

04 - SCL - 152 - PM 11.9
201.010 (SHOPP)
EA 04-0000 -1989K (0G720K)
September 2011

PROJECT STUDY REPORT

To

Request for Programming in the 2012 SHOPP

On Route SCL-152 in Santa Clara County

At Intersection of Frazier Lake Road and SCL-152

APPROVAL RECOMMENDED:



FARIBA ZHOOURY, PROJECT MANAGER

APPROVED:

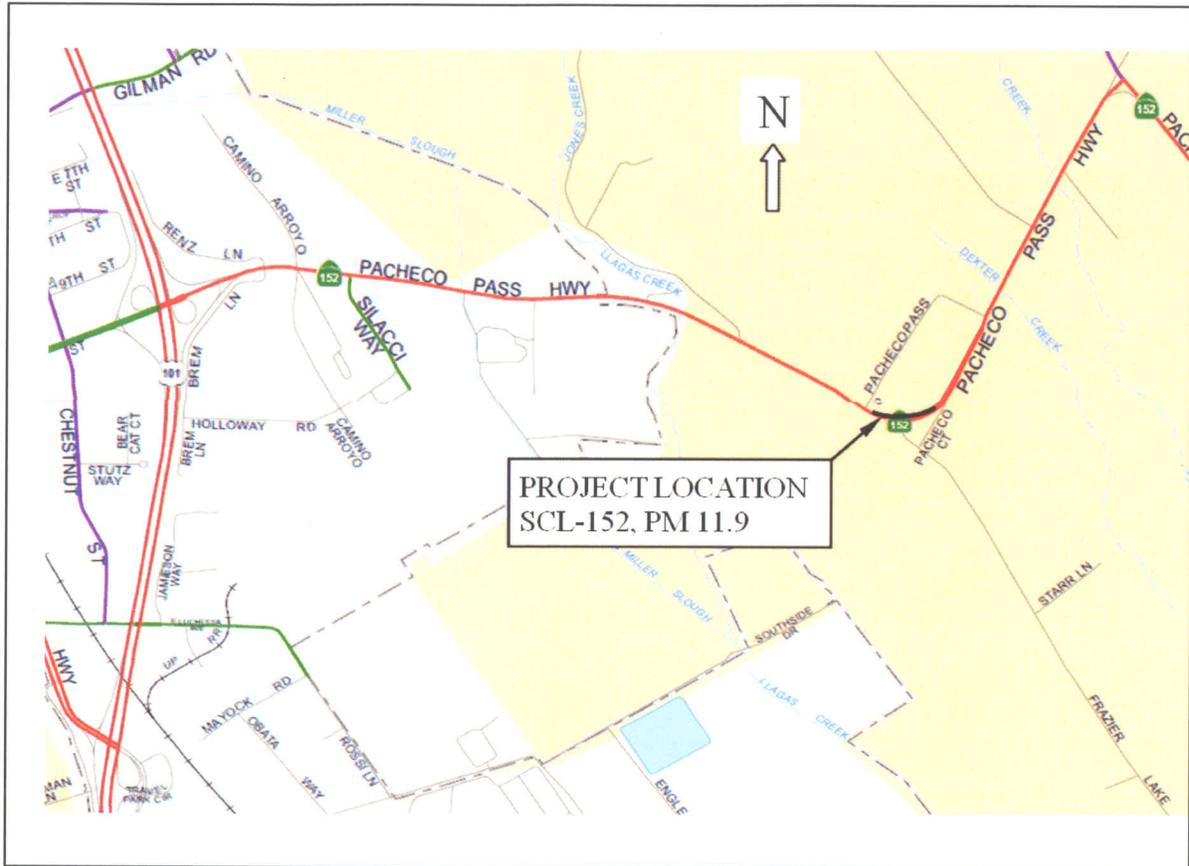


BIJAN SARTIPI, DISTRICT DIRECTOR

10-3-11

DATE

04 - SCL - 152 - PM 11.9
201.010 (SHOPP)
EA 04-0000 -1989K (0G720K)
September 2011



On Route SCL-152

At Intersection of Frazier Lake Road and SCL-152

04 - SCL - 152 – PM 11.9
EA 04-0000 -1989K (0G720K)

This Project Study Report has been prepared under the direction of the following Registered Engineer. The registered civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Richie P. Perez

RICHIE P. PEREZ - REGISTERED CIVIL ENGINEER

9/15/11

DATE



Reviewed By:

Patrick K. Pang

PATRICK K. PANG, OFFICE CHIEF
OFFICE OF ADVANCE PLANNING

9/15/11

DATE

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1. INTRODUCTION

This project proposes to install traffic signals and construct an eastbound right-turn lane at the Route 152/Frazier Lake Road intersection, in the City of Gilroy, in Santa Clara County. Traffic Signal Warrants 1 and 7 are satisfied at this location.

See the Cost Estimate for specific work items included in this project.

Project Limits (Dist., Co., Rte., PM)	04-SCL-152-PM 11.9
Number of Alternatives:	3
Alternative Recommended for Programming:	Alternative 2 Install new traffic signals and construct right turn lane without retaining wall.
Proposed Capital Construction Costs (Current Year):	\$2,600,000
Proposal Capital Right of Way Costs (Current Year):	\$119,000
Funding Source:	SHOPP
Type of Facility (conventional, expressway, freeway):	Conventional
Number of Structures:	None
Anticipated Environmental Determination/Document	CEQA-Initial Study/Negative Declaration NEPA-Routine Environmental Assessment with a Finding of No Significant Impact
Legal Description	Upgrade Intersection and Install Signal
Project Category	5

2. BACKGROUND

Route 152 serves as an important interregional, recreational, commercial, agricultural, and commuter east-west route linking the San Joaquin and Santa Clara Valleys and connecting Route 101 with Interstate 5. At the Frazier Lake Road intersection, Route 152 is a two-lane, undivided, highway set within a rural landscape featuring a horizontal curved alignment. The existing facility consists of one 12-ft lane in each direction of traffic, separated by a centerline, a left-turn lane in the westbound direction, and outside paved shoulders ranging from 1 to 4-feet in width.

Frazier Lake Road is a two-lane arterial, running north-south, that intersects Route 152 at postmile 11.9; approximately 3 miles east of Route 101. At the

Route 152 intersection, Frazier Lake Road features two 12-foot lanes, outside paved shoulders that vary between 3 and 4 feet in width, and a speed limit of 25 miles per hour.

3. PURPOSE AND NEED STATEMENT

Need:

An investigation revealed that accident rates higher than the statewide average for similar facilities are occurring within the Route 152/Frazier Lake Road intersection and that driver confusion was an associated factor in a majority of the accidents that occurred.

Purpose:

The purpose of this project is to reduce the number and severity of accidents within the Route 152/Frazier Lake Road intersection. By alleviating driver confusion through the installation of a traffic signal, to regulate the movement of vehicles, and constructing an eastbound right-turn lane, this project will accomplish its purpose.

4. DEFICIENCIES

Traffic and Accident Data

The 2009 average annual daily traffic (AADT) on Route 152, within the project limits, is 25,000 vehicles. This demand is expected to increase to a projected value of 45,000 vehicles by the year 2029.

For the seven-year study period between February 1, 2003, and January 31, 2010, the accident rates per million vehicles, and accident types within the Route 152/Frazier Lake Road intersection are as follows:

<u>ACTUAL</u>			<u>AVERAGE</u>		
<u>F</u>	<u>F+I</u>	<u>Total</u>	<u>F</u>	<u>F+I</u>	<u>Total</u>
.016	0.36	0.85	.003	0.08	0.20

<u>TYPE OF COLLISION</u>	<u>NUMBER</u>
Broadside	40
Sideswipe	4
Overturn	3
Head-On	2
Rear-End	1
Hit Object	1
Other/Not Stated	1
Total	52

An investigation of the 52 accidents that occurred within the study period revealed that 1 involved a fatality and 21 involved injuries. In addition, failing to yield, speeding, improper turns, the influence of alcohol, and other violations not specified in the traffic collision reports were found to be factors associated with these accidents. A more comprehensive study determined that 77% of the accidents that occurred within the study period involved a broadside collision where motorist confusion with the intersection controls was an associated factor. Furthermore, motorist confusion was also found to be a factor associated with many of the other accidents that occurred within the study period. As constructing an eastbound right-turn only lane and signaling the Route 152/Frazier Lake Road intersection will minimize driver confusion by regulating the movement of vehicles through this intersection, this project will reduce the number and severity of accidents in the future.

5. CORRIDOR AND SYSTEM COORDINATION

5.A Identify Systems

Route 152 within Santa Clara County is functionally classified as a rural principal arterial and designated as a Federal Aid Primary Route. The Department has designated Route 152, between Route 101 and Route 99, in Madeira County as a “Focus Route”; a designated interregional route for improvement to minimum facility standards. “Focus Route” designations are included in the Department’s Interregional Strategic Plan “to assure that a statewide system is in place and complete for higher interregional trip movements.”

5.B State Planning

The following projects on Route 152 are programmed in the STIP:

- Construct passing lanes between Bloomfield Avenue and Old Lake Road. PM R14.9/R16.2 (EA. 174921)

- Construct a Truck Climbing Lane. PM R19.6/21.2 (EA. 174931) (completed in 2008)
- Construct flyover and improvements at SR152/SR156 I/C. PM R 21.977 (EA 0A830K) (completed in 2009)

The following projects on Route 152 are programmed in the SHOPP:

- Widen to increase lane widths, shoulder widths, and sight distance at four spot locations, and construct a left-turn lane at the Watsonville Road intersection. PM 0.0/5.2 (EA 2A2500)
- Realign and signalize the Ferguson Road intersection. PM 12.81 (EA 2A2601)
- Widen to increase shoulder widths and reconstruct an existing ditch to make it traversable. PM 13.8/14.8 (EA 1G870K)
- Construct a left-turn lane at Prunedale Avenue. PM 14.391 (EA. 2A0501).
- Shoulder Widening between Old Lake Road and Dunes Lane plus Left Turn Lane at Lovers Lane. Overlay with open graded asphalt concrete, at one spot location, and widen to realign the highway, increase lane widths, shoulder widths, and sight distance, at another spot location. PM 16.2/19.5 (EA 2A4400)
- Construct a left-turn lane at Dunne Lane/San Felipe Road. PM R19.762 (EA.3A4001)
- Intersection Improvement at Ferguson Road, PM 12.81 (EA 2A2600).

5.C Regional Planning

The Metropolitan Transportation Commission drafted a plan Draft T-2030 Regional Transportation Plan (RTP) which shows a variety of programmed and planned projects within the Silicon Valley corridor. Programmed projects on Route 152 include: the widening of Route 152 from two lanes to four lanes from Miller Slough to Holsclaw Road (includes widening existing structures over Llagas Creek and old Llagas Creek, and installing a new traffic signal at the Gilroy Food/WTI Trucking entrance), upgrading this portion of Route 152 to a “limited access four-lane freeway” classification, reconstructing the Route 152/156 interchange (completed in 2009), and implementing safety improvements from Uvas Creek to Route 156, near the City of Gilroy.

The California High-Speed Rail Commission has specified a corridor preference for high-speed rail service between the San Jose and Merced through the SR 152 corridor via Pacheco Pass. High-Speed Rail has an alternative alignment that may possibly cross this intersection at grade, and the existing road to be grade separated.

This project does not have any adverse effects upon any regional, state planning and systems for Route 152.

6. ALTERNATIVES

Two “Build” alternatives and the No-build alternative are considered in this PSR. Geometric layouts and typical cross sections for the project alternatives are shown in Attachment B.

Alternative 1 –Install a new traffic signal and construct a right-turn ~~only~~ lane by widening to the north (acquisition of right of way) and to the south (building a retaining wall).

This proposed alternative would include installing traffic signals and poles at the intersection, widening the shoulders to a standard 8-foot width, and constructing an eastbound right-turn lane.

Alternative 2 (Preferred Alternative) –Install a new traffic signal and construct a right-turn lane, without building a retaining wall, by widening exclusively to the north (acquisition of right of way).

This proposed alternative would include installing traffic signals and poles at the intersection, widening the shoulders to a standard 8-foot width, constructing an eastbound right-turn lane, and realigning the highway.

Alternative 3 –No Build

As it would fail to address accident at the Route 152/Frazier Lake Road intersection, the no-build alternative was rejected.

Preferred Alternative

As it proposes a more cost effective strategy for installing a traffic signal and constructing an eastbound right-turn lane at the Route 152/Frazier Lake Road intersection, Alternative 2 is the preferred alternative. The preferred alternative will require the acquisition of right of way, utility relocation, restriping, and the replacement of a storm drain which crosses both Route 152 and Frazier Lake Road. The highway features proposed in the preferred alternative meet current design standards.

7. COMMUNITY INVOLVEMENT

This project will not have significant community impacts. This will be verified during the PA & ED phase.

8. CONSIDERATIONS REQUIRING DISCUSSION

8.1 Environmental

An environmental evaluation for this project will be prepared to satisfy the requirements of the California Environmental Quality Act (CEQA), and, if applicable, the National Environmental Policy Act (NEPA). An Initial Study/Negative Declaration is anticipated for this project under CEQA, and a Categorical Exclusion is anticipated under NEPA. A Preliminary Environmental Analysis Report (PEAR) is included as Attachment D.

8.2 Right of Way

General – A right of way data sheet has been prepared based on scope of work described and on maps provided by Design. Estimated cost information is contained in the Right of Way Data sheet in attachment “E” of this project.

Railroad – There is no railroad involvement on this project.

Utilities – Verifications of utilities will be required. The need for potholing will be determined once the verification process is complete.

9. FUNDING

The construction cost, including provisions for Treatment, Design Pollution Prevention, Construction Site BMPs, the acquisition of right of way, and the State’s share for utility relocation for the preferred alternative (Alternative 2) is \$2,600,000 which corresponds with a Safety Index of 277. Funding for this project will be from the SHOPP Safety Improvement Program (program code 201.010) for the 2014/15 fiscal year. The preliminary project cost estimate summary is included as Attachment C of this report.

9A. CAPITAL COST

Capital Cost Estimate for the Preferred Alternative (Alternative 2) for Programming in the 2012 SHOPP

Fiscal Year	Right of Way Capital	Construction Capital
FY11/12		\$2,600,000
FY12/13		\$2,730,000
FY13/14		\$2,870,000
FY14/15		\$3,020,000
FY15/16	\$119,000	\$3,180,000
FY16/17		\$3,340,000

9B. CAPITAL SUPPORT ESTIMATE FOR THE PROGRAMMABLE ALTERNATIVE IN THE 2012 SHOPP

	PROJECT SUPPORT COMPONENTS								Total
	PA&ED 0 Phase		Design 1 Phase		Right of Way 2 Phase		Construction 3 Phase		
	Dist	DES	Dist	DES	Dist	DES	Dist	DES	
Estimated PY's	2.6	0.0	2.4	0.0	0.8	0.0	1.5	0.0	7.3
Estimated PS \$'s	468	0	432	0	144	0	270	0	1314
Estimated PYE \$'s (\$1000's)									
Total \$'s	468	0	432	0	144	0	270	0	1314

The capital support cost is 50.5% of the construction costs. This is based on input from functional units and historical data from projects with similar magnitude in the area.

10. SCHEDULE

HQ Milestones	Delivery Date (Month, Year)
Begin Environmental	02/2012
Notice of Intent (NOI)	07/2013
Circulate DED	10/2013
PA&ED	02/2014
Regular Right of Way	06/2014
Project PS&E	09/2015
Right of Way Certification	01/2016
Ready to List	02/2016
Approve Contract	06/2016
Contract Acceptance	07/2017
End Project	06/2018

11. FHWA COORDINATION

Under the current FHWA/Caltrans Stewardship agreements, this project falls within the delegated authority of the State of California. Since Route 152 is not an interstate highway, there is no federal funding or any required approval and, therefore, no further FHWA involvement is necessary.

12. PROJECT REVIEWS

Field Review	<u>Richie P. Perez</u>	Date	<u>9/1/2011</u>
District Maintenance	<u>Nader Eshghipour</u>	Date	<u>9/1/2011</u>
District Safety Review	<u>Ramiel Gutierrez</u>	Date	<u>9/1/2011</u>
Constructability Review	<u>Allan Dadafarin</u>	Date	<u>9/1/2011</u>
HQ Design Coordinator	<u>Mike Thomas/Larry Moore</u>	Date	<u>9/1/2011</u>
Project Manager	<u>Fariba Zohoury</u>	Date	<u>9/1/2011</u>
District SHOPP Program Advisor	<u>Roland Au-Yeung</u>	Date	<u>9/1/2011</u>
HQ SHOPP Program Advisor	<u>Janice Benton</u>	Date	<u>9/1/2011</u>

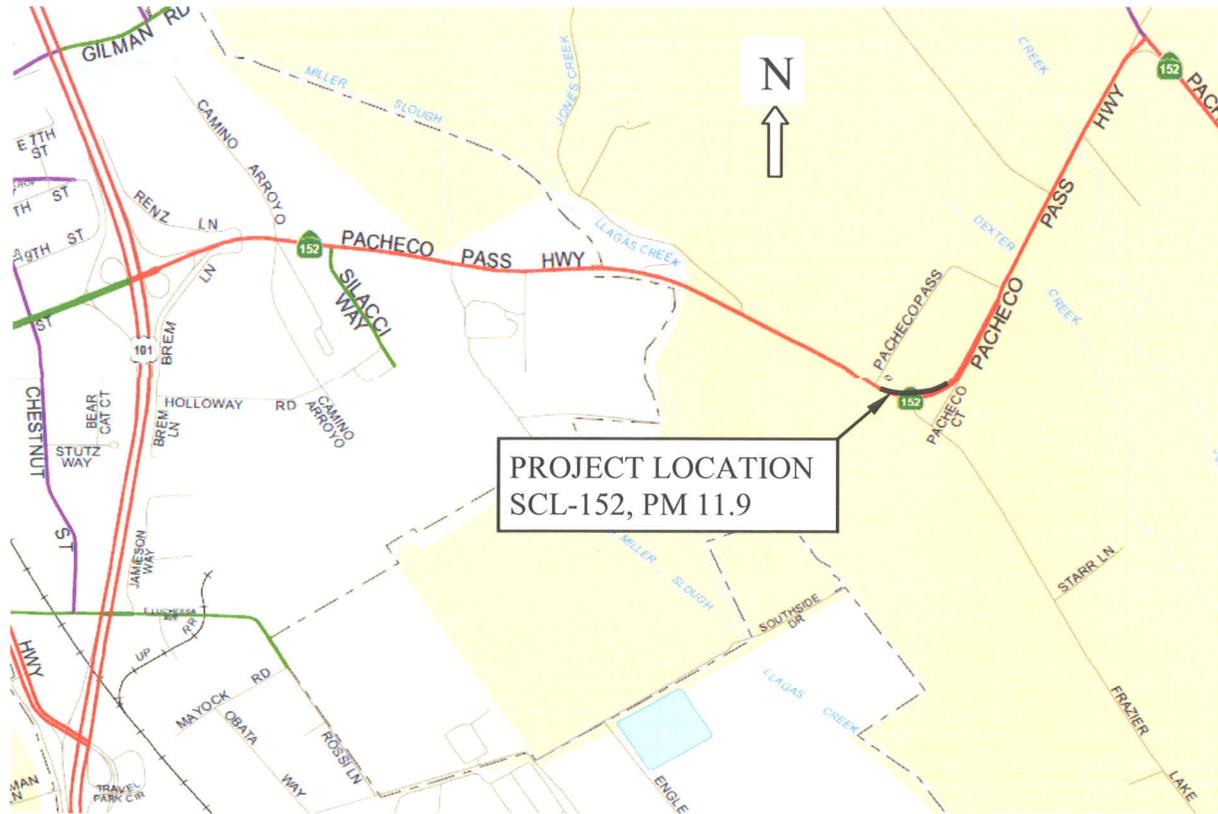
13. LIST OF ATTACHMENTS

- A. Project Location Map
- B. Conceptual Improvement Layout & Typical Cross Section
- C. Preliminary Project Cost Estimate Summary
- D. Preliminary Environmental Analysis Report (PEAR)
- E. Right of Way Data Sheet
- F. Storm Water Data Report-Signed Front Page
- G. Traffic Management Plan Data Sheet
- H. Traffic Data Set
- I. Preliminary Geotechnical Report
- J. Risk Management Plan
- K. Life Cycle Cost Analysis

ATTACHMENT A

Project Location Map

Location Map



ATTACHMENT B

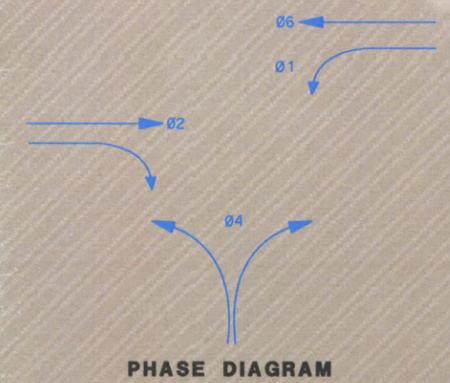
Conceptual Improvement Layout & Typical Cross Section

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	152	11.8/12.1	1	2

REGISTERED CIVIL ENGINEER DATE _____
 PLANS APPROVAL DATE _____
 THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.



STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans



- LEGEND:**
- PROPOSED WIDENING
 - EXISTING
 - RETAINING WALL
 - R/W ACQUISITION 22,000 SQ.FT.

