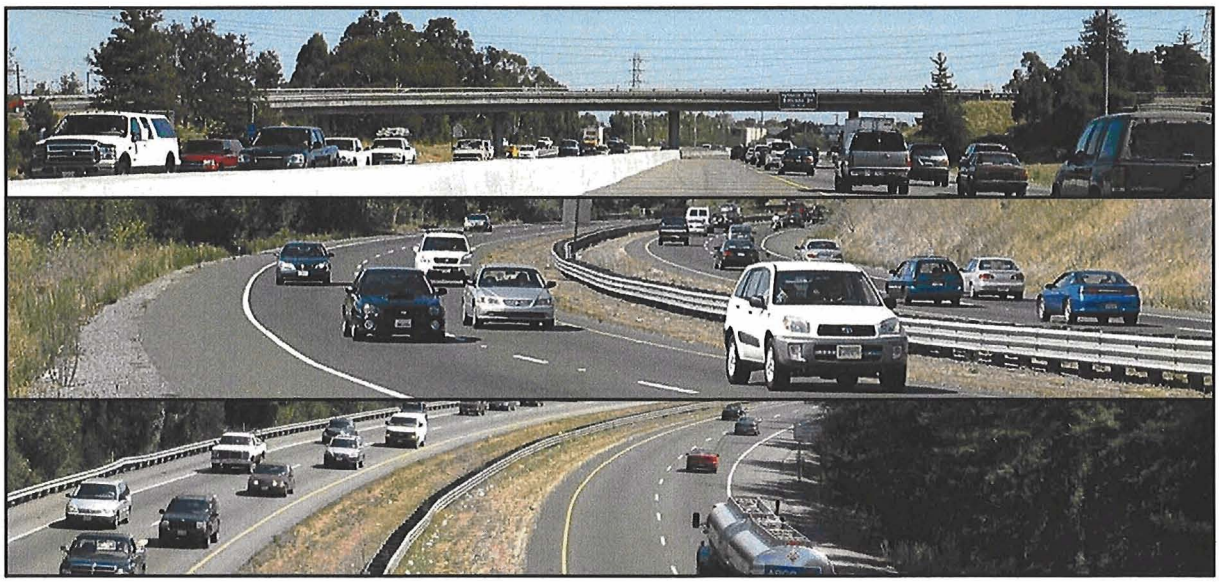
APPENDICES

Marin-Sonoma Narrows (MSN) HOV Widening Project
Draft Environmental Impact Report/
Draft Environmental Impact Statement



Along US 101, project begins 0.5 km (0.3 mi) south of the Route 37 interchange in the City of Novato (Marin County), and ends 0.5 km (0.3 mi) north of the Corona Road Overcrossing in the City of Petaluma (Sonoma County).

US 101
KP 30.0/44.5 (PM 18.6/27.7) in Marin County
KP 0.0/11.5 (PM 0.0/7.1) in Sonoma County

October 2007
SCH#2001042115
EA 264000

Table of Contents

Appendices

Appendix A Alternatives Evaluation
Appendix B NEPA/404 Coordination
Appendix C State Resources Agencies Letters
Appendix D SHP Officer Letters
Appendix E Relocation Benefits Summary
Appendix F NRCS Farmland Impacts Evaluation
Appendix G Floodplain Evaluation and FEMA Mapping
Appendix H Species and Habitat Table
Appendix I Title VI Policy Statement
Appendix J Mitigation Monitoring Plan
Appendix K CEQA Checklist
Appendix L MTC Transportation 2030 Plan
Appendix M 2002 HOV Master Plan Update

Appendix A

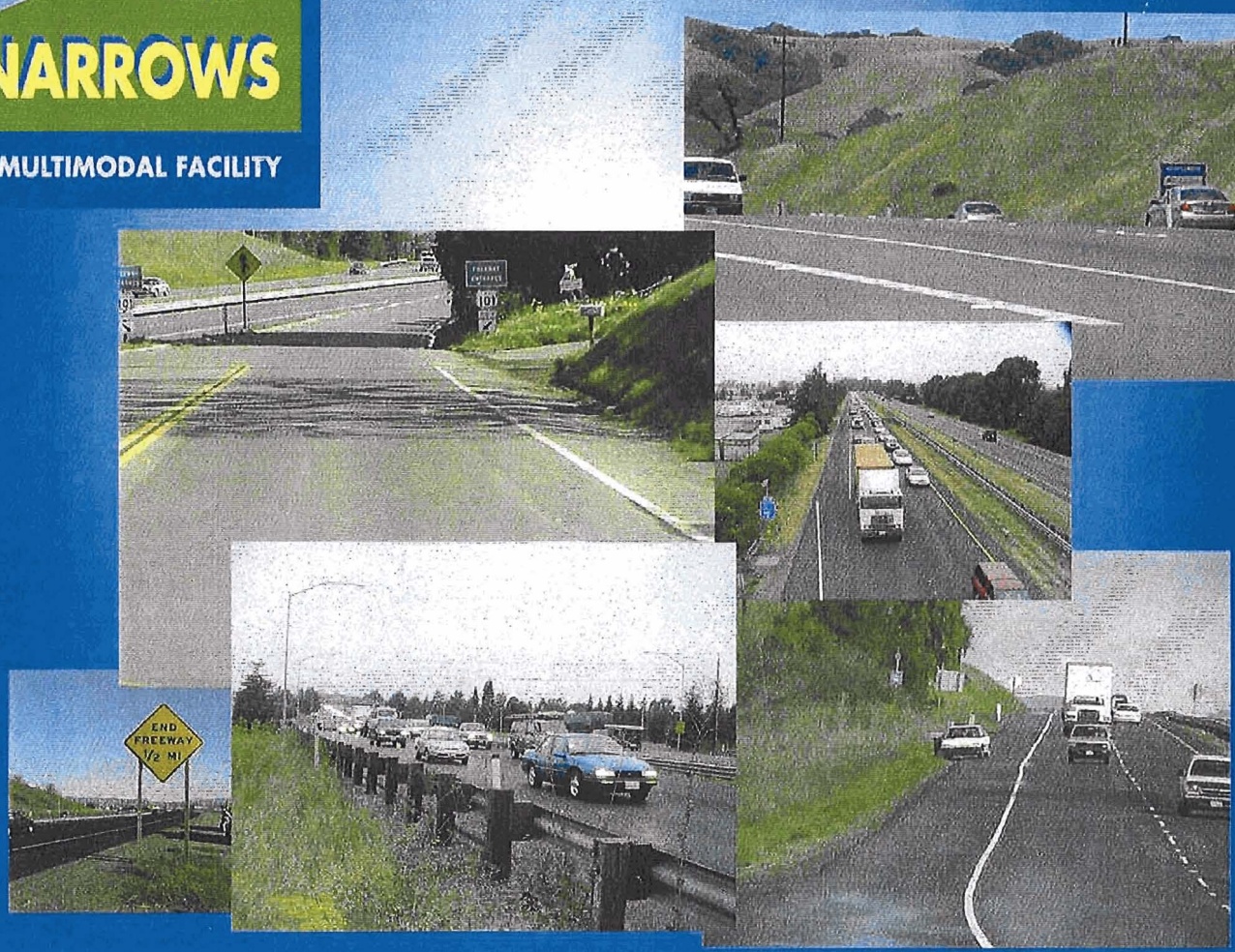
March 15, 2005

MARIN SONOMA NARROWS

US 101

A MULTIMODAL FACILITY

Evaluation Criteria Matrix



Caltrans

in Partnership with

County of Marin
co.marin.ca.us

THE CITY OF NOVATO CALIFORNIA

PETALUMA 1858

MT

FHWA

MARIN-SONOMA NARROWS
Summary of Evaluation Criteria for Selection of of Access Options in Segment B (the Central Segment)

Purpose -

Throughout a comprehensive EIR/EIS process, as studies progress, options are refined to avoid, minimize, or mitigate environmental impacts to the greatest extent practicable. At the same time the cost effectiveness of these options must be weighed and the decision to continue studies on options must be justified. The intent of this exercise is to provide a systematic process for this evaluation.

This evaluation will focus on the "Access Options" for the Segment B (the Central Segment) "Expressway to Freeway Upgrade" portion of the overall Marin Sonoma Narrows Project.

Description of Improvements -

Upgrading the Central Segment of the project from a four-lane expressway facility to a six-lane freeway will improve traffic flow by standardizing sight distance, providing wider shoulders for emergency pullouts, and eliminating recurrent flooding.

This upgrade would eliminate at-grade intersections and driveway access, replacing them with access options that are a combination of standardized interchanges and frontage roads to maintain access to intersecting roadways and adjacent parcels.

In addition, each option would provide continuous bicycle and pedestrian paths to connect the cities of Novato and Petaluma.

Evaluation Process -

Step 1: A multidisciplinary evaluation team consisting of Project Development and Environmental specialists develop a matrix that defines the criteria, measurables and relative weights (See Evaluation Matrix) that will be used for evaluating the access options that are currently under study. This matrix will be reviewed by the Project Development Team, Local Partners, and Policy Advisory Group. **<COMPLETE>**

Step 2: Specialty units fill in their portion of the matrix. **<COMPLETE>**

Step 3: The evaluation team meets and rates each of the criteria in the matrix. Average ratings and criteria weighting are then used to calculate a numeric score for each access option. Sensitivity analysis will be performed to confirm individual criteria weights. **<COMPLETE>**

Step 4: Numeric scores are used to compare access options, weigh their environmental impacts and cost effectiveness, and decide if continued study on each option is justified. **<COMPLETE>**

Step 5: This process will be reviewed by the Project Development Team. **<COMPLETE>**, Local Partners. **<COMPLETE>**, and Policy Advisory Group in a public forum **<COMPLETE>**, then forwarded to NEPA/404 interagency for concurrence **<PENDING>**.

Step 6: Finalize studies on screened options, publish findings in draft environmental document and circulate to the Public for review. Selection preferred option based upon input from the public, PAG, LPT, FHWA, and regulatory partners. **<PENDING>**

Revised: June 15, 2005

Evaluation Matrix -

	Criteria	Wt.	Description
	Meets Purpose and Need of Project	Y/N	Does Access Option meet Purpose/Need?
	Section 4(F)	L/M/H	Provides Measure of 4(F) Impacts.
	Traffic Operationally Feasible	Y/N	Is Access Option Operationally Feasible?
	Right of Way Demolition	Y/N	Is Building Demolition or Relocation Assistance Required?
Weight 10%	**Access** Number of Private Parcels Number of Residential Parcels Number of Agricultural Parcels Number of Commercial Parcels Distance to Last Private Parcel Distance to Last Residential Parcel Distance to Last Agricultural Parcel Distance to Last Commercial Parcel	**10%**	Access scoring is determined by assigning a starting value of 5 for each access option. The options are evaluated based on access to the three major areas on the west and east sides of US 101 (Redwood Landfill [RL], San Antonio Creek [SA], and Cloud Lane/Kastania [CLK]) for both major and local traffic. Due to higher traffic volumes the major movements are weighted twice as heavily as the local movements. These six traffic patterns are rated for each option, using the following scale: • 5 - Excellent • 4 - Good • 3 - Fair • 2 - Poor • 1 - Very Poor These ratings are then totaled for each access option and deductions are made to the starting value using the following range: • Above 34 – 0 pt deduction • 33-30 – 1 pt deduction • 29-22 – 2 pt deduction • 21-17 – 3 pt deduction • 16-13 – 4 pt deduction • Below 13 – 5 pt deduction
Weight 10%	**Right of Way** Parcels Area Number of Parcels Number of Owners Railroad Involvement Complexity of Utility Involvement	**10%**	Right of Way scoring is determined by assigning a starting value of 5 for each access option. Deductions are then made according to amount of right of way required for each interchange in that option. • Airport Rd - 2 pt deduction. Large footprint in industrial area, requires realignment of the existing freeway and involves significant railroad issues • Redwood Landfill (RL) - 0 pt deduction. Minor R/W to convert private overcrossing to interchange • Southerly San Antonio (SSA) - 1 pt deduction. Average R/W required for interchange • Central San Antonio (CSA) - 2 pt deduction. Additional height of freeway to create undercrossing and average area for interchange require larger footprint • Northerly San Antonio (NSA) - 1 pt deduction. Average R/W required for interchange • Southerly Petaluma Blvd South (PBS) - 0 pt deduction. Same for all options
Environmental Weight 60%	**Hazardous Waste** Number of Known Sites Is Additional Testing Required	**4%**	Same for all options, no known impacts except airborne lead

Revised: June 15, 2005

Evaluation Matrix – (Cont)

	Criteria	Wt.	Description
Environmental Weight 60%	**Potential Growth Inducement** Land Use/Zoning/Setting	**10%**	Potential Growth Inducement scoring is determined by assigning a starting value of 5 for each access option. Deductions are then made relative to the available area that could potentially be developed at each interchange in that option. • Airport Rd - 3 pt deduction. Interchange creates contiguous frontage roads, is near the urban growth boundary and existing developments • Redwood Landfill (RL) - 1 pt deduction. Minimal space at interchange for potential development • Southerly San Antonio (SSA) - 1 pt deduction. Minimal space at interchange for potential development • Central San Antonio (CSA) - 1 pt deduction. Minimal space at interchange for potential development • Northerly San Antonio (NSA) - 1 pt deduction. Minimal space at interchange for potential development • Southerly Petaluma Blvd South (PBS) - 0 pt deduction. Same for all options
	Visual Aesthetics Structure Height Structure Length Fits with Landform	**8%**	Visual Aesthetics scoring is determined by assigning a starting value of 5 for each access option. Deductions are then made based on the visual impacts of each interchange in that option. • Airport Rd - 3 pt deduction. Long high bridge that is out of context with the area, visible from the park • Redwood Landfill (RL) - 0 pt deduction. Widening existing bridge would create minimal visual impacts • Southerly San Antonio (SSA) - 1 pt deduction. New interchange • Central San Antonio (CSA) - 1 pt deduction. New interchange • Northerly San Antonio (NSA) - 2 pt deduction. New interchange with long, high bridge • Southerly Petaluma Blvd South (PBS) - 0 pt deduction. Same for all options
	Watershed/Wetland Resources Area of Direct Wetland Impact Potential for Indirect Wetland Impact Area of Floodplain Impact	**10%**	Watershed/Wetland Resources scoring is determined by assigning a starting value of 5 for each access option. Deductions are then made for each option based on the impacts to the wetlands for the areas listed. • Airport Rd - 3 pt deduction. Significant increase to wetland impacts • Marina access via Atherton - 2 pt deduction. Considerable increase to wetland impacts • Marina access east side of RR - 1 pt deduction. Slight increase to wetland impacts • Marina access west side of RR - 0 pt deduction. Minimal increase to wetland impacts • Redwood Landfill (RL) - 0 pt deduction. Minimal increase to wetland impacts • Southerly San Antonio (SSA) - 0 pt deduction. Minimal increase to wetland impacts • Central San Antonio (CSA) - 3 pt deduction. Significant increase to wetland impacts and floodplain issues • Northerly San Antonio (NSA) - 0 pt deduction. Minimal increase to wetland impacts • Southerly Petaluma Blvd South (PBS) - 0 pt deduction. Same for all options

Revised: June 15, 2005

Evaluation Matrix – (Cont)

	Criteria	Wt.	Description
Environmental Weight 60%	**Biological Resources** Number of Listed Species Area of Habitat Impact Tree Impact Number of Trees Impacted Percent of Native Trees Percent Cover Average Diameter at Breast Height	**10%**	Biological Resource scoring is determined by assigning a starting value of 5 for each access option. Deductions are then made for each option based on the impacts to the resources for the areas listed. • Airport Rd - 4 pt deduction. Significant increase in impacts to listed plants and wildlife • Marina access via Atherton - 3 pt deduction. Considerable increase in impacts to listed plants and wildlife • Marina access east side of RR - 2 pt deduction. Slight increase in impacts to listed plants and wildlife • Marina access west side of RR – 0 pt deduction. Minimal increase in impacts to listed plants and wildlife • Redwood Landfill (RL) - 0 pt deduction. Minimal impacts • Southerly San Antonio (SSA) - 1 pt deduction. Listed wildlife and Heritage Tree impacts • Central San Antonio (CSA) - 2 pt deduction. Significant impact • Northerly San Antonio (NSA) - 0 pt deduction. Minimal impact • Southerly Petaluma Blvd South (PBS) - 0 pt deduction. Same for all options
	Historic Architectural Resources Number of Eligible Properties Number of Elements Affected Visual Impact Change of Character/Use	**8%**	Historical Architectural Resource scoring is determined by assigning a starting value of 5 for each access option. Deductions are then made based on the impacts to the significant historical element (the bridge at San Antonio Rd). • 1 pt deduction. Existing bridge remains • 4 pt deduction. Bridge is widened or replaced
	Archeological Resources Number of Disturbed Sites Number of Eligible Sites Number of Sites with Human Remains Number of Sites Directly Impacted	**10%**	Archeological Resource scoring is determined by assigning a starting value of 5 for each access option. Deductions are then made based on the potential disturbance to the archeological sites, specifically those adjacent to the bridge on San Antonio Rd. • 2 pt deduction. Existing bridge remains – minimal impacts • 3 pt deduction. Bridge is widened or replaced – some impacts
Weight 20%	**Cost** Right of Way Cost Construction Cost Roadway Structures Walls Mitigation Cost Biology Archeology Historic Architecture	**20%**	Cost scoring is determined by assigning a starting value of 5 for each access option. Modifications are then made for each option based on the relative cost of Right of Way and Structures (Roadway, Wall, and Mitigation costs for all options are deemed similar). Right of Way cost modifier: • High Cost – 1 pt deduction • Average Cost – 0 pt deduction • Low Cost – 1 pt addition Structures cost modifier - All structures for each option are rated based on a comparison of the approximate cost to a typical structure: – Airport Rd - 5 pts, high/large area of structure/ramps – Redwood Landfill (RL) - 0.5 pts widen existing overcrossing – Southerly San Antonio (SSA) - 1 pt typical freeway overcrossing – Central San Antonio (CSA) - 2 pts high/large area of structure/ramps – Northerly San Antonio (NSA) - 1.5 pts high/long structure – Southerly Petaluma Blvd. South – 0 pts same for all options These ratings are then totaled for each access option and the following additional deductions are made to the starting value: • Below 1.0 – 0 pt deduction • 1.5-2.0 – 1 pt deduction • 2.5-3.0 – 2 pt deduction • 3.5-4.5 – 3 pt deduction • 5.0 - 6.5 – 4 pt deduction • Above 6.5 - 5 pt deduction

Revised: June 15, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Options	Score	Interchanges								Access			
		Atherton (Existing)	Airport Road	Redwood Landfill	Southerly San Antonio	Central San Antonio	Northerly San Antonio	Southerly Petaluma Blvd. South	Northerly Petaluma Blvd. South (Round-a-bout)	Marina East	Marina West	Dairy East	Dairy West
1	1.62		•		•			•	SEE NOTE 2	•			
2	1.20		•				•	•		•			
3a	3.14	•		•			•	•		•			
3b	3.44	•		•			•	•			•		
4a	3.56	•		•	•			•		•			
4b	3.86	•		•	•			•			•		
5a	2.80	•			•		•	•		•		•	
5b	3.10	•			•		•	•			•	•	
5c	2.80	•			•		•	•		•			•
5d	3.10	•			•		•	•			•		•
6a	2.52	•		•		•		•		•			
6b	2.82	•		•		•		•			•		
7	0.98		•			•		•		•			
8	2.52	•				•		•		•			
9a	2.90	•		•	•		•	•		•			
9b	3.20	•		•	•		•	•			•		
10	2.94	•					•	•		•			
11	1.66		•					•		•			
12a	4.04	•		•				•		•			
12b	4.34	•		•				•			•		
13	3.40	•						•		•			
14a	3.76	•			•			•		•		•	
14b	4.06	•			•			•			•	•	
14c	3.76	•			•			•		•			•
14d	4.06	•			•			•			•		•
15	1.34		•		•		•			•			

• Point of controlled access provided by different access options in Segment B.

NOTE 1: An interchange located at Airport Rd strictly to provide access to the Airport area is not within the scope of this project. Access to this area is already provided via existing infrastructure.

NOTE 2: The Northerly Petaluma Blvd. South (Round-about) alternative is not technically feasible due to ramp grades and the required vertical clearances at the Petaluma River. All of the alternatives utilize the Southerly Petaluma Blvd South interchange.

Revised : March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

ACCESS EVALUATION

			Redwood Landfill (RL)		San Antonio (SA)		Cloud Lane Kastania (CLK)	
Options	Score	Points	Main	Local	Main	Local	Main	Local
1	3	26	Poor	Good	Excellent	Good	N/A	Good
2	2	19	Poor	Good	Poor	Poor	N/A	Excellent
3a-3b	3	25	Excellent	Good	Poor	Poor	N/A	Excellent
4a-4b	4	32	Excellent	Good	Excellent	Good	N/A	Good
5a-5d	3	27	Poor	Good	Excellent	Good	N/A	Excellent
6a-6b	4	33	Excellent	Good	Excellent	Excellent	N/A	Good
7	3	27	Poor	Good	Excellent	Excellent	N/A	Good
8	3	25	Very Poor	Good	Excellent	Excellent	N/A	Good
9a-9b	5	35	Excellent	Excellent	Excellent	Excellent	N/A	Excellent
10	2	17	Very Poor	Good	Poor	Poor	N/A	Excellent
11	1	15	Poor	Good	Very Poor	Very Poor	N/A	Good
12a-12b	3	28	Excellent	Good	Good	Poor	N/A	Good
13	1	13	Very Poor	Good	Very Poor	Very Poor	N/A	Good
14a-14d	3	26	Poor	Good	Excellent	Good	N/A	Good
15	3	27	Poor	Good	Excellent	Good	N/A	Excellent

ACCESS POINTS
Excellent - 5 points, direct access
Good - 4 points, improves access
Fair - 3 points, similar to existing access
Poor - 2 points, access worse than existing
Very Poor - 1 point, Significantly worse than existing

ACCESS SCORE	
Above 34	0 pt deduction
33-30	1 pt deduction
29-22	2 pt deduction
21-17	3 pt deduction
16-13	4 ptdeduction
Below 13	5 pt deduction

GENERAL COMMENTS

Main - Major traffic movements such as Landfill traffic at Redwood Landfill or South Petaluma commuter traffic at San Antonio Rd. There is no major traffic movement from the Cloud Lane/Kastania Road area.

Local - Localized traffic from residents and local businesses.

Revised : March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 1
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good CLK - Main N/A, Local Good
Right of Way	10%	2	0.2	Airport - 2 pt deduction SSA, 1 pt deduction.
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	1	0.1	Airport - 3 pt deduction SSA - 1 pt deduction
Visual Aesthetics	8%	1	0.08	Airport - 3 pt deduction SSA - 1 pt deduction
Watershed/Wetland Resources	10%	2	0.2	Airport - 3 pt deduction
Biological Resources	10%	0	0	Airport - 4 pt deduction SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	0	0	6 bridge points High R/W costs.
Total	100%		1.62	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised : March 11,2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 2
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	2	0.2	RL - Main Poor, Local Good SA - Main Poor, Local Poor-opposite direction of commute CLK - Main N/A, Local Excellent
Right of Way	10%	2	0.2	Airport - 2 pt deduction, NSA, 1 pt deduction.
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	1	0.1	Airport - 3 pt deduction NSA - 1 pt deduction
Visual Aesthetics	8%	0	0	Airport - 3 pt deduction NSA - 2 pt deduction
Watershed/Wetland Resources	10%	2	0.2	Airport - 3 pt deduction
Biological Resources	10%	1	0.1	Airport - 4 pt deduction
Historic Architectural Resources	8%	1	0.08	4 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	0	0	6.5 bridge points, High R/W costs.
Total	100%		1.2	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 3a
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Excellent, Local Good SA - Main Poor, Local Poor - opposite direction of commute Cloud Ln - Main N/A, Local Excellent
Right of Way	10%	4	0.4	NSA - 1 pt deduction.
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	RL - 1 pt deduction NSA - 1 pt deduction
Visual Aesthetics	8%	3	0.24	NSA - 2 pt deduction
Watershed/Wetland Resources	10%	4	0.4	Marina East - 1 pt deduction
Biological Resources	10%	3	0.3	Marina East - 2 pt deduction
Historic Architectural Resources	8%	1	0.08	4 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	4	0.8	2.0 bridge points Average R/W costs.
Total	100%		3.14	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 3b
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Excellent, Local Good SA - Main Poor, Local Poor - opposite direction of commute Cloud Ln - Main N/A, Local Excellent
Right of Way	10%	4	0.4	NSA - 1 pt deduction.
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	RL - 1 pt deduction NSA - 1 pt deduction
Visual Aesthetics	8%	3	0.24	NSA - 2 pt deduction
Watershed/Wetland Resources	10%	5	0.5	Marina West - No deduction
Biological Resources	10%	5	0.5	Marina West - No deduction
Historic Architectural Resources	8%	1	0.08	4 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	4	0.8	2.0 bridge points Average R/W costs.
Total	100%		3.44	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 4a
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	4	0.4	RL - Main Excellent, Local Good SA - Main Excellent, Local Good CLK - Main N/A, Local Good
Right of Way	10%	4	0.4	SSA - 1 pt deduction.
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	RL - 1 pt deduction SSA - 1 pt deduction
Visual Aesthetics	8%	4	0.32	SSA - 1 pt deduction
Watershed/Wetland Resources	10%	4	0.4	Marina East - 1 pt deduction
Biological Resources	10%	2	0.2	Marina East - 2 pt deduction SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	4	0.8	1.5 bridge points Average R/W costs.
Total	100%		3.56	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 4b
(Marina West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	4	0.4	RL - Main Excellent, Local Good SA - Main Excellent, Local Good CLK - Main N/A, Local Good
Right of Way	10%	4	0.4	SSA - 1 pt deduction.
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	RL - 1 pt deduction SSA - 1 pt deduction
Visual Aesthetics	8%	4	0.32	SSA - 1 pt deduction
Watershed/Wetland Resources	10%	5	0.5	0 pt deduction
Biological Resources	10%	4	0.4	SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	4	0.8	1.5 bridge points Average R/W costs.
Total	100%		3.86	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 5a
(Marina East, Dairy East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good CLK - Main N/A, Local Excellent
Right of Way	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Visual Aesthetics	8%	2	0.16	SSA - 1 pt deduction NSA - 2 pt deduction
Watershed/Wetland Resources	10%	4	0.4	Marina East - 1 pt deduction
Biological Resources	10%	2	0.2	SSA - 1 pt deduction Marina East - 2 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	2	0.4	2.5 bridge points Average R/W costs.
Total	100%		2.8	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 5b
(Marina West, Dairy East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good CLK - Main N/A, Local Excellent
Right of Way	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Visual Aesthetics	8%	2	0.16	SSA - 1 pt deduction NSA - 2 pt deduction
Watershed/Wetland Resources	10%	5	0.5	0 pt deduction
Biological Resources	10%	4	0.4	SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	2	0.4	2.5 bridge points Average R/W costs.
Total	100%		3.1	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 5c
(Marina East, Dairy West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good CLK - Main N/A, Local Excellent
Right of Way	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Visual Aesthetics	8%	2	0.16	SSA - 1 pt deduction NSA - 2 pt deduction
Watershed/Wetland Resources	10%	4	0.4	Marina East - 1 pt deduction
Biological Resources	10%	2	0.2	SSA - 1 pt deduction Marina East - 2 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	2	0.4	2.5 bridge points Average R/W costs.
Total	100%		2.8	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 5d
(Marina West, Dairy West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good CLK - Main N/A, Local Excellent
Right of Way	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Visual Aesthetics	8%	2	0.16	SSA - 1 pt deduction NSA - 2 pt deduction
Watershed/Wetland Resources	10%	5	0.5	0 pt deduction
Biological Resources	10%	4	0.4	SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	2	0.4	2.5 bridge points Average R/W costs.
Total	100%		3.1	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix

Alternative 6a
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	4	0.4	RL - Main Excellent, Local Good SA - Main Excellent, Local Excellent CLK - Main N/A, Local Good
Right of Way	10%	3	0.3	CSA - 2 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	RL - 1 pt deduction CSA - 1 pt deduction
Visual Aesthetics	8%	4	0.32	CSA - 1 pt deduction
Watershed/Wetland Resources	10%	1	0.1	CSA - 3 pt deduction Marina East - 1 pt deduction
Biological Resources	10%	1	0.1	CSA - 2 pt deduction Marina East - 2 pt deduction
Historic Architectural Resources	8%	1	0.08	4 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	3	0.6	2.5 bridge points Average R/W costs.
Total	100%		2.52	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 6b
(Marina West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	4	0.4	RL - Main Excellent, Local Good SA - Main Excellent, Local Excellent CLK - Main N/A, Local Good
Right of Way	10%	3	0.3	CSA - 2 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	3	0.3	RL - 1 pt deduction CSA - 1 pt deduction
Visual Aesthetics	8%	4	0.32	CSA - 1 pt deduction
Watershed/Wetland Resources	10%	2	0.2	CSA - 3 pt deduction
Biological Resources	10%	3	0.3	CSA - 2 pt deduction
Historic Architectural Resources	8%	1	0.08	4 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	3	0.6	2.5 bridge points Average R/W costs.
Total	100%		2.82	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 7
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Excellent CLK - Main N/A, Local Good
Right of Way	10%	1	0.1	Airport - 2 pt deduction CSA - 2 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	1	0.1	Airport - 3 pt deduction CSA - 1 pt deduction
Visual Aesthetics	8%	1	0.08	Airport - 3 pt deduction CSA - 1 pt deduction
Watershed/Wetland Resources	10%	0	0	Airport - 3 pt deduction CSA - 3 pt deduction
Biological Resources	10%	0	0	Airport - 4 pt deduction CSA - 2 pt deduction
Historic Architectural Resources	8%	1	0.08	4 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	0	0	2.5 bridge points High R/W costs.
Total	100%		0.98	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 8
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	Minor Impacts to Olompali
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Very Poor, Local Good SA - Main Excellent, Local Excellent CLK - Main N/A, Local Good
Right of Way	10%	3	0.3	CSA - 2 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	4	0.4	CSA - 1 pt deduction
Visual Aesthetics	8%	4	0.32	CSA - 1 pt deduction
Watershed/Wetland Resources	10%	0	0	Marina Access via Atherton - 2 pt deduction CSA - 3 pt deduction
Biological Resources	10%	0	0	Marina Access via Atherton - 3 pt deduction CSA - 2 pt deduction
Historic Architectural Resources	8%	1	0.08	4 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	4	0.8	2.0 bridge points Average R/W costs.
Total	100%		2.52	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 9a
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	5	0.5	RL - Main Excellent, Local Excellent SA - Main Excellent, Local Excellent CLK - Main N/A, Local Excellent
Right of Way	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	2	0.2	SSA - 1 pt deduction NSA - 1 pt deduction
Visual Aesthetics	8%	2	0.16	SSA - 1 pt deduction NSA - 2 pt deduction
Watershed/Wetland Resources	10%	4	0.4	Marina East - 1 pt deduction
Biological Resources	10%	2	0.2	Marina East - 2 pt deduction SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	2	0.4	3.0 bridge points High R/W costs.
Total	100%		2.9	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 9b
(Marina West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	5	0.5	RL - Main Excellent, Local Excellent SA - Main Excellent, Local Excellent CLK - Main N/A, Local Excellent
Right of Way	10%	3	0.3	SSA - 1 pt deduction NSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	2	0.2	SSA - 1 pt deduction NSA - 1 pt deduction
Visual Aesthetics	8%	2	0.16	SSA - 1 pt deduction NSA - 2 pt deduction
Watershed/Wetland Resources	10%	5	0.5	No deductions
Biological Resources	10%	4	0.4	SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	2	0.4	3.0 bridge points High R/W costs.
Total	100%		3.2	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 10
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	2	0.2	RL - Main Very Poor, Local Good SA - Main Poor, Local Poor CLK - Main N/A, Local Excellent
Right of Way	10%	4	0.4	NSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	4	0.4	NSA - 1 pt deduction
Visual Aesthetics	8%	3	0.24	NSA - 2 pt deduction
Watershed/Wetland Resources	10%	3	0.3	Marina access via Atherton - 2 pt deduction
Biological Resources	10%	2	0.2	Marina access via Atherton - 3 pt deduction
Historic Architectural Resources	8%	1	0.08	4 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	4	0.8	1.5 bridge points Average R/W costs.
Total	100%		2.94	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 11
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	1	0.1	RL - Main Poor, Local Good SA - Main Very Poor, Local Very Poor CLK - Main N/A, Local Good
Right of Way	10%	3	0.3	Airport - 2 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	2	0.2	Airport - 3 pt deduction
Visual Aesthetics	8%	2	0.16	Airport - 3 pt deduction
Watershed/Wetland Resources	10%	2	0.2	Airport - 3 pt deduction
Biological Resources	10%	1	0.1	Airport - 4 pt deduction
Historic Architectural Resources	8%	1	0.08	1 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	1	0.2	5.0 bridge points High R/W costs.
Total	100%		1.66	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 12a
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Excellent, Local Good SA - Main Good, Local Poor CLK - Main N/A, Local Good
Right of Way	10%	5	0.5	No deductions
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	4	0.4	RL - 1 pt deduction
Visual Aesthetics	8%	5	0.4	No deductions
Watershed/Wetland Resources	10%	4	0.4	Marina East - 1 pt deduction
Biological Resources	10%	3	0.3	Marina East - 2 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	5	1	0.5 bridge points Low R/W costs.
Total	100%		4.04	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 12b
(Marina West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Excellent, Local Good SA - Main Good, Local Poor CLK - Main N/A, Local Good
Right of Way	10%	5	0.5	No deductions
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	4	0.4	RL - 1 pt deduction
Visual Aesthetics	8%	5	0.4	No deductions
Watershed/Wetland Resources	10%	5	0.5	No deductions
Biological Resources	10%	5	0.5	No deductions
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	5	1	0.5 bridge points Low R/W costs.
Total	100%		4.34	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 13
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	1	0.1	RL - Main Very Poor, Local Good SA - Main Very Poor, Local Very Poor, CLK - Main N/A, Local Good
Right of Way	10%	5	0.5	No deductions
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	5	0.5	No deductions
Visual Aesthetics	8%	5	0.4	No deductions
Watershed/Wetland Resources	10%	3	0.3	Marina Access via Atherton - 2 pt deduction
Biological Resources	10%	2	0.2	Marina Access via Atherton -3 pt deduction
Historic Architectural Resources	8%	1	0.08	4 pt deduction
Archeological Resources	10%	2	0.2	3 pt deduction
Cost	20%	5	1	0 bridge points Low R/W costs.
Total	100%		3.4	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 14a
(Marina East)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good, CLK - Main N/A, Local Good
Right of Way	10%	4	0.4	SSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	4	0.4	SSA - 1 pt deduction
Visual Aesthetics	8%	4	0.32	SSA - 1 pt deduction
Watershed/Wetland Resources	10%	4	0.4	Marina East - 1 pt deduction SSA - 1 pt deduction
Biological Resources	10%	2	0.2	Marina East - 2 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	5	1	1 bridge points average R/W costs.
Total	100%		3.76	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 14b
(Marina West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good, CLK - Main N/A, Local Good
Right of Way	10%	4	0.4	SSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	4	0.4	SSA - 1 pt deduction
Visual Aesthetics	8%	4	0.32	SSA - 1 pt deduction
Watershed/Wetland Resources	10%	5	0.5	No deductions
Biological Resources	10%	4	0.4	SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	5	1	1 bridge points Average R/W costs.
Total	100%		4.06	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

Alternative 14c
(Marina West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good, CLK - Main N/A, Local Good
Right of Way	10%	4	0.4	SSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	4	0.4	SSA - 1 pt deduction
Visual Aesthetics	8%	4	0.32	SSA - 1 pt deduction
Watershed/Wetland Resources	10%	4	0.4	Marina East - 1 pt deduction
Biological Resources	10%	2	0.2	SSA - 1 pt deduction Marina East - 2 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	5	1	1 bridge points Average R/W costs.
Total	100%		3.76	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Alternative 14d
(Marina West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good, CLK - Main N/A, Local Good
Right of Way	10%	4	0.4	SSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	4	0.4	SSA - 1 pt deduction
Visual Aesthetics	8%	4	0.32	SSA - 1 pt deduction
Watershed/Wetland Resources	10%	5	0.5	No deductions
Biological Resources	10%	4	0.4	SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	5	1	1 bridge points Average R/W costs.
Total	100%		4.06	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

MARIN SONOMA NARROWS
Evaluation Criteria Matrix
Alternative 15
(Marina West)

CRITERIA	WEIGHT	RAW SCORE	WEIGHTED SCORE	COMMENTS
Meets Purpose and Need	Y/N	Y	-	
Section 4(F)	L/M/H	L	-	
Traffic Operationally Feasible	Y/N	Y	-	
Right of Way Demolition	Y/N	N	-	
Access	10%	3	0.3	RL - Main Poor, Local Good SA - Main Excellent, Local Good, CLK - Main N/A, Local Excellent
Right of Way	10%	1	0.1	Airport - 2 pt deduction, SSA - 1 pt deduction, NSA - 1 pt deduction
Environmental				
Hazardous Waste	4%	3	0.12	Same all alternatives
Potential Growth Inducement	10%	0	0	Airport - 3 pt deduction, SSA - 1 pt deduction, NSA - 1 pt deduction
Visual Aesthetics	8%	0	0	Airport - 3 pt deduction, SSA - 1 pt deduction, NSA - 2 pt deduction
Watershed/Wetland Resources	10%	2	0.2	Airport - 3 pt deduction
Biological Resources	10%	0	0	Airport - 4 pt deduction, SSA - 1 pt deduction
Historic Architectural Resources	8%	4	0.32	1 pt deduction
Archeological Resources	10%	3	0.3	2 pt deduction
Cost	20%	0	0	1 bridge points High R/W costs.
Total	100%		1.34	

Note: Raw Score - 0 to 5, 0 is poor & 5 is best

Revised: March 11, 2005

Appendix B

"Durio, Hal E SPN contractor " <Hal.E.Durio@spd02.usace.army.mil>

02/23/2007 11:36 AM

To "Melanie Brent" <melanie_brent@dot.ca.gov>

cc

bcc

Subject Marin-Sonoma Narrows (UNCLASSIFIED)

History: This message has been forwarded.

Classification: **UNCLASSIFIED**
Caveats: NONE

Melanie,

I am trying to pack my desk and ran across a letter from you on the Narrows project setting up the meeting we had on Feb 9, but notice a statement where Caltrans is requesting a Corps response on Checkpoint 1 (Project Purpose and Need), and Checkpoint 2 (Range of Alternatives) as required in the NEPA 404 process.

Do you need a formal letter from the Corps or will an e-mail work? In either case I am going to be shut down here for at least 3 weeks while the Corps moves its office, so it may take me a while to get you a letter. In the meantime I will add a quick response to Checkpoint 1 and 2 in this e-mail.

I have reviewed the Purpose and Need of the project and the Corps is satisfied with the Caltran's purpose and need statements for this project.

I have also reviewed the alternatives that Caltrans has studied for this project. The Corps is satisfied that Caltrans has considered all reasonable alternatives and is willing to continue to modify alternatives when problems arise that were not previously considered. This was demonstrated at the last meeting when Caltrans showed a willingness to study modifying the frontage road location through parcels 125-60-18, 125-60-20, and 125-60-12. The purpose of the frontage road modification will be to move the frontage road to a location adjacent to the new highway alignment in order to avoid impacting quality wetlands. The Corps is looking forward to reviewing the results of Caltran's review.

Please let me know if you will need a formal letter from the Corps with these statements.

Hal

Hal Durio, Caltrans Liaison
U.S. Army Corps of Engineers
333 Market Street, 8th floor
San Francisco, CA 94105-2197
Phone: (415) 977 8472

Classification: **UNCLASSIFIED**
Caveats: NONE

"Brendan Thompson " <BThompson@waterboards.ca.gov>
04/19/2007 02:08 PM

To: <trang_t_hoang@dot.ca.gov>
cc: <david_yam@dot.ca.gov>, "Keith Lichten" <KLichten@waterboards.ca.gov>
Subject: Re: Marin Sonoma Narrows Project: Response to RWQCB 2-20-07 letter

Hello Trang,

Thank you very much for the update. That is fantastic that Caltrans has found a way to avoid this important, quality wetland near the Redwood Landfill Driveway. This should reduce Department mitigation requirements significantly.

We look forward to reviewing the revised environmental document.
Thanks again,

-Brendan

Brendan Thompson
Environmental Specialist
SF Bay Regional Water Quality Control Board
1515 Clay St, Suite 1400
Oakland, CA 94612
Phone: (510) 622-2506
Fax: (510) 622-2460
bthompson@waterboards.ca.gov

>>> Trang T Hoang <trang_t_hoang@dot.ca.gov> 4/17/2007 4:27:00 PM >>>

Hi Brendan,

In response to your 2-20-07 letter to Melanie Brent re: Marin-Sonoma Narrows Project expressing the Board's concern at the wetland impacts at Redwood Landfill Driveway, below are revised (and preliminary) layouts at the driveway. In addition, we will be reviewing our wetland delineation and anticipate we can substantially reduce our impacts in this area.

Please call if you have any questions.

Trang Hoang
Storm Water Coordination
w: 510.286.5629
f: 510.286.5642
----- Forwarded by Trang T Hoang/D04/Caltrans/CAGov on 04/17/2007 03:53 PM

Yolanda Rivas

To: Trang T Hoang/D04/Caltrans/CAGov@DOT

04/17/2007 03:23 PM cc:
Subject: Response to RWQCB

(See attached file: 12b.pdf)(See attached file: 14b.pdf)(See attached file: 4b.pdf)(See attached file: 14d.pdf)

Thanks for your help!
Yolanda Rivas
Senior Environmental Planner
(510) 622-1705

California Regional Water Quality Control Board

San Francisco Bay Region

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
http://www.waterboards.ca.gov/sanfranciscobay

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

Date: FEB 2 0 2007
File No.: 2148.02 (BT)

Ms. Melanie Brent
California Department of Transportation
PO Box 23660
Oakland, CA. 94623-0660

SUBJECT: Additional Comments Relating to the Purpose and Need and Range of Alternatives for the Marin-Sonoma Narrows Project

Dear Ms. Brent:

Thank you for giving the San Francisco Bay Regional Water Quality Control Board (Water Board) staff the opportunity to participate in NEPA/404 meetings pertaining to the Marin-Sonoma Narrows Project (Project). The Water Board sent the California Department of Transportation (Department) a letter on November 30, 2006, agreeing with the Project's purpose, need, and impact avoidance analyses. This letter serves as a revision to the letter sent to the Department on November 30, 2006. Water Board staff still agree with the purpose and need for the Project, but in consideration of new potential Project alternatives, staff believe that additional opportunities for wetland avoidance may be available to the Department.

Staff from the Department, Water Board, United States Environmental Protection Agency (USEPA), Federal Highway Administration and the U.S. Army Corps of Engineers met on February 9, 2007, to further discuss alternative analyses and opportunities to reduce proposed impacts to federal jurisdictional waters. Discussions focused on the proposed relocation of the access road for properties east of US-101 just south of the current Redwood landfill driveway. The current preferred alternative would impact a significant area of wetlands adjacent the western side of the rail tracks immediately south of the landfill driveway. It was agreed that the Department would further investigate opportunities to avoid these wetland areas. Potential avoidance strategies could include moving the access road west to straddle the northbound freeway lane. It was discussed that a retaining wall or steeper side slope may be necessary to accommodate this proposed alternative. Benefits to relocating the access road alongside the freeway would include dramatically lower mitigation costs for wetland impacts. Another option was discussed where the access road could be moved to the eastern side of the rail tracks.

The Water Board uses the U.S. EPA's Section 404(b)(1) "Guidelines for Specification of Disposal Sites for Dredge or Fill Material" to determine circumstances under which wetland fill may be permitted. Please note that all options to avoid wetlands at this location, including the two mentioned above, must be fully and adequately evaluated by the Department. Cost comparisons

between the currently preferred alternative and any potential alternative designs should include projected mitigation and capital costs.

If you have any questions, please contact Brendan Thompson of my staff at (510) 622-2506, or via e-mail to BThompson@waterboards.ca.gov.

Sincerely,

Keith H. Lichten, P.E.
Senior Engineer

cc: Mr. Ray Akkawi, Caltrans
Mr. Mike Monroe, USEPA, San Francisco
Mr. Hal Durio, USACE, San Francisco

California Regional Water Quality Control Board

San Francisco Bay Region

1515 Clay Street, Suite 1400, Oakland, California 94612
(510) 622-2300 • Fax (510) 622-2460
http://www.waterboards.ca.gov/sanfranciscobay

Linda S. Adams
Secretary for Environmental Protection

Arnold Schwarzenegger
Governor

Date: NOV 30 2006
File No.: 2148.02 (BT)

Ms. Melanie Brent
California Department of Transportation
PO Box 23660
Oakland, CA. 94623-0660

SUBJECT: Comments Relating to the Purpose and Need and Range of Alternatives for the Marin-Sonoma Narrows Project

Dear Ms. Brent:

Thank you for giving the Regional Water Quality Control Board (Water Board) staff the opportunity to participate in NEPA/404 meetings pertaining to the Marin-Sonoma Narrows Project (Project).

The Water Board agrees with the California Department of Transportation's (Department's) purpose and need for the proposed Project. The Water Board also finds that the Department adequately investigated alternative Project designs to avoid and minimize impacts to wetlands and waters.

