

I-880

Interstate 880

Corridor System Management Plan

October 2010

executive summary

CALTRANS DISTRICT 4

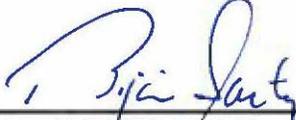
corridor system management plans





interstate 880 corridor system management plan

APPROVED BY:



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District 4 Director
California Department of Transportation

10-11-10
Date

I accept this Corridor System Management Plan for the I-880 Corridor as a document informing the regional transportation planning process.

ACCEPTED BY:



for STEVE HEMINGER,
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Metropolitan Transportation
Commission

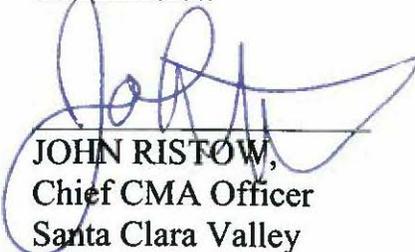
10/06/10
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ACCEPTED BY:



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09/27/10
Date



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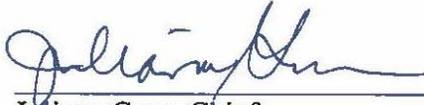
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STAKEHOLDER ACKNOWLEDGMENT

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 its key stakeholders. This CSMP represents a cooperative commitment to develop a corridor management vision for the I-880 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 I-880 Corridor Technical Advisory Committee (TAC) and provided essential information, advice and feedback for the preparation of the I-880 Corridor Management Plan Demonstration and this CSMP. The stakeholders/partners include:

- Metropolitan Transportation Commission
- Alameda County Congestion Management Agency*
- Alameda County Transportation Improvement Authority*
- AC Transit
- Bay Area Rapid Transit District
- City of Oakland
- City of Alameda
- City of San Leandro
- City of Hayward
- City of Union City
- City of Fremont
- Alameda County
- Santa Clara Valley Transportation Authority

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.

*ACCMA and ACTIA combined to form the Alameda County Transportation Commission in July 2010.

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 System Planning, whose seemingly limitless energy and passion for transportation system planning in California has been an inspiration to countless transportation planners 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.



executive summary

This Corridor System Management Plan (CSMP) represents a cooperative commitment to develop a corridor management vision for the I-880 corridor. The CSMP development process was a joint effort of the California Department of Transportation (Caltrans), the Metropolitan Transportation Commission (MTC), the Alameda County Congestion Management Agency (ACCMA) and the Santa Clara Valley Transportation Authority (VTA). This Core Stakeholder Group worked with local planning agencies through an Inter 880 (I-880) Corridor Technical Advisory Committee (TAC) and an I-880 CSMP Working Group to develop this plan. The goal is to propose strategies to achieve the highest mobility benefits to travelers along the I-880 CSMP corridor.

CORRIDOR MANAGEMENT STRATEGY/ RECOMMENDED CORRIDOR IMPROVEMENT PROJECTS

The common theme, and resulting recommended strategy for I-880 is **to implement and enhance advanced/adaptive ramp metering throughout the corridor**. This strategy promises to substantially increase freeway efficiency and throughput. “If implemented correctly, this improvement (ramp metering) will provide the highest benefits relative to its costs.” (I-880 Corridor Management Plan Demonstration report). The Central Alameda

County Freeway Study ranks adaptive ramp metering as its highest project priority. In Santa Clara County, the Valley Transportation Plan (VTP) 2035 states that I-880 Ramp Metering at various interchanges is an important Freeway Performance Initiative (FPI) project included in VTP 2035. Currently, local traffic-responsive metering has already been implemented to some degree on I-880 in both Alameda and Santa Clara County, and commitments exist to further implement this strategy.

The list of recommended improvements shown in Table ES1 will improve operational efficiency to address issues related to identified performance problems. Figure ES1 illustrates the corridor studies utilized linked to their recommended improvements and existing bottleneck locations.

