



Mrn-101 KP 30.0/44.5 (PM 18.6/27.6)

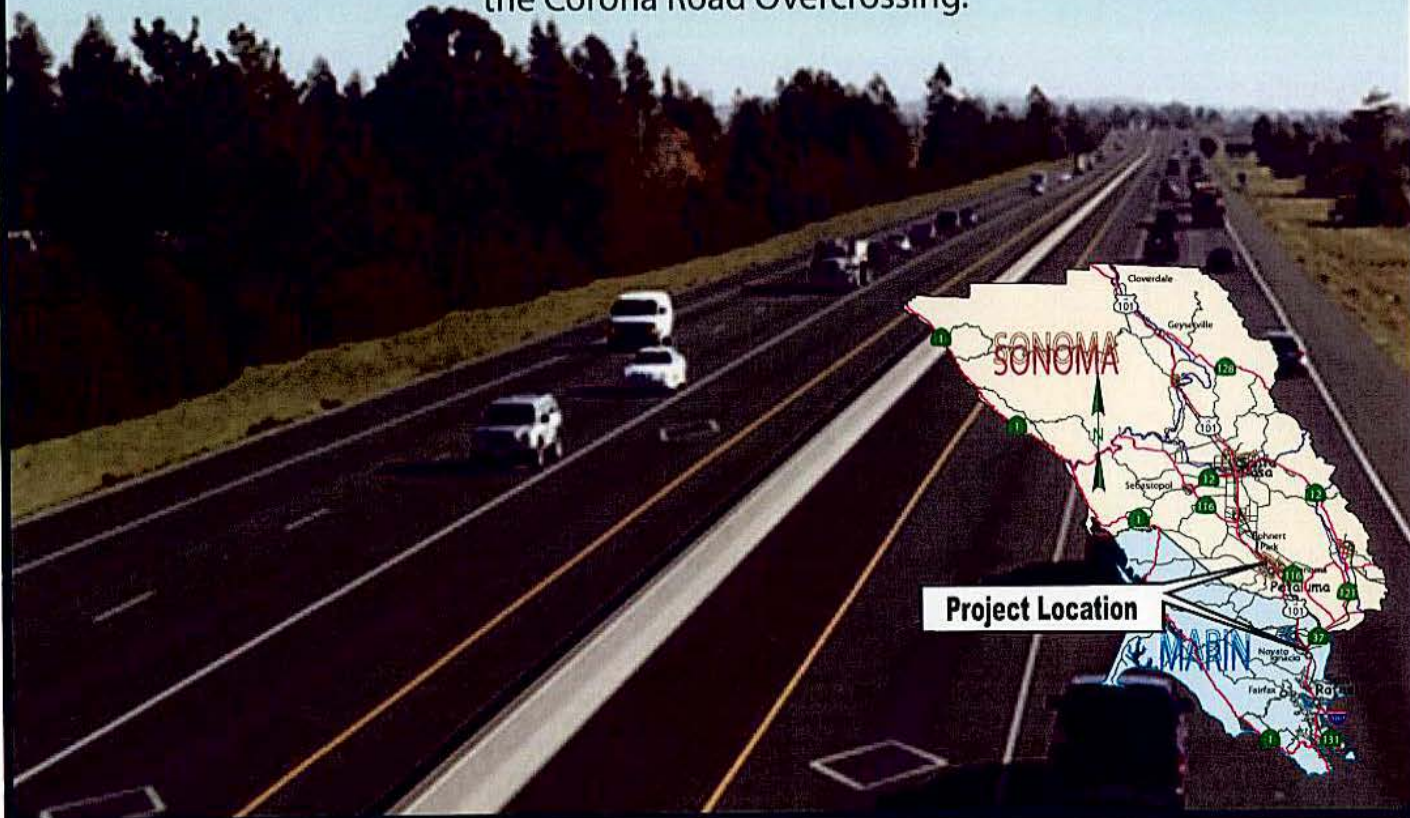
Son-101 KP 0/11.5 (PM 0/7.1)

04-264000

June 2009

# PROJECT REPORT ROUTE 101 - MARIN / SONOMA NARROWS

In Marin and Sonoma Counties  
From the Route 101/37 Separation in Novato to north of  
the Corona Road Overcrossing.



*I have reviewed the right of way information contained in this Project Report and the R/W Data Sheet attached hereto, and find the data to be complete, current and accurate:*

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APPROVAL:

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*7/2/09*

Date

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



5 JUNE 09

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John L. Martin, P.E.  
Registered Civil Engineer

Date



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## GLOSSARY OF TERMS

ABAG	Association of Bay Area Governments	OH	Overhead (Bridge over Railroad)
AC	Asphalt Concrete	PA&ED	Project Approval and Environmental Document
ADA	Americans with Disabilities Act	PAG	Policy Advisory Group
ADL	Aerially Deposited Lead	PCR	Project Change Request
AH	Ahead	PDT	Project Development Team
APS	Advance Planning Study	PID	Project Initiation Document
BMP	Best Management Practice	POC	Pedestrian Overcrossing
BK	Back	PSR	Project Study Report
CEQA	California Environmental Quality Act	RAC	Rubberized Asphalt Concrete
CHP	California Highway Patrol	RCB	Reinforced Concrete Box Culvert
CMIA	Corridor Mobility Improvement Account	RTP	Regional Transportation Plan
COZEEP	Construction Zone Enhanced Enforcement Patrol	R/W	Right-of-Way
DED	Draft Environmental Document	SB	Southbound
EIR/EIS	Environmental Impact Report/ Environmental Impact Study	SCT	Sonoma County Transit
EMS	Extinguishable Message Sign	SCTA	Sonoma County Transportation Authority
FEMA	Federal Emergency Management Agency	SIP	State Implementation Plan
FHWA	Federal Highway Administration	SHELL	State Highway Extra Legal Load
FRTIP	Federal Regional Transportation Improvement Program	SHP	State Historic Park
GGT	Golden Gate Transit	SMART	Sonoma Marin Area Rail Transit
HOT	High Occupancy Toll	SOH	Separation & Overhead
HOV	High Occupancy Vehicle	SOV	Single Occupancy Vehicle
IC	Interchange	SR	State Route
ITIP	Inter-regional Transportation Program	Sta	Station
ITS	Intelligent Transportation Systems	STAA	Surface Transportation Assistance Act
K-rail	Temporary Concrete Railing	STIP	State Transportation Improvement Plan
LOS	Level of Service	SWDR	Storm Water Data Report
MCTD	Marin County Transit District	SWPPP	Storm Water Pollution Prevention Plan
MOU	Memorandum of Understanding	TAM	Transportation Authority of Marin
MSN	Marin-Sonoma Narrows	TASAS	Traffic Accident Surveillance and Analysis System
MTA	Mendocino Transit Authority	TCE	Temporary Construction Easement
MTC	Metropolitan Transportation Commission	TCM	Transportation Control Measures
NB	Northbound	TCRP	Traffic Congestion Relief Program
NEPA	National Environmental Policy Act	TMP	Transportation Management Plan
NOI	Notice of Intent	TOS	Traffic Operations Systems
NOP	Notice of Preparation	TSM	Transportation Systems Management
NPDES	National Pollutant Discharge Elimination System	UC	Undercrossing (Street under Freeway)
NWP	Northwestern Pacific Railroad	US	United States Highway
OC	Overcrossing (Street over Freeway)	VA	Value Analysis

## SECTION 1 - INTRODUCTION

The Marin-Sonoma Narrows (MSN) HOV Widening Project proposes to add High Occupancy Vehicle (HOV) Facilities to United States Highway (US) 101 from the junction of State Route (SR) 37 in the City of Novato to just north of the Corona Road Overcrossing (OC) in the City of Petaluma, a distance of approximately 25.7 km (16.0 mi). The project limits have been divided into three segments, corresponding to the type of existing facility. Segments A & C consists of the existing freeway in the cities of Novato and Petaluma, respectively. Segment B is the existing expressway between the two cities. A Location Map is included as Attachment B.

Through Segment B, locally referred to as the "Novato Narrows," it is proposed to upgrade the existing facility from an expressway, with at-grade intersections and driveway access, to a freeway, with interchanges and frontage roads to provide access to intersecting roadways and adjacent parcels. The project will also improve the safety of the route by increasing visibility (sight distance), improving drainage to address recurring flooding and providing wider shoulders for emergencies.

The project cost for the Preferred Alternative, in current day dollars, was estimated in July 2008 at 567.8 million. A portion of the current day cost was escalated to fiscal year 11/12 (Phase 1 construction), and the remainder of the cost escalated to fiscal year 15/16 (Phase 2 construction). The escalated project cost is \$745.4 million, which includes \$480.53 million for construction, \$88.88 million for right-of-way and environmental mitigation, and \$175.99 million for support. Phased construction of this project is proposed, with Phase 1 funding from a combination of programs beginning in the 9/10 FY including STIP, CMIA, TCRP, Sonoma County Local Measure M, SAFETEA-LU, and TEA21 Demonstration. A Location Map showing the individual Phase 1 and proposed Phase 2 projects is included as Attachment C. The project has been assigned the Project Development Processing Category 1 because it requires substantial new right of way, access control and new Freeway Agreements.

## SECTION 2 - RECOMMENDATION

It is recommended that the project be approved using the Preferred Alternative, and that the project proceed to the design phase. The affected local agencies have been consulted with respect to the project and their views considered when selecting the Preferred Alternative. The local agencies concur with the project as recommended.

It is also recommended that Cooperatives Agreements be executed between the Department and TAM and SCTA for the Phase 1 projects. Cooperatives Agreements for the Phase 1 projects have been executed. The status of the various Cooperatives Agreements is listed in Section 7.4 below.

## SECTION 3 - BACKGROUND

### 3.1 - Project Background

The MSN Project was originally programmed as three separate projects that were initiated to achieve the corridor goal of reducing recurring congestion using a multi-modal approach. To

continue the individual characteristics of these original programming documents, three segments were created in the MSN Project, corresponding with the existing facility types and limits of the original Project Initiation Documents (PIDs):

- The Project Study Report (PSR) for Segment A of the project (04-28200K) was approved on April 24, 2001, and proposes HOV operational improvements to the existing freeway portion of US 101 in Marin County, in the city of Novato from 0.5 km (0.3 miles) south of the Route 101/37 separation to 1.4 km (0.9 miles) north of Atherton Avenue interchange (IC). This segment is 6.8 km (4.2 miles) in length. The estimated construction cost was \$75 million with a total project cost, including R/W and support, of \$94 million.
- The PSR for Segment B of the project (04-26400K), locally referred to as the “Novato Narrows,” was approved on January 29, 1999, and proposes HOV operational improvements and upgrading the existing expressway portion of US 101 to a controlled-access freeway from 1.4 km (0.9 miles) north of the Atherton Avenue IC in the city of Novato, Marin County, to 0.2 km (0.1 miles) south of the Lakeville Highway/SR 116 Interchange in the city of Petaluma, Sonoma County. The expressway-to-freeway conversion will improve traffic flow and safety by providing interchanges and replacing access, improving visibility, providing wider shoulders and emergency pullouts, and eliminating recurrent flooding. This segment 13.1 km (8.1 miles) in length. The estimated construction cost was \$170 million with a total project cost, including R/W and support, of \$216,166,000.
- The PSR for Segment C of the project (04-28112K) was approved on August 3, 2001, and proposes HOV operational improvements to the existing freeway portion of US 101 in Sonoma County from 0.2 km (0.1 miles) south of the Lakeville Highway/SR 116 Interchange in Petaluma to 0.5 km (0.3 miles) north of the Corona OC in Petaluma. This segment is 5.8 km (3.7 miles) in length. The estimated construction cost was \$63 million with a total project cost, including R/W and support, of \$72,085,000.

As these PIDs were finalized, Caltrans and its partner agencies, the Federal Highway Administration (FHWA), the Transportation Authority of Marin (TAM) and the Sonoma County Transportation Authority (SCTA), realized the benefits of combining the three projects into a single study area to address potential cumulative impacts in a comprehensive Environmental Impact Report/Environmental Impact Statement (EIR/EIS). A Project Change Request (PCR) was approved to combine the study limits under EA 04-264000. Studies on this combined project were initiated with a strong emphasis on pursuing early detailed studies (change control) for: surveys, aerial photography, stage construction, geotechnical work, bridge studies, and utility mapping.

The formal environmental process was initiated when the Notice of Preparation (NOP) was published in the Governor’s Office of Planning and Research State Clearinghouse on April 23, 2001. This was followed by the publication of the Notice of Intent (NOI) in the Federal Register on May 2, 2001.

Project development during the PID and Project Approval & Environmental Document (PA&ED) phases utilized the International System of units (Metric). Per current Caltrans policy, the final design will use U.S. Customary Units (English). This document, where appropriate, contains dual dimensions to indicate the English dimension to be used in the construction documents.

A portion of the funding available for the first phase of the MSN project comes from Proposition 1B through the Corridor Mobility Improvement Account (CMIA). The baseline scope for the Phase 1 project includes constructing a SB HOV lane between Route 37 and Delong Ave, a NB HOV lane between Route 37 and Atherton Ave, reconstructing the Petaluma Blvd South interchange, and PS&E and ROW for the southerly interchange (no construction). The baseline CMIA schedule included PA&ED in July 2008, right-of-way acquisition and ready to list by December 2010, approve the construction contract in June 2011 and construction complete by December 2014. A CMIA amendment was approved in March 2008. The amendment reduced the length of the proposed SB HOV lane by 1.6 km (1 mile) in order to provide construction funding for the southerly interchange. The schedule for the HOV lanes in Novato was accelerated, while the schedule for the interchanges remained the same. The CMIA amendment is included as Attachment N.

### **3.2 - Route History**

US 101 was originally constructed in 1917 as a two-lane highway, utilizing Redwood Boulevard through the City of Novato and Petaluma Boulevard through the City of Petaluma. It functioned in this capacity until 1929, when the placement of a new San Antonio Creek Bridge allowed expansion to a four-lane divided highway. In the mid- to late 1940s, the newest San Antonio Creek Bridge was constructed, allowing upgrade to the four-lane expressway that we still see today between Novato and Petaluma.

That route configuration remained until the growth of local traffic forced modifications that moved through-traffic out of downtown Novato and Petaluma. This was accomplished with the freeway construction during the mid-1950s in Petaluma and the early 1970s in Novato. A variety of rehabilitations, operational improvements and safety improvements have brought us to the route that we see today.

### **3.3 - Existing Facility**

The individual characteristics of the existing facilities vary significantly along this portion of the US 101 corridor, from urban freeway to rural highway. Caltrans' 2003 congestion monitoring studies indicate that recurrent delays occur within the study limits during the AM peak traffic period on the southbound US 101 and during the PM peak traffic period on northbound US 101. The results of these studies indicate that traffic demands for some study area roadway sections are either at or exceed their existing capacities. Consequently, congestion occurs at the approaches to several critical bottleneck locations. The roadway within the project limits has been rehabilitated several times with varying methods, culminating in a relatively smooth riding surface.



### *3.3.1 - Existing Facility Adjacent to the Project Limits:*

- US 101 south of the project limits is an eight-lane freeway with fenced access control and a 6.6 m (22 ft) paved median with a concrete barrier. It includes a contiguous HOV lane in both directions. Monday through Friday, HOV lane traffic is restricted to vehicles with two or more persons, and motorcycles and permitted fuel efficient vehicles between 6:30 and 8:30 a.m. in the southbound direction and between 4:30 and 7:30 p.m. in the northbound direction. Outside of these periods HOV lanes are open to mixed-flow traffic.
- US 101 north of the project limits is a four-lane freeway with fenced access control and a 6.6 m (22 ft) non-paved median containing a double thrie-beam barrier. Studies for upgrading this facility, similar to the scope of the MSN Project, are ongoing under 04-0A1800.