LAYOUT
ALTERNATIVE 1
UPGRADE INTERSECTION AND
INSTALL TRAFFIC SIGNAL

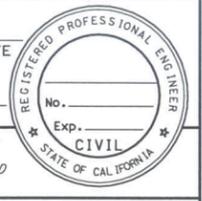
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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	152	11.8/12.1	1	2

REGISTERED CIVIL ENGINEER DATE _____

PLANS APPROVAL DATE _____

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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

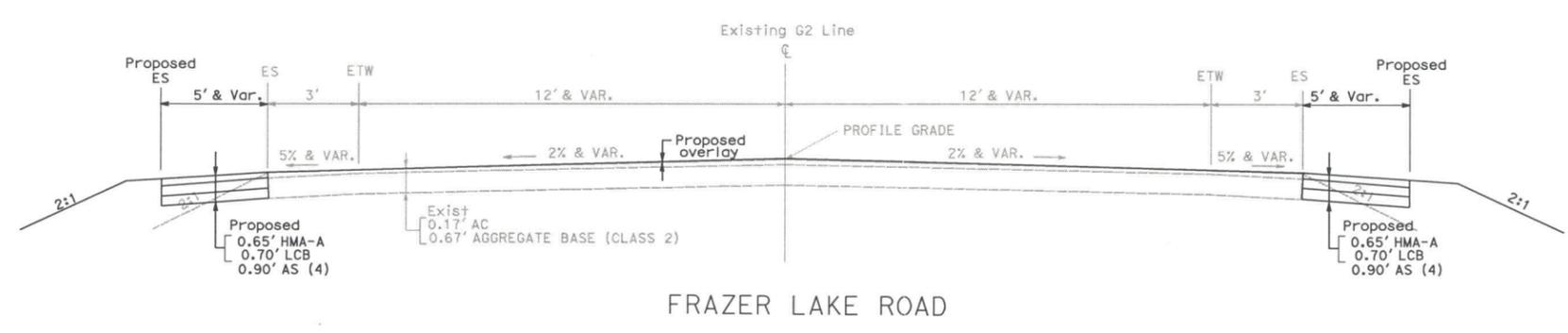
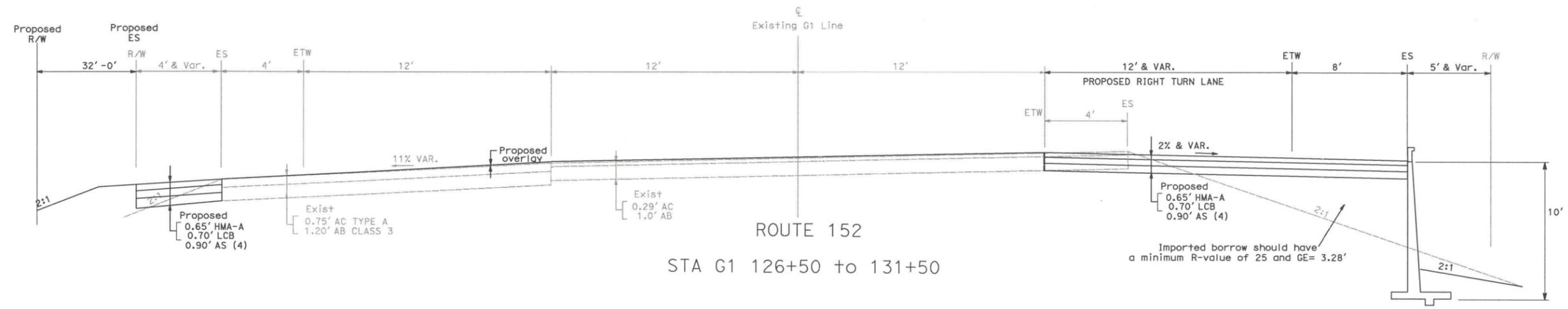
FUNCTIONAL SUPERVISOR

CHECKED BY

DESIGNED BY

REVISOR BY

DATE REVISOR



NOTES:
 -0.15' overlay on existing pavement surface should be placed in conjunction with the final lift for adjoining new widening pavement.
 -Dig out repair will be needed dig out should be performed to the base of existing AC layer or to a maximum of 0.5' from the existing surface and replaced with the same thickness of HMA-A.

ALTERNATIVE 1
TYPICAL CROSS SECTIONS
 NO SCALE

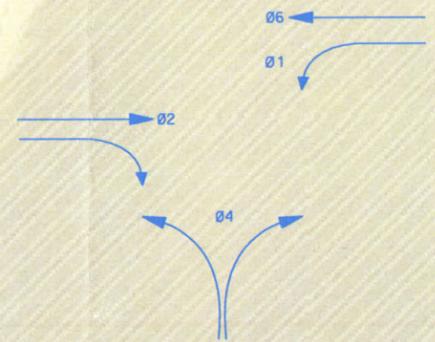
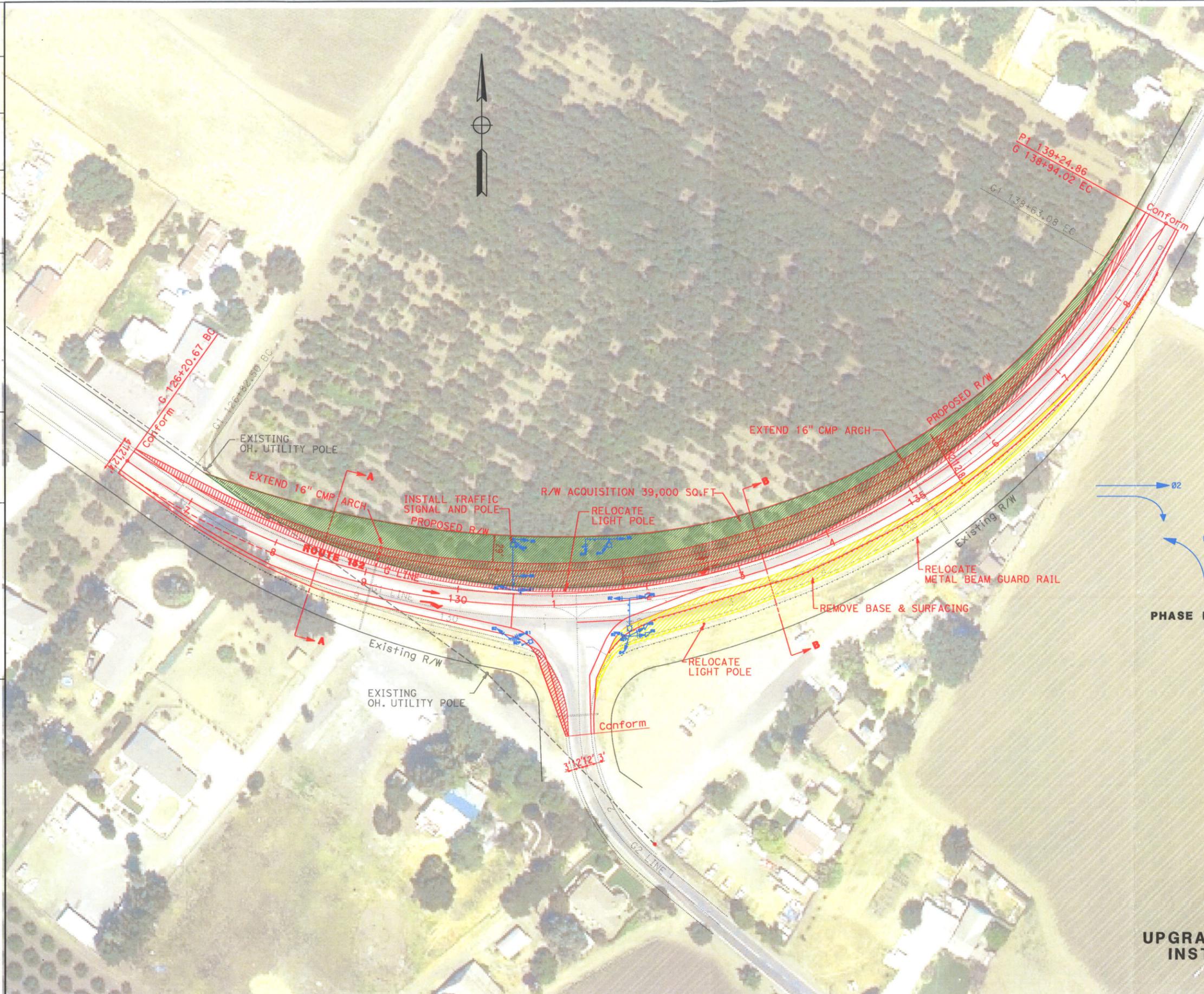
LAST REVISION DATE PLOTTED => 03-AUG-2011
 00-00-00 TIME PLOTTED => 10:07

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	152	11.8/12.1	1	2

REGISTERED CIVIL ENGINEER DATE _____
 PLANS APPROVAL DATE _____
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STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
 FUNCTIONAL SUPERVISOR _____
 CALCULATED-DESIGNED BY _____
 CHECKED BY _____
 REVISED BY _____
 DATE REVISED _____



PHASE DIAGRAM

LEGEND:

- PROPOSED WIDENING
- EXISTING
- R/W ACQUISITION 39,000 SQ.FT.
- REMOVE BASE & SURFACING

LAYOUT
ALTERNATIVE 2
UPGRADE INTERSECTION AND
INSTALL TRAFFIC SIGNAL

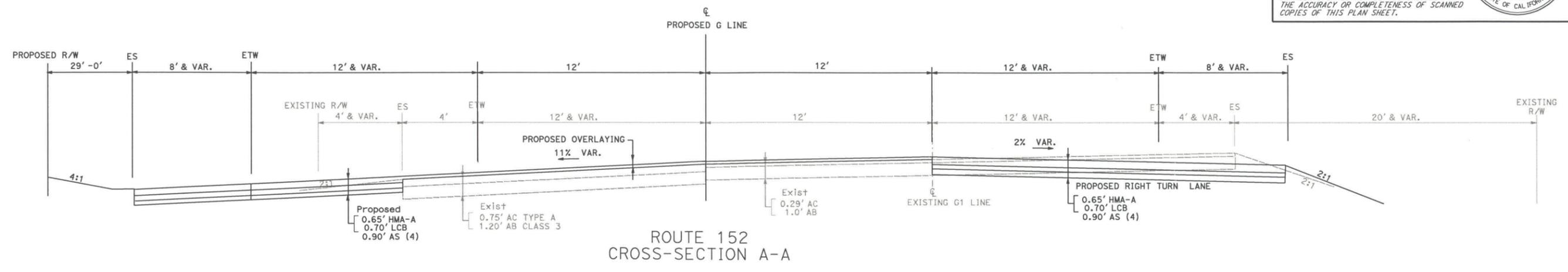
Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	SCL	152	11.8/12.1	1	2

REGISTERED CIVIL ENGINEER	DATE
PLANS APPROVAL DATE	

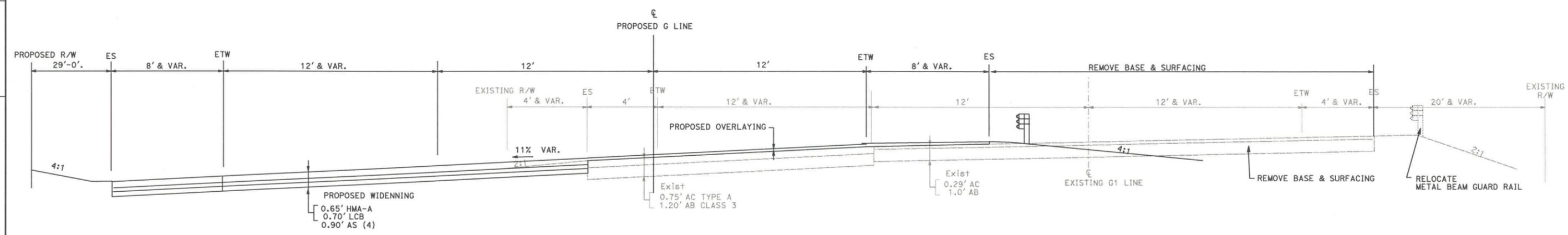
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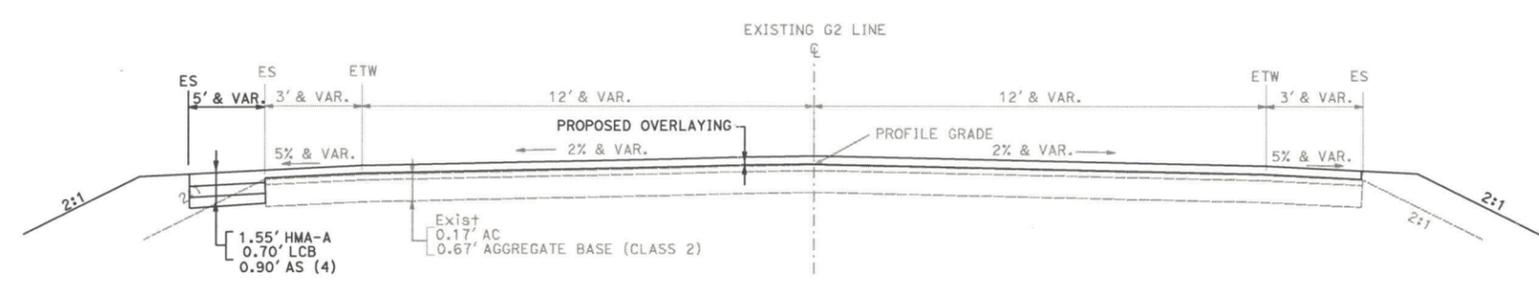
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans
 FUNCTIONAL SUPERVISOR
 CALCULATED-DESIGNED BY
 CHECKED BY
 REVISED BY
 DATE REVISED



ROUTE 152
CROSS-SECTION A-A



ROUTE 152
CROSS-SECTION B-B



FRAZER LAKE ROAD

NOTES:
 -0.15' overlay on existing pavement surface should be placed in conjunction with the final lift for adjoining new widening pavement.
 -Dig out repair will be needed dig out should be performed to the base of existing AC layer or to a maximum of 0.5' from the existing surface and replaced with the same thickness of HMA-A.

ALTERNATIVE 2
TYPICAL CROSS SECTIONS
 NO SCALE

LAST REVISION DATE PLOTTED => 22-SEP-2011
 00-00-00 TIME PLOTTED => 16:30

ATTACHMENT C

Preliminary Project Cost Estimate Summary

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

District-County-Route	04-SCL-152
PM	11.9
EA	04-0G720K
Project ID	0400001989 K
Program Code	SHOPP 201.010

PROJECT DESCRIPTION:

Limits On Rte 152 in Santa Clara County at Frazier Lake road intersection, PM 11.9

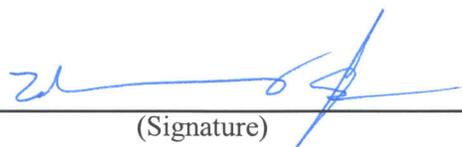
Proposed Improvement (Scope) Upgrade intersection and install traffic signals

Alternate Alternative 2

SUMMARY OF PROJECT COST ESTIMATE

TOTAL ROADWAY ITEMS	\$	2,600,000
TOTAL STRUCTURE ITEMS	\$	_____
SUBTOTAL CONSTRUCTION COSTS	\$	2,600,000
TOTAL RIGHT OF WAY ITEMS	\$	119,000
TOTAL PROJECT CAPITAL OUTLAY COSTS	\$	2,719,000

Reviewed by District Program Manager  (Signature)

Approved by Project Manager  (Signature) Date 9/7/11

Phone No. (510) 286-7239

District-County-Route	<u>04-SCL-152</u>
PM	<u>11.9</u>
EA	<u>04-0G720K</u>
Project ID	<u>0400001989 K</u>

Section 6 Planting and Irrigation

	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Item Cost</u>	<u>Section Cost</u>
Highway Planting			\$	\$	
Replacement Planting	<u>1</u>	<u>LS</u>	\$ <u>4,000</u>	\$ <u>4,000</u>	
Irrigation Modification			\$	\$	
Relocate Existing Irrigation			\$	\$	
Irrigation Crossovers			\$	\$	
Subtotal Planting and Irrigation Section					\$ <u>4,000</u>

Section 7: Roadside Management and Safety Section

	<u>Quantity</u>	<u>Unit</u>	<u>Unit Price</u>	<u>Item Cost</u>	<u>Section Cost</u>
Vegetation Control Treatments	<u>578</u>	<u>SQFT</u>	\$ <u>8</u>	\$ <u>4,624</u>	
Gore Area Pavement			\$	\$	
Pavement beyond the gore area			\$	\$	
Miscellaneous Paving			\$	\$	
Erosion Control	<u>1</u>	<u>LS</u>	\$ <u>24000</u>	\$ <u>24,000</u>	
Slope Protection			\$	\$	
Side Slopes/Embankment Slopes			\$	\$	
Maintenance Vehicle Pull outs			\$	\$	
Off-freeway Access (gates, stairways, etc.)			\$	\$	
Roadside Facilities (Vista Relocating roadside			\$	\$	
Subtotal Roadside Management and Safety Section					\$ <u>28,624</u>

TOTAL SECTIONS: 1 thru 7 \$ 1,629,912

District-County-Route	<u>04-SCL-152</u>
PM	<u>11.9</u>
EA	<u>04-0G720K</u>
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II. STRUCTURES ITEMS

	Structure (1)	Structure (2)	Structure (3)	
Bridge Name	_____	_____	_____	
Structure Type	_____	_____	_____	
Width (out to out) - (ft)	_____	_____	_____	
Span Lengths - (ft)	_____	_____	_____	
Total Area - (ft2)	_____	_____	_____	
Footing Type (pile/spread)	_____	_____	_____	
Cost Per ft2				
(incl. 10% mobilization and 25% contingency)	_____	_____	_____	
Total Cost for Structure	_____	_____	_____	
				SUBTOTAL STRUCTURES ITEMS
				(Sum of Total Cost for Structures) \$ _____
Railroad Related Costs:	_____	_____	_____	
	_____	_____	_____	
	_____	_____	_____	
				SUBTOTAL RAILROAD ITEMS \$ _____
				TOTAL STRUCTURES ITEMS \$ _____
				(Sum of Structures Items plus Railroad Items)

COMMENTS: _____

Estimate Prepared By _____ Phone # _____ Date _____
 (Print Name)

NOTE: If appropriate, attach additional pages and backup.

District-County-Route	<u>04-SCL-152</u>
PM	<u>11.9</u>
EA	<u>04-0G720K</u>
Project ID	<u>0400001989 K</u>

III. RIGHT OF WAY ITEMS

ESCALATED VALUE

A. Acquisition, including excess lands, damages to remainder(s) and Goodwill	\$ <u>111,000</u>
Project Permit Fees	\$ _____
Grantor's Appraisal Cost	\$ _____
B. Utility Relocation (State share)	\$ <u>5,000</u>
C. Relocation Assistance	\$ _____
D. Clearance/Demolition	\$ _____
E. Title and Escrow Fees	\$ <u>2,500</u>

TOTAL RIGHT OF WAY ITEMS \$ 118,500
(Escalated Value)

Anticipated Date of Right of Way Certification Jan-15
(Date to which Values are Escalated)

F. Construction Contract Work

Brief Description of Work: _____

Right of Way Branch Cost Estimate for Work * \$ _____

* This dollar amount is to be included in the Roadway and/or Structures Items of Work, as appropriate.

COMMENTS: _____

Estimate Prepared By Renata Frey Phone # (510) 286-5393 Date 11/4/2010
(Print Name)

NOTE: If appropriate, attach additional pages and backup.

ATTACHMENT D

Preliminary Environmental Analysis Report (PEAR)



Preliminary Environmental Analysis Report

Project Information

District 4	Santa Clara County	State Route 152	PM 11.9	EA 0G720K
Project Title	State Route 152 @ Frazier Lake Road Signalization			
Project Manager	Fariba Zohoury	Phone Number	510.286.7239	
Project Engineer	Richie Perez	Phone Number	510.286.1740	
Environmental Manager	Howell Chan	Phone Number	510.286.5623	
PEAR Prepared by	Patricia Maurice	Phone Number	510.286.5563	

Project Description

Purpose and Need:

The purpose of the project is to reduce the number and severity of collisions at the State Route (SR) 152 intersection at Frazier Lake Road in Santa Clara County. Improvements will better regulate the movement of vehicles through the intersection, which is expected to reduce driver confusion.

Description of Work:

Intersection improvements include signalization, adding a right-turn lane and roadway widening for approximately 0.25 miles along SR 152 at Frazier Lake Road in Santa Clara County. Both alternatives include relocating two light poles, removal of oak and fruit trees under commercial cultivation, right of way (R/W) acquisition and upgrading three storm drain systems. Pavement grinding will be done to repair existing distressed sections. Equipment staging will likely occur within both existing and newly acquired R/W. A Traffic Management Plan will be implemented during construction.

Alternatives:

In addition, Alternative 1 includes relocating existing metal beam guardrail, constructing a 600-foot long, ten-foot high retaining wall and acquiring 22,000 square feet (SF) (0.51 acres) of new R/W. Alternative 2 includes acquiring 39,000 SF (0.90 acres) of new R/W.

Anticipated Environmental Approval

CEQA

- Categorical Exemption
 Initial Study/Negative Declaration

 Environmental Impact Report

NEPA

- Categorical Exclusion
 Routine Environmental Assessment with a Finding of No Significant Impact*
 Complex Environmental Assessment with a Finding of No Significant Impact*
 Environmental Impact Statement

Lead Agency	The California Department of Transportation (Department) is the CEQA Lead Agency for this project. If there is federal participation in the project, the Department will be the NEPA Lead Agency.
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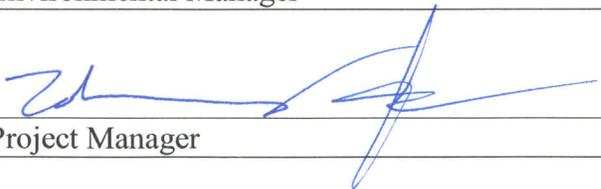
Estimated time to obtain environmental approval	12 to 24 months after receiving information necessary to begin study per Felker memo
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Estimated person hours to complete environmental document	Env Analysis	580
	Biology/Permits	640
	Cultural	700
	Hazardous Waste	50
	Air and Noise	250
	Water Quality	300
	Landscape	200
	Prog/Prog Mgt.	50
	Total (1.6 PYs)	2,770 Hours

Disclaimer

This Preliminary Environmental Analysis Report (PEAR) provides information to support programming of the proposed project. It is not an environmental document for environmental approval. Preliminary analyses, determinations, and mitigation cost estimates are based on the scope of the project as described in this Project Study Report. The estimates and conclusions in this PEAR are approximate and based on cursory analyses of probable effects. A re-evaluation of the PEAR will be needed for changes in scope, alternatives, or environmental regulations.

Reviewed by

	
Environmental Manager	Date
	
Project Manager	Date

*Environmental Document with an EA or higher will require a Class of Action (COA) Concurrence from the District Headquarters Liaison.

Environmental Technical Reports or Studies Required

	Study or Report*	Document Text Only*	Not Anticipated*
Community Impact Study	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Farmland	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Section 4(f) Evaluation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Visual Resources	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Water Quality	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Floodplain Evaluation	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Noise Study	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Air Quality Study	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Paleontology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wild and Scenic River Consistency	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Cumulative Impacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Growth Inducing/Indirect Impacts	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Cultural			
Archaeological Survey Report (ASR)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historic Resources Evaluation Report (HRER)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historic Property Survey Report (HPSR)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Historical Resource Compliance Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
SHPO / PRC 5024.5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Native American Coordination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other Finding of Effect:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Data Recovery Plan:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Memorandum of Agreement*	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(*if Federal Permit is required)			
Hazardous Waste			
ISA (Additional)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PSI	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Biological			
Endangered Species (Federal)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Endangered Species (State)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Species of Concern (CNPS, USFS, BLM, S, F)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Biological Opinion/Assessment (USFWS, NMFS, State)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Fish Passage Barriers Assessment	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Wetlands	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Invasive Species	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Natural Environment Study	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
NEPA 404 Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Migratory Bird Treaty Act	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (Incidental Take Permit for CTS)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Permits

	Study or Report*	Document Text Only*	Not Anticipated*
401 Permit Coordination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
404 Permit Coordination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
1602 Permit Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
City/County Coastal Permit Coordination/Bay Conservation and Development Commission	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
State Coastal Permit Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
NPDES Permit (402) Coordination	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
US Coast Guard (Section 9)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

*Study – requires thorough analysis including field surveys, database searches, and reports

*Document – does not require field surveys; issue is incidental and may only require memo to file and brief explanation in the environmental document.