The large list of interchange improvements and auxiliary lanes will provide a reasonable return on investment, along with delay reductions. It will also be necessary to do additional project-specific analysis to provide more specific benefits assessments through the traditional project development process. In addition, the High Occupancy Vehicle (HOV) extensions funded through the Corridor Mobility Improvement Account (CMIA) program should generate a higher return on investment than expected when an expected increase in ridesharing and transit use takes place.

The full benefit of the CMIA-funded projects and the CSMP-recommended projects will not be realized without ongoing cooperative system management in the I-880 corridor. The CSMP development process has brought the major transportation planning agencies in the corridor (Caltrans, MTC, ACCMA and VTA) together to develop this set of recommendations. The next step should be a continuous improvement process to work together on corridor management, further incorporation of other modes, and enhanced collaboration to develop the Sustainable Community Strategy (SCS) and Priority Development Areas (PDA) in the corridor. This will provide the foundation for the next generation CSMP and future Regional Transportation Plan (RTP) and FPI updates.

AREAS FOR FURTHER STUDY

Despite expected corridor performance improvements (should all of the recommended projects and strategies be implemented), some performance problems are expected to continue in the future. The following areas deserve additional study to determine how they would impact corridor performance over and above the CMIA funded projects and CSMP recommended improvements:

Goods Movement

The significant truck traffic on the I-880 corridor requires continual study and monitoring. Of particular interest will be the construction of the recommended Trade Corridor Improvement (TCIF) project, and its effect on corridor mobility. Both the Regional Goods Movement Study (2004) and the statewide Goods Movement Action Plan (2007) provide guidance for immediate and future actions related to goods movement efficiency and environmental improvement.

High Occupancy Toll (HOT)/Express Lanes

MTC's 2009 RTP proposes a Regional Express Lane Network for the Bay Area, which includes Express Lanes on the I-880 corridor. Should enabling legislation be signed into law at some point in the future, significant further analysis and consultation with jurisdictions along the corridor will be required to determine the feasibility, cost-effectiveness and appropriateness of converting the HOV lanes to Express Lanes.

I-880/US-101 Interchange Enhancements

Improvements to this interchange have been analyzed as part of previous studies, as it is consistently identified as a controlling bottleneck both now and in the future with CSMP recommended improvements. While significant benefits may be achieved through improvements to this major interchange, costs and right-of-way impacts were found to be prohibitive. Additional study will be required to identify feasible solutions.

Bay Area Rapid Transit (BART) Extension to San Jose

BART's Silicon Valley extension will begin south of the future BART Warm Springs Station in Fremont and proceed alongside the Union Pacific Railroad (UPRR) through Milpitas to San Jose and Santa Clara. The project's purpose is to address growth in corridor travel over the next 20 years by improving transit service in the Silicon Valley corridor. Specific benefits to I-880 include a reduction in travel demand, vehicle miles traveled, improved transit travel times, and a reduction in emissions. Future corridor planning efforts should review opportunities for this transit project to integrate with the broader transportation network.

California High-Speed Rail (CHSR)

When this project is built, high speed trains capable of 220 mph will link San Francisco and Los Angeles in two and one-half hours. The planned system would also serve Sacramento, San Jose, Fresno, Bakersfield, Anaheim, Riverside and San Diego. When CHSR is completed and linked to BART, Altamont Commuter Express (ACE) and the VTA light rail system in San Jose, the impact on I-880 should be a reduction in travel demand, coupled with related benefits. Future corridor planning efforts should review opportunities for integration of CHSR within the elements of the larger transportation network.

Table ES1. Short- and Long-Term Recommended Projects in I-880 CSMP Corridor.

