State Route 99 & Interstate 5

Corridor System Management Plan

May 2009

csmp

CALTRANS DISTRICT 3

corridor system management plan

Caltrans®

State Route 99/Interstate 5 Corridor System Management Plan

APPROVED BY:

Jody Jones 6/3/09

JODY JONES, Date
District 3 Director
California Department of Transportation

I accept this Corridor System Management Plan for the State Route 99 and Interstate 5 Corridor as a document informing the regional transportation planning process.

ACCEPTED BY:

6/30/09

MIKE MCKEEVER, Date
Executive Director
Sacramento Area Council of Governments

CALTRANS DISTRICT 3

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stakeholder acknowledgement

District 3 wishes to acknowledge the time and contributions of many stakeholders and partner agencies. These representatives participated in project development team and focused group meetings and provided essential information, advice and feedback for the preparation of this CSMP. The stakeholders/partners include:

- California Highway Patrol;
- The Cities of Elk Grove, Galt, Sacramento, West Sacramento, and Woodland;
- The Counties of Sacramento, Sutter, and Yolo;
- Sacramento Area Council of Governments (SACOG), Sacramento Transportation Authority (STA), and Yolo County Transportation District (YCTD);
- Transportation Management Associations (TMAs) representing employers, property owners and residents of South Natomas, and North Natomas;
- Transit service providers: Elk Grove e-Tran, Sacramento Regional Transit District, Yolo County Transit District, and Yuba-Sutter Transit;
- Sacramento Area Bicycle Advocates (SABA);
- Sacramento Metropolitan Air Quality Management District; and
- Sacramento Metropolitan Chamber of Commerce

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

DISCLAIMER

The information, opinions, commitments, policies and strategies detailed in this document are those of Caltrans District 3 and do not necessarily represent the information, opinions, commitments, policies and strategies of partner agencies or other organizations identified in this document.

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Aerojet
Road

executive summary

Caltrans and its partners are taking a dynamic turn in transportation planning and operations, with the creation of Corridor System Management Plans (CSMPs) for corridors associated with the Corridor Mobility Improvement Account (CMIA) and Highway 99 Bond Program projects. Californians rely on transportation facilities and services to get to business, recreational, and service destinations, regardless of which agency may operate or fund a facility or service. CSMPs are being developed to plan and manage transportation across modes and jurisdictional boundaries. The CSMP approach is consistent with the goals and objectives of the Governor's Strategic Growth Plan, including public accountability for bond funded projects.

The CSMP outlines a foundation to support the partnership based, integrated corridor management of all travel modes (transit, cars, trucks, bicycles) and infrastructure (rail tracks, roads, highways, information systems, bike routes), to provide mobility in the most efficient and effective manner possible. This approach brings facility operations and transportation service provision together with capital projects into a coordinated system management strategy that focuses on high demand travel corridors such as State Route 99 (SR 99) and Interstate 5 (I-5).

Interstate 5 at Pocket Road

This CSMP directly supports the implementation of the Proposition 1B Bond projects contained in the Highway 99 Bond Program:

- In Sacramento County, operational improvements, including lane extensions, from Calvine Road to Mack Road.
- In Sacramento County, at SR 99 and Elverta Road, construct interchange.
- In Sutter County, at SR 99 and Riego Road, construct interchange.
- In Sutter County, widen Feather Bridge from 2-lane highway to 4-lane expressway.

CSMPs are being developed to plan and manage transportation across modes and jurisdictional boundaries.

The objectives of the CSMP are to improve safety on the transportation system, reduce travel time or delay on all modes, reduce traffic congestion, improve connectivity between modes and facilities, improve travel time reliability, and expand mobility options along the corridor in a cost effective manner.

The CSMP includes the following sections:

- Current Corridor System Management Strategies
- Major Corridor Mobility Challenges
- Performance Measures
- Planned Corridor System Management Strategies
- Congestion and Bottleneck Analysis

The SR 99/I-5 CSMP Transportation Network includes SR 99 from the San Joaquin County Line to Highway 50 (US 50), SR 99 from I-5 to SR 20, I-5 from Hood-Franklin Road to SR 113 (north), as well as select parallel roads, transit services, and bike routes.

Together, these facilities comprise the CSMP managed network.

Major mobility challenges along the corridor include highway and roadway traffic congestion, a lack of parallel roadway capacity, transit facilities approaching ridership capacity, inadequate transit capital and operations funding needed to grow transit ridership, an incomplete High Occupancy Vehicle (HOV) network, gaps and barriers within the bicycle network, and lengthy barriers restricting cross corridor travel by all modes.

The bottleneck analysis evaluates specific causes of existing recurrent traffic congestion in the corridor. Highway bottleneck locations that create mobility constraints are identified and documented, and their relative contribution to corridor-wide congestion is reported. Causes range from high traffic demand (congestion), heavy weaving/merging areas, or physical constraints such as lane drops, lack of ramp meters, incomplete HOV network, and incomplete auxiliary lane network. The primary causes of bottlenecks on the Sacramento sections of SR 99 and I-5 are merging vehicles on to the highway, lane drops on the highway, and weaving activity of drivers.

Existing highway operations data shows that for the SR 99/I-5 corridor, many segments are forecasted to operate under Level of Service (LOS) “F” conditions in 20 years under the No-Build and Build scenarios. However, with the implementation of operational strategies and key capital projects, the severity and the duration of the traffic congestion can be significantly reduced.

This CSMP identifies corridor management strategies to be applied on a network wide basis. To implement some of these strategies, key capital projects are identified. The list is not meant to be inclusive of all projects in the corridor; rather, the CSMP incorporates by reference all projects contained in the Sacramento Area Council of Governments (SACOG) Metropolitan Transportation Plan (MTP) for 2035.