To help avoid any potential delays in the permitting process, please consult with Water Board staff as the Department's mitigation proposal for impacts to wetlands and waters is being developed. Also, please note that the Water Board expects that the Department will ensure the appropriate treatment of stormwater runoff from the entirety of the area of new and any redeveloped impervious surface. Should it prove infeasible to treat runoff, the Department should identify alternate treatment that will provide a water quality benefit equivalent to the foregone treatment.

If you have any questions, please contact Brendan Thompson of my staff at (510) 622-2506, or via e-mail to BThompson@waterboards.ca.gov.

Sincerely,

Keith H. Lichten, P.E.
Senior Engineer

cc: Mr. Ray Akkawi, Caltrans

U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION
CALIFORNIA DIVISION
650 Capitol Mall, Suite 4-100
Sacramento, CA. 95814

October 13, 2006

IN REPLY REFER TO
HDA-CA
File #: 04-MAR/SON-101
Marin-Sonoma Narrows
EA 264000
Document #: P55657

Mr. Bijan Sartipi, District Director
California Department of Transportation
District 4
P. O. Box 23660
Oakland, CA 94623-0660

Attention: Melanie Brent, Office Chief, Office of Environmental Analysis

Dear Mr. Sartipi:

SUBJECT: NEPA/404 Merger Process Agreement Concurrence Marin Sonoma Narrows

This letter is in response to your letter of September 29, 2006 requesting concurrence of the Purpose and Need, and Alternatives (development and selection) as agreed upon in the NEPA/Section 404 Merger Agreement between the Environmental Protection Agency, the Corps of Engineers, the Federal Highway Administration (FHWA), and the California Department of Transportation (Caltrans) for the Marin-Sonoma Narrows project in Marin and Sonoma Counties, California.

The FHWA has reviewed the Documentation for NEPA/404 report provided by the September 29, 2006 letter. The report addresses the Northern, Central, and Southern sections of the HOV Widening Project. The FHWA concurs that the document does a complete job of explaining the both the Purpose and Need and the Project Alternatives.

If you have any questions, please contact Mr. Leland W. Dong, at (916) 498-5860 or e-mail to leland.dong@fhwa.dot.gov.

Sincerely,

For
Gene K. Fong
Division Administrator

Appendix C

LAND RESOURCE PROTECTION

DEPARTMENT OF CONSERVATION

DIVISION OF LAND RESOURCE PROTECTION

801 K STREET • MS 18-01 • SACRAMENTO, CALIFORNIA 95814

PHONE 916 / 324-0850 • **FAX** 916 / 327-3430 • **TDD** 916 / 324-2555 • **WEBSITE** conservation.ca.gov

May 7, 2007

Ms. Melanie Brent, Office Chief
California Department of Transportation
Office of Environmental Analysis
P.O. Box 23660
Oakland, CA 94623-0660

Subject: Public Agency Acquisition of Land Enrolled in Williamson Act Contract - Department of Transportation, Marin-Sonoma Narrows HOV Widening Project, Marin and Sonoma Counties

Dear Ms. Brent:

Thank you for you letter of April 5, 2007, notifying the Department of Conservation (Department) of the possible acquisition of land enforceably restricted by Williamson Act contract by the Department of Transportation (Caltrans). The purpose of the acquisition is to widen U.S. 101 for High Occupancy Vehicle (HOV) lanes from south of State Route 37 in Novato, Marin County to north of the Corona Road over-crossing in Petaluma, Sonoma County. The project includes widening on-ramps, adding interchanges and frontage roads, building sound walls and replacing a bridge and overhead. The project involves three segments – southern (A), central (B) and northern (C) – and two build alternatives. Impacts to Williamson Act land are the same under both build alternatives but vary by access option, from 25.45 acres to 44.27 acres. Total farmland converted will range from 206.1 acres to 228.69 acres, which includes 1.9 acres of Prime Farmland and 2.3 acres of Farmland of Statewide Importance.

Required Findings

The Williamson Act requires that a public agency shall not locate a public improvement within an agricultural preserve unless the following findings are made:

- *The location is not based primarily on a consideration of the lower cost of acquiring land in an agricultural preserve (Government Code §51292(a)).*
- *If the land is agricultural land covered under a contract pursuant to this chapter for any public improvement, that there is no other land within or outside the preserve on which it is reasonably feasible to locate the public improvement (Government Code §51292(b)).*

The letter states that contracted land cannot be completely avoided because of the scale of improvements in the central segment. Pursuant to §51291(b), and to enable

Department comment, Caltrans should provide an explanation and documentation as to how the project precludes avoidance of contracted land. This should include a map of the project in relation to contracted and noncontracted lands and an explanation as to why contracted land cannot be avoided. In addition, Caltrans should address the first finding. This may include an explanation as to factors determining project location and/or Caltrans' land purchase costs in relation to fair market value without regard to contract restrictions.

Eminent Domain

A Williamson Act contract is an enforceable restriction pursuant to Article XIII, §8 of the California Constitution and Government Code §51252. Assuming other necessary requirements are met, acquisition of Williamson Act land must meet requirements of eminent domain law for acquisition by eminent domain or in lieu of eminent domain (e.g., Code of Civil Procedure §1230.010 et seq. and Government Code §7260 et seq.) in order to void the contract pursuant to §51295. If the acquisition does not void the contract, Caltrans' uses of contracted property will be affected and limited by the terms of the contract and provisions of the Act.

At least one Caltrans district has informed the Department that its acquisition process follows the policies and procedures described in Chapter 8 of the Caltrans Right of Way Manual, including Exhibit 8-EX-1, Article 6. Acquisition Policies. In the subject acquisition, if Caltrans were to follow these policies and procedures, it would appear to meet the intent of §51295 regarding voiding the subject contract with respect to the land so acquired. Please understand, however, that the Department does not provide counsel regarding eminent domain law but encourages Caltrans to obtain legal counsel for this purpose. To assist our review, we request that Caltrans acknowledge adherence to the above-noted Caltrans policies and procedures in this instance or more specifically describe its process for acquiring the subject property according to the Codes noted above.

CEQA

The letter states that Caltrans is preparing a Draft Environmental Impact Report/Draft Environmental Impact Statement (DEIR/DEIS) for June 2007 public release. In order to complete its review of the acquisition, the Department request a copy of the DEIR/DEIS.

Additional Notification

Please be advised that pursuant to Government Code §51291(d), the Department and local governing body must be notified of any proposed, significant changes to the project. The Department must also be notified within 10 days when the property is actually acquired (§ 51291(c)). If Caltrans' acquisition voids the involved contract under § 51295, and Caltrans then determines not to locate the proposed public improvement

Department comment, Caltrans should provide an explanation and documentation as to how the project precludes avoidance of contracted land. This should include a map of the project in relation to contracted and noncontracted lands and an explanation as to why contracted land cannot be avoided. In addition, Caltrans should address the first finding. This may include an explanation as to factors determining project location and/or Caltrans' land purchase costs in relation to fair market value without regard to contract restrictions.

Eminent Domain

A Williamson Act contract is an enforceable restriction pursuant to Article XIII, §8 of the California Constitution and Government Code §51252. Assuming other necessary requirements are met, acquisition of Williamson Act land must meet requirements of eminent domain law for acquisition by eminent domain or in lieu of eminent domain (e.g., Code of Civil Procedure §1230.010 et seq. and Government Code §7260 et seq.) in order to void the contract pursuant to §51295. If the acquisition does not void the contract, Caltrans' uses of contracted property will be affected and limited by the terms of the contract and provisions of the Act.

At least one Caltrans district has informed the Department that its acquisition process follows the policies and procedures described in Chapter 8 of the Caltrans Right of Way Manual, including Exhibit 8-EX-1, Article 6. Acquisition Policies. In the subject acquisition, if Caltrans were to follow these policies and procedures, it would appear to meet the intent of §51295 regarding voiding the subject contract with respect to the land so acquired. Please understand, however, that the Department does not provide counsel regarding eminent domain law but encourages Caltrans to obtain legal counsel for this purpose. To assist our review, we request that Caltrans acknowledge adherence to the above-noted Caltrans policies and procedures in this instance or more specifically describe its process for acquiring the subject property according to the Codes noted above.

CEQA

The letter states that Caltrans is preparing a Draft Environmental Impact Report/Draft Environmental Impact Statement (DEIR/DEIS) for June 2007 public release. In order to complete its review of the acquisition, the Department request a copy of the DEIR/DEIS.

Additional Notification

Please be advised that pursuant to Government Code §51291(d), the Department and local governing body must be notified of any proposed, significant changes to the project. The Department must also be notified within 10 days when the property is actually acquired (§ 51291(c)). If Caltrans' acquisition voids the involved contract under § 51295, and Caltrans then determines not to locate the proposed public improvement

on the subject property or any part thereof, before returning the land to private ownership, it must notify the Department and local governing body. The land must be reenrolled in a new contract or encumbered by an enforceable restriction at least as restrictive as that provided by the Williamson Act (§ 51295) and subject contract. If you have any questions about our comment or need further assistance, please contact Bob Blanford, Research Analyst, at (916) 327-2145.

Sincerely,

Dennis J. O'Bryant
Program Manager

Enclosure

cc: Marin County Board of Supervisors
3501 Civic Center Drive
San Rafael, CA 94903

The Honorable Joan C. Thayer
Marin County Assessor
P.O. Box C
San Rafael, CA 94913-3902

The Honorable Eeve T. Lewis
Sonoma County Assessor
585 Fiscal Drive, Room 104F
Santa Rosa, CA 95403-2872

Sonoma County Board of Supervisors
Sonoma County Administration Building
575 Administration Drive, Room 100A
Santa Rosa, California

State of California • The Resources Agency
Arnold Schwarzenegger, *Governor*
DEPARTMENT OF PARKS AND RECREATION
Ruth Coleman, *Director*
Marin District
845 Casa Grande Road
Petaluma, CA 94954

December 7, 2006

Robert Nixon
California Department of Transportation
1657 Riverside Drive
Redding, CA 96001

Robert,

On July 19, 2006, Sean Charles presented conceptual design information regarding the Marin-Sonoma Narrows Project to Tina Williams, Breck Parkman, and myself. Since a portion of the project does impact Olompali State Park, we appreciated the on site meeting and a chance for exchange regarding those impacts. As we understand it, the proposed interface with State Parks involves;

- northern extension of Redwood Boulevard to the present park entrance via the existing south bound Hwy 101 lanes for use as a park entrance and bicycle path from the Atherton/San Marin interchange,
- construction of a cul-de-sac at the park entrance gate,
- transfer to Parks those portions of existing south bound Hwy 101 adjacent to Olompali State Park for use as a possible administrative road and as a portion of a bicycle path connecting Novato to Petaluma.

In support of the greater project, State Parks is requesting funding to accomplish one or more of the following projects.

- Construction of the Olompali Historic Gardens,
- Construction of a public restroom and paving at the main parking lot,
- Construction of an artifact storage room within one of the existing buildings,
- Rehabilitation of the Native American Village.

The Marin District conceptually supports the project as outlined and looks forward to participating on those portions affecting Olompali State Park.

If you have questions, please contact me.

Sincerely,

Dave Gould
District Superintendent

STATE OF CALIFORNIA ARNOLD SCHWARZENEGGER, *Governor*

CALIFORNIA STATE LANDS COMMISSION
100 Howe Avenue, Suite 100-South
Sacramento, CA 95825-8202

PAUL D. THAYER, *Executive Officer*
(916) 574-1800 FAX (916) 574-1810
Relay Service From TDD Phone **1-800-735-2929**
from Voice Phone **1-800-735-2922**

Contact Phone: **(916) 574-1862**
Contact FAX: **(916) 574-1925**

January 6, 2006

File Ref: PRC 744 & 3987

Ms. Susan Simpson
District Office Chief
Office of Environmental Planning, North
California Department of Transportation
PO Box 23660
Oakland, CA 94623-0660

Dear Ms. Simpson:

SUBJECT: Marin-Sonoma Narrow Project

The State acquired sovereign ownership of all tidelands and submerged lands and beds of navigable waterways upon its admission to the United States in 1850. The State holds these lands for the benefit of all the people of the State for statewide Public Trust purposes which include, waterborne commerce, navigation, fisheries, water-related recreation, habitat preservation, and open space. The landward boundaries of the State's sovereign interests are generally based upon the ordinary high water marks of these waterways as they last naturally existed. Thus, such boundaries may not be readily apparent from present day site inspections. The State's sovereign interests are under the jurisdiction of the SLC. The CSLC has a leasing interest over the proposed project at the Petaluma River bridge crossings at Lakeville Road and Washington Street. The extent of the Commission's jurisdiction will be determined when the applicant provides the Commission with more specific detailed engineering drawings of the project route.

The CSLC is a responsible agency under the California Environmental Quality Act. We recommend that the proposed environmental document be circulated through the State Clearinghouse pursuant to CEQA section 15073(d).

Should you require additional information or assistance please do not hesitate to contact me at (916) 574-1862.

Sincerely,

NANCI SMITH
Public Land Management Specialist

COPY

DEPARTMENT OF TRANSPORTATION
111 GRAND AVENUE
P. O. BOX 23660
OAKLAND, CA 94623-0660
PHONE (510) 622-8729
FAX (510) 286-6374
TTY (800) 735-2929

Fish & Game

JAN 13 2006

Yountville

Flex your power!
Be energy efficient!

January 11, 2006

Mr. Carl Wilcox
California Department of Fish and Game
Region 3
P.O. Box 47
Yountville, CA 94599

04-MRN-101-KP 29.4/44.5 (PM 18.3/27.7)
04-SON-101-KP 0.0/12.1 (PM 0.0/7.5)
EA 264000

RE: Potential impact to salt marsh harvest mouse habitat at Petaluma River as a result of the Marin-Sonoma Narrows Widening Project

Dear Mr. Wilcox:

The California Department of Transportation (Caltrans), in cooperation with the Federal Highway Administration, proposes to conduct an HOV-widening project (referred to as the Marin-Sonoma Narrows Widening Project, or MSN) on U.S. Route 101 (US-101) just south of State Route 37 in Novato (Marin County) to just south of Old Redwood Highway in Petaluma (Sonoma County). The project extends a distance of approximately 27.4 kilometers (17 miles) in length.

The salt marsh harvest mouse (SMHM) (*Reithrodontomys raviventris*) is federally and state listed as endangered, and is also listed by the state as a fully protected species. Five locations were identified by Caltrans biologists as potential SMHM habitat in the area of the MSN Project. On November 7, 2003, Mr. Fred Botti (California Department of Fish and Game) and on January 8, 2004, Mr. Jim Browning (U.S. Fish and Wildlife Service) concurred that the five locations within the MSN Project are potential SMHM habitat. As a result of coordination between Caltrans and various resource and regulatory agencies, the scope of the MSN Project has been largely scaled down to avoid and minimize impacts to the natural environment. As a result, Caltrans has designed the project to avoid impacts to four of the five potential SMHM locations.

The location of potential SMHM habitat that Caltrans may be unable to completely avoid is at the Petaluma River. Pickleweed (*Salicornia virginica*) exists on either side of the existing US-101 bridge structures on the northern bank of the Petaluma River. In an email message dated April 30, 2004, Mr. Botti indicated that the patch of pickleweed on the east side of the bridge is dense and fairly well-established and "...appears to be excellent SMHM habitat." Mr. Botti also indicated during a field meeting (April 23, 2004) that the patch of pickleweed on the west side of the bridge is sparse and of very low quality, and that there is not enough SMHM habitat to sustain a population. A maintained channel currently connects the two patches of pickleweed on either side of the bridge structures.

Caltrans may be unable to completely avoid potential SMHM habitat on the east side of the bridge as a result of the construction required to replace the Petaluma River bridge structures. Caltrans originally considered six different proposed bridge designs for this location. Two of the

COPY

alternatives were not considered to be cost-effective. The remaining four alternatives consist of either lengthening or shortening the bridges with either cast-in-place or pre-cast concrete structures. The two alternatives involving shorter structures would result in approximately 3 million dollars in savings, compared to the two alternatives involving longer structures. However, the shorter length alternatives would require Caltrans to place abutment fill in a portion of the patch of potential SMHM habitat on the east side of the bridge structures. To reduce the area required to place the bridge footings, Caltrans would construct a retaining wall part way up the slope toward the existing bridge abutments.

Placement of the abutment fill may impact up to 221 square meters (264 square yards) of pickleweed on the east side of the bridge structures. The attached aerial photo shows the portion of the pickleweed that may be impacted by the MSN Project. Caltrans will place abutment fill in the existing channel that currently connects the patches of pickleweed on the east and west sides of the bridges. Per Mr. Botti's request, Caltrans will realign the channel closer to the Petaluma River to maintain connectivity between the east and west sides of the bridge structures. To mitigate for impacts to potential SMHM habitat, Caltrans will construct an additional channel between the Petaluma River and the west side of the bridge structures, allowing greater tidal influence to the area and improving the quality of the pickleweed habitat on the west side of the bridges.

During a telephone conversation with Mr. Chuck Morton on November 9, 2005, you had suggested that Caltrans avoid impacting SMHM by removing vegetation in the impacted area prior to bridge construction. You stated that a qualified biological monitor must be present during pickleweed removal in the impacted area. In addition, you suggested that Caltrans place silt fencing and environmentally sensitive area fencing around the remaining patch of pickleweed to prevent further disturbance to SMHM habitat. By implementing these measures, Caltrans will avoid "take" of SMHM.

Caltrans respectfully requests your concurrence that this letter is an accurate account of your telephone conversation with Mr. Morton on November 9, 2005. If you have any questions, please contact Tami Schane at (510) 286-5602 or John Yeakel at (510) 286-5681.

Sincerely,

JEFFREY G. JENSEN
District 4 Office Chief
Office of Biological Sciences and Permits

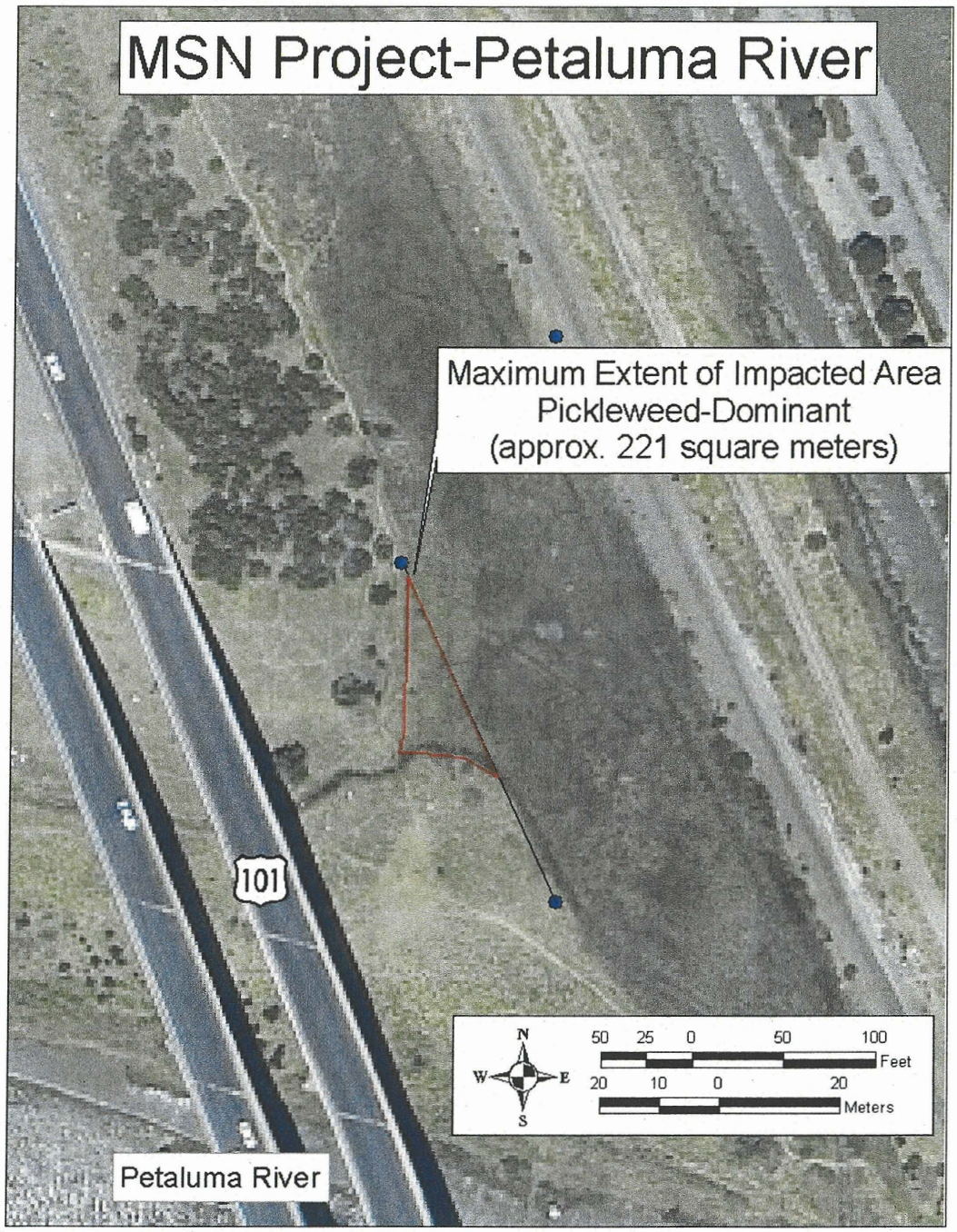
By signing on the line below, I concur that by adhering to the measures above, Caltrans will avoid "take" of the fully-protected SMHM.

Mr. Carl Wilcox
Habitat Conservation Manager
Central Coast Region
California Department of Fish and Game

COPY

bc: Melanie Brent, Office of Environmental Analysis
Yolanda Rivas, Office of Environmental Analysis
Tami Schane, Office of Biological Sciences and Permits
Chuck Morton, Office of Biological Sciences and Permits
Christopher States, Office of Biological Sciences and Permits
John Yeakel, Office of Biological Sciences and Permits
Ray Akkawi, Project Management
Sean Charles, Design

JJ: ts


MSN Project-Petaluma River
Maximum Extent of Impacted Area
Pickleweed-Dominant
(approx. 221 square meters)
101
N
W
E
S
50 25 0 50 100
Feet
20 10 0 20
Meters
Petaluma River

Appendix D

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

17 November 2006

In Reply Refer To
FHWA060328A

Jennifer Darcangelo, Chief
Office of Cultural Resource Studies
Environmental Division
California Department of Transportation, District 4
P.O. Box 23660
Oakland, California 94623-0660

RE: DETERMINATIONS OF ELIGIBILITY FOR THE PROPOSED MARIN-SONOMA NARROWS PROJECT, ON U.S. HIGHWAY 101 IN MARIN AND SONOMA COUNTIES, CALIFORNIA; EA 264000 [*SECTION 106 CONSULTATION (RND.02) ON THE* ***MARIN-SONOMA NARROWS PROJECT*** *ON U.S. HIGHWAY 101, MARIN AND SONOMA COUNTIES, CALIFORNIA*]

Dear Ms. Darcangelo,

This letter addresses the California Department of Transportation's (Caltrans) response, on behalf of the Federal Highway Administration (FHWA), to my 22 April 2006 comment on Caltrans' efforts to date to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended. Caltrans' response and my comment on it here are made pursuant to the 1 January 2004 *Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as It Pertains to the Administration of the Federal-aid Highway Program in California* (PA).

Caltrans' letter of 18 August 2006 largely defers comment on my 22 April discussion of the adequacy of the agency's efforts to identify historic properties, and primarily treats the regulatory disposition of a number of prehistoric archaeological sites in the area of potential effects for the subject undertaking.

Caltrans proposes in the subject letter to lump archaeological sites CA-MRN-196 and CA-MRN-197 together, and determines that the composite site, which is to be referred to as CA-MRN-196, is eligible for inclusion in the National Register of Historic Places (National Register) under Criterion D. Caltrans acknowledges that, due to a lack of access to portions of the composite site, the agency cannot definitively ascertain the true extent of the historic property. Caltrans further proposes to complete the identification and evaluation of the composite site as R.O.W. acquisition for the undertaking progresses.

On the basis of the information in the March 2006 *Historic Property Survey Report for the Marin-Sonoma Narrows Project on US Highway 101 from the Vicinity of Novato, Marin County to the vicinity of Petaluma, Sonoma County*, I concur that

1) the most appropriate manner to presently manage CA-MRN-196 and CA-MRN-197 is to lump them together into a single archaeological resource that will hereafter be referred to as CA-MRN-196, and
2) the new, more inclusive **CA-MRN-196** is eligible for inclusion in the National Register under Criterion D.

I agree to Caltrans' strategy to complete the identification and evaluation of the new CA-MRN-196 only in so far as Caltrans can demonstrate that such efforts are in direct support of alternatives to the undertaking that are under consideration at the time the agency intends to conduct further identification and evaluation fieldwork. I hope that this caveat will serve to clarify a persistent misinterpretation of an early on-site discussion about this undertaking that took place in August of 2002. My concern about the adequacy of Caltrans' level of effort to identify and evaluate historic properties relates to the degree to which such efforts support the active consideration of undertaking alternatives rather than how invasive such efforts may be.

Caltrans also proposes in its 18 August letter to lump prehistoric archaeological sites CA-MRN-194, CA-MRN-195, CA-MRN-507, and CA-MRN-526 into a composite property which is to be referred to as the Olompali Complex. Caltrans proposes, similar to the scenario for CA-MRN-196 above, to complete the identification and evaluation of the composite site as R.O.W. acquisition for the undertaking progresses. I do not object to the proposed strategy with the caveats that CA-MRN-193 be included in the Olompali Complex due to its spatial proximity to the balance of the complex, and that Caltrans ultimately declare which trinomial will represent the complex.

Although the FHWA has not formally notified me of its finding of effect for the undertaking, I understand, on the basis of a 5 October 2006 telephone conversation between yourself and Mike McGuirt of my staff, that Caltrans anticipates that the FHWA will find the undertaking to adversely affect historic properties, and seek to develop a memorandum of agreement (MOA) to resolve those effects. Caltrans apparently envisions the MOA stipulating the completion of a deferred final phase of identification and evaluation for the archaeological sites above. I would like to offer my advance support for this strategy, and add that I would be glad to conclude our discussion of my comments of 22 April with Caltrans and the FHWA as an aspect of our development of the subject MOA.

Please direct any questions or concerns that you may have to Project Review Unit archaeologist Mike McGuirt at 916.653.8920 or at mmcgu@parks.ca.gov.

Sincerely,

Susan K Shatton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

MWD:MDM:mdm

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov

22 April 2006

In Reply Refer To
FHWA060328A

Jennifer Darcangelo
Branch Chief, Archaeology East
Office of Cultural Resource Studies
California Department of Transportation, District 4
P.O. Box 23660
Oakland, California 94623-0660

RE: DETERMINATIONS OF ELIGIBILITY FOR THE PROPOSED MARIN-SONOMA NARROWS PROJECT, ON U.S. HIGHWAY 101 IN MARIN AND SONOMA COUNTIES, CALIFORNIA; EA 264000 [SECTION 106 CONSULTATION ON THE **MARIN-SONOMA NARROWS PROJECT** ON U.S. HIGHWAY 101, MARIN AND SONOMA COUNTIES, CALIFORNIA]

Dear Ms. Darcangelo,

This letter is a response to the California Department of Transportation's (Caltrans) submission, on behalf of the Federal Highway Administration, of the March 2006 *Historic Property Survey Report for the Marin-Sonoma Narrows Project on US Highway 101 from the Vicinity of Novato, Marin County to the vicinity of Petaluma, Sonoma County* (HPSR). Caltrans' submission and my comment on it here are made pursuant to the 1 January 2004 *Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as It Pertains to the Administration of the Federal-aid Highway Program in California* (PA).

Caltrans' letter of 23 March 2006 requests that I concur, pursuant to stipulation VIII.C.5 of the PA, with its determinations on the National Register of Historic Places (National Register) eligibility of a number of properties in the subject undertaking's area of potential effects (APE).

On the basis of my review of the HPSR, I concur that

711 Alice Street, Novato
707 Alice Street, Novato
9501 Redwood Highway, Novato
9543 Redwood Highway, Novato
155 San Antonio Road, Petaluma
156 San Antonio Road, Petaluma
5495 Redwood Highway, Petaluma
4796 Redwood Highway, Petaluma
4775 Redwood Highway, Petaluma
4410 Kastania Road, Petaluma
4408 Kastania Road, Petaluma
4300 Kastania Road, Petaluma
2760-62 S. Petaluma Boulevard, Petaluma
Bridges 20-0154L and R, U.S. Highway 101, Petaluma
1178 Lindberg Lane, Petaluma
8 Northwest Pacific Railroad segments (see p. 3 of the November 2004 DPR 523 and attachment 1 to the HPSR)
CA-MRN-192

are *not* eligible for inclusion in the National Register.

I concur further that the

Freeman-Parker residence, 4555 Redwood Highway, Petaluma

is eligible for inclusion in the National Register under Criterion C, at the local level of significance, as a rare example of a mid-nineteenth century vernacular residence. I understand the property's period of significance to be the 1850s.

I concur that archaeological site

CA-MRN-327

is eligible for inclusion in the National Register under Criterion D for its potential to yield information important in the local prehistory of the Late period.

I am presently unable to concur with Caltrans' determinations on the National Register eligibility of a number of other archaeological sites that appear to be in and along the fringe of the floodplains of San Antonio Creek and the Petaluma River. The subject sites appear to be in relatively complex depositional environments, and the HPSR and the attachments to that document do not evidence a knowledge of the sites or their physical contexts sufficient to enable me to concur in Caltrans' determinations.

The complex of archaeological deposits to the south of San Antonio Creek do not appear to be very well understood at the present time. The central to southern portions of archaeological site CA-MRN-197, archaeological deposits identified in auger test nos. 62 and 63 (attachment 5 to the HPSR), and archaeological site CA-MRN-196 may all represent a single archaeological property. I do not believe that it would be appropriate for me to comment on the National Register eligibility of the various components of what may be a single archaeological property when the character of the associations among those components remain so incompletely known.

Similar to the deposits along San Antonio Creek, the complex of archaeological deposits along and to the south of Worm Farm Creek on what appears to be the floodplain of the Petaluma River also do not appear to be well understood at the present time. I am not confident, on the basis of the documentation that I presently have in hand, that the respective extents of archaeological sites CA-MRN-193—195, -507, and -526 have been investigated enough to reliably distinguish each site as an individual property. As appears to be the case with CA-MRN-196 and -197, it is possible that the Worm Farm Creek complex of deposits may represent significantly fewer archaeological sites than presently portrayed. The evaluations of the individual sites are not presently in a condition that would enable me to provide comment on determinations of their National Register eligibility.

The degree of effort that would be appropriate to further refine Caltran's understanding of the above archaeological deposits would depend on the ultimate scope of the undertaking's potential effects on the individual deposits. As various alternatives for the undertaking appear to be under active consideration as of your 23 March letter, the consideration of the location of the above deposits in the alternative selection process may help to reduce the need for such further work.

As your 23 March letter states your anticipated finding that the implementation of the undertaking will adversely affect historic properties, I provide comment here on Caltrans' efforts to comply with the other steps in the Section 106 process. On the basis of my review of the HPSR, I believe that Caltrans' determination of the area of potential effects (APE) for the undertaking, pursuant to stipulation VIII.A of the PA and in accordance with attachment 3 to that document, is appropriate as the undertaking is presently defined.

I am presently not clear that Caltrans' efforts to identify historic properties, pursuant to stipulation VIII.B of the PA, are yet complete. The methods that Caltrans used to inventory the historic properties in the APE do not appear to be consistent with my routine guidance. As one example, the pedestrian survey of the surface of the APE was done using 30 m intervals over what attachment 5 to the

HPSR describes as often heavy vegetation. Caltrans' efforts to take into consideration the apparent fact that the surface of the mineral soil was often not visible were limited to the periodic scraping of patches of the ground surface and the examination of cut banks, equipment scrapes, and rodent borrow tailings, where these happened to occur. I would not ordinarily recommend such a methodology to a federal agency, because it lacks the systematic rigor to provide data that would reliably represent the population of historic properties in an undertaking's APE. Another example of where Caltrans' methods do not appear to be consistent with my usual guidance relates to how the agency sought to consider the effects of the subject undertaking on archaeological sites that may be buried beneath the surface of the APE. Despite having done a preliminary geoarchaeological analysis of the corridor for the undertaking (appendix A of attachment 5 to the HPSR), Caltrans does not appear to have used that information or consulted further with a professional geoarchaeologist to design a methodology or sample structure to systematically investigate the subsurface of the subject undertaking's APE. The methods that Caltrans used to observe the subsurface deposits in the APE are relatively limited in scope, and the sample structure appears to have been largely subjective in character.

In order that Caltrans and I may consult on and develop a narrow set of objectives to conclude our discussion of the agency's efforts to identify historic properties in the subject undertaking's APE, I would appreciate having some additional layers of information for Caltrans' APE map in attachment 3 to the HPSR. I would appreciate having layers that depict

1. where local vegetation cover was particularly dense and the surface of the mineral soil was not visible,
2. the portions of the APE where landowners denied Caltrans access,
3. the portions of the APE where the implementation of the undertaking is likely to disturb the ground,
4. the "geological-landform deposits" of table 2 in appendix A of attachment 5 to the HPSR, and
5. the locations of the auger tests.

To facilitate our discussion of the above information, I would further appreciate it if Caltrans would prepare statements

1. on the portions of the subject undertaking's APE where the extant pedestrian survey data may not well represent the actual frequency of archaeological deposits and on the percentage of the APE those portions represent,
2. on the portions of the APE where Caltrans will ultimately gain access through property acquisition,
3. on the portions of the APE where ground disturbance is likely to occur and on the percentage of those portions that were subject to augering, and
4. on whether and how Caltrans proposes to take into account the inventory gaps that 1–3 above would ostensibly document.

When you feel that it is appropriate, I would be glad to meet with you to discuss a strategy to conclude our consultations on the identification and evaluation of historic properties in the subject undertakings' APE.

Please direct any questions or concerns that you may have to Project Review Unit archaeologist Mike McGuirt at 916.653.8920 or at mmcgu@parks.ca.gov.

Sincerely,

Stephen D. Mikesell for

Milford Wayne Donaldson, FAIA

State Historic Preservation Officer

MWD:mdm

Appendix E

Appendix E Summary of Relocation Benefits

I. IMPORTANT RELOCATION ASSISTANCE INFORMATION

The following explanation is general in nature and is not intended to be a complete statement of Federal and State relocation laws and regulations. Any questions concerning relocation should be addressed to Caltrans.

Any persons to be displaced will be assigned to a relocation advisor, who will work closely with each displacee in order to see that all payments and benefits are fully utilized, and that all regulations are observed, thereby avoiding the possibility of displacees jeopardizing or forfeiting any of their benefits or payments. At the time of the first written offer to purchase, owner-occupants are given a detailed explanation of Caltrans' relocation services. Tenant occupants of properties to be acquired are contacted soon after the first written offer to purchase, and also are given a detailed explanation of Caltrans' Relocation Program. To avoid loss of possible benefits, no individual, family, business, farm, or nonprofit organization should commit to purchase or rent a replacement property without first contacting a Caltrans relocation advisor.

II. RELOCATION ASSISTANCE ADVISORY SERVICES

In accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, Caltrans will provide relocation advisory assistance to any person, business, farm or nonprofit organization displaced as a result of the acquisition of real property for public use. Caltrans will assist displacees in obtaining comparable replacement housing by providing current and continuing information on the availability and prices of both houses for sale and rental units that are "decent, safe and sanitary." Nonresidential displacees will receive information on comparable properties for lease or purchase. (For business, farm, and nonprofit organization relocation services, see Section IV.)

Residential replacement dwellings will be in equal or better neighborhoods at rents or prices within the financial ability of the individuals and families displaced, and reasonably accessible to their places of employment. Before any displacement occurs, comparable replacement dwellings that are open to all persons regardless of race, color, religion, sex, and national origin, and which are consistent with the requirements of Title VIII of the Civil Rights Act of 1968, will be offered to displacees. This assistance will also include the supply of information concerning Federal and State assisted housing programs, and any other known services being offered by public and private agencies in the area.

Persons who are eligible for relocation payment(s) and who are legally occupying a property required for the project will not be asked to move without first being given at least 90 days written notice, and not unless at least one decent, safe and sanitary replacement residence, available on the market, is offered to them by Caltrans.

III. RESIDENTIAL RELOCATION PAYMENTS PROGRAM

The Relocation Payment Program will help eligible residential occupants by paying certain costs and expenses. These costs are limited to those necessary for or incidental to the purchase or rental of the replacement dwelling and actual reasonable moving expenses to a new location within 50 miles of the displacement property. Any actual moving costs in excess of the 50 miles are the responsibility of the displacee. The Residential Relocation Program can be summarized as follows:

Moving Costs

Any displaced person who lawfully occupied the acquired property, regardless of the length of occupancy in the property acquired, will be eligible for reimbursement of moving costs. Displacees will receive either the actual reasonable costs involved in moving themselves and personal property up to a maximum of 50 miles, or a fixed payment based on a fixed moving cost schedule.

Purchase Supplement

In addition to moving and related expense payments, fully eligible homeowners may be entitled to payments for increased costs of replacement housing.

Homeowners who have owned and occupied their property for 180 days or more prior to the date of the first written offer to purchase the property, may qualify to receive a price differential payment and may qualify to receive reimbursement for certain nonrecurring costs incidental to the purchase of the replacement property. An interest differential payment is also available if the interest rate for the loan on the replacement dwelling is higher than the loan rate on the displacement dwelling, subject to certain limitations on reimbursement based upon the replacement property interest rate. The maximum combination of these three supplemental payments that the owner-occupant can receive is $22,500. If the total entitlement (without the moving payments) is in excess of $22,500, the Last Resort Housing Program will be used. (See the explanation of the Last Resort Housing Program below.)

Rental Supplement

Tenants who have occupied the property to be acquired by Caltrans for 90 days or more and owner-occupants of 90-179 days prior to the date of the first written offer to purchase may qualify to receive a rental differential payment. This payment is made when Caltrans determines that the cost to rent a comparable "decent, safe, and sanitary" replacement dwelling will be more than the present rent of the displacement dwelling. As an alternative, the tenant may qualify for a down payment benefit designed to assist in the purchase of a replacement property and the payment of certain costs incidental to the purchase, subject to certain limitations noted below under the Down Payment section. The maximum amount payable to any tenant of 90 days or more and any owner-occupant of 90-179 days, in addition to moving expenses, is $5,250. If the total entitlement for rental supplement exceeds $5,250, the Last Resort Housing will be used.

In addition to the occupancy requirements, in order to receive any relocation benefits, the displaced person must buy or rent and occupy a "decent, safe, and sanitary" replacement dwelling within one year from the date the department takes legal possession of the property, or from the date the displacee vacates the displacement property, whichever is later.

Down Payment

The down payment option has been designed to aid owner occupants of 90-179 days and tenants with no less than 90 days of continuous occupancy prior to Caltrans' first written offer. The down payment and incidental expenses cannot exceed the maximum payment of $5,250. The one year eligibility period in which to purchase and occupy a "decent, safe, and sanitary" replacement dwelling will apply.

Last Resort Housing

Federal regulations (49 CFR 24) contain the policy and procedure for implementing the Last Resort Housing Program on Federal-aid projects. Last resort housing benefits are, except for the amounts of payments and the methods in making them, the same as those benefits for standard residential

relocation, as explained above. Last resort housing has been designed primarily to cover situations where a displacee cannot be relocated because of lack of available comparable replacement housing, or when the anticipated replacement housing payments exceed the $5,250 and $22,500 limits of the standard relocation procedure, because either the displacee lacks the financial ability or other valid circumstances. In certain exceptional situations, Last Resort Housing may also be used for tenants of less than 90 days.

Other Relocation Information

After the first written offer to acquire the property has been made, Caltrans will, within a reasonable length of time, personally contact the displacees to gather important information, including the following:

- Preferences in area of relocation;
- Number of people to be displaced and the distribution of adults and children according to age and sex;
- Location of school and employment;
- Specific arrangements needed to accommodate any family members' special needs;
- Financial ability to relocate into comparable replacement dwelling which will adequately house all members of the family.

IV. THE NONRESIDENTIAL RELOCATION ASSISTANCE PROGRAM

The Nonresidential Relocation Assistance Program provides assistance to businesses, farms, and nonprofit organizations in locating suitable replacement property, and reimbursement for certain costs involved in relocation. The Relocation Advisory Assistance Program will provide current lists of properties offered for sale or rent, suitable for a particular business's specific relocation needs. The types of payments available to eligible businesses, farms, and nonprofit organizations are moving and searching expenses, and possibly reestablishment expenses or a fixed in-lieu payment instead of any moving, searching, and reestablishment expenses. The payment types can be summarized as follows:

Moving Expenses

- Moving expenses may include the following actual, reasonable costs:
- The moving of inventory, machinery, equipment, and similar business-related property; dismantling, disconnecting, crating, packing, loading, insuring, transporting, unloading, unpacking, and reconnecting of personal property.
- Loss of tangible personal property provides payment for actual, direct loss of personal property that the owner is permitted not to move.
- Expenses related to searching for a new business site, up to $1,000 for reasonable expenses actually incurred.

Appendix F

Marin-Sonoma Narrows from Ignacio Boulevard,
Novato to Old Redwood Highway, Petaluma

FARMLAND CONVERSION IMPACT RATING FORM (NRCS-CPA-106)

In compliance with the Farmland Protection Policy Act (7 CFR 658.1-7), Parts I and III of the Farmland Conversion Impact Rating Form (NRCS-CPA-106) and maps of the proposed project were submitted to the Natural Resources Conservation Service for determination of whether any part of the project site is farmland subject to the Act. Their review and completion of Parts II, IV, and V on May 31, 2006 indicates that the proposed highway project would use approximately 0.61 hectares (1.5 acres) to 0.77 hectares (1.9 acres) of prime and unique farmland and 0.73 hectares (1.8 acres) to 0.93 hectares (2.3 acres) of statewide and local important farmland, depending on the alternative selected. This represents approximately 0.0004 percent of the total farmland subject to the Act in Sonoma County.

The total site assessment criteria score for the project ranges from 131 to 132, depending on the alternative selected. The NRCS-CPA-106 form was not resubmitted to the Natural Resources Conservation Service for further review, based on regulation 7 CFR 658.4, which provides that "sites receiving a total score of less than 160 points be given a minimal level of consideration for protection and no additional sites need to be evaluated." The Farmland Conversion Impact Rating Form along with the Site Assessment Criteria and Point Rating are attached.

Marin-Sonoma Narrows from Ignacio Boulevard,
Novato to Old Redwood Highway, Petaluma

FARMLAND CONVERSION IMPACT RATING FORM (NRCS-CPA-106)

The site assessment criteria, as described in 7 CFR 658.5, were developed by the U.S. Secretary of Agriculture in cooperation with other Federal agencies. Each criterion is given a score on a scale of 0 to the maximum points established. Conditions suggesting top, intermediate and bottom scores are indicated for each criterion. The maximum points for each criterion are shown on the Farmland Conversion Impact Rating Form (NRCS-CPA-106). The site assessment criteria and scores for each are described below.

1. **Area in Nonurban Use.** How much land is in nonurban use within a radius of 1.0 mile from where the project is intended?

   Approximately 70 percent. (11 points)

2. **Perimeter in Nonurban Use.** How much of the perimeter of the site borders on land in nonurban use?

   Approximately 65 percent. (7 points)

3. **Percent of Corridor Being Farmed.** How much of the site has been farmed (managed for a scheduled harvest or timber activity) more than five of the last ten years?

   Approximately 70 percent. (15 points)

4. **Protection Provided by State and Local Government.** Is the site subject to State or unit of local government policies or programs to protect farmland or covered by private programs to protect farmland?

   Six sites are protected by the Williamson Act. (20 points)

5. **Size of Present Farm Unit Compared to Average.** Is the farm unit(s) containing the site (before the project) as large as the average-size farming unit in the county?

   Farming units containing the sites are approximately 45 percent smaller than the Sonoma County average of 208 acres. (2 points)

6. **Creation of Non-farmable Farmland.** If the site is chosen for the project, how much of the remaining land on the farm will become non-farmable because of interference with land patterns?

Estimated less than five percent. (0 points)

7. **Availability of Farm Support Services.** Does the site have available adequate supply of farm support services and markets, i.e., farm suppliers, equipment dealers, processing and storage facilities and farmer's markets?

Most services required are available. (5 points)

8. **On-Farm Investments.** Does the site have substantial and well-maintained on-farm investments such as barns, other storage buildings, fruit trees and vines, field terraces, drainage, irrigation, waterways, or other soil and water conservation measures?

There are some existing on-farm investments on the farmland sites under consideration. (2 points)

9. **Effects of Conversion of Farm Support Services.** Would the project at this site, by converting farmland to nonagricultural use, reduce the demand for farm support services so as to jeopardize the continued existence of these support services and thus, the viability of the farms remaining in the area?

No substantial reduction in demand for support services if the site is converted. (0 points)

10. **Compatibility with Existing Agricultural Use.** Is the kind and intensity of the proposed use of the site sufficiently incompatible with agriculture that it is likely to contribute to the eventual conversion of surrounding farmland to nonagricultural use?

