

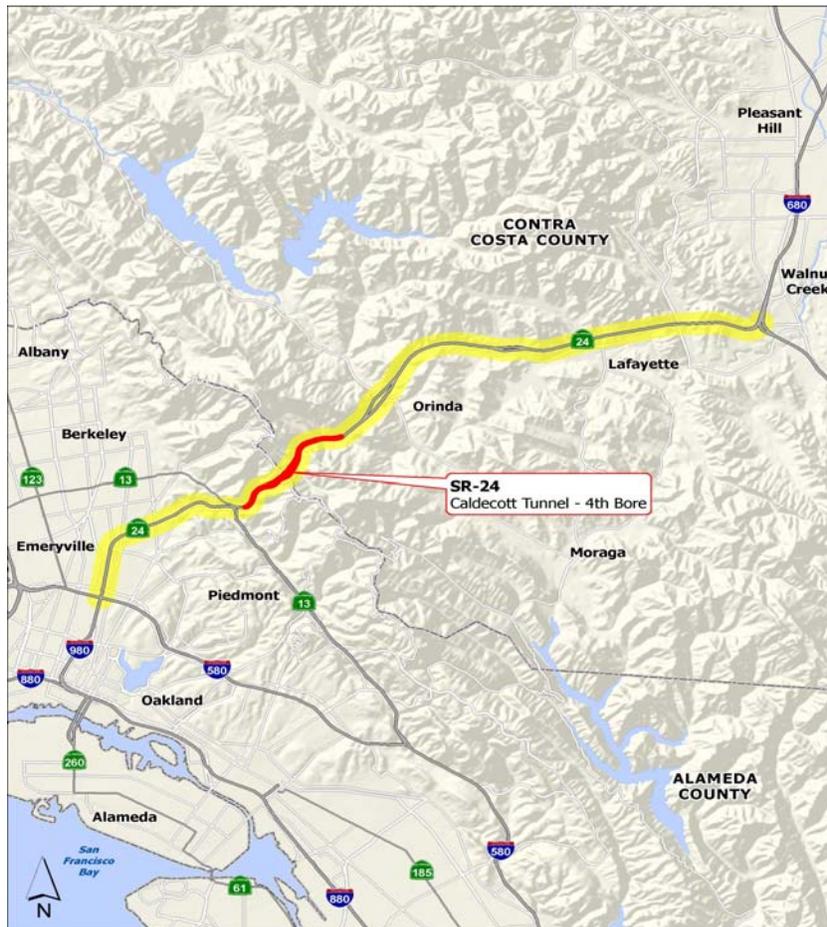
CORRIDOR SYSTEM
MANAGEMENT PLAN

FINAL
8/3/10

STATE ROUTE 24 CSMP SUMMARY

CSMP Corridor Limits

The State Route 24 Corridor in the San Francisco Bay Area is an east/west route beginning at I-580 in the City of Oakland in Alameda County traversing eastward into Contra Costa County and terminating at the SR-24/I-680 Interchange in Walnut Creek.



State Route 24 Corridor System Management Plan

APPROVED BY:



BIJAN SARTIPI,
District 4 Director
California Department of Transportation

8/3/10
Date

I accept this Corridor System Management Plan for the State Route 24 Corridor as a document informing the regional transportation planning process.

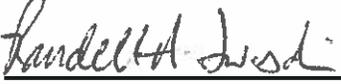
ACCEPTED BY:



STEVE HEMINGER,
Executive Director
Metropolitan Transportation
Commission

7/20/10
Date

ACCEPTED BY:



RANDELL H. IWASAKI,
Executive Director
Contra Costa Transportation Authority

7/29/10
Date

ACCEPTED BY:



DENNIS FAY,
Executive Director
Alameda County Congestion Management
Agency

7-29-10
Date

State Route 24 Corridor System Management Plan

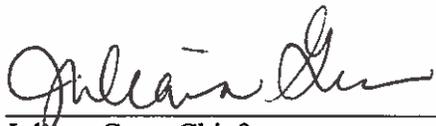
Approval Recommended by:



Lee Taubeneck, Deputy District Director
Division of Transportation Planning & Local Assistance



Katie Benouar, Chief
Office of System Planning



Juliana Gum, Chief
Traffic Operations Strategies

Document Prepared by:



Erik Alm, Chief
Office of System Planning, East Branch



John R. McKenzie, Associate Transportation Planner
Office of System Planning, East Branch

Stakeholder acknowledgement

District 4 wishes to acknowledge the time and contributions of stakeholder groups and partner agencies. Current and continuing Corridor System Management Plan (CSMP) development is dependent upon the close participation and cooperation of all major stakeholders. This CSMP represents a cooperative commitment to develop a corridor management vision for the SR-24 Corridor. The strategies evaluated have the potential to impact the local arterial system and the regional and local planning agencies that have the corridor within their jurisdiction. These representatives participated in the Technical Advisory Committee (TAC) and provided essential information, advice and feedback for the preparation of this CSMP. The stakeholders/partners include:

- Metropolitan Transportation Commission
- Contra Costa Transportation Authority
- Alameda County Congestion Management Agency
- City of Oakland
- City of Berkeley
- City of Orinda
- City of Lafayette
- Town of Moraga
- City of Walnut Creek
- Alameda County
- Contra Costa County
- Association of Bay Area Governments
- Bay Area Air Quality Management District
- Transit Agencies (BART, AC Transit, County Connection)

A website, www.corridormobility.org has been created to support the development of the CSMPs and to provide stakeholders and the public with more information and an opportunity to provide input and review documents.

Disclaimer: The information, opinions, commitments, policies and strategies detailed in this document are those of Caltrans District 4 and do not necessarily represent the information, opinions, commitments, policies and strategies of partner agencies or other organizations identified in this document.

Dedication

To Patricia “Pat” Weston
(1951 - 2009)

Caltrans District 4 Planners dedicate this Corridor System Management Plan (CSMP) to the memory of Pat Weston, Chief, Caltrans Office of Advance System Planning, whose seemingly limitless energy and passion for transportation system planning in California has been an inspiration to countless transportation planners and engineers within Caltrans and its partner agencies. Pat's efforts elevated the importance of corridor-based system planning, performance measurement for system monitoring, and the blending of long-range planning with near-term operational strategies. This has resulted in stronger planning partnerships with Traffic Operations in Caltrans and led directly to the requirement to conduct comprehensive corridor planning through CSMP documents. This is but one of a long list of major achievements in Pat's lengthy Caltrans career. She generously shared her knowledge, wisdom and guidance with us over the years. She will be sorely missed as a planner, mentor and friend.

SR 24 CSMP INTRODUCTION

This Corridor System Management Plan (CSMP) represents a cooperative effort to develop a corridor management vision for the SR-24 Corridor. The CSMP development process involved the Department of Transportation (Caltrans), the Metropolitan Transportation Commission (MTC), Contra Costa Transportation Authority (CCTA) and the Alameda County Congestion Management Agency (ACCMA). This Core Stakeholder Group worked with local planning agencies, through a Technical Advisory Committee (TAC) to develop this plan. The goal is to identify a preliminary set of strategies to achieve the highest mobility benefits to travelers across all jurisdictions and modes along the SR-24 CSMP Corridor. Further evaluation is required to determine the feasibility of implementing the strategies.

Planning and Policy Framework

Since passage of the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act, known as Proposition 1B, in November 2006, Caltrans has implemented the CSMP process statewide for all corridors with projects funded by the Corridor Mobility Improvement Act (CMIA) Program. The California Transportation Commission (CTC) requires that all corridors with a CMIA-funded project have a CSMP that is developed with regional and local partners. The CSMP recommends how the congestion-reduction gains from the CMIA projects will be maintained with supporting system management strategies. The CTC has also provided guidance in the 2008 Regional Transportation Plan (RTP) Guidelines that the CSMPs are an important input to the development of the RTP.

In the San Francisco Bay Area, Caltrans is completing nine CSMPs. This SR-24 CSMP reflects data and projects from MTC's current RTP, *Change in Motion, Transportation 2035 Plan*, adopted April 2009. The CSMP recommends strategies that could potentially become projects through the regional transportation project development and prioritization process. In the San Francisco Bay Area, the CSMP process has taken place in coordination with the MTC's Freeway Performance Initiative (FPI), which provided the performance assessment and technical analysis for the CSMPs.