The system will be continuously monitored using identified performance measures and Traffic Operations Systems (TOS) data, and will be reported in an annual State of the Corridor Report and subsequent CSMP updates. This information will be used to continually improve system performance.

what is a CSMP?

A CSMP is a foundation document supporting the **partnership based, integrated management** of all **travel modes** (transit, cars, trucks, bicycles) and **infrastructure** (rail tracks, roads, highways, information systems, bike routes) in a corridor so that mobility along the corridor is provided in the most efficient and effective manner possible.

CSMP success is based on the premise of managing a selected set of transportation components within a designated corridor as a system rather than as independent units.

The CSMP focuses on strengthening institutional partnerships, gathering and analyzing data, monitoring system performance, implementing operation strategies, and identifying and implementing strategic capital investments.

Caltrans has traditionally prepared a Transportation Concept Corridor Report (TCCR) that served as the long range planning documents for SR 99 and I-5. The TCCR would identify existing route conditions and future needs, including existing and forecasted travel data, concept LOS standard, and the facility needed to maintain the concept LOS over the next 20 years. With the development of the more comprehensive CSMP, the need for a separate TCCR is eliminated. This CSMP will serve as the TCCR for the segments of SR 99 and I-5 within the CSMP boundaries and includes information regarding the future facility needed to maintain an acceptable LOS (Concept LOS and Concept Facility, see page 35).

The **SR 99/I-5 CSMP Transportation Network** includes SR 99 from the San Joaquin County Line to US 50, SR 99 from I-5 to SR 20, I-5 from Hood-Franklin Road to SR 113 (north), as well as select parallel roads, transit services, and bike routes. Together, these facilities comprise the CSMP managed network, as indicated in Figures 1 and 2, and Table 1.

The parallel roadway, transit, and bike route components of the managed network were selected in consultation with the respective local agency. It is anticipated that as the CSMP concept matures, additional facilities will be added to the managed CSMP transportation network.

The CSMP focuses on strengthening institutional partnerships, gathering and analyzing data, monitoring system performance, implementing operational strategies, and identifying and implementing strategic capital investments. The CSMP will evolve with changing development patterns, travel demands, and technological innovations. An annual State of the Corridor Report will be produced to document system performance and track CSMP implementation progress, and the CSMP will be updated every two years.

CSMPs are being created for corridors associated with the Corridor Mobility Improvement Account (CMIA) and the

Highway 99 Bond Programs, supported by the ***Highway Safety, Traffic Reduction, Air Quality, and Port Security Bond Act of 2006***, Proposition 1B. Figure 3 shows the general location of each of the CSMP corridors within the Caltrans District 3 area and identifies Proposition 1B projects associated with the respective CSMP.

Each CSMP identifies current system management strategies, existing travel conditions, corridor performance management, management strategies, and capital improvements.

The CSMP is consistent with the SACOG MTP for 2035, city and county general plans, and regional blueprint planning. The CSMP, by reference, incorporates all projects listed in the current MTP. Because the CSMP is corridor focused, it highlights key locations where modes interact and land use decisions may have the greatest potential of reducing the need for travel and influencing modal choice.

CSMPs will assist in fulfilling the goals of recently enacted legislation such as Assembly Bill 32 that addressed air quality and green house gas emissions and Senate Bill 375 that addresses land use by:

- Improving mobility on the state highway system to more optimum speeds to reduce vehicle emissions, and
- Providing viable transportation alternatives and accessibility across modes to encourage transit and bicycling and decrease single occupant auto use.

The CSMP is consistent with the SACOG MTP for 2035, city and county general plans, and regional blueprint planning.

The CSMP also supports Caltrans policies such as Deputy Directive (DD) 64, Complete Streets-Integrating the Transportation System, and DD 98, Integrating Bus Rapid Transit into State Facilities, by bringing many modes under the same active management effort, thereby ensuring that each mode is analyzed and optimized to work together.

e-Tran bus at the SacRT Meadowview Light Rail station Park and Ride lot.

