housing objectives includes 1,700 units for the 2012-2022 term. This objective includes units under construction, and planned for construction (120 units) on sites that have already been zoned

residential (622) or need to be rezoned (958).[5] The proposed developments would potentially affect and exacerbate the traffic conditions on SR-35.

4. Alternatives

Six alternatives were considered for this report (see Attachment B for geometric drawings of build alternatives). The alternatives are described below:

No Project Alternative

SR-35 is two-lane highway with one lane in each direction. The project area of SR-35 spans from Sneath Lane to I-280. The existing corridor includes two intersections:

- Sneath Lane and SR-35
- San Bruno Avenue and SR-35

The No-Project alternative proposes no change to the existing highway.

Alternative 1 – Addition of one 12' lane (NB) utilizing retaining walls

Alternative 1 proposes to provide additional standard 12-foot wide lane and 8-foot wide shoulder along SR-35 northbound direction for the entire length of the project. This alternative utilizes retaining walls for the widening.

Alternative 1A – Addition of one 12' lane (NB) utilizing cut slopes

Alternative 1A is the same as Alternative 1 except utilizes cut slopes rather than retaining walls.

Alternative 2 – Addition of two 12' lanes (NB/SB) utilizing retaining walls

Alternative 2 proposes to provide additional standard 12-foot wide lane and 8-foot wide shoulder in both SR-35 northbound and southbound direction for the entire length of the project. This alternative utilizes retaining walls for the widening.

Alternative 2A – Addition of two 12' lanes (NB/SB) utilizing cut slopes

Alternative 2A is the same as Alternative 2 except utilizes cut slopes rather than retaining walls.

[5] City of San Bruno, *San Bruno Housing Element (2015-2023)*. 2015.

Alternative 3 – Widening to four lanes at the approach/departure of San Bruno Avenue with signal phasing improvements

Alternative 3 proposes to widen SR-35 to four lanes approaching and departing San Bruno Ave for a distance of 500 feet. Alternative 3 proposes to improve signal phasing at the Sneath Lane Intersection. This alternative utilizes retaining walls for widening.

Alternative 4 – Widening to four lanes at the approach/departure of San Bruno Avenue with signal phasing improvements

Alternative 4 is the same as Alternative 2 with the addition of signal phasing improvements at Sneath Lane.

Alternative 5 – Widening to four lanes between San Bruno Avenue and Sneath Lane with signal phasing improvements

Alternative 5 proposes to widen SR-35 to four lanes between San Bruno Avenue and Sneath Lane Intersections. This alternative would include signal phasing modifications at the Sneath Lane Intersection. This alternative utilizes retaining walls for widening.

Design Exceptions

The Project would be designed in accordance to the Caltrans Highway Design Manual. This study only analyzed horizontal features for all alternatives. The study did not find any design exceptions for any of the alternatives.

Retaining Walls

The project alternatives with the exception of 1A and 2A utilize retaining walls to minimize environmental impacts. For the residents located to the east of SR-35, the existing wooded area serves as a buffer between their homes and the highway. Using retaining walls would minimize removal of trees and potential sensitive habitats.[6]

Retaining walls proposed along the new shoulder range in height and vary in type depending on the adjacent hillside. Alternative 1 will require the construction of four retaining walls ranging from 6' to 8' in height. Alternatives 2 and 4 are fundamentally similar and are anticipated to require the construction of eight retaining walls ranging from 6' to 12' in height. Alternatives 3 spans only a portion of Alternative 2 and is anticipated to require the construction of 3 retaining walls with heights varying from 6' to 10'. Alternative 5 extends the widening from Alternative 3 to include the portion roadway between San Bruno

[6] HNTB, *State Route 35 Widening Preliminary Planning Study Environmental Memo*, 2016. See attachment E.

Ave and Sneath Lane resulting in four anticipated retaining walls with heights ranging from 6' to 12'.

5. Cost Estimate

The estimated costs associated with the alternatives are presented in **Tables 5-1**. Total costs are reflective of the rates from June 2016, the escalated cost assumes 3% forecasted escalation rate each year. A full cost estimate breakdown for each alternative is presented in Attachment C.

Table 5-1 Summary of Capital Costs

	Roadway	Utility Relocation	**Total Cost**	**Escalated Cost (2018)**
Alternative 1	$18,865,600		**$18,865,000**	**$20,014,000**
Alternative 1A	$15,433,000		**$15,433,000**	**$16,373,000**
Alternative 2	$40,256,000	$1,560,000	**$41,816,000**	**$44,363,000**
Alternative 2A	$31,824,000	$1,560,000	**$33,384,000**	**$35,418,000**
Alternative 3	$10,326,000		**$10,326,000**	**$10,955,000**
Alternative 4	Same as Alt 2/2A			
Alternative 5	$21,138,000		**$21,138,000**	**$22,426,000**

Roadway costs were done using Caltrans estimating methods identified in the Caltrans' *Plan Development Procedures Manual* (PDPM).[7] Some roadway costs such as drainage and erosion control were estimated based on similar projects in the region. Other costs such as earthwork, pavement and specialty items were based on photos, field visits, as-builts and google maps. Costs for retaining walls assume the use of Caltrans standard retaining walls. However, further refinement through the use of topographic survey, planimetrics and updated as-built information is needed to better estimate these features in future phases of work.

To determine the pavement design, a Life Cycle Cost Analysis will be conducted in a later phase of the project.

The *Preliminary Planning Study Environmental Memo (Draft)* prepared by HNTB in Attachment E made reference to the potential for environmentally sensitive land. Each alternative has a placeholder lump sum cost for the biological mitigation included in the cost estimate to factor these costs.

[7] Caltrans, *Plans Preparation Manual*. 2008.

SR 35 was in use prior to the lead ban in California in the 1980's. Aerially Deposited Lead (ADL) may be found in the soils adjacent to Skyline Drive. Costs factor in the excavation for ADL.

Additional studies in future phases of work will be necessary to further refine these costs.

Mobilization & Contingency

BKF followed Caltrans Project Development Procedures Manual (PDPM) methodology for cost estimation. Mobilization was assumed at 10% of total project cost, and contingencies were assumed at 50% for preliminary project estimates.

Utility Relocation

From PG&E utility block map, there is an existing 24" gas line crossing perpendicularly to SR 35 near the beginning of the project, and then heading north along the northbound direction. Alternatives 2/2A, and 4/4A would require relocation of the 24" gas line for an approximate 700 feet.

Right-of-Way

None of the alternatives require any acquisition of right of way. The project will all be constructed within Caltrans' right-of-way.

Escalation Factors

2016 costs use current 2016 dollars with no escalation factor. The 2018 escalated cost uses a 3% forecasted escalation rate.

6. Traffic Analysis

Existing Condition

A traffic study titled, *Preliminary Traffic Analysis for State Route 35 Widening (I-280 to Sneath Lane* by Hexagon Transportation Consultants in Attachment D, was done for our analysis using 2015 counts. The data used for their model was obtained through San Bruno 2025 General Plan, field observations and new traffic counts. The base year and forecast year for this model are year 2015 and year 2030, respectively.

Hexagon's analysis reviewed all of the alternatives using Synchro/Simtraffic software developed by Trafficware. The study focused on two of the following

signalized intersections that control the capacity and operations of the project area:

- Skyline Boulevard and Sneath Lane
- Skyline Boulevard and San Bruno Avenue

Existing traffic volumes were collected by manual turning-movement counts that were conducted on September 2, 2015 at the study intersections. From the traffic analysis, AM peak hour occurred between 7-9 AM and PM peak hour occurred between 4-6 PM. From the data collected, the existing AM traffic volumes at Sneath Lane operate at LOS E and the existing PM traffic volumes at San Bruno Avenue operation at LOS E. The study then analyzed the *No Project* condition plus each of the project alternatives. **Table 6-1** summarizes the results.

The results for the existing signal operations show that all of the alternatives would improve traffic operations during both peak hours. Based on the analysis, Alternatives 2,3,4,5 result in a much larger decrease in vehicle delay compared to Alternative 1 during the AM peak hour. This decrease is due to improvements made in the southbound direction. At Sneath intersection, there is a significant decreases in vehicle delay are found with Alternatives 3, 4, 5 during the PM peak hour. The addition of signal phasing improvements would help cycle traffic through the intersection. At San Bruno Avenue all of the alternatives would decrease vehicle delays because of the additional northbound through lane.

Table 6-1: Existing Signal Operations (Average Delay)

Alternative	San Bruno Avenue				Sneath Lane			
	AM		PM		AM		PM	
	sec/veh	LOS	sec/veh	LOS	sec/veh	LOS	sec/veh	LOS
No Project	*17.1*	*B*	*59.0*	*E*	*68.8*	*E*	*34.3*	*C*
1/1A	16.6	B	19.5	B	57.5	E	34.5	C
2/2A	15.6	B	20.3	C	48.3	D	32.8	C
3	15.2	B	20.0	B	42.7	D	30.0	C
4	15.1	B	21.3	C	37.9	D	21.0	C
5	14.9	B	20.8	C	38.6	D	21.1	C

Future Condition

The Future condition analysis was done based on 2030 forecast volumes from the City of San Bruno General Plan. The results found on **Table 6-2** show that if there are no improvements, both intersections would fail to meet applicable standards (LOS F) during peak hours. Both intersections would be characterized by unacceptable traffic delays and very high volume-to-capacity ratios.

The results for the future condition with each of the alternatives are also found on **Table 6-2**. Results show that the addition of any alternative would improve the operation at both intersections.

At San Bruno Avenue intersection, all of the alternatives would result in LOS C or better for both the AM and PM peak hours. The addition of a northbound lane would decrease future delays in traffic for the PM peak hour. The AM peak hour at this intersection shows no significant future delays.

At the Sneath Lane intersection, alternatives 4 and 5 would results in an LOS of D or better for both peak hours. Projected traffic is shown to increase in the southbound and westbound direction. The biggest improvements are shown when we introduced signal phasing improvements.

Table 6-2: Future Signal Operations (Average Delay)

Alternative	San Bruno Avenue				Sneath Lane			
	AM		PM		AM		PM	
	sec/veh	LOS	sec/veh	LOS	sec/veh	LOS	sec/veh	LOS
No Project	*17.1*	*B*	*86.1*	*F*	*115.5*	*F*	*104.1*	*F*
1/1A	16.7	B	27.2	C	109.1	F	105.7	F
2/2A	14.4	B	21.0	C	109.0	F	101.0	F
3	12.9	B	22.5	C	85.0	F	90.1	F
4	15.5	B	27.3	C	48.0	D	53.2	D
5	15.4	B	26.0	C	52.2	D	50.3	D

Travel Times

As part of the traffic study, a travel time analysis was done based on the existing and future traffic volumes shown on **Table 6-3**. The travel times reflect the time it would take to travel along SR-35 between the two intersections to about 0.25 miles past each intersection.

For the existing condition, the results show that all of the alternatives would improve travel times in both directions in the northbound direction. Alternatives 2, 3, 4, 5 show improvements in the SB direction. Alternative 1 proposes no southbound improvements.

The future condition resulted in similar trends to the existing condition with the exception of PM travel times. Alternatives 2, 3, 4 would decrease in travel time compared to the no project condition. Changes in the signal phasing for alternatives 4 and 5 would improve the intersection level of serves, however, slightly increase the overall travel time.

Table 6-3: Travel Times (SR-35) (seconds)								
Alternative	Northbound (NB)				Southbound (SB)			
	Existing		Future		Existing		Future	
	AM	PM	AM	PM	AM	PM	AM	PM
No Project	*141*	*136*	*150*	*158*	*138*	*98*	*323*	*97*
1/1A	137	122	142	117	138	98	323	97
2/2A	137	122	142	117	125	98	242	96
3	119	113	123	119	102	90	146	89
4	118	112	127	149	97	86	114	92
5	118	112	127	169	97	86	115	98

Our traffic analysis concludes that the current traffic patterns show major southbound delays during the AM peak hour and northbound delays during the PM peak hour. The projected 2030 traffic counts show that the addition of a northbound through lane would provide a significant decrease in the delays and the San Bruno Avenue intersection. At the Sneath Lane intersection, traffic is forecasted to increase in both the southbound and the westbound direction. The combination of southbound and westbound traffic prevent the addition of a new lane in the southbound direction to have significant improvements. The addition of signal phasing at this intersection would result in the biggest impact.

While all of the alternatives offer suitable solutions and accrue travel savings to forecast users, the detailed analyses show the most effective outcome when providing a combination of more lanes and the signal phasing improvements. It should be noted that Alternatives 2/2A, 3, 4, 5 show significant improvement over Alternative 1 and the No Project condition. The four latter alternatives would offer more capacity and potential congestion relief for future additional southbound traffic. However, Alternatives 4 and 5 offer the most effective solutions to mitigating traffic in the project area and offer the highest estimated travel time savings for the congested 2030 traffic volumes.

It is recommended that further analysis in later phases of work consider demand volumes and output volumes. In addition, the impacts of the proposed improvements should be considered beyond the proposed project limits.

7. Environmental Determination

The *Preliminary Planning Study Environmental Memo (Draft)* dated September 2015 prepared by HNTB can be found in Attachment E. It identifies the environmental constraints and potential environmental impacts of constructing either one or two additional lanes. This study found that some impacts will require mitigation for all of the alternatives. The project location is within a Highway Receiving Water Risk Watershed. San Bruno 2025 General Plan found three areas

with potential soil and/or groundwater contamination: the intersection San Bruno Avenue West and SR-35; Sneath lane and SR-35; and SR-35 and I-280. Further investigation of these areas is necessary to refine the environmental study.

The study found that sensitive habitats and special-status species including California red-legged frog and dusky-footed woodrat exist within the project limits.

Since SR-35 was originally constructed prior to the lead ban in California in the 1980's, the soil adjacent to Skyline Drive may contain Aerially Deposited Lead (ADL). Excavation of the ADL material will be required for all of the alternatives.

In general, the alternatives with the least amount of improvements would result in the lowest environmental impact. Thus, the Alternative 1 would have less of an impact than Alternative 2. Alternative 4 would have the same impact as Alternative 2 because the only difference is the change in signal phasing. Alternatives 3 and 5 would require the least amount of impact because the project area is only a portion of Alternative 2.

The biggest impacts in aesthetics come from Alternatives 1A, 2A and 4A due cut slope grading. The use of retaining walls in Alternatives 1, 2, 3, 4 and 5 would minimize the tree removal along the east side of the highway allowing minimal visual and aesthetic impacts to residents, and minimize disruption to surrounding habitats. Alternatives 3 and 5 would have minimal environmental impacts.

8. Risk Assessment

No major risks have been identified for any of the alternatives. The only risks identified are limited to potential cost items in determination of required funding for the project and do not include items related to other project risks such as project schedule.

As stated earlier our study only examined the horizontal geometry. Additional information is needed in order to investigate possible impacts from the vertical profile. Although unlikely of major changes, the profile could change retaining wall heights and cut slopes.

From utility block maps and as-builts, Alternatives 2/2A and 4/4A require a gas relocation. East of the roadway and South of San Bruno Avenue exists an underground gas line adjacent to the proposed improvements. West of the roadway south of Sneath Lane, exist overhead lines adjacent to the proposed improvements. Additional survey and potholing is needed to confirm that utility lines and poles are not impacted. Coordination may be required with PG&E.

As identified in the *Preliminary Planning Study Environmental Memo*, further investigation is needed to determine if hazardous materials exist on the project site. Although a lump sum cost is included in the Project estimates, it is not known if this cost is sufficient.

9. Project Phasing

As there is no current funding for the Project, it may be necessary to build the Project in phases as available funding is obtained. The discussion below identifies how the alternatives were developed in a way such that the project could be built in phases. The phasing options that are identified are as follows:

- Alternative 3
- Alternative 5
- Alternative 1/1A
- Alternative 2/2A and 4

Alternative 3 - This option proposes to only make improvements to the area around the San Bruno Avenue intersection. Although not as effective as some of the latter alternatives, improvements in signal phasing and adding additional lanes in the immediate area of the intersection will relieve current congestion while minimizing costs of construction.

Alternative 5 - This option expands on Alternative 3 and constructs the 4 lane highway between San Bruno Avenue and Sneath Lane.

Alternative 1/1A - This option proposes to construct the northbound improvements only. As identified by the *Preliminary Traffic Analysis* the improvement that provides the most congestion benefit is in the northbound direction in peak hour traffic.

Alternative 2/2A and 4 - These options will require the most time and money. However, based on the *Preliminary Traffic Analysis,* Alternative 4 offers the most overall decrease in traffic times.

Additional phasing possibilities could be to only build the northbound improvements in the area around the two intersections or only do signal phasing improvements at the intersections. It should be noted that each of these two phasing options need further analysis to verify whether or not the proposed improvement provide a benefit.

Alternative 4 would be recommended to mitigate for future traffic; however, based on the *Preliminary Traffic Analysis* it was found that Alternative 5 widening and signal improvements would provide similar improvements to travel times to Alternative 4. Therefore, Alternative 5 would be a beneficial cost effective alternative.

10. Attachments

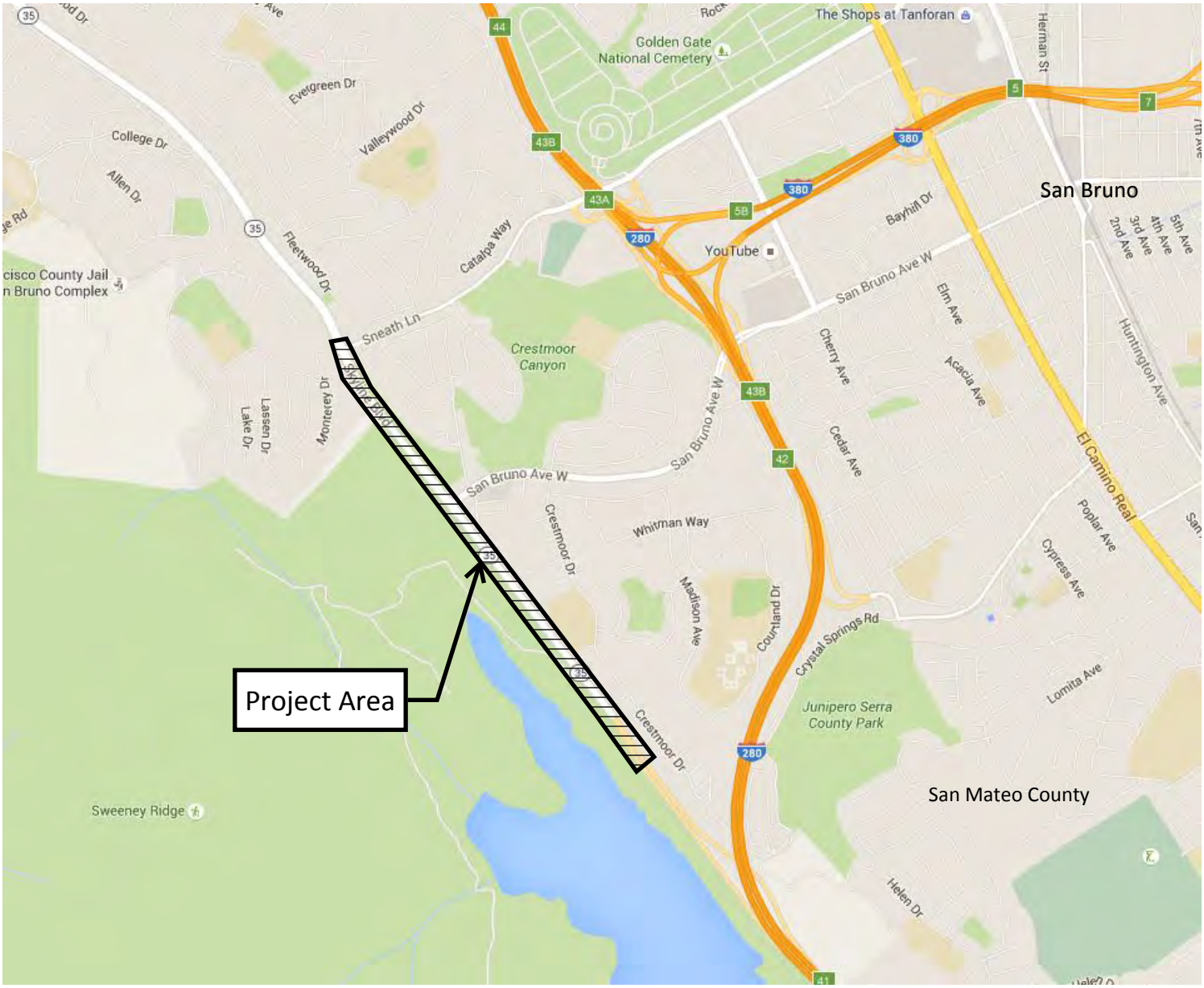
Attachment A – Location Map
Attachment B – Geometric Drawings
Attachment C – Cost Estimate
Attachment D – Preliminary Traffic Analysis for State Route 35 Widening
Attachment E – Preliminary Planning Study Environmental Memo

ATTACHMENT A

Location Map

Attachment A:

Location Map



ATTACHMENT B

Geometric Drawings

STATE ROUTE 35 WIDENING (I-280 TO SNEATH LANE) - NO PROJECT ALTERNATIVE

San Mateo County Transportation Authority

BKF ENGINEERS | SURVEYORS | PLANNERS

MATCHLINE - SEE BELOW

MATCHLINE - SEE ABOVE

PLAN

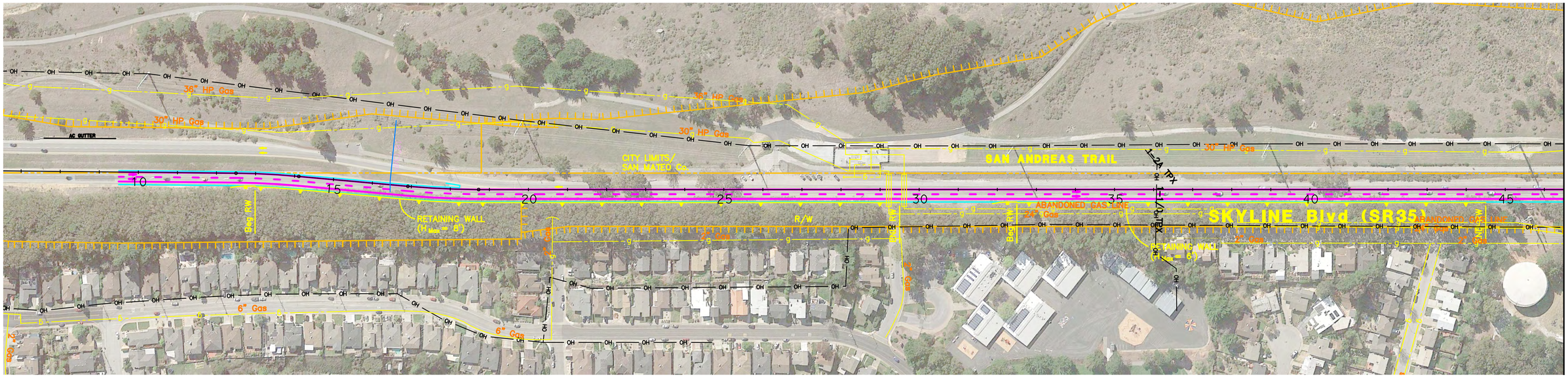
SCALE: 1" = 120'

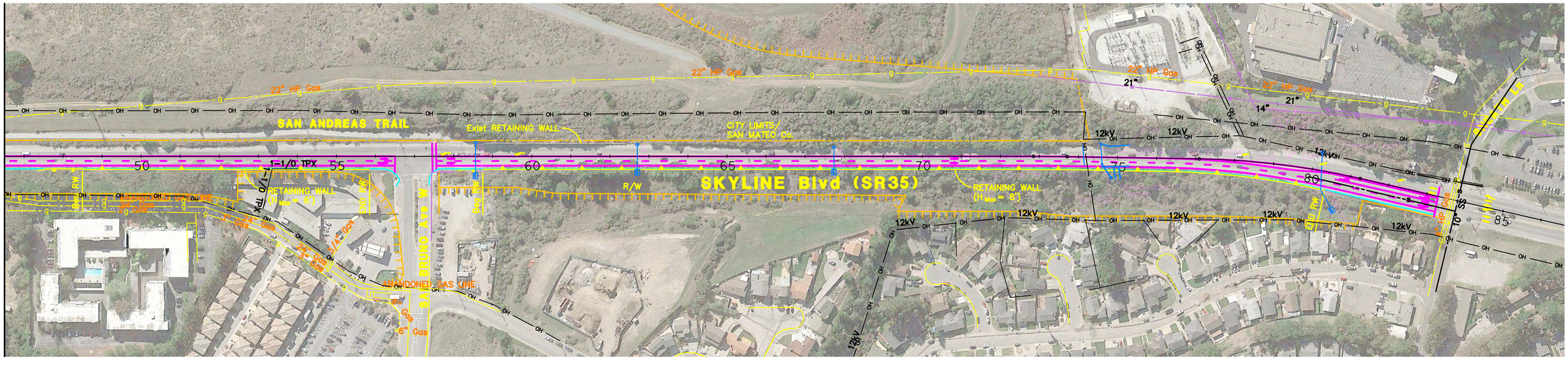
Attachment B

STATE ROUTE 35 WIDENING (I-280 TO SNEATH LANE) - ALTERNATIVE 1

Transportation Authority

BkF ENGINEERS / SURVEYORS / PLANNERS



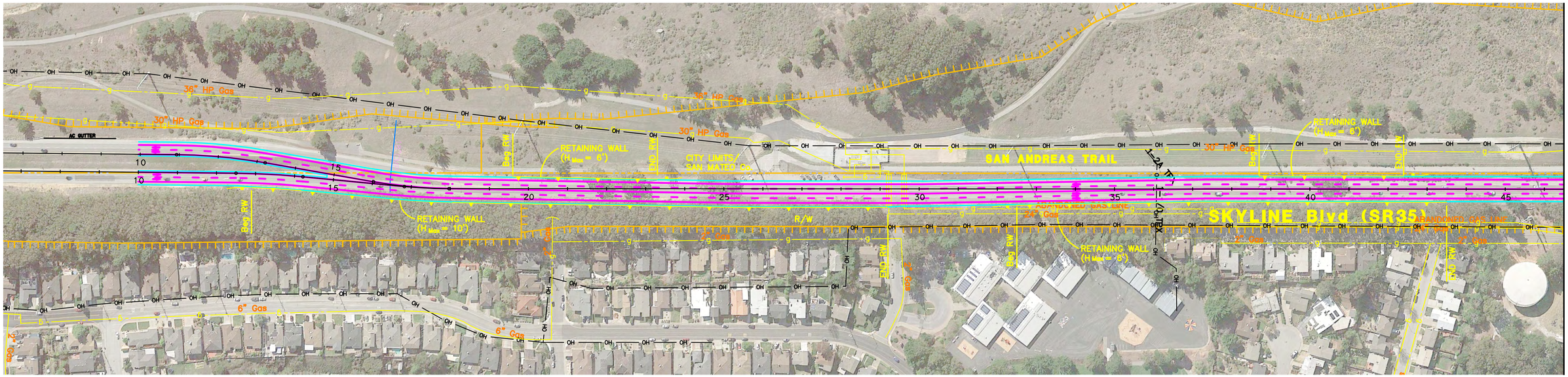


PLAN

SCALE: 1" = 120'

Attachment B

STATE ROUTE 35 WIDENING (I-280 TO SNEATH LANE) - ALTERNATIVE 2



PLAN

SCALE: 1" = 120'