This CSMP focuses on highway mobility within the context of the State's most congested urban corridors. While the CSMP describes the arterials and other modes in the corridor, the focus of the recommended strategies is on maximizing the existing infrastructure through coordinated application of system management technologies such as ramp metering, coordinated traffic signals, changeable message signs for traveler information and incident management. It describes the current land use, transit, bicycle/pedestrian facilities, and the Focusing Our Vision (FOCUS) regional blueprint Priority Development and Conservation Areas. These are provided as a backdrop for understanding how the highway corridor works.

The SR-24 CSMP

The objectives of the SR-24 CSMP are to reduce delay within the corridor (mobility), reduce variation of travel time (reliability), reduce accident and injury rates (safety), restore lost lane miles (productivity), and reduce distressed lane miles (system preservation).

The limits of the SR-24 CSMP were determined, in collaboration with MTC, by identifying the key travel corridor in which CMIA-funded projects are located. The CMIA-funded project is:

- Caldecott Tunnel Fourth Bore Project

The SR-24 CSMP addresses State Highways, local parallel roadways, the bicycle and pedestrian network, and regional transit services pertinent to corridor mobility. The CSMP also identifies gaps in the bicycle and pedestrian network and regional transit services and discusses opportunities for the future.

The CSMP makes some recommendations for increasing other modal services that can make the highway operate more efficiently, but the main thrust of the strategies is to enable better system management of the highway. By focusing on more efficient operation of the highway network, the CSMP moves toward optimizing current infrastructure, improving our ability to analyze and identify what leads to congestion in a corridor, and strengthening interagency partnerships to ensure that all parts of the transportation system work together well.

Methodology

A corridor performance assessment and technical analysis of the SR-24 CSMP Corridor was conducted through the FPI, a partnership between MTC and Caltrans. The performance assessment evaluated the current highway performance along the corridor and determined causes of performance problems.

Simulation modeling was used to forecast future travel conditions along the corridor. Traffic analysis methods were used to identify bottlenecks and to predict the impacts of a variety of operational strategies and investment scenarios. The simulation model was limited to analysis of throughput lanes at each freeway interchange and could not feasibly model the diversion effects outside of their impacts on the surface streets in the immediate vicinity of each interchange.

The comprehensive corridor analysis results consisting of existing and future traffic conditions were first discussed at the TAC in January 2009. The TAC met at regular intervals to provide further input on conclusions and recommendations for short and long-term corridor management improvement strategies.

The proposed short-term and long-term improvement strategies include:

Intelligent Transportation System (ITS) improvements	Extend and Construct Auxiliary Lanes
Corridor-wide ramp metering	Additional transit improvements
Construct High Occupancy Vehicle (HOV) lanes	Travel Demand Management (TDM) Improvements

First Generation CSMP

This CSMP represents the “*first generation*” of corridor system management plans informing the transportation planning process. This CSMP identifies corridor management strategies applied on a network wide basis. The selected strategies address existing and forecasted mobility, lost productivity, bottlenecks, and reliability problems. The CSMP recognizes that transit services and goods movement are also adversely affected by the same problems. To implement some of these strategies, key capital projects are identified. This list is not meant to be inclusive of all potential projects in the corridor. The CSMP builds upon the capital project recommendations of the Southwest Area Transportation (SWAT) Action Plan, the SR-24 Transit Capacity Study, the 2009 Contra Costa Countywide Transportation Plan and the 2009 MTC RTP (*T2035*). These recommendations add system management and other strategies to provide additional benefit and efficiencies.

Since Caltrans and the regions launched this first cycle of corridor system management planning in 2007 (called *first generation CSMPs*), the statewide planning policy context has evolved significantly. Assembly Bill (AB) 32 policy on reducing greenhouse gas emissions has moved into implementation with passage of Senate Bill (SB) 375, landmark legislation requiring the regions to meet state-designated greenhouse gas emissions reduction targets. The CTC has developed guidance on how the regions will develop a Sustainable Community Strategy (SCS) in their next RTP cycle; MTC’s next RTP is slated for completion in 2013. The SCS will promote strategies to reduce green house gas emissions through more

efficient land use patterns, reduce vehicle travel, support transit, bicycle and pedestrian mode choices, and improve supply and affordability of housing within the Bay Area to reduce commuting into the region.

The *second generation CSMPs* will reflect the SCS and the 2013 RTP, and will grapple with the issue of providing mobility and reducing highway congestion within the context of a new regional planning framework. The *second generation CSMP* scope will expand to include integrated land-use and transportation, in the context of SCS required by SB 375, and a more comprehensive look at transit and non-motorized travel strategies and options.

Stakeholder Issues and Concerns

Stakeholder concerns following the CSMP development process focused on SB 375 requirements, CSMP analysis scope, potential impacts to the local arterial network, and preservation of regional gateways. Stakeholders had concerns that recommended improvements in the CSMP do not emerge from a multi-modal and integrated transportation land use planning effort, such as integrating transit, bicycle and pedestrian networks, and demand management. Local jurisdictions point out impacts of poor freeway performance to the local jurisdictions stretch far beyond the Corridor limits. Local jurisdictions want to improve circulation on the local streets without attracting regional and interregional cut-through traffic from the freeway. A policy of preserving regional gateways at the Caldecott Tunnel and near I-680 reinforce concerns of access for local travelers. This represents a summary of the issues and concerns shared by Stakeholders during the CSMP External Review Process; a more detailed discussion of Stakeholder issues and concerns are located in Section 1.16 of the CSMP Overview.

CSMP Document

The SR-24 CSMP document is organized into three key volumes. The CSMP Summary serves as a stand-alone document and provides corridor facts and description summaries, key findings and recommended improvements from the technical analysis. The main CSMP document provides the CSMP Overview, Corridor Description, technical analysis memorandum and recommendations. The Appendix contains information about corridor segments, freeway agreements, CMIA projects, maintenance plans, and corridor concept. Within the main CSMP document, the CSMP Overview describes the CSMP purpose and need, consistency and relationship to other plans, the CSMP stakeholder engagement process and the CSMP performance measures and objectives. The CSMP Corridor Description contains a more detailed description of the corridor and its significance within the highway system and other modal systems. The CSMP technical analysis reports present existing and future conditions and trends, corridor management issues and strategies, and a prioritized list of short and long term recommendations based on these analysis.

The SR-24 Corridor system will be regularly monitored using identified performance measures and Traffic Operations Systems (TOS) data, and will be reported in subsequent CSMP updates. This information will be used to continually improve system performance. As discussed above, new strategies may emerge as the SCS is implemented to reflect new development and travel patterns that impact the operations of the highway corridor.

SR-24 CSMP SUMMARY CONTENTS

1. SR-24 CSMP Corridor Facts / Segment Data Summary
2. CSMP Overview
3. Corridor Description
4. Comprehensive Corridor Performance Assessment
5. Recommended Corridor Management Improvement Strategies

1. SR-24 CSMP Corridor Facts

Corridor Limits: I-580 interchange in Oakland/Alameda County to I-680 interchange in Walnut Creek/Contra Costa County

Corridor Description: SR-24 traverses Alameda and Contra Costa Counties. The Alameda County portion is approximately 6.24 miles long beginning at I-580 in Oakland, crossing SR-13 before ending at the Alameda-Contra Costa County line. The Contra Costa portion is approximately 9.14 miles long beginning at the Alameda-Contra Costa County line and ending at I-680 in Walnut Creek

Route Designation & Regional Setting:

Functional Classification	Urban Principal Arterial - Fwy
Designations	STAA Route: Yes Terminal Access Route: Yes SHELL Route: No
IRRS	No
Lifeline	Yes
MPO	MTC
Air Quality District	BAAQMD
Average Mode Split	SOV: 66.62%, HOVL 8.8%, Transit: 13.57%, Walk 1.7%, Other: 1.9%, Tele: 6.9%

Multi-Modal Service: BART is the primary transit provider. Additional express and local bus service is provided by Alameda Contra-Costa (AC) Transit, and Contra Costa County Transit Authority (CCCTA).

Interregional Significance: SR -24 provides a regional connection between Contra Costa and Alameda counties. The Caldecott Tunnel functions as a regional gateway between I-680 to the east and I-80 and I-580 and I-980 to the west.