Proposed project is tolerable with existing agricultural use of surrounding farmland. (5 points)

U.S. DEPARTMENT OF AGRICULTURE
Natural Resources Conservation Service

NRCS-CPA-106
(Rev. 1-91)

FARMLAND CONVERSION IMPACT RATING FOR CORRIDOR TYPE PROJECTS

PART I *(To be completed by Federal Agency)*		3. Date of Land Evaluation Request 5/1/06	4. Sheet 1 of 1
1. Name of Project Marin-Sonoma Narrows Project		5. Federal Agency Involved Federal Highway Administration	
2. Type of Project Transportation (Highway)		6. County and State Marin & Sonoma, California	
PART II *(To be completed by NRCS)*		1. Date Request Received by NRCS 5/5/06	2. Person Completing Form Jessica Sterniels
3. Does the corridor contain prime, unique statewide or local important farmland? (If no, the FPPA does not apply - Do not complete additional parts of this form).	YES ☑ NO ☐	4. Acres Irrigated 57,181*	Average Farm Size 208
5. Major Crop(s) wine grapes, market milk, misc. livestock	6. Farmable Land in Government Jurisdiction Acre 144,544 % 14.3	7. Amount of Farmland As Defined in FPPA Acres: 77,502 % 7.1	
8. Name Of Land Evaluation System Used California Storie Index	9. Name of Local Site Assessment System NONE	10. Date Land Evaluation Returned by NRCS 5/31/06	

PART III *(To be completed by Federal Agency)*	Alternative Corridor For Segment 14b	12b	14b	14d
A. Total Acres To Be Converted Directly	142.88	121.43	146.26	149.84
B. Total Acres To Be Converted Indirectly, Or To Receive Services				
C. Total Acres In Corridor				
PART IV *(To be completed by NRCS) Land Evaluation Information*				
A. Total Acres Prime And Unique Farmland #	1.9	1.9	1.5	1.5
B. Total Acres Statewide And Local Important Farmland	2.3	2.3	1.8	1.8
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted	0.0004	0.0004	0.0003	0.0003
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value				
PART V *(To be completed by NRCS) Land Evaluation Information Criterion Relative Value of Farmland to Be Serviced or Converted (Scale of 0 - 100 Points)*	64	64	65	65

PART VI *(To be completed by Federal Agency) Corridor Assessment Criteria (These criteria are explained in 7 CFR 658.5(c))*	Maximum Points				
1. Area In Nonurban Use	15	11	11	11	11
2. Perimeter In Nonurban Use	10	7	7	7	7
3. Percent Of Corridor Being Farmed	20	15	15	15	15
4. Protection Provided By State And Local Government	20	20	20	20	20
5. Size of Present Farm Unit Compared To Average	10	2	2	2	2
6. Creation Of Nonfarmable Farmland	25	0	0	0	0
7. Availability Of Farm Support Services	5	5	5	5	5
8. On-Farm Investments	20	2	2	2	2
9. Effects Of Conversion On Farm Support Services	25	0	0	0	0
10. Compatibility With Existing Agricultural Use	10	5	5	5	5
TOTAL CORRIDOR ASSESSMENT POINTS	160	67	67	67	67
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland (From Part V)	100	64	64	64	64
Total Corridor Assessment (From Part VI above or a local site assessment)	160	67	67	67	67
TOTAL POINTS *(Total of above 2 lines)*	260	131	131	132 ~~131~~	132 ~~131~~

1. Corridor Selected:	2. Total Acres of Farmlands to be Converted by Project:	3. Date Of Selection:	4. Was A Local Site Assessment Used? YES ☐ NO ☐

5. Reason For Selection:

Signature of Person Completing this Part: DATE 6/26/06

NOTE: Complete a form for each segment with more than one Alternate Corridor

* Soils designated as Prime and of Statewide Importance within corridor are only located within Sonoma County. Information for Part II, number 3-7 is therefore for Sonoma County only though corridor encompasses Marin and Sonoma Counties.

Soils are classified as Prime and of Statewide Importance if "a developed irrigation water supply that is dependable and of adequate quality. A dependable water supply is one which is available for the production of the commonly grown crops in 8 out of 10 years…".

Appendix G

EXIBIT 804.7B

Floodplain Evaluation Report Summary

Dist. 04 Co. Marin/Sonoma Rte. 101 K.P. (PM) Mar 30.7 (19.1) to Son 12.4 (7.7)

Project No. E.A. 264000 Bridge No.

Limits: 1.4 km south of Rte. 101/37 Separation in Marin County to 0.3 km south of Old Redwood Highway in Sonoma County. Total length of project is about 27.4 km (17 mi.).

Floodplain Description: Novato Creek and unnamed tributaries, with tidal influence from San Pablo Bay; Rush Creek and unnamed tributaries, with tidal influence from San Pablo Bay; San Antonio Creek and unnamed tributaries; Petaluma River and named tributaries, Washington Creek, Lynch Creek, Capri Creek and Corona Creek. Petaluma River also has unnamed tributaries and tidal influence from San Pablo Bay.

		Yes	No
1.	Is the proposed action a longitudinal encroachment of the base floodplain?	☐	☒
2.	Are the risks associated with the implementation of the proposed action significant?	☐	☒
3.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	☐	☒
4.	Are Location Hydraulic Studies that document the above answers on file? If no explain	☒	☐

Signature - Dist. Hydraulic Engineer — Date: 8-18-05

1.	Will the proposed action support probable incompatible floodplain development?	☐	☒
2.	Are there any significant impacts on natural and beneficial floodplain values?	☐	☒
3.	Routine construction procedures are required to minimize impacts on the floodplain. Are there any special mitigation measures necessary to minimize impacts or restore and preserve natural and beneficial floodplain values? If yes, explain.	☐	☒
4.	Does the proposed action constitute a significant floodplain encroachment as defined in 23 CFR, Section 650.105(q).	☐	☒

Yolanda Rivas

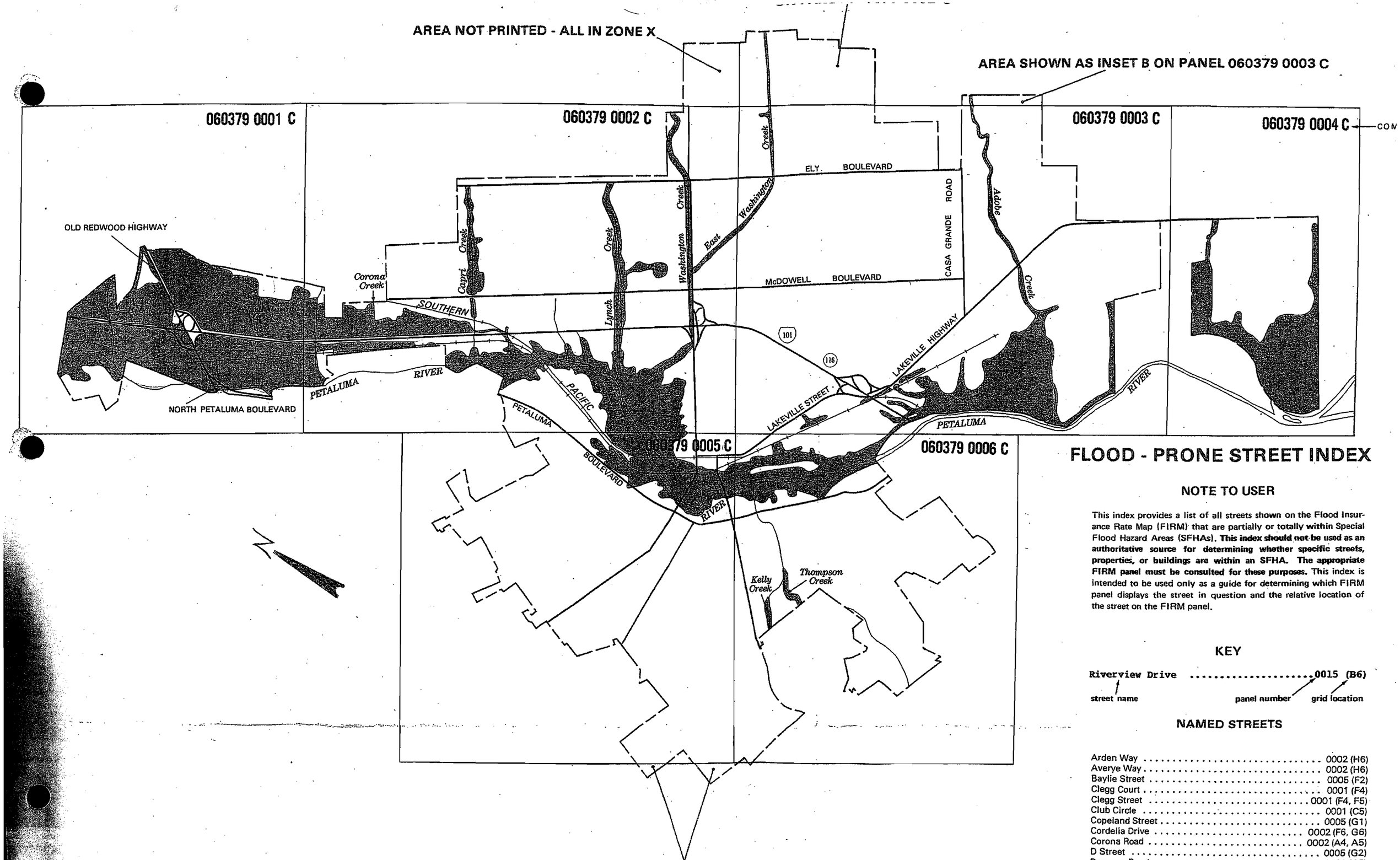
Signature - Dist. Environmental Branch Chief — Date: 4-27-07

Concurrence:

Signature - Dist. Project Engineer — Date: 5-3-07

Signature - FHWA Project Develop Engr — Date: 5/3/2007

Explanation _____



FLOOD - PRONE STREET INDEX

NOTE TO USER

This index provides a list of all streets shown on the Flood Insurance Rate Map (FIRM) that are partially or totally within Special Flood Hazard Areas (SFHAs). **This index should not be used as an authoritative source for determining whether specific streets, properties, or buildings are within an SFHA. The appropriate FIRM panel must be consulted for these purposes.** This index is intended to be used only as a guide for determining which FIRM panel displays the street in question and the relative location of the street on the FIRM panel.

KEY

Riverview Drive 0015 (B6)

street name — panel number — grid location

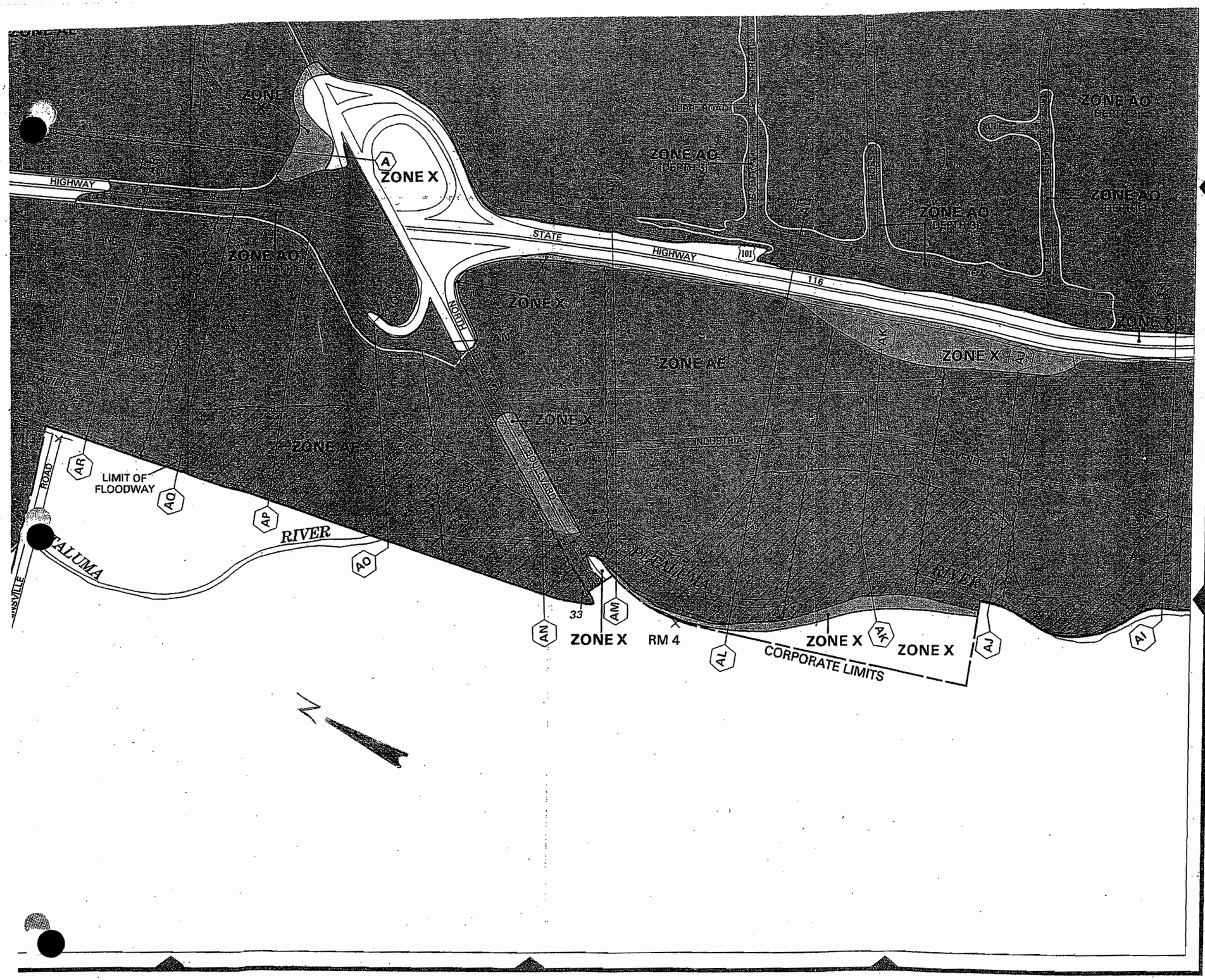
NAMED STREETS

Arden Way	0002 (H6)
Averye Way	0002 (H6)
Baylie Street	0005 (F2)
Clegg Court	0001 (F4)
Clegg Street	0001 (F4, F5)
Club Circle	0001 (C5)
Copeland Street	0005 (G1)
Cordelia Drive	0002 (F6, G6)
Corona Road	0002 (A4, A5)
D Street	0005 (G2)
Denman Road	0001 (C5)
Drake Drive	0001 (C5, D5)
E Street	0006 (A2)

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET

400 0 400



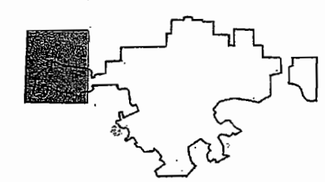
NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PETALUMA,
CALIFORNIA
SONOMA COUNTY

**SEE NOTE IN LEGEND

PANEL 1 OF 6
(SEE MAP INDEX FOR PANELS NOT PRINTED)

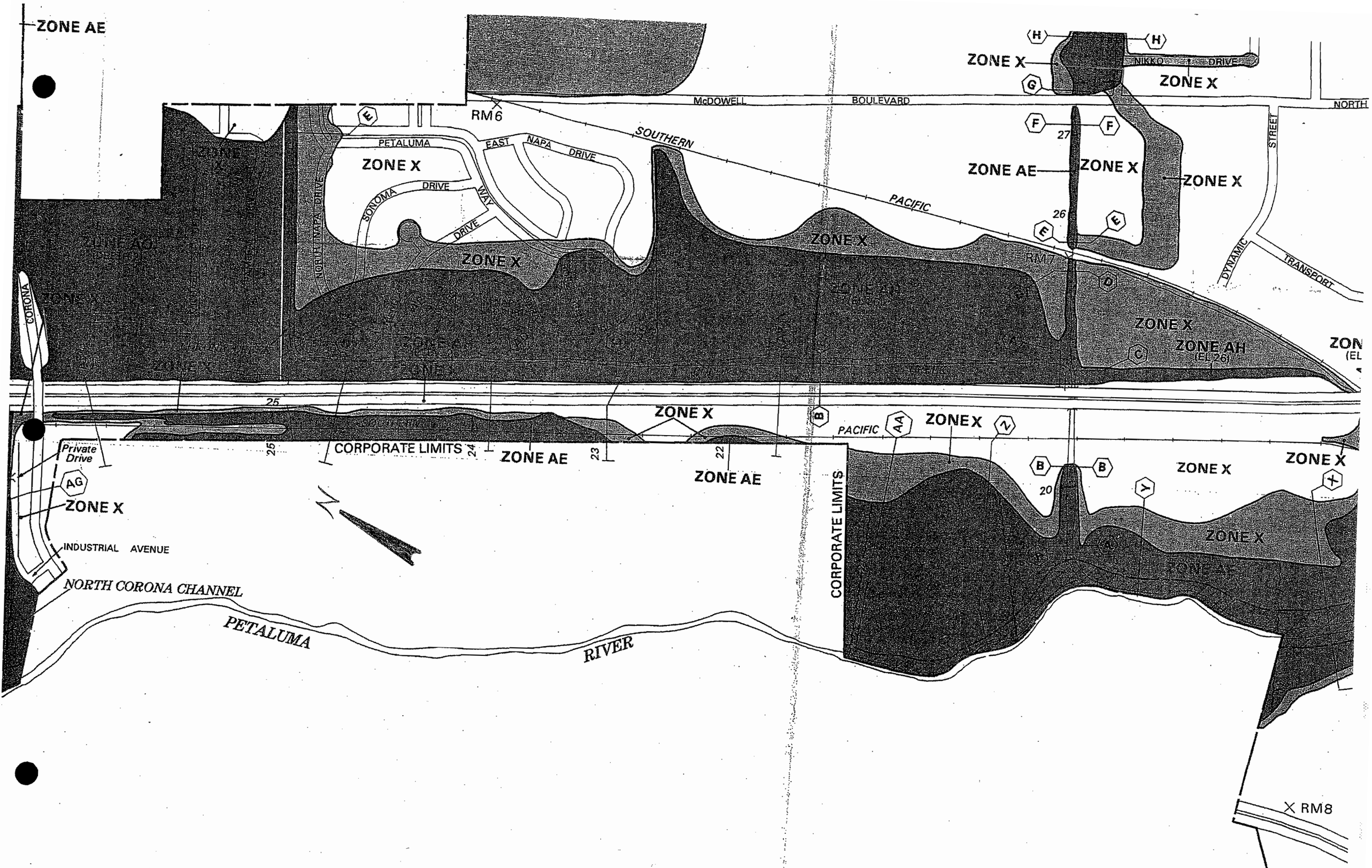


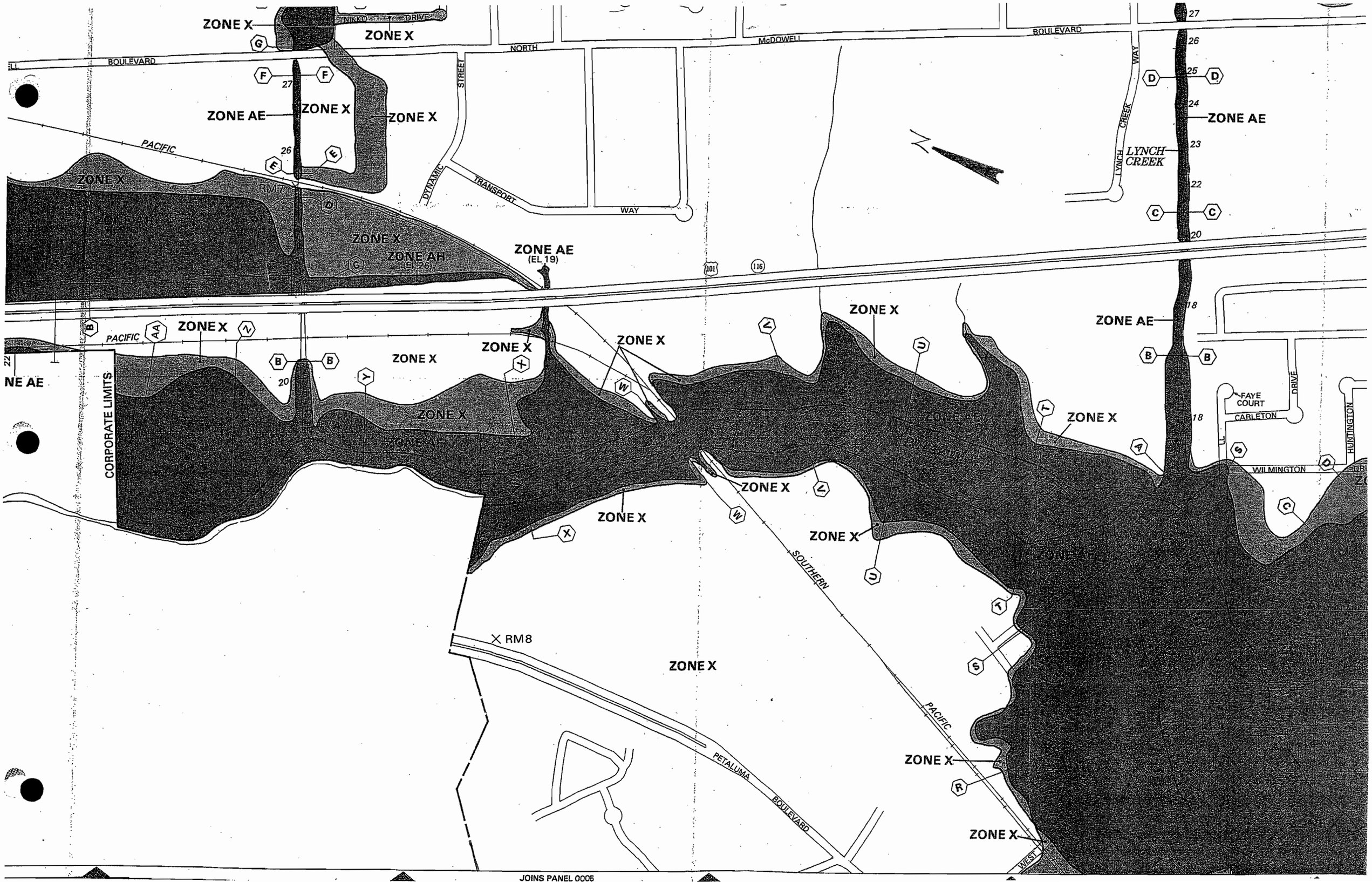
PANEL LOCATION

COMMUNITY-PANEL NUMBER
060379 0001C

MAP REVISED:
SEPTEMBER 29, 1989

Federal Emergency Management Agency


ZONE AE
ZONE X
NIKKO DRIVE
ZONE X
McDOWELL BOULEVARD
NORTH
RM6
SOUTHERN PACIFIC
PETALUMA EAST NAPA DRIVE
ZONE X
SONOMA DRIVE
WAY
DRIVE
NORTH NAPA DRIVE
ZONE AE
ZONE X
ZONE X
ZONE AE
ZONE X
ZONE X
RM7
DYNAMIC TRANSPORT STREET
ZONE X
ZONE AH
(EL 26)
ZONE AO
ZONE X
CORONA
ZONE A
ZONE X
25
ZONE X
CORPORATE LIMITS
ZONE AE
ZONE AE
PACIFIC
ZONE X
ZONE X
ZONE X
Private Drive
ZONE X
INDUSTRIAL AVENUE
NORTH CORONA CHANNEL
PETALUMA RIVER
CORPORATE LIMITS
ZONE X
ZONE AE
RM8


ZONE X
NIKKO DRIVE
ZONE X
BOULEVARD
NORTH
McDOWELL
BOULEVARD
STREET
ZONE AE
ZONE X
ZONE X
PACIFIC
RM7
ZONE X
ZONE AH
DYNAMIC
TRANSPORT
WAY
ZONE X
ZONE AH
(EL 26)
ZONE AE
(EL 19)
101
116
LYNCH CREEK
LYNCH CREEK WAY
ZONE AE
ZONE AE
ZONE X
PACIFIC
ZONE X
ZONE X
ZONE X
ZONE X
ZONE X
ZONE AE
ZONE X
FAYE COURT
CARLETON
DRIVE
HUNTINGTON
WILMINGTON
CORPORATE LIMITS
ZONE X
ZONE X
ZONE X
SOUTHERN
ZONE X
RM8
ZONE X
PACIFIC
PETALUMA
BOULEVARD
ZONE X
ZONE X
WEST
JOINS PANEL 0005

NAMES HAVE BEEN CORRECTED.

To determine if flood insurance is available, contact an insurance agent or call the National Flood Insurance Program at (800) 638-6620.

APPROXIMATE SCALE IN FEET

400 0 400

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PETALUMA,
CALIFORNIA
SONOMA COUNTY

**SEE NOTE IN LEGEND

PANEL 2 OF 6
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION

COMMUNITY-PANEL NUMBER
060379 0002 C

MAP REVISED:
SEPTEMBER 29, 1989

Federal Emergency Management Agency

BOULEVARD
LYNCH CREEK WAY
LYNCH CREEK
ZONE AE
ZONE X
101
WASHINGTON CREEK
U.S. HIGHWAY 101 EXIT
FAYE COURT
CARLETON
WILMINGTON
DRIVE
WAY
HUNTINGTON
STREET
MADISON
ELLIS
MARTIN CIRCLE
DORIS
WASHINGTON
VERNA COURT
EAST
D
PACIFIC

NATIONAL FLOOD INSURANCE PROGRA

FIRM
FLOOD INSURANCE RATE MAP

CITY OF
PETALUMA,
CALIFORNIA
SONOMA COUNTY

****SEE NOTE IN LEGEND**

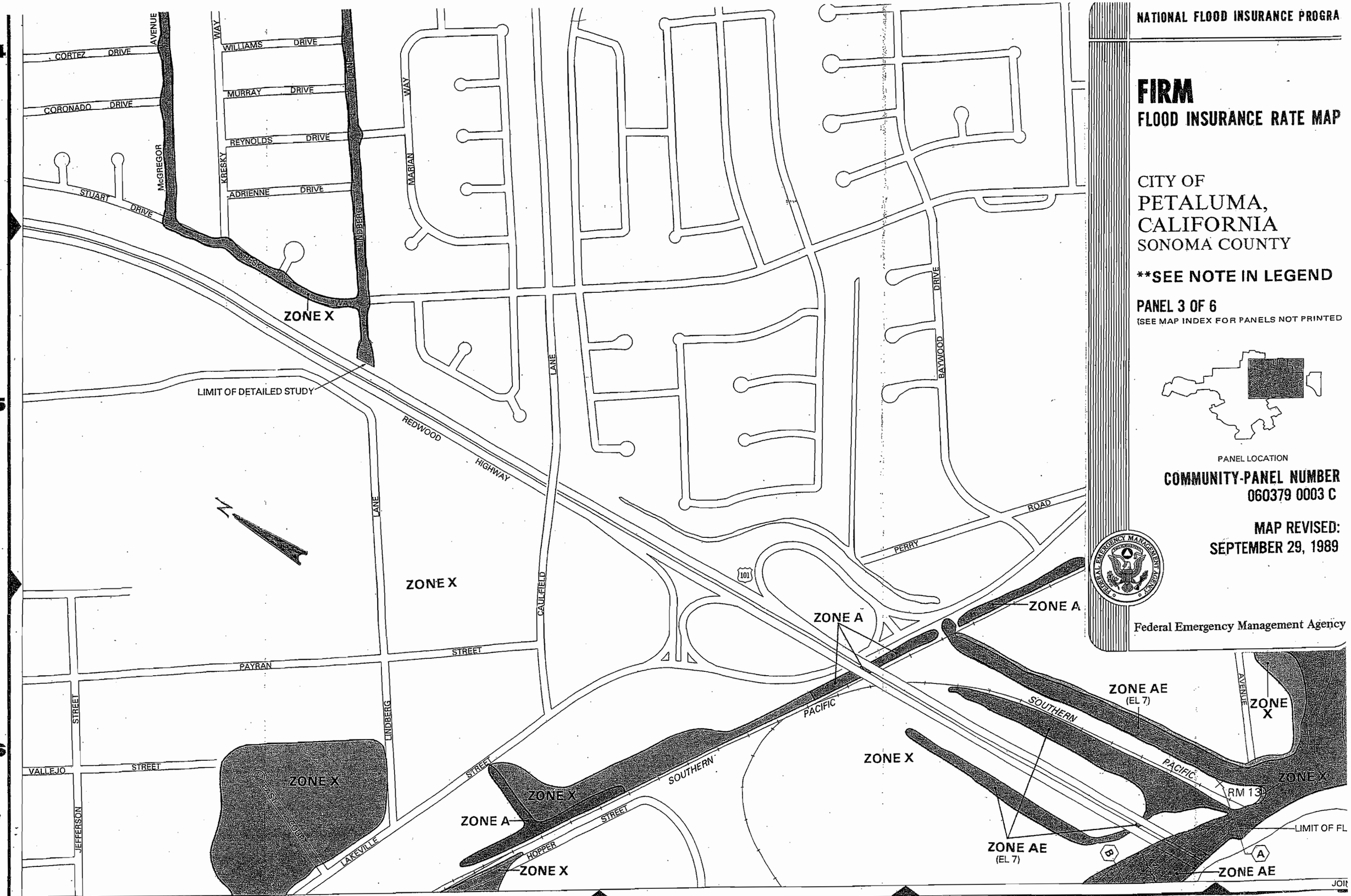
PANEL 3 OF 6
(SEE MAP INDEX FOR PANELS NOT PRINTED

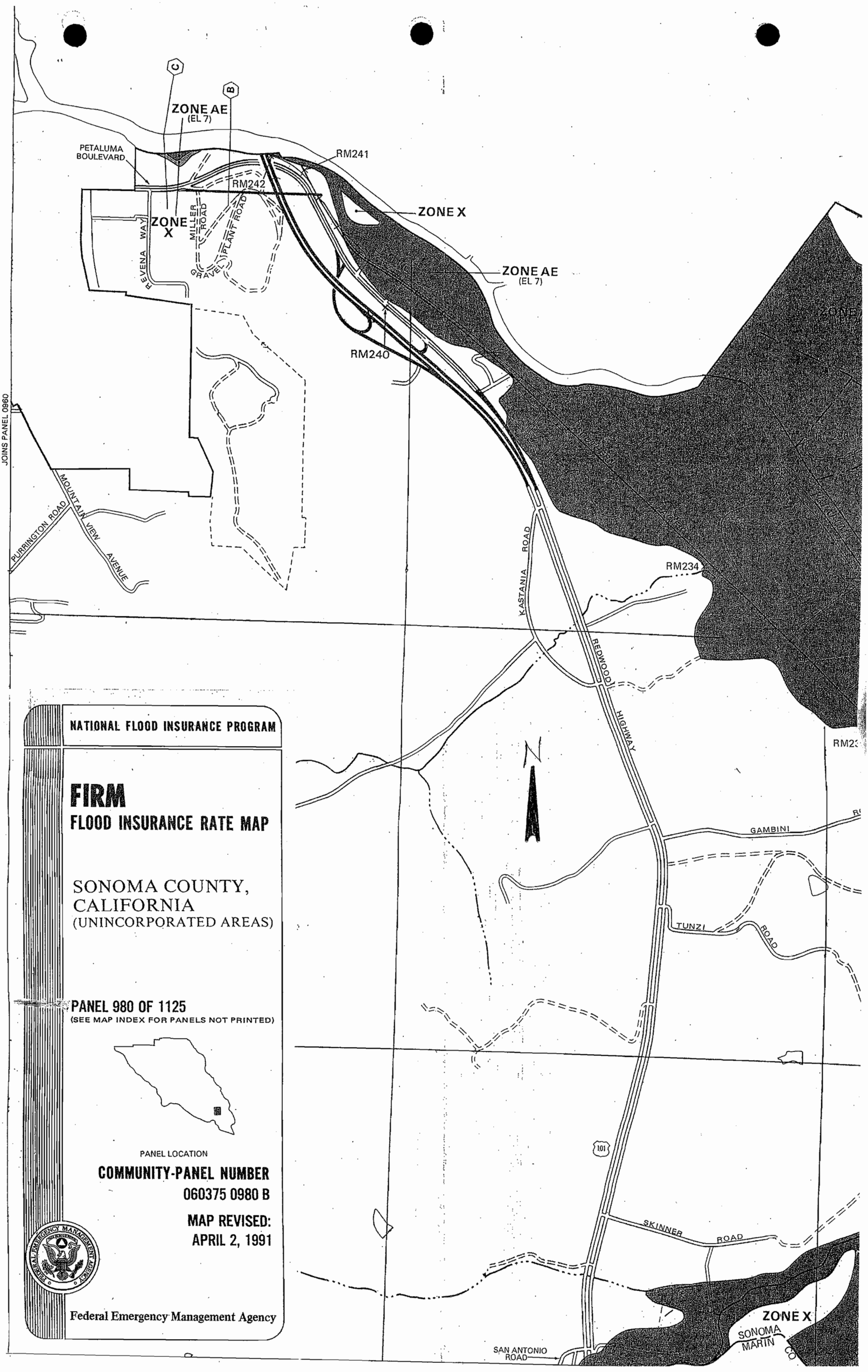
PANEL LOCATION

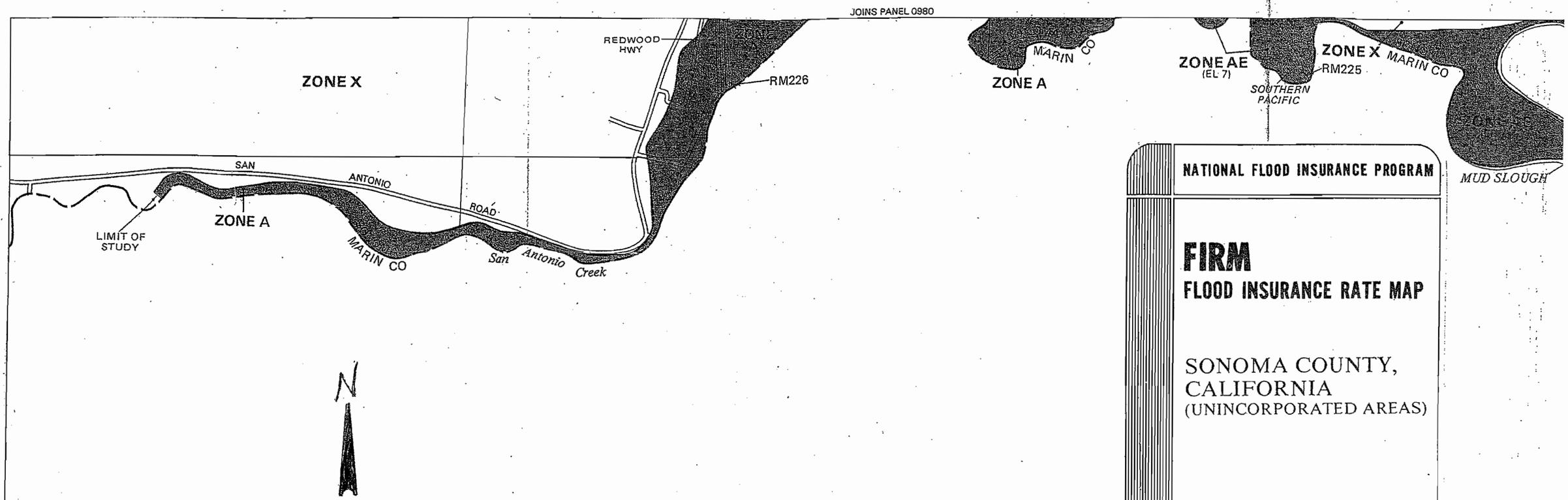
COMMUNITY-PANEL NUMBER
060379 0003 C

MAP REVISED:
SEPTEMBER 29, 1989

Federal Emergency Management Agency




C
B
ZONE AE
(EL 7)
PETALUMA BOULEVARD
RM241
RM242
ZONE X
ZONE X
MILLER ROAD
PLANT ROAD
GRAVEL
REVENA WAY
ZONE AE
(EL 7)
RM240
JOINS PANEL 0960
PURRINGTON ROAD
MOUNTAIN VIEW AVENUE
KASTANIA ROAD
RM234
REDWOOD HIGHWAY
N
GAMBINI
TUNZI ROAD
101
SKINNER ROAD
ZONE X
SONOMA
MARIN
SAN ANTONIO ROAD
NATIONAL FLOOD INSURANCE PROGRAM
FIRM
FLOOD INSURANCE RATE MAP
SONOMA COUNTY,
CALIFORNIA
(UNINCORPORATED AREAS)
PANEL 980 OF 1125
(SEE MAP INDEX FOR PANELS NOT PRINTED)
PANEL LOCATION
COMMUNITY-PANEL NUMBER
060375 0980 B
MAP REVISED:
APRIL 2, 1991
Federal Emergency Management Agency

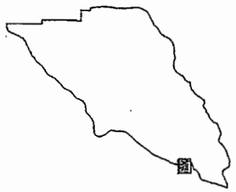


NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

SONOMA COUNTY, CALIFORNIA
(UNINCORPORATED AREAS)

PANEL 990 OF 1125
(SEE MAP INDEX FOR PANELS NOT PRINTED)



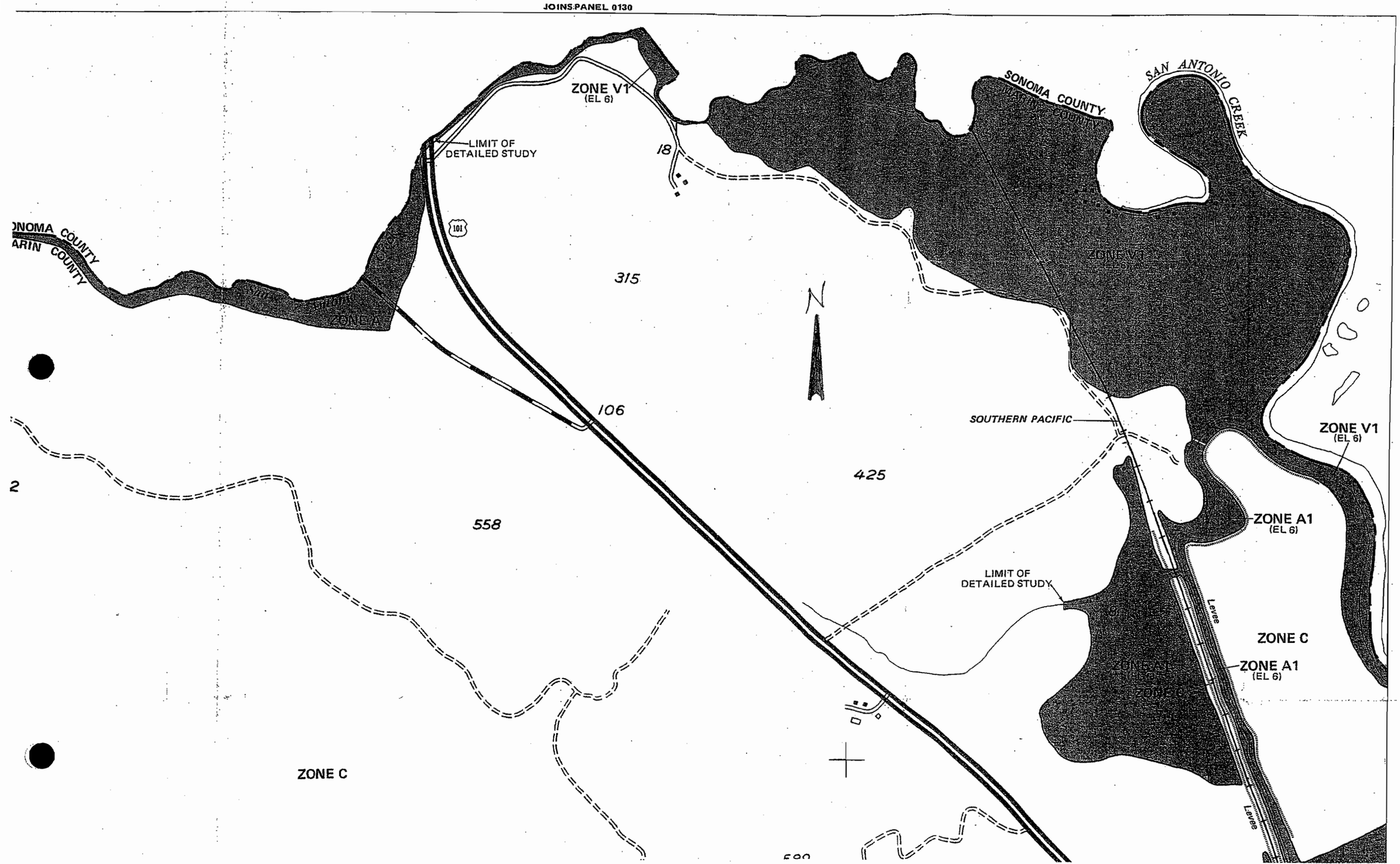
PANEL LOCATION

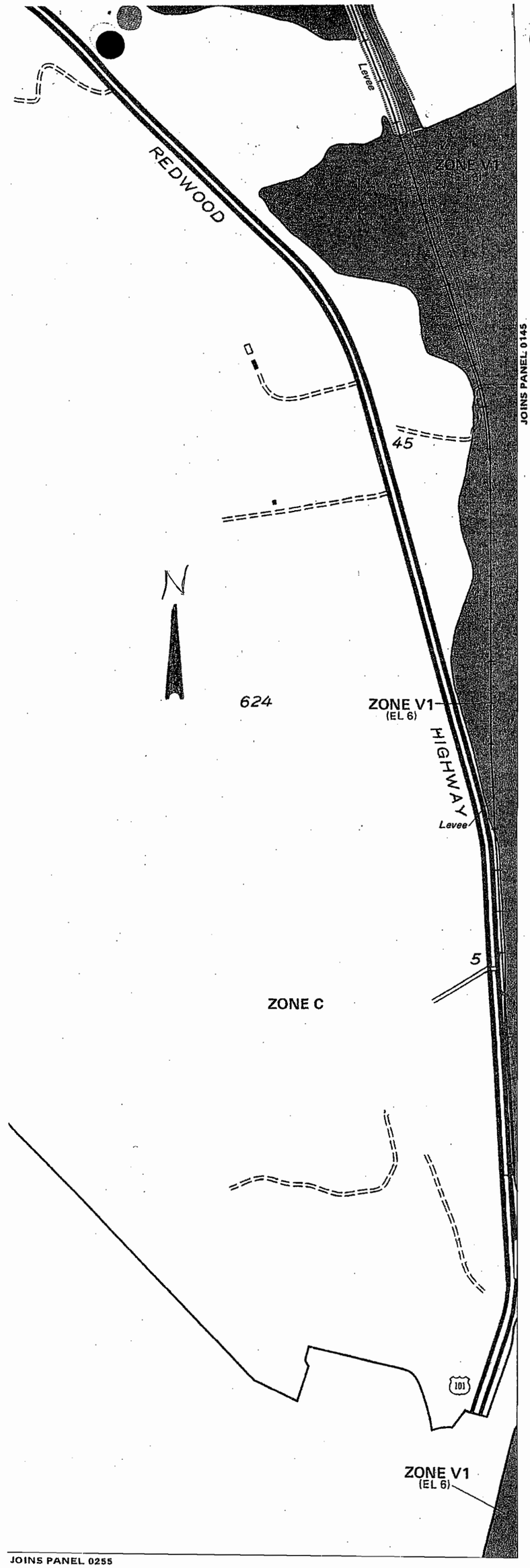
COMMUNITY-PANEL NUMBER
060375 0990 B

MAP REVISED:
APRIL 2, 1991

Federal Emergency Management Agency

JOINS PANEL 0130





For adjoining map panels, see separately printed Index To Map Panels.

INITIAL IDENTIFICATION:
FEBRUARY 25, 1977

FLOOD HAZARD BOUNDARY MAP REVISIONS:

FLOOD INSURANCE RATE MAP EFFECTIVE:
[redacted] MAR 01 1982

FLOOD INSURANCE RATE MAP REVISIONS:

Refer to the FLOOD INSURANCE RATE MAP EFFECTIVE date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent, or call the National Flood Insurance Program, at (800) 638-6620.