Attachment B

San Mateo County Transportation Authority

STATE ROUTE 35 WIDENING (I-280 TO SNEATH LANE) - ALTERNATIVE 3

BKF
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MATCHLINE - SEE BELOW

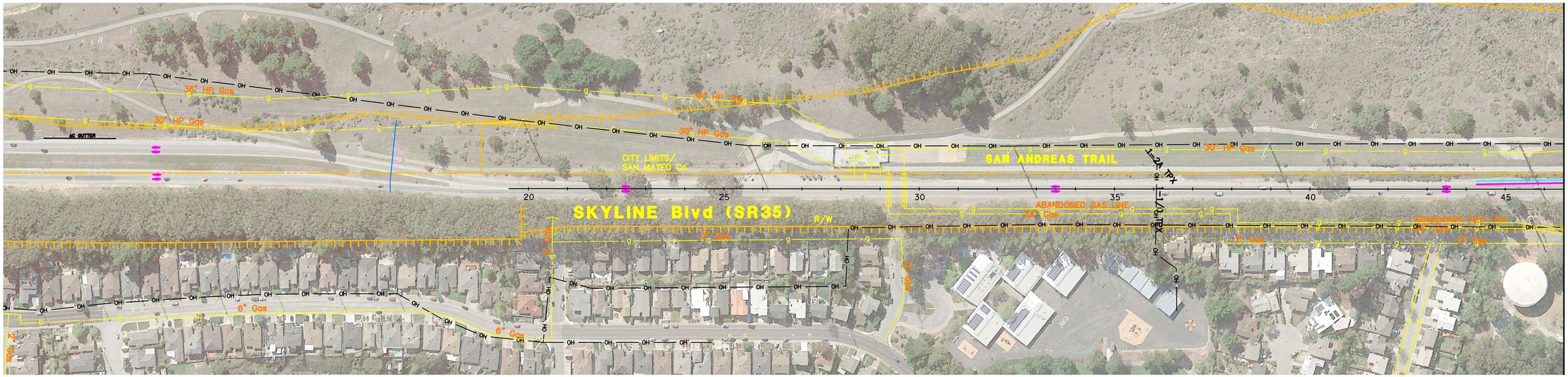
MATCHLINE - SEE ABOVE

PLAN

SCALE: 1" = 120'

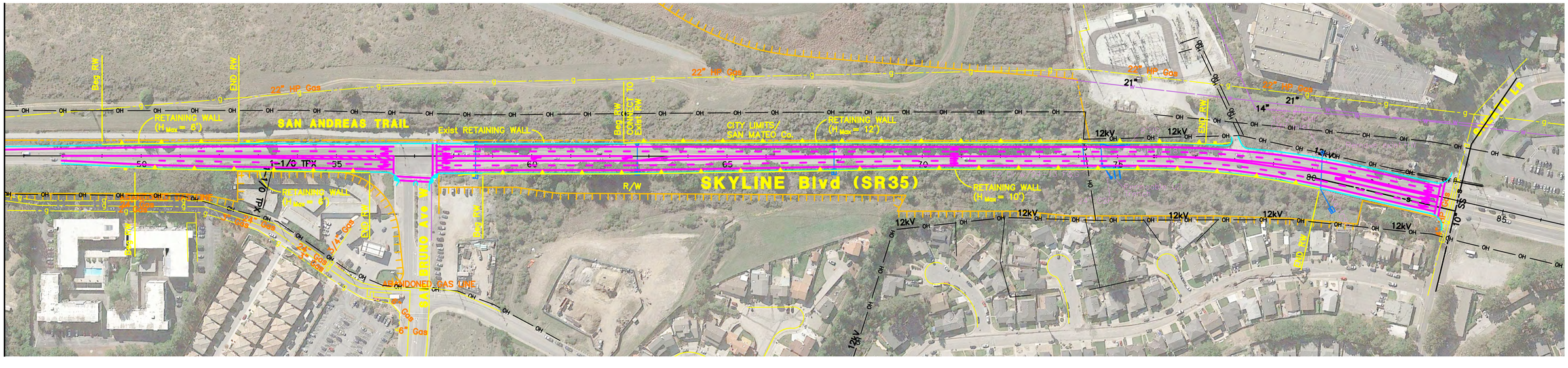
Attachment B

STATE ROUTE 35 WIDENING (I-280 TO SNEATH LANE) - ALTERNATIVE 5



MATCHLINE - SEE BELOW

MATCHLINE - SEE ABOVE



PLAN

SCALE: 1" = 120'

Attachment B

ATTACHMENT C

Cost Estimates

ALTERNATIVE ANALYSIS
Project Estimate Cost Summary

District-County-Route 04-SM-35

PM -

EA -

Program Code -

PROJECT DESCRIPTION:

Limits
Alternative #1 - Three (3) Lane Alternative
Widen NB Route 35; SB Remains as Existing
On Route 35 in San Mateo County in San Bruno from approximately SM 24.8 to SM 23.3
Proposed Improvement (Scope)
Widen NB Route 35 from one to two lanes; construct retaining walls; build barriers, fences, and drainage facilities; replace signals, including advanced signal; install signing & striping

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$	18,855,000
TOTAL STRUCTURE ITEMS	$	-
SUBTOTAL CONSTRUCTION COSTS	$	18,855,000
TOTAL UTILITY RELOCATION ITEMS (Current Value)	$	10,000.00
TOTAL PROJECT CAPITAL OUTLAY COSTS	$	18,865,000

Reviewed by
District Program Manager _____ _____
(Signature) Date

Approved by Project Manager _____ _____
(Signature) Date

Phone No. _____

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost	Section Cost
Roadway Excavation	6,700	CY	$ 10	$ 67,000	
Roadway Excavation (Type Y) ADL	2,700	CY	$ 20	$ 54,000	
Ditch Excavation	5,000	CY	$ 5	$ 25,000	
Clearing & Grubbing	1	LS	$ 10,500	$ 10,500	
Develop Water Supply	1	LS	$ 10,000	$ 10,000	
Structure Excavation (Retaining Wall)	1,340	CY	$ 20	$ 26,800	
Structure Backfill (Retaining Wall)	1,340	CY	$ 40	$ 53,600	
				Subtotal Earthwork	$ 246,900

Section 2 - Pavement Structural Section*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Cold Plane Asphalt Concrete Pavement	4,400	SQYD	$ 10	$ 44,000	
Hot Mix Asphalt (Type A)	700	TON	$ 120	$ 84,000	
Rubberized Hot Mix Asphalt (Gap Graded)	146,000	SF	$ 16	$ 2,336,000	
Place Hot Mix Asphalt Dike (Type E)	1,600	LF	$ 6	$ 9,600	
Concrete Curb Ramps	3	EA	$ 1,000	$ 3,000	
				Subtotal Pavement Structural Section	$ 2,476,600

Section 3 - Drainage	Quantity	Unit	Unit Price	Item Cost	Section Cost
Project Drainage	1	LS	$ 1,544,000	$ 1,544,000	
				Sutotal Drainage	$ 1,544,000

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 4 - Specialty Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Progress Schedule (Critical Path Method)	1	LS	$ 5,000	$ 5,000	
Remove Metal Beam Guard Rail	700	LF	$ 15	$ 10,500	
Lead Compliance Plan	1	LS	$ 10,000	$ 10,000	
Structural Concrete (Retaining Wall)	3,450	CY	$ 800	$ 2,760,000	
Chain Link Fence (Type CL-4)	5,800	LF	$ 15	$ 87,000	
Chain Link Fence (Type CL-6)	1,470	LF	$ 20	$ 29,400	
Metal Beam Guard Railing	150	LF	$ 40	$ 6,000	
Alternative Flared Terminal System	3	EA	$ 3,000	$ 9,000	
Concrete Barrier (Type 736A)	2,900	LF	$ 120	$ 348,000	
Concrete Barrier (Type 60D Mod)	2,850	LF	$ 100	$ 285,000	
			Subtotal Specialty Items		$ 3,549,900

Section 5 - Traffic Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Traffic Electrical	1	LS	$ 597,000	$ 597,000	
Traffic Signing and Striping	1	LS	$ 145,900	$ 145,900	
Stage Construction and Traffic Handling	1	LS	$ 273,270	$ 273,270	
			Subtotal Traffic Items		$ 1,016,200

Section 6 - Enviromental Mitigation	Quantity	Unit	Unit Price	Item Cost	Section Cost
Biological Mitigation	1	LS	$ 100,000	$ 100,000	
Temporary Fence (Type ESA)	7,270	LF	$ 5	$ 36,350	
Landscape and Irrigation				$ -	
			Subtotal Planting and Irrigation Section		$ 136,400

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 7 - Roadside Management and Safety Section	Quantity	Unit	Unit Price	Item Cost	Section Cost
Construction Site Management	1	LS	$ 50,000	$ 50,000	
Prepare SWPPP	1	LS	$ 20,000	$ 20,000	
Temporary Erosion Control	8,100	SQYD	$ 3	$ 24,300	
Temporary Erosion Control Blanket	4,100	SQYD	$ 10	$ 41,000	
Temporary Fiber Roll	14,540	LF	$ 5	$ 72,700	
Temporary Construction Entrance	4	EA	$ 3,000	$ 12,000	
Temporary Check Dam	240	LF	$ 20	$ 4,800	
Move In/Move Out	8	EA	$ 1,000	$ 8,000	
Tempoaray Inlet Protection	12	EA	$ 500	$ 6,000	
Street Sweeping	1	LS	$ 50,000	$ 50,000	
Tempoarary Concrete Washout	1	LS	$ 5,000	$ 5,000	
				Subtotal Traffic Items	$ 293,800

Additional Supplemental Work for Section 10 *(see page 4)*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Water Pollution Control Maintenance Sharing	1	LS	$ 10,000	$ 10,000	
Additional Water Pollution Control	1	LS	$ 10,000	$ 10,000	
Traffic Management Plan	1	LS	$ 10,000	$ 10,000	
Maintain Traffic	1	LS	$ 10,000	$ 10,000	
Value Analysis	1	LS	$ 5,000	$ 5,000	
Remove Rock and Debris	1	LS	$ 5,000	$ 5,000	
Payment Adjustments for Price Index Fluctuation	1	LS	$ 50,000	$ 50,000	
Partnering	1	LS	$ 20,000	$ 20,000	
Operation of Existing Traffic Management System	1	LS	$ 5,000	$ 5,000	
Dispute Review Board	1	LS	$ 7,500	$ 7,500	
				Subtotal Additional Supplemental Work	$ 132,500

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 8 - Minor Items

$ 9,263,800	x	5%	=	$ 463,200
Subtotal (Sections 1 thru 7)				TOTAL MINOR ITEMS

Section 9 - Roadway Mobilization

$ 9,727,000	x	10%	=	$ 972,700
Subtotal (Sections 1 thru 8)				TOTAL ROADWAY MOBILIZATION

Section 10 - Roadway Additions

Supplmental Work

$ 9,727,000	x	5%	=	$ 486,350
Subtotal (Sections 1 thru 8)				

Additional Supplemental Work

$ 132,500			=	$ 132,500
Subtotal				

TOTAL ROADWAY ADDITIONS $ 618,900

Section 11 -State Furnished Materials and Expenses

Supplmental Work

$ 9,727,000	x	5%	=	$ 486,350
Subtotal (Sections 1 thru 8)				

Additional State Furnished Materials

$ 181,000			=	$ 181,000
Subtotal				

TOTAL STATE FURNISHED $ 667,400

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 12 - Time-Related Overhead

150	x	$3,891.33	=	$	583,700
WD				TOTAL MINOR ITEMS	

Section 13 -Contingency

$	12,569,700	x	50%	= $	6,284,900
Subtotal (Sections 1 thru 12)				TOTAL CONTINGENCY	

TOTAL ROADWAY ITEMS	$ 18,854,600 (Subtotal Sect. 1 thru 13)
TOTAL ESCALATED ROADWAY ITEMS	$ 21,221,018 (Subtotal Sect. 1 thru 13)

Estimate Pepared By

(Print Name)	Phone Number	Date

Estimate Reviewed By

(Print Name)	Phone Number	Date

District-County-Route	04-SM-35
EA	-
PM	-

II. STRUCTURE ITEMS

Bridge Name	Structure (1) Retaining Wall No. 1	Structure (2) Retaining Wall No. 2	Structure (3) Retaining Wall No. 3	Structure (4) Retaining Wall No. 4
Structure Type				
Width (out to out) - (ft)				
Span Lengths - (ft)				
Total Area - (sf)				
Footing Type (pile/spread)				
Cost Per Square Foot**				
Mobilization 10%				
Contingency 25%				
Total Cost for Structure				
		SUBTOTAL STRUCTURE ITEMS		$ -
Railroad Related Costs				
		SUBTOTAL RAILROAD ITEMS		$ -

Estimate prepared by

Name	Phone No.	Date

District-County-Route	04-SM-35	
EA	-	
PM	-	

III. UTILITY RELCOATION ITEMS	CURRENT VALUE	ESCALATION RATE	ESCALATED VALUE
A. Potholing, Field Survey (Design Phase)	$ 10,000.00		$ -
B. Utility Relocation (State Share)			$ -
C. Relocation Assistance	$ -		$ -
D. Clearance/Demolition	$ -		$ -
E. Title and Escrow Fees	$ -		$ -
F. Enviromental Review			$ -
TOTAL UTILITY RELOCATION ITEMS	$ 10,000.00		
F. Construction Contract Work			

Comments:

Estimate Prepared By

Print Name	Phone No.	Date

ALTERNATIVE ANALYSIS
Project Estimate Cost Summary

District-County-Route 04-SM-35

PM -

EA -

Program Code -

PROJECT DESCRIPTION:

Limits
Alternative #1A - Three (3) Lane Alternative
Widen NB Route 35; SB Remains as Existing
On Route 35 in San Mateo County in San Bruno from approximately SM 24.8 to SM 23.3
Proposed Improvement (Scope)
Widen NB Route 35 from one to two lanes; utilize cut slopes; build barriers, fences, and drainage facilities; replace signals, including advanced signal; install signing & striping

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$	15,433,000
TOTAL STRUCTURE ITEMS	$	-
SUBTOTAL CONSTRUCTION COSTS	$	15,433,000
TOTAL UTILITY RELOCATION ITEMS (Current Value)	$	-
TOTAL PROJECT CAPITAL OUTLAY COSTS	$	15,433,000

Reviewed by
District Program Manager _____ (Signature) _____ Date

Approved by Project Manager _____ (Signature) _____ Date

Phone No. _____

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost	Section Cost
Roadway Excavation	13,000	CY	$ 10	$ 130,000	
Roadway Excavation (Type Y) ADL	4,200	CY	$ 20	$ 84,000	
Ditch Excavation	5,000	CY	$ 5	$ 25,000	
Clearing & Grubbing	1	LS	$ 75,000	$ 75,000	
Develop Water Supply	1	LS	$ 10,000	$ 10,000	
Structure Excavation (Retaining Wall)	2,600	CY	$ 20	$ 52,000	
Structure Backfill (Retaining Wall)	2,600	CY	$ 40	$ 104,000	
				Subtotal Earthwork	$ 480,000

Section 2 - Pavement Structural Section*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Cold Plane Asphalt Concrete Pavement	4,400	SQYD	$ 10	$ 44,000	
Hot Mix Asphalt (Type A)	700	TON	$ 120	$ 84,000	
Rubberized Hot Mix Asphalt (Gap Graded)	146,000	SF	$ 16	$ 2,336,000	
Place Hot Mix Asphalt Dike (Type E)	1,600	LF	$ 6	$ 9,600	
Concrete Curb Ramps	3	EA	$ 1,000	$ 3,000	
				Subtotal Pavement Structural Section	$ 2,476,600

Section 3 - Drainage	Quantity	Unit	Unit Price	Item Cost	Section Cost
Project Drainage	1	LS	$ 1,257,000	$ 1,257,000	
				Sutotal Drainage	$ 1,257,000

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 4 - Specialty Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Progress Schedule (Critical Path Method)	1	LS	$ 5,000	$ 5,000	
Remove Metal Beam Guard Rail	700	LF	$ 15	$ 10,500	
Lead Compliance Plan	1	LS	$ 10,000	$ 10,000	
Structural Concrete (Retaining Wall)	1,700	CY	$ 800	$ 1,360,000	
Chain Link Fence (Type CL-4)	2,950	LF	$ 15	$ 44,250	
Chain Link Fence (Type CL-6)	4,320	LF	$ 20	$ 86,400	
Metal Beam Guard Railing	150	LF	$ 40	$ 6,000	
Alternative Flared Terminal System	3	EA	$ 3,000	$ 9,000	
Concrete Barrier (Type 736A)	2,900	LF	$ 120	$ 348,000	
Concrete Barrier (Type 60D Mod)		LF	$ 100	$ -	
				Subtotal Specialty Items	$ 1,879,150

Section 5 - Traffic Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Traffic Electrical	1	LS	$ 597,000	$ 597,000	
Traffic Signing and Striping	1	LS	$ 145,900	$ 145,900	
Stage Construction and Traffic Handling	1	LS	$ 273,270	$ 273,270	
				Subtotal Traffic Items	$ 1,016,200

Section 6 - Enviromental Mitigation	Quantity	Unit	Unit Price	Item Cost	Section Cost
Biological Mitigation	1	LS	$ 100,000	$ 100,000	
Temporary Fence (Type ESA)	7,270	LF	$ 5	$ 36,350	
Landscape and Irrigation				$ -	
				Subtotal Planting and Irrigation Section	$ 136,400

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 7 - Roadside Management and Safety Section	Quantity	Unit	Unit Price	Item Cost	Section Cost
Construction Site Management	1	LS	$ 50,000	$ 50,000	
Prepare SWPPP	1	LS	$ 20,000	$ 20,000	
Temporary Erosion Control	8,100	SQYD	$ 3	$ 24,300	
Temporary Erosion Control Blanket	4,100	SQYD	$ 10	$ 41,000	
Temporary Fiber Roll	14,540	LF	$ 5	$ 72,700	
Temporary Construction Entrance	4	EA	$ 3,000	$ 12,000	
Temporary Check Dam	240	LF	$ 20	$ 4,800	
Move In/Move Out	8	EA	$ 1,000	$ 8,000	
Tempoaray Inlet Protection	12	EA	$ 500	$ 6,000	
Street Sweeping	1	LS	$ 50,000	$ 50,000	
Tempoarary Concrete Washout	1	LS	$ 5,000	$ 5,000	
				Subtotal Traffic Items	$ 293,800

Additional Supplemental Work for Section 10 *(see page 4)*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Water Pollution Control Maintenance Sharing	1	LS	$ 10,000	$ 10,000	
Additional Water Pollution Control	1	LS	$ 10,000	$ 10,000	
Traffic Management Plan	1	LS	$ 10,000	$ 10,000	
Maintain Traffic	1	LS	$ 10,000	$ 10,000	
Value Analysis	1	LS	$ 5,000	$ 5,000	
Remove Rock and Debris	1	LS	$ 5,000	$ 5,000	
Payment Adjustments for Price Index Fluctuation	1	LS	$ 50,000	$ 50,000	
Partnering	1	LS	$ 20,000	$ 20,000	
Operation of Existing Traffic Management System	1	LS	$ 5,000	$ 5,000	
Dispute Review Board	1	LS	$ 7,500	$ 7,500	
				Subtotal Additional Supplemental Work	$ 132,500

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 8 - Minor Items

$ 7,539,200	x	5%	=	$ 377,000
Subtotal (Sections 1 thru 7)				TOTAL MINOR ITEMS

Section 9 - Roadway Mobilization

$ 7,916,200	x	10%	=	$ 791,620
Subtotal (Sections 1 thru 8)				TOTAL ROADWAY MOBILIZATION

Section 10 - Roadway Additions

Supplmental Work

$ 7,916,200	x	5%	=	$ 395,810
Subtotal (Sections 1 thru 8)				

Additional Supplemental Work

$ 132,500			=	$ 132,500
Subtotal				

TOTAL ROADWAY ADDITIONS $ 528,400

Section 11 -State Furnished Materials and Expenses

Supplmental Work

$ 7,916,200	x	5%	=	$ 395,810
Subtotal (Sections 1 thru 8)				

Additional State Furnished Materials

$ 181,000			=	$ 181,000
Subtotal				

TOTAL STATE FURNISHED $ 576,900

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 12 - Time-Related Overhead

150	x	$3,166.67	=	$	475,100
WD				TOTAL MINOR ITEMS	

Section 13 -Contingency

$	10,288,170	x	50%	= $	5,144,100
Subtotal (Sections 1 thru 12)				TOTAL CONTINGENCY	

TOTAL ROADWAY ITEMS	$ 15,432,270 (Subtotal Sect. 1 thru 13)
TOTAL ESCALATED ROADWAY ITEMS	$ 17,369,156 (Subtotal Sect. 1 thru 13)

Estimate Pepared By

(Print Name)	Phone Number	Date

Estimate Reviewed By

(Print Name)	Phone Number	Date

District-County-Route	04-SM-35
EA	-
PM	-

II. STRUCTURE ITEMS

Bridge Name	Structure (1) Retaining Wall No. 1	Structure (2) Retaining Wall No. 2	Structure (3) Retaining Wall No. 3	Structure (4) Retaining Wall No. 4
Structure Type				
Width (out to out) - (ft)				
Span Lengths - (ft)				
Total Area - (sf)				
Footing Type (pile/spread)				
Cost Per Square Foot**				
Mobilization 10%				
Contingency 25%				
Total Cost for Structure				
		SUBTOTAL STRUCTURE ITEMS		$ -
Railroad Related Costs				
		SUBTOTAL RAILROAD ITEMS		$ -

Estimate prepared by

Name	Phone No.	Date

District-County-Route	04-SM-35
EA	-
PM	-

III. UTILITY RELCOATION ITEMS	CURRENT VALUE	ESCALATION RATE	ESCALATED VALUE
A. Potholing, Field Survey (Design Phase)			$ -
B. Utility Relocation (State Share)			$ -
C. Relocation Assistance	$ -		$ -
D. Clearance/Demolition	$ -		$ -
E. Title and Escrow Fees	$ -		$ -
F. Enviromental Review			$ -
G. Utility Relocation (Construction Cost)			$ -
TOTAL UTILITY RELOCATION ITEMS			
ANTICIPATED DATE OF RIGHT OF WAY CERTIFICATION			
F. Construction Contract Work			

Comments:

Estimate Prepared By

Print Name	Phone No.	Date

ALTERNATIVE ANALYSIS
Project Estimate Cost Summary

District-County-Route 04-SM-35

PM -

EA -

Program Code -

PROJECT DESCRIPTION:

Limits
Alternative #2 - Four (4) Lane Alternative
On Route 35 in San Mateo County in San Bruno from approximately SM 24.8 to SM 23.3
Proposed Improvement (Scope)
Widen NB & SB Route 35 from two to four lanes; retaining walls; build barriers, fences, and drainage facilities; replace signals, including advanced signal; install signing & striping

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$	40,256,000
TOTAL STRUCTURE ITEMS	$	-
SUBTOTAL CONSTRUCTION COSTS	$	40,256,000
TOTAL UTILITY RELOCATION ITEMS (Current Value)	$	1,560,000.00
TOTAL PROJECT CAPITAL OUTLAY COSTS	$	41,816,000

Reviewed by
District Program Manager _____ _____
(Signature) Date

Approved by Project Manager _____ _____
(Signature) Date

Phone No. _____

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost	Section Cost
Roadway Excavation	12,910	CY	$ 10	$ 129,100	
Roadway Excavation (Type Y) ADL	5,390	CY	$ 20	$ 107,800	
Ditch Excavation	5,000	CY	$ 5	$ 25,000	
Clearing & Grubbing	1	LS	$ 21,000	$ 21,000	
Develop Water Supply	1	LS	$ 15,000	$ 15,000	
Structure Excavation (Retaining Wall)	2,590	CY	$ 20	$ 51,800	
Structure Backfill (Retaining Wall)	2,590	CY	$ 40	$ 103,600	
				Subtotal Earthwork	$ 453,300

Section 2 - Pavement Structural Section*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Cold Plane Asphalt Concrete Pavement	7,100	SQYD	$ 10	$ 71,000	
Hot Mix Asphalt (Type A)	1,130	TON	$ 120	$ 135,600	
Rubberized Hot Mix Asphalt (Gap Graded)	289,000	SF	$ 16	$ 4,624,000	
Place Hot Mix Asphalt Dike (Type E)	5,000	LF	$ 6	$ 30,000	
Concrete Curb Ramps	3	EA	$ 1,000	$ 3,000	
				Subtotal Pavement Structural Section	$ 4,863,600

Section 3 - Drainage	Quantity	Unit	Unit Price	Item Cost	Section Cost
Project Drainage	1	LS	$ 3,330,000	$ 3,330,000	
				Sutotal Drainage	$ 3,330,000

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 4 - Specialty Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Progress Schedule (Critical Path Method)	1	LS	$ 8,000	$ 8,000	
Remove Metal Beam Guard Rail	1,600	LF	$ 15	$ 24,000	
Lead Compliance Plan	1	LS	$ 10,000	$ 10,000	
Structural Concrete (Retaining Wall)	9,600	CY	$ 800	$ 7,680,000	
Architectural Treatment	8,000	SQFT	$ 15	$ 120,000	
Chain Link Fence (Type CL-4)	8,620	LF	$ 15	$ 129,300	
Chain Link Fence (Type CL-6)	5,920	LF	$ 20	$ 118,400	
Metal Beam Guard Railing	350	LF	$ 40	$ 14,000	
Alternative Flared Terminal System	7	EA	$ 3,000	$ 21,000	
Concrete Barrier (Type 736A)	5,220	LF	$ 120	$ 626,400	
Concrete Barrier (Type 60D Mod)	3,740	LF	$ 100	$ 374,000	
				Subtotal Specialty Items	$ 9,125,100

Section 5 - Traffic Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Traffic Electrical	1	LS	$ 675,500	$ 675,500	
Traffic Signing and Striping	1	LS	$ 279,700	$ 279,700	
Stage Construction and Traffic Handling	1	LS	$ 536,540	$ 536,540	
				Subtotal Traffic Items	$ 1,491,800

Section 6 - Enviromental Mitigation	Quantity	Unit	Unit Price	Item Cost	Section Cost
Biological Mitigation	1	LS	$ 125,000	$ 125,000	
Temporary Fence (Type ESA)	14,540	LF	$ 5	$ 72,700	
Landscape and Irrigation				$ -	
				Subtotal Planting and Irrigation Section	$ 197,700

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 7 - Roadside Management and Safety Section	Quantity	Unit	Unit Price	Item Cost	Section Cost
Construction Site Management	1	LS	$ 50,000	$ 50,000	
Prepare SWPPP	1	LS	$ 25,000	$ 25,000	
Temporary Erosion Control	16,200	SQYD	$ 3	$ 48,600	
Temporary Erosion Control Blanket	8,100	SQYD	$ 10	$ 81,000	
Temporary Fiber Roll	29,080	LF	$ 5	$ 145,400	
Temporary Construction Entrance	6	EA	$ 3,000	$ 18,000	
Temporary Check Dam	480	LF	$ 20	$ 9,600	
Move In/Move Out	16	EA	$ 1,000	$ 16,000	
Tempoaray Inlet Protection	24	EA	$ 500	$ 12,000	
Street Sweeping	1	LS	$ 100,000	$ 100,000	
Tempoarary Concrete Washout	1	LS	$ 10,000	$ 10,000	
				Subtotal Traffic Items	$ 515,600

Additional Supplemental Work for Section 10 *(see page 4)*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Water Pollution Control Maintenance Sharing	1	LS	$ 10,000	$ 10,000	
Additional Water Pollution Control	1	LS	$ 10,000	$ 10,000	
Traffic Management Plan	1	LS	$ 10,000	$ 10,000	
Maintain Traffic	1	LS	$ 10,000	$ 10,000	
Value Analysis	1	LS	$ 5,000	$ 5,000	
Remove Rock and Debris	1	LS	$ 10,000	$ 10,000	
Payment Adjustments for Price Index Fluctuation	1	LS	$ 100,000	$ 100,000	
Partnering	1	LS	$ 20,000	$ 20,000	
Operation of Existing Traffic Management System	1	LS	$ 5,000	$ 5,000	
Dispute Review Board	1	LS	$ 7,500	$ 7,500	
				Subtotal Additional Supplemental Work	$ 187,500

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 8 - Minor Items

$ 19,977,100	x	5%	=	$ 998,900
Subtotal (Sections 1 thru 7)				TOTAL MINOR ITEMS

Section 9 - Roadway Mobilization

$ 20,976,000	x	10%	=	$ 2,097,600
Subtotal (Sections 1 thru 8)				TOTAL ROADWAY MOBILIZATION

Section 10 - Roadway Additions

Supplmental Work

$ 20,976,000	x	5%	=	$ 1,048,800
Subtotal (Sections 1 thru 8)				

Additional Supplemental Work

$ 187,500			=	$ 187,500
Subtotal				

TOTAL ROADWAY ADDITIONS $ 1,236,300

Section 11 -State Furnished Materials and Expenses

Supplmental Work

$ 20,976,000	x	5%	=	$ 1,048,800
Subtotal (Sections 1 thru 8)				