Corridor Specific Issues:

- Regional connector between Alameda and Contra Costa Counties.
- Caldecott Tunnel functions as a regional gateway.
- Designated as a Scenic Highway.
- Entire corridor is served by BART.

Corridor Objectives:

- Reduce reoccurring delay within the corridor
- Reduce variation of travel time
- Improve connectivity between modes
- Reduce distressed lane miles
- Reduce accident and injury rate

PERFORMANCE MEASURES	DESIRED OUTCOME
Mobility	Reduce Delay in Corridor
Reliability	Reduce Travel Time Variation
Safety	Reduce Number of Accidents

Current Performance:

Top 3 Congested Locations

Location	VHD
CC 24 Old Tunnel Rd. - Fish Ranch Rd. (EB) PM	2,512
CC 24 Old Tunnel Rd. - Fish Ranch Rd. (EB) AM	1,769
CC 24 Old Tunnel Rd. - Fish Ranch Rd. (WB) PM	961

Key Bottlenecks:

Route / Location / Direction	AM/PM
CC 24 Claremont Ave. to I-580 Off. (WB)	AM
CC 24 Deer Hill Rd. - Acalanes Rd. (WB)	AM
CC 24 Camino Pablo - Gateway Blvd / Wilder Rd. (WB)	AM
CC 24 Old Tunnel Rd. - Fish Ranch Rd. (EB)	PM
CC 24 Fish Ranch Rd. to Old Tunnel Rd. (WB)	PM

Recommended Corridor Management Strategies:

Near-Term (2015)

- Deploy ITS technologies on SR-24 throughout Alameda and Contra Costa Counties.
- Address existing and projected bottlenecks by implementing transportation management & capacity enhancement strategies WB between I-680 and the Caldecott Tunnel.
- Address existing and projected bottlenecks by implementing transportation management & capacity enhancement strategies EB between I-580 and the Caldecott Tunnel.
- Address existing and projected bottlenecks by implementing transportation management & capacity enhancement strategies EB between I-680 and St. Stephens Drive.
- Address gaps in Ramp Metering on EB SR-24 between the Caldecott Tunnel and St. Stephens Dr.
- Implement transit enhancement strategies in the SR-24 Corridor BART parking capacity, bus feeder service and expanded Park & Ride.

Long-Term (2030)

- Continue to implement transit enhancement strategies in the SR-24 Corridor.
- Implement Ramp Metering from the Caldecott Tunnel to I-580 and I-980 to I-88

**Corridor System Management Plan
State Route 24
Segment Data Summary**

CSMP Seg.	CO/RTE/PM	VHD (AM/PM)		Westbound Volumes		Eastbound Volumes		AADT (2007)	Truck %	Accident Rate (Actual / Statewide Average)		AUX	Bottleneck Location (AM/PM)	
		AM	PM	2007	2030	2007	2030			Actual	Average		EB	WB
A	ALA - 24 -1.8 - 5.12	209 (WB)		7,032	8,266	7,964	9,781	137,000	2.79	0.19	0.26	X		AM
B	ALA - 24 - 5.12 - 5.92		2512 (EB)		8,803	10,606	8,197	10,458	158,000	2.26	0.43	0.31	X	PM
C	ALA - 24 - 5.972 - 6.24	1769 (EB)	961 (WB)	8,803	10,606	8,182	10,631	160,000	2.26	0.33	0.39		AM	PM
D	ALA - 24 - 6.24CC - 24 - 0.00 - 0.346			8,803	10,606	8,182	10,631	167,000	2.50	0.08	0.36		AM	PM
E	CC - 24 -0.346 - 2.31	101 (WB)		9,343	11,233	8,390	10,916	169,000	2.50	0.23	0.28	X		AM
F	CC - 24 - 2.31 - 4.40	322 (WB)		9,203	11,765	8,696	11,013	169,000	2.50	0.11	0.26	X		AM
G	CC - 24 - 4.40 - 9.15				9,328	12,877	8,874	11,340	188,000	3.50	0.16	0.31	X	

Sources:

CO/RTE/PM: CSMP segmentation modified from 2002 TCCR segments.
VHD: SR-24 Final Existing Conditions Technical Memorandum. PBS&J February 17, 2009.
Volumes: SR-24 Final Future Conditions Technical Memorandum. PBS&J July 17, 2009.
AADT: <http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/>
Truck %: <http://www.dot.ca.gov/hq/traffops/saferesr/trafdata/>
Accident Rate: TASAS Table B

2. CSMP Overview

A CSMP is a transportation planning document that provides for the safe, efficient and effective mobility of people and goods within the most congested transportation corridors. Each CSMP presents an analysis of existing and future traffic conditions and proposes traffic management strategies and capital improvements to maintain and enhance mobility within each corridor. The corridor management planning strategy is based on the integration of system planning and system management. Each CSMP will address State Highways, local parallel roadways, regional transit services, and other regional modes pertinent to corridor mobility.

CSMPs are being developed throughout the State for corridors within which funding is being used from the CMIA and Highway 99 Bond Programs created by the passage of the Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006, approved by the voters as Proposition 1B in November 2006. The intent is to eventually develop CSMPs for all urban freeway corridors.

The CSMP transportation network is defined to include, but is not limited to, State Highways, major arterials, intercity and regional rail service, regional transit services, and regional bicycle facilities. However, the focus of this first generation of CSMPs is on highway mobility issues.

Purpose & Need Statement

The immediate purpose of preparing CSMPs is to satisfy the requirements to qualify for funding highway improvements under the CMIA and Highway 99 Bond programs, and to preserve the mobility gains of highway improvements funded through this program. The California Transportation Commission (CTC) adopted guidelines and a program of projects for funding. CSMPs are prepared based on the need to efficiently and effectively use all transportation modes and facilities in congested corridors so as to maximize mobility, improve safety and reduce delay costs.

Consistency with Strategic Growth Plan

CSMPs support the Governor's Strategic Growth Plan (SGP), which calls for an infrastructure improvement program that includes a major transportation component (GoCalifornia). The CMIA and other elements of the November 2006 transportation infrastructure bond are a down payment toward funding the most important of these infrastructure needs. The objectives of these investments are to decrease congestion, improve travel times and safety, and accommodate expected growth in the population and economy. The SGP is based on the premise that investments in mobility throughout the system will yield significant improvements in congestion relief.

The philosophy of system management is to make the most effective use of the transportation system. The system management pyramid represents a comprehensive range of strategies to improve mobility within a transportation corridor. It includes system monitoring at its base, followed by maintenance, smart land use, technology and operational strategies, and traditional system expansion. Simply put, the value of any investment decision made higher up in the pyramid is limited without a good foundation from the strategies below.



CSMP Performance Measures

Caltrans worked with stakeholders to develop performance measures that together serve to focus directed action on desired corridor strategies and improvements. Performance Measures are illustrated in Table 1 below and were used in discussions with stakeholders.

Performance Measure	Performance Measure Description	Objective Desired Outcome
Mobility	Vehicle Hour of Delay (PeMS*, Probe Vehicles)	Reduce delay within the corridor
Reliability	Travel Time (PeMS, Buffer Index)	Reduce variation of travel time
Safety	TASAS** Data	Reduce accident and injury rate

Table 1. CSMP Performance Measures.

*Freeway Performance Measurement System **Traffic Accident Surveillance Analysis System

Relationship to Other Plans

A number of Caltrans system planning documents were used as the foundation for the preparation of the CSMP. These included the 2005 *California Transportation Plan (CTP)*, and the 1998 *Interregional Transportation Strategic Plan (ITSP)*. Also, a number of related Caltrans system management documents were used including the 2006 *Strategic Growth Plan (SGP)*, 2004 *Transportation Management System Master Plan (TMSMP)*, and the 2004 *California ITS Architecture and System Plan (SWITSA)*.

System and regional planning documents prepared by other agencies that influence CSMP development included the 2009 *RTP (T2035)* and the 2004 *Bay Area Regional ITS Plan*.