### *3.3.2 - Existing Facility within the Project Limits:*

- Segment A of the project through the City of Novato is a six-lane freeway with fenced access control, typically comprising three 3.66 m (12 ft) lanes in each direction, 3.0 m (10 ft) outside shoulders and 1.5 m (5 ft) inside shoulders. The majority of the existing curves in this segment meet current horizontal alignment, vertical profile and sight distance requirements for the 110 km/h (70 mph) corridor design speed. The non-paved median varies in width from 8.5 m (28 ft) to 13.7 m (45 ft) and contains a double thrie-beam barrier. The majority of the drainage facilities through this segment can be utilized for the MSN Project with only minor modifications; no historical drainage issues or recurring flooding has been documented.
- Segment B of the project is a four-lane expressway with two 3.66 m (12 ft) lanes in each direction. Much of the existing facility in this segment does **not** meet current horizontal alignment, vertical profile and sight distance requirements for the 110 km/h (70 mph) corridor design speed. The shoulders are variable width, with the outside shoulders varying from 1.5 m to 2.4 m (5 to 8 ft) and the inside shoulders varying from 0.6 m to 1.2 m (2 to 4 ft). The non-paved median varies in width from 3.4 m (11 ft) to 15.5 m (51 ft) and contains a double thrie-beam barrier. Local traffic accesses the expressway utilizing 31 driveways and seven (7) at-grade intersections. Although access control has not been purchased for this portion of the route, privately owned fencing adjacent to the State right of way does exist. The majority of the drainage facilities through this segment must be replaced or upgraded due to their age, capacity or condition. There are two locations where roadway flooding has historically recurred.
- Segment C of the project through the City of Petaluma is a four-lane freeway with fenced access control, 3.66 m (12 ft) traffic lanes, 3.0 m (10 ft) outside shoulders and 1.5 m (5 ft) inside shoulders. The majority of the existing curves in this segment meet current horizontal alignment, vertical profile and sight distance requirements for a 110

km/h (70 mph) design speed. The non-paved median varies in width from 8.6 m (28 ft) to 10.5 m (35 ft) and contains a double thrie-beam barrier. The majority of the drainage facilities through this segment can be utilized with only minor modifications. Localized flooding has historically been a problem west of the freeway in the City of Petaluma.

- The existing structures within the project limits are shown in Table 3-1 below.

**Table 3-1. Existing Structures**

Bridge Number	Bridge Name	KP	Length (m)	Width (m)	Vertical Clearance (Railroad) (m)	Year Built (Widen)
27-0081H	Ignacio Separation & OH	30.5	322.8	10.4	5.59	1964
27-0081F	W37/N101 Connector OH	30.5	201.8	8.0	6.15	1964
27-0085F	S101-E37 Connector	30.4	93.0	10.4	5.69	1964
27-0108H	Ignacio OH	30.5	221.6	10.4	6.27(8.20)	1964
27-0086K	South Novato Blvd. OC	30.5	48.8	8.0	4.92	1964
27-0088	Rowland Blvd OC	R32.5	332.2	27.6	5.11	1974
27-0089R/L	Novato Creek	R33.0	58.5	18.5 R, 16.1 L	N/A	1974
27-0090R/L	Franklin Ave OH	R33.7	117.3	16.1 R, 19.1 L	(7.13)	1974
27-0091	De Long Ave OC	R34.0	67.4	29.2	5.15	1974
27-0103Y	De Long Ave OH	R34.0	67.1	22.6	(7.80)	1974
27-0092R/L	Olive Ave UC	R34.5	38.1	16.1 R & L	4.65	1974
27-0093	Atherton Ave OC	R35.4	71.3	28.3	5.26	1974
27-0104Y	Atherton Ave OH	R35.4	35.7	25.0	(7.05)	1974
27-0101	North Rush Creek RCB	R35.4	116.0	7.9	N/A	1974
27-0100	Rush Creek (S Branch)	R35.5	8.8	44.5	N/A	1974
27-0094R/L	North Novato OH	35.9	135.6	16.1 R & L	(7.15)	1974
27-0115	Redwood Landfill OC	40.8	77.2	10.5	5.48	2007
27-C0051	S. San Antonio Creek	N/A	30.8	8.5	N/A	1917
20-0019R/L	San Antonio Creek	44.5/0.0	36.6	12.2 R, 10.1 L	N/A	1947
20-0156R/L	South Petaluma UC	5.6	43.0	10.3 R & L	4.57	1956
20-0154R/L	Petaluma River	5.3	270.1	9.6 R & L	21.33#	1955
20-0155L	Route 101/116 SOH	5.8	162.8	9.7	4.72(6.92)	1956(2007)
20-0155R	Route 101/116 SOH	5.8	195.4	9.7	5.23(7.77)	1956
20-0245	Caulfield Lane OC	6.4	75.0	18.9	5.26	1974
20-0247	Kenilworth School POC	7.3	197.2	3.2	5.64	1971
20-0246	East Washington St OC	7.7	76.2	27.6	5.18	1975
20-0163R/L	Washington Creek	7.7	20.4	16.4 R, 13.0 L	N/A	1955
20-0164K	Washington Creek S/B Off	7.7	36.6	8.4	N/A	1955
20-0162R/L	Lynch Creek	8.3	24.1	13.0 R & L	N/A	1955
20-0158R/L	North Petaluma OH	9.3	96.9	12.1 R & L	(7.57)	1955(94)
20-0160	Corona Rd OC	11.0	107.0	10.6	5.11	1955

# Clearance over waterway

3.3.3 - Multi- Modal Facilities:

- **Bike and Pedestrian Facilities** – Bicyclists and pedestrians are not permitted on US 101 in the Segments A & C; there are alternate parallel routes on local streets. Access across US 101 is provided at interchanges throughout the corridor. Through Segment B bicyclists and pedestrians utilize the shoulder of the expressway.

The Preferred Alternative would construct a series of Class I and II Bikeways thru Segment B. These Bikeways will be located outside of the ultimate state right-of-way while allowing a continuous route through the corridor. The existing bikeways thru segments A and C, which are outside of State R/W but cross the highway at existing overcrossings, undercrossings and overheads, will not be affected by the Preferred Alternative.

- **Buses** - Transit service along the corridor is provided by several entities, including Golden Gate Transit, Marin County Transit, Sonoma County Transit and Petaluma Transit. Golden Gate Transit, with an annual patronage of nearly nine million riders, is the primary provider of bus transit services in Marin County. It provides both intra-county trips and travel between Marin, Sonoma, San Francisco and Contra Costa counties. The Marin County Transit District currently contracts with Golden Gate Transit and Whistlestop Wheels to provide four different types of service, including local fixed route services, supplemental school services, rural service and paratransit service. Petaluma Transit provides local service in the city of Petaluma and connections to Sonoma County Transit, which provides for intercity trips.
- **Rail** - The Sonoma Marin Area Rail Transit (SMART) / Northwest Pacific (NWP) rail line is currently inactive due to the Federal Railroad Authority Stop Order “Emergency Order Number 21” of 2001. The track generally parallels US 101 throughout the project limits, crossing under the facility four times. The crossings occur at: Franklin Overhead (OH), North Novato OH, Route 101/SR 116 Separation and Overhead (SOH) and North Petaluma OH. SMART is proposing to start commuter service and have prepared an EIR. A sales tax measure recently passed, providing significant funding. For a further discussion, please see Section 4.2.5.
- **Park and Ride** - There are several existing Park and Ride facilities within the MSN project limits. Their location, size and usage are summarized in Table 3-2 below.

**Table 3-2. Existing Park and Ride Lots**

Location	Available Space		Usage		Comments
	Cars	Bikes	Cars	Bikes	
Rowland (East)	240	6L/1R	60%	Low	
Atherton (East)	62	2L	74%	Low	Both locations
Redwood Blvd (West)	50	N/A	70%	Low	Informal location
Petaluma Blvd. S. (East)	40	N/A	105%	Low	
Lakeville Hwy/SR 116 (West)	111	7R	90%	Low	

L=Bike Locker      R=Bike Rack

- Ramp Metering/California Highway Patrol (CHP) Enforcement - There are no existing ramp metering facilities or CHP Enforcement Areas within the MSN project limits.

### **3.4 - Community Interaction**

Throughout the development of this document an emphasis has been placed on keeping the community and local stakeholders informed of the scope and potential impacts of this project. Numerous meetings, both formal and informal, have been held to gather input and assist in formalizing these studies, including:

- Public Map Display meetings
- Policy Advisory Group (PAG) meetings
- Mineta Transportation Institute's April 2002 "Hot Spot Forum"
- NEPA 404 Agency meetings and field reviews
- Local Partners Team meetings
- External Project Development Team meetings
- Aesthetics Committee meetings
- Matrix Evaluation Team meetings
- Local Developer meetings
- City and County Board meetings
- Public Informational Meetings

## **SECTION 4 - NEED AND PURPOSE**

The purpose of this project is to reduce congestion and improve mobility while providing an incentive for commuters to use buses, carpools or vanpools for peak period travel, and to improve freeway operations including providing safe access to and from the facility in Segment B.

In March 2008, after considering comments received during the public review of the Draft EIR/EIS, and in consultation with TAM, SCTA and MTC, the Fixed HOV Lane Alternative with Access Option 12b was selected as the Preferred Alternative. This alternative meets the need and purpose by providing an additional lane in each direction to reduce congestion and improve mobility. The new lanes will be designated for HOV traffic during peak periods, providing an incentive for bus, carpool and vanpool usage. The preferred alternative would also correct the operational deficiencies thru Segment B.

The Preferred Alternative was found to be the least environmentally damaging project alternative. The Fixed HOV Lane Alternative had a lower construction cost while requiring less maintenance of operation than the Reversible HOV Lane Alternative. While Access Option 12b had the most tree loss, the visual impacts were less than the other access options. The visual impact of a new overcrossing in the rural setting (the San Antonio Interchange proposed with Access Options 4b, 14b, and 14d) was more significant than the tree loss; impacts to other

resources were the same among access options. The overwhelming majority of the public comments that stated a preference identified 12b as their preferred alternative.

The Reversible HOV Lane Alternative was not selected due to the higher costs and increased long term maintenance. Also the reversible lane is not compatible with changes in the current commute directions. Access Options 4b, 14b and 14d were not selected due to the associated visual impacts. The No-build Alternative was not selected as it did not meet the need and purpose.

Phased construction of the Preferred Alternative is proposed. Several Phase 1 Projects have been identified. These projects include improvements in Segment A and B to extend the existing HOV lane network while also reducing the number of access points and correcting nonstandard curves in Segment B. A Location Map for the Phase 1 projects is included as Attachment C. Phase 2 projects will be programmed as funding becomes available.

#### **4.1 - Problem, Deficiencies, Justification**

US 101 is the only continuous north-south route through Marin and Sonoma counties. Due to the lack of a parallel arterial system, US 101 is used for the majority of north-south trips within the vicinity of the proposed project. Based on the most current commuter survey by RIDES for Bay Area Commuters, Marin County has the largest number of trips per household in the region, and by necessity, many of these trips involve travel on US 101.

The majority of the State Highway system within the project limits was planned, designed and built between the 1950s and the 1970s. Not only have these facilities aged beyond their original design life, they have been subjected to significantly higher truck and auto traffic than was originally planned. This combination of age and increased usage has caused increasingly longer travel times, higher concentration of accidents and faster rates of pavement deterioration.

Since this corridor is so important to the economic vitality and social fabric of the local community, it is imperative that US 101 operate as smoothly and efficiently as possible. The delays experienced by motorists during the AM and PM peak commuting periods are among the worst in the Bay Area.

- The 2002 Bay Area Freeway Congestion Data Report completed by Caltrans shows vehicle hours of delay within the project limits varying from 570 to 3,520 during the AM peak and 100 to 680 during the PM peak.
- The 2002 Transportation Corridor Concept Report authored by Caltrans found that although there were only 10 vehicle hours of delay in 1990, the number had grown to more than 1,240 vehicle/hours of delay by 1998. It is estimated that, without improvements, this segment of US 101 will operate at Level of Service (LOS) F during both the AM and PM peak periods by 2015.

- The 2003 congestion monitoring studies done by Caltrans calculated an existing maximum vehicle delay of 16 minutes for SB traffic and 6 minutes for NB traffic.

With the most recent of its construction occurring in 1955, the 13.4 km (8.2 mi) long “Novato Narrows” is showing its age as the only missing piece of freeway within this 112 km- (70 mi) section of US 101. This existing expressway portion includes narrow shoulders of varying widths, seven locations with limited visibility (sight distance), two locations with recurring flooding, and at-grade intersections and driveway accesses that adversely impact mainline operations.

## 4.2 - Regional and System Planning

Due to the size and complexity of the improvements needed, coordination among Caltrans, FHWA, PAG, Metropolitan Transportation Commission (MTC), the various transit agencies, the cities of Novato and Petaluma, and the counties of Marin and Sonoma is ongoing to ensure compatibility between roadway and mass transit facilities, as well as coordination of continuous bicycle and pedestrian paths through the corridor.

US 101 serves as the primary transportation facility for Marin and Sonoma counties, as well as for regional traffic along the northwest coastal corridor between the San Francisco Bay Area and Oregon.

### 4.2.1 - Identify Systems:

- Interstate System: Not on the Interstate System.
- National Highway System: Non-Interstate Strategic Highway Network.
- Freeway & Expressway System: Yes.
- Scenic Highway System: The portion of US 101 between State Route 37 near Ignacio and the unconstructed portion of State Route 37 near Novato is listed as “Eligible State Scenic Highways - Not Officially Designated.”
- Interregional Road System: US 101 is both an Interregional Road System “Focus Route” and a regional freight corridor, carrying timber products, wine, agricultural and mineral products, linking the San Francisco Bay Area with the rest of northwestern California.
- STAA & SHELL Route System: This portion of the route has been included in the STAA and the SHELL route systems and functions as the principle truck route for Marin and Sonoma counties.

### 4.2.2 - State Planning:

- Route Concept Report: The MSN Project is consistent with the current Route Concept Report dated March 13, 1986. A draft Transportation Corridor Concept Report was prepared in May 2002 but was never approved. The District is currently working on a Corridor System Management Plan for the north US 101 corridor. The CSMP will function as the Transportation Corridor Concept Report and is expected to be completed by September, 2010.

- Transportation System Development Plan: Caltrans developed a Statewide System Management Plan (1998) that includes a strategy for Bay Area transportation corridors. This study found that congestion relief in the US 101 corridor will require a multi-modal (carpool, bus, rail, ferry, bicycle, and pedestrian) approach.

#### *4.2.3 - Regional Planning:*

The MSN Project is listed as a Track 1 (RTP Reference Numbers 98154 and 98147) in the Golden Gate Corridor section of the current MTC Transportation 2030 Plan approved in February 2005. The Final MTC Transportation Amendment to the 2030 Plan includes \$540 million for the entire MSN Project (\$320 million for RTP#98154 and \$220 million for RTP#98147). The MSN project is also listed in the Transportation 2035 Plan in the Bay Area Region/Multi-County section as RTP Reference Number 230701. The T2035 includes \$745.4 million for the MSN project, \$569.4 million in committed funds and \$176.0 million in discretionary funds. The Transportation 2035 Plan was adopted by the MTC on April 22, 2009. The proposed project is consistent with the Congestion Management Plan and is intended to fulfill the following objectives:

- Maximize travel time benefits for high-occupancy vehicle lanes and transit in entire (Golden Gate) corridor.
- Protect operational capability of reliever routes to US 101 for short trips during the peak period.
- Maintain interchange spacing and ensure improvements to connecting east-west routes do not adversely affect operations on US 101.
- Develop ramp-metering plan for US 101 at key access points to balance access for local and through trips.
- Maintain reliable US 101 operations in off-peak period for freight mobility.
- Expand commute-period transit options in (the Golden Gate) corridor.
- Improve transit service between cities.
- Develop bicycle and pedestrian travel options for commuting, recreation and tourism.
- Develop bicycle and pedestrian access to existing and future rail and ferry facilities.

#### *4.2.4 - Local Planning:*

This project is being proposed in partnership with TAM, SCTA and FHWA. The completion of the HOV system through Marin and Sonoma counties has been a consistent goal expressed in regional planning documents such as the US 101 Corridor Strategic Plan, the Marin County Congestion Management Plan, the Sonoma/Marin 1997 Multi-Modal Transportation & Land Use Study, the MTC 2005 HOV Master Plan and the MTC Transportation 2030 Plan.