Additional State Furnished Materials

$ 220,000			=	$ 220,000
Subtotal				

TOTAL STATE FURNISHED $ 1,268,800

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 12 - Time-Related Overhead

200	x	$6,293.00	=	$	1,258,600
WD				TOTAL MINOR ITEMS	

Section 13 -Contingency

$	26,837,300	x	50%	= $	13,418,700
Subtotal (Sections 1 thru 12)				TOTAL CONTINGENCY	

TOTAL ROADWAY ITEMS	$ 40,256,000 (Subtotal Sect. 1 thru 13)
TOTAL ESCALATED ROADWAY ITEMS	$ 45,308,483 (Subtotal Sect. 1 thru 13)

Estimate Pepared By

(Print Name)	Phone Number	Date

Estimate Reviewed By

(Print Name)	Phone Number	Date

District-County-Route	04-SM-35
EA	-
PM	-

II. STRUCTURE ITEMS

Bridge Name	Structure (1) Retaining Wall No. 1	Structure (2) Retaining Wall No. 2	Structure (3) Retaining Wall No. 3	Structure (4) Retaining Wall No. 4
Structure Type				
Width (out to out) - (ft)				
Span Lengths - (ft)				
Total Area - (sf)				
Footing Type (pile/spread)				
Cost Per Square Foot**				
Mobilization 10%				
Contingency 25%				
Total Cost for Structure				
		SUBTOTAL STRUCTURE ITEMS		$ -
Railroad Related Costs				
		SUBTOTAL RAILROAD ITEMS		$ -

Estimate prepared by

Name	Phone No.	Date

District-County-Route	04-SM-35	
EA	-	
PM	-	

III. UTILITY RELCOATION ITEMS	CURRENT VALUE	ESCALATION RATE	ESCALATED VALUE
A. Potholing, Field Survey (Design Phase)	$ 50,000.00		$ -
B. Utility Relocation (State Share)			$ -
			$ -
C. Relocation Assistance			$ -
D. Clearance/Demolition	$ -		$ -
E. Title and Escrow Fees	$ -		$ -
F. Enviromental Review	$ 10,000.00		$ -
G Utility Relocation (Construction Cost)	$ 1,500,000.00		$ -
TOTAL RIGHT OF WAY ITEMS	$ 1,560,000.00		
F. Construction Contract Work			

Comments:

Estimate Prepared By

Print Name	Phone No.	Date

ALTERNATIVE ANALYSIS
Project Estimate Cost Summary

District-County-Route 04-SM-35

PM -

EA -

Program Code -

PROJECT DESCRIPTION:

Limits
Alternative #2A - Four (4) Lane Alternative
On Route 35 in San Mateo County in San Bruno from approximately SM 24.8 to SM 23.3
Proposed Improvement (Scope)
Widen NB & SB Route 35 from two to four lanes; utilize cut slopes; build barriers, fences, and drainage facilities; replace signals, including advanced signal; install signing & striping

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$	31,824,000
TOTAL STRUCTURE ITEMS	$	-
SUBTOTAL CONSTRUCTION COSTS	$	31,824,000
TOTAL UTILITY RELOCATION ITEMS (Current Value)	$	1,560,000.00
TOTAL PROJECT CAPITAL OUTLAY COSTS	$	33,384,000

Reviewed by
District Program Manager _____ _____
(Signature) Date

Approved by Project Manager _____ _____
(Signature) Date

Phone No. _____

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost	Section Cost
Roadway Excavation	27,000	CY	$ 10	$ 270,000	
Roadway Excavation (Type Y) ADL	7,890	CY	$ 20	$ 157,800	
Ditch Excavation	5,000	CY	$ 5	$ 25,000	
Clearing & Grubbing	1	LS	$ 100,000	$ 100,000	
Develop Water Supply	1	LS	$ 15,000	$ 15,000	
Structure Excavation (Retaining Wall)				$ -	
Structure Backfill (Retaining Wall)				$ -	
				Subtotal Earthwork	$ 567,800

Section 2 - Pavement Structural Section*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Cold Plane Asphalt Concrete Pavement	7,100	SQYD	$ 10	$ 71,000	
Hot Mix Asphalt (Type A)	1,130	TON	$ 120	$ 135,600	
Rubberized Hot Mix Asphalt (Gap Graded)	289,000	SF	$ 16	$ 4,624,000	
Place Hot Mix Asphalt Dike (Type E)	5,000	LF	$ 6	$ 30,000	
Concrete Curb Ramps	3	EA	$ 1,000	$ 3,000	
				Subtotal Pavement Structural Section	$ 4,863,600

Section 3 - Drainage	Quantity	Unit	Unit Price	Item Cost	Section Cost
Project Drainage	1	LS	$ 2,622,000	$ 2,622,000	
				Sutotal Drainage	$ 2,622,000

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 4 - Specialty Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Progress Schedule (Critical Path Method)	1	LS	$ 8,000	$ 8,000	
Remove Metal Beam Guard Rail	1,600	LF	$ 15	$ 24,000	
Lead Compliance Plan	1	LS	$ 10,000	$ 10,000	
Structural Concrete (Retaining Wall)	5,500	CY	$ 800	$ 4,400,000	
Architectural Treatment	5,000	SQFT	$ 15	$ 75,000	
Chain Link Fence (Type CL-4)				$ -	
Chain Link Fence (Type CL-6)	14,540	LF	$ 20	$ 290,800	
Metal Beam Guard Railing	350	LF	$ 40	$ 14,000	
Alternative Flared Terminal System	7	EA	$ 3,000	$ 21,000	
Concrete Barrier (Type 736A)	5,220	LF	$ 120	$ 626,400	
Concrete Barrier (Type 60D Mod)				$ -	
				Subtotal Specialty Items	$ 5,469,200

Section 5 - Traffic Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Traffic Electrical	1	LS	$ 675,500	$ 675,500	
Traffic Signing and Striping	1	LS	$ 279,700	$ 279,700	
Stage Construction and Traffic Handling	1	LS	$ 536,540	$ 536,540	
				Subtotal Traffic Items	$ 1,491,800

Section 6 - Enviromental Mitigation	Quantity	Unit	Unit Price	Item Cost	Section Cost
Biological Mitigation	1	LS	$ 125,000	$ 125,000	
Temporary Fence (Type ESA)	14,540	LF	$ 5	$ 72,700	
Landscape and Irrigation				$ -	
				Subtotal Planting and Irrigation Section	$ 197,700

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 7 - Roadside Management and Safety Section	Quantity	Unit	Unit Price	Item Cost	Section Cost
Construction Site Management	1	LS	$ 50,000	$ 50,000	
Prepare SWPPP	1	LS	$ 25,000	$ 25,000	
Temporary Erosion Control	16,200	SQYD	$ 3	$ 48,600	
Temporary Erosion Control Blanket	8,100	SQYD	$ 10	$ 81,000	
Temporary Fiber Roll	29,080	LF	$ 5	$ 145,400	
Temporary Construction Entrance	6	EA	$ 3,000	$ 18,000	
Temporary Check Dam	480	LF	$ 20	$ 9,600	
Move In/Move Out	16	EA	$ 1,000	$ 16,000	
Tempoaray Inlet Protection	24	EA	$ 500	$ 12,000	
Street Sweeping	1	LS	$ 100,000	$ 100,000	
Tempoarary Concrete Washout	1	LS	$ 10,000	$ 10,000	
				Subtotal Traffic Items	$ 515,600

Additional Supplemental Work for Section 10 *(see page 4)*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Water Pollution Control Maintenance Sharing	1	LS	$ 10,000	$ 10,000	
Additional Water Pollution Control	1	LS	$ 10,000	$ 10,000	
Traffic Management Plan	1	LS	$ 10,000	$ 10,000	
Maintain Traffic	1	LS	$ 10,000	$ 10,000	
Value Analysis	1	LS	$ 5,000	$ 5,000	
Remove Rock and Debris	1	LS	$ 10,000	$ 10,000	
Payment Adjustments for Price Index Fluctuation	1	LS	$ 100,000	$ 100,000	
Partnering	1	LS	$ 20,000	$ 20,000	
Operation of Existing Traffic Management System	1	LS	$ 5,000	$ 5,000	
Dispute Review Board	1	LS	$ 7,500	$ 7,500	
				Subtotal Additional Supplemental Work	$ 187,500

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 8 - Minor Items

$ 15,727,700	x	5%	=	$ 786,400
Subtotal (Sections 1 thru 7)				TOTAL MINOR ITEMS

Section 9 - Roadway Mobilization

$ 16,514,100	x	10%	=	$ 1,651,500
Subtotal (Sections 1 thru 8)				TOTAL ROADWAY MOBILIZATION

Section 10 - Roadway Additions

Supplmental Work

$ 16,514,100	x	5%	=	$ 825,705
Subtotal (Sections 1 thru 8)				

Additional Supplemental Work

$ 187,500			=	$ 187,500
Subtotal				

TOTAL ROADWAY ADDITIONS $ 1,013,300

Section 11 -State Furnished Materials and Expenses

Supplmental Work

$ 16,514,100	x	5%	=	$ 825,705
Subtotal (Sections 1 thru 8)				

Additional State Furnished Materials

$ 220,000			=	$ 220,000
Subtotal				

TOTAL STATE FURNISHED $ 1,045,800

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 12 - Time-Related Overhead

200	x	$4,954.50	=	$	990,900
WD				TOTAL MINOR ITEMS	

Section 13 -Contingency

$	21,215,600	x	50%	= $	10,607,800
Subtotal (Sections 1 thru 12)				TOTAL CONTINGENCY	

TOTAL ROADWAY ITEMS	$ 31,823,400 (Subtotal Sect. 1 thru 13)
TOTAL ESCALATED ROADWAY ITEMS	$ 35,817,517 (Subtotal Sect. 1 thru 13)

Estimate Pepared By

(Print Name)	Phone Number	Date

Estimate Reviewed By

(Print Name)	Phone Number	Date

District-County-Route	04-SM-35
EA	-
PM	-

II. STRUCTURE ITEMS

Bridge Name	Structure (1) Retaining Wall No. 1	Structure (2) Retaining Wall No. 2	Structure (3) Retaining Wall No. 3	Structure (4) Retaining Wall No. 4
Structure Type				
Width (out to out) - (ft)				
Span Lengths - (ft)				
Total Area - (sf)				
Footing Type (pile/spread)				
Cost Per Square Foot**				
Mobilization 10%				
Contingency 25%				
Total Cost for Structure				
		SUBTOTAL STRUCTURE ITEMS		$ -
Railroad Related Costs				
		SUBTOTAL RAILROAD ITEMS		$ -

Estimate prepared by

Name	Phone No.	Date

District-County-Route	04-SM-35	
EA	-	
PM	-	

III. UTILITY RELCOATION ITEMS	CURRENT VALUE	ESCALATION RATE	ESCALATED VALUE
A. Potholing, Field Survey (Design Phase)	$ 50,000.00		$ -
B. Utility Relocation (State Share)			$ -
			$ -
C. Relocation Assistance	$ -		$ -
D. Clearance/Demolition	$ -		$ -
E. Title and Escrow Fees	$ -		$ -
F. Enviromental Review	$ 10,000.00		$ -
G. Utility Relocation (Construction Cost)	$ 1,500,000.00		$ -
TOTAL UTILITY RELOCATION ITEMS	$ 1,560,000.00		
F. Construction Contract Work			

Comments:

Estimate Prepared By

Print Name	Phone No.	Date

ALTERNATIVE ANALYSIS
Project Estimate Cost Summary

District-County-Route 04-SM-35

PM -

EA -

Program Code -

PROJECT DESCRIPTION:

Limits
Alternative #3 - Four (4) Lane Alternative
Widen approach and departure of San Bruno Ave. Intersection
On Route 35 in San Mateo County in San Bruno from approximately SM 24.8 to SM 23.3
Proposed Improvement (Scope)
Widen NB & SB Route 35 from two to four lanes; retaining walls; build barriers, fences, and drainage; replace S. Bruno signal, & advanced signal, modify Sneath signal; install signing & striping

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$	10,325,300
TOTAL STRUCTURE ITEMS	$	-
SUBTOTAL CONSTRUCTION COSTS	$	10,325,300
TOTAL UTILITY RELOCATION ITEMS (Current Value)	$	-
TOTAL PROJECT CAPITAL OUTLAY COSTS	$	10,326,000

Reviewed by
District Program Manager _____ (Signature) _____ Date

Approved by Project Manager _____ (Signature) _____ Date

Phone No. _____

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost	Section Cost
Roadway Excavation	4,040	CY	$ 10	$ 40,400	
Roadway Excavation (Type Y) ADL	2,160	CY	$ 20	$ 43,200	
Ditch Excavation	1,250	CY	$ 5	$ 6,250	
Clearing & Grubbing	1	LS	$ 5,250	$ 5,250	
Develop Water Supply	1	LS	$ 3,750	$ 3,750	
Structure Excavation (Retaining Wall)	810	CY	$ 20	$ 16,200	
Structure Backfill (Retaining Wall)	810	CY	$ 40	$ 32,400	
				Subtotal Earthwork	$ 147,500

Section 2 - Pavement Structural Section*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Cold Plane Asphalt Concrete Pavement	1,500	SQYD	$ 10	$ 15,000	
Hot Mix Asphalt (Type A)	60	TON	$ 120	$ 7,200	
Rubberized Hot Mix Asphalt (Gap Graded)	58,000	SF	$ 16	$ 928,000	
Place Hot Mix Asphalt Dike (Type E)	1,300	LF	$ 6	$ 7,800	
Concrete Curb Ramps	3	EA	$ 1,000	$ 3,000	
				Subtotal Pavement Structural Section	$ 961,000

Section 3 - Drainage	Quantity	Unit	Unit Price	Item Cost	Section Cost
Project Drainage	1	LS	$ 893,000	$ 893,000	
				Sutotal Drainage	$ 893,000

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 4 - Specialty Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Progress Schedule (Critical Path Method)	1	LS	$ 1,600	$ 1,600	
Remove Metal Beam Guard Rail	400	LF	$ 15	$ 6,000	
Lead Compliance Plan	1	LS	$ 2,000	$ 2,000	
Structural Concrete (Retaining Wall)	2,400	CY	$ 800	$ 1,920,000	
Architectural Treatment	2,000	SQFT	$ 15	$ 30,000	
Chain Link Fence (Type CL-4)	2,155	LF	$ 15	$ 32,325	
Chain Link Fence (Type CL-6)	3,096	LF	$ 20	$ 61,920	
Metal Beam Guard Railing	22	LF	$ 40	$ 880	
Alternative Flared Terminal System	2	EA	$ 3,000	$ 6,000	
Concrete Barrier (Type 736A)	1,305	LF	$ 120	$ 156,600	
Concrete Barrier (Type 60D Mod)	935	LF	$ 100	$ 93,500	
				Subtotal Specialty Items	$ 2,310,900

Section 5 - Traffic Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Traffic Electrical	1	LS	$ 450,000	$ 450,000	
Traffic Signing and Striping	1	LS	$ 279,700	$ 63,250	
Stage Construction and Traffic Handling	1	LS	$ 536,540	$ 127,535	
				Subtotal Traffic Items	$ 640,800

Section 6 - Enviromental Mitigation	Quantity	Unit	Unit Price	Item Cost	Section Cost
Biological Mitigation	1	LS	$ 31,250	$ 31,250	
Temporary Fence (Type ESA)	3,635	LF	$ 5	$ 18,175	
Landscape and Irrigation				$ -	
				Subtotal Planting and Irrigation Section	$ 49,425

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 7 - Roadside Management and Safety Section	Quantity	Unit	Unit Price	Item Cost	Section Cost
Construction Site Management	1	LS	$ 10,000	$ 10,000	
Prepare SWPPP	1	LS	$ 5,000	$ 5,000	
Temporary Erosion Control	4,100	SQYD	$ 3	$ 12,300	
Temporary Erosion Control Blanket	2,100	SQYD	$ 10	$ 21,000	
Temporary Fiber Roll	7,270	LF	$ 5	$ 36,350	
Temporary Construction Entrance	2	EA	$ 3,000	$ 6,000	
Temporary Check Dam	120	LF	$ 20	$ 2,400	
Move In/Move Out	4	EA	$ 1,000	$ 4,000	
Tempoaray Inlet Protection	6	EA	$ 500	$ 3,000	
Street Sweeping	1	LS	$ 25,000	$ 25,000	
Tempoarary Concrete Washout	1	LS	$ 2,500	$ 2,500	
				Subtotal Traffic Items	$ 127,550

Additional Supplemental Work for Section 10 *(see page 4)*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Water Pollution Control Maintenance Sharing	1	LS	$ 2,000	$ 2,000	
Additional Water Pollution Control	1	LS	$ 2,000	$ 2,000	
Traffic Management Plan	1	LS	$ 2,000	$ 2,000	
Maintain Traffic	1	LS	$ 2,000	$ 2,000	
Value Analysis	1	LS	$ 1,000	$ 1,000	
Remove Rock and Debris	1	LS	$ 2,000	$ 2,000	
Payment Adjustments for Price Index Fluctuation	1	LS	$ 20,000	$ 20,000	
Partnering	1	LS	$ 4,000	$ 4,000	
Operation of Existing Traffic Management System	1	LS	$ 1,000	$ 1,000	
Dispute Review Board	1	LS	$ 1,500	$ 1,500	
				Subtotal Additional Supplemental Work	$ 37,500

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 8 - Minor Items

$ 5,130,200	x	5%	=	$ 256,600
Subtotal (Sections 1 thru 7)				TOTAL MINOR ITEMS

Section 9 - Roadway Mobilization

$ 5,386,800	x	10%	=	$ 538,700
Subtotal (Sections 1 thru 8)				TOTAL ROADWAY MOBILIZATION

Section 10 - Roadway Additions

Supplmental Work

$ 5,386,800	x	5%	=	$ 269,340
Subtotal (Sections 1 thru 8)				

Additional Supplemental Work

$ 37,500			=	$ 37,500
Subtotal				

TOTAL ROADWAY ADDITIONS $ 306,900

Section 11 -State Furnished Materials and Expenses

Supplmental Work

$ 5,386,800	x	5%	=	$ 269,340
Subtotal (Sections 1 thru 8)				

Additional State Furnished Materials

$ 44,200			=	$ 44,200
Subtotal				

TOTAL STATE FURNISHED $ 313,600

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 12 - Time-Related Overhead

200	x	$1,687.50	=	$	337,500
WD				TOTAL MINOR ITEMS	

Section 13 -Contingency

$	6,883,475	x	50%	= $	3,441,800
Subtotal (Sections 1 thru 12)				TOTAL CONTINGENCY	

TOTAL ROADWAY ITEMS	$ 10,325,275 (Subtotal Sect. 1 thru 13)
TOTAL ESCALATED ROADWAY ITEMS	$ 11,621,188 (Subtotal Sect. 1 thru 13)

Estimate Pepared By

(Print Name)	Phone Number	Date

Estimate Reviewed By

(Print Name)	Phone Number	Date

District-County-Route	04-SM-35
EA	-
PM	-

II. STRUCTURE ITEMS

Bridge Name	Structure (1) Retaining Wall No. 1	Structure (2) Retaining Wall No. 2	Structure (3) Retaining Wall No. 3	Structure (4) Retaining Wall No. 4
Structure Type				
Width (out to out) - (ft)				
Span Lengths - (ft)				
Total Area - (sf)				
Footing Type (pile/spread)				
Cost Per Square Foot**				
Mobilization 10%				
Contingency 25%				
Total Cost for Structure				
		SUBTOTAL STRUCTURE ITEMS		$ -
Railroad Related Costs				
		SUBTOTAL RAILROAD ITEMS		$ -

Estimate prepared by

Name	Phone No.	Date

District-County-Route	04-SM-35	
EA	-	
PM	-	

III. UTILITY RELCOATION ITEMS	CURRENT VALUE	ESCALATION RATE	ESCALATED VALUE
A. Potholing, Field Survey (Design Phase)	$ -		$ -
B. Utility Relocation (State Share)			$ -
Potholing (Design Phase)			$ -
C. Relocation Assistance	$ -		$ -
D. Clearance/Demolition	$ -		$ -
E. Title and Escrow Fees	$ -		$ -
F. Enviromental Review			$ -
G Utility Relocation (Construction Cost)			$ -
TOTAL UTILITY RELOCATION ITEMS *(From R/W data sheet)*			
F. Construction Contract Work			

Comments:

Estimate Prepared By

Print Name	Phone No.	Date

ALTERNATIVE ANALYSIS
Project Estimate Cost Summary

District-County-Route 04-SM-35

PM -

EA -

Program Code -

PROJECT DESCRIPTION:

Limits
Alternative #5 - Four (4) Lane Alternative
Widen Between San Bruno Ave. and Sneath Lane
On Route 35 in San Mateo County in San Bruno from approximately SM 24.8 to SM 23.3
Proposed Improvement (Scope)
Widen NB & SB Route 35 from two to four lanes; retaining walls; build barriers, fences, and drainage facilities; replace signals, including advanced signal; install signing & striping

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	$	21,137,100
TOTAL STRUCTURE ITEMS	$	-
SUBTOTAL CONSTRUCTION COSTS	$	21,137,100
TOTAL UTILITY RELOCATION ITEMS (Current Value)	$	-
TOTAL PROJECT CAPITAL OUTLAY COSTS	$	21,138,000

Reviewed by
District Program Manager _____ (Signature) _____ Date

Approved by Project Manager _____ (Signature) _____ Date

Phone No. _____

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 1 Earthwork	Quantity	Unit	Unit Price	Item Cost	Section Cost
Roadway Excavation	7,800	CY	$ 10	$ 78,000	
Roadway Excavation (Type Y) ADL	2,700	CY	$ 20	$ 54,000	
Ditch Excavation	2,500	CY	$ 5	$ 12,500	
Clearing & Grubbing	1	LS	$ 10,500	$ 10,500	
Develop Water Supply	1	LS	$ 7,500	$ 7,500	
Structure Excavation (Retaining Wall)	780	CY	$ 20	$ 15,600	
Structure Backfill (Retaining Wall)	780	CY	$ 40	$ 31,200	
				Subtotal Earthwork	$ 209,300

Section 2 - Pavement Structural Section*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Cold Plane Asphalt Concrete Pavement	3,600	SQYD	$ 10	$ 36,000	
Hot Mix Asphalt (Type A)	290	TON	$ 120	$ 34,800	
Rubberized Hot Mix Asphalt (Gap Graded)	145,000	SF	$ 16	$ 2,320,000	
Place Hot Mix Asphalt Dike (Type E)	2,500	LF	$ 6	$ 15,000	
Concrete Curb Ramps	3	EA	$ 1,000	$ 3,000	
				Subtotal Pavement Structural Section	$ 2,408,800

Section 3 - Drainage	Quantity	Unit	Unit Price	Item Cost	Section Cost
Project Drainage	1	LS	$ 1,755,000	$ 1,755,000	
				Sutotal Drainage	$ 1,755,000

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 4 - Specialty Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Progress Schedule (Critical Path Method)	1	LS	$ 4,000	$ 4,000	
Remove Metal Beam Guard Rail	800	LF	$ 15	$ 12,000	
Lead Compliance Plan	1	LS	$ 5,000	$ 5,000	
Structural Concrete (Retaining Wall)	4,800	CY	$ 800	$ 3,840,000	
Architectural Treatment	4,800	SQFT	$ 15	$ 72,000	
Chain Link Fence (Type CL-4)	5,172	LF	$ 15	$ 77,580	
Chain Link Fence (Type CL-6)	5,621	LF	$ 20	$ 112,420	
Metal Beam Guard Railing	88	LF	$ 40	$ 3,520	
Alternative Flared Terminal System	4	EA	$ 3,000	$ 12,000	
Concrete Barrier (Type 736A)	2,610	LF	$ 120	$ 313,200	
Concrete Barrier (Type 60D Mod)	1,870	LF	$ 100	$ 187,000	
			Subtotal Specialty Items		$ 4,638,800

Section 5 - Traffic Items	Quantity	Unit	Unit Price	Item Cost	Section Cost
Traffic Electrical	1	LS	$ 675,500	$ 675,500	
Traffic Signing and Striping	1	LS	$ 153,300	$ 153,300	
Stage Construction and Traffic Handling	1	LS	$ 303,870	$ 303,870	
			Subtotal Traffic Items		$ 1,132,700

Section 6 - Enviromental Mitigation	Quantity	Unit	Unit Price	Item Cost	Section Cost
Biological Mitigation	1	LS	$ 75,000	$ 75,000	
Temporary Fence (Type ESA)	7,270	LF	$ 5	$ 36,350	
Landscape and Irrigation				$ -	
			Subtotal Planting and Irrigation Section		$ 111,350

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 7 - Roadside Management and Safety Section	Quantity	Unit	Unit Price	Item Cost	Section Cost
Construction Site Management	1	LS	$ 25,000	$ 25,000	
Prepare SWPPP	1	LS	$ 12,500	$ 12,500	
Temporary Erosion Control	8,100	SQYD	$ 3	$ 24,300	
Temporary Erosion Control Blanket	4,100	SQYD	$ 10	$ 41,000	
Temporary Fiber Roll	14,540	LF	$ 5	$ 72,700	
Temporary Construction Entrance	3	EA	$ 3,000	$ 9,000	
Temporary Check Dam	240	LF	$ 20	$ 4,800	
Move In/Move Out	8	EA	$ 1,000	$ 8,000	
Tempoaray Inlet Protection	12	EA	$ 500	$ 6,000	
Street Sweeping	1	LS	$ 60,000	$ 60,000	
Tempoarary Concrete Washout	1	LS	$ 6,000	$ 6,000	
				Subtotal Traffic Items	$ 269,300

Additional Supplemental Work for Section 10 *(see page 4)*	Quantity	Unit	Unit Price	Item Cost	Section Cost
Water Pollution Control Maintenance Sharing	1	LS	$ 5,000	$ 5,000	
Additional Water Pollution Control	1	LS	$ 5,000	$ 5,000	
Traffic Management Plan	1	LS	$ 6,000	$ 6,000	
Maintain Traffic	1	LS	$ 6,000	$ 6,000	
Value Analysis	1	LS	$ 3,000	$ 3,000	
Remove Rock and Debris	1	LS	$ 6,000	$ 6,000	
Payment Adjustments for Price Index Fluctuation	1	LS	$ 60,000	$ 60,000	
Partnering	1	LS	$ 12,000	$ 12,000	
Operation of Existing Traffic Management System	1	LS	$ 3,000	$ 3,000	
Dispute Review Board	1	LS	$ 4,500	$ 4,500	
				Subtotal Additional Supplemental Work	$ 110,500

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 8 - Minor Items

$ 10,525,300	x	5%	=	$ 526,300
Subtotal (Sections 1 thru 7)				TOTAL MINOR ITEMS

Section 9 - Roadway Mobilization

$ 11,051,600	x	10%	=	$ 1,105,200
Subtotal (Sections 1 thru 8)				TOTAL ROADWAY MOBILIZATION

Section 10 - Roadway Additions

Supplmental Work

$ 11,051,600	x	5%	=	$ 552,580
Subtotal (Sections 1 thru 8)				

Additional Supplemental Work

$ 110,500			=	$ 110,500
Subtotal				

TOTAL ROADWAY ADDITIONS $ 663,100

Section 11 -State Furnished Materials and Expenses

Supplmental Work

$ 11,051,600	x	5%	=	$ 552,580
Subtotal (Sections 1 thru 8)				

Additional State Furnished Materials

$ 55,750			=	$ 55,750
Subtotal				

TOTAL STATE FURNISHED $ 608,400

District-County-Route	04-SM-35
PM	-
EA	-

I. ROADWAY ITEMS

Section 12 - Time-Related Overhead

200	x	$3,315.50	=	$	663,100
WD				TOTAL MINOR ITEMS	

Section 13 -Contingency

$	14,091,350	x	50%	= $	7,045,700
Subtotal (Sections 1 thru 12)				TOTAL CONTINGENCY	

TOTAL ROADWAY ITEMS	$ 21,137,050 (Subtotal Sect. 1 thru 13)
TOTAL ESCALATED ROADWAY ITEMS	$ 23,789,936 (Subtotal Sect. 1 thru 13)

Estimate Pepared By

(Print Name)	Phone Number	Date

Estimate Reviewed By

(Print Name)	Phone Number	Date

District-County-Route	04-SM-35
EA	-
PM	-

II. STRUCTURE ITEMS

Bridge Name	Structure (1) Retaining Wall No. 1	Structure (2) Retaining Wall No. 2	Structure (3) Retaining Wall No. 3	Structure (4) Retaining Wall No. 4
Structure Type				
Width (out to out) - (ft)				
Span Lengths - (ft)				
Total Area - (sf)				
Footing Type (pile/spread)				
Cost Per Square Foot**				
Mobilization 10%				
Contingency 25%				
Total Cost for Structure				
		SUBTOTAL STRUCTURE ITEMS		$ -
Railroad Related Costs				
		SUBTOTAL RAILROAD ITEMS		$ -

Estimate prepared by

Name	Phone No.	Date

District-County-Route	04-SM-35	
EA	-	
PM	-	

III. UTILITY RELCOATION ITEMS	CURRENT VALUE	ESCALATION RATE	ESCALATED VALUE
A. Potholing, Field Survey (Design Phase)			$ -
B. Utility Relocation (State Share)			$ -
Potholing (Design Phase)			$ -
C. Relocation Assistance	$ -		$ -
D. Clearance/Demolition	$ -		$ -
E. Title and Escrow Fees	$ -		$ -
F. Enviromental Review			$ -
G Utility Relocation (Construction Cost)			$ -
TOTAL UTILITY RELOCATION ITEMS			
F. Construction Contract Work			

Comments:

Estimate Prepared By

Print Name	Phone No.	Date

ATTACHMENT D

Preliminary Traffic Analysis for State Route 35 Widening

HEXAGON TRANSPORTATION CONSULTANTS, INC.