Figure 1: Sacramento & Yolo Area SR 99 & I-5 CSMP Transportation Network

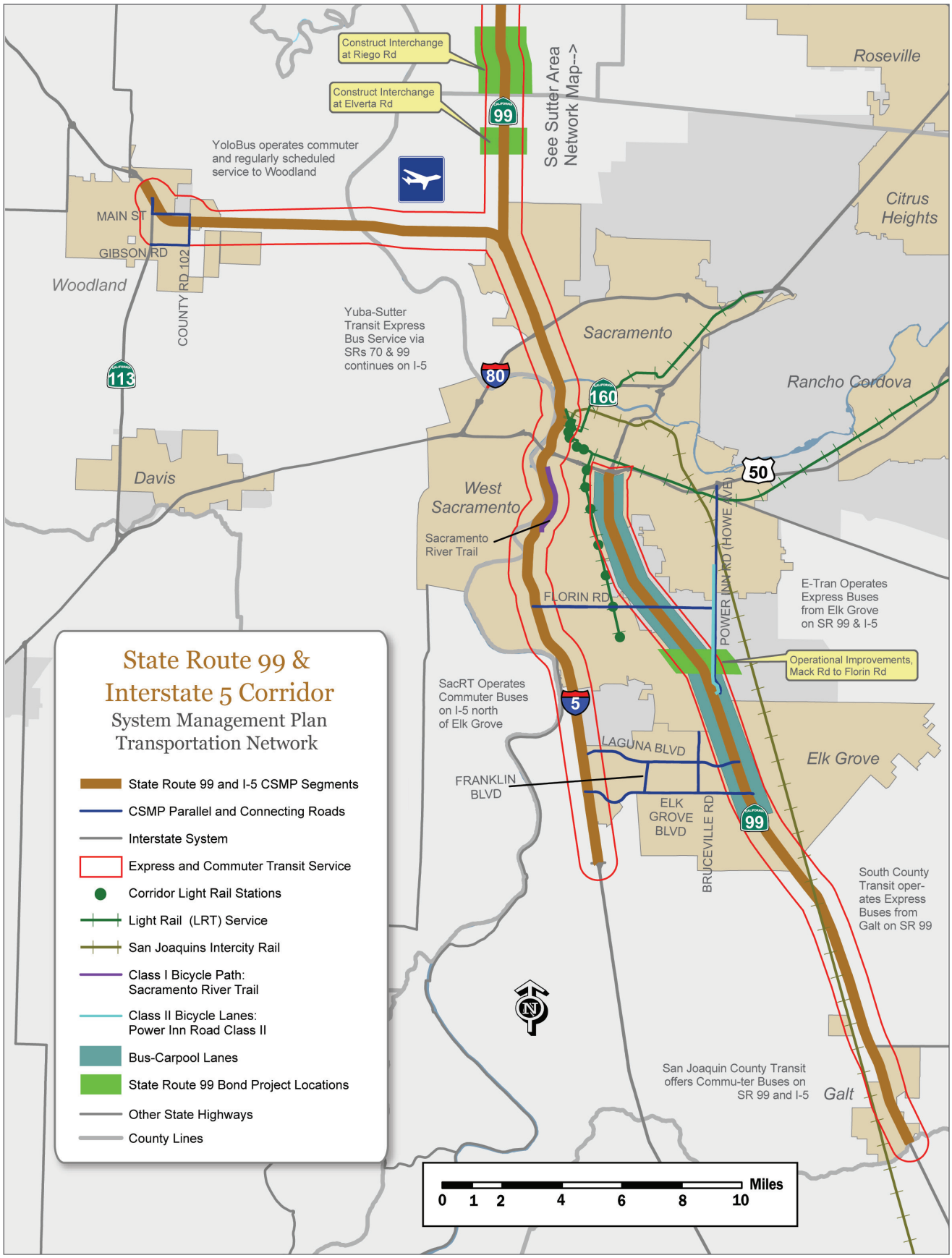