In addition, HOV alternatives show lower regional emission of air pollutants than mixed-flow alternatives and MTC studies have related HOV lanes to reductions in emissions of Reactive Organic Gases and oxides of nitrogen. The Bay Area Air Quality Management District's Clean Air Plan includes a list of Transportation Control Measures (TCM) to be

implemented to reduce vehicle emissions. TCM 8 is the Bay Area 2000 Clean Air Plan to Construct Carpool/Express Bus Lanes on Freeways.

#### 4.2.5 - Transit Operator Planning:

- **Background/Coordination:** After the last of the MSN scoping documents were approved in 2001, a change in statewide direction and potential funding came about, resulting in an emphasis on enhancing transit facilities. Due to this potentially significant change in study direction, the Project Development Team proposed adding this scope to the studies through the PCR process.

While awaiting the outcome of the PCR process, an Intermodal Transit Coordination Team was developed. This team comprised members from the local transit agencies (listed below), the local partners (TAM, SCTA, City of Novato and City of Petaluma) and Caltrans Planning and Design. Three team meetings were held in 2002 and 2003 to facilitate communication among these agencies and to coordinate the planned or ongoing planning exercises of each agency.

During these meetings, a potential concept was identified that could enhance the overall Transit Corridor by creating “full service” transit hubs that would service SMART, local bus service, bicycles, pedestrians and corridor bus service through the use of Park & Ride facilities and direct access HOV ramps. Preliminary studies identified ten potential locations for these facilities and investigated their feasibility. Where feasible, it was found that limited benefit would be provided until the adjacent HOV lanes and/or SMART facilities were completed.

Project meetings were suspended in the Fall of 2003, due to a downturn in the economy and the realization by the funding partners (TAM, SCTA and Caltrans) that the MSN Project would require a long-term funding strategy and a phased construction plan. This phased concept requires prioritization of potential construction elements and competition for limited available funds. Due to the anticipated funding shortfall, and the limited benefit of constructing transit hubs without their supporting infrastructure, direction was received to re-focus the remaining studies on “standard transit” applications and to set aside the transit hub concept for future studies.

- **Transit Agencies:** **Sonoma-Marin Area Rail Transit (SMART)** released a Final EIR in June 2006 that studied a proposed project to provide passenger rail service along approximately 70 miles of the SMART corridor from Larkspur in Marin County to Cloverdale in Sonoma County, with 14 rail stations, passing sidings and a rail maintenance facility. The EIR was certified in July 2006. SMART recently obtained significant funding thru a sales tax ballot measure. The proposed project also includes the implementation of a bicycle/pedestrian pathway, generally within or adjacent to the rail corridor, that includes a combination of Class I and Class II facilities. In Segment A, the proposed SMART bikeway would be generally within the SMART R/W, along the west side of the tracks from south of Route 37 to



Franklin Ave. Between Franklin Ave and the North Novato OH, the proposed bikeway would be along the east side of the tracks. Just before the N. Novato OH, the proposed bikeway joins Redwood Blvd. From this point to the Petaluma Blvd South interchange, SMART's proposed bikeway would utilize the proposed bikeway constructed as part of the MSN Preferred Alternative. In Segment C the proposed SMART bikeway utilizes Petaluma Blvd South, and "D" and Copeland streets, west of the tracks. The bikeway crosses to the east side of the tracks at Madison Street and continues within SMART R/W to W. Payran Street, where the bikeway crosses the tracks and continues along the west side of the tracks to Corona Street. Mapping showing the proposed SMART bikeway thru Segments A and C is included as Attachment L.

**Marin County Transit District (MCTD)** currently contracts with Golden Gate Transit and Whistlestop Wheels to provide four different types of service: Local fixed route services (Novato), supplemental school services, rural service and paratransit service.

**Sonoma County Transit (SCT)** offers connections to local transit services provided by Cloverdale Transit, Healdsburg Transit, Santa Rosa CityBus and Petaluma Transit. SCT also provides links to Mendocino Transit Authority (MTA) for service to the Sonoma/Mendocino Coast and Golden Gate Transit for regional service to Marin and San Francisco counties.

**Petaluma Transit** provides local service in the City of Petaluma and connections to Sonoma County Transit for intercity trips.

**Golden Gate Transit (GGT)** provides regional, fixed-route bus service throughout the day and evening between San Francisco, Marin and Sonoma counties, including basic and commute bus routes. Limited service is also available between San Rafael, in central Marin County, and the El Cerrito del Norte BART Station in western Contra Costa County. Marin County Local Service is provided within Marin County on weekdays, with limited weekend service, under contract with the Marin County Transit District (MCTD). The paratransit service provided through most of GGT's service area by Whistlestop Wheels complements GGT's regular intercounty non-commute, off-peak bus service. In addition, Golden Gate Transit also offers special express service to 49er games at Monster Park at Candlestick Point.

### 4.3 - Traffic

US 101 within the project limits experiences recurrent congestion, southbound in the morning and northbound in the afternoon. This congestion is expected to worsen in the future with the projected increase in traffic volumes. Future-year traffic volumes were projected for both the No Build and build alternatives. The projected traffic volumes for the HOV lane were projected to be similar for both of the build alternatives. The operational

analysis predicts traffic delays in the study years with both the no-build and build alternatives, although significantly less delay with the build alternatives.

*4.3.1 - Existing Traffic Volumes:*

Existing traffic volumes were collected during 2007 for the AM and PM peak hours along the project corridor. These results are summarized from the “2007 Traffic Volumes on California State Highways” and listed in the Table 4-1 below.

**Table 4-1. Existing Traffic Volumes**

Location	AADT	Peak Month	Peak Hour	T
SR 37 to Rowland	127,000	131,000	10,300	4.4%
Rowland to DeLong	107,000	111,000	8,700	4.7%
DeLong to Atherton	90,000	92,000	7,300	4.7%
Atherton to Petaluma Blvd. S	80,000	84,000	6,700	4.7%
Petaluma Blvd. S. to SR 116	78,000	80,000	6,300	6.4%
SR 116 to East Washington	78,000	80,000	6,300	5.0%
E. Washington to Pengrove	90,000	91,000	7,200	5.7%

*4.3.2 - Existing Traffic Operations:*

Caltrans 2003 congestion monitoring studies indicate that recurrent delays occur within the study limits during the AM peak traffic period on SB US 101 and during the PM peak traffic period on NB US 101. SB traffic congestion within the study limits typically occurs between 6:30 and 9:30 a.m. in Marin County and between 5:30 and 8:30 a.m. in Sonoma County. NB traffic congestion generally develops between 3:00 and 6:30 p.m., primarily in Marin County. The results of these studies indicate that traffic demands for portions of the roadway within the project area are either at or exceed their existing capacities.

The two SB locations within the study limits where traffic exceeds the existing capacity and regularly causes congestion during the AM peak period are:

- The SB on-ramp at the Petaluma Boulevard South Interchange, where congestion typically extends upstream to the Old Redwood Highway Interchange in northern Petaluma. Maximum vehicle delay is 9 minutes.
- The SB on-ramp at Lincoln Avenue, where congestion typically extends upstream to the Rowland Boulevard Interchange in central Novato. Maximum vehicle delay is 16 minutes.

The NB location within the study limits where traffic exceeds the existing capacity and regularly causes congestion during the PM peak period is:

- The NB lane drop just north of the Atherton Avenue Interchange, where congestion typically extends downstream to the DeLong Avenue Interchange in northern Novato. Maximum vehicle delay is 6 minutes.

In addition, minor delays are also experienced on the various uphill sections of the roadway in the Sonoma County portion of the study area.

#### *4.3.3 - Forecasted Traffic Volumes:*

The project's forecasted traffic volumes were prepared for the years 2010 and 2030 by the Caltrans District 4 Traffic Forecasting Branch. The growth factors used to forecast these traffic volumes were derived from trip tables developed by TAM models based projections developed by the Association of Bay Area Governments (ABAG). The PM peak hour (4:00-5:00) projected volumes were based on the MTC's PM travel model network. The AM peak hour (8:00-9:00) projected volumes were derived from the AM network using Miller Creek Road as the controlling point of congestion. At the same time, traffic forecast studies for SCTA projects were performed utilizing similar methodology, but with a controlling point of congestion in central Sonoma County. Comparisons were made where these two independent studies converged at the northerly MSN Project limits, and adjusted to balance. The final "balanced" results are summarized in Table 4.2 below.

**Table 4-2. Forecasted Traffic Volume**

Location	Northbound				Southbound			
	No Build Alternative		Fixed HOV Lane Alternative		No Build Alternative		Fixed HOV Lane Alternative	
	Total	HOV	Total	HOV	Total	HOV	Total	HOV
<b>2010 AM Peak Hour</b>								
SR 37 to Rowland	4666	---	4651	514	5725	---	5754	744
Rowland to DeLong	4202	---	4183	512	5008	---	5084	628
DeLong to Atherton	3475	---	3451	415	4253	---	4244	600
Atherton to Petaluma Blvd. S	3241	---	3179	346	4205	---	4274	572
Petaluma Blvd. S. to SR 116	3224	---	3124	377	3580	---	3726	552
SR 116 to East Washington	3885	---	3864	466	3633	---	3799	509
E. Washington to Pengrove	3970	---	4005	508	3703	---	3813	565
<b>2010 PM Peak Hour</b>								
SR 37 to Rowland	5735	---	5797	1005	5778	---	5927	710
Rowland to DeLong	4890	---	5054	897	5185	---	5332	709
DeLong to Atherton	3848	---	3998	817	4417	---	4571	628
Atherton to Petaluma Blvd. S	3970	---	4079	718	3840	---	3942	528
Petaluma Blvd. S. to SR 116	3645	---	3821	726	3667	---	3825	542
SR 116 to East Washington	4171	---	4378	791	4114	---	4265	687
E. Washington to Pengrove	4278	---	4419	873	4246	---	4349	753
<b>2030 AM Peak Hour</b>								
SR 37 to Rowland	4911	---	5017	540	6289	---	6592	850
Rowland to DeLong	4497	---	4489	538	5529	---	5876	719
DeLong to Atherton	3718	---	3703	434	4624	---	4899	684
Atherton to Petaluma Blvd. S	3533	---	3503	381	4646	---	4890	655
Petaluma Blvd. S. to SR 116	3481	---	3457	418	3861	---	4352	637
SR 116 to East Washington	4169	---	4175	520	3971	---	4400	584
E. Washington to Pengrove	4321	563	4498	581	4006	---	4752	615
<b>2030 PM Peak Hour</b>								
SR 37 to Rowland	5800	---	6243	1152	6396	---	6639	793
Rowland to DeLong	5407	---	5803	960	5751	---	5984	785
DeLong to Atherton	4365	---	4704	825	4821	---	5006	698
Atherton to Petaluma Blvd. S	4404	---	4788	843	4290	---	4455	597
Petaluma Blvd. S. to SR 116	3929	---	4505	851	3910	---	4353	617
SR 116 to East Washington	4419	---	5065	914	4367	---	4728	675
E. Washington to Pengrove	4636	---	5345	988	4610	728	5187	820

**4.3.4 - Forecasted Traffic Operations:**

The freeway operational analyses for the project, detailed in the February 2005 Traffic Operational Analysis Report, are based on unconstrained year 2010 and year 2030 traffic projections. This analysis utilized the simulation model FREQ12 to perform the freeway operational analysis.

The freeway operational analysis indicates that recurrent delays will occur within the study limits. The duration and location of these delays is dependent upon the selected alternative. The forecasted delay is summarized in Table 4-3 below.

**Table 4-3. Forecasted Traffic Delay**

Location	Traffic Type	Delay, minutes			
		2010		2030	
		No Build Alternative	Fixed HOV Lane Alternative	No Build Alternative	Fixed HOV Lane Alternative
<b>AM Peak Hour</b>					
Southbound	Mixed Flow	10.4	1.4	15.0	5.0
	HOV	10.2	0.2	14.6	0
Northbound	Mixed Flow	1.6	0.6	3.3	0.8
	HOV	1.5	0.4	3.1	0
<b>PM Peak Hour</b>					
Southbound	Mixed Flow	5.3	0.9	10.4	1.9
	HOV	5.2	0.2	8.9	0
Northbound	Mixed Flow	9.1	5.8	14.5	7.4
	HOV	5.1	0.8	7.9	0

The operational analysis projected a travel time savings for vehicles in the HOV lanes under the build alternatives. The expected HOV delay savings are shown in Table 4-4 below.

**Table 4-4. Expected HOV Delay Savings**

Location	Savings, minutes	
	2010	2030
	Fixed HOV Lane Alternative	Fixed HOV Lane Alternative
<b>AM Peak Hour</b>		
Southbound	1.2	5.0
Northbound	0.2	0.8
<b>PM Peak Hour</b>		
Southbound	0.7	1.9
Northbound	5.0	7.4

Signalized intersections of interest were analyzed using the computer simulation model SYNCHRO5. Intersection operations throughout the MSN Project limits were evaluated and the Atherton Avenue ramp intersections were determined to be critical. Consequently, Level of Service (LOS) calculations were performed at these locations, and the results were the same for the no-build and build alternatives. The southbound ramp intersection is expected to operate at LOS A or B during the study years (current is LOS A). The northbound ramp intersection is expected to operate at LOS B or C in 2010 and LOS C to D in 2030 (current is LOS C). The actual intersection operations may be worse because this intersection is heavily influenced by the poor operation and proximity of the Redwood Blvd/Atherton intersection.

4.3.5 - Accident Rates:

Accident rates for the 3-year period from 08/01/03 to 07/31/06 were calculated and compared to the statewide average utilizing accident data from the Traffic Accident Surveillance and Analysis System (TASAS). These data were analyzed separately for northbound and southbound US 101 mainline. The accident data from TASAS Table B are shown in Table 4-5 below.

Table 4-5. Accident Analysis

Location	Number of Accidents/Significance					Accident Rate (acc/mvm*)					
	Total	Fat	Inj	Wet	Dark	Actual			Average		
						Fat	F+I	Total	Fat	F+I	Total
NB Segment A Mrn KP 30.0/R36.8 (PM 18.6/R22.9)	145	1	58	26	50	0.004	0.23	0.55	0.007	0.29	0.91
SB Segment A Mrn KP 30.0/R36.8 (PM 18.6/R22.9)	81	0	22	25	38	0.00	0.08	0.31	0.007	0.29	0.91
NB Segment B Mrn KP R36.8/Son 5.7 (PM R22.9/Son 3.5)	262	6	98	38	76	0.016	0.28	0.69	0.027	0.49	1.11
SB Segment B Mrn KP R36.8/Son 5.7 (PM R22.9/Son 3.5)	221	2	88	45	69	0.005	0.24	0.59	0.027	0.49	1.11
NB Segment C Son KP 5.7/11.5 (PM 3.5/7.1)	110	0	44	8	41	0.00	0.24	0.61	0.015	0.48	1.32
SB Segment C Son KP 5.7/11.5 (PM 3.5/7.1)	129	0	46	28	43	0.00	0.25	0.71	0.015	0.48	1.32

acc/mvm = accidents per million vehicle miles

Post Mile Equations: KP 32.472 BK = R32.472 AH (PM 20.178 BK = R20.178 AH)

KP R37.452 BK = 37.770 AH (PM R23.272 BK = 23.470 AH)

KP 44.460 BK = 0.0 AH (PM 27.627 BK = 0.0 AH)

**Segment A:** There were 145 accidents in the northbound direction during the 3-year period with a total accident rate of 0.55, lower than the statewide average rate of 0.91 for similar facilities. Of the accidents, 70 (or 48.3%) were rear end type of collision, 38 (26.2%) were hit object, and 30 (20.7%) were sideswipe.

Of these accidents, 76 (or 52.4%) of the accidents were caused by speeding, 25 (17.2%) by improper turn, 22 (15.2%) by other violations, and 9 (6.2%) by influence of alcohol. There was one fatal accident due to DUI, the vehicle collided with the guardrail, chain link fence, and overturned in Novato Creek.

There were 81 accidents in the southbound direction during the 3-year period with a total accident rate of 0.31, lower than the statewide average rate of 0.91 for similar facilities. Of the accidents, 33 (or 40.7%) were hit object collisions, 19 (23.5%) were rear end, and 18 (22.2%) were sideswipe.

Speeding has been the primary collision factor 44.4% of total accidents, 17.3% were caused by other violations, 14.8% by improper turn, and 12.3% by influence of alcohol.