Memorandum

Date: June 9, 2016

To: Mr. Luis Garcia, BKF Engineers

From: Gary Black

Rueben Rodriguez

Subject: Preliminary Traffic Analysis for State Route 35 Widening (I-280 to Sneath Lane)

Introduction

Hexagon Transportation Consultants, Inc. has completed this Preliminary Traffic Analysis for the proposed widening of State Route (SR) 35 from I-280 to Sneath Lane in San Bruno, California. State Route 35, generally known as Skyline Boulevard, is a north-south route that extends from State Route 1 in San Francisco to Highway 17 in Santa Clara County. From I-280 to Sneath Lane, SR 35 primarily has one-lane in each direction. The project site and the surrounding study area are shown in Figure 1.

Scope of Study

The goal of the Preliminary Traffic Analysis is to understand the operational benefits to the State Route (SR) 35 facilities from five potential improvement alternatives.

Study Intersections

The capacity and operations of SR35 in the project vicinity are controlled by two signalized intersections, which are the focus of this study:

1. Skyline Boulevard and Sneath Lane
2. Skyline Boulevard and San Bruno Avenue

The locations of the study intersections within the project area are shown in Figure 1.

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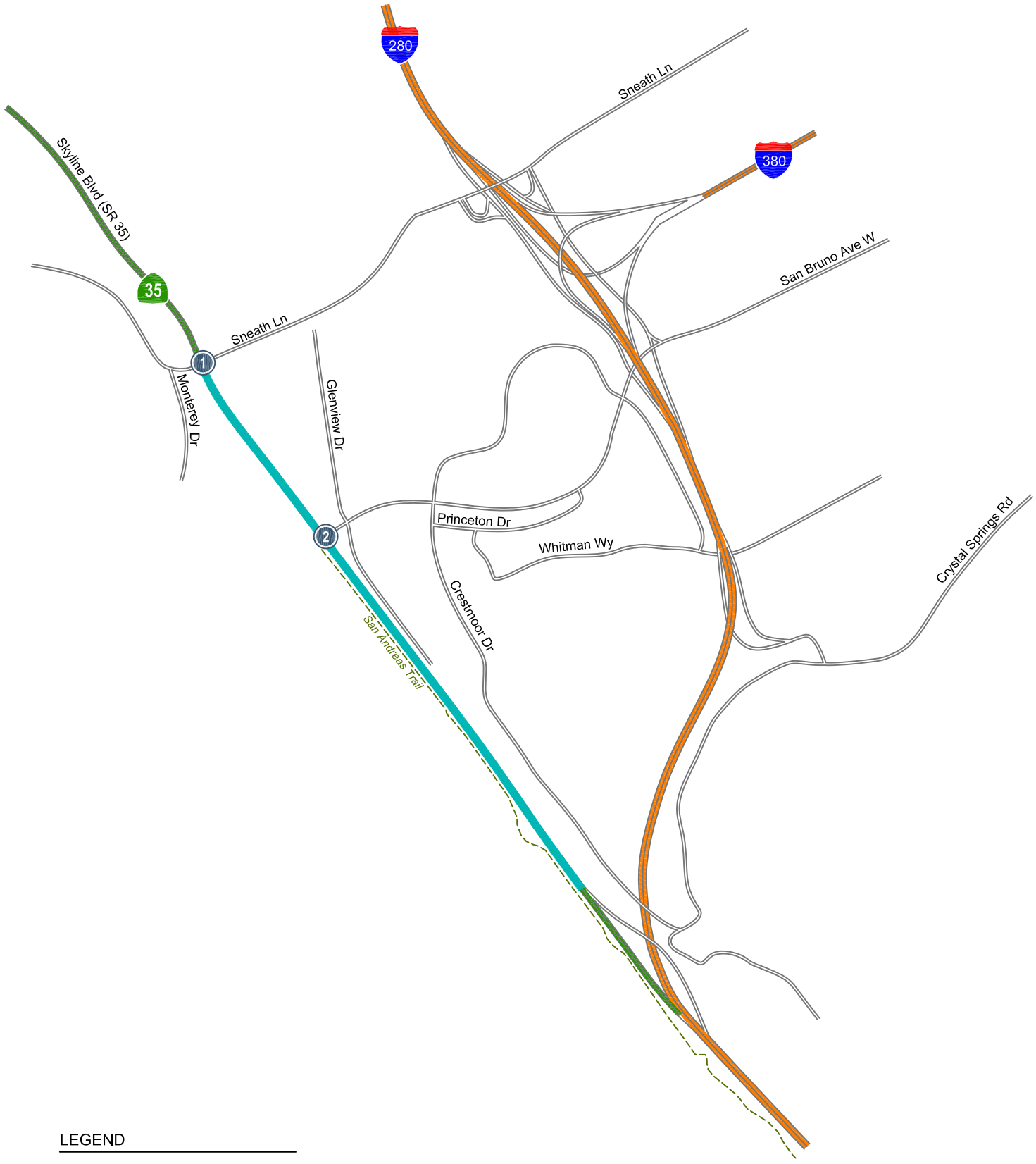


LEGEND

= Project Area

= Study Intersection

= San Andreas Trail

Figure 1
Project Study Area

Project Alternatives

Proposed improvements to SR 35 include widening to three or four lanes and changing the signal timing and lane configurations. Implementation of either of a widening alternatives could require the reconfiguration of approximately 1.4 miles of SR 35.The five project alternatives are described below.

Alternative 1 - Three-Lane Widening

The three-lane widening project alternative, denoted as Alternative 1, proposes the addition of a new lane in the northbound direction. This new lane would extend from the I-280 off ramp through the San Bruno Avenue intersection and continue to the Skyline Boulevard/Sneath Lane intersection (See Figure 2). Alternative 1 would improve the SR 35 facilities from a two-lane highway to a three-lane highway along the route from I-280 to Sneath Lane.

Alternative 2 - Four-Lane Widening

The four-lane widening project alternative, denoted as Alternative 2, proposes the addition of a one new lane in each direction. Alternative 2 would improve the SR 35 facilities from a two-lane highway to a four-lane highway along the entire route from I-280 to Sneath Lane (See Figure 3).

Alternative 3 - Signal Timing and Intersection Configuration Improvements

The City of San Bruno General Plan and the accompanying Environmental Impact Report (EIR) identify the Skyline Boulevard/Sneath Lane and Skyline Boulevard/San Bruno Avenue intersections as intersections that need improvements. The EIR suggests improvements to the study intersections that differ from the proposed Alternative 1 and Alternative 2. At the Skyline Boulevard/Sneath Lane intersection, the EIR suggests converting the eastbound and westbound approaches from split phasing to permitted control. At the Skyline Boulevard/San Bruno Avenue intersection, the EIR suggests extending the right-of-way of both approaches along Skyline Boulevard. By extending the right-of-way, the northbound can be converted to one through lane and one through/right lane, and the southbound can be converted to two through lanes and one left turn lane. The downstream receiving lanes in either directions could taper down from two lanes to one lane. These proposed changes are denoted as Alternative 3.

Alternative 4 - Four-Lane Widening and Signal Timing Improvements

Hexagon explored options to improve the projected Level of Service at the Skyline Boulevard/Sneath Lane intersection under future conditions. We found that adding an overlap phase to the signal for the westbound right turn movement would result in LOS D operations. We have called this Alternative 4. Thus, Alternative 4 includes widening the State Route 35 facilities from a two-lane highway to a four-lane highway along the entire route from I-280 to Sneath Lane. At the Skyline Boulevard and San Bruno Avenue intersection this would result in two through lanes and a left turn lane in the southbound direction and one through lane and one through plus right turn lane in the northbound direction. Alternative 4 converts the eastbound and westbound approaches from split phasing to permitted control at the intersection of Skyline Boulevard and Sneath Lane. In addition, Alternative 4 converts the westbound right turn movement from permitted control to permitted plus overlap control at the intersection of Skyline Boulevard and Sneath Lane, which would allow southbound left turning vehicles and westbound right turning vehicles to move during the same phase.

Alternative 5 – Four-Lane Widening and Signal Timing Improvements Modified

Alterative 5 is a four-lane widening alternative, however, instead of widening the entire route from I-280 to Sneath Lane, Alternative 5 would widen SR35 from two lanes to four lanes from 500 feet south of San Bruno to Sneath Lane. Alternative 5 was developed as a cost reducing alternative. Like Alternative 4, Alternative 5 would include the signal timing improvements at the intersection of Skyline Boulevard and Sneath Lane.

Traffic Operations Analysis

The proposed highway improvements were analyzed using Synchro/SimTraffic (Version 9) software developed by Trafficware.

Traffic operations analyses were conducted for the following scenarios:

Scenario 1: *Existing Conditions.* A representation of the existing roadway network was prepared using Synchro. The Synchro model was calibrated to existing conditions based on existing AM and PM peak hour traffic volumes, existing lane geometries, and observed cycle length/phasing. Existing traffic volumes for the study intersections were obtained from new manual turning movement counts.

Scenario 2: *Existing Plus Project Conditions*. To evaluate the Existing Plus Project conditions, the existing traffic volumes were analyzed with the facility improvements of each alternative. Existing Plus Project conditions were compared to existing conditions in order to determine potential project benefits.

Scenario 3: *Future No Project Conditions.* Future No Project conditions were analyzed using existing lane configurations at the study intersections and future traffic volumes, as determined by the 2030 traffic forecasts from the City of San Bruno General Plan.

Scenario 4: *Future Plus Project Conditions.* To evaluate the Future Plus Project conditions, the future traffic volumes were analyzed with the facility improvements of each alternative. Future Plus Project conditions were compared to the Future No Project conditions in order to determine potential project benefits.

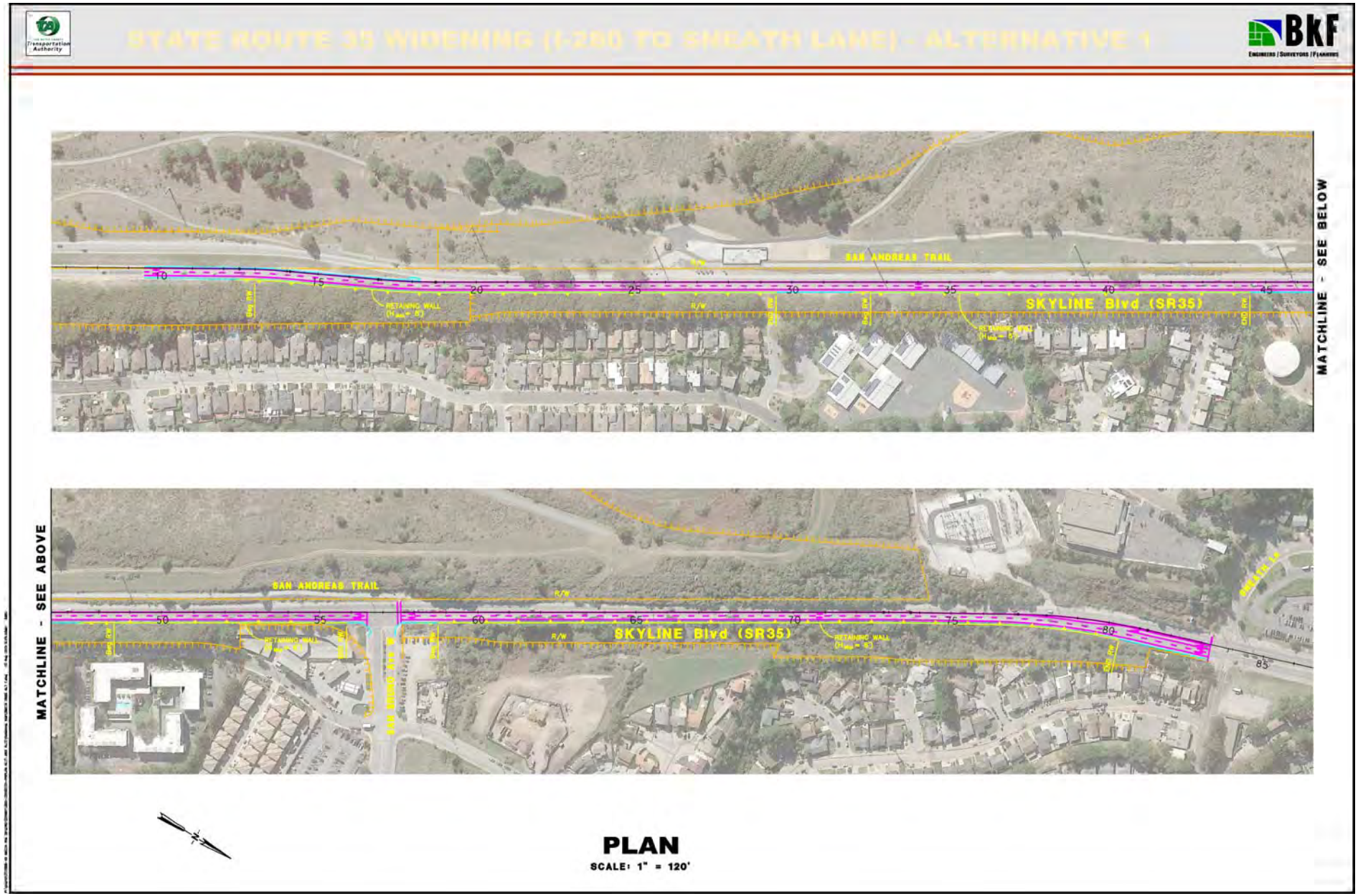


Figure 2
Proposed Three-Lane Alternative

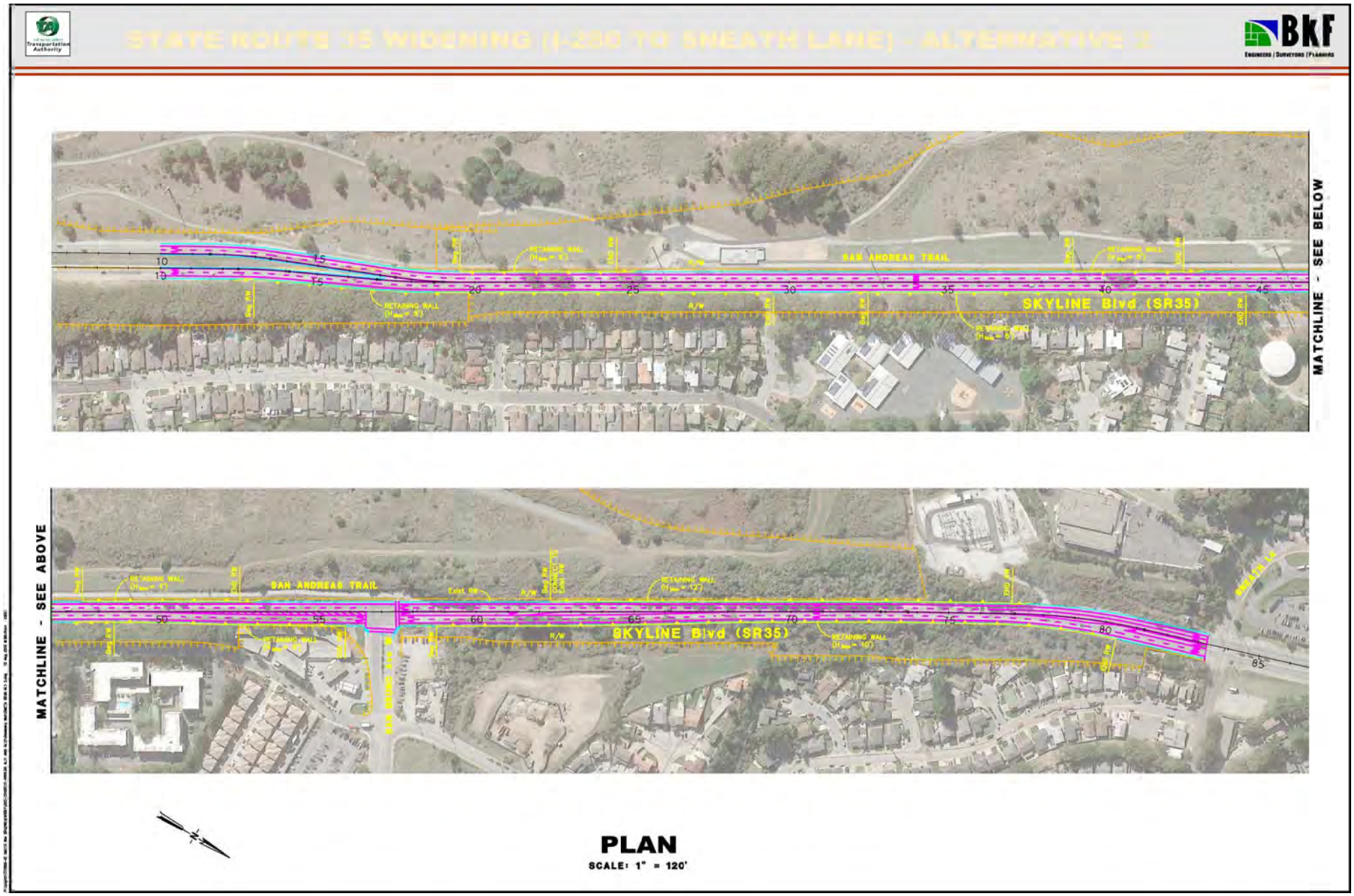


Figure 3
Proposed Four-Lane Alternative

Methodology

This section describes the methods used to determine the traffic conditions for each scenario described above. It includes descriptions of the data requirements, the analysis methodologies, and the applicable Level of Service standards.

Data Requirements

The data required for the analysis were obtained from the San Bruno General Plan, field observations, and new traffic counts. Data obtained from these sources include:

- existing peak-hour intersection turning-movement volumes
- lane configurations
- intersection cycle time and phasing
- 2030 future forecast traffic volumes

Level of Service Standards and Methodology

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

Caltrans Intersections

The study intersections are within the City of San Bruno, however, since Skyline Boulevard is designated as State Route 35 the intersections are controlled by Caltrans. According to the Caltrans *Guide for the Preparation of Traffic Impact Studies*, the LOS guideline for State highway facilities is to maintain a LOS between the transition of LOS C and LOS D. This study utilizes the Synchro/SimTraffic software to determine intersection Level of Service. This software evaluates intersection operations on the basis of average delay time (measured in seconds per vehicle) for all vehicles at the intersection. This average delay can then be correlated to a Level of Service based on the 2010 *Highway Capacity Manual* (HCM) methodology for signalized intersections. The correlation between delay and level of service is shown in Table 1.

Travel Time Analysis

The travel time along Skyline Boulevard was recorded using Synchro. The travel time measures the time it would take to travel along Skyline Boulevard between the two intersections to approximately a quarter mile past each intersection. The analysis of travel time was used to compare each alternative. Travel time was recorded in seconds.

Table 1
Signalized Intersection Level of Service Definitions Based on Delay

Level of Service	Description	Average Stopped Delay Per Vehicle (Sec.)
A	Operations with a low volume-to-capacity ratio and progression is exceptionally favorable and/or the cycle length is very short.	Up to 10.0
B	Operations with a low volume-to-capacity ratio and progression is highly favorable and/or the cycle length is short. More vehicles stop than with LOS A.	10.0 to 20.0
C	Operations with average delays resulting from progression that is favorable and/or moderate cycle lengths. Individual cycle failures begin to appear. The number of vehicles stopping is significant, although many vehicles still pass through the intersection without stopping.	20.1 to 35.0
D	Operations with longer delays due to a combination of unfavorable progression, long cycle lengths, or a high volume-to-capacity ratio. Many vehicles stop and individual cycle failures are noticeable.	35.1 to 55.0
E	Operations with high delay values indicating poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences. This is considered to be the limit of acceptable delay.	55.1 to 80.0
F	Operation with delays unacceptable to most drivers occurring due to oversaturation, very poor progression, or long cycle lengths. Volume-to-capacity ratio is high or greater than 1.0, and most cycles fail to clear the queue.	Greater than 80.0

Source: Transportation Research Board, *2010 Highway Capacity Manual* , (Washington, D.C., 2010), Ch.18 p. 5-6.

Existing Conditions

This section describes the existing road network and traffic conditions along State Route (SR) 35 at the intersections of Skyline Boulevard/San Bruno Avenue and Skyline Boulevard/Sneath Lane.

Existing Road Network

Skyline Boulevard at Sneath Lane is a four-legged signalized intersection that has pedestrian signal heads across the south and west legs. The south leg includes a striped crosswalk, however, there is no crosswalk provided for the west leg. East of Skyline Boulevard, Sneath Lane has one bike lane in each direction. At the intersection, Skyline Boulevard has two through lanes in each directions but tapers down to one lane in each direction south of the intersection.

Skyline Boulevard at San Bruno Avenue is a three-legged signalized intersection that has crosswalks with pedestrian signal heads across the north and east legs. The crosswalk across the north leg leads to the San Andreas Trail. The crosswalk on the east leg includes a pedestrian island that bisects the eastbound and westbound traffic. At the intersection, Skyline Boulevard has one through lane in each direction.

Observed Existing Traffic Conditions

Traffic conditions in the field were observed in order to identify existing operational deficiencies and to confirm the accuracy of the calculated Level of Service. The purpose of this effort was (1) to identify any existing traffic problems that may not be directly related to intersection Level of Service, and (2) to identify any locations where the Level of Service calculation does not accurately reflect Level of Service in the field. Field observations were conducted on Tuesday, September 1, 2015 and Wednesday, September 2, 2015.

Field observations showed that some operational problems currently occur during the peak commute hours. These issues are described below.

Skyline Boulevard and Sneath Lane

During the AM peak hour, the northbound left-turn movement from Skyline Boulevard sometimes failed to clear in one cycle. Queues from the eastbound Sneath Lane approach spilled back to the intersection at Monterey Drive. Traffic volumes in the southbound direction were extremely heavy and led to congestion downstream from the intersection.

During the PM peak hour, northbound vehicles on Skyline Boulevard were unable to clear the intersection in one cycle.

Skyline Boulevard and San Bruno Avenue

During the AM peak hour, some vehicles on southbound Skyline Boulevard were unable to clear the intersection in one cycle.

During the PM peak hour, the southbound left-turn moment from Skyline Boulevard occasionally failed to clear in one cycle. The northbound through traffic on Skyline Boulevard frequently failed to clear in one cycle due to high volumes and congestion downstream. A high volume of westbound right-turn moment traffic spilled back into the Glenview Drive/San Bruno Avenue intersection. Westbound right-turn traffic was observed to be unable to complete their movement due to congestion downstream on Skyline Boulevard. Pedestrians were observed to experience extensive delays while waiting to cross the north leg crosswalk.

Existing Traffic Volumes and Intersection Levels of Service

Existing traffic volumes were obtained by manual turning-movement counts conducted on Wednesday, September 2, 2015 at the study intersections. The existing peak hour intersection volumes are shown in Figure 4. The results of the intersection Level of Service analysis under Existing conditions are summarized in Table 2. Results show that the intersections are currently underperforming.

With the existing AM traffic volumes, the intersection of Skyline Boulevard and Sneath Lane operates at LOS E. With the existing PM traffic volumes, the intersection of Skyline Boulevard and San Bruno Avenue operates at LOS E.

Table 2
Existing Level of Service Analysis

Intersection	Peak Hour[1]	Cycle Length[2] (secs)	Count Date	Existing Avg. Delay[3] (sec/veh)	Existing LOS
Skyline Blvd & Sneath Lane	AM	142	9/2/2015	68.8	E
	PM	105	9/2/2015	34.3	C
Skyline Blvd & San Bruno Ave	AM	105	9/2/2015	17.1	B
	PM	140	9/2/2015	59.0	E

[1] For traffic analysis, the AM peak hour occurs between 7-9 AM and the PM peak hour occurs between 4-6 PM.
[2] Cycle lengths for Simtraffic/Synchro analysis were based on field observations.
[3] Delay based on SimTraffic simulation of individual vehicles and LOS correlated to Highway Capacity Manual (HCM) 2010 methodology.

The traffic count data and SimTraffic data output results are provided as attachments to this memorandum.

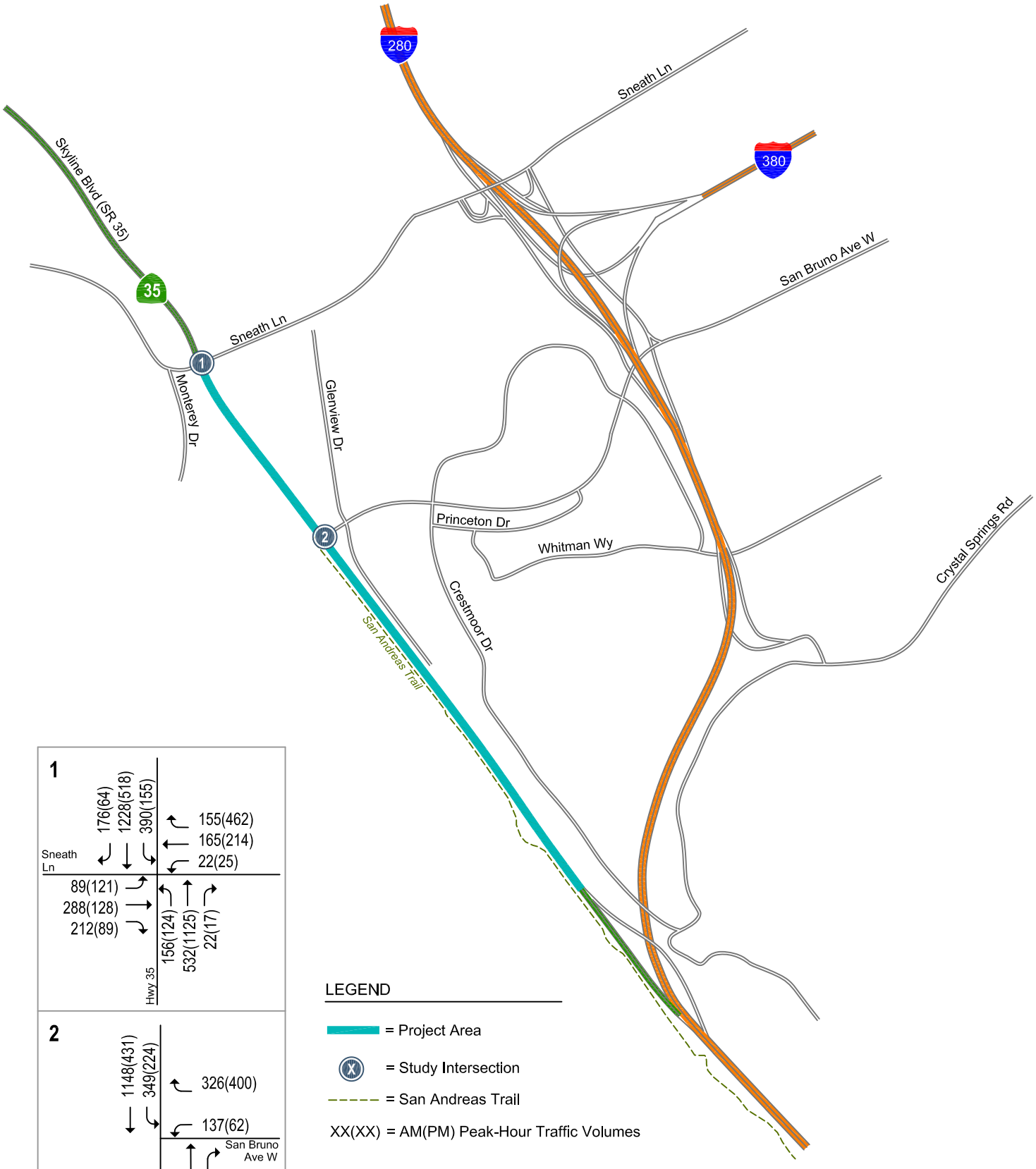


Figure 4
Existing Traffic Volumes

Existing Plus Project Conditions

The results of the intersection Level of Service under the Existing Plus Project scenario are shown in Table 3. Alternative 2, 3, 4, and 5 would improve the Skyline Boulevard/Sneath Lane intersection AM peak hour from LOS E to LOS D. All alternatives would improve the Skyline Boulevard/San Bruno Avenue PM peak hour traffic conditions from LOS E to LOS D or better.