Most notably, the MTC FPI, a regional program, has influenced corridor-level performance-based decision making for the 2009 RTP (*T2035*). Important documents in this effort are the 2007 *FPI Performance & Analysis Framework* and the 2007 *FPI Prioritization Framework*. The FPI corridor-specific documents are noted below:

US-101 North (MRN/SON)	I-580 East (ALA)	I-880 (ALA/SCL)	I-680 North (ALA/CC)
US-101 Peninsula/South (SM/SCL)	SR-4 (CC)	I-80 East (SOL)	I-680 South (ALA/SCL)

Stakeholder Engagement

Current and continuing CSMP development is dependent upon the close participation and cooperation of all major stakeholders. The strategies evaluated have the potential to impact the local arterial system, the transit service along the corridor, and the regional and local planning agencies within the corridor. The goal of the stakeholder engagement process is consensus among key stakeholder groups to develop the CSMP. The CSMP follows a work plan unique to the needs of the CSMP Corridor and identified stakeholders. Each stakeholder category group has a role during the CSMP development process. The Core Stakeholder Group provides policy and technical guidance throughout the process. Additional planning agency partners review and comment at key junctures through the corridor TAC to provide additional guidance and help evaluate corridor improvement strategies.

The stakeholder engagement process framework for the current CSMP considered stakeholders in two key categories:

- I. Core Stakeholder Group: Agencies primarily responsible for conducting planning efforts on behalf of the corridor.
- II. Planning Agency Partners: Additional agencies responsible for implementing and monitoring CSMP strategies.

District 4 CSMP Overview

Caltrans and MTC are committed to assist each other in the development of CSMPs and MTC's related FPI corridor studies. This cooperation is documented in MTC Resolutions 3792 and 3794. For the San Francisco Bay Area, Caltrans District 4, nine CSMPs are being developed. Figure 1 illustrates the nine CSMPs being developed for the San Francisco Bay Area:

US-101 North (MRN/SON)	I-580 East (ALA)
US-101 Peninsula/South (SM/SCL)	SR-4 (CC)
I-880 (ALA/SCL)	SR-24 (ALA/CC)
I-80 West (ALA/CC)	SR-12 (NAP/SOL)
I-80 East (SOL)	

The SR-24 CSMP

This CSMP represents a cooperative commitment to developing a corridor management vision for the SR-24 Corridor. The CSMP development process is a joint effort of Caltrans, MTC, and the Congestion Management Agencies for Contra Costa and Alameda Counties (CCTA and ACCMA). This Core Stakeholder Group is working with local planning agencies, through a TAC. The goal is to achieve the highest mobility benefits to travelers across all jurisdictions and modes along the SR-24 CSMP Corridor.

The SR-24 CSMP addresses State Highways, local parallel roadways/major arterials, the bicycle and pedestrian network, and regional transit services pertinent to corridor mobility. The CSMP also identifies gaps in the bicycle and pedestrian network and regional transit services.

The limits of the SR-24 CSMP were determined, in collaboration with MTC, by identifying the key travel corridor segments in which the CMIA-funded project is located. Figure 2 illustrates the SR-24 corridor limits and the scope of the CMIA-funded SR-24 Caldecott Tunnel Fourth Bore project.



District 4 CSMP Corridors



Figure 1. District 4 CSMP Corridors.

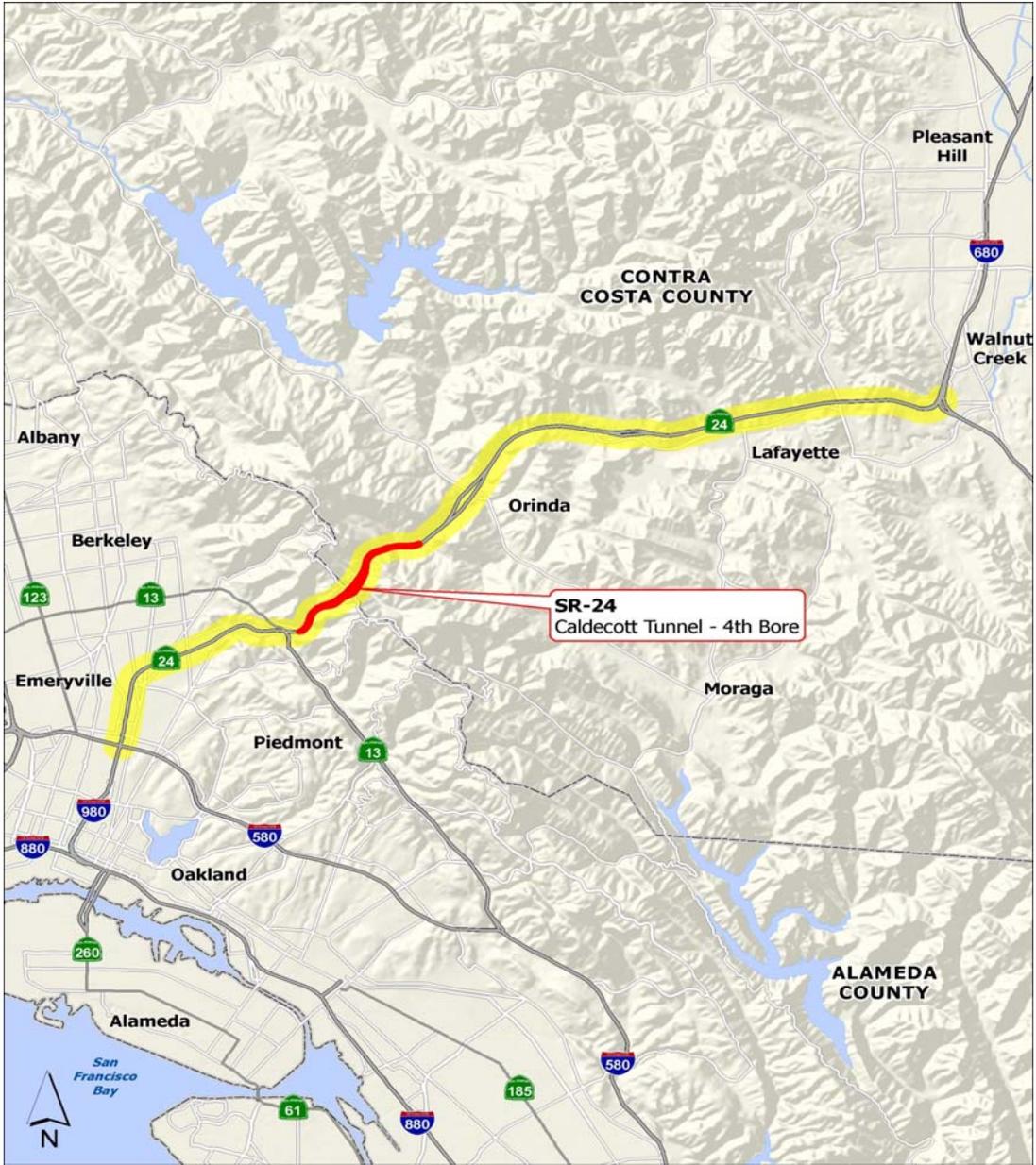


Figure 2. SR-24 CSMP Corridor Limits & CMIA Projects.

SR 24 CSMP Corridor Team

The Core Stakeholder Group for the SR-24 CSMP Corridor is identified as Caltrans, MTC, CCTA, and ACCMA. Representatives met early in the CSMP development process to discuss its goals, objectives and schedule. This group met regularly to review and approve operational and simulation data collection and analysis methodology, technical reports, and identified additional planning agency partners for further CSMP development. This Stakeholder Group and key planning agency partners along the corridor met as a TAC at regular intervals, providing valuable input on the analysis and recommended improvement strategies for the SR-24 CSMP Corridor. The key stakeholders listed below were identified for involvement in the engagement process.

Key Stakeholders

Core Stakeholder Group

- Caltrans
- Metropolitan Transportation Commission
- Contra Costa County Transportation Authority
- Alameda County Congestion Management Agency

Additional Planning Agency Partners

- Alameda County Transportation Improvement Authority (ACTIA)
- Alameda County
- City of Oakland
- City of Berkeley
- City of Orinda
- City of Lafayette
- Town of Moraga
- City of Walnut Creek
- Contra Costa County
- Transportation Partnership and Cooperation Committee (TRANSPAC)
- Southwest Area Transportation Committee (SWAT)
- Association of Bay Area Governments (ABAG)
- Bay Area Air Quality Management District (BAAQMD)
- Transit Agencies (BART, AC Transit, County Connection)

3. Corridor Description

Named the William B. Rumford Freeway, SR-24 is a traversable east-west route providing interregional travel between Contra Costa and Alameda counties for commute, recreational and commercial traffic. It serves a significant level of demand from the cities surrounding and located along the corridor such as Berkeley, Lafayette, Moraga, Oakland, Orinda, and Walnut Creek.