**Segment B:** There were 262 accidents in the northbound direction during the 3-year period with a total accident rate of 0.69, lower than the statewide average rate of 1.11 for similar facilities. Of the accidents, 108 (or 41.2%) were rear end, 90 (34.4%) were hit object, and 35 (13.4%) were sideswipe.

Speeding has been the primary collision factor for 119 accidents or 45.4% of total. Twenty-six percent of total accidents were caused by improper turn and 11.8% by other violations.

There were 6 fatal accidents within the limits of this segment. One was caused by DUI, in which the driver lost control of the vehicle, causing it to overturn and collide with a power pole. One accident was due to unsafe turning movement that caused the vehicle to hit the center divider. The vehicle then bounced back across both lanes and hit the guardrail at the right shoulder at San Antonio Creek. Unsafe turning movement resulting lose of vehicle control, leaving the roadway and colliding with a power pole or striking a log and then a tree was the cause of two other fatal accidents. One fatal accident was caused when a pedestrian crossed in the middle of the highway, then, with unknown reason, slipped and felled in the #1 lane and was hit by an oncoming vehicle, which was unable to stop in time. One fatal accident was caused when a pedestrian under the influence of drugs walked into the travel way of oncoming vehicle.

There were 221 accidents in the southbound direction during the 3-year period with a total accident rate of 0.59, lower than the statewide average rate of 1.11 for similar facilities. Of the accidents, 108 (or 41.2%) were rear end, 90 (34.4%) were hit object, and 35 (13.4%) were sideswipe.

Of the accidents, 119 (or 45.4%) were caused by speeding, 68 (26%) by improper turn, 31 (11.8%) by other violations, and 19 (7.3%) by influence of alcohol.

There were two fatal accidents on SB 101 within the limits of Segment B. One was due to DUI and speeding. The driver lost control of the vehicle causing it to overturn. It was then struck by two other vehicles. The other fatal accident was a broadside type collision, due to failure to yield the right of way to through traffic; the through traffic vehicle was the associated factor in the collision by traveling at an unsafe speed.

**Segment C:** There were 110 accidents in the northbound direction during the 3-year period with a total accident rate of 0.61, lower than the statewide average rate of 1.32 for

similar facilities. Of the accidents, 51 (or 46.4%) were rear end, 35 (31.8%) were hit object and 16 (14.5%) were sideswipe. Speeding was the primary collision factor for 45.5% of all accidents, 22.7% were caused by improper turn, 14.5% by other violations, and 10.9% by influence of alcohol.

There were 129 accidents in the southbound direction during the 3-year period with a total accident rate of 0.71, lower than the statewide average rate of 1.32 for similar facilities.

Of the accidents, 48 (or 37.2%) were hit object type of collision, 47 (36.4%) were rear end, and 26 (20.2%) were sideswipe. Of the accidents, 49 (or 38%) were caused by speeding, 31 (24%) by improper turn, and 23 (17.8%) by other violations.

In general, most of the accidents within the limits of all 3 segments were related to congestion.

## SECTION 5 - ALTERNATIVES

The alternatives under consideration have been analyzed at an equal level of detail and include a No-Build Alternative. As studies progressed, alternatives have been refined to avoid, minimize or mitigate environmental impacts to the greatest extent possible.

Due to the nature of the initial scoping documents and the existing characteristics of the facilities, the build alternatives that have been studied fall into two categories. These categories are "HOV Operational Improvement Alternatives," which applies to all three segments, and "Expressway to Freeway Upgrade Options" which applies only to Segment B.

### 5.1 - Viable Alternatives

#### 5.1.1 - High Occupancy Vehicle (HOV) Lanes:

MTC found, as part of its HOV Master Plan, that Bay Area HOV lanes convey more people during commute times than any of the adjacent mixed-flow lanes. In addition, MTC studies have correlated the presence of HOV lanes to improvements in air quality due to decreased vehicle emissions.

The local community has also expressed its desire to reduce the adverse environmental and societal impacts of building new infrastructure, while acknowledging the need to maximize the efficiency of both the existing transportation system and future transportation improvements. One way of achieving this is to promote HOV modes of travel (such as carpools, vanpools and buses) as preferred alternatives to the single-occupancy vehicle (SOV) traffic. The proposed extension of Marin and Sonoma counties' HOV lane systems is consistent with this concept.

The Traffic Operational Analysis Report indicates that if HOV lanes were constructed, overall traffic delays will be reduced, with HOV users experiencing less delay than the mixed-flow traffic. The report projects that there will still be delay during peak periods,



but much less delay with the build alternative than with the no build. Table 4-3 above summarizes the forecasted delay.

The Preferred Alternative is the Fixed HOV Lane with Access Option 12b. As an operational improvement, this alternative would construct an HOV lane in each direction throughout the project limits. The HOV lane would be contiguous with the adjacent existing mixed flow lanes, separated by a traffic stripe. Outside of posted hours, HOV lanes may be used by all vehicles. This alternative includes operational improvements to the existing on-ramps in Segments A & C (ramp meters and HOV by-pass lanes) as well as installation of other TOS elements. Segment B will be upgraded to access-controlled freeway with new interchanges, frontage roads and bike paths.

- Proposed Engineering Features: Between the US 101/SR 37 Interchange and north of the Atherton Avenue Interchange (Segment A) the existing 6-lane freeway will be widened in the median to provide an additional 3.6 m (12 ft) lane in each direction separated by a concrete barrier and varying-width inside shoulders. The median width from the start of the project to the Atherton Ave IC varies between 6.6 m and 8.8 m (22-28 ft) and will be paved. The median between the Atherton Ave IC and Olompali SHP the median will vary between 8.8 m and 13.6 m (28-44 ft) with 3.0 m (10 ft) minimum paved shoulders and the remainder unpaved.

Between north of the Atherton Avenue Interchange and south of the Lakeville Highway/SR 116 Interchange (Segment B) the existing 4-lane expressway will be substantially reconstructed as a freeway. Existing nonstandard horizontal and vertical curves will be corrected. The Fixed HOV Lane Alternative would result in a six lane freeway, two mixed flow lanes and one HOV in each direction. The typical section would be the same as that proposed for Segment A, except with a constant 6.6 m (22 ft) median.

A new diamond-type interchange is proposed at the Redwood Landfill OC. The existing Petaluma Blvd South Interchange would be reconstructed as a diamond-type interchange.

The proposed horizontal alignment shifts from the existing thru Segment B in order to correct nonstandard curves. The location of the proposed alignment relative to the existing is shown in Table 5-1 below. Approximately 75% of the existing alignment will be reconstructed with new structural section. The remaining portion will be widened similar to Segments A & C.

**Table 5-1. Proposed Alignment Shift in Segment B**

Approximate Location	Approx Station	Proposed Alignment
Begin to Olompali SHP	1368 to 1393	Maintain existing alignment
Olompali SHP to Redwood Landfill OC	1393 to 1408	Shifts easterly up to 27 m (90 ft)
Redwood Landfill OC to Silveira Dairy	1408 to 1417	Shifts westerly up to 21 m (70 ft)
Silveira Dairy to San Antonio Rd	1417 to 1436	Maintain existing alignment
San Antonio Rd to S. Kastania	1436 to 2031*	Shifts westerly up to 79 m (260 ft)
S. Kastania to N. Kastania	2031 to 2039	Shifts easterly up to 21 m (70 ft)
N. Kastania to Petaluma River	2039 to 2052	Shifts westerly up to 34 m (110 ft)
Petaluma River to SR 116	2052 to 2058	Maintain existing alignment

\* Sta Equ 1440+80 BK=2000+00 AK

The proposed vertical alignment will correct nonstandard curves. The locations of the profile corrections are from about 700 m south of the Redwood Landfill OC to about 1000 m north of the OC, from about 200 m south of San Antonio Creek to Ganbini Road and from about S. Kastania Rd to the Petaluma River Bridge. Thru these areas the proposed profile will shift the new roadway up to 8.5 m (28 ft) above or up to 7.3 m (24 ft) below the existing roadway.

Between south of the Lakeville Highway/SR 116 Interchange and north of the Corona Road Overcrossing (Segment C) the existing 4-lane freeway will be widened to provide an additional 3.6 m (12 ft) lane in each direction separated by a concrete barrier and 3.0 m (10 ft) inside shoulders. The majority of the widening will be in the median, with some outside widening. The roadway will be reconstructed at the approaches to the North Petaluma OH to correct the existing nonstandard vertical alignment. The proposed profile will new roadway up to 5.2 m (17 ft) above the existing roadway.

Frontage roads with Class II Bikeways and Class I Bikeways will be constructed through Segment B to provide access to the proposed freeway and thru the corridor. Portions of the existing expressway will be utilized as frontage roads or bikeways. The frontage roads are not continuous through Segment B; they connect existing parcels to the proposed interchanges. The frontage road proposed for the west side of US 101 between Atherton and Olompali SHP ends prior to the park entrance, as requested by park officials. This will allow the park to close their entrance; currently vehicles have to use the park's parking lot after hours to turn around.

Correcting the numerous nonstandard vertical and horizontal curves thru the rolling terrain of Segment B require significant excavations and embankments, up to 63 m (200 ft) high excavations and up to 40 m (130 ft) high embankments. Maximum slopes of 1:2 (V:H) were used, with 1:4 slopes used when the height of the cut/fill was less than 3 m (10 ft). The geotechnical report indicated that the

soils in the area are not highly erodible and that the erosion potential of the proposed excavations and embankments can be mitigated with standard erosion control devices.

Retaining walls are proposed to minimize right-of-way acquisition and accommodate grade changes along proposed sound walls. In Segments A & C, retaining walls are proposed in six locations, four for sound walls and the other two are along the W37-S101 connector ramp and along the SB Lakeville Highway/SR 116 on-ramp. These walls vary in height from 1.2 m to 2.1 m (4 ft to 7 ft). Retaining walls are proposed in Segment B at two locations: on the left side at the Redwood Landfill OC (Access Option 12b only) and on the right side between US 101 and the proposed frontage road, south of the Petaluma Blvd South IC. Wall heights vary from 1.2 m to 4.5 m (4 ft to 15 ft).

A Preliminary Drainage Report was prepared documenting the hydraulic and hydrologic characteristics of the project area and identifying proposed drainage improvements. Generally the existing culverts and drainage features function adequately. Most of the existing drainage systems in Segments A & C can be retained with minor modifications. Most of the drainage systems in Segment B will be replaced due to the realignment or deteriorated materials. Cross culverts were sized to pass design-year flows with a minimum diameter of 0.6 m (24 in) for maintenance.

Preliminary typical sections, aerial layouts, profiles and APS sheets for the preferred alternative are included as Attachment D. The proposed improvements for each segment are summarized in Table 5-2 below.

**Table 5-2. Proposed Project Features**

Locations				Ramps			Freeway			Access			Misc.				
Station to Station		Area		Ramp Metering	HOV bypass	CHP Enforcement	Median Widening	Outside Widening	Rehabilitation	Realignment	New Interchanges	New Frontage Rd's	Bike/Ped Paths	Median Barrier	Noise Barriers	Retaining Walls	Drainage Upgrades
Southern	299+80	to	320+00	SR 37	x	x	x	x	x					x	x	x	x
	320+00	to	335+00	Rowland	x	x	x	x	x					x	x		x
	335+00	to	350+00	DeLong	x	x	x	x	x					x	x		x
	350+00	to	367+80	Atherton	x	x	x	x	x					x	x		x
Central Segment	1367+80	to	1400+00	Olompali						x		x	x	x			x
	1400+00	to	1415+00	Landfill	x	x	x			x	x	x	x	x		x	x
	1415+00	to	1421+00	Dairy						x		x	x	x			x
	1421+00	to	1435+00	San Antonio Rd.					x	x		x	x	x			x
	1435+00	to	2010+00	San Antonio Crk.						x		x	x	x			x
	2010+00	to	2027+00	Gunn Way						x		x	x	x			x
	2027+00	to	2038+00	Kastania					x	x		x	x	x			x
	2038+00	to	2052+00	Petaluma Blvd. S.	x	x	x			x	x	x	x	x		x	x
	2052+00	to	2058+00	Petaluma River						x	x				x		x
Northern	2058+00	to	2070+00	SR116/Lakeville	x	x	x	x	x	x				x	x	x	x
	2070+00	to	2084+00	East Washington IC	x	x	x	x	x	x				x	x	x	x
	2084+00	to	2086+00	Lynch Creek				x	x	x				x	x		x
	2086+00	to	2103+00	N. Petaluma OH							x			x			x
	2103+00	to	2116+00	Corona OC				x	x	x				x			x

- **Nonstandard Mandatory and Advisory Design Features:** The improvements proposed with this project would correct the majority of the existing nonstandard features. However, there are nonstandard features included with the proposed improvements as well as existing nonstandard features that are proposed to remain. Fact Sheets for these nonstandard features were approved on June 27, 2007. A summary of the nonstandard features requiring mandatory or advisory design exceptions is shown in Table 5-3.

**Table 5-3. Exceptions to Mandatory and Advisory Design Standards**

Nonstandard Feature	Type	Existing to Remain	Proposed
Spacing Between Ramp and Local Street Intersections	Mandatory		X
Interchange Spacing	Mandatory	X	
Shoulder Width	Mandatory		X*
Decision Sight Distance (DSD)	Advisory	X	
Superelevation Transition	Advisory	X	
Minimum Grade	Advisory	X	
Side Slope	Advisory		X
Median Width	Advisory		X
DSD at Ramp Intersection	Advisory		X
Outer Separation	Advisory		X

\* point restriction due to OC column

- **Direct Access HOV Ramps:** Preliminary studies for direct HOV ramps were undertaken and local transit authorities were consulted, as discussed in Section 4.2.5 above. The future need for these ramps to connect to park and ride facilities and transit hubs was identified, but fell outside the scope of the MSN Project. Schematic site layouts were completed to ensure that the MSN project would not preclude any future study and development of these direct connectors.
- **Ramp Metering:** Ramp metering is proposed for all of the on-ramps throughout the project limits. This document, however, does not authorize activating the ramp meters. All of these ramps, except the northbound Delong on-ramp, will be widened to provide an HOV bypass lane; The Delong NB on-ramp already has a two-lane section that will be restriped for a bypass lane.

Other Intelligent Transportation System (ITS) elements are proposed to monitor freeway operations and relay real-time information on incidents and travel times to motorists. These ITS elements include closed circuit television cameras (a minimum of 17), changeable message signs (a minimum of four), traffic monitoring stations (a minimum of 33 in each direction) and highway advisory radio system (a minimum of three).

- **CHP Enforcement Areas:** CHP enforcement areas are proposed at the on-ramps with ramp metering described above. Median enforcement areas are not proposed.
- **Park & Ride Facilities:** No new Park and Ride facilities or improvements to existing facilities are proposed with the MSN Project. Although the original scoping documents for this project do not directly address Park & Ride facilities,

preliminary studies were undertaken to include them. A twofold approach was used: 1) Examine existing Park & Ride facilities, both formal and informal, to check their capacity and placement (see "Park and Ride" discussion in Section 3.3.3 above), and 2) Meet with the local transit authorities.

Although communication with the local transit authorities showed that there would be a mutual benefit between each potential Direct Access HOV Ramp location and its associated Park & Ride facility, these facilities fell outside the scope of the current MSN Project. However, the sites were recorded in schematic site layouts for future study and development.

- **Utility Involvement:** Utility location mapping has been completed, utility verification is under way and preliminary conflicts have been identified. Potential conflicts in Segments A and C are minimal and include 3 utility poles in Segment A and 3 utility poles in Segment C. The cost of these relocations, if required, is anticipated to be split 50-50 between the state and the utility company.

The proposed freeway upgrade through Segment B will require a significant number of intricate utility relocations. Potential conflicts in Segment B included about 200 utility poles, 6400 m (21,000 ft) of gas line with diameters varying from 200 mm (8 in) to 400 mm (16 in) and 7000 m (23,000 ft) of 750 mm (30 in) water line. The cost for the gas and water line relocation is anticipated to be paid by the state; the cost of the utility pole relocation is anticipated to be split 50-50 between the state and the utility company. Costs for the potential relocations have been included in the Right-of-Way Data Sheets.