*Not Anticipated – Issue is not applicable to the proposed project.

Discussion of Technical Review

Summary

Based on past experience with similar actions and information provided to date, environmental clearance would be obtained with an Initial Study – Mitigated Negative Declaration under CEQA, and if NEPA applies, a routine Environmental Assessment – Finding of No Significant Impact (Class III). Estimated time for the Project Approval/Environmental Document (PA/ED) phase is 12 to 24 months. Agency coordination may be required for farmland and biological resource impacts; typical Departmental mitigation should suffice for potential visual impacts. New R/W required for Alternative 1 totals 22,000 SF (0.51 acres) while Alternative 2 requires 39,000 SF (0.90 acres). The majority of new R/W would be obtained from land currently used for commercial fruit tree cultivation. Total disturbed soil area would be 0.9 acres for Alternative 1 and 1.2 acres for Alternative 2. Permits to enter will require six to nine months to obtain. Substantial changes to the project description will require review by the Environmental Manager to ensure the appropriate level of environmental review.

Air and Noise

Since signalization projects are typically exempt from conformity requirements per Table 3 of 40 CFR 93.127, and because the project is included in the current Regional Transportation Plan – Transportation 2035 Plan (Project Reference No. 230579), an air quality study is not needed; this will be confirmed during PA/ED. Since the proposed project will not significantly increase traffic capacity, and only a small portion of the roadway is likely to be moved closer to potentially sensitive receptors, there is scant potential for increased air or noise concerns. While two schools and scattered residences in the project vicinity may be considered sensitive receptors, noise impacts are unlikely because any potential noise increase resulting from moving such a small portion of the roadway closer to these receptors would be negligible. Moreover, since the project is not a Type I project under 23 CFR 772, a Traffic Noise Study is not needed.

Construction activities will generate noise and dust, but these are not expected to be significant; measures to minimize impacts will be included in the Construction Contract Specifications and Standard Special Provisions.

Greenhouse Gas Emissions

Since the proposed project could result in increased traffic capacity or an expanded carbon footprint, the need to identify increased greenhouse gas (GHG) emissions will be evaluated, and mitigation recommended where appropriate, during PA/ED. Per the Office of Planning and Research, the Technical Advisory dated June 19, 2008 provides guidance to CEQA lead agencies by suggesting they identify potential GHG emissions and recommending mitigation where appropriate.

Hazardous Waste/Materials

Both alternatives require a Preliminary Site Investigation, including soil testing, during the Plans, Specifications and Estimates phase for aerially deposited lead (ADL) and other potential contaminants. Potential impacts due to storage and disposal of pavement grindings will be evaluated, and appropriate mitigation recommended, during PA/ED. Based on previous testing of this route high levels of ADL or other contaminants are not expected. Hazardous materials testing and mitigation is estimated at \$50,000.

Water Quality and Erosion Control

Total disturbed soil area (DSA) for Alternative 1 is estimated at 0.9 acres while DSA for Alternative 2 would be 1.2 acres. The project complies with the Department's statewide national Pollutant discharge Elimination System (NPDES) permit [Order no. 99-06-DWQ (Department of Water Quality)] and the Construction General Permit (Order No. 2009-0009-DWQ). Best Management Practices (BMPs) will be incorporated into the project to reduce the discharge of pollutants during construction as well as permanently after the completion of project. These BMPs fall into four categories, i.e., (I) Permanent Design Pollution Prevention BMPs, (II) Temporary Construction Site BMPs, (III) Permanent Treatment BMPs and (IV) if needed maintenance BMPs. Design Pollution Prevention BMPs are permanent measures to improve storm water quality by reducing erosion, stabilizing disturbed soil areas, and maximizing vegetated surfaces. Erosion control measures will be applied to all disturbed areas. Permanent impacts to any creeks will be mitigated both onsite and in locations still to be determined. Temporary Construction Site BMPs are applied during construction to control sedimentation, erosion and the discharge of other pollutants throughout construction. Should the project require a Storm Water Pollution Prevention Plan, a risk level evaluation will be performed at the Plans, Specification and Estimates (PS&E) phase to determine additional monitoring requirements per the Construction General Permit.

Based on the proposed project scope and the resulting potential water quality impacts, the project is not exempt from incorporating Treatment BMPs. Treatment BMPs are permanent devices and facilities treating storm water runoff. The Department's approved Treatment BMPs are Biofiltration Strips/Swales, Infiltration Basins, Detention Basins, Traction Sand Traps, Dry Weather Flow Diversions, Media Filters, Gross Solids Removal Devices (GSRDs), Multi-Chamber Treatment Trains (MCTT), and Wet Basins. Those most feasible in the Bay Area are Biofiltration Strips/Swales, Infiltration Basins, Detention Basins, Media Filters and MCTT.

Biological Resources

The California Natural Diversity Database (CNDDB), Sacramento Office of the U.S. Fish and Wildlife Service (FWS) internet resources, United States Geological Survey (USGS) quads and the Department's Digital Highway Inventory Photography Program (DHIPP) were reviewed in preparation for this review.

A query of FWS datum indicates the presence of threatened/endangered species in the United States Geographical Survey quadrangle for the project site, including the California red-legged frog, *Rana aurora draytonii*, (CRLF), California tiger salamander, *Ambystoma californiense*, (CTS) and San Joaquin kit fox, *Vulpes macrotis mutica* (SJKF). Photos and a windshield survey conducted on June 17, 2010 indicate the project area is bordered by rural residential properties, active agricultural lands and developed landscapes.

Habitat within and adjacent to the project area consists of ruderal non-native grassland, agriculture and rural development and channelized waters comprised of roadside ditches, which can provide suitable upland and non-breeding aquatic habitat for CTS. No barriers exist between the project area and the foothills, which are one mile northeast of the project area; the project area is within the maximum dispersal range for CTS. However, the nearest CNDDB occurrence for CTS is approximately three miles southeast of the project area [California Department of Fish & Game (CDFG) 2008], which is beyond the 0.7 mile dispersal distance CTS have been observed dispersing from breeding areas (FWS 2004).

Alternative 1 would involve the removal of four oak trees; Alternative 2 will involve the removal of 30 fruit trees. The project area is located within the known range of the CRLF, and because CRSF use a wide variety of habitats for dispersal, some of the area within the project area has the potential to be used by the occasional dispersing CRSF. The nearest CNDDB occurrence for CRSF is approximately 4.5 miles southwest of the project site, in Tick Creek (CDFG 2008). The upper limit of CRSF dispersal is 2.2 miles from breeding habitat (FWS 2006). Therefore, potential is low for CRSF occurrence(s) within the proposed project area.

Likewise, the project area is located within the known range of the SJKF and any contain some areas suitable for migration and dispersal of the species, although no suitable SJKF breeding habitats are located within the project area. SJKF individuals may use the ruderal grasslands and agricultural land within or adjacent to the project areas as dispersal migratory corridors or marginal foraging habitat if a suitable prey based. The closest known occurrence, not recorded in CNDDB, was a dead SJKF observed in 1991 near the intersection of Shore Road and Frazier Lake Road, over five miles away from the project area.

Waters and Wetlands

There are no waters or wetlands in or adjacent to the project area.

Migratory Bird Treaty Act

Bird nest surveys should be conducted for nesting birds in trees, shrubs and on the ground within the project action area, to avoid adversely affecting birds as required by the Migratory Bird Treaty Act (MBTA). The Federal MBTA (16 U.S.C. 703 et seq.), Title 50 Code of Federal

Regulations part 10, and CDFG Code Sections 3503, 3513 and 3800 protect migratory birds, their occupied nests and their eggs.

Trees and shrubs in the project area may provide nesting sites for birds. If staging or access occurs here and if construction work is scheduled during the bird nesting season, which is from approximately February 1st to August 15th, then a pre-construction survey for nesting birds will be required.

Permits

Project-related drainage work may require 401 and 404 permits. In addition, a Natural Environment Study (NES), Biological Assessment, Biological Opinion, and, due to recent changes in Fish and Game policies, an Incidental Take Permit for CTS and further habitat studies may be required to adequately assess the project's biological impacts. Permits to enter will require six to nine months to obtain.

Visual Effects

The potential visual impact issues associated with Alternative 1 include the loss of the oak trees and construction of the retaining wall. Removal of the oak trees could represent the loss of positive visual elements at the roadside. It could also create views of existing land uses from the highway that are now screened. At the same time, the highway itself may become more visible from these land uses. The visual character and degree of visual exposure of the new retaining wall to adjacent land uses must also be considered. More importantly, the oak trees that would be affected may qualify as Scenic Resources depending on their age, condition, arrangement, whether they are unique within the area, and the degree of local public concern for the trees. Mitigation for the loss of trees may be necessary. However, planting replacement trees in the same location where existing trees were removed may be constrained by limited right-of-way. Replacing the trees in another area nearby may not fully mitigate the visual impact. Mitigation of visual impacts associated with the proposed retaining wall may be necessary. This would be accomplished by applying an aesthetic treatment to the face of the wall.

The potential visual impact issue associated with Alternative 2 is the loss of the fruit trees as visual elements at the fringe of the orchard. Also, any potential visual effect of adjusting the centerline of the highway must also be considered. It is unlikely that mitigation for visual impacts would be needed with this alternative. The project segment of SR 152 is neither a designated or eligible scenic highway.

According to the Office of Landscape Architecture, a formal study and Visual Impact Assessment Report may be warranted for this project. However, typical Caltrans mitigation will likely suffice. The project would result in some degree of noticeable change at the site. Such change could potentially have a negative visual effect. We propose conducting a field visit to the site and further review of the project alternatives to determine if the project would have substantial visual impacts. It is possible that photo simulations depicting the proposed action from various viewpoints could be necessary. Results of the evaluation would be presented in a brief Visual Impact Assessment Report. We estimate that the Office of Landscape Architecture will require 200 WBS hours for activity 165.10.20 to conduct the evaluation, prepare photo simulations if needed, and prepare the report. We expect the evaluation to satisfy PA&ED

requirements. Note that herein we are not providing an estimate of resources for involvement by the Office of Landscape Architecture in project PS&E should that be requested for any reason.

Cultural Resources

The project vicinity has low to moderate potential for prehistoric and historic archaeology. The potential for buried resources is considered low. An Architectural historian may need to evaluate up to six buildings, one of which is currently listed on the County Historic Resources Inventory. A finding of No Adverse Effect is anticipated.

Native American Coordination

The need for Native American Coordination will be evaluated during PA/ED.

Community Impact

By its nature, the project is not expected to result in community impacts; nonetheless, this will be verified during PA/ED. Potential impacts to existing and proposed land uses, population growth/sprawl, local economy, municipal and community services and community character will be evaluated and mitigation will be recommended where appropriate. If NEPA applies, potential impacts to Title VI populations as well as low-income and minority communities will also be evaluated.

Land uses in the project vicinity are primarily agricultural; fruit trees are under cultivation immediately north of the proposed project site and elsewhere in the vicinity. A private elementary school, the Gavilan Hills Academy, and scattered residences are located immediately south of the project site. Additional residences and a small market lie to the west while the Anchorpoint Christian High school is located east of the project site. Row crops, fruit trees, industrial agricultural buildings and scattered private residences are found further out from the project site.

Transportation Planning

As one of the major highway connections between the San Francisco Bay Area and I-5, SR 152 has been designated by the State as vital to interregional travel, and is designated as an Interregional Road System route by legislation. Moreover, the Interregional Transportation Improvement Plan identifies SR 152 as a focus route, indicating the highest priority for completion of the statewide trunk system because it is a critical truck route for interregional connection. As a link between the Central Valley and the Bay Area, SR 152 carries considerable truck and recreational traffic. Proposed operational strategies for the corridor include intersection improvements such as the proposed signalization project under study in this PEAR and Project Study Report.

The California high-Speed Rail Commission has specified a preference for high-speed rail service through the SR 152 corridor via Pacheco Pass; high-speed rail facilities could potentially share R/W with SR 152.

There is no transit service on SR 152. Bicycle facilities in the project vicinity are rated "Extreme caution" by the County.

Context Sensitive Solutions

The Department applies Context Sensitive Solutions (CSS) to achieve transportation goals in harmony with community goals and natural environments. CSS solutions are reached through a collaborative interdisciplinary approach involving all stakeholders; these efforts will be pursued during PA/ED.

Right of Way/Relocations

Alternative 1 would require 22,000 square feet (0.51 acres) R/W acquisition while Alt. 2 would require 39,000 (0.90 acres) R/W. R/W acquisition for both Alternatives would convert land currently used for commercial cultivation of fruit trees to non-agricultural use. Potential impacts to farmland will be evaluated, and mitigation recommended where appropriate, as discussed under Farmlands below.

Utilities

The project would relocate utilities, including light poles and overhead lines and poles. Impacts will be evaluated, and mitigation recommended where appropriate, during PA/ED. Utility verifications including potholing will be required.

Section 4(f)

The project will be evaluated during PA/ED to determine whether there is a Department of Transportation nexus to ascertain whether Section 4(f) is applicable, and if so, the potential for impacts to any 4(f) resources will be evaluated, and appropriate mitigation will be recommended. Based on a review of project plans and area maps, there do not appear to be any Section 4(f) resources in the immediate project vicinity.

Floodplains

The project site is located within a 100-year flood boundary according to the Flood Insurance Rate Maps for Santa Clara County. While the project is not expected to change the flood elevation, potential impacts to floodplains, as well as drainage issues will be evaluated, and mitigation recommended where appropriate, during PA/ED.

Farmlands

Since both alternatives involve R/W acquisitions from land currently under agricultural cultivation, the potential for impacts to farmland will be evaluated and mitigation recommended where appropriate, during PA/ED. Alternative 1 requires an estimated 22,000 square feet (0.51 acre) while Alt. 2 requires 39,000 square feet (0.90 acre) new R/W. The majority of new R/W would be obtained from land currently used for cultivation of fruit trees, located immediately north of the proposed project site.

During PA/ED, the Santa Clara County General Plan will be reviewed to determine whether the area identified for potential R/W acquisition is under Williamson Act Contracts. These provide tax benefits to the property owner in exchange for maintaining agricultural use of the land. CEQA requires review of projects that would convert land under Williamson Act contract to non-agricultural uses, as well as coordination with the California Department of Conservation and the County of Santa Clara. If NEPA applies, the Farmland Protection Policy Act would require coordination with the Natural Resources Conservation Service (NRCS) if the project

would either affect the economic viability of farming operations, or irreversibly convert farmland to nonagricultural use. If so, a Farmland Conversion Impact Rating Form known as AD 1006 would be completed to determine any adverse effect. Impacts will be evaluated and mitigation recommended where appropriate, during PA/ED.

Cumulative Impacts

Both alternatives could result in cumulative impacts to visual and biological resources as well as to farmlands; these will be evaluated, and mitigation recommended where appropriate during PA/ED.

Growth Inducing/Indirect Effects

While land use development is governed by local plans and policies, the project's operational improvements could accommodate greater vehicular demand. Therefore, the potential for growth inducing and indirect effects will be evaluated and mitigation recommended where appropriate during PA/ED.

Other—Coastal Zone, Wild and Scenic Rivers, Invasive Plant Species

If invasive plant species are found in the project area, mitigation measures would need to be developed during the PA/ED phase to prevent the spread of these invasive species to the extent feasible. Executive Order 13112 requires that Federal agencies carrying out actions that have the potential to affect the status of invasive species 1) identify such actions, 2) not authorize, fund, or carry out such actions that it believes are likely to cause or promote the introduction or spread of invasive species, and 3) if feasible, prevent the spread of invasive species by detecting, controlling, and monitoring the spread of invasive species, providing for the restoration of native habitats, conducting research on invasive species to prevent their spread, and educating the public on invasive species issues.

The project is not located within the Coastal Zone, nor would it impact any Wild and Scenic Rivers.

Permits

Permits	Agency	Cost
401 Water Quality Certification	Regional Water Quality Control Board	TBD
404 Nationwide Permit	Army Corps of Engineers	TBD
1602 Streambed Alteration Agreement	California Department of Fish and Game	
NPDES	State Water Resources Control Board	TBD
Permits to Enter		TBD

Reviewers

	Name	Phone
Hazardous Waste	Ray Boyer	510.286.5668
Biological Resources	Monica Gan	510.622.0795
Cultural Resources	Elizabeth Krase- Greene	510.286.5612
Visual Resources	Bryan Walker	510.286.4833
Water Quality	Kamran Nakjhiri	510.286.5664
Pedestrian Coordination	Aprile Smith	510.286.5518
PEAR Review	Jared Goldfine	510.286.6203
PEAR Review	Howell Chan	510.286.5623

PEAR Mitigation and Compliance Cost Estimate

District 4	Santa Clara County	State Route 152	PM 11.9	EA 0G720K
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Description of Work Signalize intersection, add a right-turn lane and widen roadway for 0.25 miles. New R/W will be needed.

Project Manager	Nick Saleh	Date	October 2010
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Prepared by	Patricia Maurice	Date	October 2010
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	Mitigation			Compliance
	Project Feature ¹	Enviro. Obligation ²	Statutory Require. ³	Permit & Agreement ⁴
Fish & Game 1602 Agreement				
Coastal Development Permit				
State Lands Agreement				
NPDES Permit				
COE 404 Permit- Nationwide				
COE 404 Permit- Individual				
COE Section 10 Permit				
COE Section 9 Permit				
Other: Incidental Take Permit for CTS		\$25,000/acre		
Noise attenuation				
Special landscaping				
Archaeological				
Biological – endangered species habitat		\$25,000/acre		
Wetland/riparian				
Historical				
Scenic resources				
Hazardous Materials		\$50,000		
Other:				
TOTAL (Enter zeros if no cost)				

Costs are to include all costs to complete the commitment including: 1) capital outlay and staff support; 2) cost of right-of-way or easements; 3) long-term monitoring and reporting; and 4) any follow-up maintenance.

¹ Mitigation that Caltrans would normally do if not required by a permit or environmental agreement.

² Mitigation that Caltrans would not normally do but is required by conditions of a permit or environmental agreement.

³ Mitigation that Caltrans would not normally do and is not required by a permit or Enviro. Agreement, but is required by a law.

⁴ Non-mitigation Caltrans would not normally do but is required by conditions of a permit or agreement.

Conclusions

District 4	Santa Clara County	State Route 152	PM 11.9	EA 0G720K
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Project Title	State Route 152 @ Frazier Lake Road Signalization
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Description of Work:

Intersection improvements include signalization, adding a right-turn lane and roadway widening for approximately 0.25 miles along SR 152 and upgrading, relocating or replacing three storm drain systems. Both alternatives include removal of oak trees and fruit trees under commercial cultivation, associated drainage work and R/W acquisition. Alternative 1 also includes relocating existing metal beam guardrail and two light poles, constructing a retaining wall and acquiring 22,000 square feet of new R/W. Alternative 2 includes relocating two light poles and acquiring 39,000 square feet of new R/W.

CALTRANS DISTRICT PROFESSIONALLY QUALIFIED STAFF (PQS) SIGNATURE*

- Project does not meet definition of an "undertaking". No further review is necessary under Section 106. ("No" Sec B, #25)
- Project meets the definition of an "undertaking," involves the types of activities listed in Attachment 2 of the Section 106 PA, and, based on the project description above, does not have the potential to affect historic properties. ("No" Sec B, #25)
- Project meets the definition of an "undertaking" and involves the types of activities listed in Attachment 2 of the Section 106 PA, but the following additional procedures or information is needed, to determine the potential for effect: ("To Be Determined" Sec B, #25)
- Records Search _____ _____ _____

The additional procedures conducted or information generated shall occur during PA/ED.

- The proposed undertaking is considered to have the potential to affect historic properties. Further studies for 106 compliance are indicated in this PEAR. ("Yes" Sec B, #25)

Signature PQS: *Ryason Greene* Date: 4/7/2011 Telephone #: (570) 286-5612

CALTRANS DISTRICT BIOLOGY STAFF SIGNATURE*

- Based on the scope of the project and the information generated for the PEAR, the project does not have the potential to affect biological resources.
- The following additional procedures or information is needed, to determine the potential for effect to biological resources:
- Records Search _____ _____ _____
- The proposed undertaking is considered to have the potential to affect biological resources. Further studies are indicated in this PEAR for the PA/ED phase.

Signature: *Margaret Bell* Date: 4/8/11 Telephone #: 510-286-6222

CALTRANS DISTRICT HAZARDOUS WASTE STAFF SIGNATURE*

- Based on the information provided in the project description above, the project does not have the potential to be affected by hazardous wastes and materials.
- The following additional procedures or information is needed, to determine the potential for effect:
- Records Search _____ _____ _____
- The proposed undertaking is considered to have the potential to be affected by hazardous wastes and materials. Further studies are indicated in this PEAR for the PA/ED and PS&E phases.

Signature: *Ray Boyer* Date: 4-7-11 Telephone #: 236-5668

ATTACHMENT E

Right of Way Data Sheet

T0: Office of Advance Planning -- PSR I

Date November 4, 2010
Dist 4 Co SC1 Rte 152 PM 11.9

Attention: Warwick
Branch Chief

EA 0G720K

From: ENID LAU
Right of Way Resource Manager

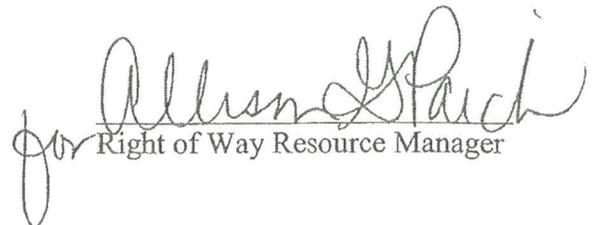
Upgrade Intersection and Install Signal
D.S. #5840
Update ALT #1

Subject: Current Estimated Right of Way Costs

We have completed an estimate of the right of way costs for the above referenced project based on maps we received from you on August 23, 2010 and the following assumptions and limiting conditions.