APPROXIMATE SCALE
1000 0 1000 FEET

NATIONAL FLOOD INSURANCE PROGRAM

1

FIRM
FLOOD INSURANCE RATE MAP

MARIN COUNTY, CALIFORNIA
(UNINCORPORATED AREAS)

PANEL 140 OF 525
(SEE MAP INDEX FOR PANELS NOT PRINTED)

COMMUNITY-PANEL NUMBER
060173 0140 A

EFFECTIVE DATE:
[redacted]

MAR 01 1982

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRA

FIRM
FLOOD INSURANCE RATE MAI

CITY OF
NOVATO,
CALIFORNIA
MARIN COUNTY

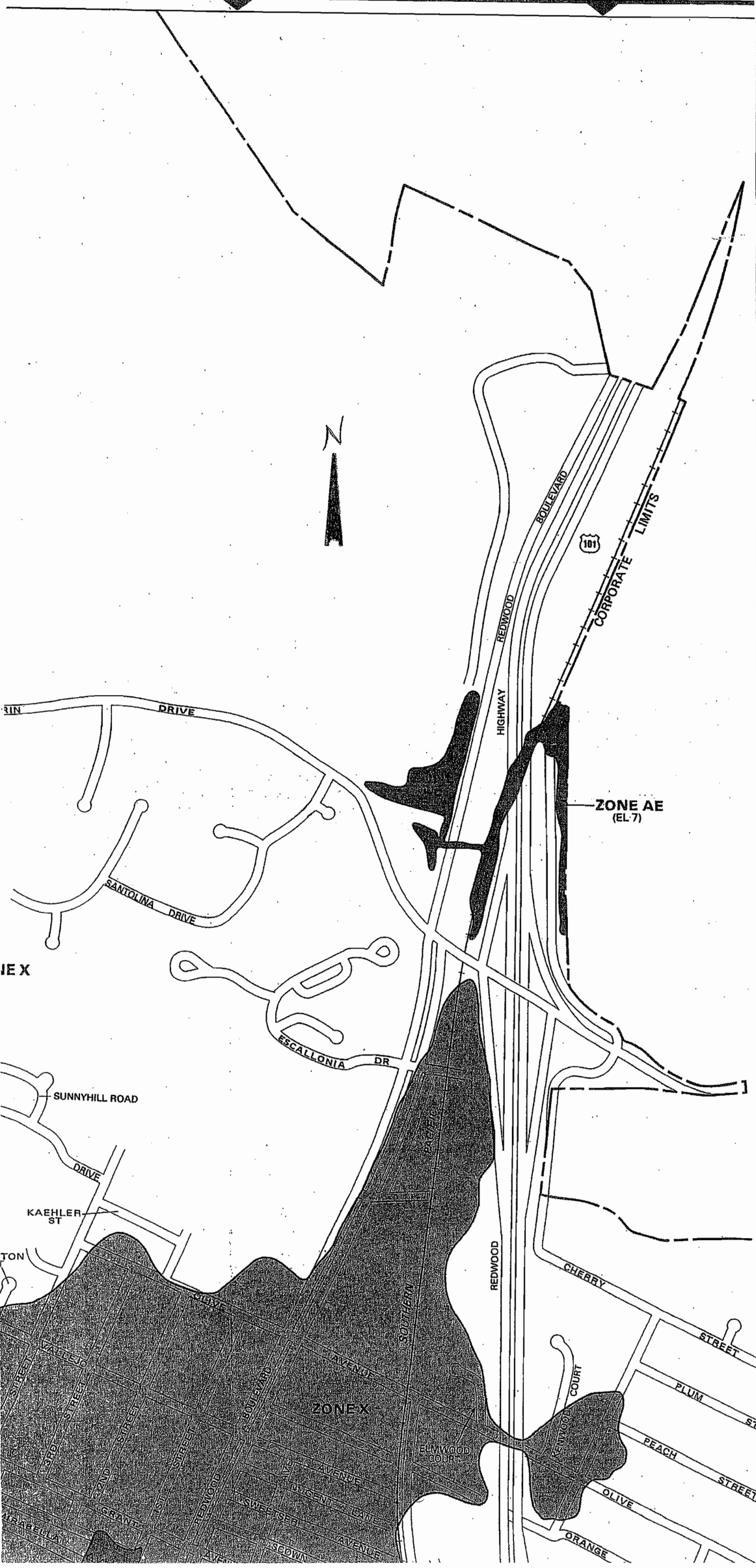
PANEL 2 OF 7
(SEE MAP INDEX FOR PANELS NOT PRINTED

PANEL LOCATION

COMMUNITY-PANEL NUMBER
060178 0002 C

MAP REVISED:
SEPTEMBER 29, 1989

Federal Emergency Management Agency



(EL 987)

RM7X

*Referenced to the Ni

This map is for use
Program; it does not
particularly from loc
features outside Spe

Areas of special floo
AE, AH, AO, A99, V,

Certain areas not in
flood control structu

Boundaries of the f
interpolated betwee
hydraulic considera
Emergency Manager

Floodway widths in s
Floodway widths are

Coastal base flood el

Elevations reference
Report.

For adjoining map pa

Comm

(Maps availabl
IN

FLOOD HAZ

FLOOD INS

FLOOD INS

Map revised April 3, 1
boundaries, zone desi
and cultural features.

Map revised Septembe
flood elevations, to ad
flood hazard areas, to u
to reflect updated topo

JOINS PANEL 0003

To determine if flo
agent or call the
638-6620.

NATIONAL FLOOD[illegible]RANCE PROG

FIRM
FLOOD INSURANCE RATE M/

CITY OF
NOVATO,
CALIFORNIA
MARIN COUNTY

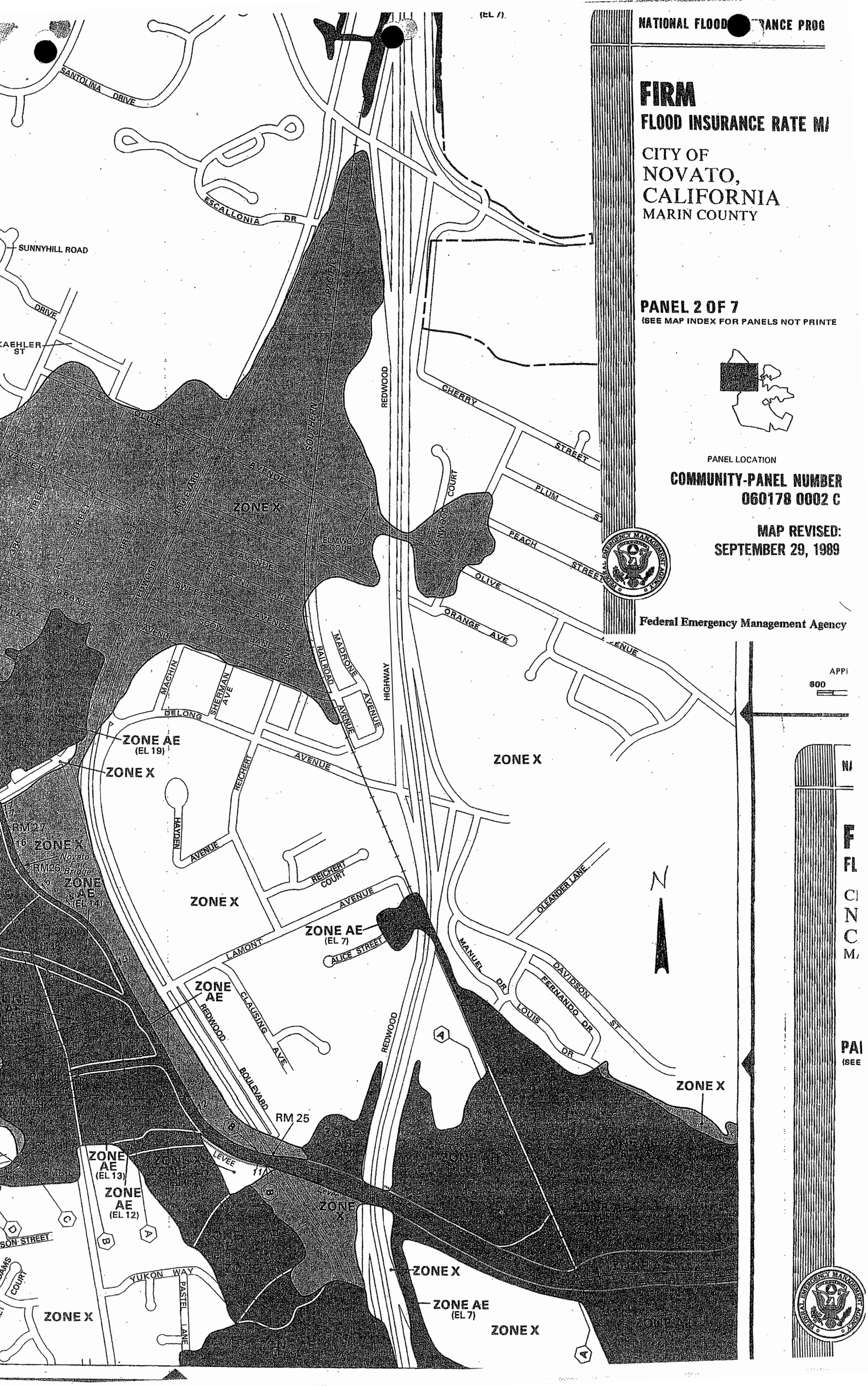
PANEL 2 OF 7
(SEE MAP INDEX FOR PANELS NOT PRINTE

PANEL LOCATION

COMMUNITY-PANEL NUMBER
060178 0002 C

MAP REVISED:
SEPTEMBER 29, 1989

Federal Emergency Management Agency



NATIONAL FLOOD INSURANCE PROGRA

FIRM
FLOOD INSURANCE RATE MAI

CITY OF
NOVATO,
CALIFORNIA
MARIN COUNTY

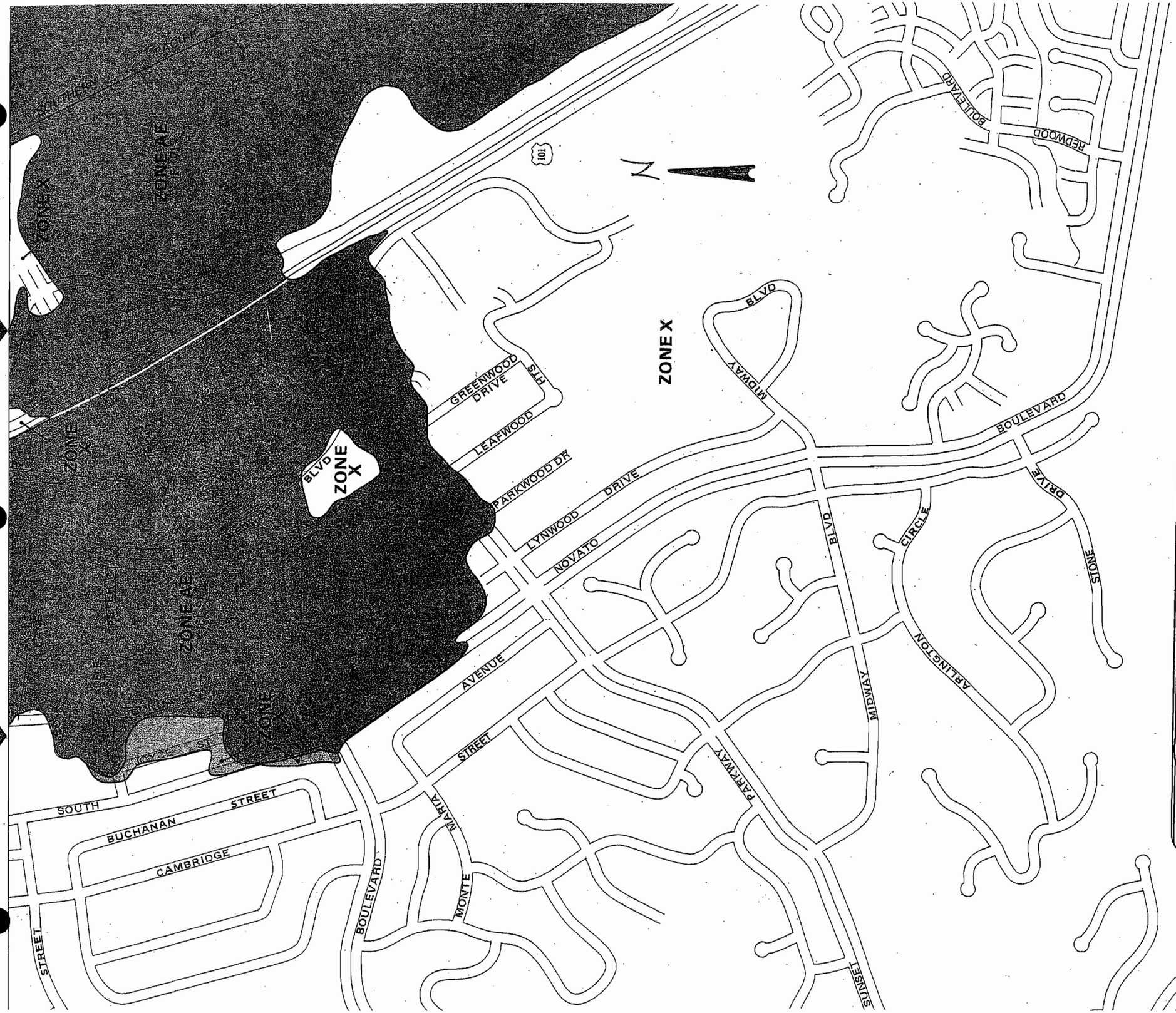
PANEL 4 OF 7
(SEE MAP INDEX FOR PANELS NOT PRINTE

PANEL LOCATION

COMMUNITY-PANEL NUMBEI
060178 0004 C

MAP REVISED
SEPTEMBER 29, 1989

Federal Emergency Management Agenc



FIRM
FLOOD INSURANCE RATE MAP

CITY OF
NOVATO,
CALIFORNIA
MARIN COUNTY

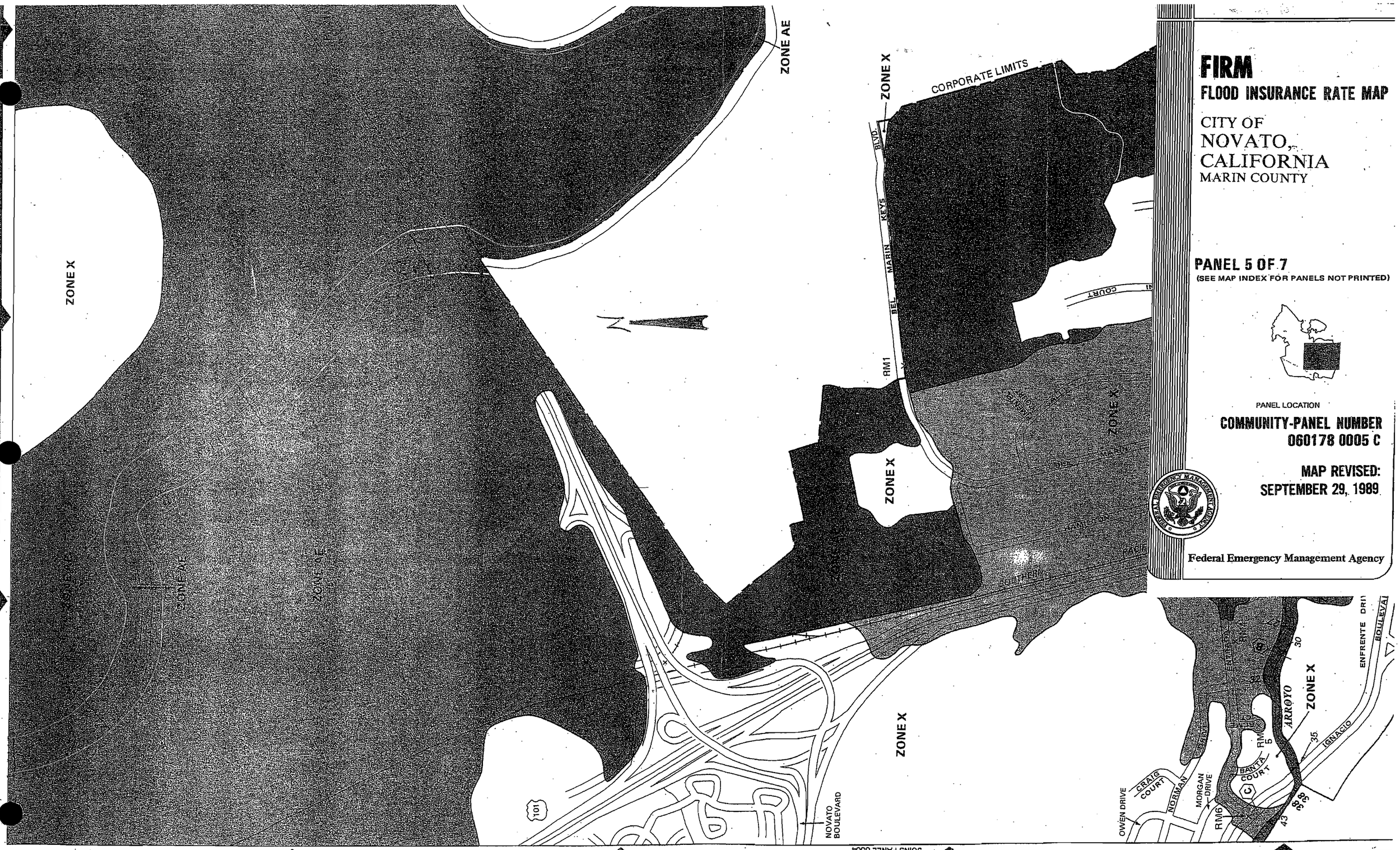
PANEL 5 OF 7
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION

COMMUNITY-PANEL NUMBER
060178 0005 C

MAP REVISED:
SEPTEMBER 29, 1989

Federal Emergency Management Agency



Appendix H

United States Department of the Interior
FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825

April 26, 2007

Document Number: 070426030028

Kelley Nelson
California Department of Transportation
111 Grand Avenue
P.O. Box 23660
Oakland, CA 94623

Subject: Species List for Marin-Sonoma Narrows Widening Project

Dear: Ms. Nelson

We are sending this official species list in response to your April 26, 2007 request for information about endangered and threatened species. The list covers the California counties and/or U.S. Geological Survey 7½ minute quad or quads you requested.

Our database was developed primarily to assist Federal agencies that are consulting with us. Therefore, our lists include all of the sensitive species that have been found in a certain area *and also ones that may be affected by projects in the area.* For example, a fish may be on the list for a quad if it lives somewhere downstream from that quad. Birds are included even if they only migrate through an area. In other words, we include all of the species we want people to consider when they do something that affects the environment.

Please read Important Information About Your Species List (below). It explains how we made the list and describes your responsibilities under the Endangered Species Act.

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate species in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be July 25, 2007.

Please contact us if your project may affect endangered or threatened species or if you have any questions about the attached list or your responsibilities under the Endangered Species Act. A list of Endangered Species Program contacts can be found at www.fws.gov/sacramento/es/branches.htm.

Endangered Species Division

TAKE PRIDE IN AMERICA

Federal Endangered and Threatened Species that Occur in or may be Affected by Projects in the Counties and/or U.S.G.S. 7 1/2 Minute Quads you requested

Document Number: 070426030028

Database Last Updated: March 5, 2007

Quad Lists

Listed Species

Invertebrates

Speyeria zerene myrtleae

Myrtle's silverspot butterfly (E)

Syncaris pacifica

California freshwater shrimp (E)

Fish

Eucyclogobius newberryi

tidewater goby (E)

Hypomesus transpacificus

delta smelt (T)

Oncorhynchus kisutch

coho salmon - central CA coast (E) (NMFS)

Oncorhynchus mykiss

Central California Coastal steelhead (T) (NMFS)
Central Valley steelhead (T) (NMFS)
Critical habitat, Central California coastal steelhead (X) (NMFS)

Oncorhynchus tshawytscha

California coastal chinook salmon (T) (NMFS)
Central Valley spring-run chinook salmon (T) (NMFS)
winter-run chinook salmon, Sacramento River (E) (NMFS)

Amphibians

Ambystoma californiense

California tiger salamander, central population (T)

Rana aurora draytonii

California red-legged frog (T)
Critical habitat, California red-legged frog (X)

Birds

Charadrius alexandrinus nivosus

western snowy plover (T)

Haliaeetus leucocephalus

bald eagle (T)

Pelecanus occidentalis californicus

California brown pelican (E)

Rallus longirostris obsoletus

California clapper rail (E)

Sternula antillarum (=Sterna, =albifrons) browni

California least tern (E)

Strix occidentalis caurina
northern spotted owl (T)

Mammals

Reithrodontomys raviventris
salt marsh harvest mouse (E)

Plants

Blennosperma bakeri
Baker's stickyseed [=Sonoma Sunshine] (E)

Chorizanthe valida
Sonoma spineflower (E)

Delphinium bakeri
Critical habitat, Baker's larkspur (X)

Delphinium luteum
yellow larkspur (E)

Hesperolinon congestum
Marin dwarf-flax (=western flax) (T)

Lasthenia burkei
Burke's goldfields (E)

Lasthenia conjugens
Contra Costa goldfields (E)

Limnanthes vinculans
Sebastopol meadowfoam (E)

Candidate Species

Fish

Oncorhynchus tshawytscha
Central Valley fall/late fall-run chinook salmon (C) (NMFS)
Critical habitat, Central Valley fall/late fall-run chinook (C) (NMFS)

Quads Containing Listed, Proposed or Candidate Species:

PETALUMA RIVER (484A)
PETALUMA (484B)
NOVATO (484D)
COTATI (501C)
GLEN ELLEN (501D)

County Lists

No county species lists requested.

Key:

(E) *Endangered* - Listed as being in danger of extinction.

(T) *Threatened* - Listed as likely to become endangered within the foreseeable future.

(P) *Proposed* - Officially proposed in the Federal Register for listing as endangered or threatened.

(NMFS) Species under the Jurisdiction of the National Oceanic & Atmospheric Administration Fisheries Service. Consult with them directly about these species.

Critical Habitat - Area essential to the conservation of a species.

(PX) *Proposed Critical Habitat* - The species is already listed. Critical habitat is being proposed for it.

(C) *Candidate* - Candidate to become a proposed species.

(V) Vacated by a court order. Not currently in effect. Being reviewed by the Service.

(X) *Critical Habitat* designated for this species

Important Information About Your Species List

How We Make Species Lists

We store information about endangered and threatened species lists by U.S. Geological Survey 7½ minute quads. The Unit States is divided into these quads, which are about the size of San Francisco.

The animals on your species list are ones that occur within, **or may be affected by** projects within, the quads covered by th list.

- Fish and other aquatic species appear on your list if they are in the same watershed as your quad or if water use in y quad might affect them.
- Amphibians will be on the list for a quad or county if pesticides applied in that area may be carried to their habitat b air currents.
- Birds are shown regardless of whether they are resident or migratory. Relevant birds on the county list should be considered regardless of whether they appear on a quad list.

Plants

Any plants on your list are ones that have actually been observed in the area covered by the list. Plants may exist in an area without ever having been detected there. You can find out what's in the surrounding quads through the California Native Pl Society's online Inventory of Rare and Endangered Plants.

Surveying

Some of the species on your list may not be affected by your project. A trained biologist or botanist, familiar with the habit requirements of the species on your list, should determine whether they or habitats suitable for them may be affected by yo project. We recommend that your surveys include any proposed and candidate species on your list.

For plant surveys, we recommend using the Guidelines for Conducting and Reporting Botanical Inventories. The results of your surveys should be published in any environmental documents prepared for your project.

Your Responsibilities Under the Endangered Species Act

All animals identified as listed above are fully protected under the Endangered Species Act of 1973, as amended. Section 9 the Act and its implementing regulations prohibit the take of a federally listed wildlife species. Take is defined by the Act a "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect" any such animal.

> Take may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or shelter (50 CFR §17.3).

Take incidental to an otherwise lawful activity may be authorized by one of two procedures:

- If a Federal agency is involved with the permitting, funding, or carrying out of a project that may result in take, ther that agency must engage in a formal consultation with the Service.

  During formal consultation, the Federal agency, the applicant and the Service work together to avoid or minimize th impact on listed species and their habitat. Such consultation would result in a biological opinion by the Service addressing the anticipated effect of the project on listed and proposed species. The opinion may authorize a limited level of incidental take.

- If no Federal agency is involved with the project, and federally listed species may be taken as part of the project, th you, the applicant, should apply for an incidental take permit. The Service may issue such a permit if you submit a satisfactory conservation plan for the species that would be affected by your project.

  Should your survey determine that federally listed or proposed species occur in the area and are likely to be affectec the project, we recommend that you work with this office and the California Department of Fish and Game to devel plan that minimizes the project's direct and indirect impacts to listed species and compensates for project-related los habitat. You should include the plan in any environmental documents you file.

Critical Habitat

When a species is listed as endangered or threatened, areas of habitat considered essential to its conservation may be designated as critical habitat. These areas may require special management considerations or protection. They provide neec

space for growth and normal behavior; food, water, air, light, other nutritional or physiological requirements; cover or shel and sites for breeding, reproduction, rearing of offspring, germination or seed dispersal.

Although critical habitat may be designated on private or State lands, activities on these lands are not restricted unless ther Federal involvement in the activities or direct harm to listed wildlife.

If any species has proposed or designated critical habitat within a quad, there will be a separate line for this on the species l Boundary descriptions of the critical habitat may be found in the Federal Register. The information is also reprinted in the Code of Federal Regulations (50 CFR 17.95). See our critical habitat page for maps.

Candidate Species

We recommend that you address impacts to candidate species. We put plants and animals on our candidate list when we ha enough scientific information to eventually propose them for listing as threatened or endangered. By considering these spe early in your planning process you may be able to avoid the problems that could develop if one of these candidates was list before the end of your project.

Species of Concern

The Sacramento Fish & Wildlife Office no longer maintains a list of species of concern. However, various other agencies a organizations maintain lists of at-risk species. These lists provide essential information for land management planning and conservation efforts. More info

Wetlands

If your project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act, you will need to obtain a permit from the U.S. Army Corps of Engineers. Impacts to wetland habitats require site specific mitigation and monitoring. For questions regarding wetlands, please contact Mark Littlefield of this office at (916) 414-6580.

Updates

Our database is constantly updated as species are proposed, listed and delisted. If you address proposed and candidate spec in your planning, this should not be a problem. However, we recommend that you get an updated list every 90 days. That would be July 25, 2007.

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
AMPHIBIANS					
Ambystoma californiense	California tiger salamander (Sonoma population)	FE, SSC	Open grassland	No	Development, highway, and Petaluma River serve as potential barriers to dispersal between project area and known breeding habitat.
Rana aurora draytonii	California red-legged frog	FT, SSC	Permanent sources of water with dense riparian vegetation	No	Species was not observed during amphibian surveys conducted by CH2M HILL on the respective dates as listed in Table 1, Chapter 2.2.
Rana aurora draytonii, Critical Habitat	California red-legged frog	FX	Permanent sources of water with dense riparian vegetation	No	Species was not observed during amphibian surveys conducted by CH2M HILL on the respective dates as listed in Table 1, Chapter 2.2.
Rana boylii	foothill yellow-legged frog	SSC	Shaded, shallow streams	No	Species was not observed during amphibian surveys conducted by CH2M HILL on the respective dates as listed in Table 1, Chapter 2.2.
BIRDS					
Agelaius tricolor	tricolored blackbird	SSC	Open water, nesting habitat	No	Species may be present within project area. Caltrans will conduct surveys prior to disturbance of potential nesting habitat. Work windows should minimize any impact to this species.
Ardea herodias	great blue heron	CDFG	Large nests present in eucalyptus trees near San Antonio Road	Yes	Visually observed foraging in project area. Caltrans will conduct surveys prior to disturbance of potential nesting habitat. Work windows should minimize any impacts to this species.

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
Athene cunicularia	burrowing owl	SSC	Open, dry annual or perennial grasslands, deserts and scrublands characterized by low-growing vegetation	No	Last known record observed outside project limits. No burrowing owls, evidence of burrowing owls, or burrows observed throughout project surveys. Project limits not optimum habitat.
Charadrius alexandrinus nivosus	western snowy plover	FT	Flat, open coastal beaches, and in dunes	No	No appropriate habitat within project limits.
Coccyzus americanus occidentalis	western yellow-billed cuckoo	FC, SE	Riparian cover, blackberry, willows, cottonwoods	No	Project is outside of species' current known range. Caltrans will conduct nesting surveys prior to disturbance of potential nesting habitat.
Elanus leucurus	white-tailed kite	CDFG	Open grasslands, meadows, or marshes for foraging close to isolated, dense-topped trees for nesting and perching	No	With use of work windows outside of nesting season, project should not impact this species.
Geothlypis trichas sinuosa	saltmarsh common yellowthroat	SSC	Marshes with tules and willows	No	Species may be present within project area. However, work will not be conducted in preferred habitat. Caltrans will conduct nest surveys prior to disturbance of potential nesting habitat.
Haliaeetus leucocephalus	bald eagle	FT	Large bodies of open water such as sea coasts, rivers, lakes and marshes	No	Project does not provide optimum habitat for the bald eagle. None have been observed within project limits during surveys. Nesting surveys will be conducted prior to beginning of construction.

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
Laterallus jamaicensis coturniculus	California black rail	ST	Pickleweed, brackish marsh	No	Species may be present within project area. Impacts to pickleweed and brackish marsh habitat will be minimized. Impacts to areas of pickleweed will be close to existing highway. Caltrans will conduct surveys prior to disturbance of potential nesting habitat.
Melospiza melodia samuelis	San Pablo song sparrow	SSC	salt marshes	No	Species may be present in project area. Caltrans will conduct nest surveys prior to disturbance of potential nesting habitat. Work windows and work outside of preferred habitat should minimize any impacts to species.
Pelecanus occidentalis californicus	California brown pelican	FE	Coastal salt water, beaches, bays, marshes and open ocean	No	Project area does not provide preferred habitat for brown pelican. No brown pelicans have been observed within project area during surveys..
Rallus longirostris obsoletus	California clapper rail	FE, SE	Pickleweed, brackish marsh	No	Species unlikely to be present within project area. No cordgrass in project area. Impacts to pickleweed and brackish marsh habitat will be minimized. Very minimal impact to pickleweed adjacent to Petaluma River Bridge. Caltrans will conduct surveys prior to disturbance of potential nesting habitat.
Sternula antillarum (=Sterna, =albifrons) browni	California least tern	FE	Shallow estuaries and lagoons, sandy beaches and mudflats near ocean	No	Project does not provide habitat for this species.
Strix occidentalis caurina	northern spotted owl	FT	Large tracts of old growth forest	No	Project does not contain habitat for the northern spotted owl.

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
FISH					
Eucyclogobius newberryi	tidewater goby	FE, SSC	Brackish water	No	No appropriate habitat based on personal communication with CH2M HILL and Bill Cox (CDFG).
Hypomesus transpacificus	Delta smelt	FT	Shallow, open water of the upper reaches of the Delta	No	No appropriate habitat within project limits
Oncorhynchus kisutch	coho salmon - Central California Coast	FE (NMFS)	Creeks with dense riparian cover	No	No appropriate habitat based on personal communication with Tim Hamaker (CH2M HILL) and Bill Cox (CDFG). Streambeds in project area contain a lot of silt.
Oncorhynchus mykiss	steelhead-Central California Coast/Central Valley	FT (NMFS)	Creeks with dense riparian cover	Yes	Species may be present in project area based on personal communication with CH2M HILL and Bill Cox (CDFG). Work windows and best management practices should preclude any impact to this species.
Oncorhynchus mykiss	Critical habitat - Central California coastal steelhead	FX (NMFS)	Creeks with dense riparian cover	No	Species could potentially be impacted, but probability is low with work windows in place and low habitat quality. Overall habitat would only be temporarily impacted within project limits.
Oncorhynchus tshawytscha	Chinook-California Coastal/Central Valley spring-run	FT (NMFS)	Large freshwater rivers	Yes	Species may be present in project area based on personal communication with Erik Schmidt (NOAA Fisheries). Work windows and best management practices should preclude any impact to this species.
Oncorhynchus tshawytscha	Winter-run chinook, Sacramento River	FE (NMFS)	Large freshwater rivers	No	Not preferred habitat (i.e.; Sacramento River). Work windows and best management practices should preclude any impact to this species.

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
Oncorhynchus tshawytscha	Central Valley fall/late fall-run chinook salmon	FC (NMFS)	Large freshwater rivers	No	Work windows and best management practices should preclude any impact to this species.
Oncorhynchus tshawytscha	Central Valley fall/late fall-run chinook salmon critical habitat	FCX (NMFS)	Large freshwater rivers	No	Project contains low quality habitat. With works windows and best management practices, habitat should not be negatively impacted.
Pogonichthys macrolepidotus	Sacramento splittail	SSC	Rivers	Yes	Species may be present in project area based on personal communication with CH2M HILL and Bill Cox (CDFG). Work windows and best management practices should preclude any impact to this species.
INVERTEBRATES					
Caecidotea tomalensis	Tomales isopod	CDFG	Freshwater streams, ponds	No	Work in freshwater streams will be conducted when they are dry. Freshwater ponds in the project area will be avoided.
Calicina diminua	Marin blind harvestman	CDFG	Serpentine grassland area on a portion of Burdell Mountain in Marin County	No	Project limits do not impact this species preferred habitat area.
*Hydrochara ricksecker*i	Ricksecker's water scavenger beetle	CDFG	Marshes, creeks, rivers	Yes	Species may be present within project area, however, known records are northeast of Petaluma, outside of project limits.
Speyeria zerene myrtleae	Myrtle's silverspot butterfly	FE	Coastal dunes or prairie habitat, usually within three miles of the coast	No	Project area does not provide preferred habitat.
Syncaris pacifica	California freshwater shrimp	FE	Shallow, slow moving streams with undercut banks and exposed roots for cover	No	Project would not impact this species per discussion with Larry Serpa (Nature Conservancy, CA. freshwater shrimp specialist).

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
Talanites ubicki	Ubick's gnaphosid spider	CDFG	Serpentine, Mount Burdell	No	Project will not impact this species preferred habiatat area.
Tryonia imitator	mimic tryonia (California brackishwater snail)	CDFG	Inhabits coastal lagoons, estuaries, and salt marshes	Yes	Salt marshes disturbed in project area. Species could potentially be impacted, however, probability is low.
Vespericola marinensis	Marin Hesperian	CDFG	Moist spots in coastal brushfield and chaparral vegetation in Marin County.	No	Project not impacting preferred habitat.
MAMMALS					
Antrozous pallidus	pallid bat	SSC	Bridge structures, riparian areas	Yes	Pallid bat guano visually observed beneath historical San Antonio Creek Bridge. Work windows and exclusion methods would minimize impacts.
Corynorhinus townsendii	Townsend's big-eared bat	SSC	Roosts in open, hanging from walls and ceilings.	Yes	Species could utilize several structures within project limits. Work windows and exclusion methods would minimize impacts.
Reithrodontomys raviventris	salt-marsh harvest mouse	FE, SE	Pickleweed, brackish marsh	Yes	Known locations near project area. Impacts to pickleweed will be minimized to avoid impacting species.
Taxidea taxus	American badger	SSC	Woodlands, shrub thickets	Yes	Species may be present in project area. No burrows observed during field visits.
REPTILES					
Emys (=Clemmys) marmorata	western pond turtle	SSC	Marshes, rivers, streams, ditches	Yes	Species may be present within project area.
Emys (=Clemmys) marmorata marmorata	northwestern pond turtle	SSC	Marshes, rivers, streams, ditches	Yes	Species may be present within project area.

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
PLANTS					
Allium peninsulare var. *franciscanum*	Franciscan onion	CNPS	Woodlands, grasslands, clay soils	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Alopecurus aequalis var. *sonomensis*	Sonoma alopecurus	FE, CNPS	Marshes, riparian scrub	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Amorpha californica var. *napensis*	Napa false indigo	CNPS	Dry brushy or wooded slopes	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Amsinckia lunaris	bent-flowered fiddleneck	CNPS	Woodlands, grasslands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Arctostaphylos hookeri ssp. montana	Mt. Tamalpais manzanita	CNPS	Grasslands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Aster lentus	Suisun Marsh aster	CNPS	Marshes and swamps (brackish and freshwater)	No	Species not observed within project limits. Last known occurrence was in 1897 in Petaluma area.
Astragalus tener var. tener	alkali milk-vetch	CNPS	Alkali flats that flood seasonally	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Blennosperma bakeri	Baker's stickyseed (=Sonoma sunshine)	FE, SE, CNPS	Grasslands, swales	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
California macrophyllum	round-leaved filaree	CNPS	Woodlands, grasslands, clay soils	No	Species not observed during surveys. Last occurrence was in 1880 near Petaluma.

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
Ceanothus sonomensis	Sonoma ceanothus	CNPS	Chaparral, sandy, serpentine or volcanic soils.	No	Species not observed during surveys. Last observed in 1939 outside of project area.
Centromadia parryi ssp. parryi	pappose tarplant	CNPS	Alkaline soils, grasslands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Chorizanthe valida	Sonoma spineflower	FE, SE, CNPS	Coastal prairie, sandy soil	No	Species not observed during surveys. Project area does not provide preferred habitat.
Cordylanthus maritimus ssp. palustris	Point Reyes bird's-beak	CNPS	Salt marshes	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2. Project not near coast.
Cordylanthus mollis ssp. mollis	soft bird's-beak	FE, SR, CNPS	Salt marshes	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2. Project not near coast.
Delphinium bakeri	Baker's larkspur	FX	Grasslands, soils derived from shale	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Delphinium luteum	yellow larkspur	FE, SR, CNPS	Chaparral, coastal prairie, coastal scrub	No	Species not observed during surveys. Project area does not provide habitat for species.
Downingia pusilla	dwarf downingia	CNPS	Grasslands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Fritillaria liliacea	fragrant fritillary	CNPS	Clay soils, grasslands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Hesperolinon congestum	Marin dwarf flax (=western flax)	FT, ST, CNPS	Grasslands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
Lasthenia burkei	Burke's goldfields	FE, SE, CNPS	Seeps, wet areas	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Lasthenia conjugens	Contra Costa goldfields	FE, CNPS	Grasslands, woodlands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Legenere limosa	legenere	CNPS	Seasonal wetlands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Leptosiphon jepsonii	Jepson's leptosiphon	CNPS	Woodlands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Limnanthes vinculans	Sebastopol meadowfoam	FE, SE. CNPS	Grasslands, clay soils	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Microseris paludosa	marsh microseris	CNPS	Woodlands, grasslands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Navarretia leucocephala ssp. bakeri	Baker's navarretia	CNPS	Alkaline soils, woodlands, grasslands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Plagiobothrys mollis var. vestitus	Petaluma popcorn-flower	CNPS	Wet areas	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Pleuropogon hooverianus	North Coast semaphore grass	ST, CNPS	Seeps, wet areas	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.

Table H Project Study Area Sensitive Species Table

Scientific Name	Common Name	Federal, State Status[1]	Specific Habitat	Species Impacted (*Yes/No)	Rationale
Polygonum marinense	Marin knotweed	CNPS	Salt marshes	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Sidalcea calycosa ssp. rhizomata	Point Reyes checkerbloom	CNPS	Marshes and swamps. Freshwater marshes near coast.	No	Species not observed during surveys. Project area is not near coast and does not provide preferred habitat.
Streptanthus glandulosus ssp. pulchellus	Mt. Tamalpais jewelflower	CNPS	Grasslands	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.
Trifolium amoenum	showy Indian clover	FE, CNPS	Grasslands with swales	No	Species not observed during plant surveys on the respective dates listed in Table 1, Chapter 2.2.

[1]Key:
CDFG – listed by the California Department of Fish and Game
CNPS – listed by the California Native Plant Society
FE – Federally endangered
FT – Federally threatened
FSC – Federal species of special concern
FSLC – Federal species of local concern
FC – Federal candidate
FCX – Federal candidate critical habitat
SE – State endangered
ST – State threatened
SSC – State species of concern
SR – State rare

*Yes = there is a low probability that species could be impacted.

Appendix I

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
1120 N STREET
O. BOX 942873
ACRAMENTO, CA 94273-0001
PHONE (916) 654-5266
FAX (916) 654-6608
TTY (916) 653-4086

Flex your power!
Be energy efficient!

January 14, 2005

TITLE VI
POLICY STATEMENT

The California Department of Transportation under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, and age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

WILL KEMPTON
Director

Appendix J

Appendix J Minimization and/or Mitigation Summary

The California Department of Transportation (Caltrans) is required to comply with all applicable Federal and State laws, statutes, regulations and policies that pertain to environmental protection, conservation, and mitigation. Federal and state environmental documents and permits from regulatory and permitting agencies often require mitigation for project impacts and for monitoring to ensure that mitigation measures are successful.

Mitigation measures for the proposed project are presented in Chapter 3 and are summarized in the Summary and in Table S-3.

An integrated tracking system known as Permits, Approvals, and Mitigation (PAM) has been developed by Caltrans District 4 to convey environmental commitment information through the different project phases of environmental analysis, design, construction, and maintenance. This allows the Project Manager and the environmental units to track the completion of all permit requirements and mitigation commitments.

There are four forms that are completed throughout the life of the project. Form 1 (see Table J-1) is completed upon completion of the environmental phase of the project. It is a summary of the required permits and environmental commitments that must be incorporated into the project. Forms 2A and 2B (see Tables J-2 and J-3) are completed during the Plans, Specifications, and Estimates (PS&E) phase. The design office responsible for the project completes these forms. Form 2A lists all permits along with their expiration dates and construction windows governing construction activities. Form 2B shows whether the commitments have been incorporated into the PS&E or are to be accomplished by Contract Change Order, Maintenance, or a separate contract. Form 2A is signed by the Senior Environmental Planner, the Project Engineer, and the Project Manager certifying that all permit conditions and environmental commitments have been properly addressed as shown on Forms 2A and 2B at the completion of the design phase. Form 3 (see Table J-4) will be completed by the Office of Construction to record all changes and additions to the environmental commitments or permit conditions made during the construction phase. After completion of the project, Form 4 (see Table J-5) is completed by the environmental office to provide the maintenance office with information about site sensitivity and actions required to ensure compliance with the permit conditions or environmental commitments. These forms and the tentative project commitments are shown in the following pages.

TABLE J-1

FORM 1: PERMITS, AGREEMENTS AND MITIGATION (PAM) COMMITMENTS - ENVIRONMENTAL PHASE

TO: ~~Boanto Nguyen~~ Jit S. Pandher PROJECT MANAGER

ATTN: Robert Nixon PROJECT ENGINEER

DATE:	3/31/07
CO. RTE. KP:	04/MRN-SON/101 KP 29.5/R44.6 and 0.0/12.4
RU/EA:	264000
P.M.	18.3/R27.7 and 0.0/7.7

Below is a summary of the required permits, and environmental commitments that must be incorporated into the PS&E, for this project. Please contact Yolanda Rivas at 622-1705 for further information.

		Y/N	Mit. Plan Reqd. (Y/N)	COMMENTS
PERMITS AND AGREEMENTS	CDFG 1601/03 Streambed Alteration Agreement.	Y	Y	To be obtained during PS&E.
	BCDC: Bay Fill Permit	N	N	
	BCDC: Pub. Access Review	N	N	
	Coastal Dev. Permit: County	N	N	
	Coastal Dev. Permit: State	N	N	
	State Lands Lease Agreement	Y	Y	New lease agreement to be obtained during the design phase.
	RWQCB: NPDES	Y		Best Management Practices will be incoporated to reduce discharge of pollutants during construction and permanently to the Maximum Extent Practicable.
	RWQCB: Water Qual. Cert.	Y		
	USACE 404: Nationwide	N	N	
	USACE 404: Individual	Y	Y	NEPA/404 Process to be completed during design phase. Individual permit to be obtained during PS&E.
	USACE Section 10 Permit	N	N	
	USCG Section 9 Permit	Y		To be obtained during PS&E.
ENVIRONMENTAL COMMITMENTS	Noise Attenuation	N	N	Construction contractor is required to comply with local noise ordinances during construction.
	Erosion Control	Y	Y	To be developed during design and reflected on PS&E.
	Hazardous MaterialsTreatment/ESA	Y	N	To be further assessed during design phase. Measures will be developed based on Site Investigations if necessary.
	ESA[1] (Archaeological)	Y		ESA will be reflected on PS&E and marked in the field. Archaeological monitors will ensure proper designations.
	ESA (Biology)	Y		ESAs pertaining to SMHM[2] and CRLF[3] habitat areas will be reflected on PS&E and marked in the field. Biological monitors will ensure proper designations.
	ESA (Historical)	N		ESA will be reflected on PS&E and marked in the field to protect one residential property eligible for the National Register of Historic Places. Monitors will ensure proper designations in the field.
	ESA (Scenic Resources)	N		Replanting plans will be developed to achieve desired aesthetic effects, to be developed during design phase.
	Wetland/Riparian Mitigation	Y	Y	To be determined as part of the NEPA/404 Process.
	Biological Mitigation	N	Y	Compliance with Migratory Bird Treaty Act will be implemented prior to tree removal.

A copy of the project PS&E must be sent to Environmental for review before finalization.

OFFICE CHIEF OF ENVIRONMENTAL PLANNING

cc: Design, Senior Envir. Planner, File

Ver 97-Dec '98

[1] ESA = Environmentally Sensitive Area

[2] SMHM = Salt Marsh Harvest Mouse

[3] CRLF = California Red Legged Frog

TABLE J-2

FORM 2A: PERMITS, AGREEMENTS & MITIGATION (PAM) COMMITMENTS-DESIGN PHASE

TO: John Bulinsky, OFFICE CHIEF
ATTN.: John Martin, BRANCH CHIEF
DESIGN OFFICE NR -1

DATE:	3/31/07
CO. RTE. KP:	MRN-SON/101/29.5/R44.6 and 0.0/12.4
RU/EA:	101/264000
P.E. CONTACT:	Robert Nixon (530) 225-2787
P.M.:	18.3/R27.7 and 0.0/7.7

- This form contains a summary of **attached** permits which contain permit conditions governing construction activities on this project.
- Please contact the Project Engineer or listed individuals above for additional information regarding specific information.

	Y/N	Permit No.	Issue Date	Exp. Date	Construction Window	Comments
CDFG 1601/03 Streambed Alteration Agreement.	Y					
SF Bay Conservation & Development Commission	N N					
Coastal Dev. Permit: County	N					
Coastal Dev. Permit: State	N					
State Lands Lease Agreement	Y					
RWQCB: NPDES Permit	Y					
RWQCB: Contaminated Groundwater Disposal	N N					To be determined.
Endangered Species Consultation Requirements	1 2					
USACE 404: Nationwide*	N					
USACE 404: Individual	Y					
USACE Regional General	N					
USCG Section 9 Permit	Y					
USACE Section 10 Permit	N					

*Indicate NWP TYPE: N/A

SENIOR, ENVIRONMENTAL PLANNER **DATE**
Office of Environmental Planning North/South

The project PS & E has been reviewed and all permits, agreements and mitigation commitments have been addressed as shown on Forms 2A & 2 B.