I-880 Corridor Management Plan Demonstration (ALA 880)	Est. Cost (\$M)	Existing Commitment to Implement (note 1)
Short-Term Recommended (2012)		
Advanced Ramp Metering	25.0	X
Advanced Traveler Information	(note 2)	X
Long-Term Planned (2013-2020)		
TCIF Project (Inc. 23rd and 29th Street Overcrossings)	85.0	
SB HOV Extension from Hegenberger Road to Marina Blvd. (CMIA Project)	108.0	
Central County Freeway Study LATIP (I-880 only, in order of priority)	(note 3)	
ICM/Adaptive Ramp Metering	32.5	
I-880 Aux. Lanes, Paseo Grande to Winton Avenue *	32.5	
I-880 Aux. Lanes, Whipple Road to Industrial Pkwy. West *	19.5	
I-880 Industrial Pkwy. interchange	41.0	
I-880 Davis Street interchange	11.1	
I-880 Marina Blvd. interchange	24.4	X
I-880/Whipple Road interchange *	13.5	
I-880/West A Street interchange *	27.0	
I-880/West Winton Avenue interchange *	25.0	
Extend Northbound HOV Lane	155.5	
I-880/Washington interchange	31.0	
SR-84 Study LATIP (I-880 only, in order of priority)	(note 3)	
I-880/Mission Blvd. interchange Completion (CMIA project candidate)	42.4	
I-880 Aux. Lanes, Dixon Landing to Alvarado-Niles	5.0	
ICM/TOS, I-880 South of SR-92	10.0	X
Valley Transportation Plan 2035 (I-880 only)		
I-880 HOT Lanes, Alameda County Line to US-101	20.0	
I-880/Montague Expressway interchange Improvement	12.0	
I-880/I-280/Stevens Creek Blvd. interchange Improvement (CMIA Project)	64.0	
I-880 Widening for HOV Lanes, SR-237 to Old Bayshore (CMIA Project)	95.0	X
I-880 NB Aux. Lane, Coleman Avenue Highway to First Street	13.0	
I-880 Ramp Metering, Various interchanges (FPI)	(note 4)	X
Valley Transportation Authority I-880 Corridor Study:		
<i>Near-Term Projects</i>		
NB Stevens Creek interchange Reconfiguration	(note 5)	
SB Stevens Creek interchange Reconfiguration		
<i>Long-Term Improvements</i>		
NB I-280 to NB I-880 Direct Connector	(note 5)	
I-880 HOV Lane Extension, US-101 to I-280	150.0	

**Also listed in I-880 Corridor Management Plan Demonstration*

Note 1) Existing Commitment to Implement is defined as a programmed project or similar funding commitment.

Note 2) Advanced Traveler Information considered 511, Travel Times on CMS, and other emerging technologies.

Note 3) LATIP projects listed are only those on I-880 and with current estimated funding needs. Other LATIP projects, such as I-238 improvements, should also reduce I-880 congestion

Note 4) Estimated cost for SCL 880 Ramp Metering (capital and operating) not precisely quantified in VTP2035; costs often included as part of larger capital projects.

Note 5) Cost included as part of 880/280/Stevens Creek project in VTP2035.



Figure ES1. I-880 Corridor Analyses with Recommended Projects and Existing Bottlenecks.

I-880 CSMP CORRIDOR FACTS

Corridor Limits: I-880 at the I-880/I-280 I/C in Santa Clara County to the I-880/7th Street Exit in Oakland

Corridor Description

The Interstate 880 corridor as defined for this Corridor System Management Plan (CSMP) is approximately 42 miles long, beginning at the I-280 interchange in Campbell, and ending in the north at 7th Street in Oakland near the San Francisco-Oakland Bay Bridge approaches. This corridor is an urban freeway that intersects State Routes 61, 82, 84, 87, 92, 237, 262, US-101, I-238, I-580 and I-980. The existing facility ranges from four to ten mixed flow lanes with bidirectional High Occupancy Vehicle (HOV) lanes in certain segments. There is a robust network of transit services and parallel arterial routes.

Route Designation & Regional Setting

Functional Classification	Urban Principal Arterial – Freeway
Trucking Designations	STAA Route: Yes Terminal Access Route: Yes SHELL Route: No
Other Designations	Interstate Highway
Interregional Road System	No
Life Line	No
Metropolitan Planning Organization (MPO)	Metropolitan Transportation Commission (MTC)
Air Quality District	Bay Area Air Quality Management District
Commuting Mode Split (City averages)	69% SOV, 11% Rideshare, 11% Transit, 3% Walk, 3% Bike, 3% Other Means

Mode Split Source: American Community Survey 2007

Multimodal Service

Primary bus and rail providers are Alameda-Contra Costa (AC) Transit, Altamont Commuter Express (ACE), Amtrak *Capitol Corridor*, Bay Area Rapid Transit (BART), and the Santa Clara Valley Transportation Authority (VTA).