- 1. The mapping did not provide sufficient detail to determine the limits of the right of way required.
- 2. The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.
- 3. Additional right of way requirements are anticipated, but are not defined due to the preliminary nature of the early design requirements.
- 4. This estimate does not include \$ _____ right of way costs previously incurred on the project, which may affect the total project right of way costs for programming purposes.
- 5. We have determined there are no right of way functional involvements in the proposed project at this time, as designed.

Right of Way Lead Time will require a minimum of 15 months after we begin receiving final right of way requirements (PYPSCAN node No. 224), necessary environmental clearance has been obtained, and freeway agreements have been approved. From the date of receipt of final right of way requirements (PYPSCAN node No. 265), we will require a minimum of 12 months prior to the date of certification of the project. Shorter lead times will require either more right of way resources or an increased number of condemnation suits to be filed. Either of these actions may reflect adversely on the District's other programs or our public image generally.


for Right of Way Resource Manager

Attachments:

- Right of Way Data Sheet -- Page One (always required)
- Right of Way Data Sheet -- All Pages (required when interest in real property is being acquired)
- Utility Information Sheet
- Railroad Information Sheet

RIGHT OF WAY DATA SHEET

TO: PSR I - Branch
Office of Advance Planning

Date 10/13/10 D.S. # 5840
Dist 04 Co SCI Rte 152 PM 11.9

ACT#1

ATTN: WARWICK W. T. CHEUNG

EA 04-0G720K

Project Description: Upgrade Intersection and Install Signal

SUBJECT: Right of Way Data – Alternate No. 1

1. Right of Way Cost Estimate:

	Current Value (Future Use)	Escalation Rate	Escalated Value
A. Acquisition, including Excess Lands, Damages, and Goodwill.	\$ <u>62,000.00</u>	%	\$ <u>62,000.00</u>
Project Permit Fees			\$ <u>0.00</u>
Grantor's Appraisal Cost			\$ <u>5,000.00</u>
B. Utility Relocation (State Share)	\$ <u>5,000.00</u>	%	\$ <u>5,000.00</u>
C. Railroad (Service Contract)			\$ <u>0.00</u>
D. Relocation Assistance	\$ <u>0.00</u>	%	\$ <u>0.00</u>
E. Clearance/Demolition	\$ <u>0.00</u>	%	\$ <u>0.00</u>
F. Title and Escrow Fees	\$ <u>2,500.00</u>	%	\$ <u>2,500.00</u>
G. <u>TOTAL ESCALATED VALUE</u>			\$ <u>74,500.00</u>
H. Construction Contract Work	\$ <u>0.00</u>		

2. Anticipated Date of Right of Way Certification _____

3. Parcel Data:

Type	Dual/Appr	Utilities	RR Involvements	
X _____		U4-1 _____	None	X
A _____		-2 _____	C&M Agrmt	
B <u>1</u>		-3 _____	Svc Contract	
C _____		-4 _____		Design _____
D _____		U5-7 <u>5</u>		Const. _____
E <u>XXXX</u>		-8 _____	Lic/RE/Clauses	
F <u>XXXX</u>		-9 _____		
Total <u>1</u>			Misc R/W Work	
			RAP Displ	<u>0</u>
			Clear Demo	<u>0</u>
			Const. Permits	<u>0</u>
			Condemnation	<u>0</u>

Areas: Right of Way _____ No. Excess Parcels _____ Excess _____
Enter PMCS Screens 10 / 14 / 10 by SO
Enter AGRE Screen (Railroad data only) _____ / _____ / _____ by _____

4. Are there any major items of construction contract work?
Yes No (If yes, explain)
5. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, etc.). No right of way required

A single fee parcel is required from a mature Cherry orchard.
6. Is there an effect on assessed valuation?
Yes Not Significant No (If yes, explain)
7. Are utility facilities or rights of way affected? Yes No
(If yes, attach Utility Information Sheet Exhibit 01-01-05)
8. Are railroad facilities or rights of way affected? Yes No
(If yes, attach Railroad Information Sheet Exhibit 01-01-06)
9. Were any previously unidentified sites with hazardous waste and/or material found?
Yes None evident (If yes, attach memorandum per Procedural Handbook Volume 1, Section 101.011)
10. Are RAP displacements required? Yes No
(If yes, provide the following information)
- | | | | |
|----------------------|-------|----------------------------|-------|
| No. of single family | _____ | No. of business/non profit | _____ |
| No. of multi-family | _____ | No. of farms | _____ |
- Based on Draft/Final Relocation Impact Statement/Study dated _____, it is anticipated that sufficient replacement housing (will/will not) be available without Last Resort Housing.
11. Are there material borrow and/or disposal sites required? Yes No
(If yes, explain)
12. Are there potential relinquishments and/or abandonments? Yes No
(If yes, explain)
13. Are there any existing and/or potential Airspace sites? Yes No
(If yes, explain)

14. Are there Environmental Mitigation costs? Yes No
(If yes, explain)

15. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than PMCS lead time and/or if significant pressures for project advancement are anticipated.)

PYPSCAN lead time (from Regular R/W to project certification) 15 months

16. Is it anticipated that all Right of Way work be performed by CALTRANS staff?
Yes No (If no, discuss)

Assumptions and Limiting Conditions

- This data sheet was completed without a hazardous waste/materials report.
- Information on this data sheet was based on maps provided by Warwick W.T. Cheung on August 23, 2010.

Evaluation Prepared By: Renata Frey

Right of Way:	Name	<u>Renata Frey</u>	Date	<u>10/13/10</u>
Railroad:	Name	<u>RR</u>	Date	<u>10/13/10</u>
Utilities:	Name	<u>Edison</u>	Date	<u>10/13/10</u>

Recommended for Approval:

Allison Paich
for Right of Way Capital Cost Coordinator

I have personally reviewed this Right of Way Data Sheet and all supporting information. It is my opinion that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and find this Data Sheet complete and current.

Mark Hill

Chief, R/W Appraisal Services

10.29.10

Date

cc: Program Manager
Project Manager

UTILITY INFORMATION SHEET

1. Utility Owners located within project limits:

PG&E, Water, AT&T (Cable), Sewer

2. Facilities potentially impacted by project (if known, include Owner(s) and facility type(s)):

3. Anticipated Workload:

- Utility Verification required
- Positive Identification
- Utility Relocation
- Other (Specify)

4. Additional information concerning anticipated utility involvements (include limiting conditions and a narrative addressing likelihood that conflicts will occur);

Involves possible relocation of electric transmission facilities
(If X'd, Data sheet should be forwarded to environmental)

5. PMCS input information

- | | | | | | | |
|------|--------------------------|---|------|--------------------------|---|---|
| U4-1 | <input type="checkbox"/> | Owner Expense Involvements | U5-7 | <input type="checkbox"/> | 5 | Verifications-without involvements |
| U4-2 | <input type="checkbox"/> | State Expense Involvements
(Conventional, No Fed Aid) | U5-8 | <input type="checkbox"/> | | Verifications-50% involvements |
| U4-3 | <input type="checkbox"/> | State Expense Involvements
(Freeway, No Fed Aid) | U5-9 | <input type="checkbox"/> | | Verifications resulting in involvements |
| U4-4 | <input type="checkbox"/> | State Expense Involvements
(Conventional or Freeway, No Fed Aid) | | | | |

NOTE: The sum of the U-4's must equal the sum of 1/2 of the U5-8's and all of the U5-9's.

ESTIMATED STATE SHARE OF COSTS \$5,000.00

Prepared by: Elizabeth Engle



Right of Way Utility
Coordinator

10/13/10

Date

T0: Office of Advance Planning – PSR I

Date November 4, 2010
Dist 4 Co SCI Rte 152 PM 11.9

Attention: Warwick
Branch Chief

EA 0G720K

From: ENID LAU
Right of Way Resource Manager

Upgrade Intersection and Install Signal
D.S. #5840
Update **ALT #2**

Subject: Current Estimated Right of Way Costs

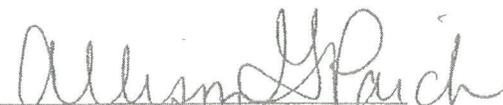
We have completed an estimate of the right of way costs for the above referenced project based on maps we received from you on August 23, 2010 and the following assumptions and limiting conditions.

- 1. The mapping did not provide sufficient detail to determine the limits of the right of way required.
- 2. The transportation facilities have not been sufficiently designed so our estimator could determine the damages to any of the remainder parcels affected by the project.
- 3. Additional right of way requirements are anticipated, but are not defined due to the preliminary nature of the early design requirements.
- 4. This estimate does not include \$ _____ right of way costs previously incurred on the project, which may affect the total project right of way costs for programming purposes.
- 5. We have determined there are no right of way functional involvements in the proposed project at this time, as designed.

Right of Way Lead Time will require a minimum of 15 months after we begin receiving final right of way requirements (PYPSCAN node No. 224), necessary environmental clearance has been obtained, and freeway agreements have been approved. From the date of receipt of final right of way requirements (PYPSCAN node No. 265), we will require a minimum of 12 months prior to the date of certification of the project. Shorter lead times will require either more right of way resources or an increased number of condemnation suits to be filed. Either of these actions may reflect adversely on the District's other programs or our public image generally.

Attachments:

- Right of Way Data Sheet – Page One (always required)
- Right of Way Data Sheet – All Pages (required when interest in real property is being acquired)
- Utility Information Sheet
- Railroad Information Sheet

for 
Right of Way Resource Manager

RIGHT OF WAY DATA SHEET

TO: PSR I - Branch
 Office of Advance Planning

Date 10/13/10 D.S. # 5840

ALT#2

Dist 04 Co SCI Rte 152 PM 11.9

ATTN: WARWICK W. T. CHEUNG

EA 04-0G720K

Project Description: Upgrade Intersection and Install Signal

SUBJECT: Right of Way Data – Alternate No. 2

1. Right of Way Cost Estimate:

	Current Value (Future Use)	Escalation Rate	Escalated Value
A. Acquisition, including Excess Lands, Damages, and Goodwill.	\$ <u>106,000.00</u>	%	\$ <u>106,000.00</u>
Project Permit Fees			\$ <u>0.00</u>
Grantor's Appraisal Cost			\$ <u>5,000.00</u>
B. Utility Relocation (State Share)	\$ <u>5,000.00</u>	%	\$ <u>5,000.00</u>
C. Railroad (Service Contract)			\$ <u>0.00</u>
D. Relocation Assistance	\$ <u>0.00</u>	%	\$ <u>0.00</u>
E. Clearance/Demolition	\$ <u>0.00</u>	%	\$ <u>0.00</u>
F. Title and Escrow Fees	\$ <u>2,500.00</u>	%	\$ <u>2,500.00</u>
G. <u>TOTAL ESCALATED VALUE</u>			\$ <u>118,500.00</u>
H. Construction Contract Work	\$ <u>0.00</u>	RT	\$ <u>119,000.00</u>

2. Anticipated Date of Right of Way Certification _____

3. Parcel Data:

Type	Dual/Appr	Utilities	RR Involvements	
X _____		U4-1 _____	None	X
A _____		-2 _____	C&M Agrmt	
B <u>1</u>		-3 _____	Svc Contract	
C _____		-4 _____		Design _____
D _____		U5-7 <u>5</u>		Const. _____
E <u>XXXX</u>		-8 _____	Lic/RE/Clauses	
F <u>XXXX</u>		-9 _____		
			Misc R/W Work	
			RAP Displ	<u>0</u>
			Clear Demo	<u>0</u>
			Const. Permits	<u>0</u>
			Condemnation	<u>0</u>
Total <u>1</u>				

Areas: Right of Way _____ No. Excess Parcels _____ Excess _____

Enter PMCS Screens 10 / 14 / 10 by WTC

Enter AGRE Screen (Railroad data only) _____ / _____ / _____ by _____

4. Are there any major items of construction contract work?
Yes No (If yes, explain)
5. Provide a general description of the right of way and excess lands required (zoning, use, major improvements, critical or sensitive parcels, etc.). No right of way required

A single fee parcel is required from a mature Cherry orchard.
6. Is there an effect on assessed valuation?
Yes Not Significant No (If yes, explain)
7. Are utility facilities or rights of way affected? Yes No
(If yes, attach Utility Information Sheet Exhibit 01-01-05)
8. Are railroad facilities or rights of way affected? Yes No
(If yes, attach Railroad Information Sheet Exhibit 01-01-06)
9. Were any previously unidentified sites with hazardous waste and/or material found?
Yes None evident (If yes, attach memorandum per Procedural Handbook Volume 1, Section 101.011)
10. Are RAP displacements required? Yes No
(If yes, provide the following information)
- | | | | |
|----------------------|-------|----------------------------|-------|
| No. of single family | _____ | No. of business/non profit | _____ |
| No. of multi-family | _____ | No. of farms | _____ |
- Based on Draft/Final Relocation Impact Statement/Study dated _____, it is anticipated that sufficient replacement housing (will/will not) be available without Last Resort Housing.
11. Are there material borrow and/or disposal sites required? Yes No
(If yes, explain)
12. Are there potential relinquishments and/or abandonments? Yes No
(If yes, explain)
13. Are there any existing and/or potential Airspace sites? Yes No
(If yes, explain)

14. Are there Environmental Mitigation costs? Yes No
(If yes, explain)

15. Indicate the anticipated Right of Way schedule and lead time requirements. (Discuss if District proposes less than PMCS lead time and/or if significant pressures for project advancement are anticipated.)

PYPSCAN lead time (from Regular R/W to project certification) 15 months

16. Is it anticipated that all Right of Way work be performed by CALTRANS staff?
Yes No (If no, discuss)

Assumptions and Limiting Conditions

- This data sheet was completed without a hazardous waste/materials report.
- Information on this data sheet was based on maps provided by Warwick W.T. Cheung on August 23, 2010.

Evaluation Prepared By: Renata Frey

Right of Way:	Name	<u>Renata Frey</u>	Date	<u>10/13/10</u>
Railroad:	Name	<u>Pat G...</u>	Date	<u>10/13/10</u>
Utilities:	Name	<u>Uebel T...</u>	Date	<u>10/13/10</u>

Recommended for Approval:

for Allison Pauch
Right of Way Capital Cost Coordinator

I have personally reviewed this Right of Way Data Sheet and all supporting information. It is my opinion that the probable Highest and Best Use, estimated values, escalation rates, and assumptions are reasonable and proper subject to the limiting conditions set forth, and find this Data Sheet complete and current.

Mark Hill
Chief, R/W Appraisal Services

10-29-10
Date

cc: Program Manager
Project Manager

UTILITY INFORMATION SHEET

1. Utility Owners located within project limits:

PG&E, Water, AT&T (Cable), Sewer

2. Facilities potentially impacted by project (if known, include Owner(s) and facility type(s)):

3. Anticipated Workload:

- Utility Verification required
- Positive Identification
- Utility Relocation
- Other (Specify)

4. Additional information concerning anticipated utility involvements (include limiting conditions and a narrative addressing likelihood that conflicts will occur);

Involves possible relocation of electric transmission facilities
(If X'd, Data sheet should be forwarded to environmental)

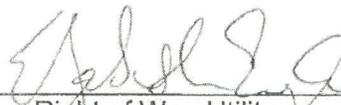
5. PMCS input information

- | | | | | | |
|------|--------------------------|---|------|--------------------------|---|
| U4-1 | <input type="checkbox"/> | Owner Expense Involvements | U5-7 | <u>5</u> | Verifications-without involvements |
| U4-2 | <input type="checkbox"/> | State Expense Involvements
(Conventional, No Fed Aid) | U5-8 | <input type="checkbox"/> | Verifications-50% involvements |
| U4-3 | <input type="checkbox"/> | State Expense Involvements
(Freeway, No Fed Aid) | U5-9 | <input type="checkbox"/> | Verifications resulting in involvements |
| U4-4 | <input type="checkbox"/> | State Expense Involvements
(Conventional or Freeway, No Fed Aid) | | | |

NOTE: The sum of the U-4's must equal the sum of 1/2 of the U5-8's and all of the U5-9's.

ESTIMATED STATE SHARE OF COSTS \$5,000.00

Prepared by: Elizabeth Engle



Right of Way Utility
Coordinator

10/13/10

Date

ATTACHMENT F

Storm Water Data Report



Dist-County-Route:04-SCL-152
 Post Mile Limits:11.9
 Project Type: Signalize intersection
 Project ID (or EA):0G720K
 Program Identification:201.010
 Phase: PID
 PA/ED
 PS&E

Regional Water Quality Control Board(s): Region 3

Is the Project required to consider Treatment BMPs? Yes No
 If yes, can Treatment BMPs be incorporated into the project? Yes No
 If No, a Technical Data Report must be submitted to the RWQCB at least 30 days prior to the projects RTL date. List RTL Date:Jan2015

Total Disturbed Soil Area:0.9acres or 1.2acres, to be determined later Risk Level: to be determined
 Estimated: Construction Start Date:05/15/2015 Construction Completion Date:12/2015
 Notification of Construction (NOC) Date to be submitted:

Erosivity Waiver: TBD Yes Date: No
 Notification of ADL reuse (if Yes, provide date): TBD Yes Date: No
 Separate Dewatering Permit (if yes, permit number) Yes Permit # No

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E.

Richie Perez (J.R.W.)
~~Cedric Dong~~, Registered Project Engineer/Landscape Architect 6/6/11
 Date

I have reviewed the stormwater quality design issues and find this report to be complete, current and accurate:
6/21/11
 Fariba Zohoury, Project Manager Date

Robert D. Braga
 Bob Braga Designated Maintenance Representative 7/6/11
 Date

David Yam
 David Yam, Designated Landscape Architect Representative 7/6/11
 Date

Norman Gonsalves
 Norman Gonsalves District/Regional Design SW Coordinator 05/17/2011
 Date

[Stamp Required for PS&E only)

STORM WATER DATA INFORMATION

1. Project Description

This project proposes to install traffic signals and construct a westbound right-turn lane at the Route 152/Frazier Lake Road intersection.

An investigation revealed that accident rates are higher at the Route 152/Frazier Lake Road intersection than the statewide average and cited driver confusion as a factor in the majority of the accidents that occurred.

The project plans to upgrade and signalize the 'T' intersection of State Route (SR) 152 and Frazier Lake Road in Santa Clara County. The 'leg' of the 'T' intersection faces north and the 'top' of the 'T' runs east-west. To the north of the 'T' intersection lies a dried fruit orchard, to the southeast a grass parking lot, and to the southwest several oak trees. The existing intersection has no signals and a left turn pocket on Westbound SR 152.

The project is located in a mostly rural setting, adjacent to a cherry orchard, homes and two schools.

There is no dry weather flow.

- The first alternative is to expand the western approach to the intersection by adding an adjacent lane to the existing road and restriping the intersection to allow for a separate turning lane and installing a traffic signal and pole at the northern and southeast faces of the intersection. The grade along the southwest face will be raised in order to allow for the lane and a retaining wall to be built. This alternative should disturb approximately 0.9 acres and remove 3 to 4 oak trees. The deepest the excavation will be in this alternative is 3'-4' for the retaining wall.
- The second alternative is to extend the entire north face of the intersection by adding a lane of pavement. This lane will be built on land taken from the orchard and 30 fruit trees will be removed. A traffic signal and pole will be installed at the northern face of the intersection for westbound traffic and southbound traffic. A traffic signal and pole will be installed on the southeast corner of the eastbound traffic. The lanes will be restriped to include a turning lane. The deepest the excavation may be for this alternative is 1' to 2' since there will be only roadwork. This option will disturb 1.2 acres.
- The total added pavement for the first alternative is estimated to be 20,400 square feet or 0.47 acres and the total added pavement for the second alternative is estimated to be 29000 square feet or 0.67 acres.
- The project is located in the Santa Clara MS4.

2. Site Data and Storm Water Quality Design Issues (refer to Checklists SW-1, SW-2, and SW-3)

- The project lies within HSA 305.30 the Pajoro River Hydrological Unit and the South Santa Clara Valley Hydrological Area. The Hydrological Sub Area is undefined. The Pajaro River

River has a TMDL for sediment and nutrients. There are no water bodies that run through the project site. This triggers the need for permanent treatment BMP's for any amount of added pavement.

- The soil consists of entirely Yolo Loam with slopes 0-2%.
- The project is located in a Mediterranean climate characterized by warm dry summers and mild wet winter. The Storm Water rainy season is October 15 to April 15.
- There are no at risk water bodies in the project limits.
- The cross culverts may be considered Waters of the United States. Any work on the culvert would require a 401 permit. A SWPPP will be necessary for the second alternative because it disturbs more than an acre of land.
- The project risk level will be revisited during subsequent design phases.
- There are no existing treatment BMPs in the project limits.

3. Regional Water Quality Control Board Agreements

- No agreements at this time. It will be assumed that a 401 certification will be required for this project until shown otherwise.

4. Proposed Design Pollution Prevention BMPs to be used on the Project.

- The strategy of implementing design pollution prevention BMPs will focus on sediment control and slope erosion.
- Design pollution prevention BMPs will be addressed later in the project.

5. Proposed Permanent Treatment BMPs to be used on the Project

Treatment BMP Strategy, Checklist T-1

- The targeted constituent is sediment.
- Treatment BMPs are anticipated with biostrips and bioswales being the likely choice. Other forms of treatment BMPs will be considered in subsequent design phases.

6. Proposed Temporary Construction Site BMPs to be used on Project

- 1st alternative: The concrete work for the retaining wall will require a concrete washout. The fill work will require temporary slope stabilization, perimeter control such as fiber rolls or a silt fence, and temporary construction entrances and exits. The proposed retaining wall runs in the way of the culvert so the culvert will have to be moved during construction.
- 2nd alternative: Perimeter control such as fiber rolls or a silt fence, and temporary construction entrances and exits are anticipated for this alternative. A SWPPP will have to be issued.
- Develop an estimate of quantities and costs (for internal Caltrans use only) for Construction Site BMPs and monitoring as a part of the Storm Water BMP Cost Summary. Complete for each phase of the project.

7. Maintenance BMPs (Drain Inlet Stenciling)

7. Maintenance BMPs (Drain Inlet Stenciling)

- Drainage inlets within MS4s will have to be stenciled to prevent pedestrians from dumping into them.