At the Skyline Boulevard/Sneath Lane intersection, Alternative 2, 3, 4, and 5 would provide a significantly larger decrease in vehicle delay for the AM peak hour traffic compared to Alternative 1. This would result from the elimination of the "bottleneck" effect that currently occurs at the taper from two lanes down to one lane for the southbound Skyline Boulevard traffic. During the PM peak hour, Alternative 1 nor Alternative 2 would provide significant improvements in vehicle delay. This is due to the high volume of northbound through traffic and the signal phase that allocates approximately 30 to 40 seconds of green time for this movement. There are already two northbound lanes on Skyline Boulevard at Sneath Lane, so neither Alternative would increase the northbound capacity. The combination of high traffic volume and a short green cycle causes many cycles when northbound traffic fails to clear. Alternatives 3, 4, and 5 would improve upon this by adjusting the cycle time and phase time allocated to each movement.

At the Skyline Boulevard/San Bruno Avenue intersection, all alternatives would have a relatively similar effect. All alternative would result in a significant decrease in vehicle delay during the PM peak hour due to the additional northbound through lane. In the existing traffic pattern, the majority of vehicles during the PM peak hour are heading northbound after exiting from I-280. The addition of a new lane would reduce congestion and would allow a larger volume of northbound through traffic to cross the intersection in each cycle. Although during the AM peak hour the majority of traffic is southbound through vehicles, the signal phasing allocates a long green cycle to this movement which reduces delays and stopped time. The addition of a southbound lane in Alternative 2, 3, 4, and 5 would reduce the delays and stopped time further, however, all alternatives would maintain the existing LOS B operation level.

Table 3
Existing Plus Project Level of Service Analysis

Scenario		Skyline Boulevard & Sneath Lane				Skyline Boulevard & San Bruno Avenue			
		Cycle Length (secs)	Avg. Delay (sec/veh)	Change Delay[1]	LOS	Cycle Length (secs)	Avg. Delay (sec/veh)	Change Delay[1]	LOS
Existing	AM	142	68.8	n/a	E	105	17.1	n/a	B
	PM	105	34.3	n/a	C	140	59.0	n/a	E
Alternative 1	AM	142	57.5	-16%	E	105	16.6	-3%	B
	PM	105	34.5	1%	C	140	19.5	-67%	B
Alternative 2	AM	142	48.3	-30%	D	105	15.6	-9%	B
	PM	105	32.8	-4%	C	140	20.3	-66%	C
Alternative 3	AM	119	42.7	-38%	D	105	15.2	-11%	B
	PM	119	30.0	-13%	C	140	20.0	-66%	B
Alternative 4	AM	117	37.9	-45%	D	105	15.1	-12%	B
	PM	65	21.0	-39%	C	140	21.3	-64%	C
Alternative 5	AM	117	38.6	-44%	D	105	14.9	-13%	B
	PM	65	21.1	-38%	C	140	20.8	-65%	C

[1] Negative values represent a decrease in delay.

Future No Project Conditions

The results of the Future No Project conditions intersection Level of Service analysis is shown in Table 4. The results show that with the existing configurations, both intersections would fail to meet the applicable standards, as follows:

- Skyline Boulevard/Sneath Lane (LOS F during the AM and PM Peak Hour)
- Skyline Boulevard/San Bruno Avenue (LOS F during the PM Peak Hour)

The Future No Project conditions analysis is based on 2030 forecast volumes from the City of San Bruno General Plan. The General Plan, along with the accompanying Environmental Impact Report (EIR), were adopted by the City of San Bruno in 2009. These documents identify the Skyline Boulevard/Sneath Lane and Skyline Boulevard/San Bruno Avenue intersections as intersections that need improvements. The General Plan and EIR concluded that both intersections would underperform, barring any improvements, with the projected 2030 forecast volumes. The peak hour future traffic volumes are shown in Figure 5.

Table 4
Future No Project Level of Service Analysis

Intersection	Peak Hour	Cycle Length (secs)	Future No Project Avg. Delay (sec/veh)	LOS
Skyline Blvd & Sneath Lane	AM	142	115.5	F
	PM	105	104.1	F
Skyline Blvd & San Bruno Ave	AM	105	17.1	B
	PM	140	86.1	F

[1] Negative values represent a decrease in delay.

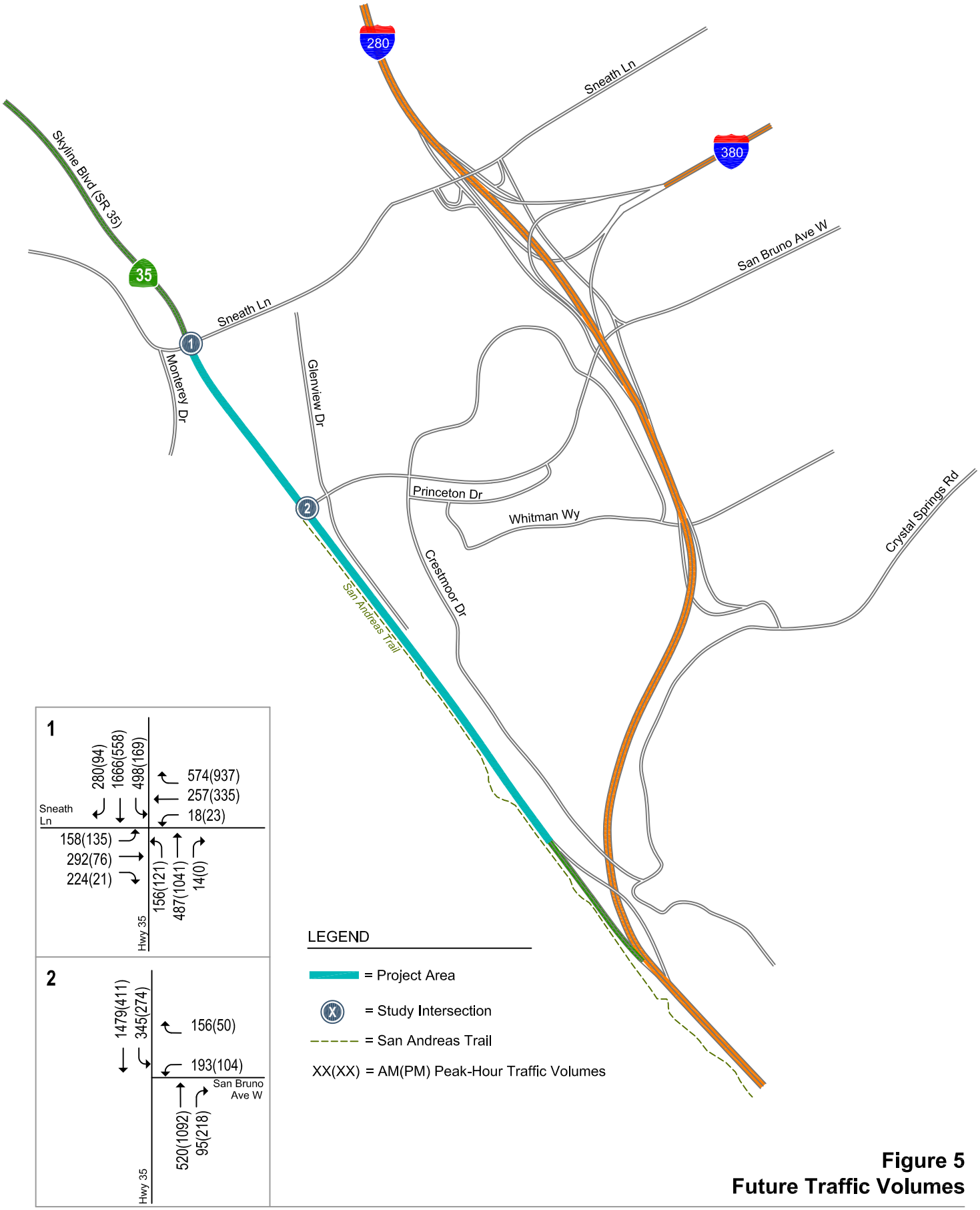


Figure 5
Future Traffic Volumes

Future Plus Project Conditions

The results of the Future Plus Project intersection Level of Service analysis are also provided in Table 5. The results show that with the future traffic volumes, Alternative 4 and 5 would result in the intersection of Skyline Boulevard and Sneath Lane operating at an LOS D or better during the AM and PM peak hours. The results show that all alternatives would result in the intersection of Skyline Boulevard and San Bruno Avenue operating at an LOS D or better during the AM and PM peak hours.

At the Skyline Boulevard/Sneath Lane intersection, minimal improvements would result from Alternative 1 or 2. The projected 2030 traffic volumes show increases in the southbound and westbound traffic volumes. Neither alternative proposes any changes to the existing Sneath Lane timing, therefore, these projected increases in traffic volume, especially the westbound direction, prevent the alternatives from providing significant improvements. Alternative 3 offers some improvement by converting the eastbound and westbound timing from split phase to permitted control, however, with this alternative the intersection would still operate at LOS F. Alternative 4 and 5 would result in significant improvements and would allow the intersection to operate at LOS D.

At the Skyline Boulevard/San Bruno Avenue intersection all alternatives would have relatively similar improvements. Each alternative would result in a significant decrease in vehicle delay during the PM peak hour due to the additional northbound through lane. During the AM peak hour, all alternatives would maintain the LOS B operation level.

Table 5
Future Plus Project Level of Service Analysis

Scenario		Skyline Boulevard & Sneath Lane				Skyline Boulevard & San Bruno Avenue			
		Cycle Length (secs)	Avg. Delay (sec/veh)	Change Delay[1]	LOS	Cycle Length (secs)	Avg. Delay (sec/veh)	Change Delay[1]	LOS
No Project	AM	142	115.5	n/a	F	105	17.1	n/a	B
	PM	105	104.1	n/a	F	140	86.1	n/a	F
Alternative 1	AM	142	109.1	-6%	F	105	16.7	-2%	B
	PM	105	105.7	2%	F	140	27.2	-68%	C
Alternative 2	AM	142	109.0	-6%	F	105	14.4	-16%	B
	PM	105	101.0	-3%	F	140	21.0	-76%	C
Alternative 3	AM	119	85.0	-26%	F	105	12.9	-25%	B
	PM	119	90.1	-13%	F	140	22.5	-74%	C
Alternative 4	AM	121	48.0	-58%	D	105	15.5	-9%	B
	PM	100	53.2	-49%	D	140	27.3	-68%	C
Alternative 5	AM	121	52.2	-55%	D	105	15.4	-10%	B
	PM	121	50.3	-52%	D	140	26.0	-70%	C

[1] Negative values represent a decrease in delay.

Travel Time Analysis

With the existing traffic volumes, all alternatives would decrease the travel time for the northbound AM and PM direction compared to the no project scenario. This decrease in time would be attributed to the additional northbound lane. For the southbound AM and PM direction, Alternative 2, 3, 4, and 5 would decrease the travel time compared to the no project scenario. Alternative 1 would maintain the same travel time as the no project scenario because Alternative 1 does not propose any improvements to the southbound lane.

With the future traffic volumes, the northbound AM travel time would decrease with all alternatives compared to the no project scenario. For the northbound direction in the PM, Alternative 1, 2, and 3 would significantly decrease the travel time compared to the no project scenario. For the Skyline Boulevard/Sneath Lane intersection, Alternative 4 and 5 include changes to the cycle time and phasing which would improve the intersection from LOS F to LOS D. However, there is a tradeoff between intersection LOS and travel time. The Alternative 4 and 5 improvements redistribute the portion of the cycle time that goes to each movement. By doing this, the travel time for the northbound direction in the PM increases in Alternatives 4 and 5 when compared to Alternatives 1, 2, and 3. For the southbound direction in the AM and PM, Alternatives 2, 3, 4, and 5 would decrease the travel time compared to the no project scenario. Alternative 1 would maintain the same travel time as the no project scenario because Alternative 1 does not propose any improvements to the southbound lane.

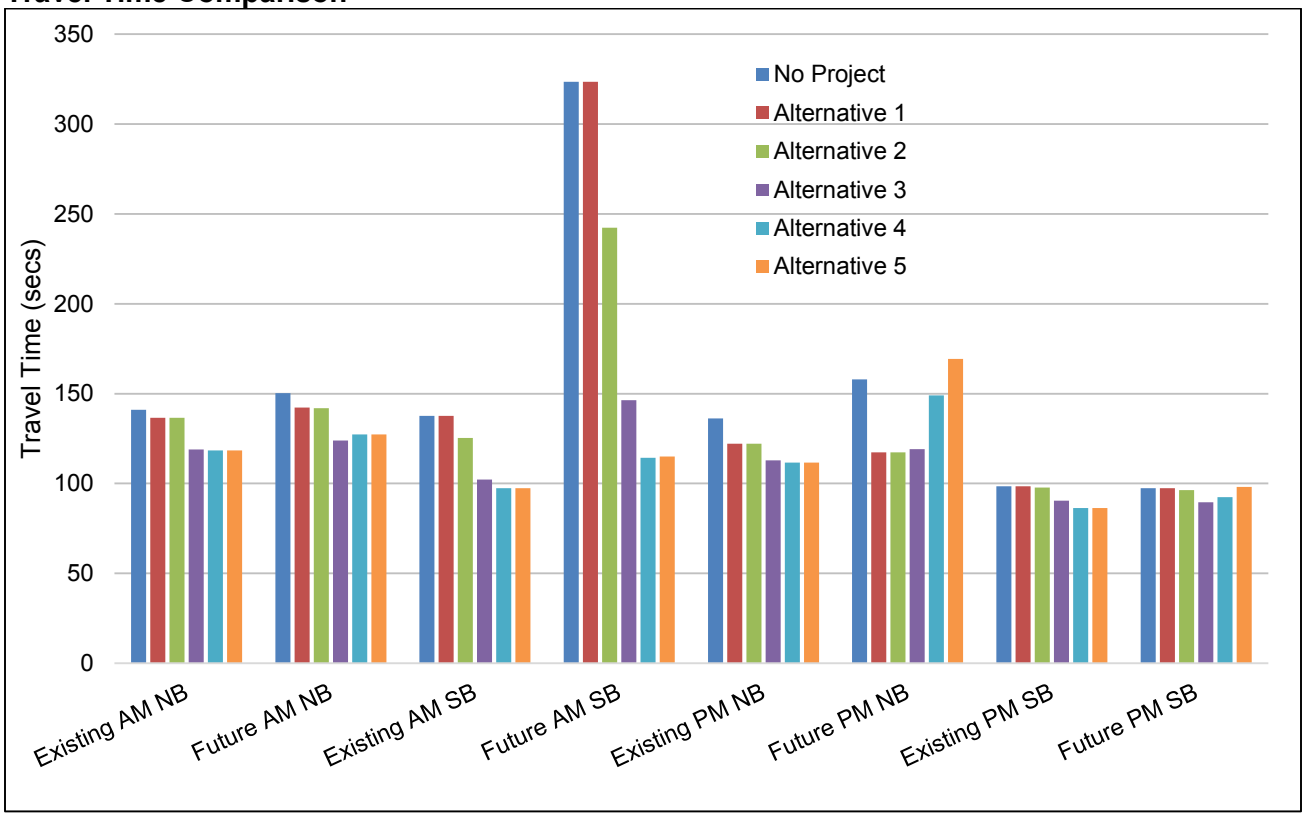
The travel time for each alternative based on the existing and future traffic volumes is shown in Table 6. Figure 6 graphically compares the travel times for each alternative and scenario. Synchro travel time reports are provided as an attachment to this memorandum.

Table 6
Travel Time Results

Scenario		Northbound		Southbound	
		Existing Travel Time	Future Travel Time	Existing Travel Time	Future Travel Time
No Project	AM	141.1	150.2	137.6	323.6
	PM	136.2	158.0	98.4	97.5
Alternative 1	AM	136.5	142.2	137.6	323.6
	PM	122.1	117.3	98.4	97.5
Alternative 2	AM	136.5	142.0	125.4	242.4
	PM	122.2	117.3	97.7	96.4
Alternative 3	AM	118.9	123.9	102.3	146.3
	PM	112.9	119.1	90.5	89.6
Alternative 4	AM	118.4	127.4	97.4	114.3
	PM	111.6	149.1	86.4	92.4
Alternative 5	AM	118.4	127.4	97.4	115.1
	PM	111.6	169.3	86.4	98.2

Notes:
Travel time is recorded in seconds.
Travel time measures the time it would take to travel along Skyline Boulevard between the two intersections to approximately .25 miles past each intersection.

Figure 6
Travel Time Comparison



Summary

This memorandum provides an analysis of the operational benefits to the State Route (SR) 35 facilities as a result of implementing one of the project alternatives. The key findings are summarized below:

- With the existing traffic volume, there are excessive southbound delays during the AM peak hour and northbound delays during the PM peak hour.
- The north leg of the Skyline Boulevard/San Bruno Avenue experiences a moderate amount of pedestrian traffic due to its proximity to the San Andreas Trail. Adequate pedestrian crosswalk time will need to be maintained with the addition of new lanes.
- The addition of a new northbound through lane would provide significant decreases in delay at the intersection of Skyline Boulevard/San Bruno Ave for both the existing traffic volume and the projected 2030 future traffic volume.
- The projected 2030 traffic volumes show increases in the southbound and westbound traffic at Skyline Boulevard/Sneath Lane, and these projected increases, especially in the westbound direction, prevent the alternatives from providing significant improvements.
- Alternative 5 widening and timing changes provide a similar improvement to LOS and travel time that Alternative 4 provides. Therefore, reducing the widening to 500 feet south of San Bruno Avenue is beneficial and cost effective.

Recommendations

Hexagon recommends the following improvements based on the analysis presented above.

- Widen the State Route 35 facilities from a two-lane highway to a four-lane highway along either the entire route from I-280 to Sneath Lane or from 500 feet south of San Bruno to Sneath Lane. At the Skyline Boulevard and San Bruno Avenue intersection this would result in two through lanes and a left turn lane in the southbound direction and one through lane and one through plus right turn lane in the northbound direction. The lane configurations at Skyline Boulevard/Sneath Lane should remain as is.
- Convert the eastbound and westbound approaches from split phasing to permitted control at the intersection of Skyline Boulevard and Sneath Lane.
- Convert the westbound right turn movement from permitted control to permitted plus overlap control at the intersection of Skyline Boulevard and Sneath Lane. This change would allow southbound left turning vehicles and westbound right turning vehicles to move during the same phase.
- Further analysis should be sure to consider demand volumes and output volumes. In addition the impacts of the proposed improvements should be considered beyond the proposed project limits.

Attachments:

1. Traffic Count Data
2. SimTraffic Performance Reports (Vehicle Delay Outputs)
3. Synchro Travel Time Reports (Arterial Analysis)

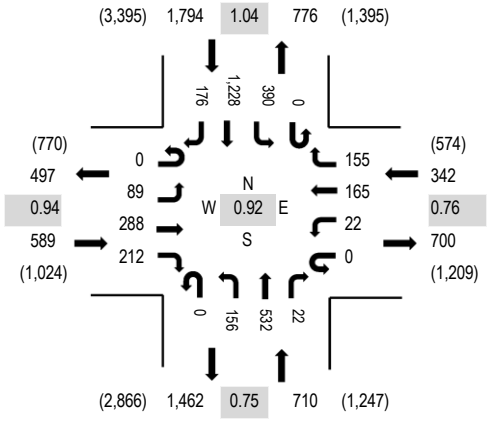
Attachment 1

Traffic Count Data

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

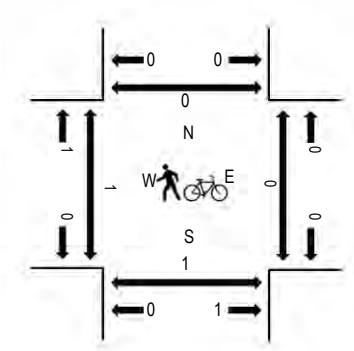
Location: 1 RT35 (SKYLINE BLVD) & SNEATH LN AM
Date and Start Time: Wednesday, September 2, 2015 at 07:00 AM
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	SNEATH LN Eastbound				SNEATH LN Westbound				RT35 (SKYLINE BLVD) Northbound				RT35 (SKYLINE BLVD) Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00:00 AM	0	12	46	40	0	7	18	20	0	18	60	2	0	44	308	18	593	3,021	0	0	1	0
7:15:00 AM	0	13	59	43	0	7	16	29	0	17	83	3	0	94	328	12	704	3,317	0	0	0	0
7:30:00 AM	0	8	58	47	0	4	31	35	0	19	127	3	0	111	319	27	789	3,435	0	0	0	0
7:45:00 AM	0	24	65	68	0	3	53	56	0	55	176	5	0	95	276	59	935	3,431	0	0	1	0
8:00:00 AM	0	28	84	43	0	6	50	38	0	53	133	4	0	87	324	39	889	3,219	0	0	0	0
8:15:00 AM	0	29	81	54	0	9	31	26	0	29	96	10	0	97	309	51	822		1	0	0	0
8:30:00 AM	0	25	56	32	0	6	18	35	0	32	137	9	0	77	329	29	785		0	0	0	0
8:45:00 AM	0	30	43	36	0	5	28	43	0	39	132	5	0	71	263	28	723		0	0	0	0

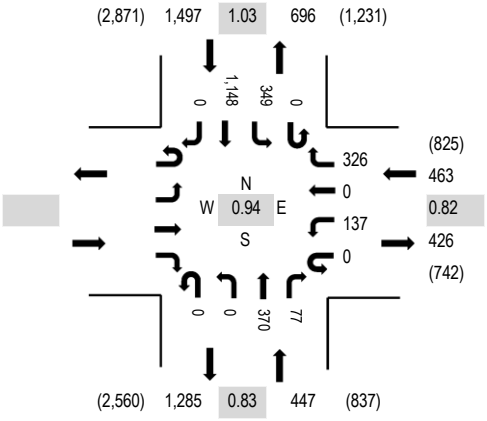
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	2
Lights	0	88	284	210	0	22	161	149	0	155	516	22	0	387	1,217	176	3,387
Mediums	0	1	4	2	0	0	4	5	0	1	15	0	0	3	11	0	46
Total	0	89	288	212	0	22	165	155	0	156	532	22	0	390	1,228	176	3,435

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

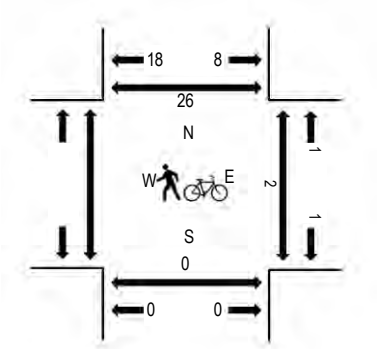
Location: 2 RT35 (SKYLINE BLVD) & SAN BRUNO AVE AM
Date and Start Time: Wednesday, September 2, 2015 at 07:00 AM
Peak Hour: 07:30 AM - 08:30 AM
Peak 15-Minutes: 07:45 AM - 08:00 AM

Peak Hour - All Vehicles



Note: Total study counts contained in parentheses.

Peak Hour - Pedestrians/Bicycles in Crosswalk



Traffic Counts

Interval Start Time	SAN BRUNO AVE Eastbound				SAN BRUNO AVE Westbound				RT35 (SKYLINE BLVD) Northbound				RT35 (SKYLINE BLVD) Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
7:00:00 AM					0	37	0	21	0	0	49	17	0	41	281	0	446	2,224		1	0	3
7:15:00 AM					0	50	0	32	0	0	74	23	0	46	320	0	545	2,381		0	0	8
7:30:00 AM					0	52	0	53	0	0	85	17	0	78	310	0	595	2,407		1	0	5
7:45:00 AM					0	27	0	114	0	0	116	19	0	93	269	0	638	2,382		0	0	8
8:00:00 AM					0	26	0	100	0	0	103	15	0	101	258	0	603	2,309		0	0	5
8:15:00 AM					0	32	0	59	0	0	66	26	0	77	311	0	571			1	0	7
8:30:00 AM					0	38	0	75	0	0	90	13	0	74	280	0	570			0	0	9
8:45:00 AM					0	17	0	92	0	0	102	22	0	80	252	0	565			0	0	6

Peak Rolling Hour Flow Rates

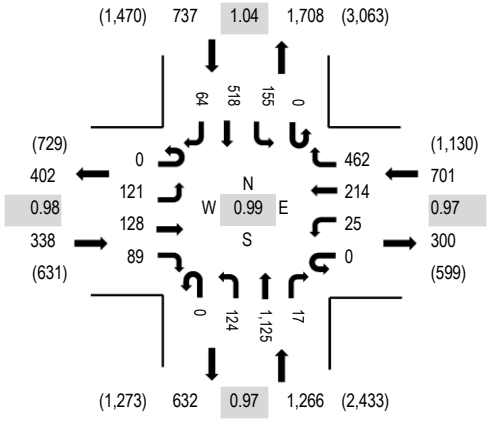
Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks					0	0	0	0	0	0	1	0	0	0	0	0	1
Lights					0	136	0	322	0	0	363	75	0	345	1,141	0	2,382
Mediums					0	1	0	4	0	0	6	2	0	4	7	0	24
Total					0	137	0	326	0	0	370	77	0	349	1,148	0	2,407

All Traffic Data Services Inc.