PROJECT ENGINEER **DATE** **PROJECT MANAGER** **DATE**

All permits and their conditions have been reviewed with the contractor and the contractor is aware of the permit conditions.

RESIDENT ENGINEER **DATE**

☐ **Attachments**

cc: Listed Contacts, Envir. Planning Senior

Ver 6.0- July '00

[1] State

[2] Federal

TABLE J-3

FORM 2B: PERMITS, AGREEMENTS AND MITIGATION COMMITMENTS-DESIGN PHASE	DATE:	3/31/07
This form contains a summary of environmental commitments governing construction activities on this project, that may not have been included in the PS &E.	CO. RTE. KP:	MRN-SON/101/29.5/R44.6 and 0.0/12.4
	EA:	264000
	P.E. CONTACT	Robert Nixon (530) 225-2787
	PM:	18.3/R27.7 and 0.0/7.7

Commitments	P-Permits C-Commitments	TO BE ACCOMPLISHED BY: Plans	Spec. Prov.	CCO's	Maintenance	Sep. Contract	Completion Date	Concurred By Date	Comments	Monitored By - - - - - - - - - - - - Frequency	CONTACTS
Noise Attenuation											
Erosion Control											
Hazardous Material Treatment											
NPDES (Storm Runoff Controls)											
Archaeological Resources											
Environmentally Sensitive Area											
Historical Resources											
Scenic Resources											
Wetland/Riparian Mitigation											
Biological Mitigation											

Ver 6.0 July '00

TABLE J-4

FORM 3: PERMITS, AGREEMENTS AND MITIGATION (PAM) COMMITMENTS - CONSTRUCTION PHASE

This form contains a summary of changes in environmental commitments made during the construction phase.

COMMITMENTS	P-Permits	TO BE ACCOMPLISHED BY...							ACTIONS REQD.	CONTACTS
		CCO			MAINTENANCE	SEPARATE CONTRACTS				
		Concurred By		Completion Date	Concurred By				Monitoring By	
		Environmental Program Mng.	Date Date		Date	Funded EA:	Programmed Y/N	ADV. Date	Frequency	

All permit conditions and environmental commitments listed on Forms 2A, 2B and 3, pertaining to construction activities, have been fulfilled. All CCOs affecting environmental commitments have been concurred by the Office of Environmental Planning.

RESIDENT ENGINEER **DATE**

July-01-97

CCO = Construction Change Orders

TABLE J-5

FORM 4: PERMITS, AGREEMENTS AND MITIGATION (PAM) COMMITMENTS - MAINTENANCE & OPERATION PHASE

To: _____, Maintenance Manager Region -

cc: _____, Branch Chief Maintenance Services

_____, Maintenance Manager Specialty Region -

DATE:	3/31/07
CO. RTE. KP:	MRN-SON 101-29.5-R44.6 and 0.0-12.4
Date Completed	
P.E. Contact:	Robert Nixon @ 530-225-2787
EA for MAINT.	299000
PM:	18.3--R27.7 and 0.0-7.7

Below is a summary of environmental mitigation commitments being carried out for this project which require either: (1) further direct action by Maintenance or (2) your awareness and protection of sensitive resources and/or mitigation sites. Please review and sign this form, maintain a copy and return the signed original to the Senior Environmental Planner listed below. If additional information is required please contact the listed individuals for additional information.

Commitments	(1) / (2)	Actions Required	Map Y/N	Monitoring By	Related Permits	Copy Attach. Y/N	Contact
Erosion Control							
Hazardous Material							
Hazardous Materials ESA							
Archaeological ESA							
Biology ESA							
Historical ESA							
Scenic Resources ESA							
Biology Mitigation	Y						Please contact Chuck Morton @ 510-286-5681
Habitat Restor./Reveg.							
RWQCB-NPDES All Permits	Y						Please contact Hoang Trang @ 510-286-5629

Senior Environmental Planner **Date** **Maintenance Manager** **Date**

July-01-97

Appendix K

Appendix K CEQA Checklist

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
I. AESTHETICS—Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☒	☐	☐	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.	☒	☐	☐	☐
c) Substantially degrade the existing visual character of quality of the site and its surroundings?	☒	☐	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the areas?	☐	☒	☐	☐
II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☒	☐	☐
b) Conflict with the existing zoning for agricultural use, or a Williamson Act contract?	☐	☒	☐	☐
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, ton non-agricultural use?	☐	☐	☒	☐
III. AIR QUALITY: Where available, the Significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☒	☐	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐
IV. BIOLOGICAL RESOURCES—Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☒	☐	☐
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☒	☐	☐
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☒	☐	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
V. CULTURAL RESOURCES—Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in A15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to A15064.5?	☐	☒	☐	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☒	☐	☐
VI. GEOLOGY AND SOILS—Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
VII. HAZARDS AND HAZARDOUS MATERIALS—Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☒	☐
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☒	☐	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒
VIII. HYDROLOGY AND WATER QUALITY—Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)	☐	☐	☒	☐
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☒	☐	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☒	☐	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☒	☐	☐
f) Otherwise substantially degrade water quality?	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☒	☐
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow?	☐	☐	☐	☒
IX. LAND USE AND PLANNING—Would the project:				
a) Physically divide an established community?	☐	☐	☐	☒

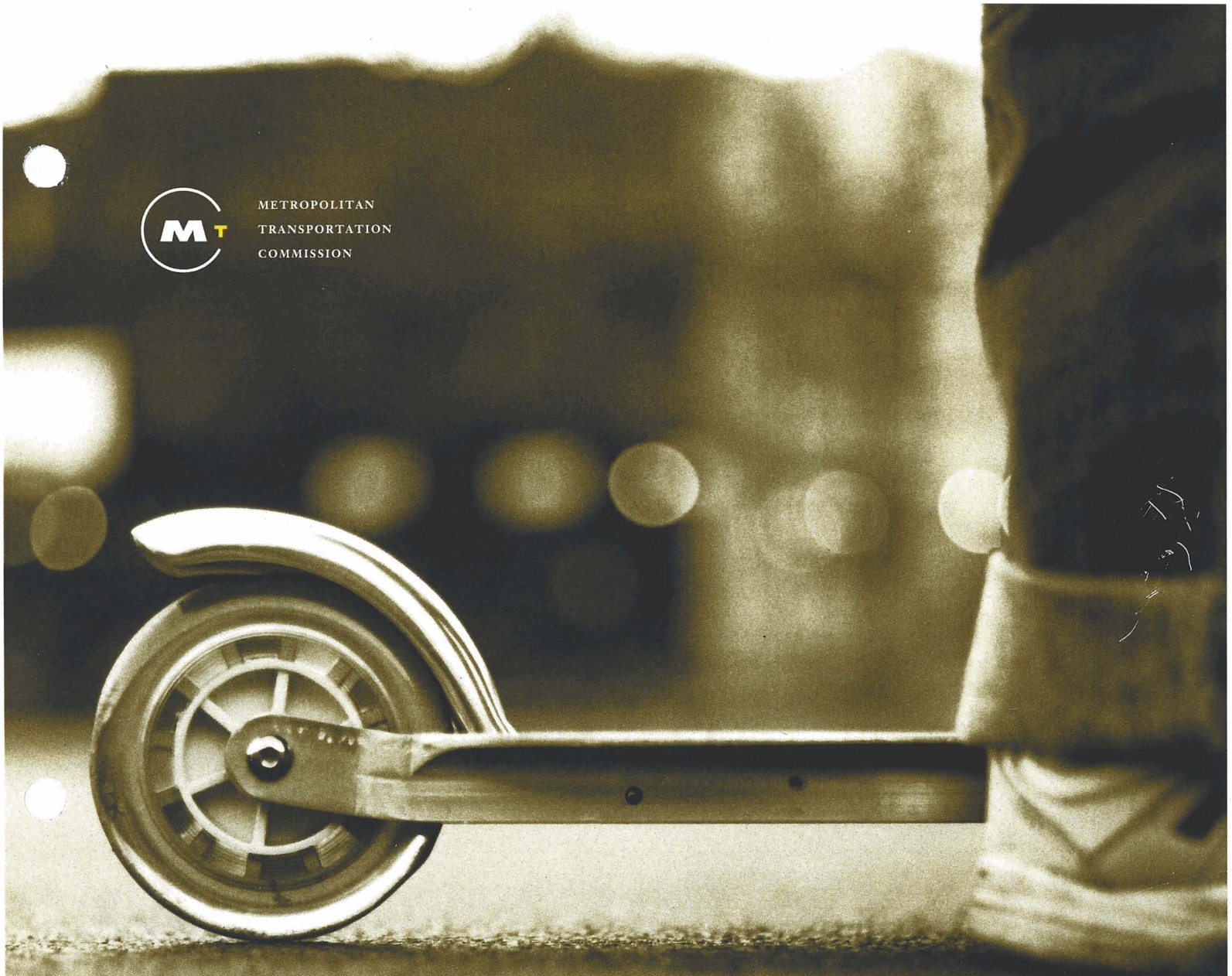
	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒
X. MINERAL RESOURCES—Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XI. NOISE—Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☒	☐	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☒	☐
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
XII. POPULATION AND HOUSING—Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☒	☐
XIII. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☐	☒
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒
XIV. RECREATION-				
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☒	☐	☐

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
XV. TRANSPORTATION/TRAFFIC—Would the project:				
a) Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	☐	☐	☒	☐
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☒	☐	☐
f) Result in inadequate parking capacity?	☐	☐	☒	☐
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒
XVI. UTILITIES AND SERVICE SYSTEMS-Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒

	Potentially Significant Impact	Less than Significant with Mitigation Incorporation	Less than Significant Impact	No Impact
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
XVII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☒	☐	☐	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☒	☐	☐

Appendix L



METROPOLITAN
TRANSPORTATION
COMMISSION

mobility
for the next generation

Transportation 2030 Plan for the San Francisco Bay Area

FINAL February 2005

TRANSPORTATION 2030

Marin County

Reference Number	Project/Program	Total Project Cost	Financially Constrained Element[1]	Vision Element[2]	Notes
		In millions of 2004 dollars			
Strategic Expansion					
94563	Widen U.S. 101 for HOV lanes (one in each direction) from Lucky Drive in Corte Madera to North San Pedro Road in San Rafael	$127.1	$127.1		2002 Traffic Congestion Relief Program (TCRP) project. Initial phase fully funded at $152.1 million.
98154	Widen U.S. 101 from Route 37 to the Sonoma County line from 4 lanes to 6 lanes (including 2 HOV lanes) and convert some highway sections to freeway standards	$200.0	$200.0		Joint project between Marin and Sonoma counties. See companion Sonoma County project #98147 on page 122.
98178	U.S. 101/Sir Francis Drake Boulevard improvements	$0.5	$0.5		Regional Measure 2 Toll Bridge Program
98179	U.S. 101/Tiburon Boulevard interchange improvements	$18.5	$10.5	$7.9	Includes developer fees
21303	Local Marin bus service enhancements (capital only)	$58.6	$26.7	$31.9	
21306	U.S. 101/Lucas Valley Road interchange improvements	$19.3	$4.7	$14.7	
21308	Expand Manzanita park-and-ride lot	$22.4	$10.1	$12.3	
21325	U.S. 101/Greenbrae interchange improvements	$47.5	$47.5		Regional Measure 2 Toll Bridge Program
22157	Park-and-ride lots for support of Regional Express Bus service	$15.3	$5.0	$10.3	
21030	I-580/U.S. 101 interchange improvements and new freeway-to-freeway connectors from westbound I-580 to northbound and southbound U.S. 101	$101.7		$101.7	
21317	Widen Route 1 from U.S. 101 to Flamingo Road	$4.3		$4.3	
22419	Widen U.S. 101 for HOV lanes (one in each direction) from Lucky Drive in Corte Madera to North San Pedro Road in San Rafael	$24.9	$24.9		
22429	U.S. 101/Manuel Freitas Parkway interchange improvements	$5.0		$5.0	

[1] Financially Constrained Element refers to programmed local, regional, state, federal funds as well as discretionary state and federal funds anticipated to be available over the long term of the Transportation 2030 Plan.

[2] Vision Element refers to new local, regional, state and federal funds that may become available over the near to mid-term of the Transportation 2030 Plan through voter approval or legislative authorization.

Sonoma County

Reference Number	Project/Program	Total Project Cost	Financially Constrained Element[1]	Vision Element[2]	Notes
		In millions of 2004 dollars			
Strategic Expansion					
94689	U.S. 101/Arata Lane interchange improvements in Windsor (Phase 2)	$3.3	$3.3		TEA-21 federal earmark project; includes developer fees
98147	Widen U.S. 101 (adding an HOV lane in each direction from the Marin/Sonoma County line north to Old Redwood Highway in Petaluma, and convert some highway sections from expressway to freeway	$200.0	$200.0		See Marin County project #98154 on page 98. Improvements to the Petaluma River Bridge in this project are distinct from Sonoma County project #21346 (on page 121).
98183	Widen U.S. 101 for HOV lane (one in each direction) between Steele Lane and Windsor River Road	$100.0	$100.0		
21902	Widen U.S. 101 for HOV lanes (one in each direction) from Old Redwood Highway to Rohnert Park Expressway	$99.0	$99.0		
22490	Convert bridges of Sonoma County from one-lane to two-lane bridges	$16.9	$16.9		Funded through Local Highway Bridge Replacement and Rehabilitation Program (HBRRP)
22655	Widen U.S. 101 for HOV lanes (one in each direction) from Rohnert Park Expressway to Santa Rosa Avenue (includes interchange improvements and ramp metering)	$40.0	$40.0		
22656	U.S. 101/East Washington Street interchange improvements	$11.0	$11.0		Project separated from larger Marin-Sonoma Narrows project in order to advance construction
21884	Petaluma crosstown connector/interchange	$33.0		$33.0	
21908	Ferry service from Port Sonoma	$25.0		$25.0	
22191	U.S. 101/Airport Boulevard interchange improvements and Airport Boulevard widening from 2 to 4 lanes (includes a center turn lane)	$30.0	$30.0		
22193	Construct Forestville bypass on Route 116	$3.6	$3.6		
22195	Old Redwood Highway/U.S. 101 interchange improvements	$20.0	$20.0		
22197	Penngrove local road improvements including Railroad Avenue interchange	$38.0	$38.0		
22204	Widen Fulton Road from 2 lanes to 4 lanes from Guerneville Road to U.S. 101 and construct Route 12/Fulton Road interchange	$38.0	$38.0		
22205	U.S. 101/Hearn Avenue interchange improvements, including widening overcrossing and ramps	$18.0	$18.0		
22207	Extend Farmers Lane as a 3-lane or 4-lane arterial from Bellevue Avenue to Route 12	$20.0	$20.0		

[1] Financially Constrained Element refers to programmed local, regional, state, federal funds as well as discretionary state and federal funds anticipated to be available over the long term of the Transportation 2030 Plan.

[2] Vision Element refers to new local, regional, state and federal funds that may become available over the near to mid-term of the Transportation 2030 Plan through voter approval or legislative authorization.

Appendix M

2002 High Occupancy Vehicle (HOV) Lane Master Plan Update

Final Summary Report

Prepared for
Metropolitan Transportation Commission,
Caltrans District 4 and the
California Highway Patrol Golden Gate Division

By
DKS Associates
1956 Webster Street, Suite 300
Oakland, CA 94612
(510) 763-2061

In association with

Parsons Brinckerhoff
ATD Northwest

March 2003

2002 High Occupancy Vehicle (HOV) Lane Master Plan Update

Final Summary Report

Prepared for

Metropolitan Transportation Commission, Caltrans District 4 and the California Highway Patrol Golden Gate Division

By

***DKS** Associates*
1956 Webster Street, Suite 300
Oakland, CA 94612
(510) 763-2061

In association with

Parsons Brinckerhoff
ATD Northwest

March 2003

Table of Contents

1 PROJECT PURPOSE AND BACKGROUND 1

2 KEY FINDINGS AND RECOMMENDATIONS 4

3 WHAT DOES THE PUBLIC THINK OF HOV LANES? 6

4 EVALUATION OF THE SYSTEM'S PERFORMANCE 6

HOV VEHICLE VOLUMES 7
HOV LANE PERSON TRIPS 10
HOV LANE PRODUCTIVITY 13
HOV TRAVEL-TIME SAVINGS 14

5 RECOMMENDATIONS FOR HOV LANE SYSTEM IMPROVEMENTS AND OPERATIONAL CHANGES 16

HOURS OF OPERATION 16
OCCUPANCY REQUIREMENT 17
CONSIDERATION OF SPOT USE OF SHOULDERS FOR TEMPORARY HOV OR BUS-ONLY LANES 18

6 HOV LANE ENFORCEMENT 19

7 CONSIDERATION OF HIGH-OCCUPANCY-TOLL (HOT) LANES 21

8 EXPRESS BUS RECOMMENDATIONS 23

Express Bus System Characteristics 25
Projected Express Bus Ridership 25
Direct Access Ramps 26
Major Express Bus Station (Intermodal Center) 26
Minor Express Bus Station 27
Express Bus Costs 29

9 RECOMMENDED HOV LANE SYSTEM INFRASTRUCTURE COSTS 29

10 RECOMMENDATIONS BY COUNTY AND CORRIDOR 36

SONOMA AND MARIN COUNTIES 36
Sonoma US 101 36
Marin US 101 36
Marin I-580 37
SOLANO AND NAPA COUNTIES 37
Solano I-80 38
Solano I-680 38
CONTRA COSTA COUNTY 38
Contra Costa SR 4 39
Contra Costa SR 24 39
Contra Costa I-80 40
Contra Costa I-580 40
Contra Costa I-680 40
ALAMEDA COUNTY 41
Alameda SR 84 42
Alameda SR 92 42
Alameda I-80 43
Alameda I-580 43
Alameda I-680 43
Alameda I-880 44
SANTA CLARA COUNTY 44
Santa Clara SR 85 45
Santa Clara US 101 45
Santa Clara I-280 45
Santa Clara I-680 46
Santa Clara I-880 46
County Expressways 46
SAN MATEO AND SAN FRANCISCO COUNTIES 46
San Mateo US 101 47

11 AIR QUALITY ANALYSIS 47

List of Figures

FIGURE 1 – BAY AREA HOV LANE MASTER PLAN UPDATE 3
FIGURE 2 – BAY AREA HOV LANE MASTER PLAN UPDATE: SANTA CLARA COUNTY 4
FIGURE 3 – 2001 A.M. PEAK-HOUR HOV LANE VEHICLE USE 7
FIGURE 4 – 2010 A.M. PEAK-HOUR HOV LANE VEHICLE USE 11
FIGURE 5 – 2025 A.M. PEAK-HOUR HOV LANE VEHICLE USE 11
FIGURE 6 – 2001 A.M. PEAK-HOUR HOV LANE PERSON USE 12
FIGURE 7 – 2025 A.M. PEAK-HOUR HOV LANE PERSON USE 12
FIGURE 8 – 2001 PRODUCTIVITY INDEX 13
FIGURE 9 – 2025 PRODUCTIVITY INDEX 14
FIGURE 10 – 2001 TRAVEL-TIME SAVINGS (MINUTES/MILE) 15
FIGURE 11 – 2025 TRAVEL-TIME SAVINGS (MINUTES/MILE) 15
FIGURE 12 – 2001 VIOLATION RATES 20
FIGURE 13 – EXPRESS BUS STREAMS 24
FIGURE 14 – EXPRESS BUS STATION 27
FIGURE 15 – PRIORITY 1 RECOMMENDED HOV LANE SYSTEM IMPROVEMENTS 31
FIGURE 16 – PRIORITY 1 RECOMMENDED HOV LANE SYSTEM IMPROVEMENTS: SANTA CLARA COUNTY 32
FIGURE 17 – PRIORITY 1 & 2 RECOMMENDED HOV LANE SYSTEM IMPROVEMENTS 33
FIGURE 18 – PRIORITY 1 & 2 RECOMMENDED HOV LANE SYSTEM IMPROVEMENTS SANTA CLARA COUNTY 34
FIGURE 19 – 2010 BAY AREA HOV ALTERNATIVE 6 49
FIGURE 20 – 2010 BAY AREA HOV ALTERNATIVE COMPARISON – VEHICLE MILES TRAVELED 50
FIGURE 21 – 2010 BAY AREA HOV ALTERNATIVE COMPARISON – SHARED RIDE MODE SPLIT 50
FIGURE 22 – 2010 BAY AREA HOV ALTERNATIVE COMPARISON – TRANSIT RIDERSHIP 51
FIGURE 23 – 2010 BAY AREA HOV ALTERNATIVE COMPARISON – SPEEDS 51
FIGURE 24 – 2010 BAY AREA HOV ALTERNATIVE COMPARISON – VEHILCE HOURS OF DELAY 52
FIGURE 25 – 2010 BAY AREA HOV ALTERNATIVE COMPARISON – ROG EMISSIONS 54
FIGURE 26 – 2010 BAY AREA HOV ALTERNATIVE COMPARISON – NOx EMISSIONS 54

List of Tables

TABLE 1 - ALREADY PLANNED HOV LANE IMPROVEMENTS 2
TABLE 2 - SUMMARY OF HOV LANE USE AND PRODUCTIVITY ANALYSIS FOR PEAK DIRECTION 8
TABLE 3 - SUMMARY OF HOV LANE USE AND PRODUCTIVITY ANALYSIS FOR OFF-PEAK DIRECTION 9
TABLE 4 - SUMMARY OF EXISTING AND PROPOSED HOV LANE MILEAGE 35

1 PROJECT PURPOSE AND BACKGROUND

The Metropolitan Transportation Commission (MTC) was created by the state Legislature in 1970 to provide transportation planning for the nine-county San Francisco Bay Area. MTC functions as both the regional transportation planning agency (RTPA) – a state designation – and for federal purposes, as the region's metropolitan planning organization (MPO). As such, MTC has undertaken an updating of its *1997 HOV Lane Master Plan* as part of its regional transportation planning and coordination responsibilities. The development of the *2002 HOV Lane Master Plan* reflects an ongoing interest in existing HOV lane operations and in expanding HOV lane use by regional express buses.

MTC also has assessed the contribution that expansion of the HOV lane system and the expansion of express bus operations can make toward improvement of air quality in the Bay Area. The Bay Area's recently adopted *2001 Ozone Attainment Plan* includes the examination of HOV lane facilities' potential air quality benefit as a "further study measure." Further Study Measures may or may not be included in the Ozone Plan, depending on the results of the analysis and other related factors.

The *2002 HOV Lane Master Plan* includes a thorough review of current HOV lane performance. An assessment of HOV lane forecasts (2025) from the latest modeling conducted for the *2001 Regional Transportation Plan* (RTP), and more current forecasts (2010) developed specifically for this plan (see Section 11) also were completed. This assessment has led to the development of recommendations for how the HOV lane system could be expanded beyond what is already included in the 2001 RTP. HOV lane improvements that support further development of MTC's Regional Express Bus Program also have been of particular interest as part of the plan update, and the study includes recommendations for expansion of the express bus operations in the region. Also included as part of the study were:

- A vehicle license plate and user survey to evaluate carpooler characteristics and attitudes
- A review of current policies for HOV lane hours of operation and occupancy requirements
- An analysis of the potential for additional HOV freeway-to-freeway connectors and direct HOV access ramps
- A look at improved HOV lane enforcement
- A review of past and ongoing Bay Area congestion pricing studies and their potential application to the HOV lane system
- Updated costs of recommended HOV and HOV support facilities (e.g. park and ride lots, bus stops/shelters, etc.)
- Analysis of the potential for spot use of some freeway shoulders for express buses

The first regional HOV master plan, which was adopted in 1990, identified 470 potential new miles of HOV lanes in addition to the 64 lane miles already then in place. That master plan became the system blueprint for federal, state, regional and local HOV lane funding over the next twelve years. By 1996 there were 270 miles of HOV lanes, as well as HOV by-passes at bridge toll booths and many of the freeway ramp meters. In 1997, MTC updated the regional

HOV Master Plan and brought it in line with the requirements for the MTC RTP to be financially constrained to reasonably available funding over a 25-year period. The plan proposed the addition of 149 new HOV lane miles to the then existing system of 270 lane miles.

The *2002 HOV Lane Master Plan* has given MTC the opportunity to review the significant developments in regional infrastructure, construction and programming that have occurred over the past five years, and provides an assessment of the implications for future HOV lane system development.

There are currently about 300 freeway HOV lane miles and 50 expressway HOV lane miles as indicated in Figures 1 and 2. In addition, there are

- 16 arterials with 13 lane miles of HOV or bus-only lanes.
- 4 bridge toll plazas with exclusive HOV lanes (HOVs pass free on all toll bridges during designated hours),
- 4 HOV freeway-to freeway connectors,
- 2 HOV-only freeway on ramps, and
- 66 HOV bypass lanes at metered freeway on-ramps.

Also indicated in Figures 1 and 2 are HOV lanes that are already funded or under construction and included in the *2003 Transportation Improvement Program* (TIP). The 2003 TIP and 2001 RTP expand the current 2002 HOV system as indicated in Table 1.

Table 1 - Already Planned HOV Lane Improvements

HOV Lane Miles	Current (2002)	2003 TIP	2001 RTP	Increase from Current to 2001 RTP
Freeway	298	368	512	214
Expressway	50	50	66	16
Total	348	418	578	230

Much of the growth in the Bay Area over the past 10 years has occurred in the region's suburbs, and not in the traditional central cities. This dispersion of travel over more origins and destinations has created significant new suburban freeway congestion and a need for more flexible modal options for meeting commute travel needs. Carpooling, vanpooling and express bus services have become increasingly more important to meeting the mobility needs of the region as the decentralization of population and employment has occurred.

The results of this study will provide MTC and its partner agencies with the information needed to make the important policy decisions about HOV lane system investments for the next 20 years. This study will provide the needed information about which operational changes, eligibility rules, enforcement methods, support facilities, express bus services and new infrastructure investments will optimize the value of the HOV lane system in providing regional mobility safely and efficiently.

FIGURE 1

Bay Area Existing and Funded HOV Lane Master System

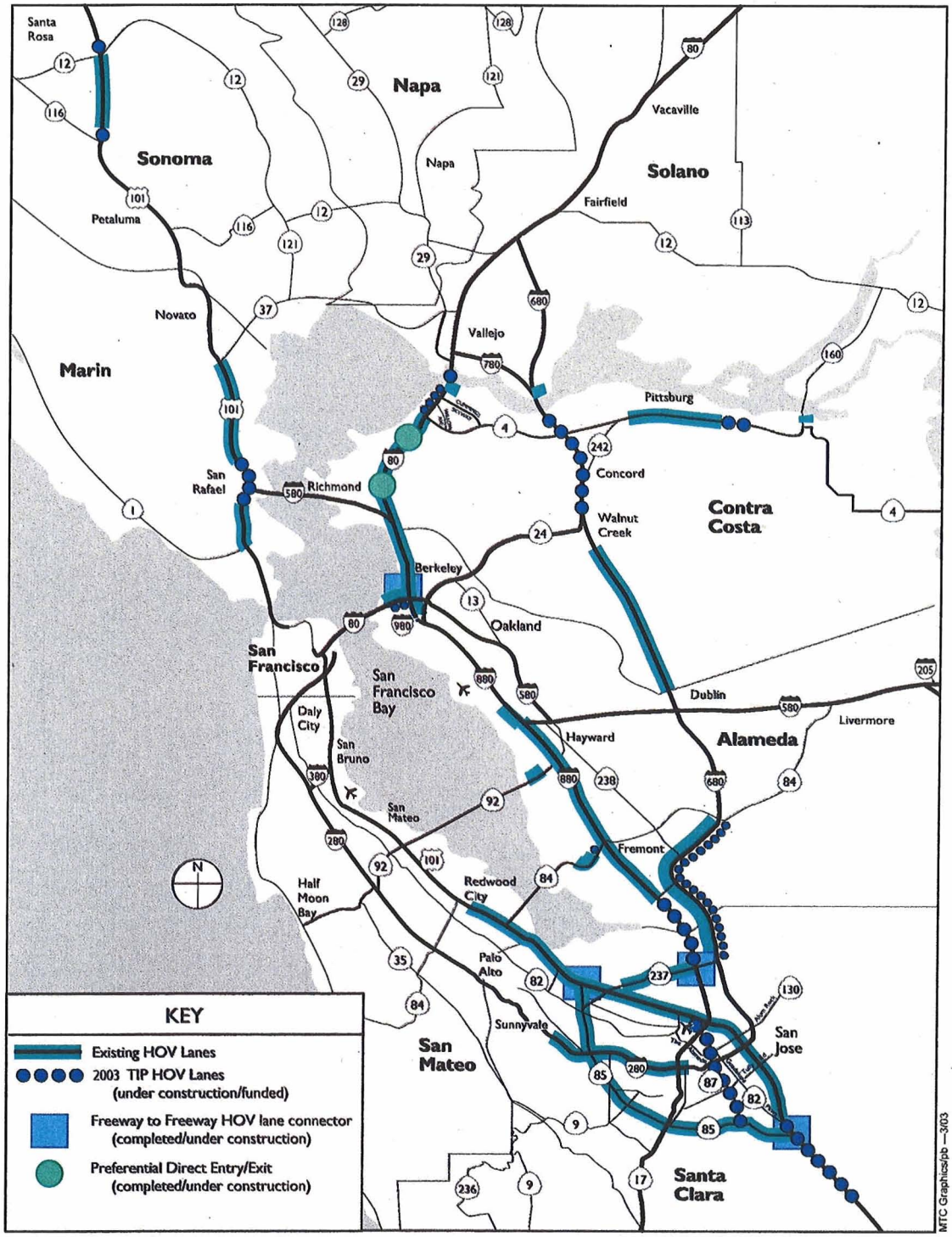
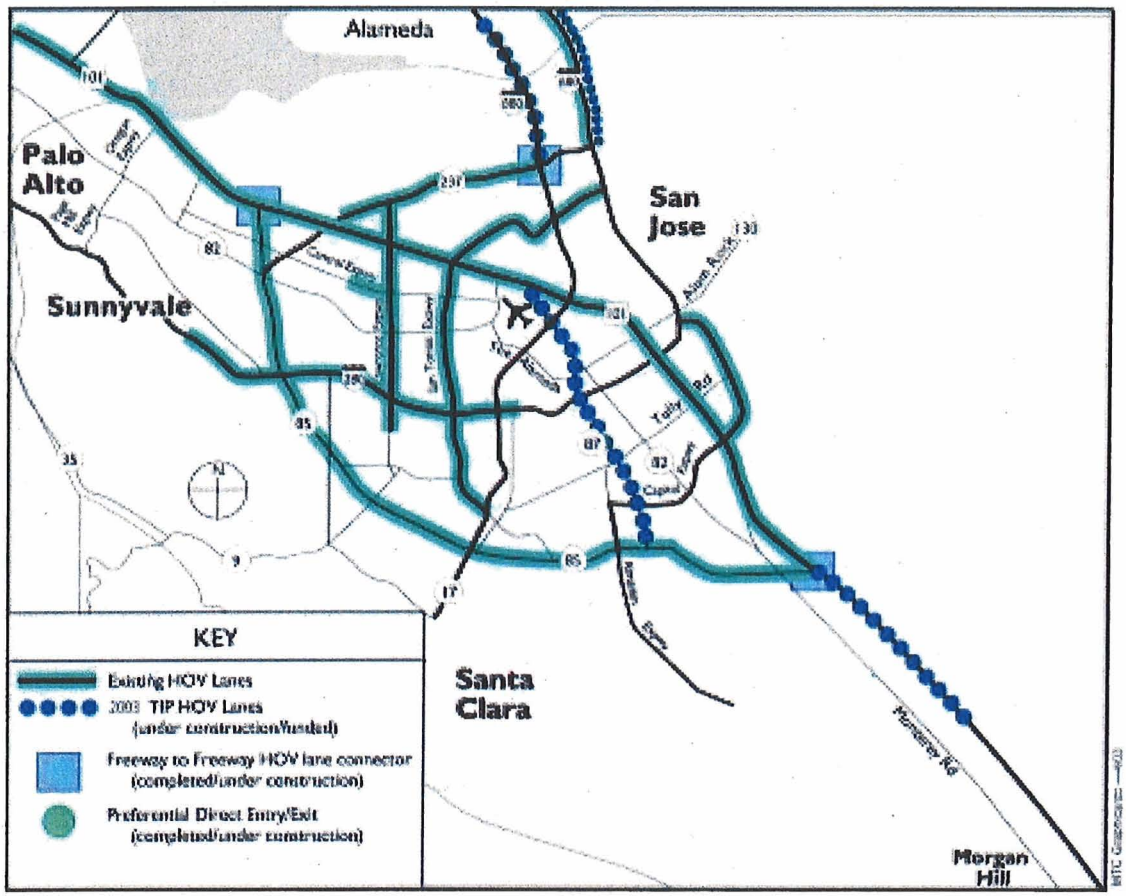


FIGURE 2

Bay Area Existing and Funded HOV Lane Master System: Santa Clara County



2 KEY FINDINGS AND RECOMMENDATIONS

MTC committed to evaluate several aspects of the region's HOV and express bus systems as part of "Further Study Measure 2" included in the adopted 2001 Ozone Plan. A brief summary of preliminary findings and recommendations is as follows:

- <u>What does the public think of HOV lanes?</u> – According to recently conducted license plate and Web surveys conducted by MTC, Bay Area HOV lanes are supported by carpoolers and non-carpoolers alike.
- <u>How well are HOV lanes used now and how well will they be used in the future?</u> - Nearly all existing peak direction freeway HOV lanes meet established Caltrans performance standards. Fewer off-peak direction HOV lanes meet standards currently, but nearly all will between 2010 and 2025. Staff recommends that Caltrans, in accordance with the "I-80 Project Assurances," (adopted by MTC to oversee Contra Costa and Alameda I-80 operations) evaluate lifting the I-80 HOV lane restrictions in the off-peak direction (eastbound a.m. and westbound p.m.) and that other HOV lanes continue to be monitored for possible adjustments to the hours of operation, especially in the off-peak direction.

The Santa Clara County Roads and Airport Department currently is evaluating its expressways' HOV lane performance; the forthcoming report may recommend that portions of County expressway HOV lanes be de-designated due to poor performance.

- How significant are HOV lane violation rates and how can CHP enforcement be improved? - Most HOV lanes have observed violation rates within acceptable Caltrans standards (below 10 percent), with the notable exception being the region's most heavily used HOV facility: I-80 westbound to San Francisco. The generally low observed violation rate is due to the generally high HOV lane use, an aggressive CHP enforcement program and high fines (second highest in the country). HOV lane enforcement funding will need to increase as the region's HOV lane system continues to grow.
- Are changes to HOV lane occupancy requirements being considered at this time? - No. Current HOV lane operations indicate the existing occupancy requirements are adequate. However, MTC projections indicate that high HOV lane vehicle volumes will significantly degrade HOV lane travel time savings on most peak direction HOV lanes after 2010.
- How can we improve HOV lane person-carrying capacity? - The region's express bus services and infrastructure to support these services should be expanded, particularly where rail services do not exist. Priority express bus corridors are: I-680, I-80 and US 101 (Sonoma/Marin counties).
- Should HOV lanes be converted to bus-only lanes? - It is unlikely that the number of freeway express buses will be great enough to warrant conversion to bus-only lanes. In addition, such conversions would force carpool and vanpool vehicles into already crowded mixed-flow lanes.
- Should freeway shoulders be used for peak-period bus use? - The evaluation indicates that there are some congested freeway segments where the shoulder may be available to accommodate HOV lane use. Caltrans does not support using shoulders for bus-only lanes that are contiguous to existing part-time HOV lanes due to potential confusion between the buses and HOVs. Caltrans, the CHP and MTC will conduct a more thorough assessment of candidate shoulder segments that could be used to extend or close HOV lane gaps.
- How feasible would it be to allow non-carpools (drive alones or commercial vehicles) to use HOV lanes by paying a toll (know as high-occupancy-toll, or HOT lanes)? - Most Bay Area HOV lanes are well used now and will not have sufficient capacity to "sell" as demand grows. Implementing HOT lanes may be a strategy to consider in some corridors to regulate users when HOV demand exceeds HOV lane capacity. Over the long term, there are six corridors where excess HOV lane capacity, particularly in the off-peak direction, may be available to sell in order to fully utilize freeway capacity.
- How much will it cost to implement the HOV Lane Master Plan? - The plan is estimated to cost about $3.7 billion to complete. Discounting lower priority (Priority 2) recommended improvements ($1 billion), which will likely require new revenue sources beyond those typically considered available in the RTP, almost three-fourths of the recommended improvements are already committed ($1.2 billion programmed in the TIP and another $770 million committed in the later years of the 2001 RTP).
- What the air quality benefits of HOV lanes? – HOV lane alternatives show lower regional emissions than mixed flow lane alternatives.

3 WHAT DOES THE PUBLIC THINK OF HOV LANES?

One key task of the plan update was to determine public perception of HOV lanes in general, and to solicit ideas on how the lanes should be operated and enforced. Two surveys were conducted as part of the plan update: 1) License plate survey of carpool lane users – 5600 surveys sent/1,300 surveys returned; and 2) Web survey for carpool and non-carpool lane users – over 5,000 responses. Findings from these two surveys are as follows:

- Respondents Support HOV lanes: 60 percent of those responding to the Web survey supported Bay Area HOV lanes; 85 percent of those responding who indicated regular (two to three times or more per week) HOV lane use supported HOV lanes, compared to almost 50 percent of non-carpoolers (less than once a week) who responded who also support HOV lanes.
- General satisfaction with HOV lane use among carpoolers: 68 percent of regular carpoolers responding think HOV lanes are well used, while 73 percent of the non-users responding tend to think HOV lanes are under used.
- Most carpool with family members or co-workers: 75 percent of surveyed carpool drivers commute with family members or co-workers; 18 percent of those surveyed drove with "casual" carpoolers.
- Most carpoolers think that HOV lanes provide substantial travel time savings: 72 percent of the respondents to the carpool lane user survey indicated that HOV lanes "greatly reduces" commute travel time.
- Most think that HOV lane enforcement needs to be increased: 51 percent of the Web survey respondents thought that enforcement was not adequate.
- Most do not support increasing HOV lane vehicle occupancy requirements: Nearly 80 percent of Web survey respondents did not support increasing HOV lanes that require two or more (2+) occupants to three or more (3+) occupants.

4 EVALUATION OF THE SYSTEM'S PERFORMANCE

The *2002 HOV Lane Master Plan Update* includes an evaluation of existing and planned HOV lanes. Caltrans also assesses HOV use at toll gates during designated hours, but these are not specifically analyzed here and are generally considered part of the freeway HOV lanes. Proposed additions to the HOV lane system included in the *2001 Regional Transportation Plan* or already in the *Regional Transportation Improvement Program* were included in the evaluation. The HOV lanes were evaluated on the basis of their performance as indicated by four primary measures:

- Total vehicle usage per average a.m. weekday peak hour
- Total person usage per average a.m. weekday peak hour
- Lane productivity: the ratio of people per lane per hour in the HOV lane to people per lane per hour in the adjacent mixed-flow lanes
- Travel-time savings per mile.

Caltrans has established performance standards with respect to three of these measures. The standards suggest that an HOV lane should generate at least 800 vehicles per lane per hour or carry at least 1,800 people per lane per hour. They also suggest that an HOV lane should provide a travel time-savings of at least one minute per mile.

Count data provided by Caltrans was used to evaluate the current performance of the freeway HOV lanes in every county except in Santa Clara County. Data provided by Santa Clara

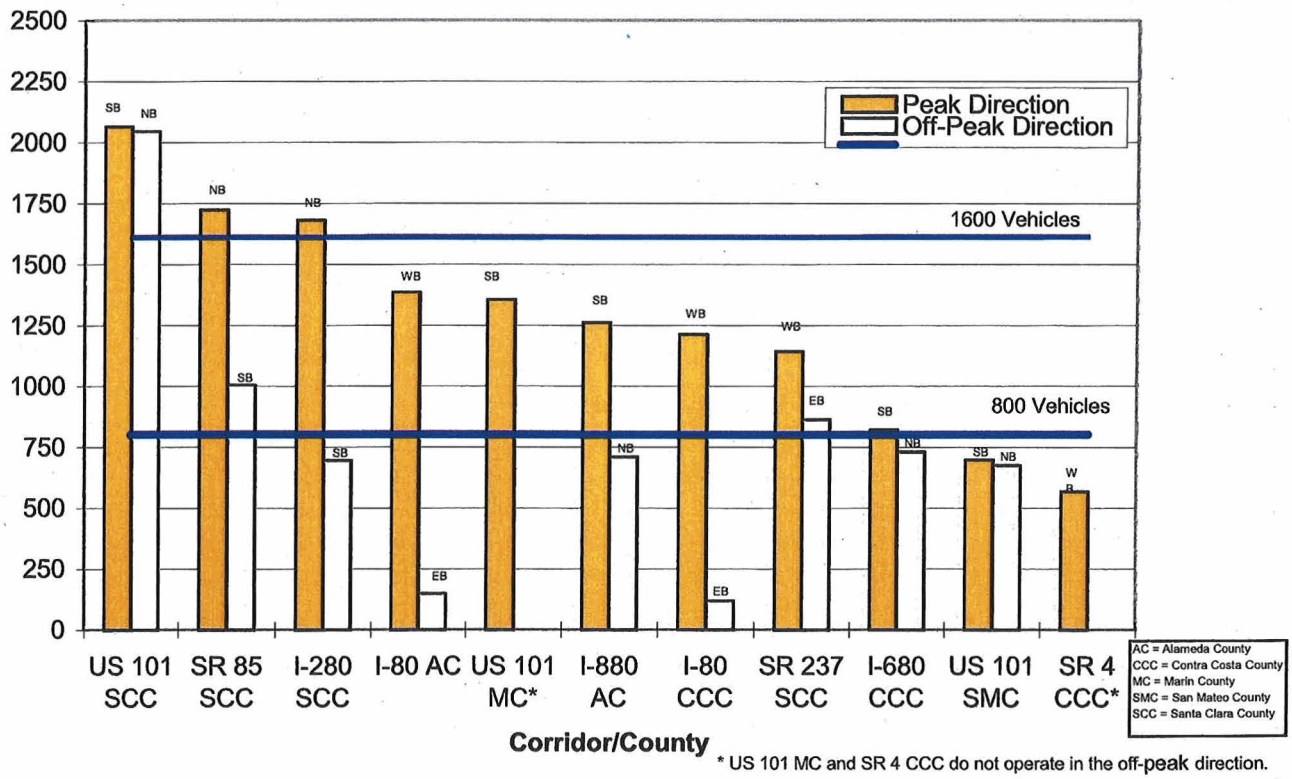
County and the Santa Clara Valley Transportation Authority were used to evaluate the freeways and expressways in Santa Clara County. To be consistent with the long-range planning horizon of the RTP, the future performance of existing and planned freeway HOV lanes was evaluated using model forecasts produced by MTC for 2025 in the 2001 RTP. Travel forecasts produced by VTA were used to evaluate the future performance of the Santa Clara County expressways.

The performance statistics presented in this section are for both the peak and off-peak direction. Some of the key performance measures are summarized in Table 2 for the peak direction and in Table 3 for the off-peak direction. As shown in Figures 3-7, HOV travel flows are fairly balanced in some corridors between directions, while in others there is a clear distinction between the two directions.

HOV Vehicle Volumes

The analysis of current performance indicates that the HOV lane system is contributing significantly to regional mobility as indicated in Figure 3, which ranks the existing HOV segments by HOV vehicles in the a.m. peak hour/peak direction.

FIGURE 3
2001 AM Peak Hour HOV Lane Vehicle Use



* US 101 MC and SR 4 CCC do not operate in the off-peak direction.

Table 2 - Summary of HOV lane Use and Productivity Analysis for Peak Direction

Corridor	A.M. Peak Direction	2001 HOV Lane Volume	2001 HOV Productivity	2025 HOV Lane Volume (vehicles)[1]	2025 HOV Lane Productivity[1]
FREEWAYS					
Alameda, I-80	WB	1,385	2.5	1,572 - 1,944	2.5 - 3.3
Alameda, SR 84	WB	1,335	2.1	1,344 - 1,357	1.7 - 1.7
Alameda, SR 92	WB	650	0.9	949 - 1,010	1.0 - 1.1
Alameda, I-580	WB	-	-	2,198 2,739	1.6 2.2
Alameda, I-680	SB	-	-	2,473 - 2,476	2.5 - 2.5
Alameda, I-880	SB	1,261	1.9	2,107 - 2,195	2.6 - 3.1
Contra Costa, SR 4	WB	568	0.6	808 - 1161	0.8 - 1.2
Contra Costa, I-80	WB	1,211	2.2	1,616 1,682	2.5 2.6
Contra Costa, I-680	SB	821	1.0	1,747 - 1,790	2.3 - 3.1
Marin, US 101	SB	1,354	3.0	1,952 - 1,958	5.2 - 5.3
Santa Clara, SR 85	NB	1,723	3.9	2300 - 2321	3.7 - 4.0
Santa Clara, SR 87	NB	-	-	2,645 - 3,175	2.3 - 3.2
Santa Clara, US 101	SB	2,064	3.3	2,202 - 2,448	2.6 - 3.2
Santa Clara, SR 237	WB	1,142	2.2	2,249 - 2,324	4.0 - 4.3
Santa Clara, I-280	NB	1,680	2.1	2,264 - 2,439	2.5 - 2.9
Santa Clara, I-680	SB	-	-	1,569 - 1,946	1.7 - 2.4
Santa Clara, I-880	SB	-	-	2,459 - 2,951	2.2 - 3.1
San Mateo, US 101	SB	698	1.2	1,362 - 1,434	1.9 - 2.0
Solano, I-80	WB	-	-	2,270 - 2,406	3.0 - 3.6
Sonoma, US 101	SB	-	-	1,348 - 1,367	3.5 - 3.5
EXPRESSWAYS					
Lawrence Expressway	NB	376	0.7	376	0.8
Montague Expressway	WB	208	0.5	208	0.4
Central Expressway	WB	84	0.2	88	0.2
San Tomas Expressway	NB	292	0.6	369	0.7

Notes:
1. Forecasts of future HOV lane use do not include possible lane violations. The lower end of the range for freeway HOV lanes represents the share of eligible vehicles using the lane as predicted by MTC's regional travel model. The high end of the range assumes that all eligible vehicles use the HOV lane. Expressway HOV lane volumes were forecasted by CCS Planning and Engineering Inc. using the Santa Clara CMA 2025 travel model and no range was presented. There also were no estimates of speed on expressway HOV lanes.