The exact location and condition of the existing facilities will not be determined until positive location (potholing) work has been completed. Any required relocations can be accommodated within the limits of environmental clearance proposed by the EIR/EIS. These facilities will be relocated along the frontage road/bike path system, outside of the ultimate State R/W. No longitudinal encroachments within state R/W are anticipated.

- **Other Owner Involvement:** Water rights are an issue for several parcels within the limits of Segment B, because they currently are provided with water by springs with deeded rights within the State R/W, or by wells that are partially fed by highway drainage that would be eliminated by the project.
- **Railroad Involvement:** The SMART/NWP rail line, which is currently inactive, generally parallels US 101 throughout the project limits. Although no new crossings are being proposed; the majority of the existing structures will require work. This work, summarized in the Proposed Structure Work table (Table5-5), was coordinated with SMART representatives who had no issue with the proposed plans. A revised Construction and Maintenance Agreement will be

required for work within the SMART/NWP R/W. For further information regarding SMART please see Section 4.2.5 above.

- **Highway Planting:** The highway planting for the MSN project consists of three components: replacement planting at the interchanges, on-site revegetation planting as mitigation for native tree loss, and off-site revegetation planting for mitigation.

Replacement planting for this project will be completed under separate contracts, as per Caltrans policy. Each of the Phase 1 projects includes replacement planting as follow-up projects. The total estimated cost for replacement planting and revegetation is \$6.1 million. A breakdown of replacement planting costs and related design for safety items is shown in the project cost estimates.

On-site and off-site revegetation planting within Segment B is required to mitigate the large number of trees proposed to be removed. The mitigation plantings will consist of oaks and other locally native species and be concentrated in areas between mainline US 101 and the proposed frontage roads. The estimated cost for the on-site revegetation is \$3 million and is included in the project construction cost estimate. The estimated cost for the off-site revegetation is \$7 million and is included in the R/W cost estimate.

Replacement planting will be completed to current Caltrans Design Standards up to the maximum allowable cost per hectare. For construction fiscal year 2009/10, the maximum cost for replacement planting with one year of plant establishment is \$91,200 per hectare and \$117,800 with three years of plant establishment, excluding mulch areas, water meters, and Design for Safety elements. Three percent per fiscal year is used for cost escalation.

Segments A & C of the project will include standard replacement highway planting and restoration, with a three-year plant establishment period. Replacement highway planting and restoration will be developed with local community input to ensure context sensitivity and enhancement of the surrounding areas along US 101.

Revegetation through Segment B will consist mainly of a seeded mix of native grasses and shrubs in combination with informal stands of California native plants, including oak tree liners, seedling or acorns. This revegetation will have a maximum one-year plant establishment and should emphasize intermittent, randomly mixed groupings of native shrubs and trees to accentuate the natural state of the corridor. The density of revegetation along proposed bike trails should include more woody plant material to provide both a physical buffer and visual screen between the proposed bike trail and highway. Planting should be timed so that it will occur in the fall, prior to the start of the rainy season, as no irrigation will be provided. Revegetation within the limits of San Antonio Creek

and other natural waterways will include plant materials that are conducive to a Riparian habitat.

All areas of replacement planting and revegetation will be reviewed to see if possible biological mitigation that can be accommodated on-site within the project corridor.

Regional or interregional transportation enhancement funds should be investigated as a source for improving the landscape and roadside elements of the project, including bicycle and non-motorized transportation facilities.

- Erosion Control: Erosion Control Type D will be utilized for temporary disturbed areas and permanent slopes. In addition to Erosion Control Type D, other temporary Best Management Practices (BMPs) will be utilized to minimize the potential for sediment entering adjacent water bodies. The proposed BMPs are described in the Storm Water Data Report (SWDR).

The SWDR identified several locations where Treatment BMPs were found to be feasible. The proposed Treatment BMPs include biofiltration swales and strips, infiltration devices and detention devices. There were not suitable sites within the project limits for enough Treatment BMPs to allow treating 100% of the new and reworked pavement areas; about 56% can be treated. Studies during the final design phase may identify additional locations where Treatment BMPs are feasible.

The cost estimate includes \$6 million for hydromodification; \$1.2 million for Segment A, \$3.9 million for Segment B, and \$900,000 for Segment C. These costs were recommended by the D4 Water Quality unit as probable costs based on their discussions with the regional water quality control board. The specific hydromodification requirements at either the program level or the project level have yet to be determined by the board. Water Quality is working with the various boards within the District to define the hydromodification requirements. This issue will be closely monitored during the final design phase, and has been included as a risk in the Risk Management Plan.

- Noise Barriers: There are no existing State-owned sound walls within the project limits; private sound walls exist at several locations adjacent to the state right of way. A Traffic Noise Impact Report was prepared to document existing noise levels, project future levels and evaluate attenuation measures. The report recommended eight locations where sound walls are feasible to provide the required minimum attenuation, four in the city of Novato and four in the city of Petaluma.

There were locations within the project limits where predicted noise levels were less than 67 dBA and abatement was not considered. These locations are in the



City of Novato and include the residential area between Novato Boulevard and the south end of Redwood Boulevard (existing developer wall) and the residential area with existing earth berms between Orange Avenue and Cherry Street (Orange Avenue area).

There was an area where the predicted noise levels exceeded 67 dBA and sound walls were not proposed. The residences at 5381 Redwood Hwy and 4747 Redwood Hwy are single family homes with predicted noise levels of 69 dBA and 72 dBA, respectively. The Noise Impact Report concluded that it was not feasible to construct sound walls and achieve 5 dBA of attenuation.

A preliminary construction cost for each of the feasible sound walls was determined and compared to the reasonable cost based on FHWA criteria. Six of the eight sound walls met the reasonable cost criteria. The eight feasible sound wall locations were shown at the two public meetings held during the public review period for the Draft EIR/EIS. An additional public meeting was held in the city of Novato to discuss the sound wall locations.

**NADR** A Noise Abatement Decision Report (NADR) was not required for this project due to the date that the noise analysis was completed. However, the issues addressed in a NADR have been addressed for the MSN Project. Feasible sound wall locations were identified with the noise study. Each of these locations was assigned a reasonable cost based on FHWA protocols. A cost estimate was prepared for each location based on terrain and affected utilities.

Proposed sound walls were located along the right of way where feasible. In those areas where the freeway is elevated above the adjacent properties, the sound wall was located at the proposed edge of shoulder to provide effective attenuation. Sound walls proposed for the edge of shoulder accommodate the ultimate roadway section as described in the Transportation Concept Report.

After considering public comments and input from local officials, the Department decided to include seven sound walls in the project. One sound wall was reduced in length because the property owner of the RV Park at the north end of the proposed sound wall did not want the wall. The seven sound walls are listed in Table 5-4 below and shown on the preliminary plans included as Attachment D.

The Department received comments requesting sound walls from residents in the Orange Avenue area, where measured and projected noise levels were less than 67 dBA. Additional existing noise levels were measured and the area modeled again, and measured and projected noise levels were less than 67 dBA. The Department and TAM are currently in discussion regarding funding options. These sound walls are not included in the Phase 1 projects. If funding becomes available, separate environmental clearance would be required to construct the sound walls.

**Table 5-4. Feasible Sound Walls Included With Project**

	Approximate Location	Length	Height	Within Reasonable Cost	Comment
<b>City of Novato</b>					
1.	Right, Manuel Dr to Davidson St (south of DeLong)	200 m (660 ft)	3.7 m (12 ft)	Yes	Along ES on barrier and on OH
2.	Right, Cherry St to Atherton	180 m <sup>(1)</sup> (590 ft)	4.3 m (14 ft)	Yes	Along ES on barrier, length reduced
3.	Left, Harkle Rd to DeLong	500 m <sup>(2)</sup> (1640 ft)	3.7 m (12 ft)	No <sup>(3)</sup>	Along ES and on OH
4.	Left, along Redwood Blvd (south of Rowland)	270 m <sup>(2)</sup> (900 ft)	4.3 m (14 ft)	Yes	Along R/W and on retaining wall
<b>City of Petaluma</b>					
5.	Right, Ponderosa Dr to E. Washington	1760 m <sup>(2)</sup> (5770 ft)	3.7 m (12 ft)	Yes	Along edge of shoulder on barrier
6.	Right, North of Lynch Creek	230 m (750 ft)	4.3 m (14 ft)	Yes	Along edge of shoulder on barrier
7.	Left, E. Washington to n/o Lynch Cr	820 m <sup>(2)</sup> (2690 ft)	3.7 m (12 ft)	Yes	Along edge of shoulder on barrier

- (1) Revised length; original length 480 m (1570 ft)
- (2) portion of sound wall is on retaining wall
- (3) Will be funded with State funds only

One of the eight feasible sound walls will not be included in the project. The estimated cost for the sound wall exceeds the reasonable cost criteria developed by FHWA. Also, neither the City of Petaluma nor local residents expressed a desire to have the sound wall included with the project. The one feasible sound wall that is not proposed to be constructed with the project is listed in Table 5-5 below.

**Table 5-5. Feasible Sound Walls Not Included With Project**

	Approximate Location	Length	Height	Within Reasonable Cost	Comment
<b>City of Petaluma</b>					
1.	Right, Napa Dr to Corona Rd	920 m (3020 ft)	4.3 m (14 ft)	No	Along edge of shoulder on barrier

Noise barriers and other wall features will include aesthetic treatments developed with local community input to ensure context sensitivity. This input will better ensure a design that is aesthetically accepted by the local communities while maintaining an aesthetic integrity of the US 101 corridor.

- Non-Motorized and Pedestrian Features: Segments A & C comprise existing freeway facilities that prohibit non-motorized travel. This project does not propose to change this restriction. Parallel routes on local streets are available for bicyclists and pedestrians. The existing overcrossings accommodate bicycles and pedestrians. There are existing curb ramps along the accessible paths through the

interchanges. No exceptions to the Americans with Disabilities Act (ADA) requirements are anticipated.

Segment B is an existing expressway that currently acts as the non-motorized route between the cities of Novato and Petaluma. Since the preferred alternative proposes to convert the expressway to an access-controlled freeway, thus eliminating the non-motorized route, a replacement route was included in this study. The proposed replacement comprises a series of Class I and II Bikeways that will place the non-motorized facilities outside the ultimate state right of way, while still allowing a continuous route through the corridor. Approximately 2.2 km (1.4 mi) of Class I bikeway and 15.3 km (9.5 mi) of Class II bikeway are proposed. The 15.3 km of Class II includes the frontage roads on both sides of US 101, of which 9.6 km (5.9 mi) combines with the Class I bikeway to provide a non-motorized corridor between Novato and Petaluma. The non-motorized route for the preferred alternative is shown on the aerial layout sheets included as Attachment D.

As part of their EIR, SMART proposes to construct a bike/pedestrian path along the railroad tracks in Segments A and C. The path is proposed to be constructed both within and adjacent to the railroad right-of-way, as described above in Section 4.2.5. Existing at-grade crossings and local streets are being utilized to shift the path from one side of the tracks to the other. Through Segment B, the proposed SMART bikeway would utilize the bikeway proposed with the MSN project. Mapping showing the approximate location of the proposed SMART bikeway through Segments A and C is included as Attachment L.

The Kenilworth School Pedestrian Overcrossing (POC) is an existing structure in Segment C. The school on the west side of the POC has closed and the property is being developed as retail stores. The POC does not meet ADA standards due to the grade of the approach sections and is currently closed. The structure is on the STRAIN list due to the ADA issue. No work on the POC is proposed with the MSN project.

- **Context Sensitive Solutions:** There has been significant local input into the Project's design elements, specifically the development of the Access Options and the frontage road/bikeway network. Local input will be included during the final design of the aesthetic features for the sound walls and retaining walls, as well as landscaping.
- **Needed Roadway Rehabilitation and Upgrading:** According to the MSN Preliminary Materials Recommendation Report, the analysis of the deflection levels shows no need for a hot mix asphalt (HMA) overlay for structural integrity or to alleviate roughness.

An overlay consisting of HMA, gap-graded rubberized HMA (RHMA-G) and open-graded HMA (HMA-O) is recommended to extend the service life of the existing pavement 20 years, control reflective cracking, provide a friction course, and improve wet weather driving conditions. The RHMA-G will be placed from edge of pavement to edge of pavement. The HMA-O will be placed from 0.3 m (1 ft) past edge of traveled way to 0.3 m (1 ft) past edge of traveled way. Replacement of deteriorated sections of pavement (digouts) is also proposed and included in the cost estimate.

A Preliminary Pavement Recommendation was prepared to provide design structural sections. It is included as Attachment F. A Life Cycle Cost Analysis was conducted in December 2007 to evaluate a 40-year pavement design life and a 20-year life. Both performed similarly in the analysis; the 40-year design had an estimated life cycle cost 6% more (\$3.6 million) than the 20-year design. As the projected ADTs were approaching the threshold for the 40-year design, the proposed structural sections for the widening and reconstruction are based on a 40-year design; the structural section for the rehabilitation of the existing pavement, where proposed to remain, is based on a 20-year design.

Proposed pavement structural sections have been developed and coordinated with the District Pavement Strategy Review Committee. The committee's checklist, approved on March 8, 2007, is included as Attachment F. The proposed structural sections for the median and outside widening, and roadway reconstruction are listed in the checklist and shown in the Typical Sections included as Attachment D. The same structural section will be used for the traveled way and shoulders for ease of construction and future expansion. Approximately 114,600 tonnes (126,300 tons) of gap-graded rubberized HMA will be utilized on the project.

The existing roadway through the Rowland Boulevard Interchange is experiencing pavement distress due to poor subgrade soils. It is proposed to reconstruct approximately 150 m (500 ft) of pavement. The subgrade would be excavated to a depth of 3.6 m (12 ft) and backfilled with lightweight fill.

Maintenance vehicle pullouts will be constructed at various locations throughout the project limits. The specific locations will be determined in final design in coordination with Maintenance and Traffic Operations.

The existing shoulders have a thinner structural section than the traffic lanes. As discussed in Section 7.8, Stage Construction, the existing shoulders will only be used for traffic handling if the shoulder will be reconstructed in a subsequent stage of the project. Outside shoulder will not be used for traffic handling in Segment A, but will be used in the Stage 1 median widening of Segment C. Stage 2 construction of Segment C would remove the outside shoulder for the outside widening.

- **Needed Structure Rehabilitation and Upgrading:** The structure work to accommodate the improvements proposed with the Preferred Alternative is shown in Table 5-6 below. Advance Planning Studies (APSs) have been completed for proposed structure work and are included as Attachment D. Several structure types were considered for the replacement of the Petaluma River Bridge, with the precast concrete bulb T type the most economical.

Traditional widening of the Olive Ave UC does not provide adequate falsework clearance. In lieu of closing Olive Ave to vehicle traffic during construction, it is proposed to construct the widening of the single-span structure on raised falsework to provide the required vertical clearance. After construction and falsework removal, the newly constructed portion would be lowered to final grade. This work is not shown on the APS, but the additional cost has been included in current cost estimates.

All of the work identified on the STRAIN report for those structures within the project limits has been included with the structure work proposed with the project except at Corona Rd OC. The STRAIN included upgrading the rails and replacing the deck treatment at the overcrossing. This work has not been included with the project since no other work was proposed for the overcrossing. The cost of the STRAIN work at the OC was minor and could be added during the final design phase.