(303) 216-2439
www.alltrafficdata.net

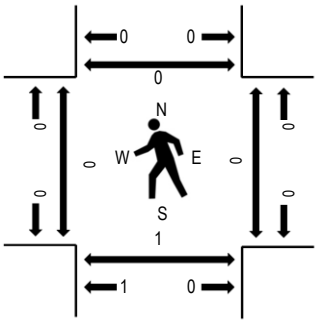
Location: 1 RT35 (SKYLINE BLVD) & SNEATH LN PM
Date and Start Time: Wednesday, September 2, 2015 at 04:00 PM
Peak Hour: 05:00 PM - 06:00 PM
Peak 15-Minutes: 05:15 PM - 05:30 PM

Peak Hour - All Vehicles



Peak Hour - Bicycles

Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	SNEATH LN Eastbound				SNEATH LN Westbound				RT35 (SKYLINE BLVD) Northbound				RT35 (SKYLINE BLVD) Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00:00 PM	0	15	25	25	0	5	40	43	0	20	212	11	0	35	152	13	596	2,622	1	0	1	0
4:15:00 PM	0	16	25	25	0	7	33	65	0	24	269	8	0	32	109	19	632	2,787	1	0	0	0
4:30:00 PM	0	21	28	26	0	1	33	71	0	29	272	10	0	46	118	14	669	2,924	0	0	0	0
4:45:00 PM	0	21	37	29	0	8	39	84	0	40	266	6	0	36	136	23	725	3,022	0	0	0	0
5:00:00 PM	0	31	29	16	0	10	40	96	0	29	286	4	0	50	151	19	761	3,042	0	0	0	0
5:15:00 PM	0	33	33	20	0	5	65	111	0	38	280	7	0	38	125	14	769		0	0	1	0
5:30:00 PM	0	26	31	23	0	3	64	128	0	34	283	1	0	32	128	14	767		0	0	0	0
5:45:00 PM	0	31	35	30	0	7	45	127	0	23	276	5	0	35	114	17	745		0	0	0	0

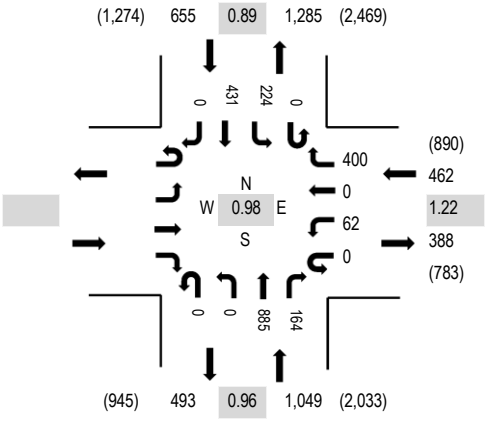
Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Lights	0	118	126	89	0	20	210	462	0	124	1,120	17	0	154	511	63	3,014
Mediums	0	2	2	0	0	5	4	0	0	0	5	0	0	1	7	1	27
Total	0	121	128	89	0	25	214	462	0	124	1,125	17	0	155	518	64	3,042

All Traffic Data Services Inc.
(303) 216-2439
www.alltrafficdata.net

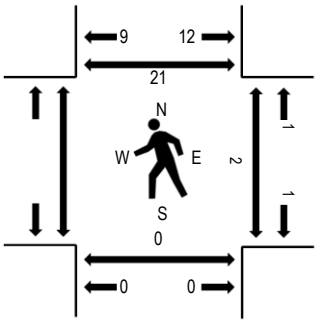
Location: 2 RT35 (SKYLINE BLVD) & SAN BRUNO AVE PM
Date and Start Time: Wednesday, September 2, 2015 at 04:00 PM
Peak Hour: 04:45 PM - 05:45 PM
Peak 15-Minutes: 04:45 PM - 05:00 PM

Peak Hour - All Vehicles



Peak Hour - Bicycles

Peak Hour - Pedestrians



Note: Total study counts contained in parentheses.

Traffic Counts

Interval Start Time	Eastbound				SAN BRUNO AVE Westbound				RT35 (SKYLINE BLVD) Northbound				RT35 (SKYLINE BLVD) Southbound					Rolling Hour	Pedestrain Crossings			
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	Total		West	East	South	North
4:00:00 PM					0	11	0	81	0	0	167	34	0	54	125	0	472	2,042		0	0	6
4:15:00 PM					0	16	0	79	0	0	210	45	0	50	97	0	497	2,116		1	0	5
4:30:00 PM					0	14	0	86	0	0	232	49	0	55	83	0	519	2,153		0	0	7
4:45:00 PM					0	16	0	79	0	0	229	45	0	61	124	0	554	2,166		0	0	5
5:00:00 PM					0	16	0	90	0	0	242	39	0	53	106	0	546	2,155		2	0	5
5:15:00 PM					0	15	0	111	0	0	221	46	0	53	88	0	534			0	0	1
5:30:00 PM					0	15	0	120	0	0	193	34	0	57	113	0	532			0	0	10
5:45:00 PM					0	18	0	123	0	0	206	41	0	67	88	0	543			0	0	6

Peak Rolling Hour Flow Rates

Vehicle Type	Eastbound				Westbound				Northbound				Southbound				Total
	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	U-Turn	Left	Thru	Right	
Articulated Trucks					0	1	0	0	0	0	0	0	0	0	0	0	1
Lights					0	61	0	397	0	0	882	164	0	220	429	0	2,153
Mediums					0	0	0	3	0	0	3	0	0	4	2	0	12
Total					0	62	0	400	0	0	885	164	0	224	431	0	2,166

Attachment 2

SimTraffic Performance Reports
(Vehicle Delay Outputs)

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.2	0.3	0.0	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	95.9	102.6	54.1	56.9	60.6	10.9	67.8	46.3	36.8	68.2	83.5	56.8
Vehicles Entered	67	262	174	15	162	161	166	568	21	416	1231	159
Vehicles Exited	66	265	172	16	159	160	168	554	21	418	1212	158
Hourly Exit Rate	66	265	172	16	159	160	168	554	21	418	1212	158
Input Volume	89	288	212	22	165	155	156	532	22	390	1228	176
% of Volume	74	92	81	73	96	103	108	104	95	107	99	90
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	68.8
Vehicles Entered	3402
Vehicles Exited	3369
Hourly Exit Rate	3369
Input Volume	3435
% of Volume	98
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.4	0.5	3.5	0.1	0.1	0.3
Total Del/Veh (s)	38.5	14.1	21.2	7.4	39.3	8.6	17.1
Vehicles Entered	120	339	393	78	318	1120	2368
Vehicles Exited	119	338	398	78	320	1120	2373
Hourly Exit Rate	119	338	398	78	320	1120	2373
Input Volume	137	326	370	77	349	1148	2407
% of Volume	87	104	108	101	92	98	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	68.9
Total Del/Veh (s)	119.4
Vehicles Entered	3637
Vehicles Exited	3614
Hourly Exit Rate	3614
Input Volume	21814
% of Volume	17
Denied Entry Before	0
Denied Entry After	124

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	83.4	84.8	37.8	57.5	60.0	7.8	69.3	49.6	55.8	64.6	60.5	36.6
Vehicles Entered	77	300	198	17	147	152	153	551	18	413	1284	170
Vehicles Exited	76	295	199	17	147	150	152	559	19	415	1271	171
Hourly Exit Rate	76	295	199	17	147	150	152	559	19	415	1271	171
Input Volume	89	288	212	22	165	155	156	532	22	390	1228	176
% of Volume	85	102	94	77	89	97	97	105	86	106	104	97
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	57.5
Vehicles Entered	3480
Vehicles Exited	3471
Hourly Exit Rate	3471
Input Volume	3435
% of Volume	101
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.3	0.3	0.1	0.2	0.0	0.1	0.1
Total Del/Veh (s)	40.7	8.5	17.5	6.3	39.0	9.2	16.6
Vehicles Entered	132	312	401	87	371	1149	2452
Vehicles Exited	130	311	399	87	374	1148	2449
Hourly Exit Rate	130	311	399	87	374	1148	2449
Input Volume	137	326	370	77	349	1148	2407
% of Volume	95	95	108	113	107	100	102
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	2.8
Total Del/Veh (s)	98.0
Vehicles Entered	3771
Vehicles Exited	3716
Hourly Exit Rate	3716
Input Volume	21814
% of Volume	17
Denied Entry Before	0
Denied Entry After	13

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.3	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	62.2	61.6	27.7	63.3	62.2	9.7	76.4	52.1	42.0	57.1	45.6	23.3
Vehicles Entered	73	276	219	18	173	155	159	592	23	398	1207	151
Vehicles Exited	72	275	222	18	179	153	160	590	23	394	1179	144
Hourly Exit Rate	72	275	222	18	179	153	160	590	23	394	1179	144
Input Volume	89	288	212	22	165	155	156	532	22	390	1228	176
% of Volume	81	95	105	82	108	99	103	111	105	101	96	82
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	48.3
Vehicles Entered	3444
Vehicles Exited	3409
Hourly Exit Rate	3409
Input Volume	3435
% of Volume	99
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.3	0.2	0.1	0.2	0.0	0.1
Total Del/Veh (s)	36.5	8.4	16.8	10.4	46.8	5.3	15.6
Vehicles Entered	120	333	419	94	363	1116	2445
Vehicles Exited	121	334	421	96	365	1122	2459
Hourly Exit Rate	121	334	421	96	365	1122	2459
Input Volume	137	326	370	77	349	1148	2407
% of Volume	88	102	114	125	105	98	102
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.5
Total Del/Veh (s)	64.2
Vehicles Entered	3681
Vehicles Exited	3698
Hourly Exit Rate	3698
Input Volume	21814
% of Volume	17
Denied Entry Before	0
Denied Entry After	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.5	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	103.5	102.5	61.3	59.9	50.9	7.3	54.2	30.2	23.3	44.7	33.8	17.5
Vehicles Entered	91	254	160	15	176	146	156	562	27	414	1274	153
Vehicles Exited	88	246	161	15	174	146	158	571	27	421	1278	152
Hourly Exit Rate	88	246	161	15	174	146	158	571	27	421	1278	152
Input Volume	89	288	212	22	165	155	156	532	22	390	1228	176
% of Volume	99	85	76	68	105	94	101	107	123	108	104	86
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	42.7
Vehicles Entered	3428
Vehicles Exited	3437
Hourly Exit Rate	3437
Input Volume	3435
% of Volume	100
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.4	0.0	0.0	0.2	0.0	0.1
Total Del/Veh (s)	40.1	10.4	16.5	7.7	40.8	5.8	15.2
Vehicles Entered	132	354	374	77	358	1130	2425
Vehicles Exited	129	355	374	77	362	1131	2428
Hourly Exit Rate	129	355	374	77	362	1131	2428
Input Volume	137	326	370	77	349	1148	2407
% of Volume	94	109	101	100	104	99	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	26.8
Total Del/Veh (s)	91.4
Vehicles Entered	3686
Vehicles Exited	3664
Hourly Exit Rate	3664
Input Volume	27010
% of Volume	14
Denied Entry Before	0
Denied Entry After	61

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.2	0.2	0.7	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	95.4	92.9	59.6	50.2	44.3	7.1	82.0	29.2	24.8	42.2	22.1	9.9
Vehicles Entered	79	266	195	19	141	171	153	537	12	369	1204	154
Vehicles Exited	81	261	194	19	141	167	154	541	12	369	1212	155
Hourly Exit Rate	81	261	194	19	141	167	154	541	12	369	1212	155
Input Volume	89	288	212	22	165	155	156	532	22	390	1228	176
% of Volume	91	91	92	86	85	108	99	102	55	95	99	88
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	37.9
Vehicles Entered	3300
Vehicles Exited	3306
Hourly Exit Rate	3306
Input Volume	3435
% of Volume	96
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.3	0.3	0.1	0.2	0.1	0.0	0.1
Total Del/Veh (s)	39.9	8.2	19.0	6.4	40.8	5.3	15.1
Vehicles Entered	133	303	385	88	344	1108	2361
Vehicles Exited	134	305	389	89	348	1118	2383
Hourly Exit Rate	134	305	389	89	348	1118	2383
Input Volume	137	326	370	77	349	1148	2407
% of Volume	98	94	105	116	100	97	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	14.5
Total Del/Veh (s)	71.9
Vehicles Entered	3587
Vehicles Exited	3567
Hourly Exit Rate	3567
Input Volume	21814
% of Volume	16
Denied Entry Before	0
Denied Entry After	32

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	91.9	94.2	52.2	67.8	58.0	5.0	70.9	30.2	38.4	45.8	22.9	10.3
Vehicles Entered	66	275	199	29	157	163	154	526	17	404	1218	173
Vehicles Exited	65	274	200	28	154	163	151	524	17	402	1215	174
Hourly Exit Rate	65	274	200	28	154	163	151	524	17	402	1215	174
Input Volume	89	288	212	22	165	155	156	532	22	390	1228	176
% of Volume	73	95	94	127	93	105	97	98	77	103	99	99
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	38.6
Vehicles Entered	3381
Vehicles Exited	3367
Hourly Exit Rate	3367
Input Volume	3435
% of Volume	98
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.3	0.3	0.0	0.0	0.2	0.0	0.1
Total Del/Veh (s)	33.3	9.6	17.0	6.2	43.5	5.3	14.9
Vehicles Entered	138	337	349	87	349	1131	2391
Vehicles Exited	138	339	346	88	347	1135	2393
Hourly Exit Rate	138	339	346	88	347	1135	2393
Input Volume	137	326	370	77	349	1148	2407
% of Volume	101	104	94	114	99	99	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	24.7
Total Del/Veh (s)	75.4
Vehicles Entered	3681
Vehicles Exited	3631
Hourly Exit Rate	3631
Input Volume	27010
% of Volume	13
Denied Entry Before	0
Denied Entry After	55

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	106.7	112.0	56.0	293.6	301.3	55.3	67.2	41.1	36.6	113.2	147.1	124.3
Vehicles Entered	110	205	129	16	241	623	150	489	11	378	1264	188
Vehicles Exited	111	213	129	15	224	603	150	488	10	370	1245	188
Hourly Exit Rate	111	213	129	15	224	603	150	488	10	370	1245	188
Input Volume	158	292	224	18	257	574	156	506	14	498	1666	280
% of Volume	70	73	58	83	87	105	96	96	71	74	75	67
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	115.5
Vehicles Entered	3804
Vehicles Exited	3746
Hourly Exit Rate	3746
Input Volume	4643
% of Volume	81
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.2	0.7	3.1	0.0	0.0	0.3
Total Del/Veh (s)	42.6	10.7	18.7	8.1	41.9	7.8	17.1
Vehicles Entered	195	159	498	113	261	1139	2365
Vehicles Exited	196	158	494	111	265	1137	2361
Hourly Exit Rate	196	158	494	111	265	1137	2361
Input Volume	193	156	520	95	345	1563	2872
% of Volume	102	101	95	117	77	73	82
Denied Entry Before	0	0	0	1	0	0	1
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	350.1
Total Del/Veh (s)	172.7
Vehicles Entered	4114
Vehicles Exited	4077
Hourly Exit Rate	4077
Input Volume	29362
% of Volume	14
Denied Entry Before	31
Denied Entry After	1000

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	79.1	86.1	39.5	333.5	306.5	28.2	85.7	40.7	40.4	115.1	140.3	121.8
Vehicles Entered	133	244	192	19	276	547	169	470	12	377	1278	199
Vehicles Exited	134	248	192	17	228	546	171	470	12	365	1262	192
Hourly Exit Rate	134	248	192	17	228	546	171	470	12	365	1262	192
Input Volume	158	292	224	18	257	574	156	506	14	498	1666	280
% of Volume	85	85	86	94	89	95	110	93	86	73	76	69
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	109.1
Vehicles Entered	3916
Vehicles Exited	3837
Hourly Exit Rate	3837
Input Volume	4643
% of Volume	83
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.2	0.2	0.2	0.0	0.0	0.1
Total Del/Veh (s)	42.1	5.8	15.6	7.1	42.8	9.0	16.7
Vehicles Entered	196	143	512	93	278	1204	2426
Vehicles Exited	190	146	513	94	276	1209	2428
Hourly Exit Rate	190	146	513	94	276	1209	2428
Input Volume	193	156	520	95	345	1563	2872
% of Volume	98	94	99	99	80	77	85
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	246.2
Total Del/Veh (s)	164.0
Vehicles Entered	4196
Vehicles Exited	4140
Hourly Exit Rate	4140
Input Volume	29362
% of Volume	14
Denied Entry Before	6
Denied Entry After	712

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	85.9	85.6	45.1	283.9	312.4	40.0	76.9	47.0	36.5	130.2	131.5	107.4
Vehicles Entered	140	226	186	27	259	565	174	489	12	417	1327	198
Vehicles Exited	140	235	185	24	219	543	169	498	12	414	1299	203
Hourly Exit Rate	140	235	185	24	219	543	169	498	12	414	1299	203
Input Volume	158	292	224	18	257	574	156	506	14	498	1666	280
% of Volume	89	80	83	133	85	95	108	98	86	83	78	72
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	109.0
Vehicles Entered	4020
Vehicles Exited	3941
Hourly Exit Rate	3941
Input Volume	4643
% of Volume	85
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.2	0.2	0.2	0.0	0.0	0.1
Total Del/Veh (s)	44.9	5.7	14.5	6.4	43.0	5.0	14.4
Vehicles Entered	191	144	533	104	274	1263	2509
Vehicles Exited	190	142	533	105	266	1260	2496
Hourly Exit Rate	190	142	533	105	266	1260	2496
Input Volume	193	156	520	95	345	1563	2872
% of Volume	98	91	102	111	77	81	87
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	188.7
Total Del/Veh (s)	152.1
Vehicles Entered	4347
Vehicles Exited	4253
Hourly Exit Rate	4253
Input Volume	27709
% of Volume	15
Denied Entry Before	0
Denied Entry After	562

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.4	0.3	1.6	0.3	0.2	0.0	0.0	0.0
Total Del/Veh (s)	167.3	168.2	96.6	66.5	61.4	20.6	59.9	32.7	34.8	94.4	115.8	104.7
Vehicles Entered	86	132	104	22	250	582	151	510	12	466	1468	244
Vehicles Exited	83	133	106	22	250	584	149	497	12	464	1428	235
Hourly Exit Rate	83	133	106	22	250	584	149	497	12	464	1428	235
Input Volume	158	292	224	18	257	574	156	487	14	498	1666	280
% of Volume	53	46	47	122	97	102	96	102	86	93	86	84
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.2
Total Del/Veh (s)	85.0
Vehicles Entered	4027
Vehicles Exited	3963
Hourly Exit Rate	3963
Input Volume	4624
% of Volume	86
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.3	0.2	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	46.8	6.2	13.6	5.5	37.7	3.5	12.9
Vehicles Entered	189	153	374	90	287	1287	2380
Vehicles Exited	187	152	368	90	289	1285	2371
Hourly Exit Rate	187	152	368	90	289	1285	2371
Input Volume	193	156	370	77	349	1559	2704
% of Volume	97	97	99	117	83	82	88
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	198.2
Total Del/Veh (s)	141.2
Vehicles Entered	4350
Vehicles Exited	4244
Hourly Exit Rate	4244
Input Volume	31941
% of Volume	13
Denied Entry Before	0
Denied Entry After	603

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.4	0.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	157.1	151.1	85.9	33.2	42.1	9.1	99.1	39.1	27.6	44.5	45.1	34.1
Vehicles Entered	92	153	109	19	251	570	153	519	10	501	1609	264
Vehicles Exited	91	153	110	18	251	582	158	516	10	495	1568	264
Hourly Exit Rate	91	153	110	18	251	582	158	516	10	495	1568	264
Input Volume	158	292	224	18	257	574	156	506	14	498	1666	280
% of Volume	58	52	49	100	98	101	101	102	71	99	94	94
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	48.0
Vehicles Entered	4250
Vehicles Exited	4216
Hourly Exit Rate	4216
Input Volume	4643
% of Volume	91
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.3	0.2	0.2	0.2	0.0	0.0	0.1
Total Del/Veh (s)	43.5	6.7	17.2	9.8	42.1	5.7	15.5
Vehicles Entered	231	151	529	104	304	1400	2719
Vehicles Exited	228	150	536	104	311	1413	2742
Hourly Exit Rate	228	150	536	104	311	1413	2742
Input Volume	193	156	520	95	345	1563	2872
% of Volume	118	96	103	109	90	90	95
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	124.6
Total Del/Veh (s)	80.4
Vehicles Entered	4595
Vehicles Exited	4590
Hourly Exit Rate	4590
Input Volume	27709
% of Volume	17
Denied Entry Before	2
Denied Entry After	325

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.6	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	143.8	148.2	83.5	55.5	49.3	10.1	74.9	41.0	22.6	49.9	55.2	43.2
Vehicles Entered	82	166	116	21	244	598	138	535	14	501	1691	301
Vehicles Exited	78	165	119	21	246	597	134	542	13	504	1679	294
Hourly Exit Rate	78	165	119	21	246	597	134	542	13	504	1679	294
Input Volume	158	292	224	18	257	574	156	506	14	498	1666	280
% of Volume	49	57	53	117	96	104	86	107	93	101	101	105
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	52.2
Vehicles Entered	4407
Vehicles Exited	4392
Hourly Exit Rate	4392
Input Volume	4643
% of Volume	95
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	38.2	7.2	15.6	6.9	39.8	8.6	15.4
Vehicles Entered	190	170	522	88	321	1482	2773
Vehicles Exited	185	167	523	88	315	1497	2775
Hourly Exit Rate	185	167	523	88	315	1497	2775
Input Volume	193	156	520	95	345	1563	2872
% of Volume	96	107	101	93	91	96	97
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	117.3
Total Del/Veh (s)	94.7
Vehicles Entered	4703
Vehicles Exited	4667
Hourly Exit Rate	4667
Input Volume	34570
% of Volume	14
Denied Entry Before	5
Denied Entry After	323

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	36.5	41.1	7.8	57.1	47.5	40.6	58.0	28.6	25.5	74.7	21.2	8.5
Vehicles Entered	117	124	114	27	216	466	131	1117	18	170	509	63
Vehicles Exited	115	123	113	29	219	467	131	1107	18	169	509	63
Hourly Exit Rate	115	123	113	29	219	467	131	1107	18	169	509	63
Input Volume	121	128	89	25	214	462	124	1144	17	155	518	64
% of Volume	95	96	127	116	102	101	106	97	106	109	98	98
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.0
Total Del/Veh (s)	34.3
Vehicles Entered	3072
Vehicles Exited	3063
Hourly Exit Rate	3063
Input Volume	3061
% of Volume	100
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.0	0.0	1.6	3.3	0.0	0.0	0.9
Total Del/Veh (s)	75.2	182.2	36.6	23.4	63.8	6.9	59.0
Vehicles Entered	55	366	898	170	217	452	2158
Vehicles Exited	58	368	894	169	215	453	2157
Hourly Exit Rate	58	368	894	169	215	453	2157
Input Volume	62	400	885	164	224	431	2166
% of Volume	94	92	101	103	96	105	100
Denied Entry Before	0	0	1	0	0	0	1
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	2.0
Total Del/Veh (s)	103.8
Vehicles Entered	3339
Vehicles Exited	3313
Hourly Exit Rate	3313
Input Volume	21222
% of Volume	16
Denied Entry Before	1
Denied Entry After	6

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.3	0.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	48.8	53.6	11.2	51.6	47.2	37.0	47.6	30.9	26.3	70.9	20.8	5.5
Vehicles Entered	102	140	103	25	218	493	110	1133	18	159	541	56
Vehicles Exited	100	139	102	25	218	485	113	1152	18	158	549	56
Hourly Exit Rate	100	139	102	25	218	485	113	1152	18	158	549	56
Input Volume	121	128	89	25	214	462	124	1144	17	155	518	64
% of Volume	83	109	115	100	102	105	91	101	106	102	106	88
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	34.5
Vehicles Entered	3098
Vehicles Exited	3115
Hourly Exit Rate	3115
Input Volume	3061
% of Volume	102
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.4	0.2	0.3	0.0	0.0	0.2
Total Del/Veh (s)	43.3	19.1	16.1	11.7	62.0	4.7	19.5
Vehicles Entered	55	388	871	184	236	467	2201
Vehicles Exited	57	393	862	186	239	467	2204
Hourly Exit Rate	57	393	862	186	239	467	2204
Input Volume	62	400	885	164	224	431	2166
% of Volume	92	98	97	113	107	108	102
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	50.9
Vehicles Entered	3362
Vehicles Exited	3381
Hourly Exit Rate	3381
Input Volume	19371
% of Volume	17
Denied Entry Before	0
Denied Entry After	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.2	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	46.4	44.6	9.5	55.2	50.4	33.2	48.2	30.2	22.6	54.2	21.4	4.7
Vehicles Entered	114	137	83	28	213	459	128	1158	14	149	529	65
Vehicles Exited	116	139	83	28	207	445	126	1146	14	152	529	67
Hourly Exit Rate	116	139	83	28	207	445	126	1146	14	152	529	67
Input Volume	121	128	89	25	214	462	124	1144	17	155	518	64
% of Volume	96	109	93	112	97	96	102	100	82	98	102	105
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	1	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	32.8
Vehicles Entered	3077
Vehicles Exited	3052
Hourly Exit Rate	3052
Input Volume	3061
% of Volume	100
Denied Entry Before	0
Denied Entry After	1

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.4	0.2	0.2	0.0	0.0	0.2
Total Del/Veh (s)	49.9	19.0	16.0	10.2	66.9	2.7	20.3
Vehicles Entered	68	382	907	125	232	430	2144
Vehicles Exited	68	387	912	125	231	429	2152
Hourly Exit Rate	68	387	912	125	231	429	2152
Input Volume	62	400	885	164	224	431	2166
% of Volume	110	97	103	76	103	100	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	50.0
Vehicles Entered	3281
Vehicles Exited	3267
Hourly Exit Rate	3267
Input Volume	19371
% of Volume	17
Denied Entry Before	0
Denied Entry After	1

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.6	0.4	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	79.4	85.7	23.8	31.2	37.0	31.8	53.1	19.9	15.0	49.0	15.6	4.3
Vehicles Entered	114	127	86	29	224	470	134	1132	11	124	492	61
Vehicles Exited	111	126	85	29	221	474	134	1132	11	124	495	60
Hourly Exit Rate	111	126	85	29	221	474	134	1132	11	124	495	60
Input Volume	121	128	89	25	214	462	124	1144	17	155	518	64
% of Volume	92	98	96	116	103	103	108	99	65	80	96	94
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	30.0
Vehicles Entered	3004
Vehicles Exited	3002
Hourly Exit Rate	3002
Input Volume	3061
% of Volume	98
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.4	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	55.2	25.5	14.1	9.0	60.3	4.0	20.0
Vehicles Entered	60	415	868	153	220	409	2125
Vehicles Exited	61	412	881	154	221	410	2139
Hourly Exit Rate	61	412	881	154	221	410	2139
Input Volume	62	400	885	164	224	431	2166
% of Volume	98	103	100	94	99	95	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	54.6
Vehicles Entered	3240
Vehicles Exited	3248
Hourly Exit Rate	3248
Input Volume	23997
% of Volume	14
Denied Entry Before	0
Denied Entry After	1

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.1	0.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	40.3	38.2	10.0	26.3	23.3	14.8	28.2	21.2	18.0	44.5	12.2	3.4
Vehicles Entered	105	129	101	17	235	486	130	1186	18	138	493	52
Vehicles Exited	105	129	102	17	237	482	128	1175	18	141	492	53
Hourly Exit Rate	105	129	102	17	237	482	128	1175	18	141	492	53
Input Volume	121	128	89	25	214	462	124	1144	17	155	518	64
% of Volume	87	101	115	68	111	104	103	103	106	91	95	83
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	21.0
Vehicles Entered	3090
Vehicles Exited	3079
Hourly Exit Rate	3079
Input Volume	3061
% of Volume	101
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.4	0.2	0.3	0.0	0.0	0.2
Total Del/Veh (s)	42.1	23.2	20.1	13.4	51.5	6.6	21.3
Vehicles Entered	67	419	895	161	212	426	2180
Vehicles Exited	69	425	891	160	207	429	2181
Hourly Exit Rate	69	425	891	160	207	429	2181
Input Volume	62	400	885	164	224	431	2166
% of Volume	111	106	101	98	92	100	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.3
Total Del/Veh (s)	39.3
Vehicles Entered	3319
Vehicles Exited	3329
Hourly Exit Rate	3329
Input Volume	19371
% of Volume	17
Denied Entry Before	0
Denied Entry After	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Denied Del/Veh (s)	0.0	0.0	0.0	0.5	0.3	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	35.7	38.8	8.1	26.2	28.0	11.9	26.7	23.0	16.5	37.3	12.1	4.1
Vehicles Entered	110	121	89	26	237	442	116	1134	20	154	534	52
Vehicles Exited	110	118	90	26	239	439	113	1126	19	154	537	52
Hourly Exit Rate	110	118	90	26	239	439	113	1126	19	154	537	52
Input Volume	121	128	89	25	214	462	124	1144	17	155	518	64
% of Volume	91	92	101	104	112	95	91	98	112	99	104	81
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	All
Denied Del/Veh (s)	0.1
Total Del/Veh (s)	21.1
Vehicles Entered	3035
Vehicles Exited	3023
Hourly Exit Rate	3023
Input Volume	3061
% of Volume	99
Denied Entry Before	0
Denied Entry After	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.1	0.4	0.0	0.0	0.0	0.0	0.1
Total Del/Veh (s)	41.4	19.0	20.2	13.7	54.7	5.7	20.8
Vehicles Entered	69	401	857	179	231	441	2178
Vehicles Exited	68	402	872	181	224	441	2188
Hourly Exit Rate	68	402	872	181	224	441	2188
Input Volume	62	400	885	164	224	431	2166
% of Volume	110	100	99	110	100	102	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	39.9
Vehicles Entered	3298
Vehicles Exited	3297
Hourly Exit Rate	3297
Input Volume	23997
% of Volume	14
Denied Entry Before	0
Denied Entry After	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	36.8	40.2	7.5	161.8	144.2	338.7	44.1	25.0	131.2	22.5	6.8	104.1
Vehicles Entered	121	95	23	14	205	557	117	945	177	591	99	2944
Vehicles Exited	120	94	23	14	207	558	120	948	179	594	96	2953
Hourly Exit Rate	120	94	23	14	207	558	120	948	179	594	96	2953
Input Volume	135	76	21	23	335	937	121	1041	169	558	94	3510
% of Volume	89	124	110	61	62	60	99	91	106	106	102	84
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.1	200.5	210.2	14.5	7.5	124.2
Total Del/Veh (s)	49.2	32.1	106.6	94.2	132.8	17.0	86.1
Vehicles Entered	113	62	986	225	297	424	2107
Vehicles Exited	108	62	989	222	294	429	2104
Hourly Exit Rate	108	62	989	222	294	429	2104
Input Volume	104	50	1092	218	274	411	2149
% of Volume	104	124	91	102	107	104	98
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	104	14	0	0	118