Source: DKS Associates

Table 3 - Summary of HOV lane Use and Productivity Analysis for Off-Peak Direction

Corridor	A.M. Peak Direction	2001 Off-Peak HOV Volume	2001 Off-Peak HOV Productivity	2025 HOV Lane Volume (vehicles)[1]	2025 HOV Lane Productivity[1]
FREEWAYS					
Alameda, I-80	EB	149	0.5	182 - 426	0.3 - 0.8
Alameda, I-580	EB	-	-	983 1276	1.1 1.5
Alameda, I-680	NB	-	-	1,543 - 1,545	1.8 - 1.9
Alameda, I-880	NB	709	1.9	977 - 1081	1.9 - 2.1
Contra Costa, SR 4[2]	EB	-	-	943 - 951	1.3 - 1.3
Contra Costa, I-80	EB	119	0.3	159 400	0.3 0.9
Contra Costa, I-680	NB	731	0.9	1,461 - 1,549	3.7 - 4.2
Marin, US 101[2]	NB	-	-	1,166 - 1,273	1.4 - 1.5
Santa Clara, SR 85	SB	1,004	1.1	1,095 - 1,518	1.2 - 1.4
Santa Clara, SR 87	SB	-	-	887 - 1,151	1.8 - 2.6
Santa Clara, US 101	NB	2,044	2.3	2,178 - 2,367	2.1 - 2.8
Santa Clara, SR 237	EB	863	1.4	1,378 - 1,450	1.5 - 1.8
Santa Clara, I-280	SB	696	0.9	687 - 1282	0.6 - 1.4
Santa Clara, I-680	NB	-	-	1,231 - 1,263	1.2 - 1.3
Santa Clara, I-880	NB	-	-	1,194 - 1,426	1.3 - 1.8
San Mateo, US 101	NB	677	1.2	1,139 - 1,477	1.2 - 1.7
Solano, I-80	EB	-	-	1,576 - 1,576	2.3 - 2.3
Sonoma, US 101	NB	-	-	1,258 - 1,283	1.8 - 1.8
EXPRESSWAYS					
Lawrence Expressway	SB	194	2.4	203	1.1
Montague Expressway	EB	0	0.0	0	0.0
Central Expressway	EB	60	0.2	60	0.2
San Tomas Expressway	SB	130	1.9	150	2.3

Notes:
1. Forecasts of future HOV lane use do not include possible lane violations. The lower end of the range for freeway HOV lanes represents the share of eligible vehicles using the lane as predicted by MTC's regional travel model. The high end of the range assumes that all eligible vehicles use the HOV lane. Expressway HOV lane volumes were forecasted by CCS Planning and Engineering Inc. using the Santa Clara CMA 2025 travel model and no range was presented. There were also no estimates of speed on expressway HOV lanes.
2. Operates peak direction only.

Source: DKS Associates

All but two of the 11 existing freeway HOV segments carry 800 or more eligible vehicles per hour (Caltrans' minimum threshold for use) in the peak direction in the a.m. peak hour Only SR 4 in Contra Costa County and the segment of US 101 in San Mateo County fell short of this level of use in the peak direction. The future-year forecasts indicate that, over time, all of the existing and planned HOV lane segments will achieve this minimum threshold for the peak direction. Three HOV lane corridors in Santa Clara County currently carry the highest volume of HOV-eligible vehicles: US 101, SR 85 and I-280.

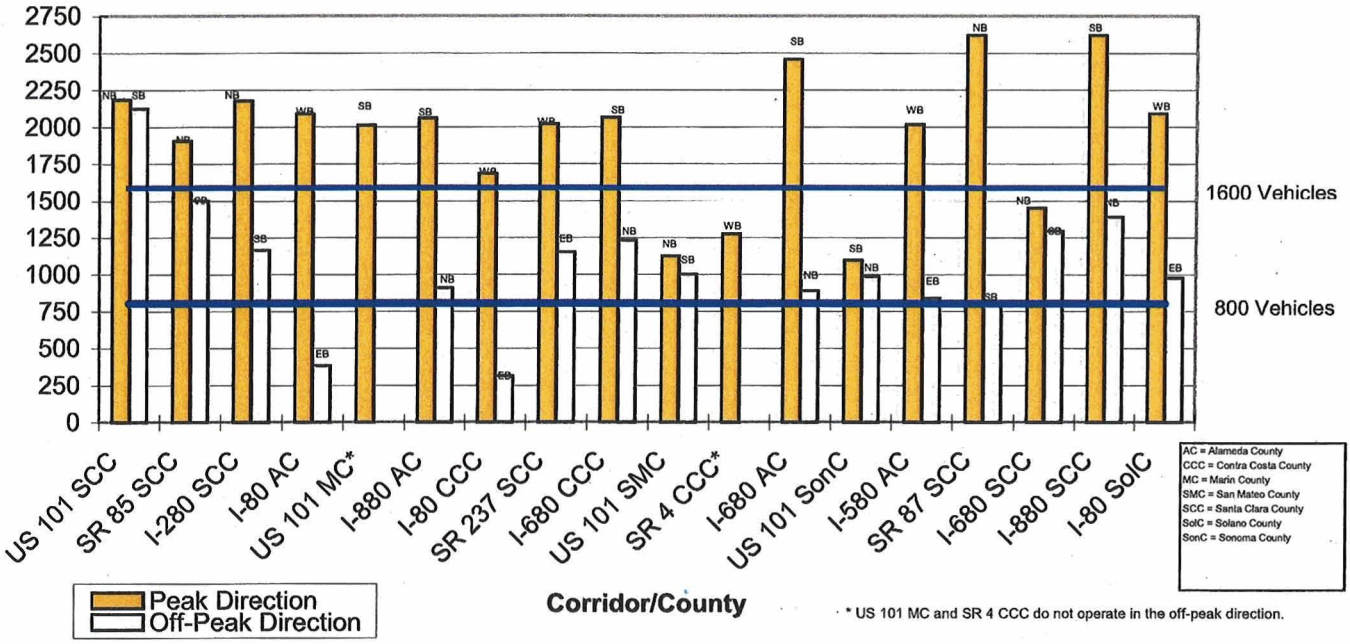
In the off-peak directions, three of the corridors carried at least 800 eligible vehicles in 2001 : US 101, SR 85 and SR 237, all in Santa Clara County. By 2025, all but three off-peak direction HOV lanes are expected to carry at least 800 eligible vehicles. Existing vehicular volumes in the HOV lane in the off-peak direction range from 119 to 2,044 eligible vehicles in the a.m. peak hour. The I-80 corridors in Alameda and Contra Costa Counties had the lowest off-peak direction volumes, with each under 150. The rest of the corridors had at least 600 eligible vehicles in the HOV lane in the off-peak direction in the a.m. peak hour.

A future concern about HOV lane use is the possibility that segments of the HOV lane system will attract more eligible HOV vehicles than can be accommodated by the lane thus jeopardizing the travel-time advantage provided by the lane. Because of the mix of vehicles in an HOV lane - passenger cars, motorcycles, vans and buses (and since new legislation – alternative fueled vehicles) - and because of the need for vehicles to weave into and out of the lanes, the practical vehicle capacity of an HOV lane is usually considered to be less than that of a mixed-flow lane. Caltrans and MTC generally use a standard of 1,600 vehicles/hour as the capacity of an HOV lane. Above this level, there is likely to be deterioration of the HOV lane speed. In 2001, the three highest volume freeway corridors in Santa Clara County exceeded this level of usage. Between 2010 and 2025, 12 corridors are expected to exceed this level, of which seven are existing facilities (as indicated in Table 2 and in Figures 4 and 5) and five are new corridors. Only six corridors are expected to have a.m. peak hour HOV lane vehicle volumes under 1,600.

HOV Lane Person Trips

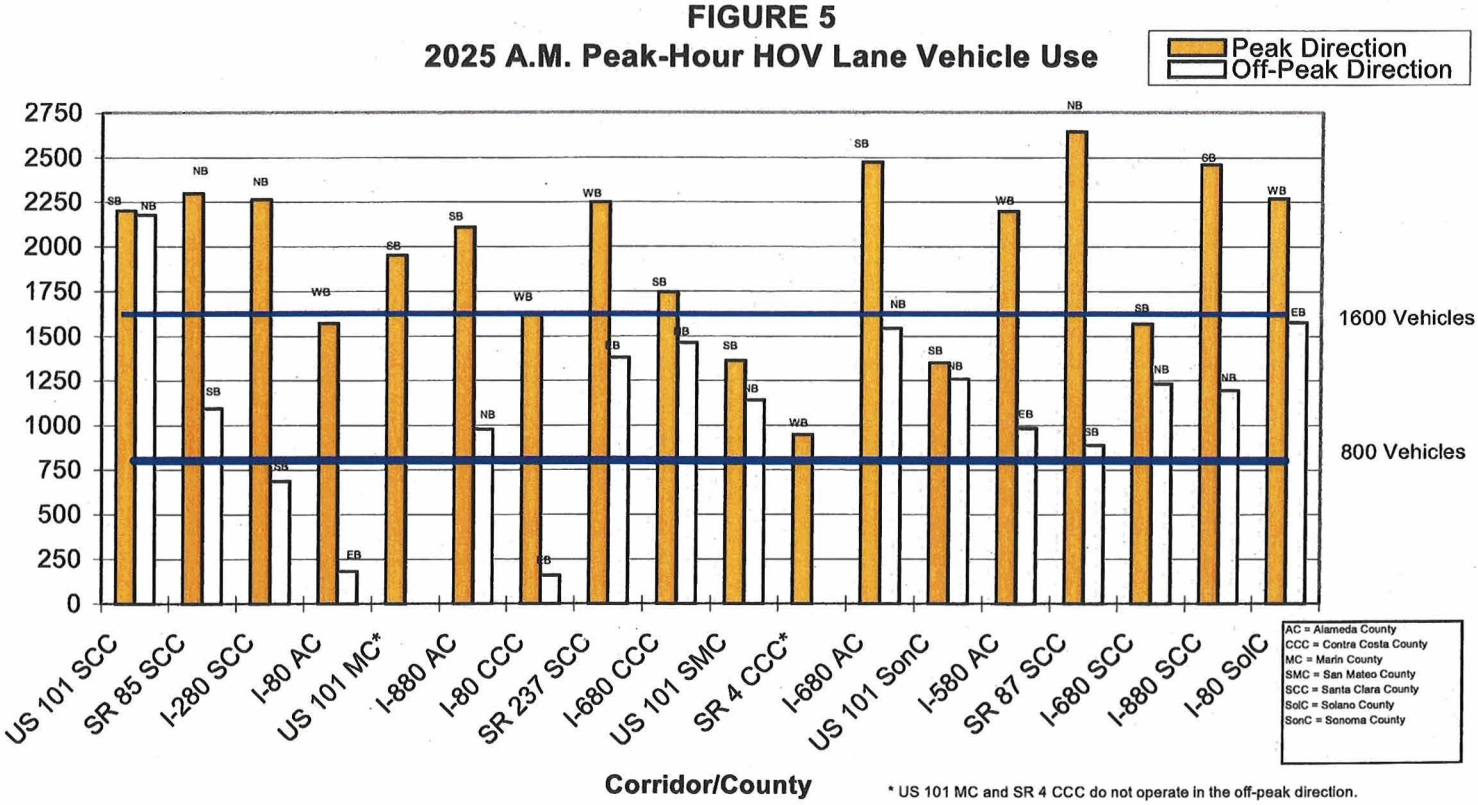
An assessment of the number of people moved in the HOV lanes in an average a.m. peak hour indicates that the highest volumes of people moved are on the two segments of I-80 where the occupancy requirement is 3+. As indicated in Figure 6, these two HOV segments and one segment on US 101 in Santa Clara County move more than 4,500 people per hour in the peak direction in the a.m. peak hour. The HOV corridors are plotted in the same order as in the previous two figures where they are ranked by HOV vehicles carried in the a.m. peak hour. Of the 11 existing freeway HOV segments, 10 are carrying more than 1,800 people per hour in the peak direction. By 2025, 14 out of 18 segments will carry at least 4,500 people per hour if all lanes continue to have 2+ occupancy requirements (see Figure 7). In the off-peak directions, four corridors carried more than 1,800 in 2001 and seven are expected to in 2025.

FIGURE 4
2010 A.M. Peak-Hour HOV Lane Vehicle Use (No Change to HOV Requirement)



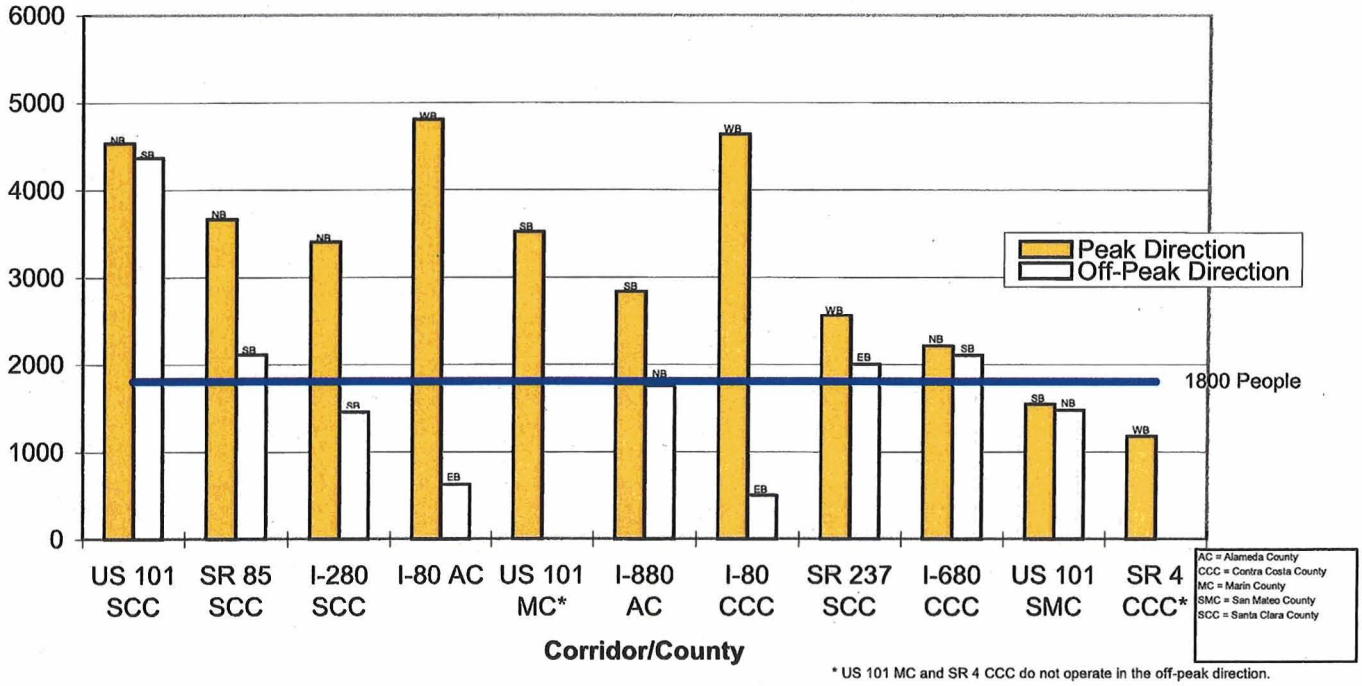
* US 101 MC and SR 4 CCC do not operate in the off-peak direction.

FIGURE 5
2025 A.M. Peak-Hour HOV Lane Vehicle Use



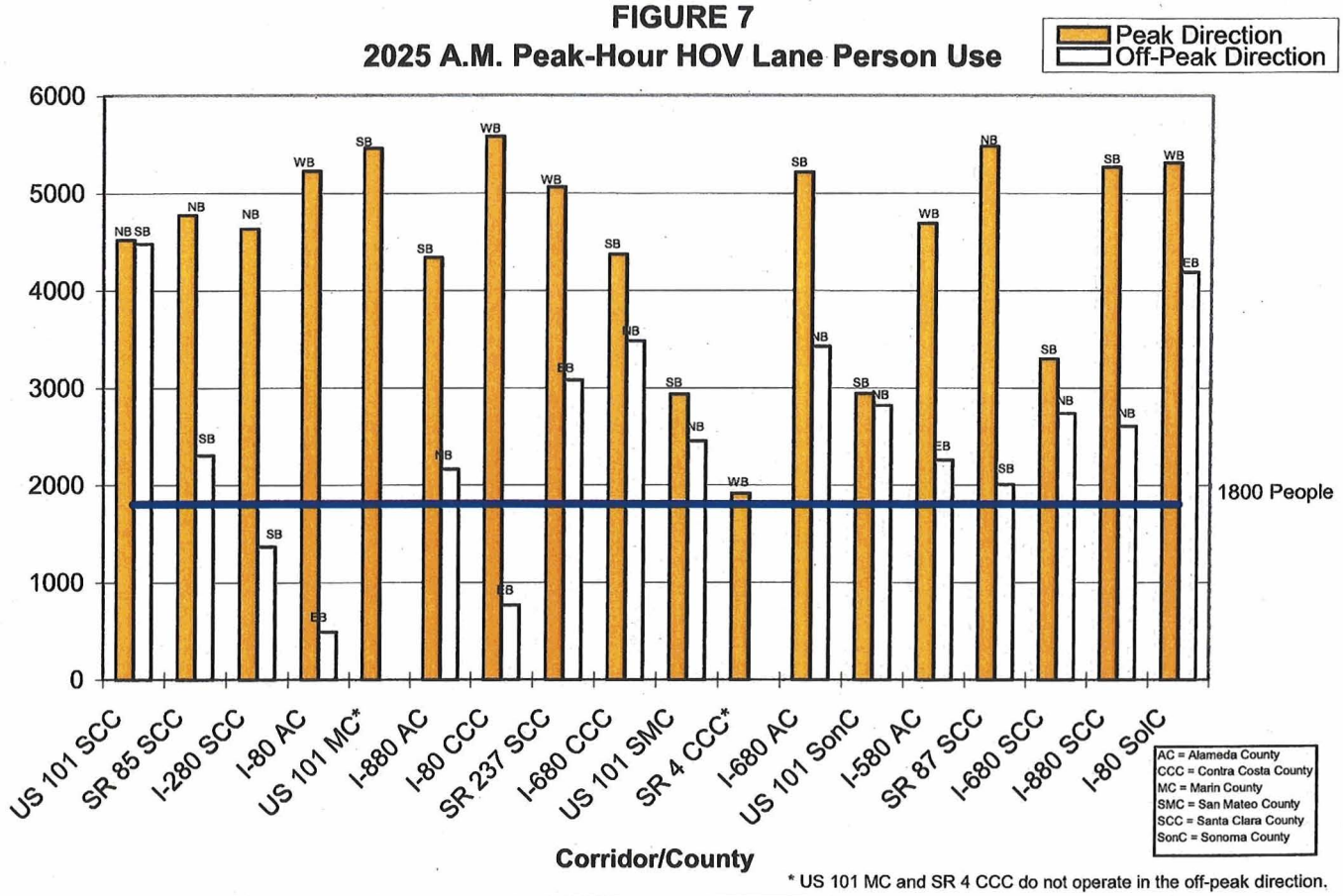
* US 101 MC and SR 4 CCC do not operate in the off-peak direction.

FIGURE 6
2001 A.M. Peak-Hour HOV Lane Person Use



* US 101 MC and SR 4 CCC do not operate in the off-peak direction.

FIGURE 7
2025 A.M. Peak-Hour HOV Lane Person Use

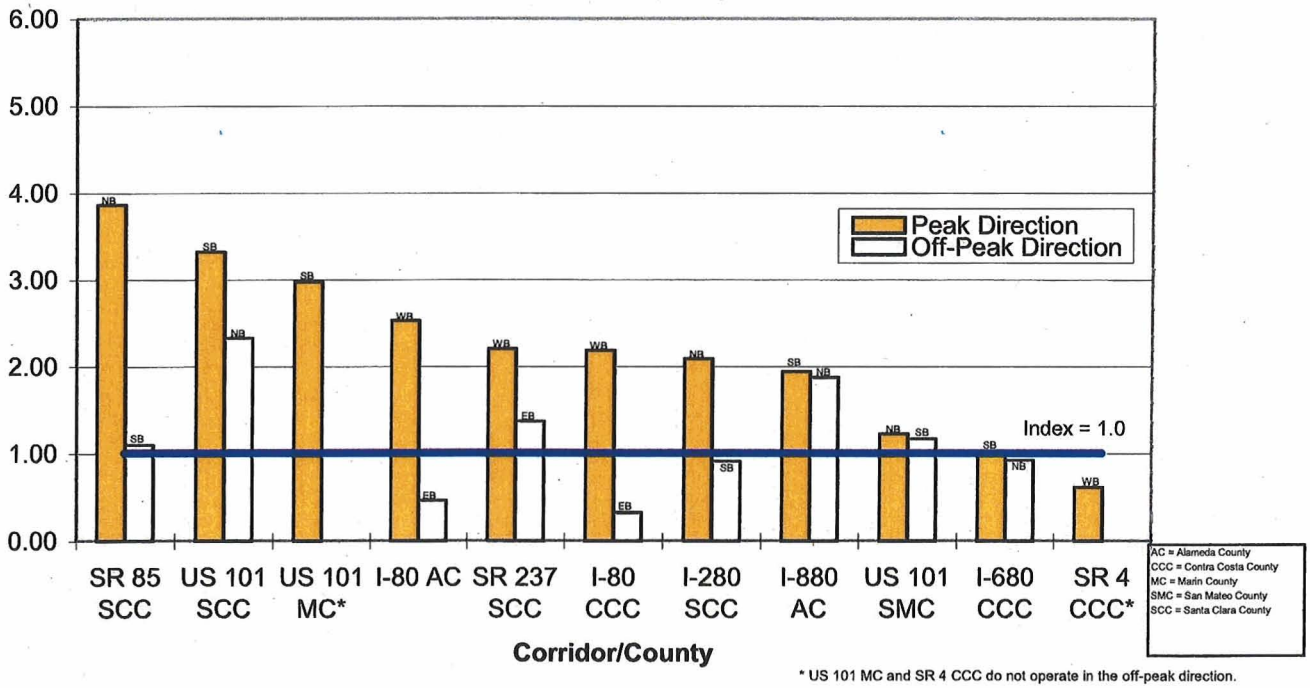


* US 101 MC and SR 4 CCC do not operate in the off-peak direction.

HOV Lane Productivity

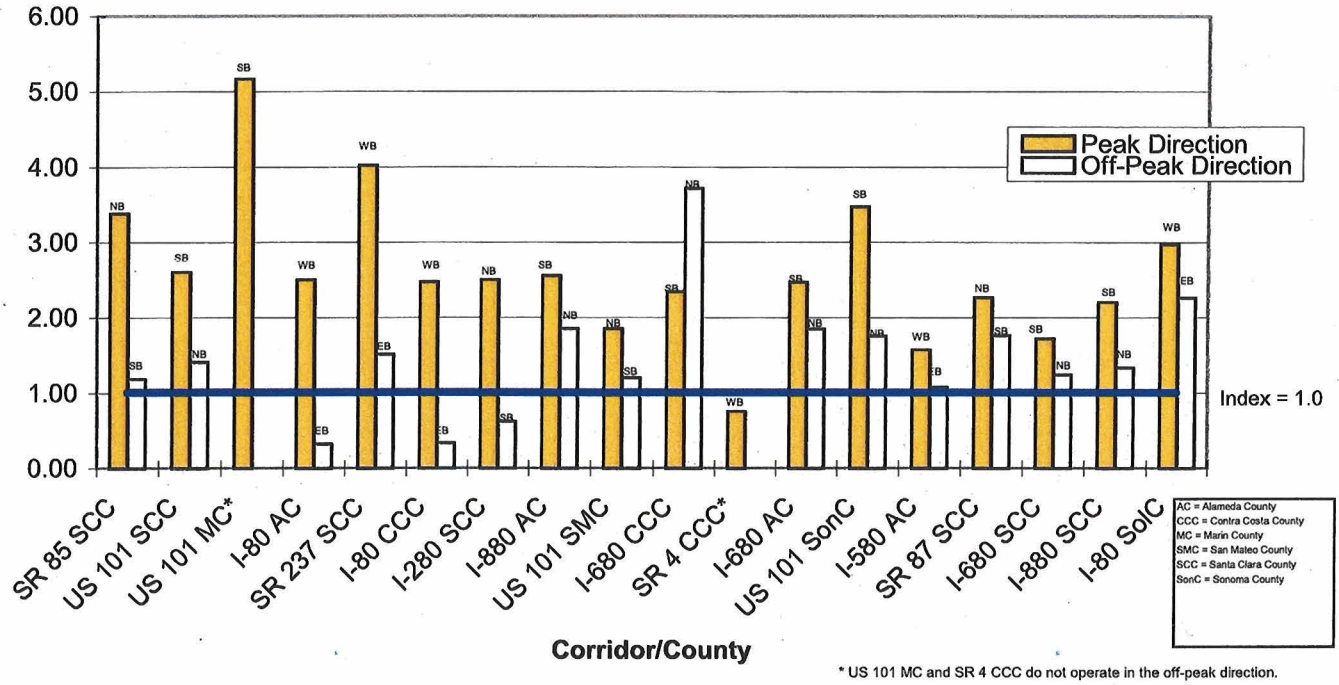
The value of the HOV lane system is demonstrated by an evaluation of how well the HOV lane segments perform in carrying people when compared to the mixed-flow lanes on the same freeway segments. In 2001, all of the 11 freeway HOV lane segments studied except one (Contra Costa SR 4) achieved an HOV lane productivity of 1.0 or better as indicated in Figure 8 (HOV lane productivity is measured as the ratio of people per lane per hour in the HOV lane to the average number of people per lane per hour in the adjacent mixed-flow lanes). Seven of the segments had productivity indices of 2.0 or better, indicating that they were carrying more than twice the number of people per lane as the mixed-flow lanes. SR 85 in Santa Clara had the highest productivity, at 3.9. By 2025, all of the existing and planned HOV lanes are expected to have productivities of greater than 1.0 except SR 4 in Contra Costa County (see Figure 9). In the off-peak direction, five corridors achieved a productivity of 1.0 or better in 2001. Seven are expected to in 2025.

FIGURE 8
2001 Productivity Index



* US 101 MC and SR 4 CCC do not operate in the off-peak direction.

FIGURE 9
2025 Productivity Index



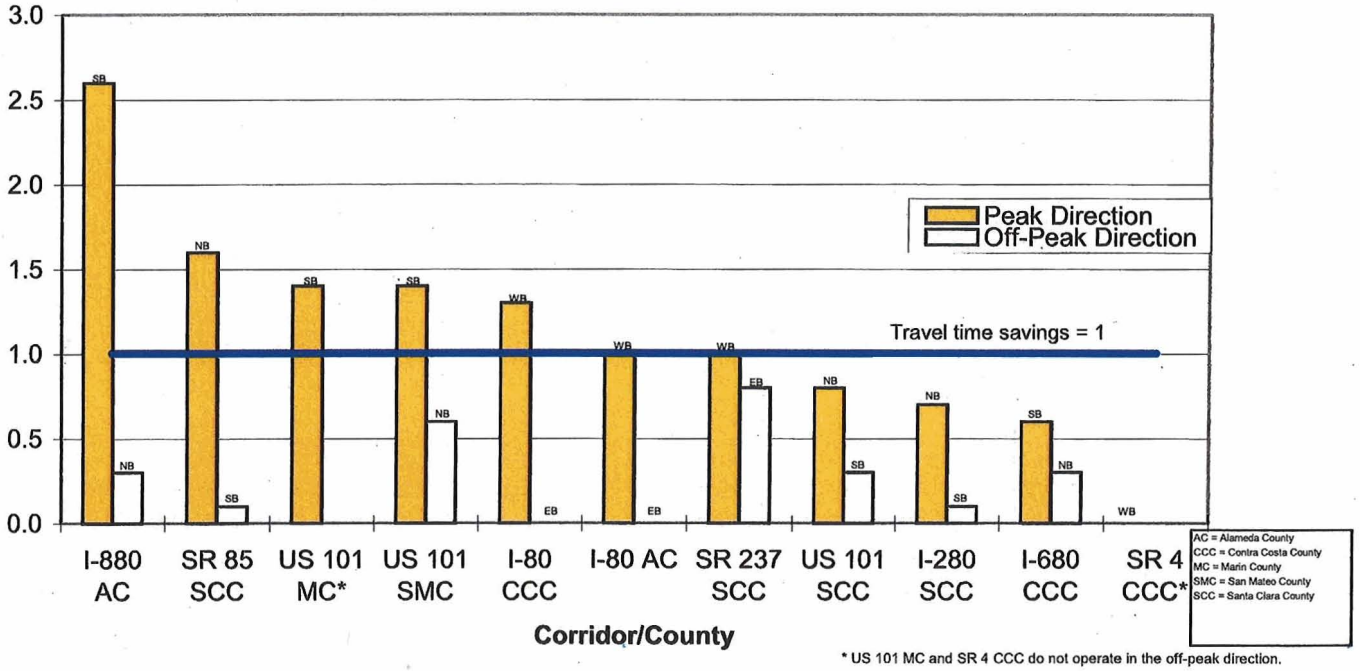
* US 101 MC and SR 4 CCC do not operate in the off-peak direction.

HOV Travel-Time Savings

The primary purpose of an HOV lane is to give a travel-time advantage to higher-occupancy vehicles and in doing so, induce more people to shift from traveling alone to carpooling, vanpooling and using express bus services that use the HOV lanes. A frequently used goal for HOV planning nationally is a travel-time savings of at least one minute per mile of HOV lane. This could be achieved on a 10-mile segment by a speed in the HOV lane of 60 miles per hour and a speed in the mixed-flow lane of 30 miles per hour, for example. As indicated in Figure 10, where the HOV lane corridors are ranked by travel-time savings per mile, six of the 11 existing HOV lane segments produce this level of savings in the peak direction, and four others produce savings of over 0.5 minutes per mile. The HOV lane segment on SR 4 in Contra Costa County demonstrated no discernable travel-time savings, which may provide the explanation for the corridor's weak overall performance. None of the corridors achieve a time savings of one minute per mile in the off-peak direction and only two achieve savings of 0.5 minutes per mile.

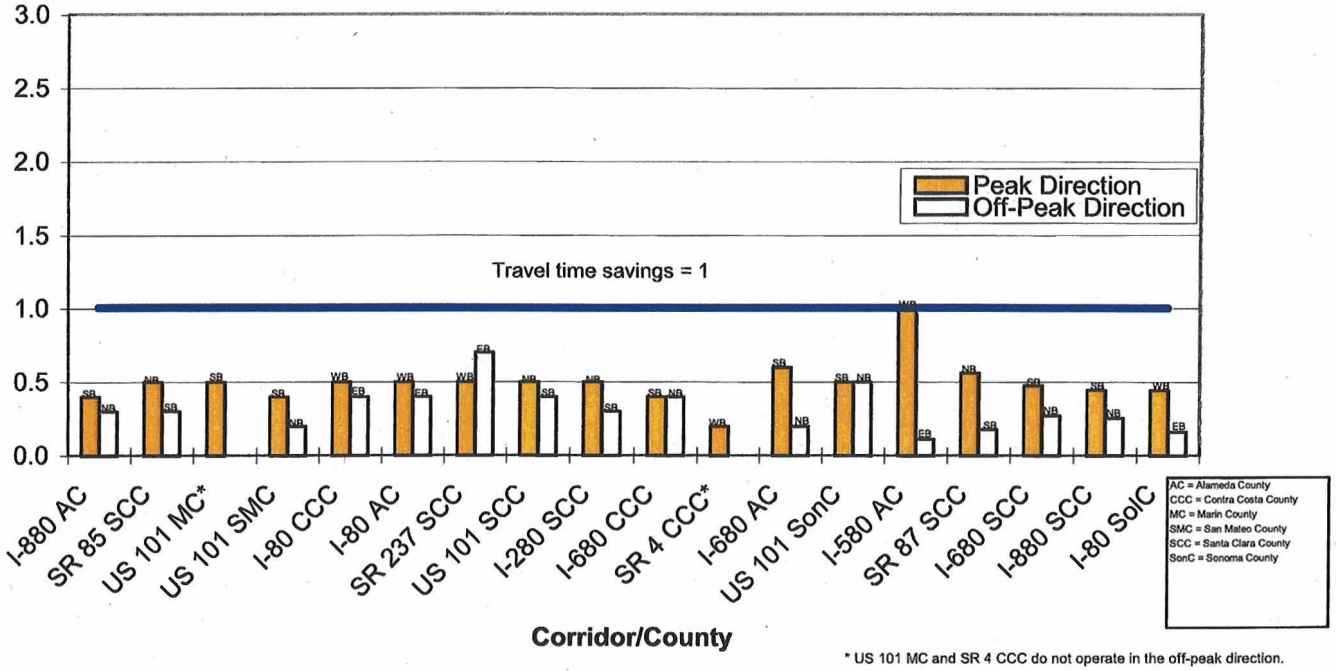
By 2025, HOV lane volumes are expected to grow (see Figure 5) to the point that many HOV lanes will be congested and provide little or no travel time savings over adjacent mixed-flow lanes. Figure 11 shows that only I-580 HOV lanes will meet the minimum time savings threshold due to congested HOV lane conditions in the peak direction with current vehicle occupancy requirements; the low travel time savings in the off-peak direction is primarily due to relatively uncongested conditions in both the HOV lanes and the mixed flow-lanes.

FIGURE 10
2001 Travel Time Savings (minutes/mile)



* US 101 MC and SR 4 CCC do not operate in the off-peak direction.

FIGURE 11
2025 Travel Time Savings (minutes/mile)



* US 101 MC and SR 4 CCC do not operate in the off-peak direction.

5 RECOMMENDATIONS FOR HOV LANE SYSTEM IMPROVEMENTS AND OPERATIONAL CHANGES

In addition to the infrastructure improvements identified in this report, a number of operational changes were considered and recommendations made. They are described in the sections that follow. Except where noted, the recommendations for operational changes are based on analysis of the HOV lane system performance (existing and predicted future) in the peak direction and during the a.m. peak period.

Hours of Operation

Bay Area transportation agencies have chosen to adopt a policy of tailoring the hours of operation of HOV lanes to the travel patterns in each individual corridor. As a result, the hours of operation are not the same throughout the region, but instead vary from corridor to corridor. The policy also is to have HOV restrictions only during the peak commute periods and not 24 hours per day as in many other metropolitan areas. In two instances, Marin US 101 and Contra Costa SR 4, HOV lanes operate in the peak direction only. At present, this approach appears to work well. It provides the HOV lanes for use during congested periods of the day and provides supplemental capacity in the off-peak if it is needed. This helps to maintain public support and potentially improves the operation of the freeways during some off-peak periods when the mixed-flow lanes might get congested.

The differences in hours of operation between corridors do not seem to be causing confusion for motorists, nor did the California Highway Patrol (the agency with responsibility for enforcing the HOV restrictions) see the different hours of operation in various corridors as a problem.

As congestion continues to increase in the Bay Area and the length of the peak period expands on the region's freeways, the Bay Area should consider moving toward a consistent regionwide set of hours. This should probably correspond to the current maximum spread of 5:00 a.m. to 10:00 a.m. and 3:00 p.m. to 7 p.m. Although congestion may occur outside of these peak periods in some corridors, the effectiveness of HOV lanes in producing a shift in mode to carpooling, vanpooling or transit is primarily an issue for commute trips. Having HOV lane restrictions in the off-peak period may provide HOVs with a travel-time advantage but would be less likely to produce a mode shift than the peak-period restrictions. There is no evidence that the Bay Area would benefit from 24-hour HOV lane restrictions that are common in Southern California or other parts of the U.S.

An analysis of peak-period HOV lane use in the off-peak directions indicates that the I-80 segments between the Carquinez and Bay bridges would be the only appropriate segments to consider for converting to mixed-flow lanes. These segments did not have an HOV vehicle volume-to-capacity (V/C) ratio higher than 0.27 in either the a.m. or p.m. off-peak direction. In each case there were less than 300 eligible vehicles in the HOV lane. Mixed-flow lanes in these segments had V/C ratios between 0.51 and 0.71, indicating mostly uncongested conditions. The I-80 HOV lanes therefore are providing little if any travel time savings for the small number of HOVs using the facility in the off-peak direction. All of the other HOV lane corridors that had HOV lanes in effect in both directions had HOV lane V/C ratios of 0.5 or higher (at least 800 vehicles), suggesting that the peak direction

are not all that clear. The other corridors are also fairly balanced flow corridors: Alameda I-880, Contra Costa I-680, Santa Clara Santa Clara 85, Santa Clara SR 237, Santa Clara I-280 Santa Clara US 101 and San Mateo US 101. The 2025 forecast suggests the same patterns: I-80 looks like a reasonable candidate for conversion of off-peak direction HOV lanes to mixed-flow lanes, but all of the others have HOV V/C ratios over 0.5 and more than 800 eligible HOVs in the off-peak direction Caltrans, CHP and MTC will continue to monitor HOV lane use in this corridor.

Based on the review of the 2001 data and the 2025 forecast, it is recommended that SR 4 in Contra Costa County and the four expressways in Santa Clara County be monitored by Caltrans and the Santa Clara County Roads Department to see if the HOV lane productivity increases. Santa Clara County is currently conducting an assessment of the expressway HOV lanes as part of an overall assessment of the county roadway system. Preliminary recommendations include designation of HOV segments on Montague and Lawrence Expressways. More HOV lane mileage is already programmed for SR 4 and this may provide the critical threshold of travel-time savings to attract more trips to the lane. If these HOV lanes do not increase in productivity over time, further analysis by Caltrans and MTC will be necessary to determine whether conversion to mixed-flow lanes. When conversion to mixed-flow is considered, a thorough analysis of the extent of express bus use and ridership in the HOV lane should be included in the evaluation. Consideration should also be given to creation of a High Occupancy Toll (HOT) lane to make the most effective use of the excess capacity while maintaining the HOV lane.

Occupancy Requirement

The most recent performance data (2001) for all existing freeway and expressway HOV lanes were examined to determine whether all of the facilities were achieving a high enough productivity under existing occupancy requirements. Facilities with a lane productivity of greater than 1.0 are considered to be sufficiently productive because the HOV facility is carrying more people per lane per hour than the average of the adjacent mixed-flow lanes. Almost all of the freeway corridors had productivity levels of 1.0 or greater in 2001, the exception being SR 4 in Contra Costa County with a westbound a.m. productivity level of 0.6.

The lane productivity for all of the existing HOV corridors also increased in the 2025 forecasts. The 2025 productivity estimates ranged from a low of about 1.0 (a range of 0.8 to 1.2) on SR 4 in Contra Costa County to over 5.0 on US 101 in Marin County (a range of 5.2 to 5.3). The data suggest that the Bay Area's freeway HOV system is very productive in moving people. The four expressway HOV lanes in Santa Clara County all had productivity levels of less than 1.0. In the 2025 forecast, the Lawrence and San Tomas Expressways approach a productivity level of 1.0, but the Montague and Central Expressways do not.

Current HOV lane volumes indicate that there is not need to consider changing HOV lane occupancy requirements at this time. However, by 2010, seven corridors are projected to have HOV lane volumes that will be near or exceed the practical capacity of 1,600 vehicles per hour; by 2025, 15 out of 18 freeway corridors will have HOV lane volumes that exceed HOV lane capacity.

Because of high forecasted use of the freeway HOV lanes between 2010 and 2025, the Bay Area should consider strategies to ensure the HOV lanes remain relatively congestion free and continue to provide travel time savings, including:

1. Improve overall corridor performance – Strategies would include: expanding express bus service, expanding CHP enforcement, adding auxiliary lanes to remove key bottlenecks and expanding use of ramp metering.
2. Increase HOV lane vehicle occupancy – No freeway segments currently warrant a change in occupancy requirement. Over the longer-term, increasing the HOV vehicle occupancy requirement would reduce HOV lane volumes and restore travel time savings. Forecasts for 2010 indicated that by that date 14 out of 18 freeway corridors would have at least 800 HOV eligible vehicles in the peak direction in the a.m. peak hour with the 3+ occupancy requirement. An increase in the HOV vehicle occupancy requirement would likely generate some public concern, but could be phased to correspond to individual corridor changes in the monitored HOV lane and mixed-flow lane volumes and travel-times.
3. Increase vehicle occupancy but charge for 2+ carpool use – This option is similar to #2, but a limited number of registered 2+ carpools could be allowed to use HOV lanes for a fee (see Section 7 of this report for more discussion of this concept). A similar program is currently operated on I-10 in Houston, Texas (Katy QuickRide program).

The Bay Area is not likely be able to implement a level of express bus service to warrant bus-only lanes on any part of the HOV lane system over the next 25 years based on 2001 RTP investments. Although the projected number of express buses would not warrant any exclusive freeway lanes, service would be improved if the HOV lane occupancy requirement were raised.

Consideration of Spot Use of Shoulders for Temporary HOV or Bus-Only Lanes

The temporary use of shoulders was analyzed as an interim step for all freeway segments where future HOV lane segments are proposed. In addition, the use of shoulders was analyzed for segments where the addition of an HOV lane seemed desirable from a system perspective but where the available right of way would prevent the addition of another lane. This included Alameda I-880 from 98th Avenue north to the Bay Bridge approach and San Mateo US 101 from Millbrae Avenue north to I-280.

The analysis of all of the freeway corridors for possible shoulder use indicated that in almost every case there was not sufficient shoulder width on a continuous basis to safely allow for use of the shoulder. Almost all of the corridors analyzed had bottleneck points in one or both directions where there was not at least 16 feet of shoulder width between the two sides of the freeway lanes, which is considered to be the minimum to allow for a 12-foot lane and leave a 2-foot shoulder on both sides. Only the following locations appeared to have the minimum width required to consider the use of the shoulders and to provide critical gap closures for express bus streams.:

- Alameda I-880 – northbound from just north of I-980 to the existing HOV lane on the approach to the Bay Bridge

- Alameda I-580 – west of I-680 in both directions
- Alameda I-680 – northbound from just north of SR 84 through the I-580/I-680 interchange to the existing HOV lane. Southbound will not work.

It is recommended that further consideration be given to the possible temporary use of shoulders for HOVs on these segments as a way to close gaps in the HOV lane system or to provide an interim HOV priority until a permanent HOV lane can be constructed. Caltrans does not support using shoulders for bus-only lanes that are contiguous to existing part-time HOV lanes due to potential confusion between the buses and HOVs. Shoulder bus-only lanes are used in other parts of the country, but these are in operation 24 hours per day.

While the use of shoulders for HOV use might be justifiable on a temporary basis as a way to significantly improve overall mobility and increase vehicle occupancy, it is suggested only as a temporary measure because using a shoulder as a traffic lane also eliminates the space that is used for emergency stops, disabled vehicles and for traffic enforcement.

Further, Bay Area freeway shoulders are generally not designed to carry daily traffic, especially heavy-duty vehicles such as buses. Most Bay Area freeway shoulders are eight feet or less in width and constructed with minimal paving and substructure. Use of the shoulder without substantial reconstruction of the shoulders would result in an uneven surface for newly created lanes (potentially on both the inside and outside lane if shoulder width has to be taken from both sides.) Without substantial reconstruction, use of the shoulders would also result in rapid deterioration of the shoulder and uneven wear in the lanes where shoulders are used.

Caltrans, the CHP and MTC will conduct a more thorough assessment of candidate shoulder segments that could be used to extend or close HOV lane gaps.