**Table 5-6. Proposed Structure Work**

Bridge No.	Bridge Name	KP	Type of Work
27 0081H	Ignacio Separation/OH	30.5	Deck treatment with Methacrylate
27 0081F	W37-N101 Connector OH	30.5	Deck treatment with Methacrylate
27 0086K	South Novato Blvd. OC	30.5	Earthquake retrofit of columns and footings
27 0089L/R	Novato Creek	R33.0	Widen in median, replace outside rails
27 0090L/R	Franklin Ave OH	R33.7	Widen in median and outsides, sound wall both sides
27 0092L/R	Olive Ave UC	R34.5	Widen in median, add sound walls on both side Build on raised falsework due to poor clearance
27 0094L/R	North Novato OH	35.9	Widen in median, replace outside rails
27 0115	Redwood Landfill OC	40.8	Widen on left (north) side with options 4b & 12b
NEW	San Antonio OC	42.6	New Overcrossing with options 4b, 14b and 14d
27 C0051	S. San Antonio Creek	N/A	Minor maintenance
NEW	S. San Antonio Creek	N/A	New Bridge for frontage road
20 0019L/R	San Antonio Creek	44.5/0	Remove left Bridge, replace joint seals on right Bridge
NEW	San Antonio Creek	44.5/0	New Bridge for US 101 on new alignment
NEW	Petaluma Blvd S. OC	5.1	New OC with all Access Options
20 0156L/R	South Petaluma UC	5.6	Remove
20 0154L/R	Petaluma River	5.3	Replace on new vertical alignment
20 0155L/R	Route 101/116 SOH	5.8	Widen left Bridge, replace right Bridge
20 0245	Caulfield Lane OC	6.4	Deck treatment with Methacrylate
20 0246	East Washington St OC	7.7	Deck treatment with Methacrylate
20 0163L/R	Washington Creek	7.7	Widen in median and on left & right sides
20 0162L/R	Lynch Creek	8.3	Widen in median and on left & right sides
20 0158L/R	North Petaluma OH	9.3	Replace OH on new vertical alignment

- **Cost Estimate:** The current year construction costs for the preferred alternative are shown in Table 5-7 and do not include support costs. The six-page estimate for the preferred alternative is included as Attachment G. Total construction costs were estimated in July 2008 and are \$429.7 million for the Preferred Alternative.

An independent cost estimate was developed to verify the unit prices used in the construction cost estimate. The independent estimate was within 5% of the project cost estimate. TAM and SCTA have reviewed the cost estimate and their comments incorporated.

**Table 5-7. Estimated 2008 Project Construction Costs**  
(millions)

Alternative	Roadway	Structure	R/W <sup>(1)</sup>	Env <sup>(2)</sup>	Total
<b>Preferred Alternative</b>					
Segment A	\$61.0	\$11.5	\$1.9	\$1.3	\$75.7
Segment B – Access Option 12B	\$166.6	\$35.9	\$41.4	\$19.6	\$263.5
Segment C	\$66.3	\$20.7	\$1.7	\$1.8	\$90.5
<b>Total</b>	<b>\$293.9</b>	<b>\$68.1</b>	<b>\$45.0</b>	<b>\$22.7</b>	<b>\$429.7</b>

<sup>(1)</sup> Includes railroad and utility relocation costs

<sup>(2)</sup> Includes off-site environmental mitigation

The current day estimated construction costs were escalated at 5% per year to FY 11/12, the proposed mid year of Phase 1 construction. The proposed Phase 1 budgeted construction cost was subtracted from the FY 11/12 escalated total estimated construction costs. The remaining capital costs were escalated at 5% per year from FY 11/12 to FY 15/16, the proposed mid year of Phase 2 construction.

Total project costs for the preferred alternative include construction, right-of-way, utility relocations, off-site environmental mitigation, and support costs. Support costs for the PS&E and construction phases were each estimated at 15% of the construction capital costs (roadway and bridge). Support costs for R/W were estimated at 10% of the R/W capital costs (R/W and Environmental mitigation).

The Phase 1 project costs and the unfunded remainder carried forward to Phase 2 are shown in Section 8. The total MSN project costs are shown in Table 5-8 below.

**Table 5-8. Total Project Costs**  
(dollars in millions and escalated)

Segment	Capital				Support				Total
	Roadway	Bridge	R/W	Env	PA&ED	PS&E	R/W	Con	
A	\$77.99	\$15.10	\$2.65	\$1.65	\$7.6	\$14.30	\$0.43	\$13.96	\$133.69
B	\$219.73	\$46.36	\$54.06	\$25.63	\$7.6	\$40.40	\$7.96	\$39.93	\$441.67
C	\$92.48	\$28.87	\$2.37	\$2.51	\$7.6	\$17.52	\$0.49	\$18.20	\$170.04
<b>Total</b>	<b>\$390.208</b>	<b>\$90.33</b>	<b>\$59.08</b>	<b>\$29.80</b>	<b>\$22.80</b>	<b>\$72.22</b>	<b>\$8.88</b>	<b>\$72.09</b>	<b>\$745.4</b>
	<b>\$569.40</b>				<b>\$175.99</b>				

FHWA conducted a cost estimate review (CER) to assess the probability that the actual cost would not exceed the estimated project costs. The CER assigned minimum and maximum ranges for the major items, the unit price and/or the quantity. The CER then performed a Monte Carlo simulation of the potential costs, using all of the ranges assigned to the major items. The results of the

modeling indicate a 70% confidence level that the cost would exceed \$909 million. The major uncertainty effecting costs in the analysis was the escalation year for the Phase 2 construction. A revised cost estimate was submitted to FHWA in July 2008. The Major Project Oversight Agreement, approved by FHWA, Caltrans, TAM and SCTA on August 26, 2008, and included as Attachment M, lists the estimated project cost at \$745 million. Approval of the Major Project Oversight Agreement constitutes approval of the cost estimate.

- **Right of Way Data:** A Right of Way Data Sheet has been prepared for the preferred alternative. The Data Sheet, included as Attachment H, shows the costs to purchase all currently identified needs, including temporary rights, permanent rights, utility relocations, and mitigation land or bank credits.

## 5.2 - Rejected Alternatives

The Reversible HOV Lane Alternative and Access Options 4b, 14b and 14d were included in the Draft Project Report and Draft EIR/EIS but not selected as the preferred alternative.

Several alternatives were considered and rejected during the PID and PA&ED phases. These alternatives were proposed in the original PSR's, developed during the course of study or identified through community interaction. They have been evaluated during the design studies that accompanied the environmental studies. These alternatives, with the concurrence of the PDT, have been set aside from further study and were not included as alternatives in the DEIR/EIS or the DPR. For a more complete description of these rejected alternatives, please see the Draft Project Report or the Final EIR/EIS. The rejected alternatives include the following:

- Reversible HOV Lane Alternative
- Access Options 4b, 14b and 14d in Segment B
- No-Build
- Transportation Systems Management (TSM)
- Reversible HOV Lane in Southern and Northern Segments
- High Occupancy Vehicle Toll (HOT) Lane
- Access Options (except 4b, 12b, 14b & 14d) in Segment B
- Realign West Washington Interchange Ramps

## SECTION 6 - CONSIDERATIONS REQUIRING DISCUSSION

### 6.1 - Hazardous Waste

During the Record Search phase of the February 2006 Hazardous Waste Preliminary Site Investigation, more than 70 sites that are located within or adjacent to the proposed project footprint were identified as known or potential areas of contamination. Twenty-three of these sites are considered to have a medium probability, and two sites are considered to have a high probability that if the site is contaminated with hazardous wastes, those contaminants would be encountered during construction of the project.



One of the high probability sites is the Gas N Shop located at the intersection of US 101 and Kastinia Rd. The State leaking underground storage tank (LUST) database indicates that the aquifer beneath the site is contaminated with MTBE. The groundwater at the site is approximately 2.4 m (8 ft) below the existing ground and flows eastward underneath US 101. Site investigation reports indicate that the groundwater beneath the site, as well as US 101 is contaminated with benzene and MTBE.

The other high probability site is the Novato Disposal Services located on Petaluma Boulevard South. The property is listed as an active LUST site, although documents indicate that the Sonoma County Environmental Health Division and the Regional Water Quality Control Board recommend closing the case.

The Record Search phase did not include any soil or groundwater sampling or testing. It is anticipated that any impacts with the preferred alternative can be mitigated and the report recommends that a Phase I Environmental Site Assessment be conducted for each parcel that requires a partial, or full, right-of-way take.

Although naturally occurring asbestos is not known to be present at the project site, the potential for its existence in the sediments of Novato Creek and San Antonio Creek should be evaluated due to the upstream proximity of ultramafic rocks. In addition, due to the age of the man-made structures throughout the project limits, industrial asbestos could be present and tests should be performed to ascertain its presence prior to any bridge demolition.

Aerially deposited lead (ADL) is known to exist in the surface soils adjacent to the edge of pavement within the project limits. Soil excavated from along the shoulders or median of existing US 101 with the preferred alternative has the potential to be characterized as a California hazardous waste and a detailed site investigation should be completed to determine the concentration of lead in that soil. Based on similar testing on adjacent projects, it is assumed that the levels of lead concentration, once determined, will allow this material to be encapsulated on-site within the proposed roadway embankments. The cost estimates include \$1.6 million for Type Y excavation and \$830,000 for Type Z excavation for handling the material to be encapsulated or hauling and disposal at an approved facility.

Lead-containing traffic markings that are typically characterized as a California hazardous waste were found within the project limits. Any waste material generated by the removal of these yellow thermoplastic and painted traffic stripes is addressed during construction by incorporation of standard special provisions. A cost for handling and disposing of this waste is included in project costs.

## 6.2 - Value Analysis

A formal Value Analysis (VA) was conducted in September 2006. The Value Analysis Report validated the techniques that were utilized throughout the development and winnowing of alternatives by the PDT. In addition, the VA found:

- The project would benefit from coordinating future utility upgrade projects.
- Eliminating the RHMA-O on the shoulders would save costs. The RHMA-O would extend 0.3 m (1 ft) past the edge of traveled way.
- The project will be phased to allow greater flexibility in funding. Early phases of construction should focus on Segment B.
- Numerous Design Suggestions were developed including using a longer bridge at the Petaluma River instead of having to surcharge an embankment, lowering mainline profile at the Redwood Landfill OC, lightweight sound wall on bridges, and lime treating the subgrade.

An implementation meeting was held on January 31, 2007. Comments and decisions from the meeting were incorporated into the final VA Report. Eliminating the RHMA-O on the shoulders and using the longer structure at the Petaluma River Bridge were implemented and incorporated into the preliminary design and cost estimates. Coordinating future utility upgrades will be done with a corridor wide approach so that upgrades will be compatible with the MSN project as well as the individual Phase 1 projects.

### 6.3 - Resource Conservation

The scope of the MSN Project is to reduce recurring congestion through a multi-modal approach and improve traffic safety and vehicular access with the freeway upgrade of the existing expressway. These improvements in operational efficiency would allow the most effective use of limited resources.

The freeway upgrade of Segment B will require a significant amount of new alignment and structural section to be built. However, wherever possible, the existing highway is being utilized as part of the new freeway, frontage road and bikeway system. In addition, ADL-laden soil excavated from along the shoulders or median of existing US 101 has been identified for encapsulation within the proposed roadway embankments. Asphalt grindings will be recycled as aggregate and shoulder backing and rubberized hot mix asphalt will be used in the proposed structural section.

### 6.4 - Right of Way

**General** – Right of Way Data Sheets for the preferred alternative were prepared based on the scope of work described and on maps provided by Design. Estimated cost information is contained in the Right of Way Data Sheets, included as Attachment H.

The majority of work identified within Segments A & C, the existing freeway portions of the project, generally require only temporary rights from the adjacent property owners and local entities for work such as sound walls and pavement conforms on local streets.

The freeway upgrade of Segment B would require the purchase of a significant amount of right of way to provide for the combination of interchanges and frontage roads required to maintain access to intersecting roadways and adjacent parcels, as well as to replace the current bicycle and pedestrian access. In addition ingress/egress rights are needed at two parcels to avoid land-locking a parcel.

The Preferred Alternative requires 71 ha (176 ac) of new right-of-way from 62 parcels. In addition 5.6 ha (13.8 ac) of temporary construction easements (TCEs) are required from an additional 108 parcels. The approximate amount of new right-of-way and temporary easements required for each Segment and the Access Options within Segment B are shown in Table 6-1 below.

In Segment A, new right of way is required for the proposed Rowland Ave NB on-ramp widening. Temporary construction easements are needed for sound wall and structure construction. Access to city streets is required for pavement conforms, via Section 83 of the Streets and Highways Code.

In Segment B, new right of way is required for the proposed freeway and frontage roads. Right-of-way for the frontage roads will be relinquished to the respective county after construction. Temporary construction easements are needed for conforming private roads and driveways.

In Segment C new right-of-way is required along the northbound SR 116 on-ramp for a sound wall and along the southern approach to the North Petaluma OH for embankment slopes. Temporary construction easements are needed for sound wall and structure construction. Access to city streets is required for pavement conforms, via Section 83 of the Streets and Highways Code.

**Table 6-1. Proposed R/W Acquisition and Easements**

Segment	Fee		TCE	
	hectares	acres	hectares	acres
Segment A	0.25	0.63	1.18	2.92
Segment B – Access Option 12b	70.76	174.85	2.88	7.12
Segment C	0.12	0.30	1.53	3.79
Total	71.13	175.78	5.59	13.83

The Relocation Impact Memo determined that there is no significant impact to owners, tenants, businesses or persons in possession of real property to be acquired who would qualify for relocation assistance benefits or entitlements under the Uniform Relocation Assistance and Real Property Act of 1970. One residential unit would be required to relocate as a result of this project. The proposed R/W acquisition will not result in any severed or bisected parcels.

The PDT determined that the proposed project is in an area of high land values, having a potential for future airspace leases, though Marin and Sonoma counties have shown a past

tendency for deterring this type of use through County Plans and the purchase of property rights. If this local inclination changes in the future, then Segments A & C will not have changed the existing conditions, while Segment B proposes to create a County-owned frontage road and bikeway system that will parallel the freeway and could accommodate future airspace leases.

A portion of the Park and Ride lot at the Rowland Blvd Interchange is leased as airspace on weekends. Potential impacts to the airspace lease will be coordinated with R/W Airspace during Final Design so as to allow proper notification times for any tenants.

It is the Departments intention to relinquish the right-of-way to be acquired for the frontage roads and bike paths to the respective county. The Department has informed the counties about its intention regarding the relinquishments. The relinquishment of the frontage road is shown on the Draft Freeway Agreement, which was transmitted to county on 06/26/2009. See Attachment O.

**Railroad** – Improvements are proposed for within SMART/NWP right of way. SMART's consultant verbally notified the Department on November 27, 2006 that the clearances for the overhead work near SMART's tracks are adequate.

**Utilities** – Utility relocations, primarily in Segment B, are required with the proposed improvements. The anticipated relocations in Segment A include 2 joint utility poles and one telephone utility pole. The anticipated relocations in Segment B include about 200 utility poles, 6400 m (21,000 ft) of gas line with diameters varying from 200 mm (8 in) to 400 mm (16 in) and 7000 m (23,000 ft) of 750 mm (30 in) water line. The anticipated relocations in Segment C include 1 joint utility pole and 2 electric utility poles. The cost for the gas and water line relocation is anticipated to be paid by the state; the cost of the utility pole relocation is anticipated to be split 50-50 between the state and the utility company. Costs for the potential relocations, estimated at \$27.92M (\$26.52M for Segment B) have been included in the Right-of-Way Data Sheets.

The facilities in Segment B will be relocated along the frontage road/bike path system, outside of the ultimate State R/W and access control. No longitudinal encroachments within the freeway access control are anticipated. The HQ Utility section has reviewed the project and concurred with the proposed utility relocations. Utility easements will be established along the frontage road right-of-way for installation and maintenance of the utilities.

The locations of the relocated utilities will not be determined until final design, in coordination with the affected utility. At a minimum these utilities will be located outside of the US 101 access control.

As part of the Phase 1 project, some of the utilities will be relocated. Other utilities in conflict with Phase 2 construction will be left in place during Phase 1. Utility Encroachment Exceptions will be obtained for the utilities proposed to be left in place during Phase 1. HQ Utility has reviewed this strategy and concurred.

## 6.5 - Environmental Issues

The Final EIR/EIS has been bound separately, but the approval page and Summary Section have been included as Attachment A.

There are jurisdictional wetlands within the project limits. Wetland impacts in Segments A & C are minor and occur within the Route 101/37 Interchange, the Rowland Blvd Interchange, the Lakeville Highway/SR 116 Interchange, and along Washington and Lynch creeks. There are also wetlands in Segment B. Wetland delineations have been done and reviewed and concurred by the Environmental Protection Agency and the US Army Corps of Engineers. This area, on the east side of US 101 across from Olompali SHP, is a large wetland complex and is where the project's wetland impacts primarily occur. Significantly smaller impacts occur near San Antonio Creek and along the small unnamed creeks and drainages thru the segment. The wetland impacts for the preferred alternative are estimated at 2.2 ha (5.4 ac). Impacts to Other Waters of the US are estimated at 1.4 ha (3.4 ac).