Interregional Significance

Interstate 880 connects the San Francisco-Oakland Bay Bridge with the Silicon Valley, serving the Port of Oakland, Oakland International Airport, Mineta International Airport in San Jose, and about ten East Bay Area cities. I-880 also provides a critical link for the movement of goods between the Central Valley and the Port of Oakland through its connection to the I-580 corridor at the I-238/880 interchange. The corridor is also a major commuter link between major employment centers in Silicon Valley and the East Bay.

Corridor Specific Issues

- Key international trade corridor (Port of Oakland and commercial airports in Oakland & San Jose)
- Regionally highest five-axle truck volume
- Commuter link between major employment centers in Silicon Valley and the East Bay
- Urban freeway with corridor-wide traffic generators: event/retail venues, industry and residential areas
- Connects Central Business Districts for two of the largest cities in California at each end
- Transbay traffic collector from three bridges: the Bay Bridge (I-80), the San Mateo Bridge (SR-92), and the Dumbarton Bridge (SR-84)

Current Performance

Top Three Congested Locations (2008)

Time/Direction/Location	VHD
PM: North - Decoto Road to Tennyson Road	1,990
AM: South -Marina Blvd. to south of Industrial Parkway	1,760
PM: North - Route 237 to south of Auto Mall Parkway	1,410