The SR-24 CSMP Corridor is characterized best by the Caldecott Tunnel which functions as a regional gateway between Alameda and Contra Costa counties. The corridor begins at the I-580/I-980 interchange and traverses eastward on elevated structures through the city of Oakland until reaching SR-13 and the Caldecott Tunnel. East of the Caldecott Tunnel SR-24 is a designated Scenic Route until it ends at I-680 in Walnut Creek.

The SR-24 CSMP Corridor is part of the Lifeline Program Network designed to improve the mobility of low-income bay area residents with improvements in transit service. SR-24 is functionally classified as both an Urban Principal Arterial and as expressway-freeway due to access changes along its 15 mile stretch. The lane configuration varies between six to eight lanes with two additional reversible lanes through the Caldecott Tunnel.

Major Arterials

There is an extensive network of arterial roadways and local streets that provide access to SR-24 and serve local travel throughout the corridor. These include Ashby Ave. (SR-13) in Berkeley, Camino Pablo/San Pablo Dam Rd. in Orinda, Moraga Rd. in Moraga, and Pleasant Hill Rd. in Lafayette.

Goods Movement

The SR 24 corridor serves local and intercity truck and heavy vehicle travel for surrounding communities such as Berkeley, Oakland, Walnut Creek, and the Lamorinda area. Additionally, it serves truck and heavy vehicle travel between the San Francisco/Oakland area to locations in Central and Eastern Contra Costa Counties along SR-4 such as Concord, Pittsburg, Antioch and Brentwood. Truck and heavy vehicle traffic makes up two to three percent of daily vehicle trips along the SR-24 corridor. There are truck restrictions on the SR-24 corridor through the Caldecott Tunnel (PM 4.04 – 4.70). Within this segment, the transport of explosives, flammables, liquefied petroleum gas or poisonous gas in tanker trucks, trailers or semitrailers are only permitted during the hours of 3:00 AM to 5:00 AM.

Transit

The SR-24 CSMP Corridor includes regional rail between Alameda and Contra Costa Counties, express and local bus service within Contra Costa and Alameda Counties (specifically Oakland, Berkeley, Moraga, Orinda, Lafayette and Walnut Creek). The major providers are AC Transit, Bay Area Rapid Transit District (BART) and Contra Costa County Connection. The California Public Utilities Commission (PUC) requires that transit operators work together cooperatively to address service issues that cross service boundaries. This includes transit operators dropping off passengers at BART stations.

Bicycle and Pedestrian Network

The SR-24 CSMP Corridor allows bicycle shoulder access between Fish Ranch Rd. and Camino Pablo Way, but no pedestrian access. On the remaining segments of SR-24 bicyclists and pedestrians may traverse or travel parallel to SR-24 using local arterials furnishing access to local job centers, shopping centers, K-12 schools, colleges and transit stations. Bicycle facility types include Class I (multi-use), Class II (bicycle lane) and Class III (bicycle route). BART stations and Park and Ride lots within the corridor have bicycle parking and storage facilities. Pedestrian walkways provide access across SR-24 at Gateway Blvd./ Wilder Rd., Camino Pablo, Acalanes and Pleasant Hill Rd. in Orinda and Lafayette.

Intelligent Transportation System (ITS) and Detection

Current ITS infrastructure on the SR-24 CSMP Corridor includes Ramp Metering (RM) stations, Traffic Monitoring Stations (TMS), Wireless Magnetometer Vehicle Detection Stations, Changeable Message Signs (CMS), Highway Advisory Radio (HAR), Extinguishable Message Signs (EMS), and Closed-Circuit Television (CCTV) cameras. Caltrans strives for traffic detection to be located at one-third to one half-mile intervals along the corridor. This has recently been achieved with the filling of a key gap in the detection network between I-580 and the Alameda/Contra Costa County line. Figure 3 illustrates the TMS along the SR-24 CSMP Corridor.

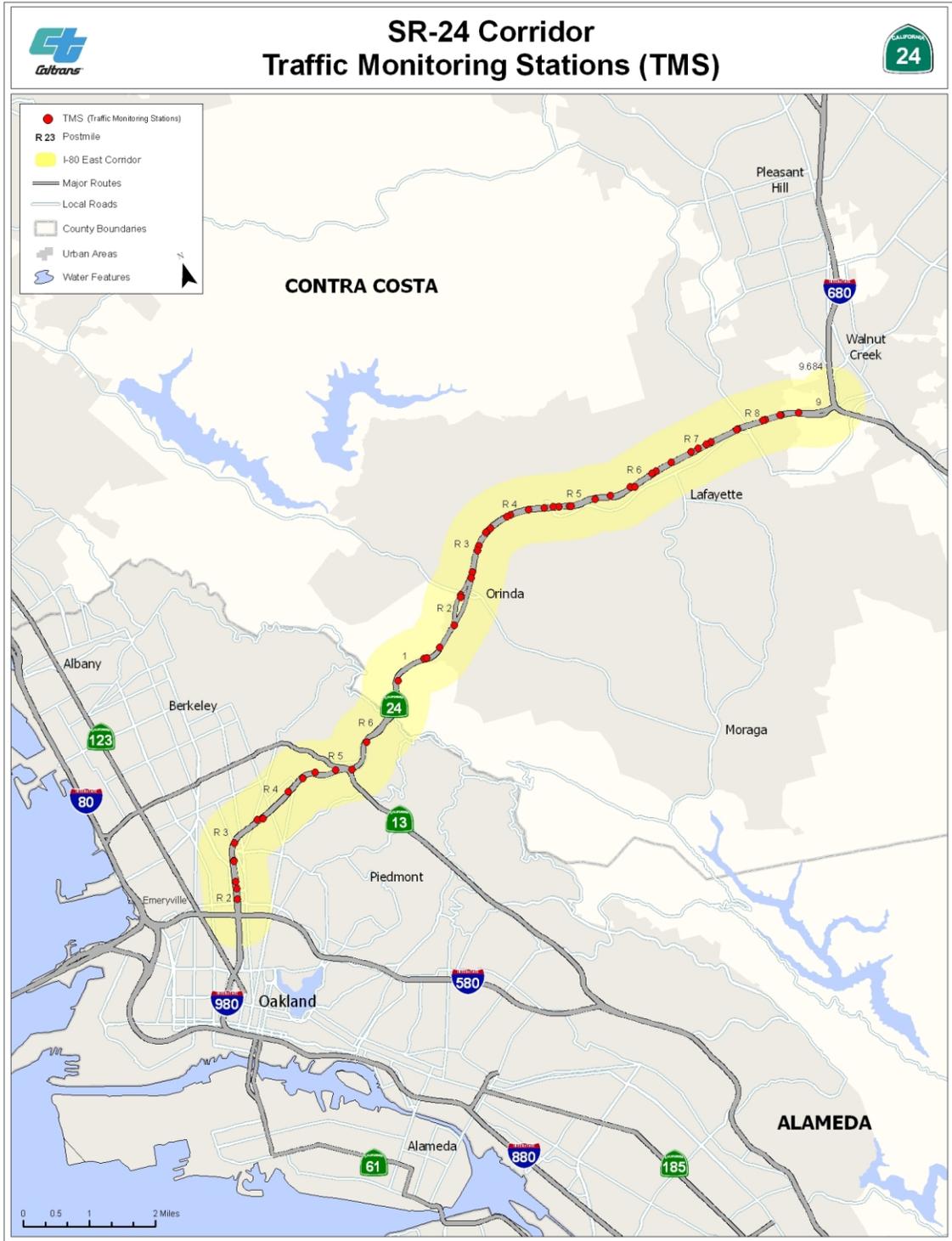


Figure 3. Traffic Monitoring Stations along the SR-24 CSMP Corridor.

Land Use-Major Traffic Generators

The SR-24 CSMP corridor illustrates a variety of land uses traveling between the Cities of Oakland and Walnut Creek. Industrial-commercial and high intensity residential land use are present within the urban landscape of Oakland. Traveling east, the landscape transitions to single and multi family residential, watershed, open space, recreational and commercial uses.