6 HOV LANE ENFORCEMENT

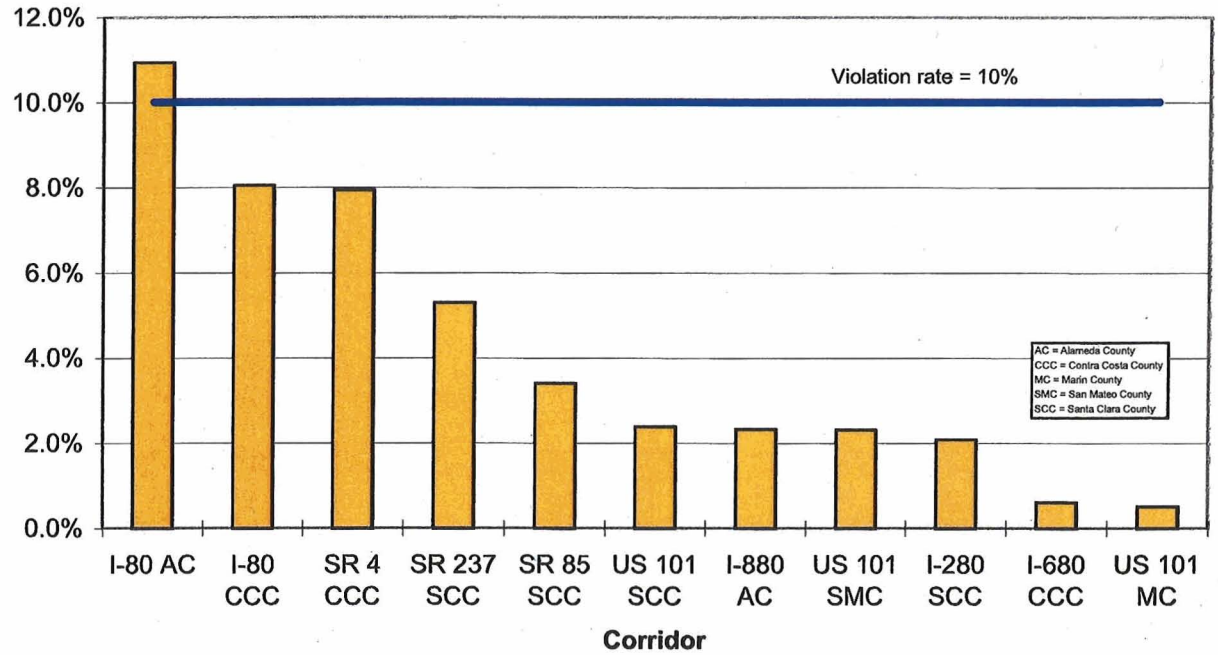
The CHP operates with the philosophy that the most effective deterrent to HOV lane violations is for CHP officers to be visible on the roadways watching for violators and issuing citations. CHP officers enforce HOV restrictions as part of their normal patrol of the roadways for safety violations and criminal behavior. This enforcement activity also is supplemented by targeted enforcement where patrol officers are sent out specifically to enforce HOV violations. The supplemental enforcement activity is made possible through overtime pay to patrol officers that is funded by Caltrans.

The distribution of enforcement resources throughout the Bay Area is based on several factors. These include the violation rates monitored by Caltrans, as well as congestion patterns that might benefit from increased enforcement. The distribution is evaluated periodically throughout the year and is often modified based upon input from CHP area commanders.

A review of the history of HOV lane violation rates in the Bay Area indicates that there has been dramatic improvement in HOV lane compliance. The review also indicates that Bay Area freeways are almost all within the national guidance standards for acceptable violation rates. Nationally, a violation rate of less than 10 percent is considered good. As indicated in Figure 12, where the corridors are ranked by violation rate, only I-80 in Alameda County at the approach to the Bay Bridge Toll plaza had a violation rate that

exceeded 10 percent. Violation rates for the peak direction were generally in the range of 2 percent to 8 percent

FIGURE 12
2001 Violation Rates



Based on the analysis conducted in this task, the following actions are recommended to potentially improve the efficiency and effectiveness of HOV lane enforcement in the Bay Area:

1. Continue monitoring HOV lane violation rates and distributing targeted HOV enforcement resources where appropriate. HOV lane violations not only reduce the effectiveness of the HOV lanes in offering a travel-time advantage to carpools, vanpools and express bus use; the lane violations also threaten the public's support of the HOV lane system
2. Enforcement areas should be constructed in the medians of freeways at a spacing of two to three miles wherever 14-foot median shoulders are not available and the median width will allow construction of the enforcement areas.
3. A method for providing consistent and regular funding of HOV lane enforcement should be sought to allow targeted enforcement to occur without incurring the additional overtime cost for officers. Consideration should be given to earmarking revenue from HOV lane fines for enforcement.
4. Bay Area legislators should seek to pass legislation to allow the penalty for HOV lane violation to increase with multiple offenses.

7 CONSIDERATION OF HIGH-OCCUPANCY-TOLL (HOT) LANES

Several in-depth analyses have been conducted on congestion pricing concepts in the Bay Area. These analyses have focused on assessment of the feasibility and desirability of implementing congestion-based tolls and the potential for HOV lane buy-in by drivers of vehicles not otherwise eligible for the HOV lane; those tolled facilities are known as HOT lanes. These analyses have examined congestion pricing concepts on the Bay Bridge, US 101 in Sonoma County, I-880 in Alameda County and I-680 in Alameda County. These analyses have led to the conclusion that the best opportunities for implementation of congestion pricing in the Bay Area are on the Bay Bridge or the other toll bridges in the region. The toll bridges already have HOV by-pass lanes and the infrastructure necessary to collect tolls. The studies for US 101 in Sonoma and Marin counties and I-680 in Alameda County both found the concept to be technically and financially feasible and worthy of further public discussion. Additional assessment of the operational requirements for implementation is still under way for I-680.

For HOV applications, HOT lanes could be employed to:

1. Manage the total number of vehicles in the HOV lane by charging all but the 3+ vehicles.
2. Sell excess capacity in peak or off-peak directions to optimize overall freeway performance by allowing SOVs into lanes.

Managing HOV lane demand

In order to manage entry into HOV lane and to preserve travel time savings, given projected use by 2+ vehicles, HOV carpool use would need to be rationed among eligible vehicles.

The previous assessment efforts have clearly indicated that any HOT lane application on most existing Bay Area HOV lanes would almost certainly have to be one that relies on a low level of infrastructure and lane separation. Most existing Bay Area HOV lanes and freeways do not have the lane separation or the median space to implement the limited-entry/exit systems that are found in other areas of the country. A low-cost Bay Areawide application on existing HOV lanes could rely on a monthly subscription system that allows use of a prominently displayed color-coded sticker on non-carpool vehicles to determine eligibility. This type of system was successfully used in the first phase of the I-15 HOT lane in San Diego County. Vehicles using the lanes would be charged a monthly fee and would relinquish the sticker for other users if they did not use the lane.

Public opinion can be a significant issue in the implementation of HOT lanes. Many travelers think that the lanes will provide an advantage to higher-income travelers and is therefore not equitable. The experience with HOT lanes in other parts of the country suggests that the lanes are regularly used by a large percentage of medium-income commuters, contrary to the notion that these are exclusively used by higher-income commuters. In addition, the implementation of a HOT lane can be used as a way to sustain a viable HOV lane or to achieve a shift to a 3+ occupancy requirement that provides travel-time advantages to HOV eligible vehicles, which do not have to pay the toll.

Selling Excess Capacity in HOV Lanes

With the current 2+ occupancy requirement on all of the freeway lanes in the Bay Area except I-80, there is only potentially available capacity to be sold on four existing HOV lane corridors. The corridors and the 2001 and 2010 HOV lane peak hour/peak direction volumes are as follows:

Corridor	2001 HOV Volume	2010 Volume
• CC SR 4	568	1,200
• CC I-680	821	1,100
• SM US 101	698	1,100
• SON US 101	N/A	1,000

To determine whether there would be available capacity to be sold with a 3+ occupancy requirement, a travel forecast was prepared for 2010 with all HOV lanes designated as being 3+. Of the 18 corridors tested, eight had HOV volumes of less than 1,200 vehicles per hour in the peak period when all eligible HOV vehicles are assumed to be in the HOV lane. These segments were evaluated, with additional consideration given to the length of the HOV lane as planned in each corridor and the expected congestion in the mixed-flow lanes. Based on these criteria, six corridors seemed to be most promising for consideration for long-term congestion pricing:

- Alameda I-580
- Contra Costa SR 4
- Contra Costa I-680
- Santa Clara SR 85
- San Mateo US 101
- Sonoma US 101

The segments of US 101 in Sonoma County and I-680 in Alameda County that have been considered for HOT lanes have new HOV lanes; current information is not available, but the initial demand forecast suggests that excess capacity will be available.

If more HOV lanes are converted from 2+ to 3+ as the HOV lanes reach capacity, there may be a period of time during which there is considerable excess capacity in the HOV lane. As the demand for 3+ carpools and vanpools builds, there may be an opportunity for implementation of HOT lane concepts in which two-occupant and possible single-occupant vehicles are allowed into the HOV lanes for a toll. Providing this opportunity for low-occupant-vehicle (LOV) buy-in could raise revenue for system maintenance or improvement and could maximize the efficiency of the system by improving the flow in the mixed-flow lanes. The amount of the toll could be set to achieve a shifting of some LOVs to the HOV lane but keeping the number of LOVs shifting to a level that would not impact the operating speed of the HOV lane.

I-680 Sunol Grade HOV Lanes – A Possible HOT Lane Demonstration Project

The Alameda County Congestion Management Agency is currently studying the operation and financial feasibility of implementing HOT lanes on the newly opened I-680 Sunol Grade HOV lanes. Initial results from the study indicate that the HOT lane concept is operationally feasible, with some improvements needed at the current HOV lane terminus near SR 237. Preliminary estimates indicate that revenues in excess of HOT lane operating

costs could be available for additional corridor transportation improvements. Consideration should be given to the opportunities for congestion pricing on these facilities plus intermediate-term opportunities on I-680 in Alameda County.

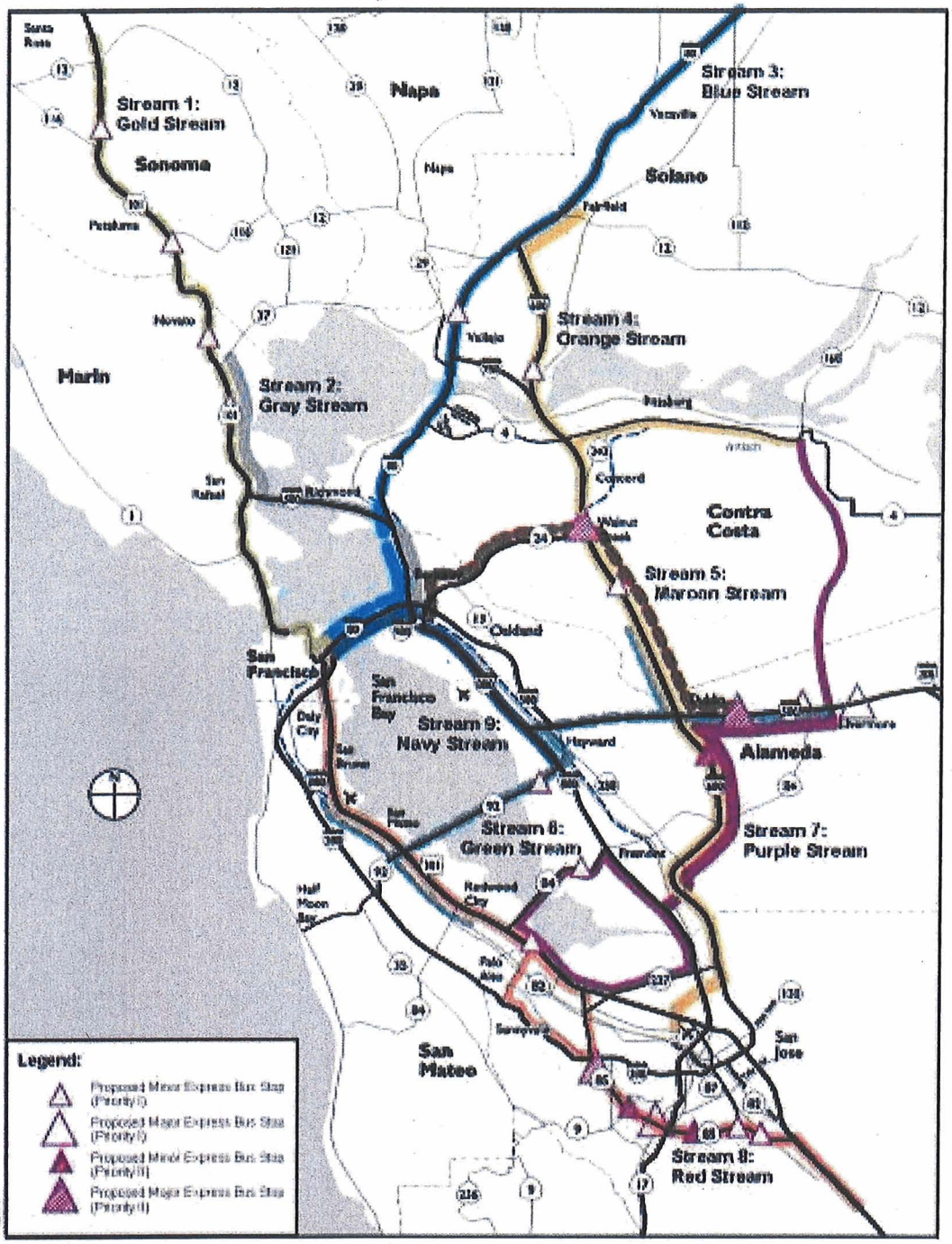
8 EXPRESS BUS RECOMMENDATIONS

The *2002 HOV Lane Master Plan Update* differs from previous HOV lane planning efforts in the Bay Area because it includes specific consideration of the integration of express bus services with the HOV lane system to ensure that the two systems are mutually consistent and supportive. Existing express bus routes were identified and new services have been proposed where the present or future HOV system would support additional service between high demand origins and destinations. Additional HOV –related facilities also to support the express bus service recommendations also have been identified. These include direct HOV lane access ramps, park-and-ride facilities and major in-line transit stations adjacent to the HOV lanes.

Express bus service "streams" have been defined that could use HOV lanes to move freely from one part of the region to another, especially in corridors without rail service, and generally serve long-distance regional peak period commute trips, and to a lesser extend, off-peak trips. When buses cannot easily enter and leave this stream, the usefulness of the stream for moving people is diminished. With faster express bus speeds, more riders per hour can be served and operating subsidy requirements can be lowered. The proposed express bus streams, illustrated in Figure 11, are as follows:

- Stream 1 (Gold) – Sonoma County to downtown San Francisco via US 101
- Stream 2 (Gray) – Marin County to Berkeley/Oakland via I-580 and I-80
- Stream 3 (Blue)– Solano/Napa counties to downtown San Francisco via I-80, the Carquinez Bridge and the Bay Bridge
- Stream 4 (Orange) – Solano/Contra Costa counties to Santa Clara County via I-680 and the Benicia Bridge
- Stream 5 (Maroon) – Tri-Valley to Berkeley/Emeryville via I-580, I-680 and SR 24
- Stream 6 (Green) – Tri-Valley to San Mateo County via I-580, I-238, I-880, SR 92 and the San Mateo Bridge
- Stream 7 (Purple) – East Contra Costa County/Tri-Valley to Santa Clara County via I-580, I-680, I-880, SR 84, SR 237, US 101 and the Dumbarton Bridge
- Stream 8 (Red) – Southern Santa Clara County to San Francisco via SR 85 and US 101
- Stream 9 (Navy) – Hayward/Oakland to San Francisco via I-880 and the Bay Bridge

Express Bus Streams



DKS Associates

FIGURE 13

Although the streams proposed here are new in concept, they will augment and unify many on-going express bus initiatives and allocation of bus resources in the region. Not only do they offer improvements to productivity (through faster travel-times and resulting increases in ridership), but they provide a setting to consider new routes that are not typically contemplated. To augment existing services 12 new routes have been defined and 24 existing routes have been expanded, thereby more than doubling existing peak period regional express bus frequency.

The highest priorities for express bus system expansion (Priority 1) are in the following corridors:

- I-680 corridor in Contra Costa, Alameda and Santa Clara counties
- I-80 corridor in Solano, Contra Costa, Alameda and San Francisco counties
- US 101 in Sonoma and Marin Counties.

Express Bus System Characteristics

Listed below are some express bus system characteristics for Priority 1 and 2 improvements:

	# of New Buses	# of New Bus Trips	New Bus Revenue Miles
Priority 1	110	253	1,917
Priority 2	28	64	479
Total	138	317	2,396

Projected Express Bus Ridership

The MTC forecast models evaluated an expanded HOV lane system with and without the recommended express bus system in place. The results are as follows:

Alternative	Average Weekday Regional Transit Trips (yr. 2010)	Increase Transit Trips over Base Case	Increase - #2 to #3
1) Base Case – 2003 TIP	1,436,000		
2) 2001 RTP plus Priority 1 improvements	1,455,000	19,000 (1.3%)	
3) 2001 RTP plus Priority 1 improvements and expanded express bus system	1,470,000	34,000 (2.4%)	15,000 (1%)

As seen above, average weekday regional transit trips in 2010 are projected to total 1,436,000 riders with programmed 2003 TIP HOV lanes in operation. Regional transit trips are projected to increase by an additional 19,000 riders (1.3 percent) if HOV lanes included in the 2001 RTP and those recommended as Priority 1 improvements in this plan (see Section 9) are added to the 2003 TIP system. Adding the recommended express bus system in this plan to the expanded RTP/Priority 1 HOV lane system increases regional

transit ridership by 34,000 riders (2.4 percent) compared to the 2003 TIP HOV lane base case.

Direct Access Ramps

The existing and proposed new express bus service can be supported by a variety of HOV lane system improvements that give priority to express buses, saving travel-time and costs. Direct access ramps that provide priority access to and egress from HOV lanes for express buses and other HOVs are proposed for eight locations at an estimated cost of $400 million to $500 million. The eight locations are as follows:

County	Corridor	Location/Limits
Alameda	I-80	Berkeley (Ashby Avenue)
Alameda	I-580/SR 24	Oakland (to the Bay Bridge HOV lane)
Contra Costa	I-80	Richmond Parkway (under construction)
Contra Costa	I-80	Cutting Blvd (under construction)
Contra Costa	I-680	San Ramon (Bollinger Canyon Road)
Marin	US 101	Larkspur (Sir Francis Drake Boulvard)
Santa Clara	I-680	Milpitas (Montague Expressway)
San Mateo	US 101	Millbrae Avenue

In addition, two types of express bus stations are proposed to facilitate the transfer of passengers from local buses or private vehicle to the HOV lane-bound express buses. Six major stations and 15 minor stations are proposed. The characteristics of each type of station are described below. The total estimated cost for the 21 new stations is $213 million.

Major Express Bus Station (Intermodal Center)

The express bus system is highly dependent on good local bus connections and adequate park-and-ride space. The major express bus station is intended to provide a place that major regional connections between express buses and other regional and local transit services can be made. These facilities are places where major transfers between buses would occur, resulting in a substantial number of vehicles laying over in the freeway median to allow riders to make connections. They are most appropriate where high volumes of regional rail service are provided (such as BART and Caltrain stations) or where several express bus streams converge.

The major stations would be located in the freeway median at interchanges where local bus stops and park and ride facilities can be located below the station. When these stations are created, freeways will need to be widened. Direct access to and from the station would be provided for express buses by using slip ramps to and from the HOV lane. The stations would include bus lane pull-outs for freeway/express buses with up to four buses that can meet at one time; room for 12 local/surface street buses/shuttles (six in each direction); pedestrian connections to surface street; bus shelters with real-time transit information, advance fare purchase machines, bicycle parking areas, lighting and benches for express buses and any local bus connection. An example of a major express bus station is provided in Figure 12.

FIGURE 14 Express bus transit station on the El Monte Freeway in Los Angeles

The supporting park-and-ride demand is generally anticipated to be between 300 to 800 park-and-ride spaces. These park-and-ride facilities are designed to serve many express buses going to several destinations. The high frequency of bus service and the resulting attractiveness of boarding buses here will create demand for additional spaces. Actual spaces demanded will depend on analysis of park-and-ride demand at these locations.

Major express bus stations are proposed at the following locations:

County	Corridor	Location/Limits
Alameda	I-580	Livermore (Airway Boulevard/Isabel Avenue)
Alameda	I-580	Livermore (Greenville/Vasco Road)
Alameda	I-580	Pleasanton (Dublin/Pleasanton BART)
Contra Costa	I-680	Pleasant Hill or Walnut Creek (BART)
Santa Clara	SR 85	Los Gatos (Winchester Boulevard/Vasona Junction)
Santa Clara	SR 85	Cupertino (DeAnza College/Stevens Creek Boulevard.)

Minor Express Bus Station

The minor bus station is intended to provide an interface between the express buses in HOV lanes and the local pedestrian and transit network, and a few buses and shuttles that are used to carry passengers to local destinations. While these facilities are intended to provide locations where local passengers can board or alight express buses, there also may be some opportunities to provide minor transfers between a small number of express buses, or between express buses and a few local buses that operate on a route that crosses on the local street at the express bus stop. The minor bus stations would be located off the freeway and would not require direct access to and from the HOV lane.

The park-and-ride need for these stations is anticipated to be up to 200 spaces per station, but not all stations would need parking. These park-and-ride facilities are designed to serve

express buses that stop on this route; not all express buses in a stream would stop at these locations.

Minor express bus stations are proposed at the following locations:

County	Corridor	Location/Limits
Alameda	SR 92	Hayward (Clawiter Road)
Alameda	SR 84	Newark (Newark Boulevard)
Contra Costa	I-680	Danville (Sycamore Valley Road)
Marin	US 101	Novato (Alameda del Prado/Smith Ranch Road)
Marin	US 101	Novato (Rowland Blvd.)
Santa Clara	US 101	Palo Alto (Oregon Expressway)
Santa Clara	SR 85	San Jose (Santa Teresa LRT/Cottle Light Rail Transit)
Santa Clara	SR 85	San Jose (Oakridge area/LRT connection)
Solano	I-80	Vallejo (Marine World area/SR 37)
Solano	I-680	Benicia (Lake Herman Road)
Sonoma	US 101	Rohnert Park (Rohnert Park Expressway)
Sonoma	US 101	Petaluma (Lakeville Road)
Alameda	I-680	Pleasanton (Bernal Road)
Santa Clara	SR 85	San Jose (Camden Avenue)
Santa Clara	SR 85	Saratoga (Saratoga Avenue)

In addition to the direct access ramps and the express bus stations, priority treatments also are recommended on select arterials to give buses priority in getting to and from the freeway. The priority treatment could range from transit priority in the signal system to bus-only arterial roadway lanes and transit stations in freeway medians.

The arterial corridors where priority bus treatments are already proposed or operating include the following:

County	Corridor	Location/Limits
Alameda	I-80	San Pablo Avenue and Telegraph Avenue
Alameda	I-880	International Boulevard
Santa Clara	US 101 and I-280	El Camino Real

Other corridors where bus priority treatments are recommended for further study are as follows:

County	Corridor	Arterial
Alameda	I-580	Vasco Road and MacArthur Boulevard
Contra Costa	I-680	Contra Costa Boulevard and Main Street
Santa Clara	SR 85	Monterey Highway
Santa Clara	I-280	Stevens Creek Boulevard
Santa Clara	I-680	Montague Expressway
San Mateo	US 101	El Camino Real
Solano	I-80	Curtola Parkway and Travis Boulevard

Some express bus routes could operate within the "streams" on these arterials as well. The resulting travel-time benefits would further reduce operating time and costs, attract more ridership and increase farebox recovery ratios.

Express Bus Costs

The cost (in millions of 2002 $) to implement the express bus system is as follows

Capital Costs	Priority 1	Priority 2	Total
Buses	$32 – $40	$8 - $10	$40 – 50
Major Stations	$114	$71	$185
Minor Stations	$23	$6	$29
Total Capital Cost	$169 - $177	$85 - $87	$254 - $264
Annual Bus Operating Cost	$12 - $20	$3 - $5	$15 - $25

9 RECOMMENDED HOV LANE SYSTEM INFRASTRUCTURE COSTS

Recommendations for future HOV lane system expansion and infrastructure improvements have been developed and cost estimates produced. The recommended improvements are intended as long-range improvements designed to be implemented over the next 20 to 30 years, to support the role of the HOV lane system and the express bus system in providing Bay Area mobility. They are contingent on identifying new funding. The recommendations are based on an analysis of existing (2001) system operating conditions and forecasted (2025) baseline conditions for the transportation system defined by the 2001 RTP.

Cost analysis was performed using the Caltrans Preliminary Cost Analysis Worksheet. Assumptions were made for available right of way based upon inspection of aerial photography. Unit construction costs were based on planning-level documentation. Utility relocations were included, but verification of utilities was not made. All structure construction was estimated to be on pile support foundations. Acquisition of additional right of way was quantified based on a broad per-square-foot average for the region. Widening of the freeway to accommodate the additional HOV lanes was tailored to meet Caltrans policies. There are locations where design exceptions will be required from the state. Environmental clearance and engineering were anticipated in the cost assessment. In addition to all of the known cost elements, a 30 percent contingency also is included in each cost estimate. All costs are stated in 2002 dollars.

The recommendations are presented in two groups: Priority I and Priority II. Those in Priority I are recommended for inclusion in the next RTP update, subject to funding availability, while those in Priority II are recommended for inclusion in a future RTP only if new funding sources beyond those currently assumed in the RTP can be identified for the improvements. Five types of improvements have been identified:

1. New HOV Lane Miles – These represent gap-closure projects as well as new facilities and extension of existing facilities.
2. Freeway-to-Freeway HOV Connections – Ramps directly connecting the HOV lanes on two or more intersecting freeways.
3. Direct HOV Lane Access Ramps – Entry and/or exit ramps providing direct HOV-only access to and from the HOV lane.

4. Major In-Line Freeway Express Bus Stations – Major intermodal stations in the freeway median where express buses can load and unload passengers without having to leave the freeway. The major stations also would include local bus loading bays and park-and-ride spaces on the local crossing streets adjacent to the station.
5. Minor Freeway Express Bus Stations – Minor stations would not be located in the freeway median but would be located adjacent to the freeway instead. Minor stations would have local bus service bays and park-and-ride spaces as well as priority lanes on the on- and off-ramps where that is appropriate.

In addition to these major improvements, additional park-and-ride sites and additional ramp priority should be pursued as opportunities permit, but specific locations have not been identified in this project.

The recommended Priority I improvements, which will cost roughly $706 million in 2002 dollars, are illustrated graphically in Figures 13 and 14:

- 71 new freeway HOV lane miles - $337 million
- one new freeway-to-freeway HOV connection - $34.8 million
- two new direct access ramp locations and two expansion locations - $196.9 million
- three new major freeway express bus stations - $114 million
- 12 new minor express bus stations - $22.9 million.

The recommended Priority II improvements, which will cost roughly $1.05 billion in 2002 dollars, are illustrated graphically in Figure 15 and 16:

- 87 new HOV lane miles - $469 million
- five new freeway-to-freeway HOV connections - $290 million
- four new direct access ramp locations - $215.4 million
- three new major freeway express bus stations - $70.6 million
- three new minor express bus stations - $5.7 million.

Priority 1 Recommended HOV Lane System Improvements

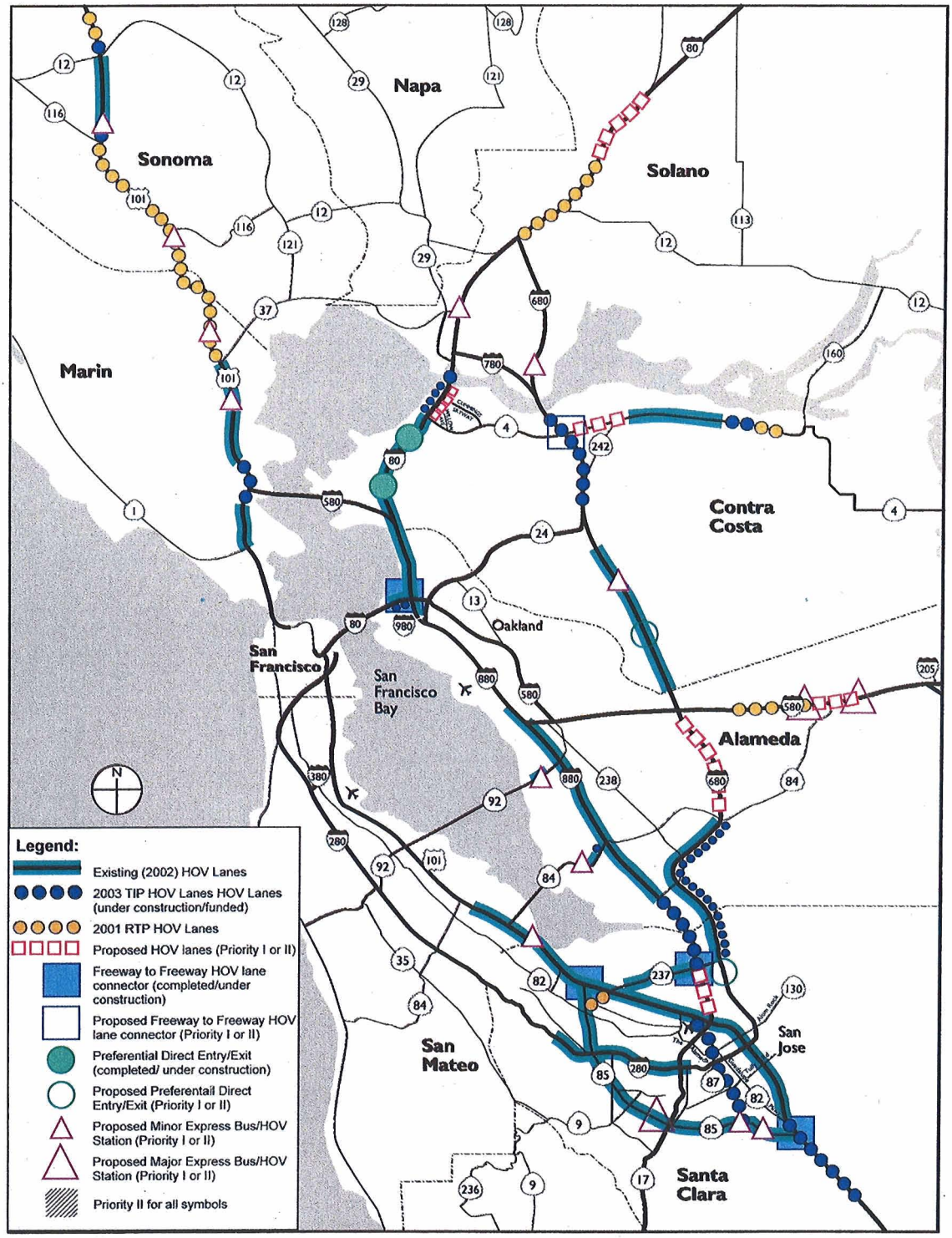


FIGURE 15

Priority 1 Recommended HOV Lane System Improvements: Santa Clara County

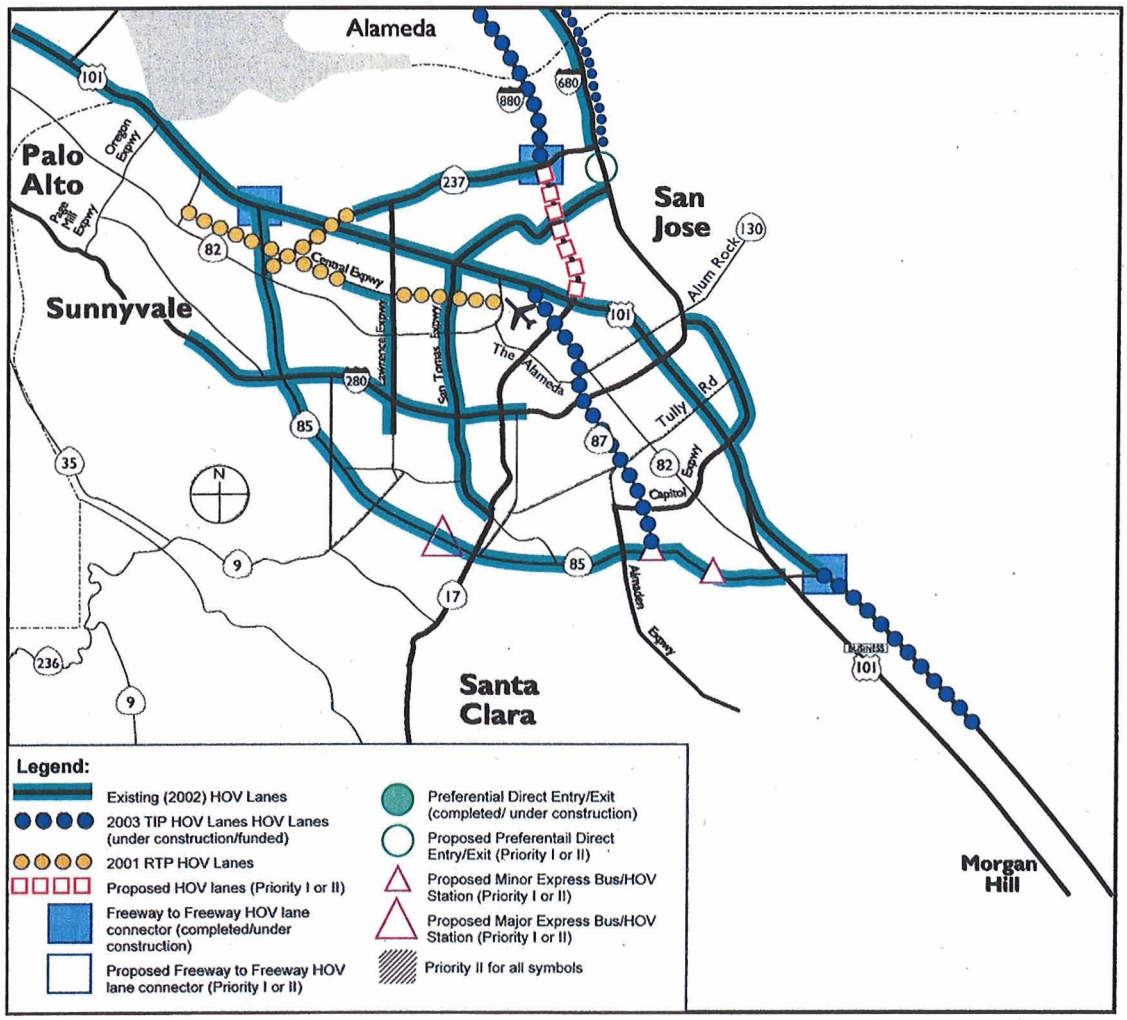


FIGURE 16

Priority 1 & 2 Recommended HOV Lane System Improvements

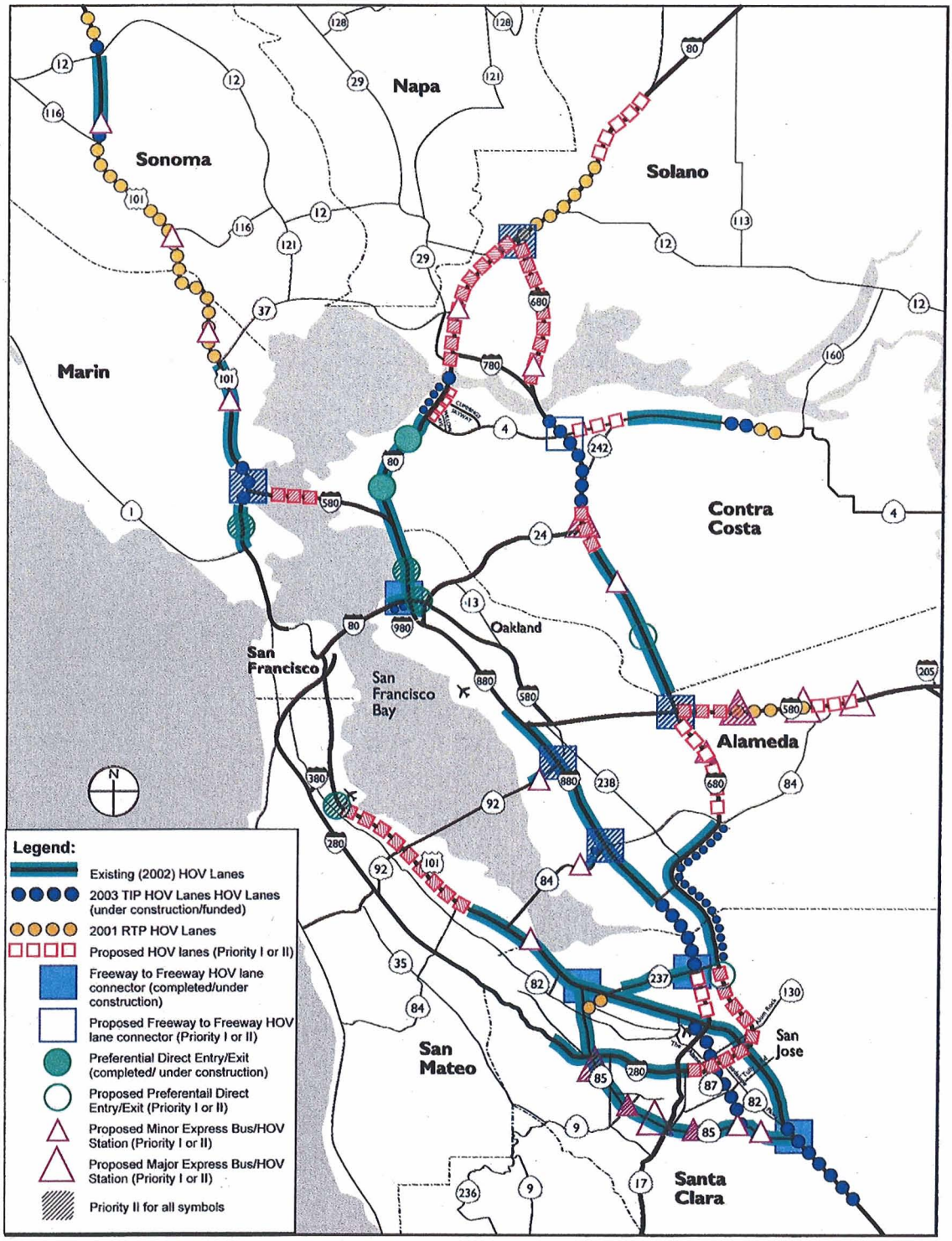


FIGURE 17

Priority 1 & 2 Recommended HOV Lane System Improvements: Santa Clara County

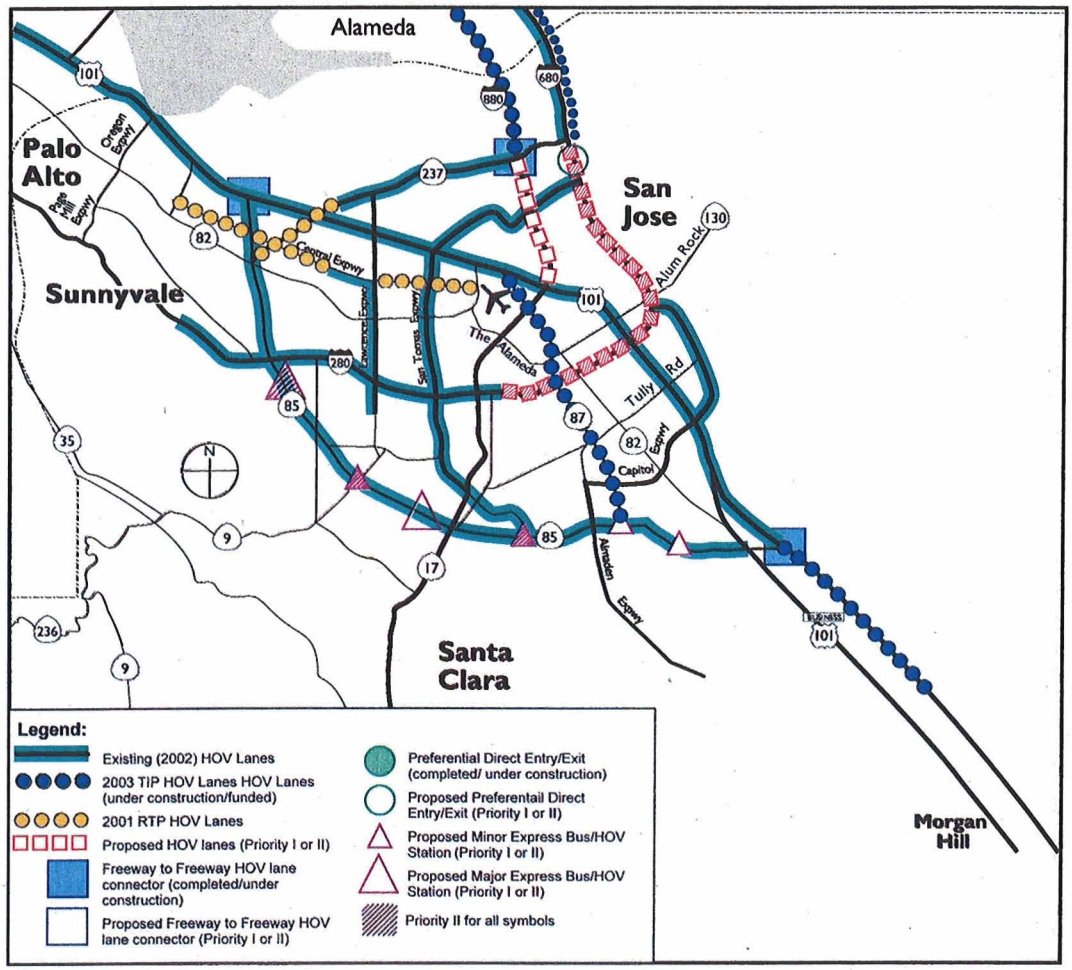


FIGURE 18

Table 4 – Summary of Existing and Proposed HOV Lane Mileage

	HOV LANE MILEAGE SUMMARY					
Corridor	**Existing**	**2003 TIP**	**2001 RTP**	**Priority I**	**Priority II**	**TOTAL**
Alameda County I-80	11.3	1.1	--	--	--	**12.4**
Alameda County SR 84	1.8					
Alameda County SR 92	3.0					
Alameda County I-580	--	--	7.2	11.1	3.4	**21.7**
Alameda/Santa Clara Counties I-680	14.0	14.0	--	16.9	--	**44.9**
Alameda County I-880	38.4	4.4	--	--	--	**42.8**
Contra Costa County SR 4	14.5	9.4	10.9	5.7	--	**40.5**
Contra Costa County I-80	19.6	2.7	5.4	3.3	--	**31.0**
Contra Costa County I-680	24.7	--	17.4	4.7	--	**46.8**
Marin County US 101	19.4	4.6	29.6	--	--	**53.6**
Santa Clara County SR 85	47.1	--	--	--	--	**47.1**
Santa Clara County SR 87	--	5.6	--	--	--	**5.6**
Santa Clara County US 101	49.1	19.6	--	--	--	**68.7**
Santa Clara County SR 237	10.3	--	6.5	--	--	**16.8**
Santa Clara County I-280	21.9	--	--	--	6.9	**28.8**
Santa Clara County I-680	--	see Ala 680	--	--	13.4	**13.4**
Santa Clara County I-880	--	see Ala 880	--	15.4	--	**15.4**
Santa Clara County Exwys	50.0	--	16.0			
San Mateo County US 101	13.2	--	--	--	22.0	**35.2**
Solano County I-80	--	--	16.4	14.3	18.4	**49.1**
Solano County I-680	--	--	--	--	22.5	**22.5**
Sonoma County US 101	10.0	--	50.7	--	--	**69.3**
Regional Total	**348.3**	**70.0**	**160.0**	**71.4**	**86.6**	**665.5**

10 RECOMMENDATIONS BY COUNTY AND CORRIDOR

Sonoma and Marin Counties

The recommended improvements in Sonoma and Marin counties are designed to support an HOV lane system that will run continuously in both directions from Santa Rosa to Mill Valley once roughly 70 new HOV lane miles are added with existing TIP and RTP funding, as illustrated in Table 4. The improvements also are designed to support one of the key express bus streams (Steam 1: Gold – Sonoma County to downtown San Francisco). This corridor has existing express bus and ferry services and the proposed improvements would augment the service between counties and to downtown San Francisco. Express bus service would be tailored to the corridor to complement future planned expanded ferry service and new Marin/Sonoma rail service.

Recommended Priority I improvements include four minor express bus stations – two in Sonoma County and two in Marin County. Recommended Priority II improvements include freeway-to-freeway HOV lane connections at the US 101/I-580 interchange and a preferential HOV entry and exit point adjacent to the Larkspur Ferry Terminal.

No infrastructure improvements are recommended on I-580 where the Stream 2: Gray - Marin County to Berkeley/Oakland via I-580 and I-80 express bus service is proposed. An HOV lane on I-580 was de-designated due to lack of sufficient use. HOV lanes formed by using the shoulders during peak hours in each direction on the bridge is recommended as a Priority II.

A summary of the recommendations by corridor is provided below.

Sonoma US 101

Infrastructure Improvements

Priority I

- Minor HOV lane express bus stop, Rohnert Park (Rohnert Park Expressway)
- Minor HOV lane express bus stop, Petaluma (Lakeville Rd)

Priority II

- None

Operational Improvements

- Support express service by adding service in the Gold Stream
- Consider implementation of HOT lane as a way to make effective use of excess capacity or as a transition from 2+ to 3+ occupancy requirement
- HOV lanes should operate in both directions during morning and afternoon peak periods

Marin US 101

Infrastructure Improvements

Priority I

- Minor HOV lane express bus stop, Novato (Alameda del Prado/Smith Ranch Road)
- Minor HOV lane express bus stop, Novato (Rowland Blvd)

Priority II

- Freeway-to-Freeway HOV connection, US 101/I-580
- Direct HOV access ramps, Larkspur (Sir Francis Drake Blvd)

Operational Improvements

- Support express bus service by adding service in the gold and gray streams
- HOV lanes should continue to operate in peak direction only (southbound a.m. and northbound p.m.)

Marin I-580

Infrastructure Improvements

Priority I

- None

Priority II

- None

Operational Improvements

- None

Solano and Napa Counties

The recommendations for Solano and Napa counties focus future HOV lane system investments on I-80 and I-680; all of the proposed improvements are in Solano County. The 2001 RTP includes roughly 16 miles of new HOV lanes on I-80 between I-680 and North Texas Street in Fairfield. Continuing the HOV lane east from North Texas Street to I-505 is recommended as a Priority I improvement. Completing the HOV connections to the Carquinez Bridge on I-80 and the Benicia Bridge on I-680 are recommended, but as Priority II improvements. If funded, these additions would create continuous HOV lanes from Solano County to jobs in Contra Costa and Alameda counties as well as connections to the Bay Bridge and San Francisco.