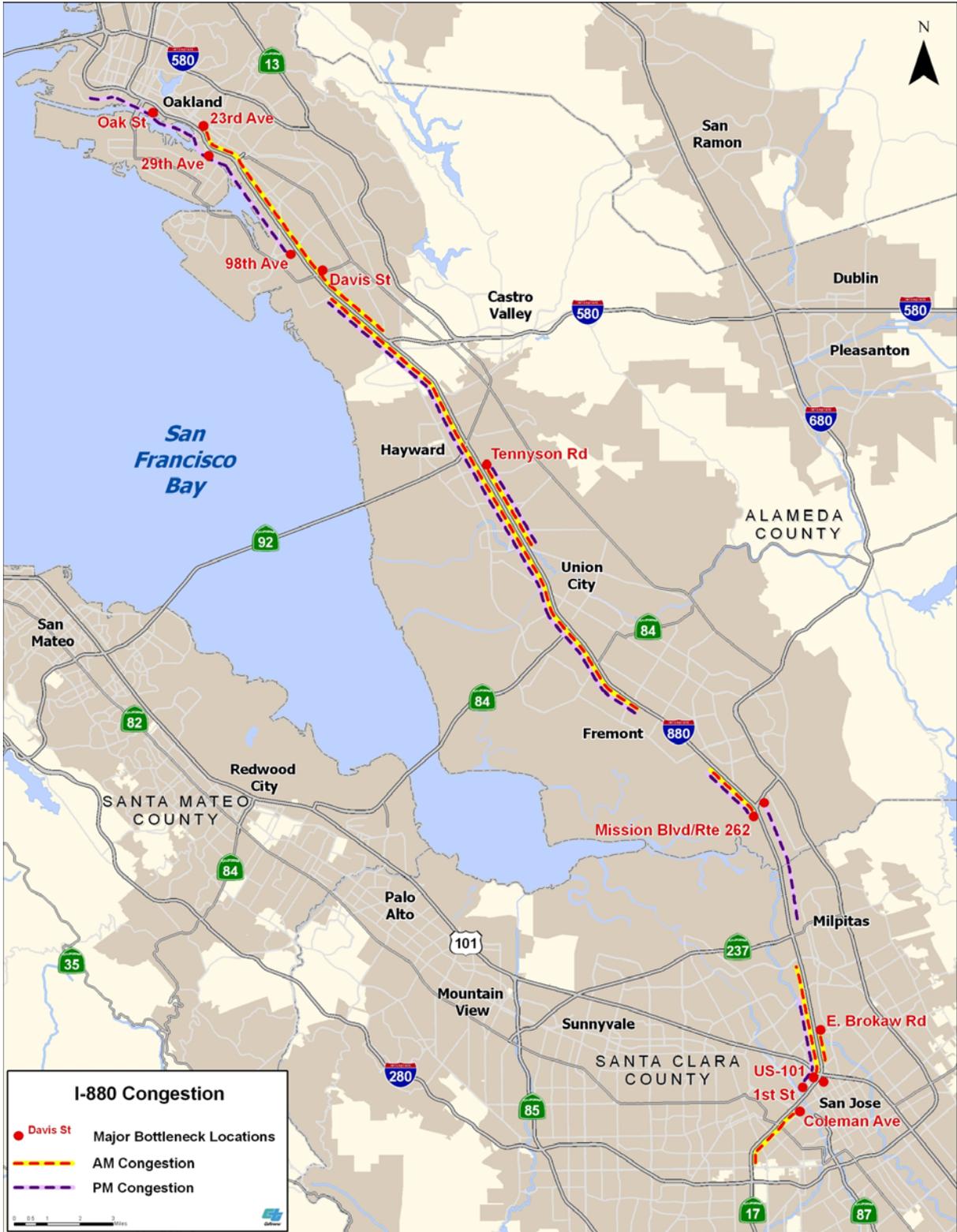


Figure ES2. Bottlenecks and Congestion Queues on I-880 Corridor (2004-2007).



introduction

This Corridor System Management Plan (CSMP) represents a cooperative commitment to develop a corridor management vision for the Interstate 880 (I-880) corridor. The CSMP development process was a joint effort of the California Department of Transportation (Caltrans), the Metropolitan Transportation Commission (MTC), the Alameda County Congestion Management Agency (ACCMA) and the Santa Clara Valley Transportation Authority (VTA). This Core Stakeholder Group worked with local planning agencies, through an (I-880) Corridor Technical Advisory Committee (TAC) and an I-880 CSMP Working Group to develop this plan. The goal is to propose strategies to achieve the highest mobility benefits to travelers along the I-880 CSMP Corridor.

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 Account (CMIA). 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 and 2010 Regional Transportation Plan (RTP) Guidelines that CSMPs are an important input to the development of an RTP.

In the San Francisco Bay Area, Caltrans is completing nine CSMPs, with a tenth added in July 2010. This I-880 CSMP reflects data and projects from MTC's current Regional Transportation Plan (RTP), *Change in Motion, Transportation 2035 Plan*, adopted April 2009. The CSMP recommends strategies for consideration in the regional transportation planning process. In the Alameda County portion of the corridor, the CSMP development process has taken place in coordination with University of California (UC) Berkeley's California Center for Innovative Transportation (CCIT). Analysis of the Santa Clara County segment of the corridor was done in part through MTC's Freeway Performance Initiative (FPI). This work has been tied together through the efforts of an I-880 CSMP Working Group.

THE I-880 CSMP

This CSMP focuses on highway mobility within the context of one of California's most congested urban corridors. While the CSMP describes the arterials and other modes in the corridor, the focus of the recommended strategies is to enable better system management of the highway. It also describes the current land use, transit bicycle/pedestrian facilities, and Priority Development Areas (PDAs) identified from the Bay Area's FOCUS regional blueprint program. These are provided as a backdrop for understanding how the highway corridor works. 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.

The objectives of the I-880 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 I-880 CSMP were determined, in collaboration with MTC, by identifying the key travel corridor in which CMIA-funded projects are located. The CMIA-funded projects are:

- I-880 High Occupancy Vehicle (HOV) Lane Widening Project, SR-237 to US-101
- I-880 Southbound HOV Lane Extension, Hegenberger to Marina Boulevard
- I-880/I-280 Stevens Creek interchange Improvements

In addition, the I-880 Mission Boulevard interchange Completion project is seeking CMIA funding.