Figure 2: Sutter Area SR 99 CSMP Transportation Network

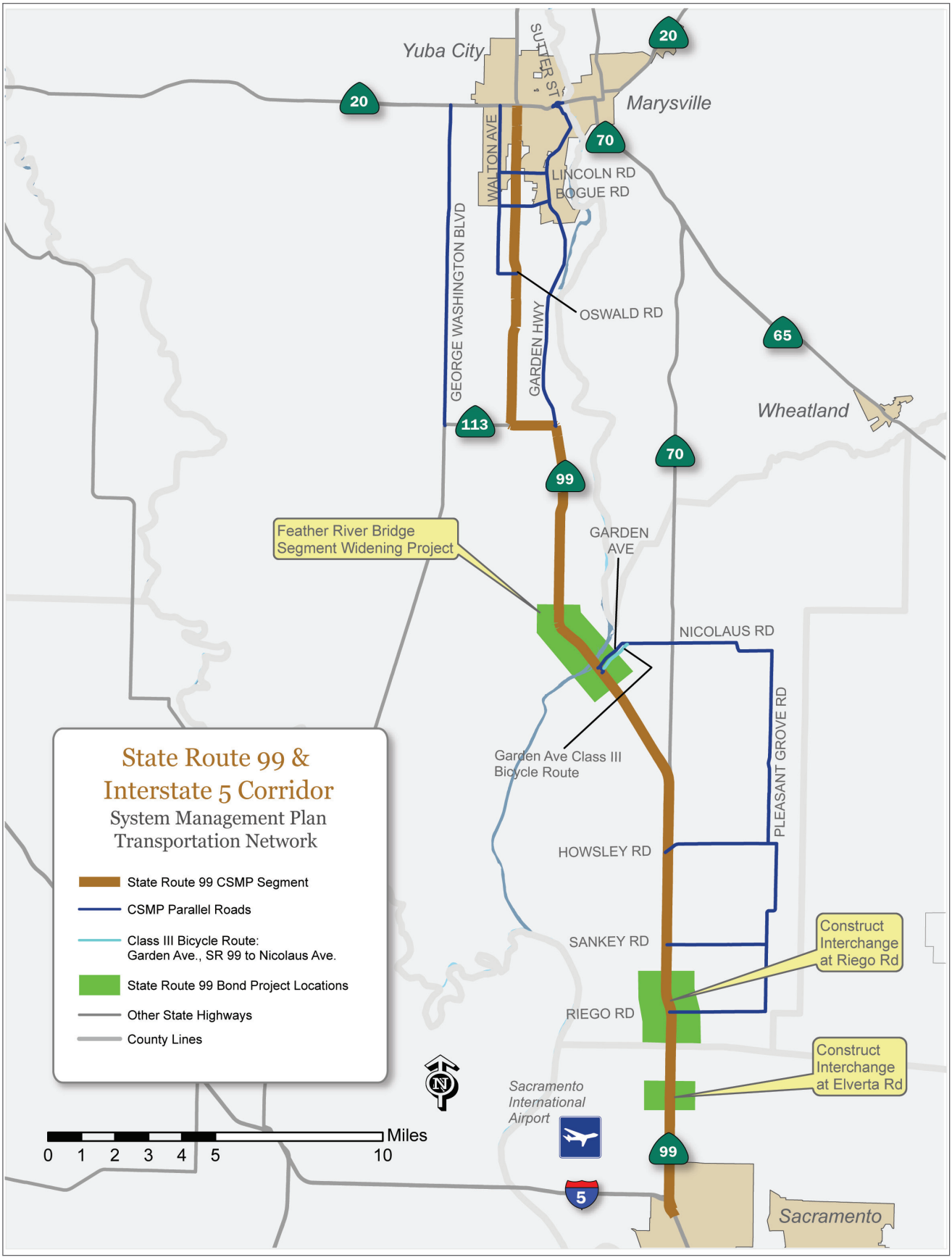
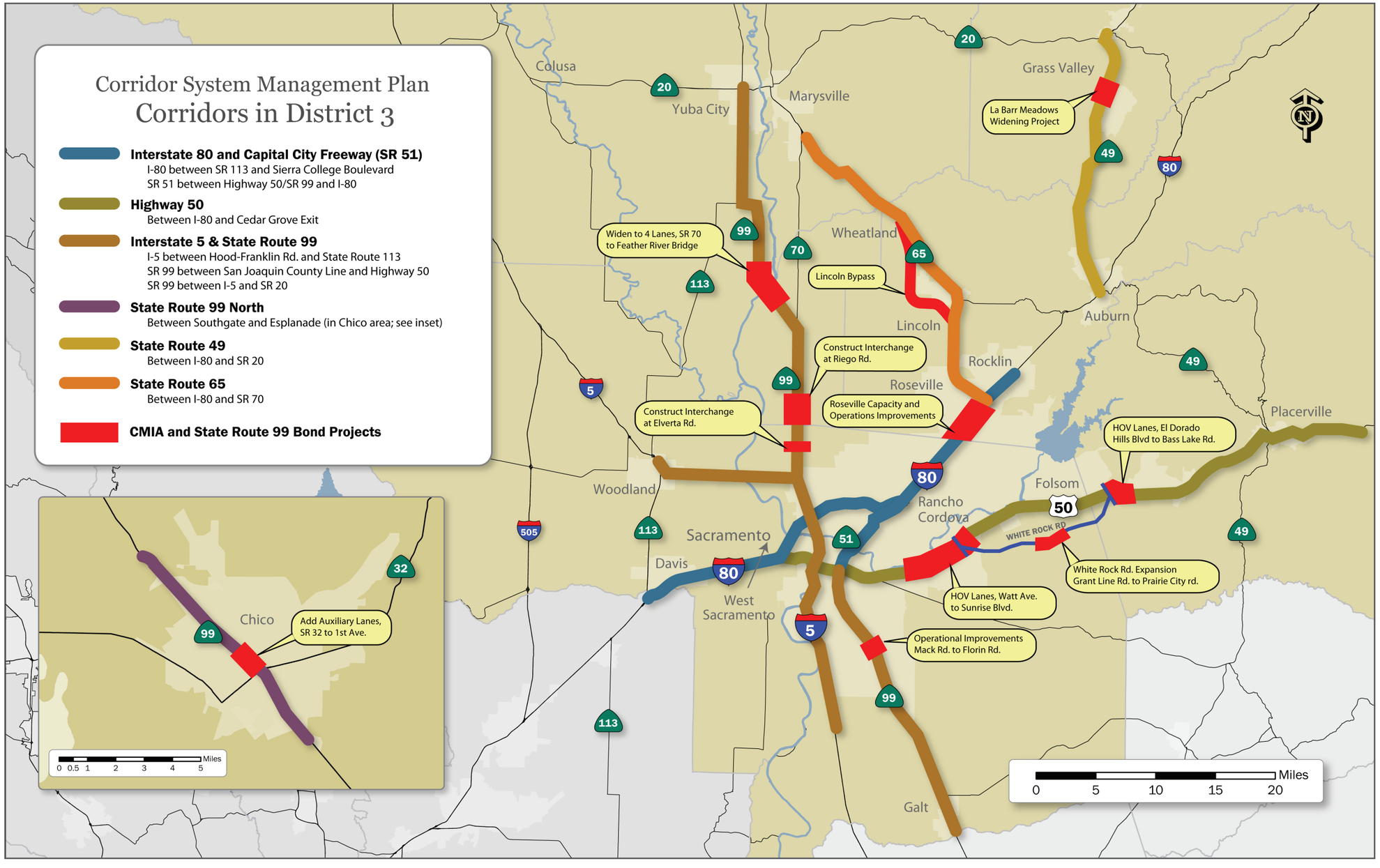