Total Network Performance

Denied Del/Veh (s)	279.8
Total Del/Veh (s)	242.4
Vehicles Entered	3385
Vehicles Exited	3373
Hourly Exit Rate	3373
Input Volume	21806
% of Volume	15
Denied Entry Before	0
Denied Entry After	608

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	37.8	39.3	4.8	155.6	143.5	341.1	52.4	30.7	147.3	20.5	6.3	105.7
Vehicles Entered	129	79	27	18	184	561	109	1060	185	548	95	2995
Vehicles Exited	127	81	28	18	180	546	109	1067	185	557	95	2993
Hourly Exit Rate	127	81	28	18	180	546	109	1067	185	557	95	2993
Input Volume	135	76	21	23	335	937	121	1041	169	558	94	3510
% of Volume	94	107	133	78	54	58	90	102	109	100	101	85
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.1	0.3	0.3	4.4	1.9	1.1
Total Del/Veh (s)	56.6	7.2	18.4	12.7	90.3	10.6	27.2
Vehicles Entered	107	45	1109	226	275	398	2160
Vehicles Exited	109	45	1097	226	262	394	2133
Hourly Exit Rate	109	45	1097	226	262	394	2133
Input Volume	104	50	1092	218	274	411	2149
% of Volume	105	90	100	104	96	96	99
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	6	3	9

Total Network Performance

Denied Del/Veh (s)	182.1
Total Del/Veh (s)	190.0
Vehicles Entered	3491
Vehicles Exited	3371
Hourly Exit Rate	3371
Input Volume	21806
% of Volume	15
Denied Entry Before	0
Denied Entry After	471

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	46.5	51.9	9.6	152.2	149.5	341.2	45.3	29.9	55.4	19.7	4.4	101.0
Vehicles Entered	119	77	20	11	225	576	121	1066	163	580	81	3039
Vehicles Exited	123	77	20	10	221	546	119	1073	160	593	78	3020
Hourly Exit Rate	123	77	20	10	221	546	119	1073	160	593	78	3020
Input Volume	135	76	21	23	335	937	121	1041	169	558	94	3510
% of Volume	91	101	95	43	66	58	98	103	95	106	83	86
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.1	0.3	0.4	0.7	0.2	0.3
Total Del/Veh (s)	53.5	8.2	16.7	12.7	71.0	3.2	21.0
Vehicles Entered	98	55	1105	237	246	449	2190
Vehicles Exited	98	55	1099	237	245	447	2181
Hourly Exit Rate	98	55	1099	237	245	447	2181
Input Volume	104	50	1092	218	274	411	2149
% of Volume	94	110	101	109	89	109	101
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	130.8
Total Del/Veh (s)	181.1
Vehicles Entered	3566
Vehicles Exited	3410
Hourly Exit Rate	3410
Input Volume	21806
% of Volume	16
Denied Entry Before	0
Denied Entry After	388

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Del/Veh (s)	113.2	103.9	58.0	113.5	110.9	270.3	55.4	25.2	48.8	16.2	4.6	90.1
Vehicles Entered	126	87	22	20	230	655	116	1030	187	577	102	3152
Vehicles Exited	130	86	22	20	235	625	116	1011	189	573	102	3109
Hourly Exit Rate	130	86	22	20	235	625	116	1011	189	573	102	3109
Input Volume	135	76	21	23	335	937	121	1041	169	558	94	3510
% of Volume	96	113	105	87	70	67	96	97	112	103	109	89
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	0.2	0.0	0.0
Total Del/Veh (s)	43.2	11.0	23.3	17.8	45.3	3.2	22.5
Vehicles Entered	103	57	1072	224	289	418	2163
Vehicles Exited	105	56	1059	224	292	418	2154
Hourly Exit Rate	105	56	1059	224	292	418	2154
Input Volume	104	50	1092	218	274	411	2149
% of Volume	101	112	97	103	107	102	100
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	111.2
Total Del/Veh (s)	169.6
Vehicles Entered	3634
Vehicles Exited	3517
Hourly Exit Rate	3517
Input Volume	27281
% of Volume	13
Denied Entry Before	1
Denied Entry After	316

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.1
Total Del/Veh (s)	59.4	70.9	14.3	48.2	38.3	98.5	50.7	46.7	34.3	18.3	5.9	53.2
Vehicles Entered	133	80	22	17	324	884	117	1036	174	606	111	3504
Vehicles Exited	133	81	22	16	326	851	122	1026	171	610	111	3469
Hourly Exit Rate	133	81	22	16	326	851	122	1026	171	610	111	3469
Input Volume	135	76	21	23	335	937	121	1041	169	558	94	3510
% of Volume	99	107	105	70	97	91	101	99	101	109	118	99
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.1	0.2	0.3	2.5	0.8	0.7
Total Del/Veh (s)	58.9	7.1	16.9	12.2	103.5	4.9	27.3
Vehicles Entered	101	47	1084	234	285	434	2185
Vehicles Exited	102	47	1088	235	282	433	2187
Hourly Exit Rate	102	47	1088	235	282	433	2187
Input Volume	104	50	1092	218	274	411	2149
% of Volume	98	94	100	108	103	105	102
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	0.6
Total Del/Veh (s)	69.1
Vehicles Entered	3907
Vehicles Exited	3883
Hourly Exit Rate	3883
Input Volume	21806
% of Volume	18
Denied Entry Before	0
Denied Entry After	0

1: Skyline Blvd & Sneath Lane Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	SBL	SBT	SBR	All
Denied Del/Veh (s)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
Total Del/Veh (s)	74.4	66.8	11.7	27.4	32.9	71.4	58.2	51.4	44.0	24.5	8.1	50.3
Vehicles Entered	135	88	22	22	339	920	124	993	177	543	96	3459
Vehicles Exited	138	88	22	22	338	888	126	993	178	540	95	3428
Hourly Exit Rate	138	88	22	22	338	888	126	993	178	540	95	3428
Input Volume	135	76	21	23	335	937	121	1041	169	558	94	3510
% of Volume	102	116	105	96	101	95	104	95	105	97	101	98
Denied Entry Before	0	0	0	0	0	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0	0	0	0	0	0

2: Skyline Blvd & San Bruno Ave Performance by movement

Movement	WBL	WBR	NBT	NBR	SBL	SBT	All
Denied Del/Veh (s)	0.2	0.1	0.0	0.0	3.3	1.5	0.7
Total Del/Veh (s)	56.8	6.3	14.3	8.7	108.1	3.7	26.0
Vehicles Entered	91	59	1041	208	270	383	2052
Vehicles Exited	90	60	1038	207	271	381	2047
Hourly Exit Rate	90	60	1038	207	271	381	2047
Input Volume	104	50	1092	218	274	411	2149
% of Volume	87	120	95	95	99	93	95
Denied Entry Before	0	0	0	0	0	0	0
Denied Entry After	0	0	0	0	0	0	0

Total Network Performance

Denied Del/Veh (s)	1.1
Total Del/Veh (s)	66.7
Vehicles Entered	3832
Vehicles Exited	3788
Hourly Exit Rate	3788
Input Volume	27281
% of Volume	14
Denied Entry Before	0
Denied Entry After	0

Attachment 3

Synchro Travel Time Reports
(Arterial Analysis)

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	22.4	48.3	0.26	19.3	E
Sneath Lane	I	50	39.3	53.5	92.8	0.50	19.6	E
Total	I		65.2	75.9	141.1	0.76	19.5	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.4	53.2	81.6	0.28	12.3	F
San Bruno Ave	I	50	39.3	16.7	56.0	0.50	32.4	C
Total	I		67.7	69.9	137.6	0.78	20.5	E

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	17.8	43.7	0.26	21.3	D
Sneath Lane	I	50	39.3	53.5	92.8	0.50	19.6	E
Total	I		65.2	71.3	136.5	0.76	20.1	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.4	53.2	81.6	0.28	12.3	F
San Bruno Ave	I	50	39.3	16.7	56.0	0.50	32.4	C
Total	I		67.7	69.9	137.6	0.78	20.5	E

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	17.8	43.7	0.26	21.3	D
Sneath Lane	I	50	39.3	53.5	92.8	0.50	19.6	E
Total	I		65.2	71.3	136.5	0.76	20.1	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	42	28.1	53.2	81.3	0.28	12.2	F
San Bruno Ave	I	50	39.3	4.8	44.1	0.50	41.1	B
Total	I		67.4	58.0	125.4	0.78	22.4	D

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	17.8	43.7	0.26	21.3	D
Sneath Lane	I	50	39.3	35.9	75.2	0.50	24.1	D
Total	I		65.2	53.7	118.9	0.76	23.1	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	42	28.1	30.1	58.2	0.28	17.0	E
San Bruno Ave	I	50	39.3	4.8	44.1	0.50	41.2	B
Total	I		67.4	34.9	102.3	0.78	27.4	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	17.8	43.7	0.26	21.3	D
Sneath Lane	I	50	39.3	35.4	74.7	0.50	24.3	D
Total	I		65.2	53.2	118.4	0.76	23.2	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	40	28.4	24.9	53.3	0.28	18.8	E
San Bruno Ave	I	50	39.3	4.8	44.1	0.50	41.1	B
Total	I		67.7	29.7	97.4	0.78	28.9	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	17.8	43.7	0.26	21.3	D
Sneath Lane	I	50	39.3	35.4	74.7	0.50	24.3	D
Total	I		65.2	53.2	118.4	0.76	23.2	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.4	24.9	53.3	0.28	18.8	E
San Bruno Ave	I	50	39.3	4.8	44.1	0.50	41.1	B
Total	I		67.7	29.7	97.4	0.78	28.9	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	29.0	54.9	0.26	17.0	E
Sneath Lane	I	50	39.3	56.0	95.3	0.50	19.0	E
Total	I		65.2	85.0	150.2	0.76	18.3	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.2	168.0	196.2	0.28	5.1	F
San Bruno Ave	I	50	39.3	88.1	127.4	0.50	14.2	F
Total	I		67.5	256.1	323.6	0.78	8.7	F

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	20.8	46.7	0.26	19.9	E
Sneath Lane	I	50	39.5	56.0	95.5	0.51	19.1	E
Total	I		65.4	76.8	142.2	0.76	19.4	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.0	168.0	196.0	0.28	5.1	F
San Bruno Ave	I	50	39.5	88.1	127.6	0.51	14.3	F
Total	I		67.5	256.1	323.6	0.78	8.7	F

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	20.8	46.7	0.26	19.9	E
Sneath Lane	I	50	39.3	56.0	95.3	0.50	19.0	E
Total	I		65.2	76.8	142.0	0.76	19.3	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.2	168.0	196.2	0.28	5.1	F
San Bruno Ave	I	50	39.3	6.9	46.2	0.50	39.3	B
Total	I		67.5	174.9	242.4	0.78	11.6	F

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	19.1	45.0	0.26	20.7	E
Sneath Lane	I	50	39.3	39.6	78.9	0.50	23.0	D
Total	I		65.2	58.7	123.9	0.76	22.2	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.3	73.2	101.5	0.28	9.8	F
San Bruno Ave	I	50	39.3	5.5	44.8	0.50	40.5	B
Total	I		67.6	78.7	146.3	0.78	19.2	E

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	20.8	46.7	0.26	19.9	E
Sneath Lane	I	50	39.3	41.4	80.7	0.50	22.5	D
Total	I		65.2	62.2	127.4	0.76	21.5	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	44	27.4	40.7	68.1	0.28	14.6	F
San Bruno Ave	I	50	39.3	6.9	46.2	0.50	39.3	B
Total	I		66.7	47.6	114.3	0.78	24.6	D

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	20.8	46.7	0.26	19.9	E
Sneath Lane	I	50	39.3	41.4	80.7	0.50	22.5	D
Total	I		65.2	62.2	127.4	0.76	21.5	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.2	40.7	68.9	0.28	14.5	F
San Bruno Ave	I	50	39.3	6.9	46.2	0.50	39.3	B
Total	I		67.5	47.6	115.1	0.78	24.4	D

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	30.2	56.1	0.26	16.6	E
Sneath Lane	I	50	39.3	40.8	80.1	0.50	22.7	D
Total	I		65.2	71.0	136.2	0.76	20.2	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.3	26.4	54.7	0.28	18.2	E
San Bruno Ave	I	50	39.3	4.4	43.7	0.50	41.5	B
Total	I		67.6	30.8	98.4	0.78	28.6	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	16.2	42.1	0.26	22.1	D
Sneath Lane	I	50	39.2	40.8	80.0	0.50	22.6	D
Total	I		65.1	57.0	122.1	0.76	22.5	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.5	26.4	54.9	0.28	18.3	E
San Bruno Ave	I	50	39.2	4.3	43.5	0.50	41.6	B
Total	I		67.7	30.7	98.4	0.78	28.6	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	16.2	42.1	0.26	22.1	D
Sneath Lane	I	50	39.3	40.8	80.1	0.50	22.7	D
Total	I		65.2	57.0	122.2	0.76	22.5	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.7	26.4	55.1	0.28	18.4	E
San Bruno Ave	I	50	39.3	3.3	42.6	0.50	42.6	A
Total	I		68.0	29.7	97.7	0.79	28.9	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	16.2	42.1	0.26	22.1	D
Sneath Lane	I	50	39.3	31.5	70.8	0.50	25.6	D
Total	I		65.2	47.7	112.9	0.76	24.3	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.5	19.4	47.9	0.28	21.0	E
San Bruno Ave	I	50	39.3	3.3	42.6	0.50	42.6	A
Total	I		67.8	22.7	90.5	0.78	31.2	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	17.1	43.0	0.26	21.6	D
Sneath Lane	I	50	39.3	29.3	68.6	0.50	26.4	D
Total	I		65.2	46.4	111.6	0.76	24.6	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	42	28.0	16.1	44.1	0.28	22.4	D
San Bruno Ave	I	50	39.3	3.0	42.3	0.50	42.9	A
Total	I		67.3	19.1	86.4	0.78	32.5	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	17.1	43.0	0.26	21.6	D
Sneath Lane	I	50	39.3	29.3	68.6	0.50	26.4	D
Total	I		65.2	46.4	111.6	0.76	24.6	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	42	28.0	16.1	44.1	0.28	22.4	D
San Bruno Ave	I	50	39.3	3.0	42.3	0.50	42.9	A
Total	I		67.3	19.1	86.4	0.78	32.5	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	58.7	84.6	0.26	11.0	F
Sneath Lane	I	50	39.3	34.1	73.4	0.50	24.7	D
Total	I		65.2	92.8	158.0	0.76	17.4	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.4	26.4	54.8	0.28	18.3	E
San Bruno Ave	I	50	39.3	3.4	42.7	0.50	42.5	A
Total	I		67.7	29.8	97.5	0.78	28.9	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	18.0	43.9	0.26	21.2	D
Sneath Lane	I	50	39.3	34.1	73.4	0.50	24.7	D
Total	I		65.2	52.1	117.3	0.76	23.4	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.4	26.4	54.8	0.28	18.3	E
San Bruno Ave	I	50	39.3	3.4	42.7	0.50	42.4	A
Total	I		67.7	29.8	97.5	0.78	28.8	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	18.0	43.9	0.26	21.2	D
Sneath Lane	I	50	39.3	34.1	73.4	0.50	24.7	D
Total	I		65.2	52.1	117.3	0.76	23.4	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	42	28.1	26.4	54.5	0.28	18.2	E
San Bruno Ave	I	50	39.3	2.6	41.9	0.50	43.3	A
Total	I		67.4	29.0	96.4	0.78	29.1	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	23.6	49.5	0.26	18.8	E
Sneath Lane	I	50	39.3	30.3	69.6	0.50	26.1	D
Total	I		65.2	53.9	119.1	0.76	23.1	D

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	42	28.0	19.7	47.7	0.28	20.8	E
San Bruno Ave	I	50	39.3	2.6	41.9	0.50	43.3	A
Total	I		67.3	22.3	89.6	0.78	31.3	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	18.0	43.9	0.26	21.2	D
Sneath Lane	I	50	39.3	65.9	105.2	0.50	17.2	E
Total	I		65.2	83.9	149.1	0.76	18.4	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.3	22.2	50.5	0.28	19.8	E
San Bruno Ave	I	50	39.3	2.6	41.9	0.50	43.3	A
Total	I		67.6	24.8	92.4	0.78	30.5	C

Arterial Level of Service: NB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
San Bruno Ave	I	50	25.9	18.0	43.9	0.26	21.2	D
Sneath Lane	I	50	39.3	86.1	125.4	0.50	14.5	F
Total	I		65.2	104.1	169.3	0.76	16.2	E

Arterial Level of Service: SB Skyline Blvd

Cross Street	Arterial Class	Flow Speed	Running Time	Signal Delay	Travel Time (s)	Dist (mi)	Arterial Speed	Arterial LOS
Sneath Lane	I	41	28.3	28.0	56.3	0.28	17.7	E
San Bruno Ave	I	50	39.3	2.6	41.9	0.50	43.3	A
Total	I		67.6	30.6	98.2	0.78	28.6	C

ATTACHMENT E

Preliminary Planning Study Environmental Memo

STATE ROUTE 35 WIDENING (1-280 TO SNEATH LANE) PRELIMINARY PLANNING STUDY ENVIRONMENTAL MEMO

1. Project Description

1.1 Purpose and Need

The purpose of the proposed project ("project") is to reduce traffic congestion on Skyline Boulevard/State Route SR-35 ("Skyline Boulevard" or "SR-35") between Sneath Lane and I-280. Although relatively few intersections in the City of San Bruno ("City") experience significant amounts of congestion, the two intersections located within in the proposed project corridor (at Sneath Lane and San Bruno Avenue West) are among the four most congested intersections in the City.

The SR-35 intersections at Sneath Lane and San Bruno Avenue West currently operate at Level of Service (LOS) of E and F respectively, during both the morning and afternoon peak periods. LOS E and F conditions are caused when traffic demand exceeds more than 90% of the available roadway capacity, and is characterized by reduced travel speeds, long delays, and queuing at signalized intersections. LOS F signifies stop-and-go traffic operation and extreme delays. Intersection improvements including widening of the proposed project corridor have been identified as an Implementing Policy in the City's 2009 General Plan in order to restore these intersections to an acceptable level of service and conform to the City/County of San Mateo Congestion Management Plan (CMP).[1]

1.2 Description of Work

The proposed project would construct either one or two additional lanes on the two-lane segment of SR-35 between Sneath Lane and I-280. The majority of the project will be constructed within the existing paved right-of-way (ROW), however widening of the paved road may be necessary to accommodate the additional lanes and new shoulder(s). Utility relocation including trenching will likely be required.

1.2.1 Alternative 1 (2-Lane Northbound Lane)

Alternative 1 would convert the existing northbound shoulder of SR-35 into an additional travel lane for a total of two northbound lanes. This would result in three total lanes in the proposed project corridor.

1.2.2 Alternative 2 (2-Lane Northbound and Southbound Lanes)

Alternative 2 would convert the existing northbound and south shoulders of SR-35 into an additional travel lane for a total of two northbound lanes and two southbound lanes. This would result in four total lanes in the proposed project corridor.

2. Methodology

The following environmental constraints assessment was developed based on a windshield survey conducted on September 14, 2015 from 1330-1530. Findings are based on observations made during the survey as well as information from other approved environmental

[1] "Implementing Policy T-8: Support widening of Skyline Boulevard between Sneath Lane and I-280 to alleviate traffic congestion problems, if concerns regarding sensitive natural resources can be mitigated. Preserve the mature trees in the area, if feasible." (Dyett and Bhatia. 2009. San Bruno General Plan.)

impact assessments, local, state, and federal plans and regulations, as well as guidance from Caltrans Standard Environmental Reference. Summaries of expected constraints to the proposed project development for each environmental resource area are included below.

3. Potential Environmental Constraints by Resource Area

3.1. Traffic and Transportation

Currently, the two intersections within the SR-35 project corridor, Sneath Lane and San Bruno Avenue West, operate at Levels E and F during AM and PM peak periods, respectively. At San Bruno Avenue, traffic volumes exceed more than 100% of the roadway capacity, resulting in severe delays.

The San Andreas Trail segment of the Crystal Springs Regional Trail (a designated recreational part of the Peninsula Watershed) runs parallel and directly west of the proposed project corridor, beginning at Sneath Lane and continuing past the terminus of the proposed project at I-280. Trail entry begins at the San Bruno Avenue West intersection, with bicyclists and pedestrians using the cross walk at San Bruno Avenue for access to the trail. In addition to vehicular and non-motorized traffic, the SamTrans 140 bus route crosses Sneath Lane at SR- 35.

Figure 1. San Andreas trail entrance at SR-35 and San Bruno.

The capacity enhancements of either alternative will help restore acceptable levels of service. Both alternatives will allow for additional roadway capacity, reducing congestion particularly at the intersections along the project corridor.

3.1.1 Alternative 1

This alternative is not expected to require temporary or permanent encroachments into the Peninsula Watershed or the Regional Trail. Additional ROW east of the project corridor would likely be required for construction and operation of the additional northbound lane and shoulder. Bicycle and pedestrian traffic could be temporarily impacted during construction of Alternative 1, particularly in terms of trail access to the Regional Trail. The additional northbound lane is expected to reduce congestion and delay at both intersections, providing that such capacity does not induce more travel demand for the roadway. Intersection improvements at San Bruno Avenue West would be required to ensure the safety and mobility of bicyclists and pedestrians given the increased roadway capacity.

3.1.2 Alternative 2

Bicycle and pedestrian facilities could be impacted by Alternative 2, particularly in terms of access to and use of the Crystal Springs Regional Trail **(Figure 1).** The construction of an additional travel lane and the reconstructed shoulder on the south side of the existing roadway would require an easement for use of San Francisco Public Utilities Commission's (SFPUC)

property. This would require realignment of the trail and entryway at San Bruno Avenue West. Potential impacts to SFPUC property and recreational facilities as a result of Alternative 2 could be reduced by widening only to the east of SR-35. Intersection improvements at San Bruno Avenue would also be required to ensure the safety and mobility of bicyclists and pedestrians. Increased roadway capacity is expected to improve delay at the two intersections, as is projected in the San Bruno General Plan.

3.2 Land Use

3.2.1 Existing and Future Land Uses

The current land uses surrounding the project are primarily low-density residential and parks/open space.[2] Areas of medium- to high-density residential developments are found at the southeast end of the project as well as along San Bruno Ave West and Sneath Lane at Skyline Boulevard. A portion of northbound SR-35 around San Bruno Avenue falls within a designated redevelopment area. The only commercial area within the project limits is considered "neighborhood commercial," at San Bruno Avenue West and SR-35. There is a buffer of parks/open space running the length of the project between SR-35 and residences to the east. Immediately to the west of the project is the San Andreas Trail, which is part of a Scenic and Recreation Easement in the SFPUC's Peninsula Watershed (also part of California Department of Fish and Wildlife's San Francisco Fish and Game Refuge).[3] The San Andreas Trail is open to the public for hiking, biking, walking, and running.

If additional ROW is needed to accommodate one or two more lanes, land use changes will be required.

3.2.2 Consistency with State, Regional, and Local Plans

The proposed project is consistent with the Transportation Element of the San Bruno General Plan. The project would increase capacity of SR-35 and reduce congestion, which is identified in Implementing Policy T-8.

However, the General Plan also proposes a bikeway along SR-35 from Sneath Lane to the San Andreas Trail entrance as a part of the 2030 Plan. Currently the San Andreas Trail is accessible from the San Bruno Avenue West and SR-35 intersection. The Trail provides a designated path for non-motorized methods of transportation south from San Bruno Avenue West. The proposed bikeway would serve an existing gap in designated bicycle routes from Sneath Lane to San Bruno Avenue West. Discussions with the City of San Bruno are recommended during project design in case additional SR-35 lane(s) are incompatible with bicycle traffic on SR-35, particularly between Sneath Lane and San Bruno Avenue West.

3.3 Parks and Recreation

There are multiple trails with access points along SR-35 within the project limits. The Sweeney Ridge Trail, part of the Golden Gate National Recreation Area, can be accessed from the end of Sneath Lane, west of SR-35. Sweeney Ridge also connects with the Fifield-Cahill Ridge Trail, managed by the SFPUC. There are two entrances to the San Andreas Trail from within the

[2] Dyett and Bhatia. 2009. San Bruno General Plan.
http://www.sanbruno.ca.gov/comdev_images/planning/General%20Plan/Approved/SBGP_CompleteGP.pdf.
[3] Fish and Game Code Section 10770-10771.

project limits: SR-35 at San Bruno Avenue West and SR-35 opposite Cambridge Lane, just north of I-280. Parking is available on the west/southbound side of SR-35 at Cambridge Lane.

Expanding SR-35 ROW to the west would likely result in permanent impacts to the recreational trail facility. Easements or property acquisition would require negotiations with CDFW and SFPUC, as well as Section 4(f) determination from the Federal Highway Administration (FHWA). Section 4(f) of the Department of Transportation Act of 1966[4] prohibits the use of land of significant publicly owned public parks, recreation areas, wildlife and waterfowl refuges, and land of a historic site for transportation projects unless FHWA determines that there is no feasible and prudent avoidance alternative and that all possible planning to minimize harm has occurred.

Construction of the proposed project could result in temporary impacts to accessibility of the neighboring recreational facility. Temporary (construction-phase) impacts to Section 4(f) resources (publicly-owned public parks, recreational areas or wildlife or waterfowl refuges, historic or archeological sites eligible for NRHP status) can be minimized or avoided by carefully planning construction staging, lane closures, and traffic management.

Either alternative will require planning and documentation of how permanent and temporary impacts to Section 4(f) resources will be avoided or minimized. If the project needs to encroach into the Watershed, FHWA will require the project proponent to show that no other avoidance alternatives would be feasible, and that harm to the resources will be minimized.

3.4 Growth

The project will improve accessibility of SR-35 and connecting streets by reducing congestion and travel times along the project corridor. The project will not be located along a new alignment, provide new access, or have reasonably foreseeable growth or land use change. A full growth-related impact analysis is not expected to be required. A short memorandum is recommended to document the change in accessibility in conjunction with the area's development pressures.

3.5 Farmlands/Timberlands

No farmlands are identified in San Bruno either in the General Plan, or by the California Department of Conservation's Farmland Mapping and Monitoring Program.[5] Timber production does not occur in the City of San Bruno. Therefore, there are no expected impacts to farm or timberlands as part of the proposed project.

3.6 Community Impacts

3.6.1 Economic

No businesses are located within the project limits. The nearest commercial area is just east of the project corridor on San Bruno Avenue West. Businesses here provide retail services as well as jobs. During project construction of either Alternative, accessibility to businesses may be

[4] Pub. L. 89– 670, 80 Stat. 931; codified in 23 U.S.C. § 138 and 49 U.S.C. § 303
[5] California Department of Conservation. 2012. San Mateo County Important Farmland. ftp://ftp.consrv.ca.gov/pub/dlrp/FMMP/pdf/2012/smt12.pdf

altered (with the potential to indirectly affect retail sales and number of employment opportunities), but can be minimized or avoided by planning staging and traffic shifts.