The SR-24 corridor is critical in accommodating vehicle trips between and within Alameda and Contra Costa Counties. Unique to the SR-24 CSMP Corridor is that its majority of trips have origins and destinations outside the corridor. This is because SR-24 is the primary route providing travelers a link between the suburbs of central and east Contra Costa County and the job centers, airports and entertainment centers located in Oakland and San Francisco. The remaining trips originate from the cities along the corridor. Land uses including educational institutions, local and regional shopping centers, low density commercial and retail within the corridor provide significant trip generation.

Environmental Constraints/Factors

From the Caldecott Tunnel's east portal to the I-680 interchange, SR-24 is designated as a Scenic Route. Three historical bridges are identified in the western half of the corridor while a wetland area is identified near its center. Hazardous sites (underground tanks) are also identified along the corridor with concentration at either end of the corridor. Numerous habitats supporting threatened or endangered species are present throughout the corridor with the largest concentrations found near the center and northern end of the corridor. The East Bay Municipal Water District and Briones Regional Park are adjacent to the center of the corridor and are considered protected open space. Figure 4 illustrates key SR-24 environmental factors.

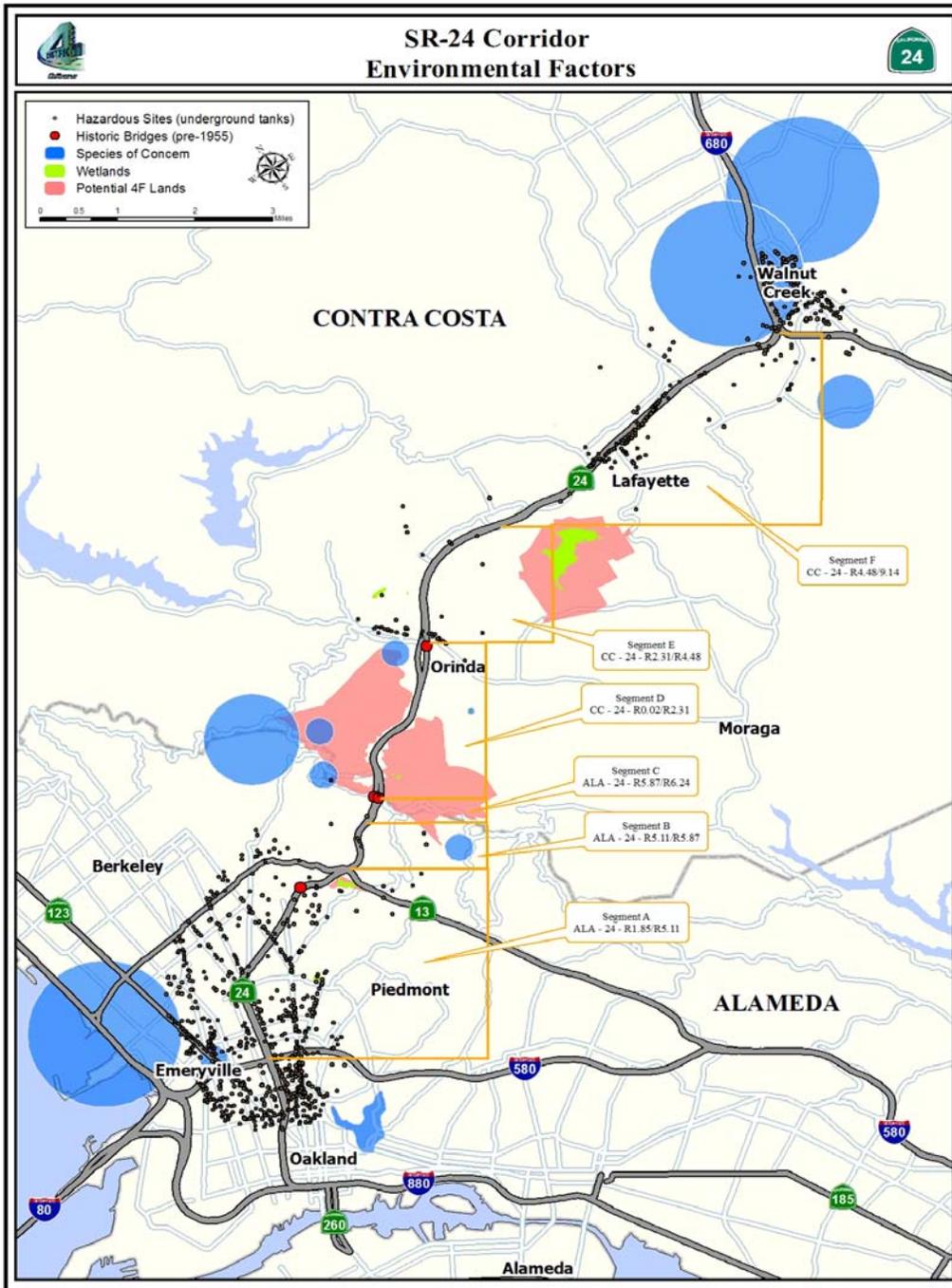


Figure 4. SR-24 Corridor Environmental Factors.

4. Comprehensive Corridor Performance Assessment

Freeway Performance Initiative (FPI)

A corridor performance assessment and technical analysis of the SR-24 CSMP Corridor was conducted through the FPI partnership between MTC and Caltrans. Current performance along the corridor, traffic bottlenecks and causes of performance problems were identified. Simulation modeling was used to forecast future travel conditions along the corridor, as well as analyze a variety of operational strategies and investment scenarios. Each scenario's performance was evaluated based on quantifiable criteria of mobility, reliability and safety.

Key Findings-Current Conditions

The traffic analysis of the SR-24 CSMP corridor existing conditions concludes that existing congestion along the SR-24 CSMP Corridor is the result of a lack of corridor wide traffic management strategies, implementation of ITS, and segments with inadequate capacity and weave-merge sections. Delay and congestion occur upstream of Deer Hill Road, Gateway Boulevard./Wilder Rd., the I-580 interchange and the Caldecott Tunnel. Table 2 lists and Figure 5 illustrates SR-24 AM bottlenecks and the resulting queues while Table 3 lists and Figure 6 Illustrates SR-24 PM Bottlenecks and the resulting queues.

Location	Bottleneck-Queue	Direction	Cause	VHD
1	Old Tunnel Rd. to Fish Ranch Rd.	EB	Insufficient Capacity	1,789
2	Deer Hill Rd. to Acalanes Rd.	WB	Insufficient Capacity	322
3	Camino Pablo to Gateway Blvd./Wilder Rd.	WB	Insufficient Capacity	101
4	Claremont Ave. to I-580	WB	Demand-Weave	209

Table 2. SR-24 AM Bottleneck Locations, 2008.

Source: SR-24 Final Existing Conditions Technical Memorandum. PBS&J February 17, 2009.

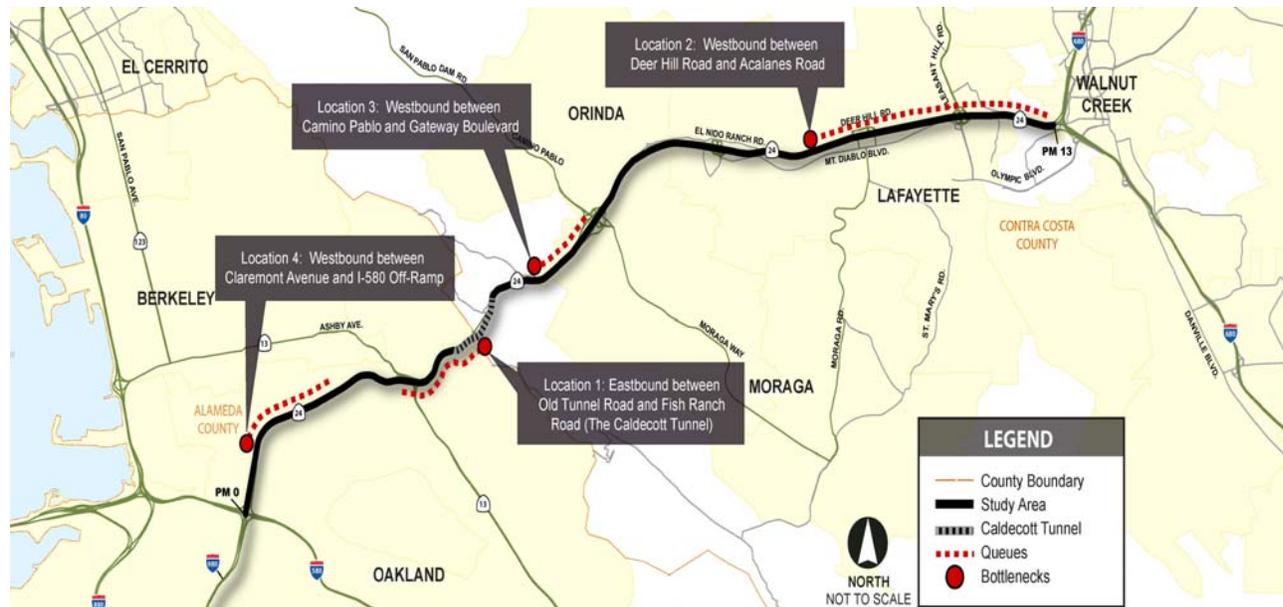


Figure 5. SR-24 AM Bottlenecks, 2008.