Required Attachments

- Vicinity Map
- Evaluation Documentation Form (EDF)

Supplemental Attachments

- Storm Water BMP Cost Summary
- Checklist SW-1, Site Data Sources
- Checklist SW-2, Storm Water Quality Issues Summary
- Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water BMPs



APPENDIX E

Evaluation Documentation Form

DATE: 11/22/2010 _____

Project ID (or EA): OG720K _____

NO.	CRITERIA	YES ✓	NO ✓	SUPPLEMENTAL INFORMATION FOR EVALUATION
1.	Begin Project Evaluation regarding requirement for consideration of Treatment BMPs	X		See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs. Go to 2
2.	Is this an emergency project?		X	If Yes , go to 10. If No , continue to 3.
3.	Have TMDLs or other Pollution Control Requirements been established for surface waters within the project limits? Information provided in the water quality assessment or equivalent document.	X		If Yes , contact the District/Regional NPDES Coordinator to discuss the Department's obligations under the TMDL (if Applicable) or Pollution Control Requirements, go to 9 or 4. <i>MG</i> (Dist./Reg. SW Coordinator initials) If No , continue to 4.
4.	Is the project located within an area of a local MS4 Permittee?	X		If Yes . (<i>Santa Clara</i>), go to 5. If No , document in SWDR go to 5.
5.	Is the project directly or indirectly discharging to surface waters?	X		If Yes , continue to 6. If No , go to 10.
6.	Is it a new facility or major reconstruction?		X	If Yes , continue to 8. If No , go to 7.
7.	Will there be a change in line/grade or hydraulic capacity?	X		If Yes , continue to 8. If No , go to 10.
8.	Does the project result in a <u>net increase of one acre or more of new impervious surface</u> ?		X	If Yes , continue to 9. If No , go to 10. <i>(Net Increase New Impervious Surface)</i>
9.	Project is required to consider approved Treatment BMPs.			See Sections 2.4 and either Section 5.5 or 6.5 for BMP Evaluation and Selection Process. Complete Checklist T-1 in this Appendix E.
10.	Project is not required to consider Treatment BMPs. <i>MG</i> (Dist./Reg. Design SW Coord. Initials) <i>RPP</i> (Project Engineer Initials) <u>6/6/11</u> (Date)	X		Document for Project Files by completing this form, and attaching it to the SWDR.

See Figure 4-1, Project Evaluation Process for Consideration of Permanent Treatment BMPs

Construction Site BMP Cost Summary

EA 0G720K
County SCL
Route 152
Post Mile 11.9

Cost Summary Allocation

	Alternative 1 Cost(\$)	Alternative 2 Cost(\$)
	2627000	2400000
Water Pollution Control	39405	36000
Erosion Control	26270	24000
Treatment BMPs	52540	48000
Total Site BMP Allocation	118215	108000

Checklist SW-1, Site Data Sources

Prepared by: Jonathan Wellen Date: 12/17/2010 District-Co-Route: 04-SCL-152

PM : 11.9 Project ID (or EA): 0G720K RWQCB: Region 3

Information for the following data categories should be obtained, reviewed and referenced as necessary throughout the project planning phase. Collect any available documents pertaining to the category and list them and reference your data source. For specific examples of documents within these categories, refer to Section 5.5 of this document. Example categories have been listed below; add additional categories, as needed. Summarize pertinent information in Section 2 of the SWDR.

DATA CATEGORY/SOURCES	Date
Topographic	
<ul style="list-style-type: none"> • Caltrans photolog and satellite photos • • 	
Hydraulic	
<ul style="list-style-type: none"> • N/A • • 	
Soils	
<ul style="list-style-type: none"> • USDA National Resource Conservation Service • • 	
Climatic	
<ul style="list-style-type: none"> • Caltrans Construction Manual • • 	
Water Quality	
<ul style="list-style-type: none"> • US Environmental Protection Agency • • 	
Other Data Categories	
<ul style="list-style-type: none"> • Caltrans Construction Site BMP Manual • • 	March 2007



Checklist SW-2, Storm Water Quality Issues Summary

Prepared by: Jonathan Wellen Date: 12/17/2010 District-Co-Route: 04-SCL-152

PM : 11.9 Project ID (or EA): 0G720K RWQCB: Region 3

The following questions provide a guide to collecting critical information relevant to project stormwater quality issues. Complete responses to applicable questions, consulting other Caltrans functional units (Environmental, Landscape Architecture, Maintenance, etc.) and the District/Regional Storm Water Coordinator as necessary. Summarize pertinent responses in Section 2 of the SWDR.

- | | | |
|--|--|-----------------------------|
| 1. Determine the receiving waters that may be affected by the project throughout the project life cycle (i.e., construction, maintenance and operation). | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 2. For the project limits, list the 303(d) impaired receiving water bodies and their constituents of concern. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 3. Determine if there are any municipal or domestic water supply reservoirs or groundwater percolation facilities within the project limits. Consider appropriate spill contamination and spill prevention control measures for these new areas. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 4. Determine the RWQCB special requirements, including TMDLs, effluent limits, etc. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 5. Determine regulatory agencies seasonal construction and construction exclusion dates or restrictions required by federal, state, or local agencies. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 6. Determine if a 401 certification will be required. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 7. List rainy season dates. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 8. Determine the general climate of the project area. Identify annual rainfall and rainfall intensity curves. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 9. If considering Treatment BMPs, determine the soil classification, permeability, erodibility, and depth to groundwater. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 10. Determine contaminated soils within the project area. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 11. Determine the total disturbed soil area of the project. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 12. Describe the topography of the project site. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 13. List any areas outside of the Caltrans right-of-way that will be included in the project (e.g. contractor's staging yard, work from barges, easements for staging, etc.). | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 14. Determine if additional right-of-way acquisition or easements and right-of-entry will be required for design, construction and maintenance of BMPs. If so, how much? | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 15. Determine if a right-of-way certification is required. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 16. Determine the estimated unit costs for right-of-way should it be needed for Treatment BMPs, stabilized conveyance systems, lay-back slopes, or interception ditches. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 17. Determine if project area has any slope stabilization concerns. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 18. Describe the local land use within the project area and adjacent areas. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |
| 19. Evaluate the presence of dry weather flow. | <input checked="" type="checkbox"/> Complete | <input type="checkbox"/> NA |

Checklist SW-3, Measures for Avoiding or Reducing Potential Storm Water Impacts

Prepared by: Jonathan Wellen Date: 12/17/2010 District-Co-Route: 04-SCL-152

PM : 11.9 Project ID (or EA): 0G720K RWQCB: Region 3

The PE must confer with other functional units, such as Landscape Architecture, Hydraulics, Environmental, Materials, Construction and Maintenance, as needed to assess these issues. Summarize pertinent responses in Section 2 of the SWDR.

Options for avoiding or reducing potential impacts during project planning include the following:

1. Can the project be relocated or realigned to avoid/reduce impacts to receiving waters or to increase the preservation of critical (or problematic) areas such as floodplains, steep slopes, wetlands, and areas with erosive or unstable soil conditions? Yes No NA

2. Can structures and bridges be designed or located to reduce work in live streams and minimize construction impacts? Yes No NA

3. Can any of the following methods be utilized to minimize erosion from slopes:
 - a. Disturbing existing slopes only when necessary? Yes No NA
 - b. Minimizing cut and fill areas to reduce slope lengths? Yes No NA
 - c. Incorporating retaining walls to reduce steepness of slopes or to shorten slopes? Yes No NA
 - d. Acquiring right-of-way easements (such as grading easements) to reduce steepness of slopes? Yes No NA
 - e. Avoiding soils or formations that will be particularly difficult to re-stabilize? Yes No NA
 - f. Providing cut and fill slopes flat enough to allow re-vegetation and limit erosion to pre-construction rates? Yes No NA
 - g. Providing benches or terraces on high cut and fill slopes to reduce concentration of flows? Yes No NA
 - h. Rounding and shaping slopes to reduce concentrated flow? Yes No NA
 - i. Collecting concentrated flows in stabilized drains and channels? Yes No NA

4. Does the project design allow for the ease of maintaining all BMPs? Yes No

5. Can the project be scheduled or phased to minimize soil-disturbing work during the rainy season? Yes No

6. Can permanent storm water pollution controls such as paved slopes, vegetated slopes, basins, and conveyance systems be installed early in the construction process to provide additional protection and to possibly utilize them in addressing construction storm water impacts? Yes No NA

ATTACHMENT G

Traffic Management Plan Data Sheet

TRANSPORTATION MANAGEMENT PLAN DATA SHEET (Preliminary TMP Elements and Costs)

Co/Rte/PM SCL/152-PM 11.9 EA 0G720K Project Engineer Cederick Dong
 Project Limit In Santa Clara County at the intersection of Rte 152 and Frazier Lake Road
 Project Description Roadway widening for a right turn land and the installation of traffic signal to improve safety and operation at the intersection of Rte 152 and Frazier Road

1) Public Information

- | | | |
|-------------------------------------|--|-------------|
| <input type="checkbox"/> | a. Brochures and Mailers | \$ _____ |
| <input checked="" type="checkbox"/> | b. Press Release | |
| <input type="checkbox"/> | c. Paid Advertising | \$ _____ |
| <input type="checkbox"/> | d. Public Information Center/Kiosk | \$ _____ |
| <input type="checkbox"/> | e. Public Meeting/Speakers Bureau | |
| <input type="checkbox"/> | f. Telephone Hotline | |
| <input type="checkbox"/> | g. Internet, E-mail | |
| <input type="checkbox"/> | h. Notification to impacted groups
(i.e. bicycle users, pedestrians with disabilities, others...) | |
| <input checked="" type="checkbox"/> | i. Others _____ | \$ 2,000.00 |

2) Traveler Information Strategies

- | | | |
|-------------------------------------|--|-------------|
| <input type="checkbox"/> | a. Changeable Message Signs (Fixed) | \$ _____ |
| <input checked="" type="checkbox"/> | b. Changeable Message Signs (Portable) | \$ 2,000.00 |
| <input type="checkbox"/> | c. Ground Mounted Signs | \$ _____ |
| <input type="checkbox"/> | d. Highway Advisory Radio | \$ _____ |
| <input type="checkbox"/> | e. Caltrans Highway Information Network (CHIN) | |
| <input type="checkbox"/> | f. Detour maps (i.e. bicycle, vehicle, pedestrian...etc) | |
| <input type="checkbox"/> | g. Revised Transit Schedules/maps | |
| <input type="checkbox"/> | h. Bicycle community information | |
| <input checked="" type="checkbox"/> | i. Others _____ | \$ _____ |

3) Incident Management

- | | | |
|-------------------------------------|--|---------------|
| <input checked="" type="checkbox"/> | a. Construction Zone Enhanced Enforcement Program (COZEEP) | \$ 240,000.00 |
| <input type="checkbox"/> | b. Freeway Service Patrol | \$ _____ |
| <input type="checkbox"/> | c. Traffic Management Team | |
| <input type="checkbox"/> | d. Helicopter Surveillance | \$ _____ |
| <input type="checkbox"/> | e. Traffic Surveillance Stations
(Loop Detector and CCTV) | \$ _____ |
| <input type="checkbox"/> | f. Others _____ | \$ _____ |

TMP Data Sheet (cont.)

4) Construction Strategies

- | | | |
|-------------------------------------|--------------------------------|--------------|
| <input checked="" type="checkbox"/> | a. Lane Closure Chart | |
| <input type="checkbox"/> | b. Reversible Lanes | |
| <input type="checkbox"/> | c. Total Facility Closure | |
| <input type="checkbox"/> | d. Contra Flow | |
| <input type="checkbox"/> | e. Truck Traffic Restrictions | \$ _____ |
| <input type="checkbox"/> | f. Reduced Speed Zone | \$ _____ |
| <input type="checkbox"/> | g. Connector and Ramp Closures | |
| <input type="checkbox"/> | h. Incentive and Disincentive | |
| <input type="checkbox"/> | i. Moveable Barrier | \$ _____ |
| <input checked="" type="checkbox"/> | j. Maintain Traffic (Flaggers) | \$ 36,000.00 |
| <input type="checkbox"/> | k. Others _____ | \$ _____ |

5) Demand Management

- | | | |
|--------------------------|---|----------|
| <input type="checkbox"/> | a. HOV Lanes/Ramps (New or Convert) | \$ _____ |
| <input type="checkbox"/> | b. Park and Ride Lots | \$ _____ |
| <input type="checkbox"/> | c. Rideshare Incentives | \$ _____ |
| <input type="checkbox"/> | d. Variable Work Hours | |
| <input type="checkbox"/> | e. Telecommute | |
| <input type="checkbox"/> | f. Ramp Metering (Temporary Installation) | \$ _____ |
| <input type="checkbox"/> | g. Ramp Metering (Modify Existing) | \$ _____ |
| <input type="checkbox"/> | h. Others _____ | \$ _____ |

6) Alternate Route Strategies

- | | | |
|--------------------------|---|----------|
| <input type="checkbox"/> | a. Add Capacity to Freeway Connector | \$ _____ |
| <input type="checkbox"/> | b. Street Improvement (widening, traffic signal... etc) | \$ _____ |
| <input type="checkbox"/> | c. Traffic Control Officers | \$ _____ |
| <input type="checkbox"/> | d. Parking Restrictions | |
| <input type="checkbox"/> | e. Others _____ | \$ _____ |

7) Other Strategies

- | | | |
|--------------------------|----------------------------------|----------|
| <input type="checkbox"/> | a. Application of New Technology | \$ _____ |
| <input type="checkbox"/> | b. Others _____ | \$ _____ |

TOTAL ESTIMATED COST OF TMP ELEMENTS = **\$ 280,000.00**

*Please note that any change in project scope, schedule, or cost will require resubmittal of TMP Data Sheet request.

PREPARED BY Louis Wong DATE 5/12/2010

APPROVAL RECOMMENDED BY Shein Lin DATE 5/12/2010

ATTACHMENT H

Traffic Data Set

Memorandum

*Flex your power!
Be energy efficient!*

To: WARWICK W.T. CHEUNG
Branch Chief, Project Study Report I-Branch
Office of Advance Planning – District 4

Date: March 21, 2011

File: 04-SCL-152/Frazier Lake Rd
EA 04-0G720K
(0400001989K)


From: LANCE HALL
Senior T.E.
Office of Highway Operations

Subject: SR 152/Frazier Lake Road intersection analysis

The Office of Highway Operations has completed the traffic analysis of State Route 152/Frazier Lake Road intersection in Santa Clara County. The purpose of this analysis is to evaluate the Level of Service (LOS) and traffic operations of the intersection before and after the proposed project. The proposed Alternative 1 and Alternative 2 will operate the same and therefore, the results of the operational analysis under proposed (signalized) conditions apply to both of these alternatives.

A. Existing (Unsignalized) Conditions:

The operations of unsignalized intersections are based on LOS for the worse leg of the intersection. The SR 152/Frazier Lake Rd. intersection operates at LOS F in the AM and PM peak hour due to the stopped control on the Frazier Lake Rd. approach to this intersection and the heavy volumes on SR 152.

B. Proposed (Signalized) Conditions:

The proposed project includes roadway widening to accommodate an eastbound right-turn only lane and the installation of a traffic signal to improve safety and operations of this intersection. Our analysis shows that this proposed signalized intersection would operate at acceptable LOS B in the AM peak hour and LOS C in the PM peak hour. The eastbound SR 152 approach to this intersection will operate at LOS B(D), westbound SR 152 approach will operate at LOS A(A) and the northbound Frazier Lake Rd. approach will operate at LOS C(D) in the AM(PM) peak hour.

The Office of Highway Operations does not have any concerns with signalizing the SR 152/Frazier Lake Road intersection.

If you have any questions concerning this analysis, please call Bo Fang 286-4942 or myself at 286-6311.

Attachments

Lanes, Volumes, Timings

1: Int

3/18/2011



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↖	↑	↘	↙
Volume (vph)	778	115	7	493	111	8
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	175		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Frnt		0.850			0.991	
Flt Protected			0.950		0.956	
Satd. Flow (prot)	1712	1455	1626	1712	1622	0
Flt Permitted			0.950		0.956	
Satd. Flow (perm)	1712	1455	1626	1712	1622	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		125			5	
Link Speed (mph)	30			30	30	
Link Distance (ft)	580			528	390	
Travel Time (s)	13.2			12.0	8.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%
Adj. Flow (vph)	846	125	8	536	121	9
Shared Lane Traffic (%)						
Lane Group Flow (vph)	846	125	8	536	130	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type		Perm	Prot			
Protected Phases	4		3	8	2	
Permitted Phases		4				

Baseline

Synchro 7 - Report
Page 1

SP 1521 Fraziers Lake Rd.
AM peak hour

Lanes, Volumes, Timings

1: Int

3/18/2011



Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	4	4	3	8	2	
Switch Phase						
Minimum Initial (s)	4.0	4.0	4.0	4.0	4.0	
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	
Total Split (s)	42.0	42.0	8.0	50.0	20.0	0.0
Total Split (%)	60.0%	60.0%	11.4%	71.4%	28.6%	0.0%
Maximum Green (s)	38.0	38.0	4.0	46.0	16.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	None	None	None	None	Min	
Walk Time (s)	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	31.8	31.8	4.3	33.0	9.7	
Actuated g/C Ratio	0.62	0.62	0.08	0.64	0.19	
v/c Ratio	0.80	0.13	0.06	0.49	0.42	
Control Delay	16.4	1.8	28.9	6.5	24.7	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	16.4	1.8	28.9	6.5	24.7	
LOS	B	A	C	A	C	
Approach Delay	14.5			6.9	24.7	
Approach LOS	B			A	C	
Queue Length 50th (ft)	134	0	2	62	35	
Queue Length 95th (ft)	#541	20	16	149	91	
Internal Link Dist (ft)	500			448	310	
Turn Bay Length (ft)		250	175			
Base Capacity (vph)	1302	1137	135	1487	543	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	0.65	0.11	0.06	0.36	0.24	

Intersection Summary

Area Type: Other

Cycle Length: 70

Actuated Cycle Length: 51.2

Natural Cycle: 70

Control Type: Actuated-Uncoordinated

Maximum v/c Ratio: 0.80

Intersection Signal Delay: 12.8

Intersection LOS: B

Intersection Capacity Utilization 54.3%

ICU Level of Service A

Analysis Period (min) 15

95th percentile volume exceeds capacity, queue may be longer.

Queue shown is maximum after two cycles.

Splits and Phases: 1: Int

 ø2	 ø3	 ø4
20 s	8 s	42 s
	 ø8	
	50 s	

Lanes, Volumes, Timings

1: Int

3/18/2011

	→	↘	↙	←	↖	↗
Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Lane Configurations	↑	↗	↙	↑	↖	
Volume (vph)	1212	222	14	507	92	6
Ideal Flow (vphpl)	1900	1900	1900	1900	1900	1900
Storage Length (ft)		250	175		0	0
Storage Lanes		1	1		1	0
Taper Length (ft)		25	25		25	25
Lane Util. Factor	1.00	1.00	1.00	1.00	1.00	1.00
Fr _t		0.850			0.991	
Fl _t Protected			0.950		0.955	
Satd. Flow (prot)	1712	1455	1626	1712	1620	0
Fl _t Permitted			0.950		0.955	
Satd. Flow (perm)	1712	1455	1626	1712	1620	0
Right Turn on Red		Yes				Yes
Satd. Flow (RTOR)		201			3	
Link Speed (mph)	30			30	30	
Link Distance (ft)	580			528	390	
Travel Time (s)	13.2			12.0	8.9	
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92
Heavy Vehicles (%)	11%	11%	11%	11%	11%	11%
Adj. Flow (vph)	1317	241	15	551	100	7
Shared Lane Traffic (%)						
Lane Group Flow (vph)	1317	241	15	551	107	0
Enter Blocked Intersection	No	No	No	No	No	No
Lane Alignment	Left	Right	Left	Left	Left	Right
Median Width(ft)	12			12	12	
Link Offset(ft)	0			0	0	
Crosswalk Width(ft)	16			16	16	
Two way Left Turn Lane						
Headway Factor	1.00	1.00	1.00	1.00	1.00	1.00
Turning Speed (mph)		9	15		15	9
Number of Detectors	2	1	1	2	1	
Detector Template	Thru	Right	Left	Thru	Left	
Leading Detector (ft)	100	20	20	100	20	
Trailing Detector (ft)	0	0	0	0	0	
Detector 1 Position(ft)	0	0	0	0	0	
Detector 1 Size(ft)	6	20	20	6	20	
Detector 1 Type	CI+Ex	CI+Ex	CI+Ex	CI+Ex	CI+Ex	
Detector 1 Channel						
Detector 1 Extend (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Queue (s)	0.0	0.0	0.0	0.0	0.0	
Detector 1 Delay (s)	0.0	0.0	0.0	0.0	0.0	
Detector 2 Position(ft)	94			94		
Detector 2 Size(ft)	6			6		
Detector 2 Type	CI+Ex			CI+Ex		
Detector 2 Channel						
Detector 2 Extend (s)	0.0			0.0		
Turn Type		Perm	Prot			
Protected Phases	2		1	6	8	
Permitted Phases		2				

Baseline

Synchro 7 - Report
Page 1

*SR 1521 FRAZIER Lake Rd.
pm peak hour*

Lanes, Volumes, Timings

1: Int

3/18/2011

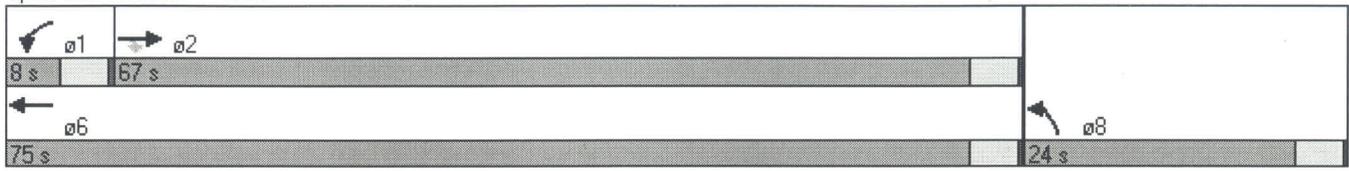


Lane Group	EBT	EBR	WBL	WBT	NBL	NBR
Detector Phase	2	2	1	6	8	
Switch Phase						
Minimum Initial (s)	4.0	4.0	1.0	4.0	4.0	
Minimum Split (s)	20.0	20.0	8.0	20.0	20.0	
Total Split (s)	67.0	67.0	8.0	75.0	24.0	0.0
Total Split (%)	67.7%	67.7%	8.1%	75.8%	24.2%	0.0%
Maximum Green (s)	63.0	63.0	4.0	71.0	20.0	
Yellow Time (s)	3.5	3.5	3.5	3.5	3.5	
All-Red Time (s)	0.5	0.5	0.5	0.5	0.5	
Lost Time Adjust (s)	0.0	0.0	0.0	0.0	0.0	0.0
Total Lost Time (s)	4.0	4.0	4.0	4.0	4.0	4.0
Lead/Lag	Lag	Lag	Lead			
Lead-Lag Optimize?	Yes	Yes	Yes			
Vehicle Extension (s)	3.0	3.0	3.0	3.0	3.0	
Recall Mode	Min	Min	None	None	Min	
Walk Time (s)	5.0	5.0		5.0	5.0	
Flash Dont Walk (s)	11.0	11.0		11.0	11.0	
Pedestrian Calls (#/hr)	0	0		0	0	
Act Effct Green (s)	63.3	63.3	4.0	64.7	10.8	
Actuated g/C Ratio	0.76	0.76	0.05	0.77	0.13	
v/c Ratio	1.02	0.21	0.19	0.42	0.50	
Control Delay	42.6	1.5	46.9	4.6	41.8	
Queue Delay	0.0	0.0	0.0	0.0	0.0	
Total Delay	42.6	1.5	46.9	4.6	41.8	
LOS	D	A	D	A	D	
Approach Delay	36.2			5.7	41.8	
Approach LOS	D			A	D	
Queue Length 50th (ft)	499	4	8	71	50	
Queue Length 95th (ft)	#1198	32	30	151	108	
Internal Link Dist (ft)	500			448	310	
Turn Bay Length (ft)		250	175			
Base Capacity (vph)	1297	1151	78	1462	392	
Starvation Cap Reductn	0	0	0	0	0	
Spillback Cap Reductn	0	0	0	0	0	
Storage Cap Reductn	0	0	0	0	0	
Reduced v/c Ratio	1.02	0.21	0.19	0.38	0.27	

Intersection Summary

Area Type: Other
 Cycle Length: 99
 Actuated Cycle Length: 83.6
 Natural Cycle: 130
 Control Type: Actuated-Uncoordinated
 Maximum v/c Ratio: 1.02
 Intersection Signal Delay: 28.8
 Intersection LOS: C
 Intersection Capacity Utilization 75.9%
 ICU Level of Service D
 Analysis Period (min) 15
 # 95th percentile volume exceeds capacity, queue may be longer.
 Queue shown is maximum after two cycles.