METHODOLOGY

A corridor performance assessment and technical analysis of the I-880 CSMP corridor was conducted on the Alameda County portion of the corridor by UC Berkeley CCIT through the I-880 Corridor Management Plan Demonstration. A similar performance assessment of the Santa Clara County segment of the corridor was done through MTC's FPI program. The performance assessment evaluated the current highway performance along the corridor and determined causes of performance problems.

The results of these two I-880 corridor analysis efforts (as well as the CMIA project analyses) have been incorporated into the I-880 CSMP through the efforts of the I-880 CSMP Working Group. This working group included members of the Core Stakeholder Group of agency partners, whose primary task was to coordinate activities and material necessary for the development of the I-880 CSMP following the completion of the I-880 Corridor Management Plan Demonstration in January 2010. The Working Group members met regularly to review and comment on the synthesis of technical documents, analyses, recommendations and other material necessary to produce the CSMP.

The I-880 Corridor Management Plan Demonstration work took place between 2005 and 2009, engaging stakeholder agencies through the Alameda County Congestion Management Agency's (ACCMA) I-880 Corridor TAC. The TAC has met at irregular intervals since 2005 to provide input on existing and future performance as well as conclusions and recommendations for short- and long-term corridor management improvement strategies. Simulation modeling was used to identify future bottlenecks and analyze the impacts of future travel conditions along the corridor under different operational strategies and investment scenarios. The results of the comprehensive corridor analysis were first discussed at the TAC in November 2008.

The CSMP also builds upon the I-880 project recommendations of ACCMA's 2008 Central County Freeway Study [also known as the Central County Local Alternative Transportation Improvement Program (LATIP)], the 2009 Southern Alameda County SR-84 Historic Parkway LATIP, VTA's 2008 I-880 Corridor Study and the Santa Clara Valley Transportation Plan (VTP2035). These recommendations add system management and other strategies to provide additional benefit and efficiencies.

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

- Intelligent Transportation System (ITS) improvements
- Corridor-wide ramp metering
- Construction of HOV lanes
- Extension of and construction of auxiliary lanes
- Additional transit and 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.

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. AB 32 policy on reducing greenhouse gas emissions has moved into implementation with passage of 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 Sustainable Community Strategies (SCS) in their next RTP cycle; MTC's next RTP is slated for completion in 2013. The SCS will promote strategies to reduce greenhouse 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 Sustainable Community Strategy (SCS) required by SB 375, and a more comprehensive look at transit and non-motorized travel strategies and options.

STAKEHOLDER ISSUES AND CONCERNS

Through the CSMP development process, stakeholder concerns focused on how non-highway strategies factor into the CSMP analysis scope, SB 375 requirements and how the CSMP recommendations are expected to be used. Stakeholders commented that recommended improvements in the CSMP do not yet emerge from a multi-modal and integrated transportation land use planning effort, such as integrating transit, bicycle and pedestrian networks, and demand management. Stakeholders

also noted that the statewide planning policy context has evolved significantly since the CSMP has been developed; the CTC has in its 2010 RTP Guidelines provided guidance on how the regions will develop a SCS in response to SB 375 requirements. In response to questions on how CSMP recommendations will be used, Caltrans noted the role of the CSMP is both as a CMIA funding requirement and as a document informing the transportation planning process. We hope that the results of this collaborative corridor planning effort will help inform future investment choices made through the traditional planning and programming processes. This represents a summary of the issues and concerns shared by stakeholders during the CSMP process.

CSMP DOCUMENT

The full I-880 CSMP document is organized into three key areas. First is the CSMP Summary, which provides corridor facts and description summaries, as well as key findings and recommended improvements from the technical analysis. The second key area is the main CSMP document, which includes the CSMP Overview, Corridor Description and summaries of the technical analyses. The CSMP technical analyses 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 analyses. The third key area is the Appendices, containing additional corridor information (corridor segment data, freeway agreements, CMIA projects, maintenance plans, and corridor concept) and supporting documents.

The I-880 Corridor system will be 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.