TABLE 1: SR 99/I-5 CSMP TRANSPORTATION NETWORK

Location		State Route 99		Interstate 5		Parallel/Connecting Roadways			Mass Transit					Bike Routes		
County	City	From	To	From	To	Roadway	From	To	Operator/ Service/ Route			From	To	Route	From	To
Sacramento	Elk Grove, Galt, and unincorporated area	San Joaquin/ Sacramento County Line	South of Elk Grove Boulevard	-	-	-	-	-	-	-	-	-	-	-	-	-
Sacramento	Elk Grove, and unincorporated area	Elk Grove Boulevard	Sheldon Rd.	Hood-Franklin Boulevard	Laguna Boulevard	Franklin Blvd.	Laguna Blvd.	Elk Grove Blvd.	ET	EB	49, 52, 53, 57, 58, 59, 60,66	Elk Grove	Downtown	-	-	-
						Bruceville Rd.	Sheldon Rd.	Elk Grove Blvd.								
						Elk Grove Blvd.	I-5	SR 99								
						Laguna Blvd	I-5	SR 99								
Sacramento	Elk Grove, Sacramento, and unincorporated area	Sheldon Rd.	US 50	Laguna Boulevard	US 50	Power Inn Rd.	US 50	Calvine Rd.	SacRT	EB	3, 7, 50E	Sacramento	Downtown	Sacramento River Trail	Miller Park	Captain's Table Rd.
						Florin Rd.	I-5	Power Inn Rd.		LR	Blue Line South	Sacramento	Downtown	Power Inn Rd.	Calvine Rd.	14th Ave.
Sacramento	Sacramento	Break in State Route 99		US 50	I-5/SR 99 IC	-	-	-	SacRT	Bus	11, 88	Sacramento	Downtown	-	-	-
Sacramento	Sacramento, and unincorporated area			I-5/SR 99 IC	Sacramento/ Yolo County Line	-	-	-	YCTD	Bus	42A/42B	Woodland	SMF & Downtown	-	-	-
Yolo	Woodland, and unincorporated area			Sacramento/ Yolo County Line	I-5/ SR 113 Junction (end of CSMP segment)	County Road 102	East Main Street	East Gibson Rd.	YCTD	EB	45	Woodland	Downtown	-	-	-
						East Main Street	SR 113	County Road 102								
						East Gibson Rd.	SR 113	County Road 102								
Sacramento & Sutter	Sacramento, and unincorporated areas	I-5 / SR 99 IC	SR 99 / SR 70 split			Riego Rd.	SR 99	Pleasant Grove Rd.	-	-	-	-	-	-	-	-
						Sankey Rd.	SR 99	Pleasant Grove Rd.								
						Howsley Rd.	SR 99	Pleasant Grove Rd.								
						Pleasant Grove Rd.	Riego Rd.	Nicolaus Ave.								
Sutter	unincorporated area	SR 99 / SR 70 split	SR 113			Nicolaus Ave./ Garden Ave.	SR 99	Pleasant Grove Rd.	-	-	-	-	-	Garden Ave.	SR 99	Nicolaus Ave.
Sutter	Yuba City, and unincorporated area	SR 113	SR 20			George Washington Blvd.	SR 113	SR 20	YS	EB	SR 99	Yuba City	Downtown	-	-	-
						Walton Ave.	Oswald Rd.	SR 20								
						Garden Hwy.	SR 99	Sutter Street								
						Lincoln Rd.	Garden Hwy.	George Washington			SR 70	Marysville	Downtown			
						Bogue Rd.	Garden Hwy.	George Washington								
						Oswald Rd.	SR 99	George Washington								

Notes: SacRT = Sacramento Regional Transit District, LR = Light Rail, EB = Express Bus, YCTD = Yolo County Transportation District, ET = Elk Grove E-Tran, YS = Yuba-Sutter Transit, SMF = Sacramento International Airport

Figure 3: CSMP Corridors in District 3



need, purpose, goal and objectives

There is a **need** for a planning approach that brings facility operations and transportation service provision together with capital projects into one coordinated system management strategy that focuses on high demand travel corridors such as SR 99 and I-5. SR 99 and I-5 serve some of the same communities and travel patterns. South of US 50, SR 99 and I-5 function as primary reciprocal parallel routes, within and beyond the Sacramento region. Given their interrelationship, these segments are treated as a single corridor for system management.

A CSMP is needed for the SR 99/I-5 corridor to address severe traffic congestion that often exceeds the capacity of existing facilities, transit ridership demands that exceed the capacity of the transit system, and bicycle facilities that do not provide a fully linked network of bike routes.

The CSMP directly supports the implementation of the four State Route 99 Bond Program projects on the corridor.

The **purpose** of the CSMP is to create a partnership planning process that focuses on system management strategies and coordinated capital investments so that all the pieces of the corridor function as an efficient transportation system, and performance evaluation measures are implemented to track the effectiveness of strategies and projects.

The CSMP directly supports the implementation of the four State Route 99 Bond Program projects on the corridor:

- **In Sacramento County, operational improvements, including lane extensions, from Calvine Road to Mack Road.**
- **In Sacramento County, at SR 99 and Elverta Road, construct interchange.**
- **In Sutter County, at SR 99 and Riego Road, construct interchange.**
- **In Sutter County, widen Feather Bridge from 2-lane highway to 4-lane expressway.**

The **goal** of the CSMP is to improve mobility along the SR 99/I-5 corridor by focusing on the integrated management of a subset of the entire transportation network within the corridor, including select freeway and parallel roadways, transit and bicycle components of the corridor.

SR 99 HOV lanes at Calvine Road.

The **objectives** of the CSMP are to **reduce travel time or delay** on all modes, **improve connectivity** between modes and facilities, **improve travel time reliability, improve safety** on the transportation system, and **expand mobility options** along the corridor in a cost effective manner. Implementation of the CSMP will **increase access** to jobs, housing, and commerce.

CONSISTENCY WITH OTHER STATE TRANSPORTATION PLANS AND POLICIES

The CSMP approach is consistent with the goals and objectives of the Governor's ***Strategic Growth Plan***, which among other things commits to minimizing increases in traffic congestion. Key elements of the strategy are illustrated in Figure 4.

At the base of the pyramid, and the foundation of transportation system management, is system monitoring and evaluation. It is essential to understand what is happening on the transportation system so that the best decisions can be made based on reliable data. The next few layers up the pyramid are focused on making the best use of existing resources and reducing the demand for transportation, particularly during peak travel hours. The top layer of the pyramid is system expansion. This layer assumes that all the underlying components are being addressed and that system capacity expansion investments are necessary.