The recommended improvements in Solano County also are designed to support two proposed express bus streams: Stream 3: Blue – Solano/Napa counties to Downtown San Francisco and Stream 4: Orange – Solano/Contra Costa counties to Santa Clara County. In addition to providing direct access to destination employment centers, these streams also would link Napa and Solano County commuters to BART, Muni and VTA rail stations, which can provide distribution to a large number of additional employment sites.

The recommended Priority I improvements include minor express bus stations in the Marine World area near the I-80/SR 37 interchange and at the I-680/Lake Herman Road interchange. The Priority I minor express bus stations are recommended on freeway segments that would not have HOV lanes under the Priority I recommendations; they would provide support to express bus operation in HOV lanes south of the bridges. Freeway-to-freeway HOV connections at the I-80/I-680 interchange are recommended as Priority II improvements.

A summary of the recommendations by corridor is provided below.

Solano I-80

Infrastructure Improvements

Priority I
- New HOV segment, N Texas St to I-505
- Minor HOV lane express bus stop, Vallejo (Marine World area/SR 37)

Priority II
- New HOV lane segment, I-680 to Carquinez Bridge
- Freeway-to-Freeway HOV lane connection, I-80/I-680

Operational Improvements
- Support cxprcss service by adding service in the Blue Stream
- Support express bus service by identifying locations to implement bus rapid transit improvements on arterial streets that provide access to and from I-80 HOV lanes

Solano I-680

Infrastructure Improvements

Priority I
- Minor HOV lane express bus stop, Benicia (Lake Herman Rd) – Priority I

Priority II
- New HOV segment, I-80 to Benicia Bridge – Priority II
- Freeway-to-Freeway HOV connection, I-80/I-680 – Priority II

Operational Improvements

- Support express service by adding service in the Orange Stream
- Consider temporary use of shoulders for HOV and/or express bus use until permanent HOV lanes are constructed if the road is rebuilt with a third mixed-flow lane in each direction

Contra Costa County

The improvements in Western Contra Costa County are designed to support the already mature 3+ HOV lane on I-80 and the Bay Bridge HOV toll by-pass lanes. The I-80 HOV lanes will also support two proposed express bus streams: Stream 3: Blue – Solano/Napa counties to downtown San Francisco and a portion of Stream 2: Gray – Marin County to Berkeley/Oakland. The recommended Priority I improvements in Western Contra Costa County include eastbound HOV lanes on I-80 from SR 4 to the Carquinez Bridge and completion of the direct access ramps on I-80 at the Richmond Parkway and at Cutting Boulevard to provide access and egress to the north. There are no recommended Priority II recommendations in Western Contra Costa County.

In Central and Eastern Contra Costa County, the proposed improvements are designed to develop a currently limited HOV lane system. Although the 2003 TIP and 2001 RTP include roughly 15 lane miles of new HOV lanes on I-680 and 19 lane miles of new HOV lanes on SR 4, gaps would still remain in the HOV system. The I-680 HOV lanes would support the main north-south bus stream in the East Bay: Stream 4: Orange – Solano/Contra Costa Counties to Santa Clara County. The recommended Priority I improvements for Central and Eastern Contra Costa County include new HOV lanes on SR 4 between I-680 and SR 242, direct freeway-to-freeway HOV lane connection at the I-

680/SR 4 interchange (between the southern leg of I-680 and the eastern leg of SR 4 only), direct HOV access ramps on I-680 and Bollinger Canyon Road, and a minor express bus station at Sycamore Valley Road. A gap closure on I-680 between North Main and South Main through the I-680/SR 24 interchange and a major new express bus station at the Pleasant Hill or Walnut Creek BART station are recommended as Priority II improvements.

Although there are no HOV facilities on SR 24, a previous study of the corridor has recommended evaluation of a "queue jumper" lane for buses at the entrance to the Caldecott Tunnel in the off-peak direction using an inside lane that would normally carry traffic to the central bore.

No infrastructure improvements are recommended on I-580 where the Stream 2: Gray - Marin County to Berkeley/Oakland via I-580 and I-80 express bus service is proposed. An HOV lane on I-580 was de-designated due to lack of sufficient use. An HOV lane in each direction on the Richmond-San Rafael Bridge is recommended as a Priority II improvement by using the shoulders during peak hours.

A summary of the recommendations by corridor is provided below.

Contra Costa SR 4

Infrastructure Improvements

Priority I

- New HOV lane segment, SR 242 to I-680
- Freeway-to-Freeway HOV lane connection, I-680/SR 4

Priority II

- None

Operational Improvements

- Support express service by adding service in the Orange Stream
- Explore implementation of a HOT lane to take advantage of excess HOV lane capacity
- Continue to operate in peak direction only (westbound a.m. and eastbound p.m.)

Contra Costa SR 24

Priority I

- None

Priority II

- None

Operational Improvements

- Consider off-peak direction HOV "queue jumper" lanes as recommended in the SR 24/Caldecott Tunnel Corridor Study

Contra Costa I-80

Infrastructure Improvements

Priority I

- New HOV lane segment, eastbound from SR 4 to Carquinez Bridge
- Direct HOV lane access ramps, Richmond Pkwy (under construction)
- Direct HOV lane access ramps, Cutting Blvd (under construction)

Priority II

- None

Operational Improvements

- Support express service by adding service in the Blue and Gray streams
- Consider eliminating HOV lane in off-peak direction (eastbound a.m. and westbound p.m.) in accordance with the "I-80 Project Assurances"

Contra Costa I-580

Infrastructure Improvements

Priority I

- None

Priority II

- Add HOV lanes on both sides of the Richmond-San Rafael Bridge by taking the shoulders

Operational Improvements

- None

Contra Costa I-680

Infrastructure Improvements

Priority I

- Freeway-to-Freeway HOV connection, I-680/SR 4
- Direct HOV lane access ramps, San Ramon (Bollinger Canyon Rd)
- Minor HOV lane express bus stop, Danville (Sycamore Valley Rd)

Priority II

- New HOV segment, North Main Street to South Main Street
- Major HOV lane express bus stop, Pleasant Hill/Walnut Creek BART

Operational Improvements

- Support express service by adding service in the Orange, Green and Maroon streams
- MTC and Caltrans to evaluate the discrepancy between the proposed I-680 2+ occupancy requirement and the current 3+ requirement for HOV toll free passage at the Benicia Bridge
- Consider implementation of HOT lane as a way to make effective use of excess capacity or as a transition from 2+ to 3+ occupancy requirement
- Support express bus service by identifying locations to implement bus rapid transit improvements on arterial streets that provide access to and from I-680 HOV lanes

Alameda County

In Eastern Alameda County, increasing congestion on I-580 will necessitate the introduction of additional capacity through HOV lanes. Although HOV lanes are already included for some portions of I-580 in the RTP, it is recommended that these be expanded to stretch from Greenville Road to I-680 in both directions. These new I-580 HOV lanes would support the introduction of three new express bus streams:

- Stream 5: Maroon - Tri-Valley to Berkeley/Emeryville
- Stream 6: Green - Tri-Valley to San Mateo County
- Stream 7: Purple - Eastern Contra Costa County to Santa Clara County

Improvements are proposed to support regional transit centers in the Greenville Road/Vasco Road area and the Airway Boulevard/Isabel Avenue area. Proposals also include completion of the I-680 HOV lane gap between the portions to the north (beginning in Dublin) and south (Sunol Grade). The proposed improvements in Eastern Alameda County also would support one north-south express bus stream: Stream 4: Orange – Solano/Contra Costa Counties to Santa Clara County.

The Priority I recommendations for Eastern Alameda County include HOV lanes on I-580 from Greenville Road to Isabel Avenue, new HOV lanes on both sides of I-680 from I-580 to SR 84, and major express bus stations on I-580 at Airway Boulevard and Greenville Road. Priority II recommendations include extension of the I-580 HOV lanes west from Tassajara Road to I-680, a freeway-to-freeway direct HOV lane connection at the I-580/I-680 interchange, a major express bus station on I-580 at the Dublin/Pleasanton BART station, and a minor express bus station on I-680 at Bernal Road.

In Western Alameda County, a number of HOV lane improvement projects are identified at the three bridge approaches, to take advantage of the HOV bypass lanes and free tolls at the toll plazas. For the Bay Bridge, direct access ramps at Ashby Avenue and for the I-580/SR 24 approach are recommended as Priority II improvements. Also included in Priority II is the easterly extension of one of the south side Bay Bridge HOV lanes through the I-80/580/880 distribution structure. Adding an HOV lane to I-880 from the present northern terminus of the lane to the Bay Bridge did not seem to be feasible without using an elevated structure, which did not appear to be warranted.

In approaching the San Mateo Bridge, a minor express bus station on SR 92 at Clawiter Road is included as a Priority I improvement and a freeway-to-freeway direct connector at I-880/SR 92 is recommended as a Priority II improvement. The possibility of adding a reversible HOV lane on the San Mateo Bridge currently is being explored by MTC.

A freeway-to-freeway direct HOV lane connector at the I-880/SR 84 interchange also is recommended as a Priority II improvement to provide access to the Dumbarton Bridge. Finally, enhancements at the Dumbarton Bridge approach in Newark are envisioned that would intercept drivers using a regional park-and-ride lot. A minor express bus station on the Dumbarton Bridge approach is recommended as a Priority I improvement.

Similar to the recommendation for SR 24 in Contra Costa County, it is recommended that there be an evaluation of a "queue jumper" lane for buses at the entrance to the Caldecott

Tunnel in the off-peak direction, using an inside lane that would normally carry traffic to the central bore.

Bay Bridge HOV Lane Consideration

Consideration was given to taking eastbound and westbound mixed flow lanes on the Bay Bridge and designating them as HOV lanes. An analysis conducted by Caltrans District 4 indicated that taking Bay Bridge traffic lanes for HOV use would exacerbate congestion in the bridge corridor and provide little or no time savings for HOVs. Caltrans' analysis indicates that, in the westbound direction, the metering operation at the toll plaza is designed to ensure that the bridge itself operates with as little congestion as possible – even when incidents occur. The majority of the traffic queue is held upstream of the metering lights and HOVs get unimpeded access through the metering lights, often saving up to 20 minutes during the morning peak. Because the metering lights ensure that the bridge remains relatively uncongested, HOVs would not gain any substantial travel time savings by extending a westbound HOV lane across the bridge. In the eastbound direction, the three-lane approach also "meters" traffic transitioning to the five eastbound lanes on the bridge; once on the bridge, traffic flows fairly smoothly with little potential time savings for HOVs. Using one of the three eastbound approach lanes for HOVs would create severe freeway congestion that would back up onto local San Francisco streets making it difficult for HOVs and other vehicles to access the freeway. For these reasons, it is not recommended that Bay Bridge mixed flow lanes be designated as HOV lanes.

A summary of the recommendations by corridor is provided below.

Alameda SR 84

Infrastructure Improvements

Priority I

- Minor HOV lane express bus stop, Newark (Newark Boulevard)

Priority II

- Extend HOV lane to proposed freeway-to-freeway HOV connection, I-880/SR 84,

Operational Improvements

- Increase express bus service over the Dumbarton Bridge with the addition of the Purple Stream

Alameda SR 92

Infrastructure Improvements

Priority I

- Minor HOV lane express bus stop, Hayward (Clawiter Road)

Priority II

- Freeway-to-freeway HOV lane connection and gap closure, I-880/SR 92

Operational Improvements

- Increase express bus service over the San Mateo Bridge with the addition of the Green Stream
- Evaluate HOV reversible lanes on the bridge

Alameda I-80

Infrastructure Improvements

Priority I
- None

Priority II
- Direct HOV lane access ramps, Berkeley (Ashby Avenue)
- Provide additional left-side bus-only lane at the Bay Bridge toll plaza

Operational Improvements

- Reduce HOV violations from enhanced enforcement on the mainline segments, on the HOV ramps to the Bay Bridge toll plaza and at the toll plaza approach
- Support express service by adding service in the Blue and Gray Streams
- Consider eliminating HOV lane in off-peak direction (eastbound a.m./westbound p.m. only)

Alameda I-580

Infrastructure Improvements

Priority I
- New HOV segment, Isabel Avenue to Greeneville Road
- Major HOV lane express bus stop, Livermore (Airway Boulevard/Isabel Avenue)
- Major HOV lane express bus stop, Livermore (Greeneville Road/Vasco Road)

Priority II
- New HOV segment, I-680 to Tassajara Road
- Freeway-to-Freeway HOV connection, I-580/I-680
- Direct HOV access ramps, Oakland (I-580/SR 24 to the Bay Bridge HOV lanes)
- Major HOV lane express bus stop, Pleasanton (Dublin/Pleasanton BART station)

Operational Improvements

- Support express service by adding service in the Green, Purple and Maroon streams
- Explore implementation of HOT lane as a transition from 2+ to 3+ occupancy requirement
- Explore the peak-period, peak-direction use of shoulders west of I-680 as temporary HOV lanes until permanent lanes are built
- Support express bus service by identifying locations to implement bus rapid transit improvements on arterial streets that provide access to and from I-580 HOV lanes

Alameda I-680

Infrastructure Improvements

Priority I
- New HOV lane segment, I-580 to SR 84

Priority II
- Freeway-to-freeway HOV lane connection, I-580/I-680
- Minor HOV lane express bus stop, Pleasanton (Bernal Road)

Operational Improvements

- Support express service by adding service in the Green and Orange streams
- Explore the use of the northbound shoulders from SR 84, through the I-580/I-680 interchange to the existing HOV lane as a temporary HOV lane

Alameda I-880

Infrastructure Improvements

Priority I

- None

Priority II

- Freeway-to-freeway HOV lane connection, I-880/SR 84
- Freeway-to-freeway HOV lane connection, I-880/SR 92
- Widen West Grand/Maritime on-ramp for HOVs

Operational Improvements

- Support express service by adding service in the Navy Stream
- Explore extending the Bay Bridge approach HOV lane by using the northbound shoulder from I-980 to the existing HOV lane

Santa Clara County

The 2003 TIP and 2001 RTP included expansion of the HOV system in Santa Clara County on I-680, I-880, US 101 and SR 87 for a total of roughly 40 new HOV lane miles. Freeway-to-freeway direct HOV lane connections also are planned for the northern US 101/SR 85 interchange and at I-880/SR 237. Freeway-to-freeway direct HOV lane connections are under construction at the southern US 101/SR 85 interchange.

This study does not make HOV lane recommendations on County expressways. A Comprehensive County Expressway Planning Study being conducted by the Santa Clara County Roads and Airport Department is evaluating existing and proposed County expressway HOV lanes.

Additional HOV lane improvements are recommended in this project to close HOV gaps and to support three new express bus streams:

- Stream 4 – Orange – Solano/Contra Costa counties to Santa Clara County
- Stream 7 – Purple - Eastern Contra Costa County to Santa Clara County
- Stream 8 – Red – Southern Santa Clara County to San Francisco.

Priority I HOV lane extensions are recommended for I-680 and I-880 to reach US 101 from their current termini in northern San Jose/Milpitas. A Priority II HOV lane extension is recommended for I-280 to reach US 101. To enhance access, direct freeway connectors also are also proposed at Montague Expressway in Milpitas from I-680 (Priority I), and between US 101 and SR 85 in south San Jose (Priority II). Direct HOV lane connections are already currently under construction for the northbound US 101 to northbound SR 85 and southbound SR 85 to southbound US 101 connections at the above location. Therefore, the improvements recommended under the Priority II listing would be the southbound SR 85 to northbound US 101 connection and the southbound US 101 to the northbound SR 85 connection. Without direct connections, HOVs would need to leave the HOV lanes to access other roadways.

A new express bus corridor (Stream 8 – Red) is envisioned that would use the HOV lanes of Route 85 across the south edge of Santa Clara County. Major stations are proposed that would allow an interface with regional light rail stations, park-and-ride lots, and other

amenities: one at Winchester Boulevard as a Priority I improvement and one at Stevens Creek Boulevard as a Priority II improvement. Two minor express bus stations are proposed as Priority I improvements on SR 85 in San Jose, and two other minor express bus stations, one in San Jose and the other in Saratoga, are proposed as Priority II improvements on SR 85. This should allow the HOV lane on SR 85 to operate as a productive busway/HOV hybrid facility for its entire length. A minor express bus station also is recommended as Priority I improvement on US 101 in Palo Alto at Oregon Expressway.

A summary of the recommendations by corridor is provided below.

Santa Clara SR 85

Infrastructure Improvements

Priority I

- Major HOV lane express bus stop, Los Gatos (Winchester Boulevard/Vasona Junction)
- Minor HOV lane express bus stop, San Jose (Santa Teresa LRT/Cottle LRT)
- Minor HOV lane express bus stop, San Jose (Oakridge area/LRT connection)

Priority II

- Major HOV lane express bus stop, Cupertino (DeAnza College/Stevens Creek Boulevard)
- Minor HOV lane express bus stop, San Jose (Camden Avenue)
- Minor HOV lane express bus stop, Saratoga (Saratoga Avenue)

Operational Improvements

- Support express bus service by adding service in the Red Stream
- Consider implementation of HOT lane as a transition from 2+ to 3+ occupancy requirement
- Support express bus service by identifying locations to implement bus rapid transit improvements on arterial streets that provide access to and from SR 85 HOV lanes

Santa Clara US 101

Infrastructure Improvements

Priority I

- Minor HOV lane express bus stop, Palo Alto (Oregon Expressway)

Priority II

- Freeway-to-Freeway HOV connection, US 101/SR 85 (So. San Jose) (southbound SR 85 to southbound US 101 and northbound US 101 to NB SR 85 connectors currently under construction)

Operational Improvements

- Support express bus service by adding service in the Red and Purple streams (north of SR 237)

Santa Clara I-280

Infrastructure Improvements

Priority I

- None

Priority II
- New HOV segment, SR 17 to US 101

Operational Improvements

- Support express bus service by identifying locations to implement bus rapid transit improvements on arterial streets that provide access to and from I-280 HOV lanes

Santa Clara I-680

Infrastructure Improvements

Priority I
- New HOV lane segment, SR 237 to US 101
- Direct HOV lane access ramps, Milpitas (Montague Expressway)

Priority II
- Support express service by adding service in the Orange stream

Operational Improvements

- Support express bus service by identifying locations to implement bus rapid transit improvements on arterial streets that provide access to and from I-680 HOV lanes

Santa Clara I-880

Infrastructure Improvements

Priority I
- New HOV segment, SR 237 to US 101 – Priority I

Priority II
- None

Operational Improvements

- Support express service by adding service in the Purple Stream

County Expressways

Santa Clara County Roads and Airport Department's Comprehensive County Expressway Planning Study will be developing preliminary recommendations for elimination and addition of expressway HOV lanes.

San Mateo and San Francisco Counties

Operational improvements in this corridor are recommended along US 101. Although all of the proposed improvements are in San Mateo County, they also should benefit San Francisco, because they will improve access to jobs in San Francisco. The constrained and congested US 101 corridor would benefit from new HOV lanes south of Millbrae, so that a continual HOV lane would run from there into Santa Clara County. The project would represent a difficult design challenge, and is listed as a Priority II improvement unless a lane can be taken for HOVs as a result of the planned addition of auxiliary lanes. In addition, a connection with the intermodal station at Millbrae represents an important regional investment with anticipated high volumes of shuttles and regional buses. For this reason, a direct access treatment to link this station with US 101 is recommended as a

Priority II improvement. Adding an HOV lane between Millbrae and downtown San Francisco did not seem to be feasible without using an elevated structure, which did not appear to be warranted.

A summary of the recommendations by corridor is provided below.

San Mateo US 101

Infrastructure Improvements

Priority I
- None

Priority II
- New HOV lane segment, Redwood City to Millbrae Avenue
- Direct HOV lane access ramps, Millbrae Ave

Operational Improvements

- Support express service by adding service in the Red and Green streams

11 AIR QUALITY ANALYSIS

The analysis of HOV lane emissions is included as a "Further Study Measure" in the *2001 Ozone Attainment Plan.* This section of the HOV Plan update summarizes the analysis of HOV lane emission benefits conducted for the Further Study Measure. The analysis combines the results of MTC's travel demand forecast model with the latest Bay Area motor vehicle emission factors developed by the California Air Resources Board (CARB) to quantify emission benefits.

The Further Study Measure component of the HOV Master Plan update focuses on the air quality implications of the HOV Master Plan and also provides summary comparisons of the transportation performance of different HOV lane configurations.

Alternatives Evaluated

The HOV lane analysis first defined a set of discrete HOV lane, mixed flow lane and express bus alternatives that were then analyzed using MTC's travel demand forecast model:

1. **2003 TIP.** Includes all existing HOV lanes and HOV lanes that are programmed for funding in the 2003 TIP
2. **Mixed Flow.** Converts all HOV lanes in Alternative 1 to mixed flow lanes open to all traffic.
3. **HOV Master Plan.** Includes all HOV lanes in the 25-year *Regional Transportation Plan*, plus additional lanes (Priority 1) recommended for expansion in this study.
4. **HOV Lanes with Increased Occupancy Requirements (2+ to 3+).** All HOV Lane Master Plan lanes have 3+ occupancy requirements.
5. **HOV Master Plan with Express Bus.** Includes the HOV Lane Master Plan system with the plan's proposed express bus system operating on HOV lanes.

6. **Convert Select Mixed Flow Lanes to HOV Lanes.** Includes all Alternative 1 HOV lanes and converts mixed flow lanes to HOV lanes in select corridors (see Figure 19); also includes the plan's proposed express bus system operating on HOV lanes

Methodology

The HOV lane configurations defined above were input into the MTC travel demand model's transportation network for 2010 and travel forecasts were developed for each configuration. The travel demand forecast model estimates carpool and transit use based on travel time, cost, and other factors. Outputs from the travel model affecting regional emissions include total vehicle miles of travel (VMT), speeds in the mixed flow and carpool lanes (freeway speeds), and total vehicle trips (trip starts).

To analyze regional motor vehicle emissions, the latest version of CARB's EMFAC model was employed. The current model provides updated emission rates for various vehicles (passenger cars, trucks and buses) based on their age, engine characteristics and other factors. In the EMFAC model, the emission rates are combined with travel forecast model outputs of vehicle activity to calculate total mobile source emissions.

The following steps were performed to calculate mobile source emission inventories in this study:

Step 1: The MTC travel demand model was run for all alternatives to generate total vehicle trips, vehicle miles of travel (VMT) and vehicle miles of travel by speed range.

Step 2: The travel demand model outputs were processed to produce three variables by county:

a) VMT
b) number of trips/engine starts
c) hourly speed distributions

Step 3: For each county and alternative, the three variables were incorporated into the EMFAC input file using the "What If Scenario" (WIS) generator tool.

Step 4: Results for reactive organic compounds and nitrogen oxides (ROG and NOx are precursors to ozone formation) were tabulated (along with travel characteristic data) by county and summed.

Transportation Results

Travel activity forecasts were analyzed for five major statistics, which are illustrated in the Figures below:

1. Vehicle miles of travel (Figure 20)
2. Number of carpools (Figure 21)
3. Number of transit riders (Figure 22)
4. Average freeway speed (Figure 23)
5. Vehicle Hours of Travel (Figure 24)

Figure 19

HOV Master Plan Alternative 6 – Conversion of Select Mixed Flow Lanes to HOV Lanes

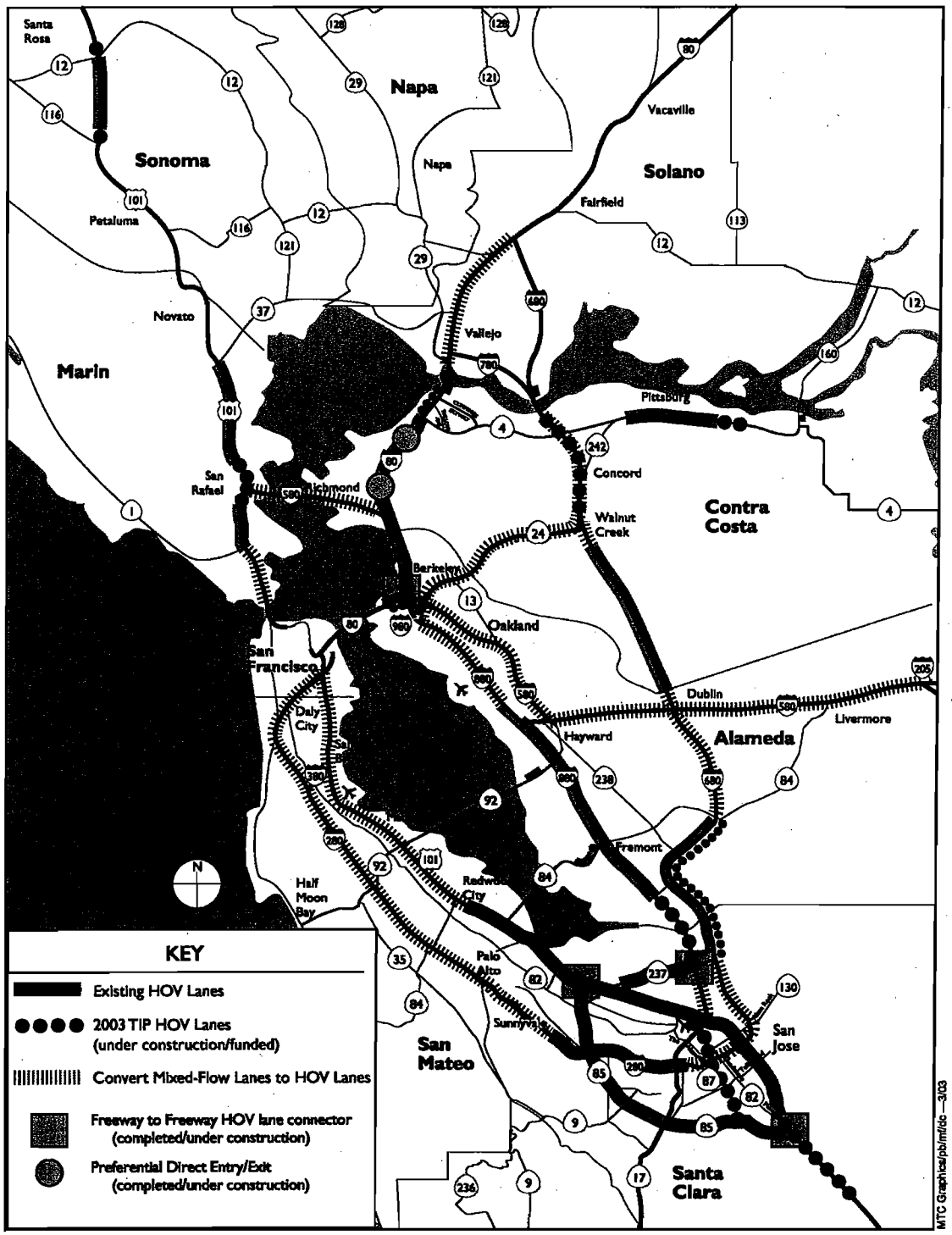


Figure 20

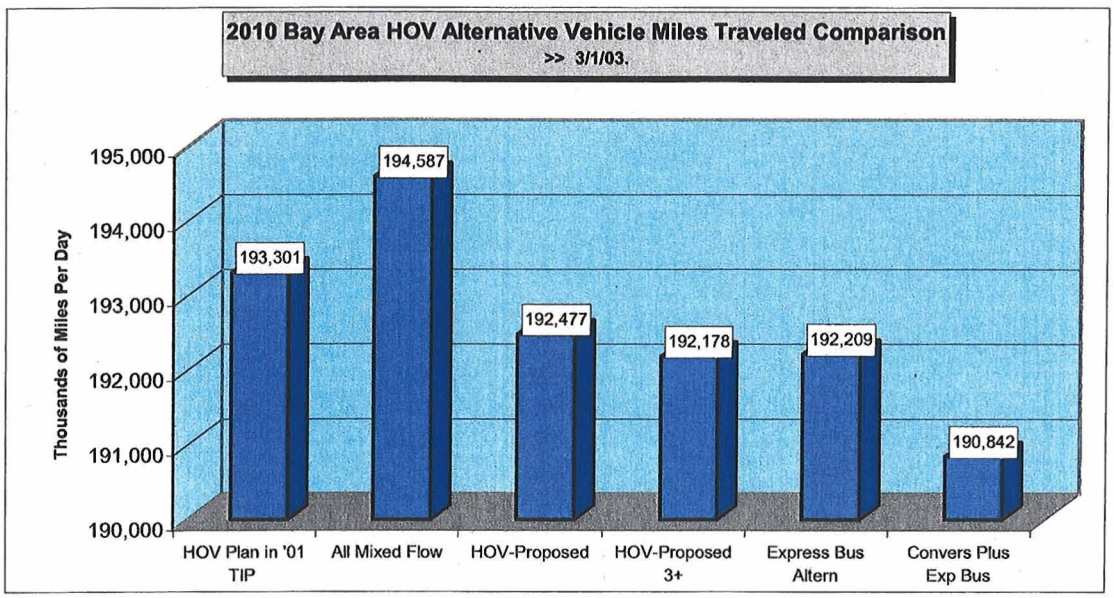


Figure 21

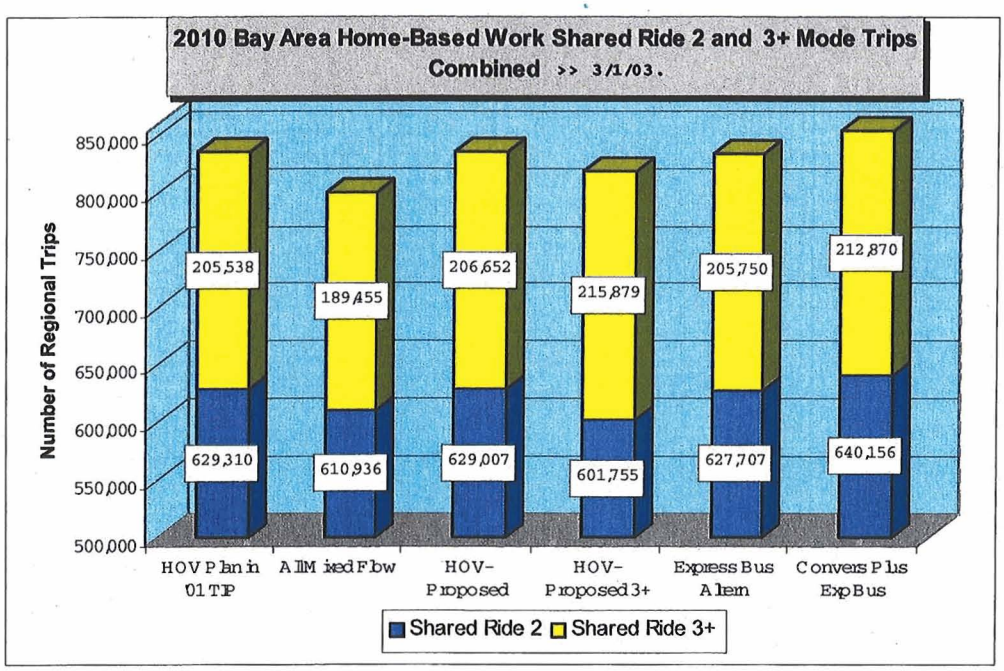


Figure 22

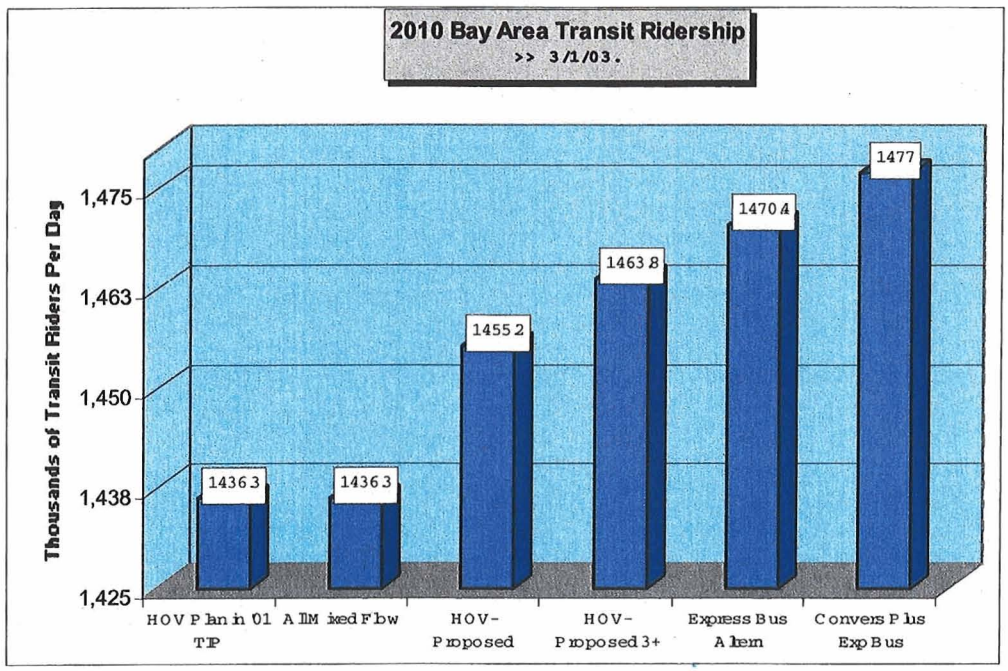


Figure 23

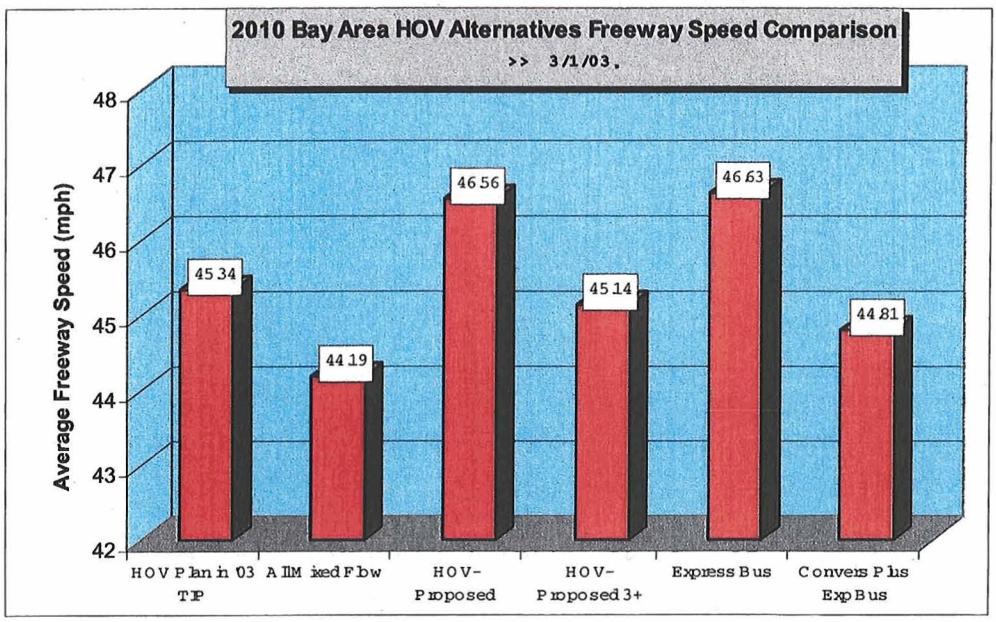
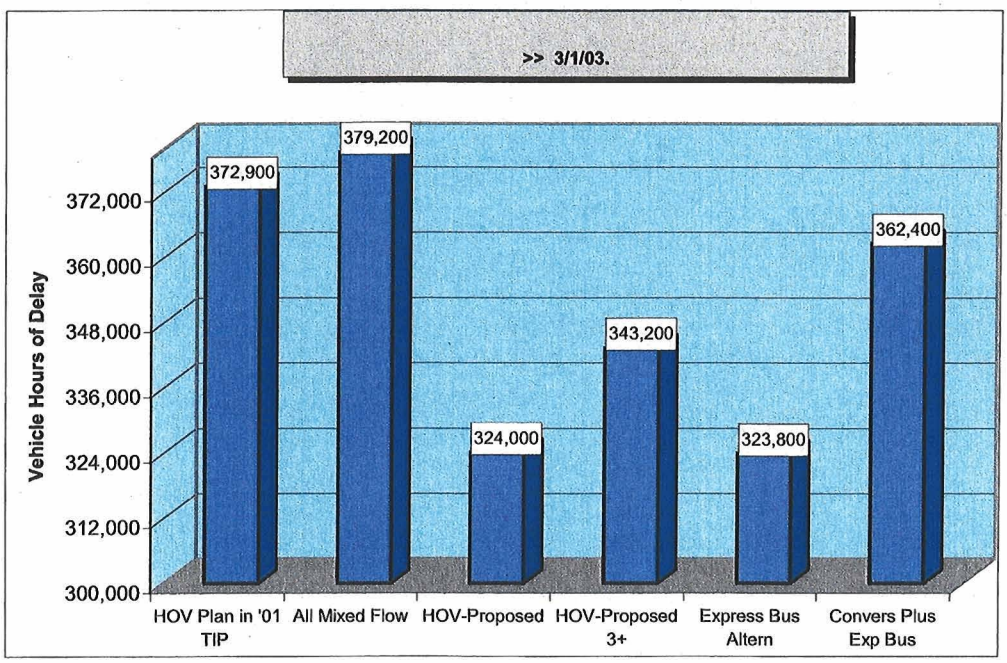


Figure 24



Overall differences in any measures at the regional level are small, since the HOV system and express buses operating on HOV lanes are just one component of a larger regional transportation network. Summary conclusions are as follows:

- HOV lane alternatives perform better than mixed flow lane alternatives.
- Carpool use (combined 2+ and 3+) is lowest for the mixed flow lane alternative and highest for the conversion of some existing lanes to HOV with express bus service. The difference in total carpools between the conversion alternative and the recommended HOV Master Plan is about 17,000 daily carpool trips (about a 2% difference).
- Among HOV alternatives, vehicle hours of delay are highest when some existing mixed flow lanes are converted to HOV lanes (with express bus), and lowest with the proposed HOV Master Plan.
- Restricting HOV lanes in the Master Plan to 3+ person carpools causes increases in vehicle delays, since the 2+ person carpools are shifted back into the crowded mixed flow lanes increasing congestion in these lanes.
- Regional transit ridership is highest when some existing mixed flow lanes are converted to HOV with express bus service. The difference in transit ridership between this alternative and the HOV Master Plan is about 6,600 daily transit trips in 2010 (a 0 .4% increase).

Other Transportation Issues

A question has been raised in the past about whether HOV lanes may induce more vehicular traffic. Answering this question involves a qualitative response, as there are not analytical ways to address it, certainly not within MTC's travel model framework.

Answering this question further requires a common understanding of what is meant by induced traffic, and secondly an understanding of the long-term relationships between freeway demand and capacity. Most aspects of individual or induced travel, including time of day shifts, routes shifts, and modal shifts (e.g. bus to auto) are directly handled in the MTC forecasts. That is, some of the travel on new HOV facilities that is perceived as "new" would actually be traffic that has shifted as described above. A second type of induced traffic relates to new trips that would otherwise not have been made had additional freeway capacity not been provided. Since most Bay Area freeway corridors will be congested in the future, due to projected growth in regional population and jobs, the peak direction commute period will have little available capacity that could induce individuals to take extra trips—with or without HOV lancs. Bay Area IIOV lanes currently operate as mixed flow lanes during non-commute periods. Non-commute trips (e.g. shopping, recreational) show lower sensitivity to time and cost variables in traditional models; therefore, the availability of new capacity would likely be a weak incentive to induce additional non-commute trips.

Air Quality Results

The key air quality questions that were addressed in this study are:

1. What are the differences in regional emissions (ROG and NOx), comparing the HOV alternatives to mixed flow lane alternatives?

2. Which HOV lane alternatives provide the lowest emission reductions?

The first question is addressed by comparing the 2003 TIP (Basecase) with its HOV lanes to the same freeway network with no HOV lanes. The second question is addressed by comparing emissions among the various HOV lane/express bus configurations. Figures 25 and 26 illustrate these comparisons.

Emissions with and without HOV lanes. Converting all HOV lanes in the TIP to mixed flow lanes would produce about 1.3 more tons daily of ROG and 0.9 more tons of NOx. Put another way, HOV lanes would reduce regional ROG by about 1% and NOx by about 0.4%.

Emissions from various HOV configurations. All HOV lane alternatives show lower emissions than the mixed flow alternative (Alternative 2). The HOV Lane Master Plan with express buses produces the lowest amount of ROG followed by the HOV Master Plan; however, the difference is only about 0.2 tons per day (0.2% regionally). The HOV lane alternative with the lowest NOx is the conversion of some mixed flow lanes to HOV with express bus service. The lower NOx emissions result from slowing traffic down in the mixed flow lanes, as they become more congested (a consequence that emanates from the relationship between NOx and average speed).

Figure 25

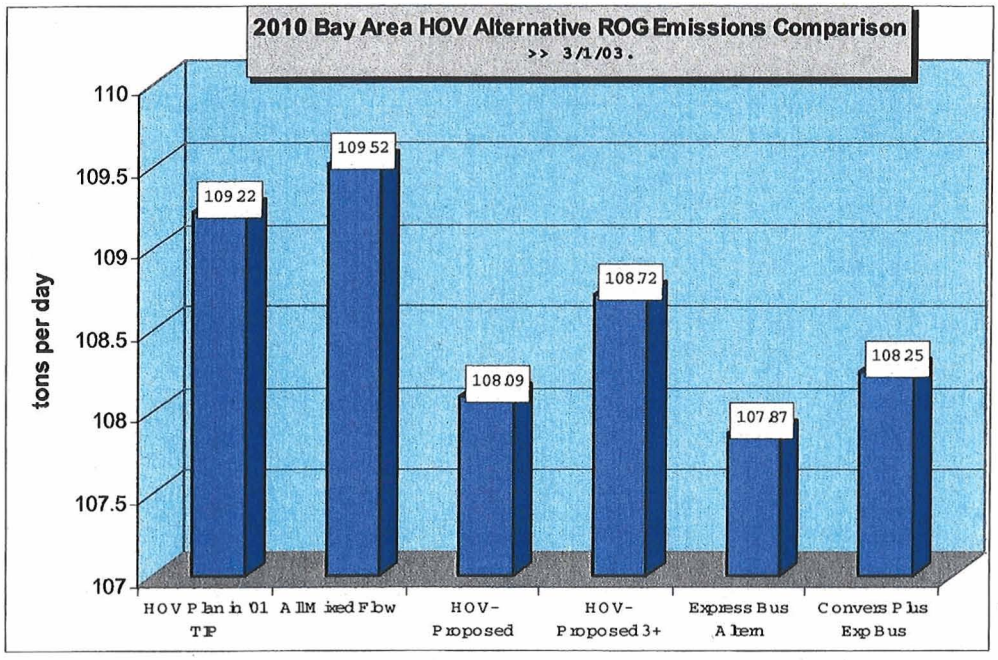
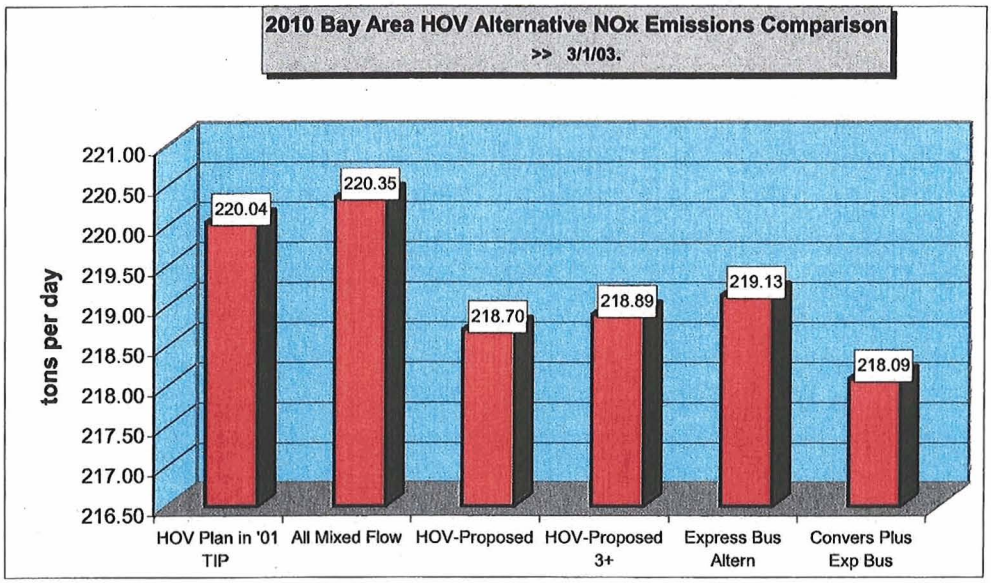


Figure 26



Conclusion

Like most TCMs HOV lanes reduce both ROG and NOx. The region's air quality control strategy has historically focused on obtaining more ROG reduction than NOx as the most efficient path to attainment of the federal ozone standard. Therefore, the net impact of HOV lanes on emissions is mixed due to this simultaneous reduction of both pollutants.

For a number of years, HOV lane emission benefits in regional air quality plans have been accounted for in the "baseline" emission inventory for the SIP. This is the preferred approach, rather than identifying HOV lanes as a separate TCM, since it provides for a more systematic analysis of the transportation network and is consistent with the way the transportation air quality "conformity" analysis has been carried out under the regulations promulgated by the US Environmental Protection Agency.