There are several FEMA-designated flood zones within or adjacent to the project limits. No longitudinal encroachments into the existing floodplain are anticipated; revisions to FEMA maps will not be required as a result of the proposed improvements.

This project will replace some existing impervious areas as well as create new impervious areas. The proposed improvements will comply with Caltrans' Statewide National Pollutant Discharge Elimination System (NPDES) permit. A Storm Water Data Report (SWDR) was prepared summarizing the proposed actions for compliance with the permit. The approval page of the SWDR is included as Attachment E. Treatment BMP are proposed including biofiltration strips and swales, and infiltration and detention devices. Dewatering will be required for foundation work around bridges and culverts. The groundwater encountered will be tested for contamination and properly disposed of if necessary.

The environmental issues identified in the EIR/EIS include farmland conversion, riparian and tree removal and visual impacts in Segment B, avoidance of bats and nesting birds, and temporary and permanent loss of habitat for threatened and endangered species (steelhead and Chinook salmon, red-legged frog, and salt marsh harvest mouse).

There are five archeological sites meeting criteria for determination of eligibility that would be impacted by the proposed improvements. A MOU is being prepared to provide a mechanism to recover significant data. Archeological monitoring would be implemented during construction.

A range of mitigation measures have been identified including on- and off-site mitigation planting; off-site wetland restoration or existing bank; acquiring additional red-legged frog habitat; surveying and excluding bats and protected birds from nesting on bridges where work is proposed; pickleweed restoration; storm water treatment; and aesthetic treatments on structures and walls. The costs for these mitigation measures have been included in project cost estimates and are shown in Table 6-2 below.

**Table 6-2. Environmental Mitigation**

Resource	Assumption	Cost	Comment
Trees On-Site	2034 trees	\$3,000,000	Construction capital cost, work to be done as follow-up contract to the roadway contract
Trees Off-Site	4841 trees	\$7,000,000	R/W capital cost, work to be done thru revegetation program
Wetlands	4.27 ha (10.555 ac) @ \$757,130 per acre	\$7,991,507	R/W capital cost, work to be done as a separate contract or acquire credits at existing bank
California Red Legged Frog	83 ha (205 ac) @ \$15,000 per acre, 1:1 ratio	\$3,075,000	R/W capital cost, acquire conservation easements
Salmonids	1.8 ha (4.44 ac) @ \$18,000 per acre	\$79,920	R/W capital cost
Cultural Resource Data Recovery		\$2,500,000	Funded thru A&E for data recovery consultant
Water Quality Treatment		\$6,000,000	Construction capital cost, work to be done as part of roadway contract
Hydromodification		\$6,000,000	Construction capital cost, work to be done as part of roadway contract

Two Biological Opinions were prepared and approved. One was approved by the National Oceanic and Atmospheric Administration (NOAA) Fisheries on January 26, 2009, and the other was approved by the US Fish and Wildlife Service on April 1, 2009.

## 6.6 - Air Quality Conformity

This project conforms to regional air quality standards. The Preferred Alternative is fully compatible with the design concept and scope described in the current Regional Transportation Plan (RTP) as well as the current Federal Regional Transportation Improvement Program (FRTIP). The Congestion Management Agency, TAM and SCTA have determined that it conforms to the State Implementation Plan (SIP) for air quality.

The December 2005 Air Quality Impact Report analysis utilizes a protocol jointly developed by Caltrans and the University of California-Davis Institute of Transportation, and approved by the Environmental Protection Agency for use in the Bay Area.

## 6.7 - Title VI Considerations

The provisions for low-mobility and minority groups will be incorporated into the project. These features will include:

- A series of Class I and II Bikeways will replace the current non-motorized route along the shoulder of the existing expressway between the cities of Novato and Petaluma.
- Curb ramps will be provided at intersections within the State R/W where they currently don't exist and where new sidewalk is being added, or where existing curb ramps don't conform to ADA standards.
- Where sidewalks are being added, a minimum 1.2 m clearance will be provided to obstacles such as electroliers, signal standards, fire hydrants, etc.

The above proposed improvements were designed in accordance with Design Information Bulletin 82-03 "Pedestrian Accessibility Guidelines for Highway projects." These improvements will bring the corridor into conformance with ADA standards.

## **SECTION 7 - OTHER CONSIDERATIONS**

### **7.1 - Public Hearing Process**

Two "open house" style public hearing were held, one on November 6, 2007 in the city of Petaluma and the other on November 14, 2007 in the city of Novato. The meetings were held about mid way through the public comment period for the Draft EIR/EIS. Various displays related to the build alternatives were presented. Project staff and meeting facilitators were present to answer questions and direct members of the public to the appropriate display or staff. Representatives from TAM, SCTA and Caltrans management were also present.

During both public hearings, project staff made a presentation describing the project limits and improvements proposed with each of the build alternatives as well as the next steps in the project and how to submit comments. A court reported was present during the meetings to take verbal comments. Comment cards were also available and the public was encouraged to submit comments.

Many of the comments and opinions received during the meetings involved to proposed right-of-way acquisition in Segment B and the noise levels adjacent to the freeway in segments A and C. A number of people expressed the desire to reduce lane and shoulder width to reduce the project footprint. At the meeting in Petaluma there were a significant number of comments related to the proposed Rainier Road connection to US 101. This is a separate project proposed by the city.

In response to the noise concerns raised by residents in Novato, the city requested Caltrans make a presentation at a city council meeting. On December 10, 2007 project displays were set up before the city council meeting. Project staff was available to answer questions. The vast majority of the questions concerned the noise study and proposed sound wall locations.

## 7.2 - Route Matters

The majority of work identified within Segments A & C will only require widening of the existing facilities that will not change the existing freeway agreements. However, the freeway upgrade of the existing expressway in Segment B will require new agreements.

### 7.2.1 - Freeway Agreements and New Connections:

There are existing freeway agreements covering the MSN project limits. Within Marin County, the agreements cover freeways adopted on April 20, 1944, July 17, 1946 and November 27, 1962. The agreement within the City of Novato was executed on January 24, 1998 and covers from the south city limits to the north city limits. The agreements with Marin County were executed on September 24, 1974 covering from the Novato north city limits to Airport Rd and on July 24, 1944 covering from Airport Rd to the county line.

Within Sonoma County the freeway agreements cover freeways adopted on April 20, 1944 and March 23, 1950. The agreements with Sonoma County were executed on June 8, 1944 covering from the south county line to south of the Petaluma Boulevard South Interchange, and on February 16, 1954 covering from south of the Petaluma Boulevard South Interchange to south of the Lakeville Highway/SR 116 Interchange. The agreement with the City of Petaluma was executed on December 21, 1966 and covers from south of the Lakeville Highway/SR 116 Interchange to north of the Old Redwood Highway Interchange.

Revisions to the existing Freeway Agreements will be required with Marin County, Sonoma County and the Department of State Parks for Segment B as part of the expressway-to-freeway upgrade. These agreements will provide for the relinquishment of the local roads and bicycle facilities that are constructed as part of the project.

Approval from the California Transportation Commission will be required for the new connection for the proposed interchange at the Redwood Landfill OC as part of the expressway to freeway conversion in Segment B.

### 7.2.2 - Route Adoptions:

A Route Adoption is not required for Segment B since the right of way required for the new alignment is substantially contiguous to the existing expressway. In addition, the right of way to be relinquished will contain new frontage roads, not the existing highway.

### 7.2.3 - Relinquishments:

After the project is constructed and access control established the state R/W that contains the frontage roads or Class I bikeway and is outside of access control is proposed to be relinquished to the respective county.



### 7.3 - Permits

A Streambed Alteration Agreement (1602 permit) is required from the Department of Fish and Game for the proposed bridge and box culvert work. An Individual Section 404 permit is required from the US Army Corps of Engineers for fill material in wetland areas. A Section 401 Water Quality Certification is required from the Regional Water Quality Control Board.

The proposed replacement of the Petaluma River Bridge requires a new lease agreement from the State Lands Commission. Because the Petaluma River is navigable at US 101 a Section 9 approval from the US Coast Guard is required for proposed temporary and permanent horizontal and vertical bridge clearance.

### 7.4 - Cooperative Agreements

A Memorandum of Understanding (MOU) has been executed among TAM, SCTA and Caltrans to outline the individual roles/responsibilities for each of the partners, as this project completes the environmental process and proceeds into design and construction. A copy of the MOU is included as Attachment I. Due to the very large scope of the MSN Project, design and construction will occur in smaller elements that will allow for easier funding. Individual cooperative agreements for funding and staff responsibilities have been negotiated utilizing the terms of the completed MOU. Cooperative Agreement Reports have been approved and cooperative agreements executed for the individual Phase 1 projects, as listed in Table 7-1 below.

**Table 7-1. Cooperative Agreements**

Cooperative Agreement #	Project	Status	CAR Approval
04-2210	04-26407, Project B1, Southerly Interchange	Executed September 19, 2008	September 16, 2008
04-2213	04-26408, Project B2, Petaluma Blvd South Interchange	Executed February 29, 2009	February 19, 2009
04-2214	04-26409, Project B3, San Antonio Curve Correction	Executed October 21, 2008	October 20, 2008
04-2215	04-2640C, Project B4, Petaluma River Bridge	Executed March 30, 2009	March 30, 2009

### 7.5 - Other Agreements

There are existing freeway maintenance agreements with the MSN Project limits. The existing agreements are listed in Table 7-2 below. No changes to the existing agreements within the cities of Novato and Petaluma are anticipated.

**Table 7-2. Existing Freeway Maintenance Agreements**

Entity	Date Approved
Marin County	June 16, 1983
City of Novato	July 1, 1980
City of Petaluma	March 12, 1980
Sonoma County	January 12, 1990
City of Novato – Electrical Facilities	March 30, 1993
Golden Gate Bridge, Highway and Transportation District – Electrical Facilities	May 14, 2003
Sonoma County – Traffic Signals and Intersection Lighting	March 11, 1974
Golden Gate Bridge, Highway and Transportation District – Bus Shelters	March 12, 2004

Revised Freeway Maintenance Agreements are anticipated with Marin County, Sonoma County and Department of State Parks to outline their roles/responsibilities with respect to the overcrossings, frontage roads and bike paths required for the freeway upgrade of Segment B. Preliminary meetings have been held with each of these entities. Formal agreement will be finalized during the final design phase.

A Section 134 “long clause” will be required, as well as an Amended Construction and Maintenance Agreement from SMART/NWP Railroad is required for the proposed widening of the Franklin Ave OH, North Novato OH, Route 101/116 SOH (Lt structure) and the replacement of the Route 101/116 SOH (right structure) and the North Petaluma OH.

## 7.6 - Involvement with Navigable Waterways

Consultations with the US Coast Guard and the California State Lands Commission have determined that the Petaluma River is the only navigable waterway within the project limits. This project proposes to replace the existing Petaluma River Bridge. The US Coast Guard has been intrinsically involved with the preliminary bridge design, has agreed to both temporary and permanent preliminary clearances, and is working to ascertain any “special needs” of the local mariners. In a letter from the California State Lands Commission, staff identified additional possible jurisdiction at Lakeville Road and Washington Street, which will be resolved as the design details are developed.

## 7.7 - Transportation Management Plan

A Transportation Management Plan (TMP) will be required for this project. The TMP is a special program that will be implemented during construction to minimize and prevent delay and inconvenience to the traveling public. The proposed construction and improvements may include roadwork requiring lane closures or detouring.

The TMP for the project will be developed and refined during the final design phase, supported by detailed traffic studies to evaluate traffic operations. The need for necessary lane closures during off-peak hours or at night, or short-term detour routes will be identified, as required. The TMP will include press releases to notify and inform motorists, business,

community groups, local entities, emergency services, and politicians of upcoming closures or detours. Various TMP elements such as portable Changeable Message Signs and CHP Construction Zone Enhanced Enforcement Program (COZEEP) may be utilized to alleviate and minimize delay to the traveling public.

A Transportation Management Plan (TMP) Data Sheet has been prepared to identify the significant TMP elements and ensure all anticipated costs are included in this report. The TMP Data Sheet is included as Attachment J.

## 7.8 - Stage Construction

Due to the high-traffic volumes and existing delays, any construction activity on US 101 requires that stage construction be considered to minimize impacts to the traveling public. Preliminary stage construction designs have been completed for all major elements of the proposed MSN Project. Through a multi-stage approach, the existing number of lanes will be maintained throughout construction.

The median widening, primarily in Segments A & C, is proposed to be done in one stage with k-rail on both sides of the median and traffic shifted to the outside. The existing 12' wide lanes would be restriped for 11' lanes. Through the six-lane freeway in Segment A, the restriping would provide room for the k-rail and 1 foot behind the k-rail without impacting the existing outside shoulder. The inside shoulder, however, would be eliminated during median construction.

Through the four-lane freeway in Segment C, traffic would be shifted onto the outside shoulder in order to construct the median. Prior to that shift the outside shoulder would be rehabilitated with digouts, and a cold plane and overlay in order to accommodate the construction traffic loading. Once the median is paved, traffic would be shifted to the median and the outside shoulder removed and the traveled way widened to accommodate the HOV lane.

Significant portions of the Segment B will be reconstructed. Some of this work can be constructed in two stages. Alignments have been developed to allow building portions of the roadway on either side of the existing roadway. One direction of traffic would then be shifted onto the recently build roadway. Other portions of the reconstruction, where the existing alignment is being maintained, will require a three stage construction. The median would be constructed during the first stage, and then used alternately for each direction of traffic while that side is being reconstructed. All of this work would be done behind k-rail, with minimum 0.6 m (2 ft) inside and 3.0 m (10 ft) outside shoulders provided. Temporary retaining walls are required thru some portions where profile correction is proposed. Existing shoulders thru Segment B will not be used for traffic handling unless they are rehabilitated prior to shifting traffic.

Work along the outside shoulder thru portions of Segment A is needed for sound wall construction. This work will be done behind k-rail with shoulder closures after the median

widening is completed. Outside widening is also required in Segment C. This work will be done behind k-rail with traffic shifted to the median to provide an outside shoulder.

The Petaluma River Bridge and North Petaluma OH will be replaced on the existing horizontal alignment but with a raised vertical alignment. Three stages will be utilized; the first stage would use temporary retaining walls to construct the middle portion within the existing median. One direction of traffic would then be routed to the new section, and the outside portion of that direction constructed. Inside and outside shoulder width for traffic on the new section would be 0.6 m (2 ft).

The Petaluma Boulevard South Interchange will be reconstructed from a slip ramp type to a spread diamond type interchange. Also, mainline US 101 is shifting to the west thru the existing interchange. Extensive staging is required to maintain access for the southbound ramps.

The final stage of construction will place the RHMA-G and HMA-O overlay. The placement of this material is temperature sensitive and will be placed during daylight, most likely on weekends, under lane closure. Since only a thin overlay is proposed (60 mm, 0.2 ft of RHMA-G and 30 mm, 0.1 ft of HMA-O), this work will proceed quickly.

The existing traveled way thru the Rowland Boulevard Interchange will be reconstructed to remove poor subgrade soils. The median in the area would be widened first, then traffic shifted to the median and the reconstruction done behind k-rail.

There is insufficient falsework vertical clearance for widening the Olive Ave OC. Instead it is proposed to construct the widening for this single-span, cast-in-place box girder on raised falsework, and then lower into place. This additional work was not included in the APS. The estimated cost has been increased to reflect the additional work. An alternative that could be evaluated during the final design phase is to close the roadway at the overcrossing.

All existing and operational Traffic Operational System (TOS) elements will be maintained throughout the construction phase. Any TOS elements that may be affected by temporary or permanent construction will be relocated, modified or replaced as necessary.

Phase 1 of the MSN construction consist of 4 separate construction projects. Each of these projects will have its own stage construction plans as well as provisions for coordination between the other MSN projects, including traffic handling and materials balancing.