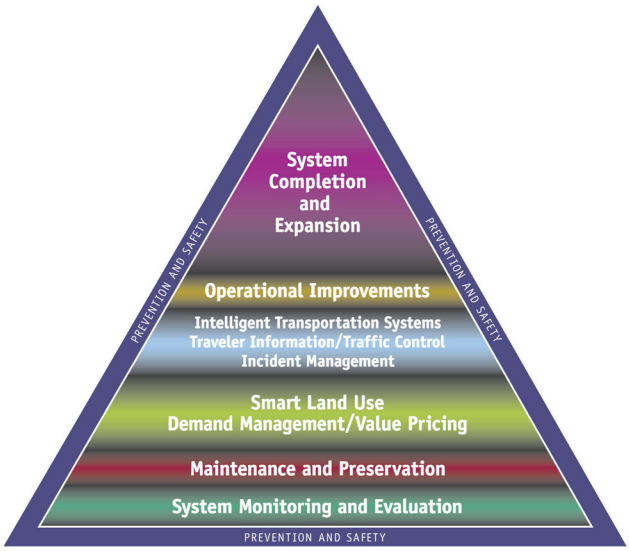


Figure 4: Strategic Growth Plan Strategy

Corridor system management is consistent with the **Caltrans Mission:**

Improve Mobility Across California

Corridor system management is consistent with **Caltrans' Goals:**

- **SAFETY:** Provide the safest transportation system in the nation for users and workers.
- **MOBILITY:** Maximize transportation system performance and accessibility.
- **DELIVERY:** Efficiently deliver quality transportation projects and services.
- **STEWARDSHIP:** Preserve and enhance California's resources and assets.
- **SERVICE:** Promote quality service through an excellent workforce.

The CSMP is also consistent with the California Transportation Plan (CTP), the statewide, long-range transportation plan for meeting future mobility needs. The CTP defines goals, policies, and strategies to achieve our collective vision for California's future transportation system.

Air Quality Planning

Corridor System Management seeks to create conditions where vehicle flow on highways and roads occurs at a steady pace and travelers have a range of mobility options that enable them to travel other than by single occupant vehicle. System expansion is focused only where needed when travel demand exceeds the capacity of the well managed existing system. These conditions are beneficial to attaining air quality goals and reducing green house gas emissions.

current corridor system management strategies

SR 99 extends over 400 miles through California's San Joaquin and Sacramento Valleys. The highway links over 11 urbanized communities in 13 counties, and provides critical connections between Chico, Yuba City, Sacramento, and Stockton. SR 99 has high truck volumes with significant increases in truck traffic during peak agricultural seasons. In District 3, the route is not completed to expressway standards, primarily north of Sacramento. There are numerous conventional highway "gaps", and a lack of adequate expressway capacity for travel demand between growing communities.

I-5 serves as the transportation backbone of the State of California and the western United States. It connects travelers between Canada and Mexico, and supports vital trade and goods movement routes that sustain California's economy. In Caltrans District 3, near downtown Sacramento, I-5 provides connections to I-80 and US 50, and serves as the primary bridge crossing of the American River – where daily traffic volumes exceed 180,000 vehicles.

In the urbanized areas, severe peak traffic congestion is found on both I-5 and SR 99. South of US 50, I-5 and SR 99 serve the same corridor linking downtown Sacramento, Elk Grove, and Stockton. Commute transit services often operate near maximum ridership capacity.

Given the complexity of the corridor and its extensive geographic range, there are a wide variety of system management strategies and elements currently being implemented by jurisdictions and transportation service providers. Strategies and elements range from vehicle detection devices to traveler information systems to traffic flow control mechanisms. A common element among all the strategies and elements is data collection and analysis. There is presently some system management coordination and inter-jurisdictional partnerships among the entities such as the Sacramento Transportation Area Network (STARNET).

There are a wide variety of system management strategies and elements currently being implemented by jurisdictions and transportation service providers.

The STARNET web application initial release is anticipated for the late fall of 2009. Features to be included in the initial release will include: Changeable Message Sign (CMS) display, a chain control application, integration of Regional Transit data, California Highway Patrol incident data, connectivity to the 511 systems (web and telephone), Closed Circuit Television (CCTV) display and interagency messaging and coordination [Caltrans Transportation Management Center (TMC), Kingvale Operation Center, City of Sacramento Traffic Operation Center (TOC), Sacramento County TOC, Roseville TOC, and Elk Grove TOC].

STARNET's associated management strategies can and will evolve as the application is implemented throughout the region and as additional features are added in annual releases.

Changeable Message Sign at Interstate 5 and Garden Highway

STATE HIGHWAY SYSTEM

With the construction of California's state highway system virtually complete in the Sacramento region, Caltrans' major emphasis on highway projects has largely shifted from new construction to focused capacity expansions, reconstruction, operation, and maintenance of existing facilities.

The State Highway System has an extensive set of system management strategies in operation. Some cities, counties, and transit operators also have robust system management elements and programs applied to their facilities or services. There are also specific instances of system management linkages among transportation modes and services at particular locations. Existing management strategies are depicted on Figure 5 and summarized in Table 2.

These strategies work as a system to gather, analyze, and disseminate information through the Caltrans TMC. Information about collisions, other incidents, road closures, and emergency notifications are fed into this information hub and disseminated to public and private information users. The TMC operates 24 hours a day, seven days a week.