Source: SR-24 Final Existing Conditions Technical Memorandum. PBS&J February 17, 2009.

Location	Bottleneck-Queue	Direction	Cause	VHD
5	Old Tunnel Rd. to Fish Ranch Rd.	EB	Insufficient Capacity	2,512
6	Fish Ranch Rd. to Old Tunnel Rd.	WB	Insufficient Capacity	961

Table 3. SR-24 PM Bottleneck Locations, 2008.

Source: SR-24 *Final Existing Conditions Technical Memorandum*. PBS&J February 17, 2009.

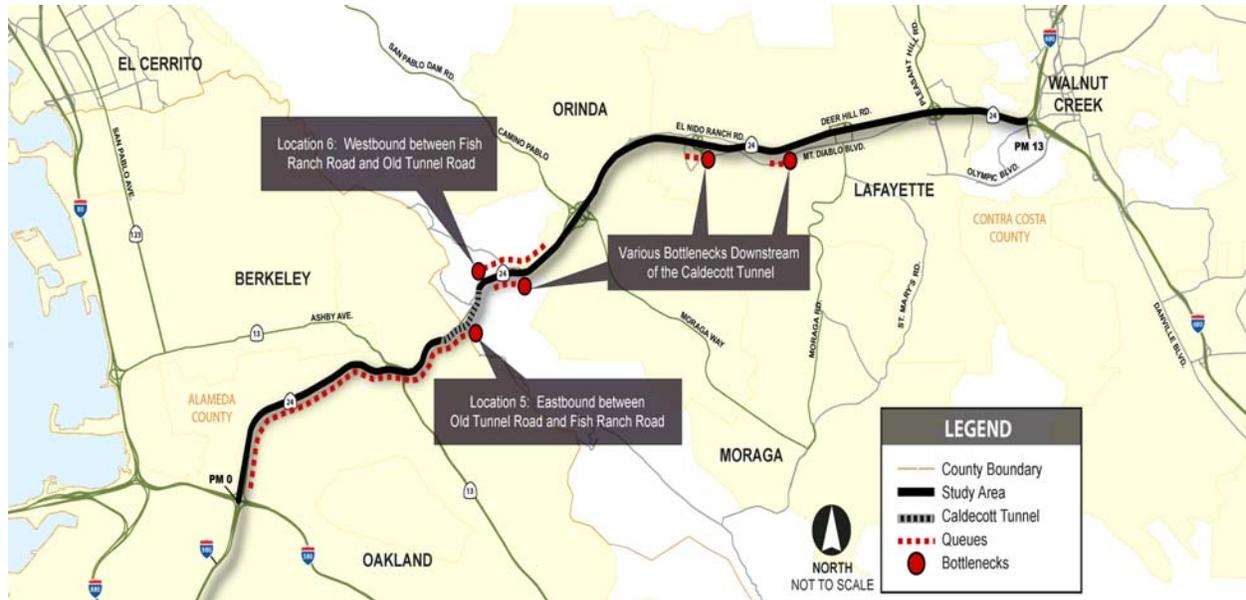


Figure 6. SR-24 PM Peak Bottlenecks, 2008.

Source: SR-24 *Final Existing Conditions Technical Memorandum*. PBS&J February 17, 2009.

Future Conditions (2015-2030)

The findings of the future year analysis are based on forecasts of travel demand in the SR-24 Corridor and committed improvements that are assumed to be in-place by 2015, which for this corridor consists only of the Caldecott Tunnel Fourth Bore project. The 2015 and 2030 forecasts findings suggest that increases in population and employment will be accompanied by corresponding increases in traffic demand along the SR-24 Corridor. During the morning peak (westbound), demand is expected to increase 29 percent, or the equivalent of more than one additional lane of traffic demand.

Key Findings

- The future conditions analysis does not reveal any bottlenecks on the segment of I-980 west of I-580. For this reason, mitigation strategies will not be considered for this segment of SR-24.
- With the construction of the two-lane fourth tunnel bore at the Caldecott Tunnel (*Caldecott Improvement Project*), The AM off peak Eastbound (EB) bottleneck between Old Tunnel Road to Fish Ranch Road and the PM off peak Westbound (WB) bottleneck between Fish Ranch Road and Tunnel Road are completely mitigated in 2015 and 2030.
- The WB bottleneck between Claremont Avenue and I-580 will continue to impact SR-24 mainline operations in 2015 and 2030.
- The highest growth in travel demand takes place in the peak direction in 2015 and 2030, so strategies that enhance the efficiency of the system and provide alternatives to personal vehicle traffic on SR-24 will need to be further explored and incorporated into the management plan for the corridor

2015 Conditions

- The WB bottleneck, from Deer Hill Road to Acalanes Road (Figure 7, Location 1) continues with queues approaching I-680.
- The WB bottleneck from Camino Pablo to Gateway Boulevard /Wilder Road (Location 2) continues with queues approaching St. Stephens Road
- The EB bottleneck, from Tunnel Road to Fish Ranch Road (at Caldecott Tunnel - Location 3) continues with queues approaching Claremont Avenue.
- An EB bottleneck from Pleasant Hill Road Off-Ramp to Pleasant Hill Road On-Ramp (Location 4) emerges with queues approaching Stephens Drive.
- A WB bottleneck located at the SR-24 WB off ramp to I-680 (Location 5) will continue to impact operations on SR-24.

A summary of SR-24 2015 recurrent congestion locations are illustrated in Figure 7.



Figure 7. SR-24 2015 Locations of Recurrent Congestion.

Source: SR-24 *Final Future Conditions Technical Memorandum*. PBS&J July 17, 2009.

2030 – Conditions

- The westbound AM bottleneck from Deer Hill Road to Acalanes Road (Figure 8, Location 1) will continue and increase.
- The westbound AM bottleneck from Camino Pablo to Gateway Boulevard/Wilder Road (Location 2) will continue and increase.
- The eastbound PM bottleneck from Old Tunnel Road to Fish Ranch Road (at Caldecott Tunnel – Location 3) will continue and increase.
- The eastbound PM bottleneck between the Pleasant Hill Road on and off ramps (Location 4) will continue and increase.

A summary of SR-24 2030 recurrent congestion locations is featured in Figure 8.



Figure 8. SR-24 2030 Locations of Recurrent Congestion.

Source: SR-24 *Final Future Conditions Technical Memorandum*. PBS&J July 17, 2009.

5. Recommended Corridor Management Improvement Strategies

The proposed prioritized mitigation strategies recommended for the SR-24 CSMP Corridor address the existing and forecasted Mobility, Reliability, and Safety concerns identified through the comprehensive analysis. The recommended Mitigation Strategies include auxiliary lanes, ramp metering, and increasing capacity of existing lanes. Transit improvement recommendations with the SR-24 CSMP Corridor are listed separately. Figure 9 summarizes the proposed priority mitigation strategies.