Splits and Phases: 1: Int



Memorandum

To: **JANICE BENTON**
Chief, Office of Traffic Safety Program

Date: July 23, 2009

File: 4-SCI-152-PM 11.902

4380-937500

Upgrade Intersection & Install Signal

From: 
ROLAND AU-YEUNG
Chief, Office of Traffic – District 4

Subject: Request for Conceptual Approval into the 201.010 Safety Program

We are preparing a Project Study Report for a project which proposes to upgrade and signalize the Route 152/Frazier Lake Road intersection, in Santa Clara County, near the City of Gilroy. A traffic signal warrant analysis determined that Warrant #1 - Condition A (Minimum Vehicular Volume) and Warrant #7 (Crash Experience) are satisfied at this intersection. Attached is a Project Fact Sheet for your conceptual approval to reserve \$2 million from the 201.010 Safety Program on behalf of this project. As upgrading the Route 152/Frazier Lake Road intersection will create an improved facility comprised of standard lanes and shoulders, and signalizing will regulate the movement of vehicles at this location, this project will reduce the number and severity of accidents in the future.

Upgrading and signalizing the Route 152/Frazier Lake Road intersection at a cost of \$2 million is associated with a Safety Index of 404; attached is the Safety Index calculation sheet for your reference. Alex Kennedy, Headquarters Traffic Liaison, reviewed and concurred with this project in a meeting on July 23, 2009.

Should you have any questions, please contact Mr. Ramiel Gutierrez, Senior Transportation Engineer of my staff, at ATSS 8-541-5994. Thank you in advance for all of your efforts.

Attachment

bc: Alex Kennedy – HQ Traffic Liaison
RAu-Yeung/RFGutierrez/Traffic Files

**PROJECT FACT SHEET
FOR CONCEPTUAL APPROVAL**

PROGRAM CODE: 201.010 – SHOPP Safety Improvement Program

PROJECT LIMITS: SCI-152-PM 11.902

PROJECT DESCRIPTION/SCOPE OF WORK:

This project will upgrade and signalize the Route 152/Frazier Lake Road intersection, in Santa Clara County, near the City of Gilroy.

NEED AND PURPOSE:

An investigation determined that, for the study period between January 1, 2003, and December 31, 2007, there were a total of 42 accidents; 33 broadside collisions, 3 overturns, 2 head-on collisions, 2 sideswipe collisions, 1 rear-end collision, and 1 not stated in the collision report. A more detailed investigation revealed that 18 of the accidents (15 broadside collisions) involved injuries and 1 of the accidents (broadside collision) involved a fatality. As upgrading the Route 152/Frazier Lake Road intersection will create an improved facility comprised of standard lanes and shoulders, and signalizing will regulate the movement of vehicles at this location, this project will reduce the number and severity of accidents in the future. For this reason, we are requesting that \$2 million be reserved from the 201.010 SHOPP Safety Improvement Program towards this project.

PROJECT REVIEWS:

As upgrading and signalizing the Route 152/Frazier Lake Road intersection will reduce the number and severity of accidents at this location, and as the Safety Index associated with this improvement is 404 (cost of \$2 million), Alex Kennedy, Headquarters Traffic Liaison, reviewed and concurred with this project in a meeting on July 23, 2009.

Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 4 of 4)

WARRANT 6 - Coordinated Signal System
 (All Parts Must Be Satisfied)

SATISFIED YES NO

MINIMUM REQUIREMENTS	DISTANCE TO NEAREST SIGNAL	
≥ 300 m (1000 ft)	N _____ ft, S _____ ft, E _____ ft, W _____ ft	Yes <input type="checkbox"/> No <input type="checkbox"/>
On a one-way street or a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning.		Yes <input type="checkbox"/> No <input type="checkbox"/>
OR, On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive operation.		Yes <input type="checkbox"/> No <input type="checkbox"/>

WARRANT 7 - Crash Experience Warrant
 (All Parts Must Be Satisfied)

SATISFIED YES NO

Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency.		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
REQUIREMENTS	Number of crashes within a 12 month period susceptible to correction by a traffic signal, and involving injury or damage exceeding the requirements for a reportable crash.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
5 OR MORE		
REQUIREMENTS	CONDITIONS	✓
ONE CONDITION SATISFIED 80%	Warrant 1, Condition A - Minimum Vehicular Volume	✓
	OR, Warrant 1, Condition B - Interruption of continuous traffic	
	OR, Warrant 4, Pedestrian Volume Condition Ped Vol ≥ 152 for any hour OR, Ped Vol ≥ 80 for any 4 hours	
		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

WARRANT 8 - Roadway Network
 (All Parts Must Be Satisfied)

SATISFIED YES NO

MINIMUM VOLUME REQUIREMENTS	ENTERING VOLUMES - ALL APPROACHES	✓	FULFILLED
1000 Veh/Hr	During Typical Weekday Peak Hour _____ Veh/Hr and has 5-year projected traffic volumes that meet one or more of Warrants 1, 2, and 3 during an average weekday.		Yes <input type="checkbox"/> No <input type="checkbox"/>
	OR During Each of Any 5 Hrs. of a Sat. and/or Sun _____ Veh/Hr		
CHARACTERISTICS OF MAJOR ROUTES		MAJOR ROUTE A	MAJOR ROUTE B
Hwy. System Serving as Principal Network for Through Traffic			
Rural or Suburban Highway Outside Of, Entering, or Traversing a City			
Appears as Major Route on an Official Plan			
Any Major Route Characteristics Met, Both Streets			Yes <input type="checkbox"/> No <input type="checkbox"/>

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

Calculated by <u>E. Reyes</u>	<h1 style="margin:0;">Safety Evaluation</h1> <p style="margin:0;">(SPOT Improvement)</p>	*** HQ Use Only ***
Checked by <u>R. Gutierrez</u>	Dist. Unit <u>04.352</u> EA: <u>937500</u>	HQ APPROVED _____ 3.1.20 _____ FM _____ COMPLETION DATE _____
Date <u>7/14/2009</u>		

PROJECT DATA							Rate Group from Table 2		Data: <u>12/22/05</u>		
	DIST	CO	RTE	PM to PM	LENGTH MILES	EXISTING	PROPOSED	PROPOSED IMPROVEMENT			
EXIST RDWY	04	SCI	152	11.902 11.902	0	117	104				
PROJECT LOC	At the Frazier Lake Road Intersection							LIFE	COST (\$1000)		
PROP IMPR	New Signals								15	CONST	RW
									1850	150	2000

ACCIDENT SUMMARY

BEGIN DATE	END DATE	TOTAL	FAT	INJ	F+I	PDO	SV	MV	LT	DK	WET	DRY
1/1/2003	12/31/2007	42	1	18	19	23						
NO YRS	5	Average (-) * →	0	1.0	17.9	18.6	23.4	↔ Total x% Severity				
		Difference →	0	0.0	0.1	0.4	-0.4	↔ Total - Average				
		% Severity →	100	1.8	42.6	44.4	55.6	↔ Refer to Table 2				
		Significant →	No	No	No			↔ Refer to Figure 2, either Yes(+), Yes(-), or No				

TRAFFIC DATA

RURAL
 URBAN
 SUBURBAN

1	2	3	4	5	6	7	8	9	10	11	12
ADT (1000)				VCF	TOTAL NO. OF		ACC/YR	TOTAL TRAVEL		ACCIDENTS	
PRESENT	FUTURE	AVERAGE	CROSS STREET		YEARS	ACC		MV/YR	MVM/YR	/MV	/MVM
25.5	38.2	31.85	0.3	(3/1)	(From Above)	(7/6)	0.365 x (1+4)	(9 x Mi)	(8/9)	(8/10)	
				1.25	5	42	8.40	9.42		0.89	

REDUCTION FACTOR

1	2	3	4	5	6	7	8	9	10	11	12	
METH	ACC/MV(M)	RF	AMOUNT OF RED	REDUCED ACC RATE	BASE RATE	Statewide ACC/MVM	Average ACC/MVM	DIFFERENTIAL RATE			CALC RF or IF	
	(From Above)	TABLE 1	(2 x 3)	(2 - 4)	TABLE 2	TABLE 2		(MV)	(MV)	(MVM)		
I	0.89 MV	0.20	0.18	0.71	0.70			(5 - 6)	(2 - 6)			
II	MV							0.01 (B)			(D)	
III	MVM		FOR LENGTH >= 0.5 MILE					(A)			(C)	(E)

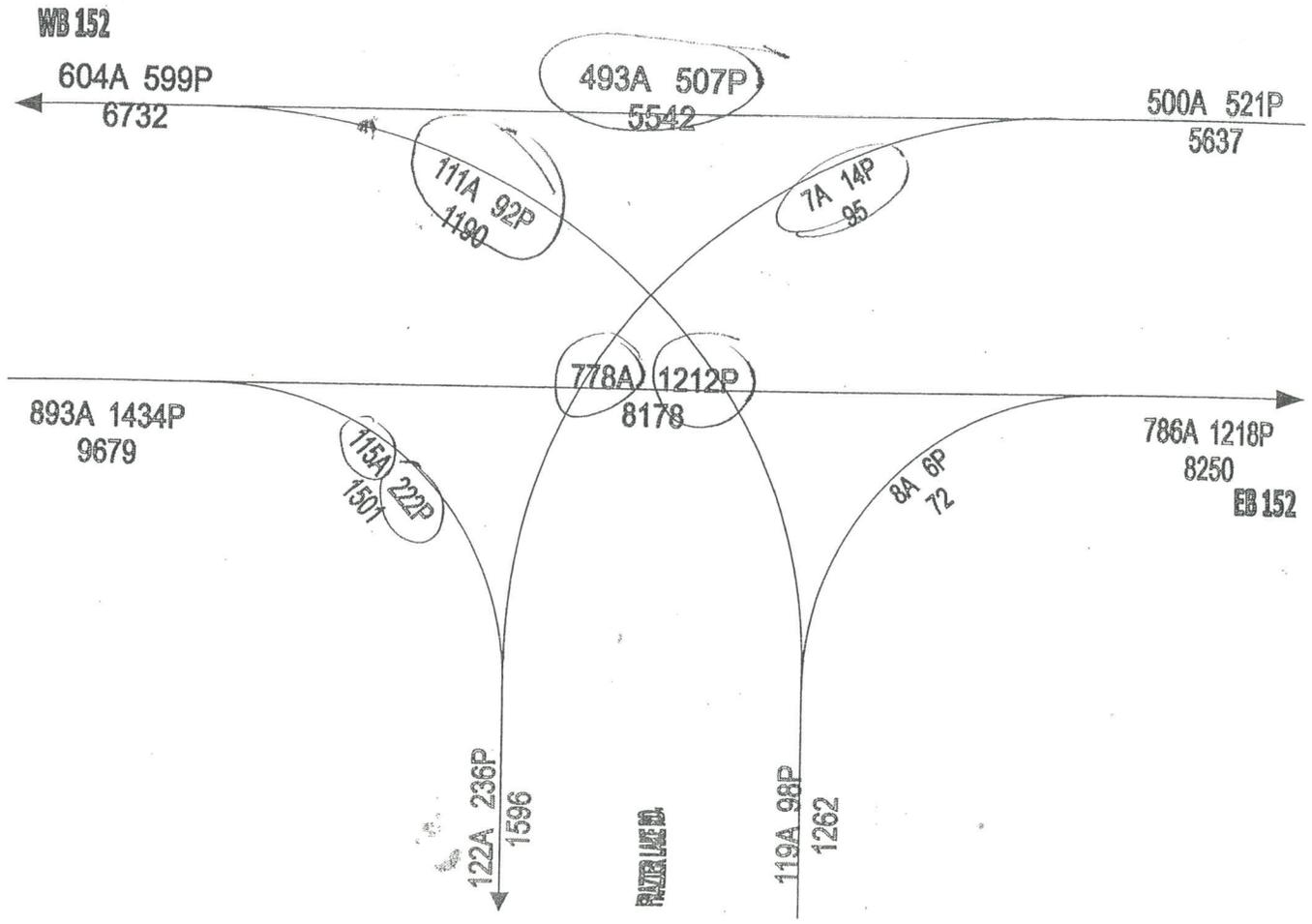
SAFETY INDEX CALCULATION

SIGNIFICANT	ACCIDENTS		BEFORE ACCIDENT COST		COST/ACC							
	(From Above)		in \$1000		TOTALS							
	Type	NUMBER	TABLE 2		(2 x 3)	(4/2)						
	F						6	7	8	9	10	11
	I						ACC/YR	VCF	LIFE	1.00 - RF or 1.00 + IF	TOTAL ACC COST (\$1000)	
	F+I						(From Above)				BEFORE	AFTER
PDO										(5 x 6 x 7)	(3 x 6 x 7)	(3 x 6 x 7 x 8)
YES (+)												
YES (-)												
NO	42	122.2	88.5			8.40	1.25	15	0.80		19231	11142
TRAFFIC SAFETY INDEX = [100 x [(9 - 11) or (10 - 11)]] / Total Cost =											404	

NOTES:

- (A) Existing ACC/MVM x (1.00 - RF), based on analysis of accidents
- (B) If (+) use RF, If (-) calculate RF by Method II
- (C) (2) - (larger of 7 or 8)
- (D) (10) / (2) or show calculations on backside of sheet
- (E) (11) / (2) for RF based on analysis of accidents

TOTAL	TRUCK AADT	% TRUCKS	2	3	4	5+
21000	2268	10.8%	308	152	50	1758



	TIME	DATE
AM PEAK	10:45-11:45	08-03-06
PM PEAK	15:45-16:45	08-03-06

FLOW DIAGRAM

CREATED BY: _____
 CHECKED BY: _____

INTERSECTION OF
 SR-152 & FRAZIER LAKE, GILROY,
 COUNTY OF SANTA CLARA
 SCL 82 - PM 11.902

ATTACHMENT I

Preliminary Geotechnical Report

Memorandum

*Flex your power!
Be energy efficient!*

To: MR. ROBERT BLANCO
District Branch Chief
Office of Advance Planning- District 4

Date: August 19, 2010

Attention: C. Dong

File: 04-SCL-152 PM 11.9
04-0G720K
Widening Frazier Lake Road
Intersection and Install Signal

From: RIFAAT NASHED *RN*
Engineering Geologist
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

GRANT WILCOX *GW*
Chief, Branch B
Office of Geotechnical Design – West
Geotechnical Services
Division of Engineering Services

Subject: Preliminary Geotechnical Report

This report represents the results of our geological and geotechnical studies performed for the proposed improvement of Highway 152/ Frazier Lake Road intersection.

The purpose of this report is to evaluate the geotechnical potential impacts, to document the geotechnical conditions of the proposed project.

INTRODUCTION

Route 152 (Pacheco Pass Highway) serves as important link between the Santa Clara Valley and the Central Valley of California.

Initial improvement of this roadway as a State highway consisted of the construction of 21 ft wide gravel road in 1924. The pavement has been overlaid and widened on numerous occasions since the original construction ¹(Caltrans – Materials File, 1986)

Route 152 is an interregional, recreational, commercial, agricultural and commuter route which serves as a major route connecting Route 101 with Interstate 5. Within the limits of this project, Route 152 is a two-lane undivided conventional highway, running east west, located approximately 3 miles east of Route 101, featuring 12-foot lanes and

¹ Caltrans, 1986, Materials Files, SCL-152 PM9.9/12.8, Junction Rte 101 to Ferguson Road, EA 4272-117880.

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outside shoulders that vary between 0 and 8 feet in width. Route 152 traverses through the Frazier Lake Road intersection (Fig 1). South of this intersection is Frazier Lake Road to Bloomfield Avenue Road that runs in an east-west direction and links Frazier Lake Road with Route 25.

PROJECT DESCRIPTION AND EXISTING FACILITIES

The proposed project is to improve the safety on Pacheco Pass Hwy segment of State Route 152 in Santa Clara County at Post Mile 11.9, east of the City of Gilroy. (See Location Map (Fig.1)). The project purpose is to eliminate or minimize emerging safety problems as recommended by “the Two-Three-Lane Safety Monitoring” program. By constructing the improvements proposed at the Route 152/Frazier Lake Road intersection, it will help reduce cross-centerline accidents at the subject location.

There are two proposed alternatives (Alternative 1 and 2) that would include roadway widening to accommodate a southbound right-turn lane and the installation of traffic signal to improve safety and operation. Alternative 1 would require a retaining wall at the southwest corner of the intersection.

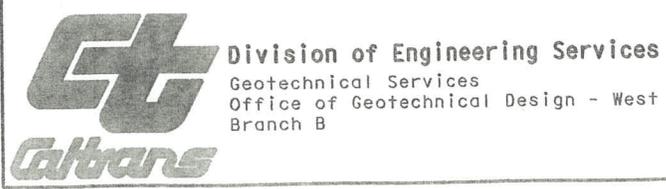
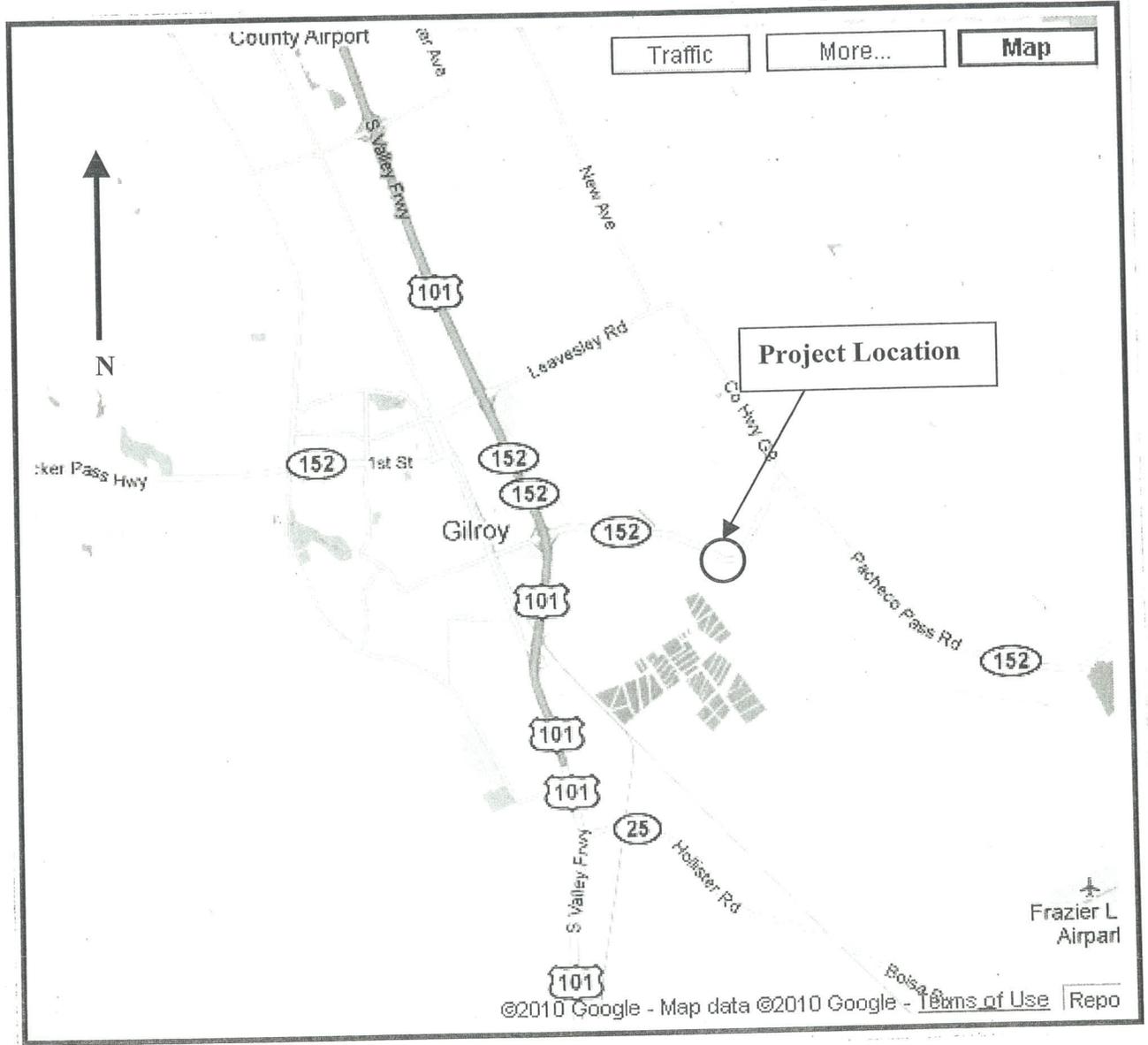
PHYSICAL SETTING

Climate

Santa Clara County has moderate temperatures and light to heavy precipitation. During the summer, the cool temperature and the prevailing weather, moderate to strong, west and north west offshore winds move into the San Francisco Bay area at low elevations; thus, the effect of the marine air is felt in the Santa Clara Valley mainly late in the afternoon and in the evening ²(USDA, 1974).