Figure 5: Existing Highway Traffic Operations Systems

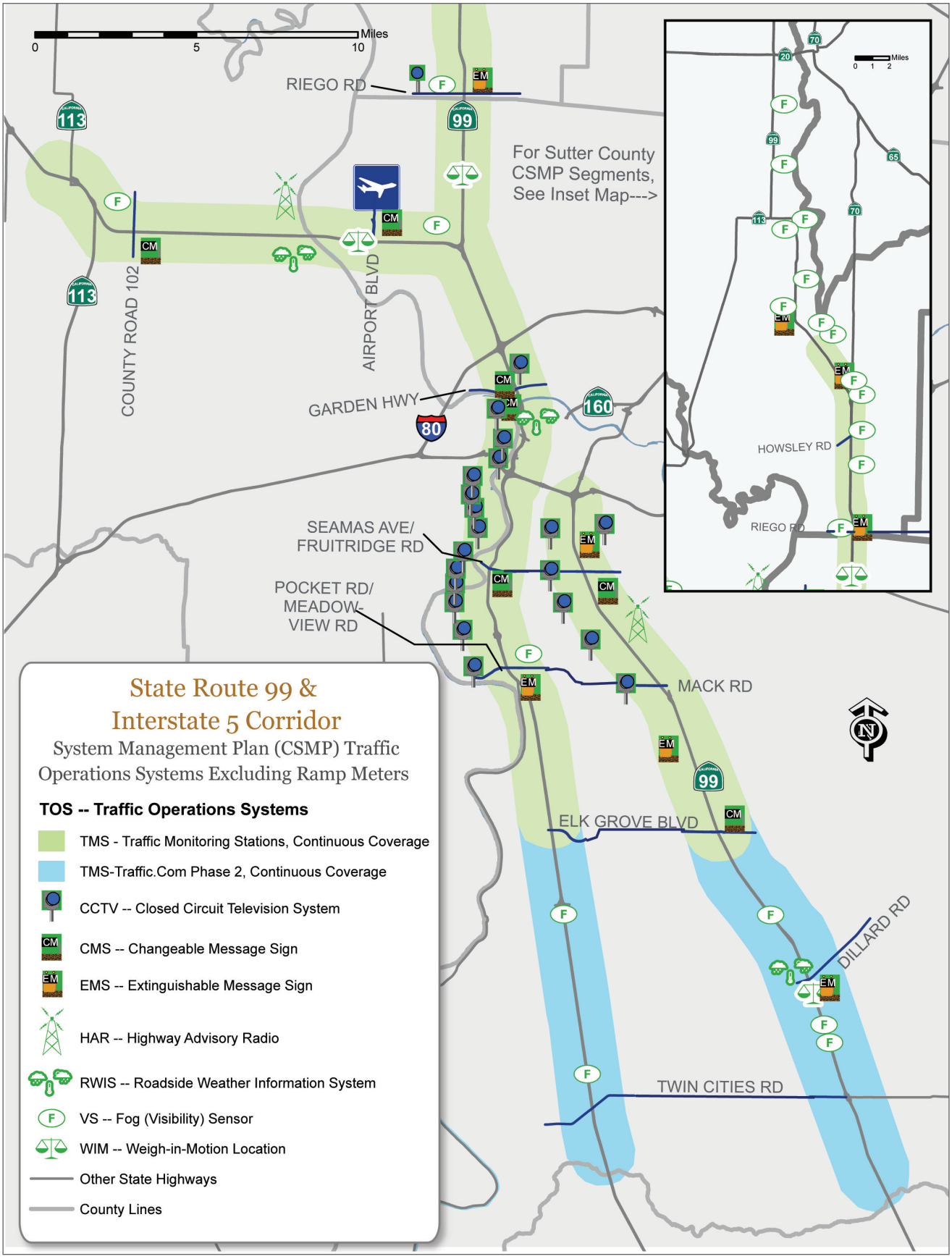


TABLE 2: EXISTING HIGHWAY TRANSPORTATION OPERATIONS SYSTEMS

County	Location	PM	TOS Elements								
			TMS	RM	HAR	RWIS	CMS	EMS	VS	CCTV	WIM
Interstate 5											
SAC	Hood-Franklin Boulevard to Elk Grove Boulevard	8.49 / 10.83	3 (2 part of Traffic.com Ph. 2)	0	0	0	0	0	0	0	0
	Elk Grove Boulevard to Laguna Boulevard	10.83 / 12.04	1	1	0	0	0	0	0	0	0
	Laguna Boulevard to Pocket Road	12.04 / 16.15	3	4	1	0	0	1	0	1	0
	Pocket Road to US 50 Ramps: South of I-5/US 50 IC	16.15 / 22.00	5	6	0	0	1	0	1	8	0
	US 50 Ramps: South of I-5/US 50 IC to Richards Boulevard	22.00 / 24.65	3	4	0	1	1	0	0	4	0
	Richards Boulevard to I-5/I-80 IC	24.65 / 26.69	1	4	0	0	2	0	0	1	0
	I-5/I-80 IC to I-5/SR 99 IC	26.69 / 29.91	4 (3 part of Traffic.com Ph. 1)	4	0	0	0	0	0	1	0
	I-5/SR 99 IC to Sacramento/Yolo County Line	29.91 / 34.65	4 (all part of Traffic.com Ph. 1)	0	0	0	1	0	1	0	0
Yolo	Yolo/SAC County Line to County Rd. 102	0.00 / 5.53	5 (4 part of Traffic.com Ph. 1)	0	1	1	1	0	1	0	0
	County Road 102 to I-5/ SR 113 Junction	5.53 / 8.26	1 (part of Traffic. com Ph. 1)	0	0	1	0	0	1	0	0
TOTAL			**30**	**23**	**2**	**3**	**6**	**1**	**4**	**15**	**0**
State Route 99											
SAC	SJ / SAC County Line to Elk Grove Blvd.	0.00 / 12.76	11 (10 part of Traffic.com Ph. 2)	0	0	1	0	1	3	0	1
	Elk Grove Blvd. to Mack Road	12.76 / 17.66	4	10 built; some inactive	0	0	1	1	0	0	0
	Mack Road to Fruitridge Road	17.66 / 21.94	8	6 built; some inactive	1	0	1	0	3	0	0
	Fruitridge Road to Junction SR 51	21.94 / 24.35	5	2	1	0	0	1	0	3	0
	Junction I-5 to Sacramento/Sutter County Line	32.12 / 36.86	3	0	0	0	0	0	0	0	0
SUT	Sacramento/Sutter County Line to South of Feather River Bridge	0.00 / 11.50	6	0	0	0	0	2	5	1	0
	South of Feather River Bridge to Passing Lanes North of Sacramento Avenue	11.50 / 14.00	0	0	0	0	0	1	2	1	0
	Passing Lanes North of Sacramento Avenue to Wilson Road	14.00 / 17.77	0	0	0	0	0	0	2	1	0
	Wilson Road to North of Junction SR 113	17.77 / 22.99	0	0	0	0	0	0	2	0	0
	North of Junction SR 113 to Lincoln Road	22.99 / 28.67	0	0	0	0	0	0	2	0	0
	Lincoln Road to SR 20	28.67 / 30.63	0	0	0	0	0	0	0	0	0
TOTAL			**37**	**18**	**2**	**1**	**2**	**6**	**16**	**9**	**1**