Property values are not expected to decrease as a result of construction or operation of the proposed project. Improved accessibility can have a positive impact on property values.[6]

3.6.2 Community Character

The proposed project is not expected to alter community character or cohesion, for either Alternative 1 or Alternative 2. San Bruno is primarily a residential community. Because of its proximity to Silicon Valley and San Francisco, residents of San Bruno are able to work outside of San Bruno with relatively short commutes. Due to capacity issues on SR-35, the addition of one or two lanes will benefit commuters with decreased travel times and increased fuel efficiency.

3.6.3 Relocations

Acquisition or relocation of businesses or residences is not required.

3.6.4 Environmental Justice

No environmental justice impacts are expected as a result of this project because there are no communities defined as disadvantaged or environmental justice communities within the proposed project limits. This determination is based on the California Environmental Protection Agency (CalEPA) statewide designation of disadvantaged communities based on socio-economic, as well as transportation and air quality related vulnerabilities.[7]

3.7 Utilities, Emergency Services and Public Facilities

Permanent relocation of utilities as well as road signage will be required, which will necessitate coordination with the utility companies. A sewer pump station is located next to the I-280 on-ramp, but is not expected to be affected by project construction or operation.

Although the project will result in improved accessibility around SR-35, including to public facilities and emergency services, there could be temporary negative impacts during construction. During construction, lane and/or shoulder closures will be required to safely accommodate lane shifts and/or construction of additional lanes. Staging and traffic management plans should be developed to minimize construction-phase impacts to local community resources such as the following:

- San Bruno Fire Station #52 at Sneath Lane and SR-35;
- John Muir Elementary School (San Bruno Ave W and I-280) and Portola Elementary School (Sneath Lane west of SR-35);
- Samtrans Bus route 40 on Sneath Lane;
- Class II bike lane on Sneath Lane and bicycle access at San Bruno Avenue West on SR-35;
- Church of the Highlands (1900 Monterey Drive);
- Access to San Andreas Trail (see **3.3 Parks and Recreation**).

[6] Caltrans. 2011. Vol. 4 SER Handbook.
http://www.dot.ca.gov/ser/vol4/downloads/chap_appdx/AppendixD_PropertyValues_21102011.pdf.
[7] CalEPA. 2014. CalEnviroScreen. http://oehha.ca.gov/ej/pdf/CES20FinalReportUpdateOct2014.pdf

3.8 Visual and Aesthetics

The most prominent visual feature in the project area is the Crystal Springs Reservoir and Trail and associated views of the natural landscape. Permanent visual impacts are likely to be limited to tree removals, additional or modified signage, and alteration to aboveground utilities. Alternative 2 may require removal or reconstruction of retaining walls on the west side of SR-35, which should be incorporated into the analysis of visual impacts.

Figure 2. View of SR-35 and Peninsula Watershed from 610 Skyline Blvd.

Potential viewer groups requiring analysis are the residents on the east side of SR-35, motorists along SR-35, and pedestrians and cyclists on the San Andreas Trail. For these viewers, the project is expected to have a negligible to noticeable impact. Surrounding residences currently experience views of the existing roadway. These views are mitigated by a partially wooded area which provides a partial visual buffer to SR-35. Removal of some trees and a portion of the wooded area on the east side of SR-35 will reduce the natural buffer and increase visibility of the road and traffic. However, it may also increase residents' views of the San Andreas Reservoir, Sweeney Ridge, and the Peninsula Watershed, which would be a net benefit. Construction staging may temporarily impact views in the project's vicinity; however construction materials and equipment will be removed after project construction has been completed. During project development and approval, it may be necessary to undergo design review by the City of San Bruno, as is required for sites that are visible for multiple locations.

State Road-35 runs along the eastern ridge of the coastal mountain range. The full length of Skyline Boulevard is eligible to be designated by as a California State Scenic Highway. Additionally, Sneath Lane west of El Camino Real is designated by the City of San Bruno as a scenic corridor.

Tree removals within the state ROW may not need local approval since they are managed by Caltrans. However, mature trees outside Caltrans ROW should be avoided if feasible.[8] The General Plan also requires identification of all trees over six inches in diameter and approval of landscaping plans is during design review.

A brief memorandum or visual impact assessment (VIA) will be necessary.

3.9 Cultural Resources

A Historic Resource Inventory of San Bruno was conducted in 2003, but did not identify any historic resources, historic districts, or California points of historic interest within or adjacent to

[8] Implementing Policy OSR-34. See footnote [2].

the project. The project is not located on and will not affect tribal lands. If trenching or excavation below or outside the existing road fill is required, a technical memorandum, including a site survey by an archaeologist and a records search of known historic resources, would be necessary to ensure that there are no foreseeable impacts to historic cultural resources.

4.0 Hydrology and Floodplain

The proposed project corridor forms the boundary between the San Andreas Reservoir Sub-basin to the west, and three watersheds to the east: San Bruno Creek, Huntington Creek, and Crystal Springs Creek. There are no areas in San Bruno designated by the Federal Emergency Management Agency (FEMA) as 100-year floodplains. Areas that are likely to flood due to a combination of high tide and heavy rain are not within or around the Project.

A full Location Hydraulic Study is not needed since there is no encroachment on a base floodplain. The lack of floodplain impacts as well as the basis for this conclusion should be documented in a brief memorandum. Consultation with FEMA and floodplain management agencies is not required.

4. Physical Environment

4.1 Water Quality and Storm Water Runoff

4.1.1 Water Quality

The project is located within a High Receiving Water Risk Watershed. The San Bruno General Plan found potential soil and/or groundwater contamination areas along the project area at the intersections of Sneath Lane and San Bruno Avenue West.

A Water Quality Assessment Report (WQR) will need to be prepared. The WQR will identify the receiving water, existing surface water quality, storm water regulations and potential impacts.

The requirement for a Section 401 (Clean Water Act) Water Quality Certification will be triggered if a Section 404 permit is needed due to impacts to wetlands/waters of the U.S. (see **4.8 Biological Environment**).

4.1.2 Storm Water

A Storm Water Data Report (SWDR) should be prepared for every project. Several gated storm drains were found along SR-35southbound and northbound lanes. The identified storm drains were located in trenches that sloped from the shoulder of the existing roadway. Projects that do not have the potential to create storm water impacts and have little or no soil disturbance can utilize a Short Form SWDR. If the road is widened outside the existing paved ROW, a Long Form SWDR will likely be required.

If the project will disturb one acre or more of soil, it will need to obtain coverage under the State of California's Construction General Permit (which includes the National Pollutant Discharge Elimination System, NPDES, permit) to comply with Section 402 of the Clean Water Act.[9] A

[9] State Water Resources Control Board Order No. 2009-0009-DWQ; National Pollutant Discharge Elimination System (NPDES) General Permit No. CAS000002; Waste Discharge Requirements for Discharges of Storm Water Runoff.

Storm Water Pollution Prevention Plan (SWPPP) will need to be prepared. More intensive pollution prevention measures, as well as monitoring, sampling, and reporting procedures will be required if the site is determined to have a higher risk level. Risk level (1, 2, 3) will be determined in the SWDR based on receiving water risk, and the sediment risk of the construction site. Due to sensitive drinking water sources nearby, but with limited soil disturbance required, the project will likely qualify for Risk Level 2. For projects that do not require preparation of a SWPPP, Caltrans requires preparation of a Water Pollution Control Program.[10]

The San Bruno General Plan requires construction-related grading and other activities to comply with the Association of Bay Area Governments' (ABAG) Manual of Standards for Erosion and Sediment Control Measures, and with the California Storm Water Quality Association, Storm Water Best Management Practice Handbook for Construction.

Although Design Pollution Prevention BMPS and Temporary Construction Site BMPs must be considered for every Caltrans project, only some projects need to consider incorporating Treatment BMPs. If the project results in a net increase in one acre or more of new impervious surface, the project must consider incorporating Treatment BMPS.[10]

4.2 Geology, Soils, Seismic and Topography

The project area is 4-500 feet in elevation.[2] This puts the project at a topographically superior location to the central and eastern parts of the City of San Bruno. The San Bruno General Plan identifies Franciscan bedrock to the east of the project corridor between Sneath Lane and San Bruno Avenue West. Serpentine rock is noted as widespread at the northeastern end of the San Andreas Fault.[11]

Geotechnical investigation is required for all sites proposed for development in areas with risk of landslides, slippage, erosion, liquefaction, or expansive soils.[12] Ground stability is dependent on the slope, geology, rainfall, excavation, and seismic activities. Although expansive soils are not found within the Project, due to hilly topography, settlement and erosion are a risk downslope to the east of the project. The San Bruno General Plan identifies areas west of SR-35 as susceptible to erosion while areas east of SR-35 range from moderately to highly susceptible to landslides, which would potentially affect both Alternatives 1 and 2. Landslide activity occurs most frequently during El Nino seasons, due to very saturated soils. If Alternative 2 requires removal or alteration of retaining walls along SR-35, it will likely require geotechnical evaluation.

The San Andreas Fault is a strike-slip fault that follows closely to Skyline Drive for the length of the project. Seismic activity can cause or exacerbate four hazards: fault surface rupture, ground shaking, ground failure (landslides), and settlement. Ground shaking is magnified by loose,

Associated with Construction and Land Disturbance Activities as amended by Order 2010-0014-DWQ and 2012-006-DWQ.

[10] Caltrans Storm Water Quality Handbooks, Project Planning and Design Guide. July 2010. http://www.dot.ca.gov/hq/oppd/stormwtr/ppdg/swdr2012/PPDG-May-2012.pdf

[11] San Francisco Planning Department. June 29, 2007. Final Program Environmental Impact Report on SFPUC Watershed Improvement Program. Water Supply and System Operations – Setting and Impacts. Section 5.5.2-2. http://www.sf-planning.org/Modules/ShowDocument.aspx?documentid=8044

[12] Implementing Policy HS-3. See footnote [2].

unconsolidated soils, but is not likely to induce liquefaction in areas that are not underlain by Bay margin artificial fill. The San Bruno General Plan recommends a geologic report by a qualified geologist for construction or remodeling of all structures within 100 feet of an active fault.[13] No structures will be allowed across or within 50 feet of an active fault.[14] Development in areas subject to seismic hazards must comply with guidelines in the California Division of Mines and Geology Special Publication 117.[15]

4.3 Paleontology

The proposed project will primarily be within the existing road and shoulder, potentially with some impact to the adjacent area due the addition of 1 or 2 lanes. Due to the existing development within the paved roadway, type of bedrock (Franciscan complex has low potential for fossil resources), and the lack of fossils identified in the Program EIR for SFPUC's Watershed Improvement Program[16], no paleontological resources are expected.

4.4 Hazardous Waste/Materials

State Road 35 between San Francisco and north of Santa Cruz was originally funded by a 1919 bond issue. Since the road was in use prior to the lead ban in California in the 1980's, Aerially Deposited Lead (ADL) may be found in the soils adjacent to Skyline Drive. Lead is typically found within the top 2 feet of material in unpaved areas of the highway.[17] Activities that could result in lead exposure due to soil disturbance include clearing and grubbing, excavating, trenching, grading, drilling, planting, constructing foundations, installing signs, and installing posts. If any of these will take place as part of the project, soil testing for heavy metals will be required prior to construction. Depending on the lead concentrations found on site, additional health and safety measures may be required to protect workers. Additional disposal costs and precautions will be necessary if the soil is considered to be hazardous material. In some cases lead-contaminated soil may be used on site. Caltrans SSP 14-11.03 specifies disposal methods depending on lead concentration.

The San Bruno General Plan identifies three areas with potential soil or groundwater contamination around the intersection of San Bruno Avenue West and SR-35; Sneath Lane and SR-35; and SR-35 and I-280.[2] Further investigation of the nature and status of these sites should be done if grading or excavation will take place**.**

Serpentine is a metamorphosed form of Franciscan rock that is common on the northeastern side of San Andreas Fault.[11] Serpentine rock is a source of naturally occurring asbestos (NOA). Any areas with serpentine soils or rock will require additional health and safety procedures during excavation, grading, drilling, or trenching. Spoils containing NOA may require special disposal protocol.

[13] Implementing Policy HS-10. See footnote [2].
[14] Implementing Policy HS-9. See footnote [2].
[15] Implementing Policy HS-7. See footnote [2].
[16] SFPUC. 2005. WSIP Facility Projects – Setting and Impacts. 4.7 Cultural Resources. http://www.sf-planning.org/Modules/ShowDocument.aspx?documentid=8044
[17] Caltrans Standard Special Provision (SSP) 7-1.02K(6)(j)(iii)

4.5 Air Quality

4.5.1 Regional Air Quality Setting

As the proposed project is located in San Mateo County, a non-attainment or attainment maintenance area for the National Ambient Air Quality Standards (NAAQS) – federal conformity requirements apply.[18]

The project is also non-exempt from Transportation Conformity Regulations pursuant to the Code of Federal Relations (CRF) 40, Section 93.126. It falls within a Transportation Conformity Area according to CRF 40, 93 Subpart A, and as such, it is subject to conformity analysis for carbon monoxide (maintenance), 1-hour ozone and particular matter 2.5 (PM2.5 2006 standard) pollutants.[19] If the proposed project will receive federal funding, it must not "cause or contribute to any new violation of any standard [NAAQS] in any area; increase the frequency or severity of any existing violation of any standard in any area; or delay timely attainment of any standard or any required interim emission reductions or other milestones in any area" pursuant to Clean Air Act (CAA) Section 176(c)(1)(B).

4.5.2 Project-Level PM2.5 Hot Spot Analysis

It is not anticipated that a quantitative, project-level PM hot spot analysis will be required for this project, in accordance with 40 CFR 93.123(b)(1) and 2013 EPA Guidance.[20]

PM hot spot analyses are not required for projects that are not of local air quality concern. Projects of Air Quality Concern ("POAQC" or "Project of Concern") include certain highway and transit projects that involve significant levels of diesel vehicle traffic specifically and any other project identified in the PM State Implementation Plan (SIP) as a project of localized air quality concern.

The rule further applies to projects affecting intersections of existing Level of Service D or below or which will increase to Level of Service D or below as a result of the project and due to an increase in the number of diesel vehicles. The rule does not generally apply to expanded highway projects that primarily service gasoline vehicle traffic, including projects operating at a Level of Service D or below.

4.5.3 Project-Level CO Hot Spot Analysis

It is anticipated that a quantitative CO hot spot analysis will be necessary for this project. Quantitative CO hot spot analyses are generally required for projects which are identified as possible violations of the SIP or with intersections of Level of Service D or below related to increased traffic volumes related to the project pursuant to 40 CFR 93.105(a)(1). CO concentrations are generally found near intersections and roadways with congested traffic as is characteristic of the project corridor. The proposed project is not considered an exempt project under 40 CFR 93.126 or 128.

[18] Caltrans Areas Subject to Conformity Requirements Map, 2013.
[19] Areas Subject to Transportation Conformity Regulations in California.
[20] Unites States Environmental Protection Agency. 2013. Transportation Conformity Guidance for Quantitative Hot-Spot Analyses in PM2.5 and PM10 Nonattainment and Maintenance Areas.

During the morning and evening peak hours, SR-35 at San Bruno Avenue experiences severe levels of congestion. The San Bruno General Plan designates the following intersections within the project corridor as Level E or below during either the AM or PM peak periods:

Figure 3: Existing Level of Service for Intersections in Project Corridor

Intersection	AM Peak Hour	PM Peak Hour
Skyline Boulevard/SR-35 at San Bruno Ave. W.	F	F
Skyline Boulevard/SR-35 at Sneath Lane	E	E

Demonstrations of CO conformity would be conducted based on quantitative analysis using the EPA approved air quality model. It is recommended that the Transportation Project-Level Carbon Monoxide Protocol (1997 CO Protocol) be used to determine whether project may be of concern for CO violations and the appropriate modeling methodology for further detailed analysis.

4.5.4 Project of Air Quality Concern

Consistent with PM2.5 and PM10 nonattainment areas, a regional interagency consultation process will be required to determine if the project is also a "Project of Air Quality Concern" (POAQC). POAQCs are generally characterized as a capacity or alignment change on a road with more than 125,000 AADT and more than 10,000 truck AADT or otherwise will substantially increase or concentrate diesel exhaust emissions. 2014 Back AADT for the project corridor was approximately 36,100 and Ahead AADDT, approximately 54,500. Back and Ahead AADT truck traffic for 2013 for SR-35 at Rt. 280 estimated at 40 and 139 respectively.

4.5.5 Mobile Source Air Toxics (MSAT)

It is anticipated that the proposed project will not result in high MSAT effects and thus will be categorized as a "project with low potential MSAT effects". This include projects which improve operations of highways, transit or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase MSAT emissions. Most highway projects requiring an MSAT fall within this category and include most minor widening projects where design year traffic is projected to be less than 140,00 to 150,000 AADT.[21] A qualitative assessment of MSAT emissions projections should be conducted.

4.6 Noise and Vibration

Permanent and construction-phase noise and vibration levels may increase with changes in vehicle type, capacity, and flow along SR-35. Ambient noise levels during the windshield survey (non-peak hours) were low; however, noise levels are expected to be higher during busier traffic periods. Current roadway noise exposure for the project corridor is approximately 65 dB CNEL[22]. This is conditionally acceptable for the general land use compatibility noise levels in the project area, provided that an analysis of noise reduction requirements is conducted and noise insulation features are included in the design. Noise insulation features could include natural buffers and landscaped berms between the roadway and residential areas, which are

[21] FHWA Guidance on MSATs.

[22] San Bruno General Plan, Health and Safety Element.

currently in use on the existing roadway. Although trees and vegetation are perceived to provide noise reduction benefits, actual reduction in noise levels requires a dense, thick buffer strip. The relative increase in noise exposure due to the project is largely dependent on anticipated traffic speeds and the proportion of increased truck traffic. Residences located along the east side SR-35, may perceive changes in the noise and vibration levels, particularly residences that are less than 100 feet from the project (see **Figure. 2**). Due to the potential for increased noise and vibration levels, a technical report analyzing the effect of traffic changes on sensitive receptors will be required.

4.7 Energy and Climate Change

The City of San Bruno lies in the northern portion of the Bay Area's peninsula climatological subregion and includes several different microclimates due to its topography. Temperatures are generally mild and are heavily influenced by the Pacific Ocean, San Francisco Bay and Santa Cruz Mountains. In the San Bruno area, pollutant emissions are high, especially from motor vehicle congestion, but winds are generally strong enough to disperse pollutants away and mitigate pollutant accumulation.

Increases in greenhouse gas emissions (GHG), indicated by increased vehicle trips and vehicle miles traveled, are likely to result from congested roadways. The capacity improvements of Alternative 1 and 2 are likely to improve traffic flow and reduce delay and emissions. It is recommended that project level emissions are quantified to determine whether operation-related GHG emissions as a result of the project have a less than significant impact according to the Bay Area Air Quality Management District (BAAQM). The BAAQMD threshold is 4.6 metric tons of CO_2 per year.

4.8 Biological Environment

The proposed project is located adjacent to the Peninsula Watershed, which has been protected from urbanization due to its use for drinking water collection, storage, and water quality protection. The Peninsula Watershed (including Crystal Springs, San Andreas, and Pilarcitos Reservoirs) is also part of a State Fish and Game Refuge. The San Andreas Reservoir, at the north end of the Watershed, is visible from SR-35. Due to a long history of resource protection as well as diversity of climate, topography, geology, and soils, the Watershed is home to a variety of habitats and special-status species, including old growth Douglas fir forests, serpentine grasslands dominated by native bunchgrasses, coastal scrub and chaparral, streams, and wetlands, and supports a wide variety of plants and animals, including rare, threatened, and endangered species.

Figure 4. Potential dusky-footed woodrat nest location.

Although roadsides are typically highly disturbed habitats dominated by non-native invasive/weed species, the west side of SR-35 is contiguous with the largest remaining area of intact natural habitat on the San Francisco Peninsula. California red-legged frog (*Rana aurora*

draytonii) is a concern due to the project's connectivity with suitable habitat, historic populations and documented occurrences, as well as the frog's mobility and dispersal capability. No critical habitat has been designated at the north end of the Peninsula Watershed. While there is no critical habitat designated for the San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), encroachment into the Refuge would require additional consultation (possibly a formal Section 7 and Section 10) and potential monitoring by a qualified biologist during construction. A potential dusky-footed woodrat (*Neotoma fuscipes annectens)* nest was observed on the east side of SR-35 during the windshield survey. Multiple bat species are known to occur within the Peninsula Watershed.[23] Any potential roost sites (such as larger trees) should be noted so that surveys can confirm the absence of bat roosts/colonies prior to removal and or clearance. If the project will require work outside the existing paved ROW, additional surveys by a qualified biologist and/or botanist will be required to identify any protected resources (sensitive habitat or special-status species) that could be impacted.

If tree removals are required, the San Bruno General Plan Implementing Policy ERC-17 requires that removals take place outside breeding bird season (March through June), unless a tree survey is conducted to confirm that no active bird nests (protected under California Fish and Game Codes 3503, 3503.5, and 3511) are present. Trees or structures that have the potential to support bat roost or colonies including any identified in earlier habitat surveysshould be confirmed empty before removal or alteration.

Drainages and depressions on either side of SR-35 may qualify as waters of the state or wetlands/waters of the U.S. Standing water or saturated soils were not observed during the site survey; however the lack of wetlands should be confirmed by surveying vegetated areas on either side of SR-35 during the wet season. The lack of observed wetlands during the dry season of a drought year does not confirm absence of wetlands. If standing or saturated water or a high concentration of wetland-adapted plants is observed, a wetland delineation will be necessary if the area will be impacted by project construction. If it is determined that jurisdictional wetlands or waters of the US will be impacted by the proposed project, a Clean Water Act Section 404 permit and possibly mitigation and or compensation will be required, as well as Section 401 Water Quality Certification from the Regional Water Quality Control Board.

The following permits will not be required based on the current project description:

- CDFW 1602 Permit/Streambed Alteration Agreement (required for any project that would divert, obstruct, or change the natural flow or bed, channel or bank of any river, stream, or lake).
- California Coastal Commission Development Permit (outside oceanic coastal zone jurisdiction)
- SFBCDC permits (outside coastal zone within San Francisco Bay)

[23] San Francisco Planning Department. June 29, 2007. Final Program Environmental Impact Report on SFPUC Watershed Improvement Program. Water Supply and System Operations – Setting and Impacts. Section 5.5.6-8. http://www.sf-planning.org/Modules/ShowDocument.aspx?documentid=8044

5. Summary of Potential Environmental Constraints

Due to the sensitivity of biological, water, and recreational resources within the Peninsula Watershed, obtaining property or access rights on the west side of SR-35 from CDFW, SFPUC, and FHWA will be very challenging. Impacting these resources would likely result in extensive delays and significant additional costs for evaluation, coordination and approval. The limitations of impacting Section 4(f) resources may entirely preclude expanding SR-35 into a recreation area.

If work for either alternative will take place outside the existing paved ROW, surveys for sensitive habitats and special-status species will be required. Pre-construction surveys for nesting birds during breeding season as well as surveys for bat colonies will be required prior to removing trees. If significant ground disturbing activities will take place, a memorandum describing potential cultural resources will also be necessary.

Community resources, growth, noise and vibration, aesthetics, water quality, storm water, greenhouse gasses, air quality, hazardous materials, and geology will require a technical memorandum or reports explaining how the project will not result in significant impacts to these resources.

Although this is not a formal Preliminary Environmental Analysis Report, a list of technical studies, permits, and level of analysis that is expected for the proposed project is provided in **Appendix A**. Further refinement of project design and alternatives is required prior to determining the appropriate level of environmental documentation for CEQA or NEPA and confirming the required technical reports.

6. Disclaimer

This Preliminary Planning Study (PPS) Environmental Memorandum provides information to support programming of the proposed project. It is not an environmental determination or document. The guidance and information provided in the PPS is generalized based on a very general project description, common design components of road widening projects, typical construction activities, general site features, and a cursory analysis of probable effects. Further analysis will be required to conclusively determine the extent and degree of environmental impacts. Additional documentation will be required to satisfy CEQA and/or NEPA, as well as resource agencies, state, local, and federal government agencies; and other environmental laws, regulations, and policies.

7. List of Preparers

Kristen Johnson, HNTB
Rosanna McGuire, HNTB

ATTACHMENT A

Attachment A: Environmental Studies Checklist

Rev. 11/08

	Not anticipated	Memo to file	Report required	Risk* L M H	Comments
Land Use	☐	☒	☐	**L**	
Growth	☐	☒	☐	**L**	
Farmlands/Timberlands	☒	☐	☐	**L**	
Community Impacts	☐	☒	☐	**L**	
Community Character and Cohesion	☒	☐	☐	**L**	
Relocations	☒	☐	☐	**L**	
Environmental Justice	☒	☐	☐	**L**	
Utilities/Emergency Services	☐	☒	☐	**L**	
Visual/Aesthetics	☐	☒	☐	**L**	
Cultural Resources:	☐	☒	☐	**L**	If grading/excavation required, confirm with records search that no known archaeological sites are present/potentially impacted by project.
Archaeological Survey Report	☒	☐	☐	**L**	
Historic Resources Evaluation Report	☒	☐	☐	**L**	
Historic Property Survey Report	☒	☐	☐	**L**	
Historic Resource Compliance Report	☒	☐	☐	**L**	
Section 106 / PRC 5024 & 5024.5	☒	☐	☐	**L**	
Native American Coordination	☒	☐	☐	**L**	
Finding of Effect	☒	☐	☐	**L**	
Data Recovery Plan	☒	☐	☐	**L**	
Memorandum of Agreement	☒	☐	☐	**L**	
Other:	☒	☐	☐	**L**	
Hydrology and Floodplain	☐	☒	☐	**L**	
Water Quality and Storm water Runoff	☐	☐	☒	**M**	
Geology, Soils, Seismic and Topography	☐	☐	☒	**M**	
Paleontology	☒	☐	☐	**L**	
PER	☒	☐	☐	**L**	
PMP	☒	☐	☐	**L**	
Hazardous Waste/Materials:	☐	☒	☐	**M**	
ISA (Additional)	☐	☒	☐	**M**	
PSI	☒	☐	☐	**L**	
Other:	☒	☐	☐	**L**	

STATE ROUTE 35 WIDENING (1-280 TO SNEATH LANE)
PRELIMINARY PLANNING STUDY ENVIRONMENTAL MEMO

	Not anticipated	Memo to file	Report required	Risk* L M H	Comments
Air Quality	☐	☒	☐	L	
Noise and Vibration	☐	☒	☐	L	
Energy and Climate Change	☒	☐	☐	L	
Biological Environment	☐	☒	☐	M	
Natural Environment Study	☐	☒	☐	M	
Section 7:	☐	☒	☐	L	
Formal	☒	☐	☐	L	
Informal	☐	☒	☐	L	
No effect	☒	☐	☐	L	
Section 10	☒	☐	☐	L	
USFWS Consultation	☒	☐	☐	L	
NMFS Consultation	☒	☐	☐	L	
Species of Concern (CNPS, USFS, BLM, S, F)	☐	☒	☐	L	
Wetlands & Other Waters/Delineation	☐	☒	☐	M	
404(b)(1) Alternatives Analysis	☒	☐	☐	L	
Invasive Species	☐	☒	☐	M	
Wild & Scenic River Consistency	☒	☐	☐	L	
Coastal Management Plan	☒	☐	☐	L	
HMMP	☒	☐	☐	L	
DFG Consistency Determination	☒	☐	☐	L	
2081	☒	☐	☐	L	
Other:	☒	☐	☐	L	
Cumulative Impacts	☒	☐	☐	L	
Context Sensitive Solutions	☒	☐	☐	L	
Section 4(f) Evaluation	☐	☐	☒	H	Documentation will be required showing how temporary and permanent impacts to Section 4(f) resources will be avoided.
Permits:					
401 Certification Coordination	☒	☐	☐	L	
404 Permit Coordination, IP, NWP, or LOP	☒	☐	☐	L	
1602 Agreement Coordination	☒	☐	☐	L	
Local Coastal Development Permit Coordination	☒	☐	☐	L	
State Coastal Development Permit Coordination	☒	☐	☐	L	
NPDES Coordination	☐	☐	☒	L	
US Coast Guard (Section 10)	☒	☐	☐	L	
TRPA	☒	☐	☐	L	

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BCDC	☒	☐	☐	L	