In the project area the average maximum temperature is between 71° F and 72 F° and the minimum temperature is between 46.1° F and 49.6 F°. Most precipitation in southern Santa Clara County occurs during winter months as rain. The average annual precipitation at the project area is between 14.66 and 24.78 inch (Western Climate Center, wrrcc@dri.edu).

² USDA, 1978, Soil Survey of Eastern Santa Clara Area, CA.



RTE. 152/ FRAZIER LAKE RD. IC	
04-SCL-152	EA 0G720K
PM 11.9	JULY 2010
LOCATION MAP	FIGURE 1

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Topography and Drainage

The project area is located in the southern Santa Clara Valley that is a broad valley and separates the Diablo Range from Santa Cruz Mountains. Hollister Valley lies at the southern end of the Santa Clara Valley and separated from it by the Pajaro River. The project area is located in Old Gilroy City, north of the Pajaro River, 2 miles east of Gilroy City and Route 101.

The project area is nearly flat. The average elevation in the project area is approximately 170 ft.

The project area is drained by the Pajaro River, which flows southwesterly, ultimately emptying into Monterey Bay. The Pajaro River flows out to Hollister Valley through a narrow steep walled valley known as "Pajaro Gap"³(Caltrans, PGR, 1991). There are numerous drainage creeks adjacent to the project area: Llagas Creek, Furlong Creek, Dexter Creek, and Johnson Creek.

GEOLOGICAL SETTING

Regional Geology

The Project area is located in southernmost Santa Clara Valley. The Santa Clara Valley is a broad alleviated valley, which separates the Diablo Range from the Santa Cruz Mountain (Fig. 2) within the Central Coast Range⁴(CDMG, 1973). This broad valley has been filled with large quantities of sand, silt, clay and gravels more or less continuously for the last 4 million years (Caltrans, PGR, 1991). The Santa Clara Valley is a structural trough extending 110 km southeast from San Francisco.

The structures in southernmost Santa Clara County with the largest amount of cumulative offset are the block boundary faults. These faults must have undergone large amounts of offset to bring the distinct stratigraphic sequence into juxtaposition. The offset probably mostly predates the Quaternary deposition of surficial deposits in the Santa Clara Valley, judging from the absence of a pronounced lineament or offset of Quaternary units.

³ Caltrans 1991 & 1991 Geotechnical Report For Environmental Study, SCL/SBT, PM 5.4/22.1, EA4142-152000, Route 152 Transportation Corridor Study
⁴ California Division of Mines and Geology, 1973, Environmental Geological Analysis of the South County Study Area, Santa Clara County- Preliminary Report 18.

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Santa Clara Valley contains a large Quaternary alluvial complex overlying and obscuring bedrock relationship. The valley is bounded on the southwest by the San Andreas Fault and on the northeast by Hayward and Claveras Faults (Fig.3). The consolidated bedrock bordering the valley ranges in age from Cretaceous to Pliocene and consists largely of sedimentary rocks but includes areas of metamorphic and igneous rocks ⁵(USGS, 1997).

Site Geology

The project area is covered entirely by Alluvial Fan and Fluvial Deposits (Holocene), (Fig. 2).

Alluvial Fan and Fluvial Deposits are brown or tan, medium to dense, gravely sand or sandy gravel that generally grades upward to sandy or silty clay. Near distal fan edges, the fluvial deposits are typically brown, never reddish, medium dense sand that fines upward to sandy or silty clay (USGS, 1997).

Caltrans conducted a foundation investigation in 1986 and 1987 at Johnson Creek Bridge (PM12.58), just adjacent to the project area. The foundation study consisted of 1-inch soil tube test and one rotary sample boring. The foundation material encountered at this site consists of stiff to very stiff brown silty clay and clay overlying dense to very dense brown coarse sand and gravel ⁶(Materials Files, 1987).

Soils

A general soil map of Santa Clara Area, California is shown in Fig. 4. The distribution of soils covering the project sites (see the Appendix A) is as follows:

Yolo loam, 0 to 2 percent slopes. This soil is on small to medium -sized fans. The texture of the surface layer is loam or light clay loam. Included with this soil in mapping area areas of Garretson gravelly loam and Yolo loam that have slopes range to 9 percent. Run off is slow, and the hazard of erosion is slight. Shrink-swell is moderate; corrosivity is low and permeability ranges between 0.63 and 2.00 inch per hour.

⁵ Graymer, R. W., 1997, Geology of Southermost Santa Clara, California, US. Geological Survey, Open File Report 97-710

⁶ Caltrans, 1987, Materials File, From 10th Street Separation East of Ferguson Road, EA 04-117880.

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Seismicity

The project area is near three active fault zones: San Andreas Fault, 8.5 miles to the west; the Sargent Fault, 4.7 miles to the west of the project area; and the Calaveras Fault, 2.2 miles to the east (Fig 3).

By applying the Caltrans ARS (shake) program, the dominant fault for the project area is Calaveras Fault with Maximum Magnitude (Mmax) of 7.4; estimated Deterministic Peak Bed Rock Acceleration (PBA) 0.45 and probabilistic USGS 5% in 50 years hazard anticipated 0.89.

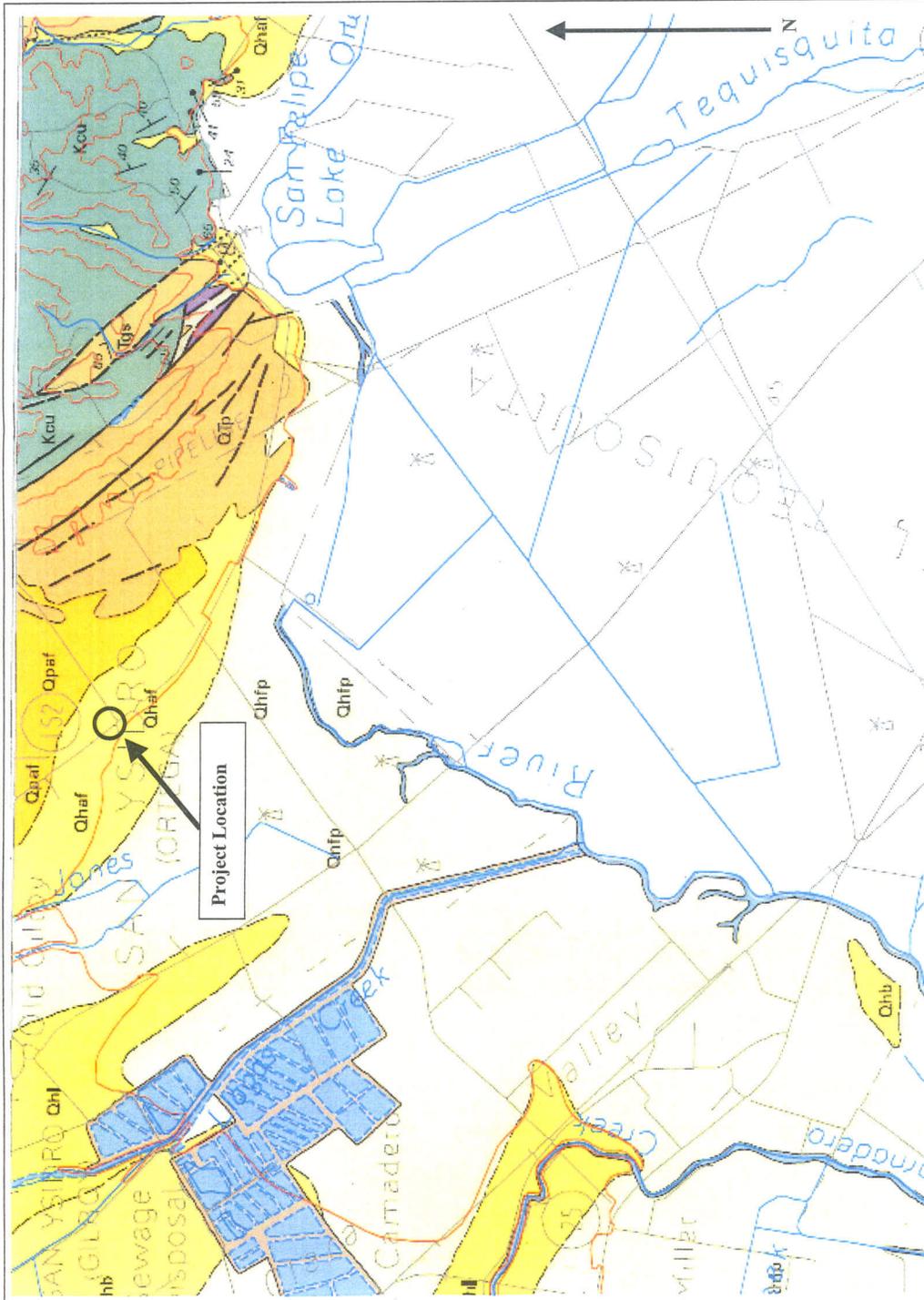
The Calaveras Fault is a major strand of the San Andreas Fault system, having as much as 170 km of Miocene or lateral-right offset, much of which may have been complete by about 3 to 5 Ma⁷ (McLaughlin and others, 1996). The Calaveras Fault is also the one active fault in the study area that has generated historic large earthquakes. It has an average short-term right-lateral seismic slip (creep) rate of 1.5 cm/yr. Trenching studies suggested 14 ± 5 mm/yr late Holocene geologic slip rate at latitude of Gilroy.

The Calaveras Fault has a probability of 18 % at least one $M \geq 6.7$ Earthquake before 2030 (USGS, 1999 – Earthquake Probability, Fault Classification Study, Working Group 99).

The Sargent Fault is Holocene active reverse-oblique and dextral strike-slip fault zone in the Santa Cruz Mountains, located between the Calaveras and San Andreas Fault zones. There is geodetic evidence of 3 mm/yr dextral creep (Prescott and Burford, 1976). Nolan and others, 1995 reported a preliminary recurrence interval of 1,200 – 1300 years for 0.7-0 slip events.

The San Andreas Fault is paralleled offshore to the west by the San Gregorio-Hosgri fault system and displays large right-lateral offset. The northward movement of the Pacific plate relative to North America is manifested in coastal California as slip along the San Andreas Fault zone and the subsidiary faults (Herd, 1979 & USGS-OF98-137).

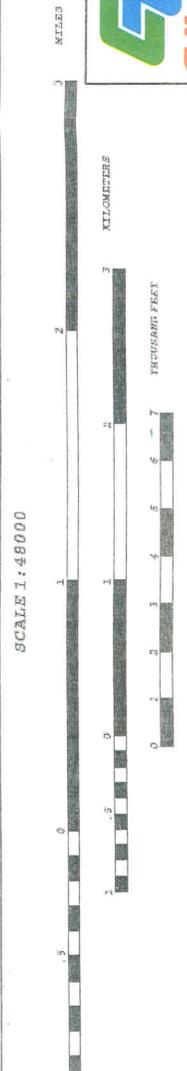
Mualchin, L., 1996, Technical Report to accompany the California Seismic Hazard Map, California Department of Transportation.



Geologic Units

- Qh1** - Natural Levee Deposits (Holocene)
- Qhfp** - Floodplain deposits (Holocene)
- Qhb** - Basin Deposits (Holocene)
- Qhaf** - Alluvial Fan and Fluvial Deposits (Holocene)
- Qpaf** - Alluvial Fans and Fluvial Deposits (Pleistocene)
- Qtp** - Packwood Gravels of Crittenda (Pliocene & Pleistocene)
- Tgs** - Glauconitic sandstone (Paleocene and/or Eocene)
- Kcu** - Sandstone, mudstone, and conglomerate (Late Cretaceous)

Source: Graymer, R.W., 1997, Geology of the Southernmost Part of Santa Clara, USGS OFR 97-710



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The San Andreas Fault zone is considered to be the Holocene and historically active dextral strike-slip fault that extends along most of coastal California. Historic fault creep at rates as high as 32 mm/yr characterizes the 132-km-long in the creeping section in central California (Burford and Harsh, 1980). The creep rate gradually tapers off to 0 mm/yr at the northwestern and southeastern ends of this section. The northern and southern ends of the creeping section are transitional to the surface-rupture termination points of the 1906 Earthquake to the north and 1857 Earthquake to the south (USGS, 2002).

San Andreas Fault has a probability of 21% at least one $M \geq 6.7$ Earthquake before 2030 (USGS, 1999 – Earthquake Probability, Fault Classification Study, Working Group 99).

Seismic Hazard

The site may be affected by activity along any of active faults discussed above. Earthquakes induce hazards can be divided into primary and secondary seismic effects.

Primary seismic effects such as ground rupture or surface deformation resulting from differential movement along a fault trace are not expected to occur on the site. The project area is not intersected by any known faults.

Secondary seismic effects result from various soil responses to ground acceleration. These effects may result from activity on any of the nearby active faults.

Ground Shaking

The site is expected to undergo strong ground shaking in response to local earthquake events. According to ABAG earthquake, it is classified as “very strong level to violent”. The ground at the site is not considered unsuitable and therefore, structures built to the requirements of latest uniform Building Code would be expected to withstand the ground shaking induced by earthquake.

Cracking – Southwest of the project area (south of Gilroy), near the Pajaro River, settlement occurred in alluvium, and lurch cracks were found on the floodplain (CDMG, 1973).

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Liquefaction of Natural Ground – Previous foundation study adjacent to and included in the project area (from 10th street separation east to Ferguson Road) in 1986 and 1987, indicates that the foundation material encountered consists of stiff to very stiff brown silty clay and clay overlying dense to very dense brown coarse sand and gravel (Materials File, 1987). This material is not considered as liquefiable materials.

According to USGS Liquefaction Susceptibility Level Map (<http://quake.abag.ca.gov>), the liquefaction potential for the project area is moderate.

GEOLOGICAL AND GEOTECHNICAL CONSIDERATIONS

Excavation Characteristics

Excavation will be required in some areas to facilitate the installation of underground utilities and drainage structure.

According to a widening Project Report at PM 9.4/ 10.1 (just north of the project site) prepared by Greiner, Inc in 1996, excavated material composed of saturated clay, muck or other material not suitable for backfill shall not be used in the backfill of the trench. Where such unsuitable material is encountered, it shall be replaced with sand, drain rock or aggregate base rock. The excavated material not suitable for backfill shall be removed from the job site. The trench may be backfilled with native material resulting from trench excavation, or with select imported material. Tamping and/or rolling may accomplish compaction to a relative density of 95%. In unimproved areas, native material acceptable for use as backfill, compacted to a relative density of 90% may be used.

It is expected that both temporary construction and permanent dewatering installations will be necessary to handle water that may be encountered in the excavations.

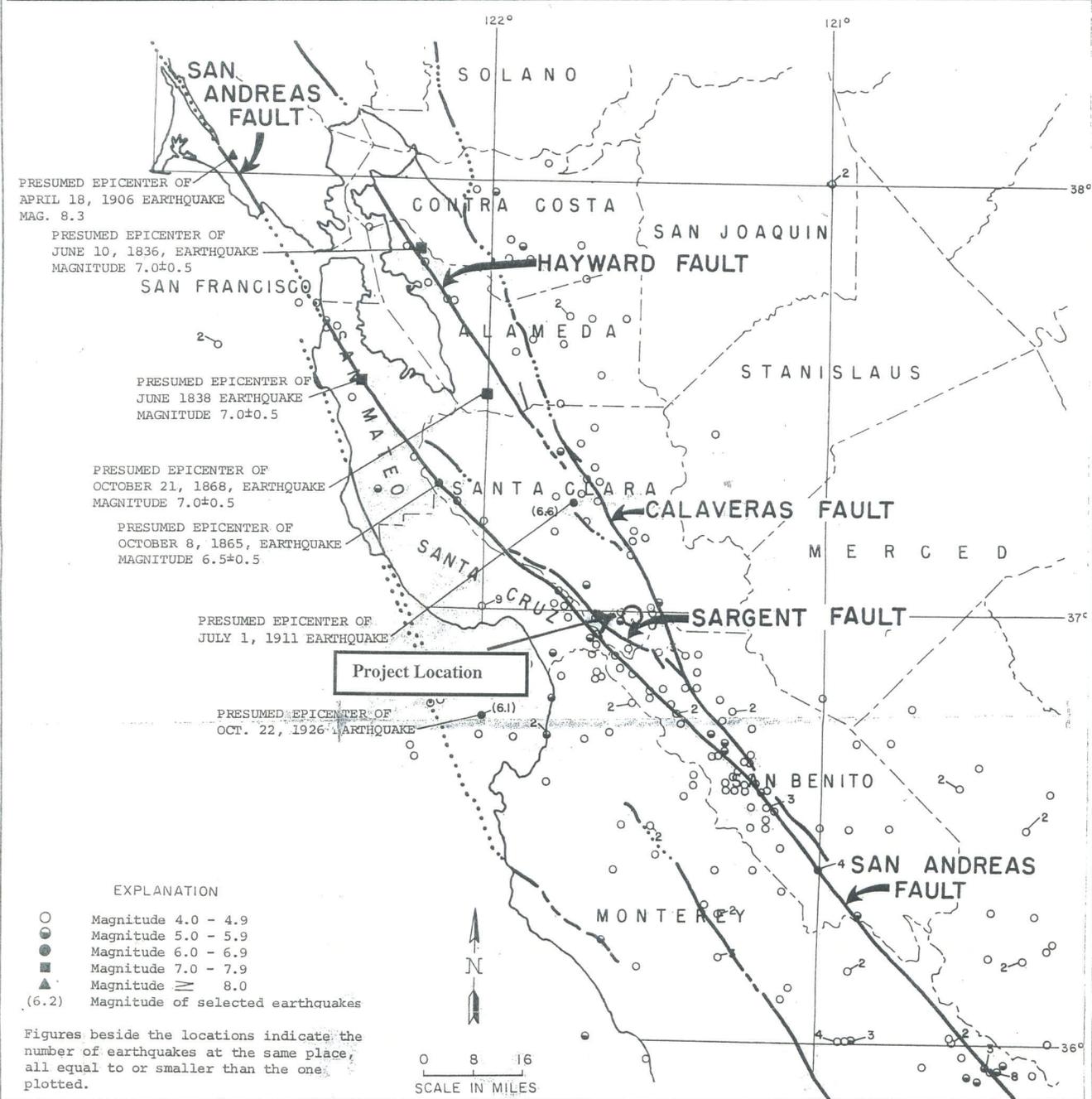
Borings may be drilled to determine if water is present within the expected depth of any planned excavation.

Erosion

According to the Eastern Santa Clara Area, California, USDA, 1974, erosion within the project limits can be classified as slight.

REGIONAL SEISMICITY MAP

includes earthquakes during the period 1934 through 1971 and selected pre-1934 earthquakes of magnitude 6.0 or greater (after Williams *et al.*, 1973).



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Excessive erosion can result in gullyng, clogging of drainage facilities, and habitat destruction by sedimentation. The risk of sedimentation to local waterway will be greatest during construction.

Two broad categories of erosion control methods are vegetative and structural.

Groundwater

The project area is located in the Llagas sub-basin. The Llagas sub-basin is located northerly of the Pajaro River and underlies the project alignment. This sub-basin is defined by the Santa Cruz Range on the west, the Diablo Range on the east, the Coyote sub-basin (just north of Morgan Hill) on the north. Groundwater flow within the Llagas sub-basin is southward toward the Pajaro River.

Borings (LOTB's) from previous work in 1986 and 1987 (Appendix B) adjacent to the project area at Dexter Creek Bridge (PM 12.3) and Johnson Creek Bridge (PM 12.58) indicate that the approximate groundwater elevation is 162.2 ft and at depth below ground surface ranging from one foot at PM 12.3 to 13 feet at PM 12.58.

Embankment

The foundation study at Johnson Creek bridge (PM 12.58) consisted of one 1-inch soil tube test and one rotary sample boring. The foundation material encountered at the site consists of stiff to very stiff brown silty clay and clay overlying dense to very dense brown coarse sand and gravel (Materials File, 1987).

Settlement

Some settlement and cracking could be expected during a large earthquake on one of nearby faults. Subsequent pavement distress is likely to be minor and easily repairable. The potential for shear failure of embankment is considered low. Good construction practice in embankment replacement, with standard compaction requirements and testing, will significantly reduce the potential for cracking, settlement, and/or shear failure within the embankment due to seismic shaking (Caltrans - PGR, 1991).

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Slope Stability

The project area is almost entirely flat and there is no any slope in concern. Site reconnaissance and aerial photograph analysis revealed no landslides that underlie or are immediately adjacent to the project (Caltrans - PGR, 1991).

PRELIMINARY RECOMMENDATIONS

Exploration and Investigation

The field exploration and investigation of this project should include borings, SPT, cone penetrometer (CPT) tests. Laboratory tests should include corrosion, moisture content, density, plasticity index, gradation, consolidation, and shear strength tests.

Geotechnical

Fill, cut, retaining wall, traffic signals, improving drainage facilities are required for widening, upgrade and modify the Frazier Lake Road/ Hwy 152 Intersection. Also, removal of unsuitable material and removal of trees and shrubs, land acquisition is needed.

Embankment Foundation Treatment

In general, foundation conditions are anticipated to be fair to good. The underlying soils appear to be adequate to support such embankments, subject to localized shallow stripping or foundation treatment where needed.

Soils which have been determined by the USDA Soil Conservation Services to exhibit moderate shrink-swell potential underlies virtual all the proposed alignment.

Additional soil sampling and testing would be required. Once identified, expansive soils could be given special consideration in design and construction.

Corrosion

Caltrans conducted a previous Corrosion Study in 1986 for the same area. The corrosion investigation consisted of sampling of soil and water from existing drainage ways,

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laboratory testing, and inspection of the existing facilities. Test results indicate a pH range from 7.4 to 8.4 and resistivities of 600 to 2100 ohm-cm, resulting in an estimated service life from approximately 20 to 30 years for standard 18 gage metal pipe (Materials File, 1986).

PERMITS

This project requires permits of entry and drilling since a new right of way is required for this project to construct areas for permanent "Treatment Best Management Practices (BMP's)". Agricultural part takes are involved in this project to accommodate the replacement of a Treatment BMP that is required due to the construction.

Conclusions and recommendations presented in this report are based on site reconnaissance and literature review. This study should be followed up with subsurface and laboratory study.