## **7.9 - Accommodation of Oversize Loads**

Upon completion of the MSN Project, all structures within the project limits will meet the minimum clearance for new construction. Existing vertical clearances have been checked throughout the project limits and all of the existing structures meet these minimum clearances, with the exception of the South Novato Boulevard OC, which is planned for a profile correction, and the South Petaluma UC, which is slated for removal as part of this project.

## 7.10 - Graffiti Control

Vines are proposed for sound walls to discourage graffiti. Anti-graffiti coatings were considered, but due to maintenance and storm water issues, were rejected. Maintenance prefers to paint the surfaces to cover graffiti.

## 7.11 – Risk Management Plan

A Risk Management Plan (RMP) has been prepared for the project. The plan has been maintained and updated by the PDT at the regularly schedule PDT meetings. The Risk Management Plan is included as Attachment K.

The major risks included in the RMP concern impacts to the project schedule due to timing of environmental surveys, concurrence from regulatory agencies and the large number of R/W parcels; impacts to project costs due to additional traffic handling requirements, volatile material prices, undefined hydromodification requirements, and contaminated groundwater and aerially deposited lead impacts beyond those included in the project cost estimates.

## SECTION 8 - PROGRAMMING

### 8.1 - Programming

This project is a partially funded STIP project with current programmed funding for portions of the PA&ED Support, PS&E Support, R/W Support, Construction Support, R/W Capital and Construction Capital Components. This current funding comprises multiple programs as shown in Section 8.9 below

Future programming is required for the PS&E Support, R/W Support, Construction Support, R/W Capital and Construction Capital Components of the project. Caltrans has given US 101 priority for the programming of ITIP funds as a High Emphasis Focus Route.

Total project costs for the preferred alternative include construction, right-of-way, utility relocations, off-site environmental mitigation, and support costs. Support costs for the PS&E and construction phases were each estimated at 15% of the construction capital costs (roadway and bridge). Support costs for R/W were estimated at 10% of the R/W capital costs (R/W and Environmental mitigation). The total project costs in current day dollars are shown in Table 8-1 below.

**Table 8-1. Total 2008 Project Costs**  
 (dollars in millions)

Segment	Capital				Support				Total
	Roadway	Bridge	R/W	Env	PA&ED	PS&E	R/W	Con	
A	\$61.0	\$11.5	\$1.9	\$1.3	\$7.6	\$10.88	\$0.32	\$10.88	<b>\$105.37</b>
B	\$166.6	\$35.9	\$41.4	\$19.6	\$7.6	\$30.38	\$6.10	\$30.38	<b>\$337.95</b>
C	\$66.3	\$20.7	\$1.7	\$1.8	\$7.6	\$13.05	\$0.35	\$13.05	<b>\$124.55</b>
	\$293.9	\$68.1	\$45.0	\$22.7	\$22.8	\$54.30	\$6.77	\$54.30	
<b>Total</b>	<b>\$429.7</b>				<b>\$138.17</b>				<b>\$567.87</b>

Construction of the MSN Project is proposed to be phased to match available funding. Based on the currently available funds, five separate projects have been identified. Four of these are funded thru construction and the other two are funded thru final design. The five projects are as follows:

- **Project A1, EA 04-264061:** Construct a NB HOV lane from SR 37 to north of Atherton Avenue and a southbound HOV lane from SR 37 to north of Rowland Blvd; construct an HOV bypass lane and install ramp meters at eight on-ramps in the City of Novato (four northbound and four southbound); construct sound walls at four locations; and install Traffic Operation System elements such as changeable message signs and closed circuit television cameras.
- **Project B1, EA 04-264071:** Convert the existing Redwood Landfill Overcrossing to an interchange by constructing ramps; construct new frontage roads and widen San Antonio Road. These improvements will close 17 access points, including the median crossings at the two San Antonio Road connections.
- **Project B2, EA 04-264081:** Reconstruct the Petaluma Blvd South interchange; construct new frontage roads and widen Kastania Road. These improvements will close 10 access points, including the median crossings at the two Kastania Road connections.
- **Project B3, EA 04-264091:** Realign and reconstruct about 4 km of US 101 at San Antonio Creek; construct the remaining portions of the frontage road and bikeway network. These improvements will close the remaining 10 access points and address the recurring flooding.
- **Project B4, EA 04-2640C1:** Realign and reconstruct US 101 between the Petaluma Blvd Overcrossing and SR 116, including replacing the Petaluma River Bridge and the right bridge of the 101/116 SOH. This project is funded thru final design only.

Phase 1 projects are scheduled to begin construction in late 2010 and early 2011. Total current day project costs were escalated at 5% per year to FY 11/12, the mid year of Phase 1 construction. The total project costs escalated to FY 11/12 are shown in Table 8-2 below.

**Table 8-2. Total FY 11/12 Project Costs**  
 (dollars in millions and escalated)

Segment	Capital				Support				Total
	Roadway	Bridge	R/W	Env	PA&ED	PS&E	R/W	Con	
A	\$74.15	\$13.98	\$2.31	\$1.58	\$7.6	\$13.22	\$0.39	\$13.22	<b>\$126.44</b>
B	\$202.50	\$43.64	\$50.32	\$23.82	\$7.6	\$36.92	\$7.41	\$36.92	<b>\$409.14</b>
C	\$80.59	\$25.16	\$2.07	\$2.19	\$7.6	\$15.86	\$0.43	\$15.86	<b>\$149.75</b>
Total	\$357.24	\$82.78	\$54.70	\$27.59	\$22.8	\$66.00	\$8.23	\$66.00	<b>\$685.34</b>
	<b>\$522.30</b>				<b>\$163.03</b>				

Total project costs for the Phase 1 projects include construction, right-of-way, utility relocations, off-site environmental mitigation, and support costs. The construction support cost was based on 15% of the construction capital costs. For the overall project 15% was used for design support for planning purpose. The design support costs for the Phase 1 projects vary depending on the project. For the A1 project, the PS&E support budget is 10.9% of the construction capital costs, B1 is 13.6%, B2 is 14.0%, and B3 is 10.0%. Project costs were escalated at 5% to FY 11/12. The total project costs for the Phase 1 projects escalated to FY 11/12 are shown in Table 8-3 below.

**Table 8-3. Total FY 11/12 Phase 1 Project Costs**  
 (dollars in millions and escalated)

Project	Capital				Support				Total
	Roadway	Bridge	R/W	Env	PA&ED	PS&E	R/W	Con	
A1	\$48.06	\$6.36	\$0	\$1.10	\$7.6	\$5.92	\$0.11	\$8.16	\$77.31
B1	\$24.71	\$2.93	\$11.66	\$10.42	\$7.6	\$3.76	\$2.21	\$4.15	\$67.44
B2	\$25.50	\$5.77	\$8.06	\$1.13	\$7.6	\$4.38	\$0.92	\$4.69	\$58.05
B3	\$35.55	\$16.50	\$5.27	\$0	\$0	\$5.20	\$0.61	\$7.66	\$70.795
B4	---	---	---	---	\$0	\$4.62	---	---	\$4.62
Total	\$133.82	\$31.56	\$24.99	\$12.65	\$22.8	\$23.88	\$3.85	\$24.66	\$278.21
	\$203.02				\$75.19				

The unfunded FY 11/12 project costs (Table 8-3 subtracted from Table 8-2) are shown in Table 8-4 below.

**Table 8-4. Total FY 11/12 Unfunded Project Costs**  
 (dollars in millions and escalated)

Segment	Capital				Support				Total
	Roadway	Bridge	R/W	Env	PA&ED	PS&E	R/W	Con	
A	\$26.09	\$7.62	\$2.31	\$0.48	\$0	\$7.30	\$0.39	\$5.06	\$49.13
B	\$116.74	\$18.44	\$25.33	\$12.27	\$0	\$23.58	\$3.67	\$20.42	\$220.46
C	\$80.59	\$25.16	\$2.07	\$2.19	\$0	\$11.24	\$0.43	\$15.86	\$137.53
Total	\$223.42	\$51.22	\$29.71	\$14.94	\$0	\$42.12	\$4.38	\$41.34	\$407.13
	\$319.28				\$87.84				

The mid year of construction for the Phase 2 projects was assumed to be FY 15/16. These projects would construct the remainder of the MSN project improvements. The unfunded project costs shown in table were escalated at 3.5% per year to FY 15/16 for Phase 2 costs. The total Phase 2 project costs are shown in Table 8-5 below.

**Table 8-5. Total FY 15/16 Phase 2 Project Costs**  
 (dollars in millions and escalated)

Segment	Capital				Support				Total
	Roadway	Bridge	R/W	Env	PA&ED	PS&E	R/W	Con	
A	\$29.93	\$8.74	\$2.65	\$0.55	\$0	\$8.38	\$0.32	\$5.80	<b>\$56.38</b>
B	\$133.97	\$21.16	\$29.07	\$14.08	\$0	\$27.06	\$4.22	\$23.43	<b>\$252.99</b>
C	\$92.48	\$28.87	\$2.37	\$2.51	\$0	\$12.90	\$0.49	\$18.20	<b>\$157.82</b>
Total	\$256.38	\$58.77	\$34.09	\$17.15	\$0	\$48.34	\$5.02	\$47.44	<b>\$467.19</b>
	<b>\$366.38</b>				<b>\$100.80</b>				

The total MSN project costs (the sum of Tables 8-3 and 8-5) are shown in Table 8-6 below.

**Table 8-6. Total Project Costs**  
 (dollars in millions and escalated)

Segment	Capital				Support				Total
	Roadway	Bridge	R/W	Env	PA&ED	PS&E	R/W	Con	
A	\$77.99	\$15.10	\$2.65	\$1.65	\$7.6	\$14.30	\$0.43	\$13.96	<b>\$133.69</b>
B	\$219.73	\$46.36	\$54.06	\$25.63	\$7.6	\$40.40	\$7.96	\$39.93	<b>\$441.67</b>
C	\$92.48	\$28.87	\$2.37	\$2.51	\$7.6	\$17.52	\$0.49	\$18.20	<b>\$170.04</b>
Total	\$390.208	\$90.33	\$59.08	\$29.80	\$22.80	\$72.22	\$8.88	\$72.09	<b>\$745.4</b>
	<b>\$569.40</b>				<b>\$175.99</b>				

The proposed project schedule for the Phase 1 projects is shown in Table 8.7 below. The schedule is based on starting final design work after selection of the preferred alternative but prior to PA&ED.

**Table 8-7. Proposed Project Schedule**

Milestone	Date
PA&ED	July 2009
PS&E	July 2010
RTL	December 2010
CCA	December 2014

The estimated capital support required for the MSN Project is shown in Table 8-8 below.



**Table 8-8. Proposed Project Support in PYs**

	Prior	06/07	07/08	08/09	09/10	10/11	11/12	Future	Total
Transportation Planning	15	15	10	0	0	0	0	0	<b>40</b>
District Design	19	10	14	36	34	15	11	177	<b>316</b>
Right-of-Way	8	4	4	10	5	0		25	<b>56</b>
District Construction						45	48	182	<b>275</b>
59-DES Design	10	3	2	10	10	5	3	65	<b>108</b>
59-DES Construction						15	15	55	<b>85</b>
<b>Total PYs</b>	<b>52</b>	<b>32</b>	<b>30</b>	<b>56</b>	<b>49</b>	<b>80</b>	<b>77</b>	<b>504</b>	<b>880</b>

## 8.2 - Funding

As mentioned above, the MSN Project is currently partially funded. The current funding sources as well as additional funding needs are shown below in Table 8-9. Funding sources include TCRP, IIP, RIP, Local Measure M, SAFETEA-LU and TEA 21 Demonstration.

**Table 8-9. Project Funding Sources**  
(dollars in thousands and escalated)

Funding Source	Component						Total
	PA&ED	PS&E	R/W Sup	Con Sup	R/W	Con	
CMIA				\$10,200		\$72,200	\$82,400
TCRP	\$5,600	\$13,800					\$19,400
ITIP-IIP	\$14,100	\$400	\$1,660	\$14,460	\$5,270	\$51,050	\$86,940
RIP Marin		\$1,900	\$2,320		\$5,783	\$27,197	\$37,200
RIP Sonoma					\$6,700	\$12,500	\$19,200
SAFETEA-LU HPP Marin					\$11,322		\$11,322
SAFETEA-LU 3763 Marin						\$425	\$425
SAFETEA-LU 3763 Sonoma						\$425	\$425
Demo - Tea 21	\$3,100					\$5,650	\$8,750
Measure M Sonoma		\$7,780	\$919		\$2,065	\$1,433	\$12,197
<b>Available Funding</b>	<b>\$22,800</b>	<b>\$23,880</b>	<b>\$4,899</b>	<b>\$24,660</b>	<b>\$31,140</b>	<b>\$170,880</b>	<b>\$278,259</b>
<b>Future</b>		<b>\$48,340</b>	<b>\$3,971</b>	<b>\$52,920</b>	<b>\$31,460</b>	<b>\$419,321</b>	<b>\$467,141</b>
<b>Total</b>	<b>\$22,800</b>	<b>\$72,220</b>	<b>\$8,870</b>	<b>\$72,100</b>	<b>\$88,880</b>	<b>\$480,530</b>	<b>\$745,400</b>

## SECTION 9 - REVIEWS

The MSN project is a High Profile project, as defined in the Joint Stewardship and Oversight Agreement between FHWA and Caltrans. A Major Project Oversight Agreement for the MSN project was approved on August 26, 2008. The agreement defines the general and project-

specific oversight requirements, as well as including a responsibilities list. The list identifies which agency, FHWA or Caltrans, is has approval authority for specific project activities. The Major Project Oversight Agreement is included as Attachment M.

This project has been reviewed by several FHWA engineers during the development of the proposed improvements. This project is eligible for federal-aid funding.

FHWA was included in the distribution for the review of the Draft Project Report in March 2007. No comments were received. By letter dated October 13, 2006, Gene K. Fong, FHWA Division Administrator, concurred with the project's Purpose and Need and Project Alternatives.

Headquarters personnel have reviewed the project during the development of the proposed features for each alternative and access option. They concur with the proposed improvements. FHWA reviewed the proposed improvements and concurred with the preliminary design.

A review by the District 4 functional units occurred in March, 2007. Their comments have been incorporated. Future constructability and management reviews will occur at the 65% plans and 95% Draft PS&E stages.

As mentioned above in Section 5, FHWA conducted a Cost Estimate Review at the Caltrans District 4 office from April 29 thru May 1, 2008.

FHWA	Lanh Phan Leland Dong
HQ Project Development Coordinator	Mike Thomas
HQ Geometric Reviewers	Gordon Brown Rebecca Mowry J.D. Bamfield
HQ Traffic Reviewer	Phil Jang
Marin County Public Works	Art Brook Kevin McGowan
Sonoma County Public Works	Steve Urbanek Dave Robertson
SMART R/R Engineer	Michael Strider
United States Coast Guard	Jerry Olmes
State Park Superintendent - Olompali SHP	Roy McNamee Tina Williams

## SECTION 10 - PROJECT PERSONNEL

Project Manager	Jit Pandher	Calnet 541 or (510) 286-6425
Design Branch Chief	John Martin, P.E.	Calnet 442 or (530) 225-3476
Design Project Engineer	Robert Nixon, P.E.	Calnet 442 or (530) 225-2787
Environmental Office Chief	Melanie Brent	Calnet 541 or (510) 286-5231
Environmental Branch Chief	Yolanda Rivas	Calnet 542 or (510) 622-1705
Right of Way Branch Chief	Dave Keba	Calnet 541 or (510) 286-5497

## SECTION 11 – ATTACHMENTS

Attachment A	Final EIR/EIS approval page and Summary Section
Attachment B	Location Map
Attachment C	Location Map for Phase 1 Projects
Attachment D	Preliminary Project Plans
Attachment E	PA&ED Storm Water Data Report Cover Sheet
Attachment F	Pavement Strategy Review Committee Checklist and Preliminary Pavement Recommendation
Attachment G	Cost Estimates
Attachment H	Right of Way Data Sheets
Attachment I	MOU
Attachment J	TMP Data Sheets
Attachment K	Risk Management Plan
Attachment L	Proposed SMART Bikeway
Attachment M	Major Project Oversight Agreement
Attachment N	CMIA Amendment
Attachment O	Transmittal Letter- Draft Freeway Agreement