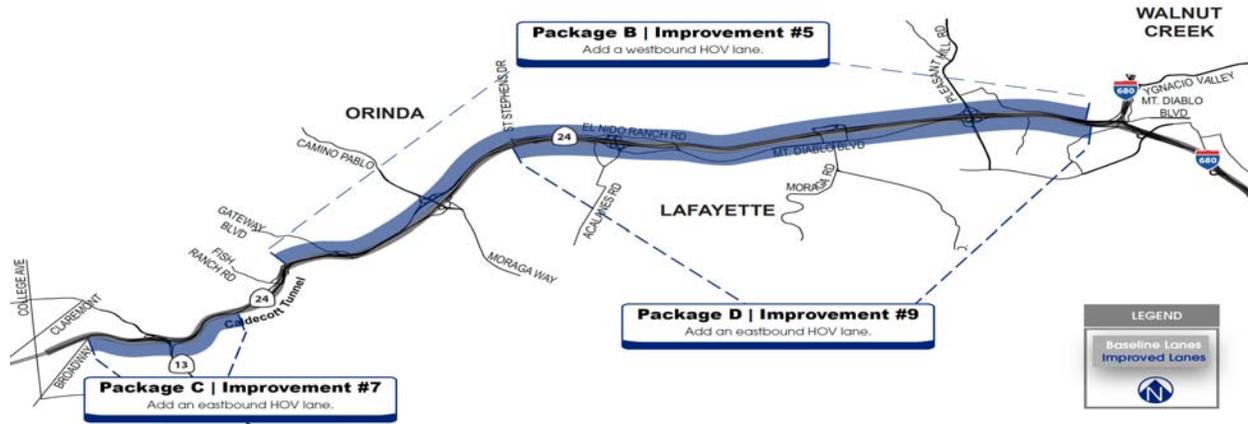


Figure 9 SR-24 CSMP Proposed Priority Mitigation Strategies.

Source: SR-24 *Prioritized Congestion Mitigation Strategies Technical Memorandum*. PBS&J November 9, 2009.

Recommended Short-Term Operations and Capacity Improvements

The performance assessment analysis identified approximately \$237 million in short-term improvement packages (in addition to currently programmed projects expected to be in place by 2015). The short-term improvement packages are intended to preserve corridor mobility for single and high occupant vehicles into 2015. The recommended short term Mitigation Strategies are listed in Table 4 and the Short Term Mitigation Strategies Reduction in Peak Direction Delay is illustrated in Figure 10.

Pkg	Yr	Dir.	Mitigation Improvement	Rank	Cost
A	2015	Both	Activate existing ITS installations that currently are not fully operational.	1	\$12 M
			Fill gaps in the current and programmed ITS installations as needed.		
D	2015	EB	Implement ramp metering in the EB direction from the Caldecott Tunnel and I-680.	2	\$66 M*
			Add an EB HOV lane from St Stephens Dr. interchange to the I-680 interchange (Improvement #9).		
B	2015	WB	Implement ramp metering in the WB direction between I-680 and the Caldecott Tunnel.	3	\$108 M*
			Add a WB HOV lane from I-680 to the Caldecott Tunnel (Improvement #5).		
C	2015	EB	Implement ramp metering in the EB direction between I-580 and the Caldecott Tunnel and on I-980 between I-880 and I-580.	4	\$31 M*
			Add an EB HOV lane from the Broadway Avenue on-ramp to the Caldecott Tunnel (Improvement #7).		

* Cost estimate assumes inside left HOV lane; actual operational design to be determined in project development.

Table 4. Recommended Short-Term Capacity and Operational Improvements.

Source: SR-24 *Prioritized Congestion Mitigation Strategies Technical Memorandum*. PBS&J November 9, 2009

Reduction in Peak-Direction Delay	Vehicle Hours	16,200 hrs. – 4,140 hrs = 12,060 hrs	26% reduction
	Person Hours	17,700 hrs. – 5,040 hrs = 12,660 hrs	28% reduction

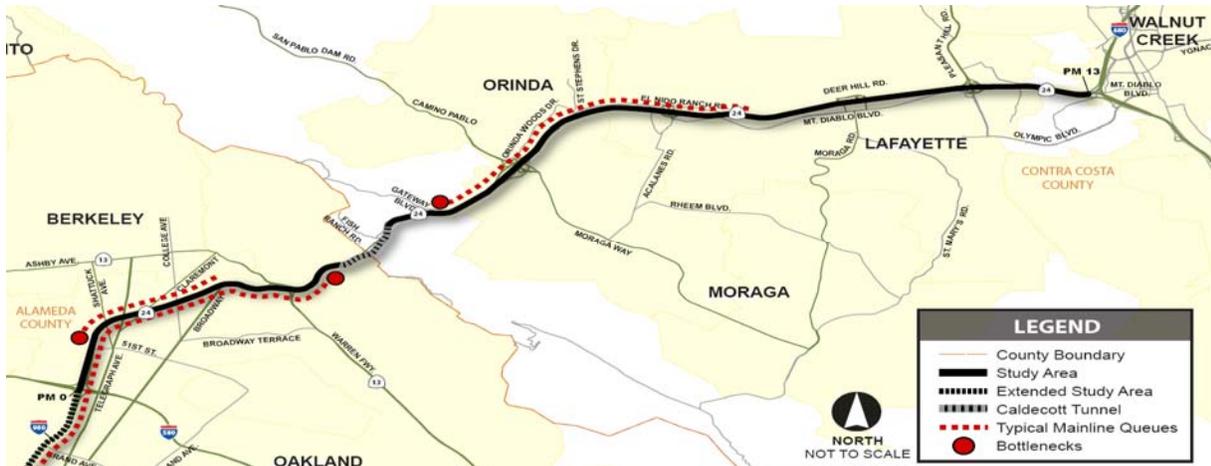


Figure 10. SR-24 CSMP Short Term Mitigation Strategies Reduction in Peak Direction Delay.
 Source: SR-24 *Prioritized Congestion Mitigation Strategies Technical Memorandum*. PBS&J November 9, 2009.

Recommended Long-Term Operations and Capacity Improvements

The performance assessment analysis identified approximately \$6 million in long term improvement packages (in addition to those improvements expected to be in place by 2015). The combined short and long term improvement packages are intended to extend corridor mobility for single and high occupant vehicles into 2030. The recommended long term Mitigation Strategies are listed in Table 5 and the Long-Term Mitigation Strategies Reduction in Peak Direction Delay is illustrated in Figure 11.

E	2030	WB	Implement ramp metering in the WB direction between the Caldecott Tunnel and I-580 and I-980 between I-880 and I-580.	5	\$6M
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Table 5. Recommended Long-Term Capacity and Operational Improvements.
 Source: SR-24 *Prioritized Congestion Mitigation Strategies Technical Memorandum*. PBS&J November 9, 2009.

Reduction in Peak-Direction Delay	Vehicle Hours	32,200 hrs. – 9,140 hrs = 23,060 hrs	28% reduction
	Person Hours	34,100 hrs. – 9,890 hrs = 24,210 hrs	29% reduction



Figure 11. SR-24 CSMP Long Term Mitigation Strategies Reduction in Peak Direction Delay..
 Source: SR-24 *Prioritized Congestion Mitigation Strategies Technical Memorandum*. PBS&J November 9, 2009.

Recommended Short and Long-Term Transit Improvements

While the FPI analysis and CSMP development processes focus on freeway mitigation strategies, improved transit service was discussed by stakeholders along the SR-24 corridor. These recommended services related to transit include a general package of increased transit access strategies, including additional parking at BART stations upstream of the corridor, enhanced bus feeder services, and operational enhancements to BART at a system-wide level that could accommodate ridership increases of 10 to 20 percent.

The transit mitigation strategies in Package F include both short-term and long-term strategies. Transit cost effectiveness could not be estimated for this report, and thus these transit mitigation strategies cannot be ranked against other mitigation strategies for which life-cycle benefits and costs were available. For this reason, no prioritized recommendations are offered on this set of transit strategies by this analysis. The recommended short and long-term transit improvements are listed in Table 6.

Package	Short & Long-Term Transit Improvement Packages (2015-2030)
F	<ul style="list-style-type: none"> • Additional BART Parking Capacity at upstream BART stations • Increased bus transit access to the BART Stations within the SR-24 corridor. • BART system wide operational improvements

Table 6. SR-24 Recommended 2015 and 2030 Transit Improvement Strategies.
 Source: SR-24 *Prioritized Congestion Mitigation Strategies Technical Memorandum*. PBS&J November 9, 2009.