If you have any questions or need additional information, please call me at (510) 622-1773 or Grant Wilcox at (510) 286-4835.

c: TPokrywka, GWilcox, PCE(RSchaerli), Daily File

RNashed/mm

ATTACHMENT J

Risk Management Plan

Project Risk Register

DIST- EA		04-0G720K		Project Name: Upgrade intersection and install signal at Frazier Lake Road intersection Co - Rte - PM: SCL-152-11.9		Project Manager: Nick Saleh Telephone: (510) 286-6355		Last Updated:									
ID #	Status	Threat/ Opportunity	Category	Date Risk Identified	Risk Description	Root Causes	Primary Objective	Overall Risk Rating	Cost/Time Impact Value	Risk Owner	Risk Trigger	Strategy	Response Actions w/ Pros & Cons	Adjusted Cost/Time Impact Value	WBS Item	Date Created:	Status Date and Review Comments
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)	(r)
04-0G720K-01	Active	Threat	EXT	11/15/10	Landowner unwilling to sell	Complexity and Interface	SCOPE	Low Probability (20-39%) Impact 2 = Low		Nick Saleh (510) 286-6355 Nick.Saleh@sdi.ca.gov	PAVED	Avoid			225 OBTAIN RIGHT OF WAY INTERESTS FOR PROJECT RIGHT OF WAY CERTIFICATION	11/15/10	
04-0G720K-02	Active	Threat	EXT	11/15/10	Increase in material cost due to market forces		COST	Med Probability (20-39%) Impact 4 = Med		Nick Saleh 5102866355 Nick.Saleh@sdi.ca.gov	PS&E	Mitigate			270 CONSTRUCTION ENGINEERING AND GENERAL CONTRACT ADMINISTRATION		
04-0G720K-03	Active	Threat	R/W	11/15/10	Right of Way Data Sheet incomplete or underestimated		COST	Med Probability (10-19%) Impact 4 = Med		Nick Saleh 5102866355	Preliminary Engineering	Avoid			225 OBTAIN RIGHT OF WAY INTERESTS FOR PROJECT RIGHT OF WAY CERTIFICATION		
04-0G720K-04	Active	Threat	R/W	11/15/10	Additional R/W and Construction Easement may be needed		COST	Low Probability (10-19%) Impact 2 = Low		Nick Saleh 5102866355 Nick.Saleh@sdi.ca.gov	PS&E	MITIGATE			185 PREPARE BASE MAPS AND PLAN SHEETS		
04-0G720K-05	Active	Threat	DES	11/15/10	Inaccurate assumptions on technical issues in planning stage		SCOPE	Med Probability (10-19%) Impact 4 = Med		Nick Saleh 5102866355 Nick.Saleh@sdi.ca.gov	Preliminary Engineering	Avoid			180 PREPARE AND APPROVE PROJECT REPORT AND FINAL ENVIRONMENTAL DOCUMENT		
04-0G720K-06	Active	Threat	ENV	11/15/10	Measures to minimize noise and dust impact during construction	Requirement	COST	Low Probability (10-19%) Impact 2 = Low		Patricia Maurice 5102866563 Patricia.Maurice@sdi.ca.gov	Construction	MITIGATE			165 PERFORM ENVIRONMENTAL STUDIES AND PREPARE DRAFT ENVIRONMENTAL DOCUMENT		
04-0G720K-07	Active	Threat	CON	11/15/10	Hazardous materials encounter during construction	Requirement	TIME	Low Probability (10-19%) Impact 2 = Low		Nick Saleh 5102866355 Nick.Saleh@sdi.ca.gov	Soil testing during the PS&E	MITIGATE			230 PREPARE DRAFT PS&E		

Project Risk Register

DIST- EA		04-0G720K		Project Name: Upgrade Intersection and install signal at Frazier Lake Road Intersection		Project Manager: Nick Saleh		Telephone: (510) 286-6355		Date Created: 11/15/10		Last Updated:				
ID #	Status	Threat/ Opportunity	Category	Date Risk Identified	Risk Description	Root Causes	Primary Objective	Overall Risk Rating	Cost/Time Impact Value	Risk Owner	Risk Trigger	Strategy	Response Actions w/ Pros & Cons	Adjusted Cost/Time Impact Value	WBS Item	Status Date and Review Comments
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)	(m)	(n)	(o)	(p)	(q)
04-0G720K-08	Active	Threat	ENV	11/15/10	Storm water pollution Prevention Plan	requirement	COST	2=Low (10-19%) Med Impact 4=Med		Patricia Maurice 5102866563 Patricia.Maurice@dot.ca.gov	PS&E	MITIGATE			185 PERFORM ENVIRONMENTAL STUDIES AND PREPARE DRAFT ENVIRONMENTAL DOCUMENT	
04-0G720K-08	Active	Threat	ENV	11/15/10	Potential visual Impact	Requirement for alternative 1	COST	3=Med (20-39%) Med Impact 4=Med		Patricia Maurice 5102866563 Patricia.Maurice@dot.ca.gov	PS&E	MITIGATE			185 PERFORM ENVIRONMENTAL STUDIES AND PREPARE DRAFT ENVIRONMENTAL DOCUMENT	
								Probability								
								Impact								
								Probability								
								Impact								

ATTACHMENT K

Life Cycle Cost Analysis

RealCost Input Data

1. Economic Variables	
Value of Time for Passenger Cars (\$/hour)	\$10.46
Value of Time for Single Unit Trucks (\$/hour)	\$27.83
Value of Time for Combination Trucks (\$/hour)	\$27.83
2. Analysis Options	
Include User Costs in Analysis	Yes
Include User Cost Remaining Service Life Value	Yes
Use Differential User Costs	Yes
User Cost Computation Method	Calculated
Include Agency Cost Remaining Service Life Value	Yes
Traffic Direction	Both
Analysis Period (Years)	55
Beginning of Analysis Period	2011
Discount Rate (%)	4.0
3. Project Details and Quantity Calculations	
State Route	152
Project Name	Upgrade Intersection and Install Signal
Region	District 4
County	Santa Clara
Analyzed By	Cederick Dong
Mileposts	
Begin	11.80
End	12.10
Length of Project (miles)	0.30
Comments	
4. Traffic Data	
AADT Construction Year (total for both directions)	32,000
Cars as Percentage of AADT (%)	86.3
Single Unit Trucks as Percentage of AADT (%)	2.1
Combination Trucks as Percentage of AADT (%)	11.7
Annual Growth Rate of Traffic (%)	1.1
Speed Limit Under Normal Operating Conditions (mph)	25
No of Lanes in Each Direction During Normal Conditions	1
Free Flow Capacity (vphpl)	2080
Rural or Urban Hourly Traffic Distribution	Rural
Queue Dissipation Capacity (vphpl)	1700
Maximum AADT (total for both directions)	53,773
Maximum Queue Length (miles)	5.0

Alternative 1

Initial Construction	Widening shoulder and construct a right turn lane	
Agency Construction Cost (\$1000)	\$2,600.00	
User Work Zone Costs (\$1000)		
Work Zone Duration (days)	70	
No of Lanes Open in Each Direction During Work Zone	0.5	
Activity Service Life (years)	55.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost (\$1000)	2	
Work Zone Length (miles)	1.00	
Work Zone Speed Limit (mph)	10	
Work Zone Capacity (vphpl)	1510	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Rehabilitation #1	22year CAMP	
Agency Construction Cost (\$1000)	\$96.00	
User Work Zone Costs (\$1000)		
Work Zone Duration (days)	4	
No of Lanes Open in Each Direction During Work Zone	0.5	
Activity Service Life (years)	5.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost (\$1000)	0.7	
Work Zone Length (miles)	1.00	
Work Zone Speed Limit (mph)	10	
Work Zone Capacity (vphpl)	1510	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	6
Second period of lane closure	20	24
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	6
Second period of lane closure	20	24
Third period of lane closure		

Rehabilitation #2		25-year rehab	
Agency Construction Cost (\$1000)		\$227.00	
User Work Zone Costs (\$1000)			
Work Zone Duration (days)		4	
No of Lanes Open in Each Direction During Work Zone		0.5	
Activity Service Life (years)		20.0	
Maintenance Frequency (years)		1	
Agency Maintenance Cost (\$1000)		1.74	
Work Zone Length (miles)		1.00	
Work Zone Speed Limit (mph)		10	
Work Zone Capacity (vphpl)		1510	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)			
Inbound		Start	End
First period of lane closure		0	6
Second period of lane closure		20	24
Third period of lane closure			
Outbound		Start	End
First period of lane closure		0	6
Second period of lane closure		20	24
Third period of lane closure			

Rehabilitation #3		45 year CAPM	
Agency Construction Cost (\$1000)		\$96.00	
User Work Zone Costs (\$1000)			
Work Zone Duration (days)		4	
No of Lanes Open in Each Direction During Work Zone		0.5	
Activity Service Life (years)		5.0	
Maintenance Frequency (years)		1	
Agency Maintenance Cost (\$1000)		0.7	
Work Zone Length (miles)		1.00	
Work Zone Speed Limit (mph)		10	
Work Zone Capacity (vphpl)		1510	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)			
Inbound		Start	End
First period of lane closure		0	6
Second period of lane closure		20	24
Third period of lane closure			
Outbound		Start	End
First period of lane closure		0	6
Second period of lane closure		20	24
Third period of lane closure			

Rehabilitation #4		50 year Rehab	
Agency Construction Cost (\$1000)		\$227.00	
User Work Zone Costs (\$1000)			
Work Zone Duration (days)		4	
No of Lanes Open in Each Direction During Work Zone		0.5	
Activity Service Life (years)		20.0	
Maintenance Frequency (years)		1	
Agency Maintenance Cost (\$1000)		1.74	
Work Zone Length (miles)		1.00	
Work Zone Speed Limit (mph)		10	
Work Zone Capacity (vphpl)		1510	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)			
Inbound		Start	End
First period of lane closure		0	6
Second period of lane closure		20	24
Third period of lane closure			
Outbound		Start	End
First period of lane closure		0	6
Second period of lane closure		20	24
Third period of lane closure			

Rehabilitation #5			
Agency Construction Cost (\$1000)			
User Work Zone Costs (\$1000)			
Work Zone Duration (days)			
No of Lanes Open in Each Direction During Work Zone			
Activity Service Life (years)			
Maintenance Frequency (years)			
Agency Maintenance Cost (\$1000)			
Work Zone Length (miles)			
Work Zone Speed Limit (mph)			
Work Zone Capacity (vphpl)			
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)			
Inbound		Start	End
First period of lane closure			
Second period of lane closure			
Third period of lane closure			
Outbound		Start	End
First period of lane closure			
Second period of lane closure			
Third period of lane closure			

Rehabilitation #6		
Agency Construction Cost (\$1000)		
User Work Zone Costs (\$1000)		
Work Zone Duration (days)		
No of Lanes Open in Each Direction During Work Zone		
Activity Service Life (years)		
Maintenance Frequency (years)		
Agency Maintenance Cost (\$1000)		
Work Zone Length (miles)		
Work Zone Speed Limit (mph)		
Work Zone Capacity (vphpl)		
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

Alternative 2

Initial Construction	Widening shoulder and construct a right turn lane	
Agency Construction Cost (\$1000)	\$2,600.00	
User Work Zone Costs (\$1000)		
Work Zone Duration (days)	70	
No of Lanes Open in Each Direction During Work Zone	0.5	
Activity Service Life (years)	55.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost (\$1000)	1.3	
Work Zone Length (miles)	1.00	
Work Zone Speed Limit (mph)	10	
Work Zone Capacity (vphpl)	1510	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Rehabilitation #1	22 CAPM	
Agency Construction Cost (\$1000)	\$97.00	
User Work Zone Costs (\$1000)		
Work Zone Duration (days)	4	
No of Lanes Open in Each Direction During Work Zone	0.5	
Activity Service Life (years)	6.0	
Maintenance Frequency (years)	1	
Agency Maintenance Cost (\$1000)	0.54	
Work Zone Length (miles)	1.00	
Work Zone Speed Limit (mph)	10	
Work Zone Capacity (vphpl)	1510	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	2
Second period of lane closure	20	24
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	6
Second period of lane closure	20	24
Third period of lane closure		

Rehabilitation #2		28 Rehab	
Agency Construction Cost (\$1000)		\$227.00	
User Work Zone Costs (\$1000)			
Work Zone Duration (days)		4	
No of Lanes Open in Each Direction During Work Zone		0.5	
Activity Service Life (years)		22.0	
Maintenance Frequency (years)		1	
Agency Maintenance Cost (\$1000)		1.5	
Work Zone Length (miles)		1.00	
Work Zone Speed Limit (mph)		10	
Work Zone Capacity (vphpl)		1510	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)			
Inbound		Start	End
First period of lane closure		0	2
Second period of lane closure		20	24
Third period of lane closure			
Outbound		Start	End
First period of lane closure		0	6
Second period of lane closure		20	24
Third period of lane closure			

Rehabilitation #3		50 CAPM	
Agency Construction Cost (\$1000)		\$97.00	
User Work Zone Costs (\$1000)			
Work Zone Duration (days)		4	
No of Lanes Open in Each Direction During Work Zone		0.5	
Activity Service Life (years)		6.0	
Maintenance Frequency (years)		1	
Agency Maintenance Cost (\$1000)		0.54	
Work Zone Length (miles)		1.00	
Work Zone Speed Limit (mph)		10	
Work Zone Capacity (vphpl)		1510	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)			
Inbound		Start	End
First period of lane closure		0	6
Second period of lane closure		20	24
Third period of lane closure			
Outbound		Start	End
First period of lane closure		0	6
Second period of lane closure		20	24
Third period of lane closure			

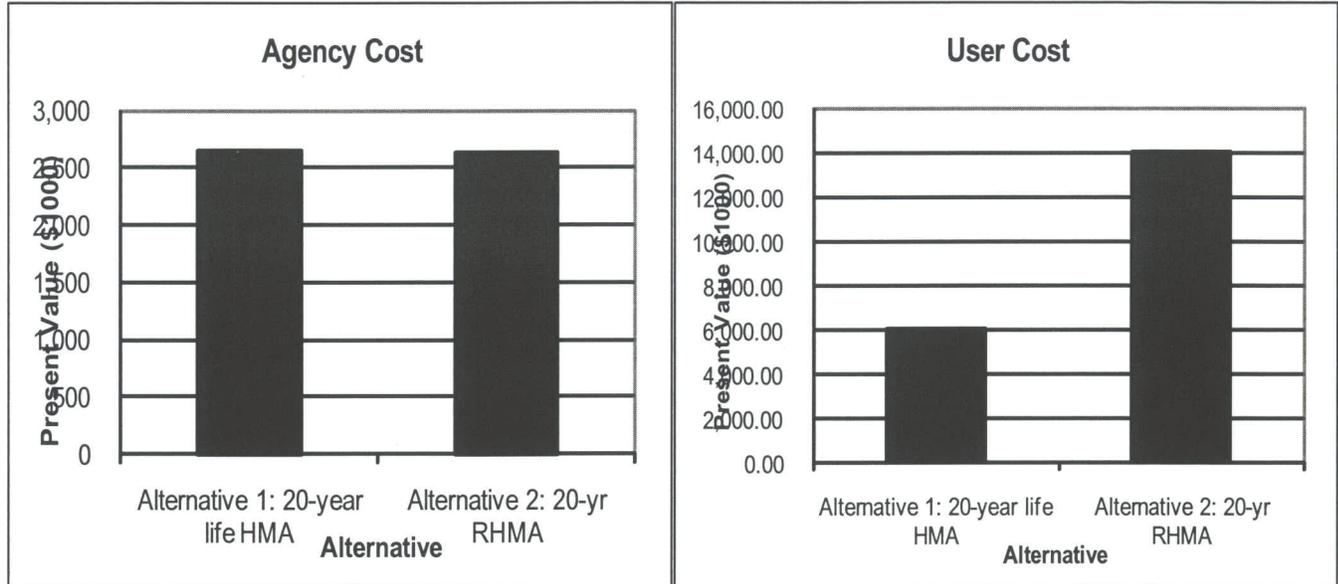
Rehabilitation #4		
Agency Construction Cost (\$1000)		
User Work Zone Costs (\$1000)		
Work Zone Duration (days)		
No of Lanes Open in Each Direction During Work Zone		
Activity Service Life (years)		
Maintenance Frequency (years)		
Agency Maintenance Cost (\$1000)		
Work Zone Length (miles)		
Work Zone Speed Limit (mph)		
Work Zone Capacity (vphpl)		
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

Rehabilitation #5		
Agency Construction Cost (\$1000)		
User Work Zone Costs (\$1000)		
Work Zone Duration (days)		
No of Lanes Open in Each Direction During Work Zone		
Activity Service Life (years)		
Maintenance Frequency (years)		
Agency Maintenance Cost (\$1000)		
Work Zone Length (miles)		
Work Zone Speed Limit (mph)		
Work Zone Capacity (vphpl)		
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

Rehabilitation #6		
Agency Construction Cost (\$1000)		
User Work Zone Costs (\$1000)		
Work Zone Duration (days)		
No of Lanes Open in Each Direction During Work Zone		
Activity Service Life (years)		
Maintenance Frequency (years)		
Agency Maintenance Cost (\$1000)		
Work Zone Length (miles)		
Work Zone Speed Limit (mph)		
Work Zone Capacity (vphpl)		
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

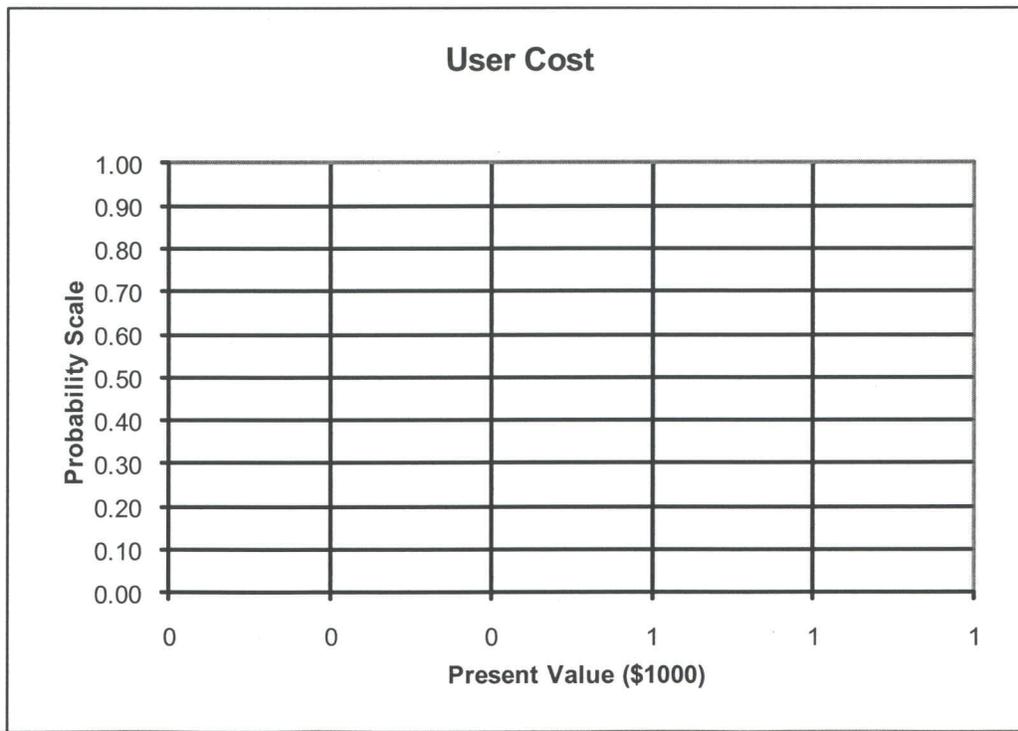
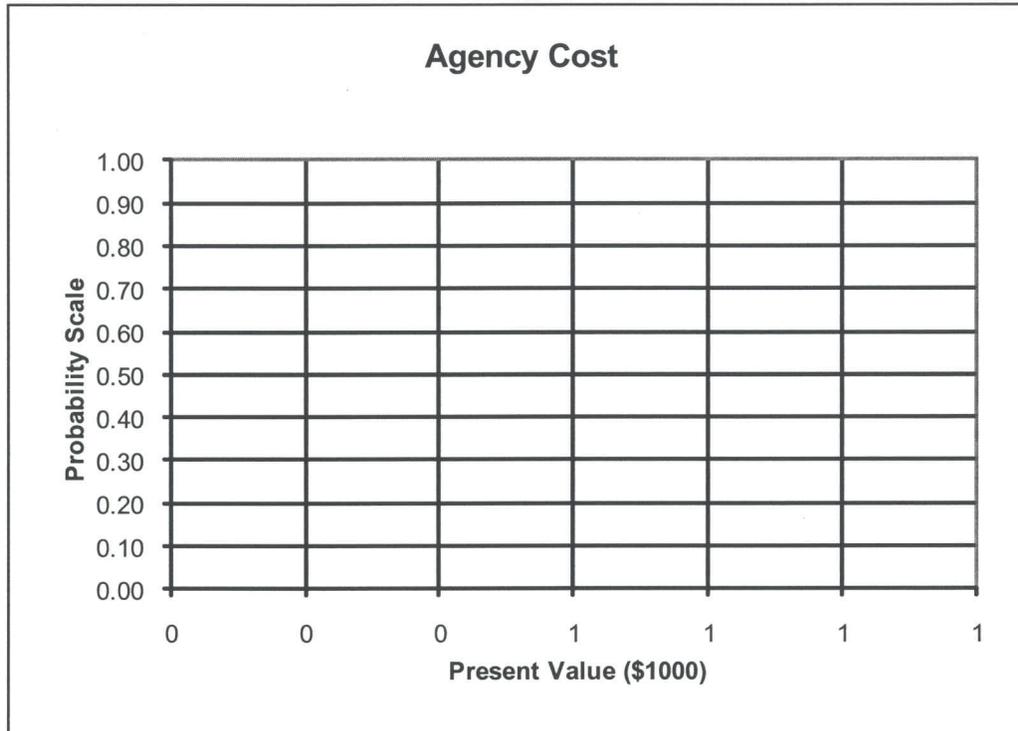
Deterministic Results

Total Cost	Alternative 1: 20-year life HMA		Alternative 2: 20-yr RHMA	
	Agency Cost (\$1000)	User Cost (\$1000)	Agency Cost (\$1000)	User Cost (\$1000)
Undiscounted Sum	\$2,708.00	\$5,984.27	\$2,670.20	\$13,963.30
Present Value	\$2,643.99	\$5,984.27	\$2,628.59	\$13,963.30
EUAC	\$119.59	\$270.68	\$118.89	\$631.58



Probabilistic Results

Total Cost (Present Value)	Alternative 1: 20-year life HMA		Alternative 2: 20-yr RHMA	
	Agency Cost (\$1000)	User Cost (\$1000)	Agency Cost (\$1000)	User Cost (\$1000)
Mean				
Standard Deviation				
Minimum				
Maximum				



Tornado Graphs