PARALLEL AND CONNECTING ROADWAYS

City of Elk Grove utilizes traditional control devices; traffic signals and stop signs. In addition, there is one CCTV on Laguna Boulevard.

City of Sacramento operates a TOC. Sensors in the street detect the passage of vehicles, vehicle speed, and the level of congestion. This information is received on a second-by-second (real-time) basis and is analyzed at the TOC.

Sacramento County also operates a TOC by gathering information through CCTV cameras, CMS, HAR, and a Fiber Optics (FO) network placed along major traffic corridors throughout the county.

City of Woodland data unavailable.

Sutter County data unavailable.

TRANSIT AND RIDESHARING

This CSMP corridor is served by numerous transit agencies. Key components of the network include commuter and local bus services, and light rail service to downtown Sacramento, and the Sacramento Valley Station. The agencies included are: Sacramento Regional Transit District, Elk Grove e-Tran, Yuba-Sutter Transit and Yolo County Transportation District. See Figures 6 and 7 for route details.

Sacramento Regional Transit District (SacRT) uses Global Positioning Systems (GPS) for transit route analysis.

SacRT has installed pre-emptive traffic signals at at-grade intersections along light rail routes. Sacramento County has installed pre-emptive traffic signals to give preferential signal timing to transit buses at select locations that serve high priority transit corridors.

The Sacramento Valley Station in downtown Sacramento is the 7th busiest station in the national Amtrak system, with over 1.1 million annual passenger trips. Passengers can make connections with numerous local and commuter bus services, as well as the SacRT's light rail system. The expansion project of this station will enhance the connectivity of this facility for the region.

Yolo County Transportation District uses GPS in an Automatic Vehicle Location (AVL) system, which provides riders with up to the minute bus location information.

Elk Grove E-Tran data unavailable.

Yuba-Sutter Transit data unavailable.

SACOG manages the Regional Rideshare Program for Sacramento, Yolo, Yuba and Sutter Counties in this corridor. This program, including 511, provides information about carpooling, transit ridership, vanpooling and bicycling. SACOG is creating an on-line route planning system for bicyclists. Additionally, SacRT provides an on-line trip planning application to assist transit users.

SacRT Meadowview Light Rail station.

Park and Ride lots located adjacent to or nearby the SR 99/I-5 corridor are used regurlarly by commuters to park their cars or bicycles and then meet with carpools, vanpools, and transit. Some park and ride lots in this corridor are near capacity. Table 3 provides a CSMP Park and Ride lot listing.

BICYCLE FACILITIES

Bicycle facilities in the corridor are not actively managed in the same manner as motor vehicle facilities. However, there are traffic operation systems that serve bicyclists such as dedicated bicycle lanes, bicycle detection loops at signalized intersections, video detection, other non-loop type detection, and bicyclist activated signal change but-

tons. The City of Sacramento is installing video detection at some locations.

SacRT buses and the new light rail trains are equipped with bicycle racks. There are over 170 weatherproof bicycle lockers at 23 light rail stations. YCTD has the Bikes on Buses Program that allows bicycles to travel on any YOLOBUS.

The Sacramento Area Bicycle Advocates maintain an on-line hazard reporting system to allow users to report hazardous locations for bicyclist such as potholes, inadequate signal timing, hazardous railroad crossings, insufficient shoulder, and inadequate bikeway markings. The reports are then sent to the applicable jurisdiction. SACOG is creating an on-line route planning system for bicyclists. In addition, SACOG maintains bicycle maps on their website which are currently being updated.

The bicycle routes included in the CSMP network are shown on Figures 6 and 7.

PEDESTRIAN FACILITIES

Pedestrian facilities are not included as part of the managed network because they do not directly provide corridor mobility. However, complete and safe pedestrian access to corridor modes, such as bike routes and transit services, is an important component of corridor system management. Therefore, subsequent updates of the CSMP will seek to identify key pedestrian facilities and barriers to pedestrian mobility with regard to access and modal connectivity.

Figure 6: Northern CSMP Corridor Transit and Bicycle Routes

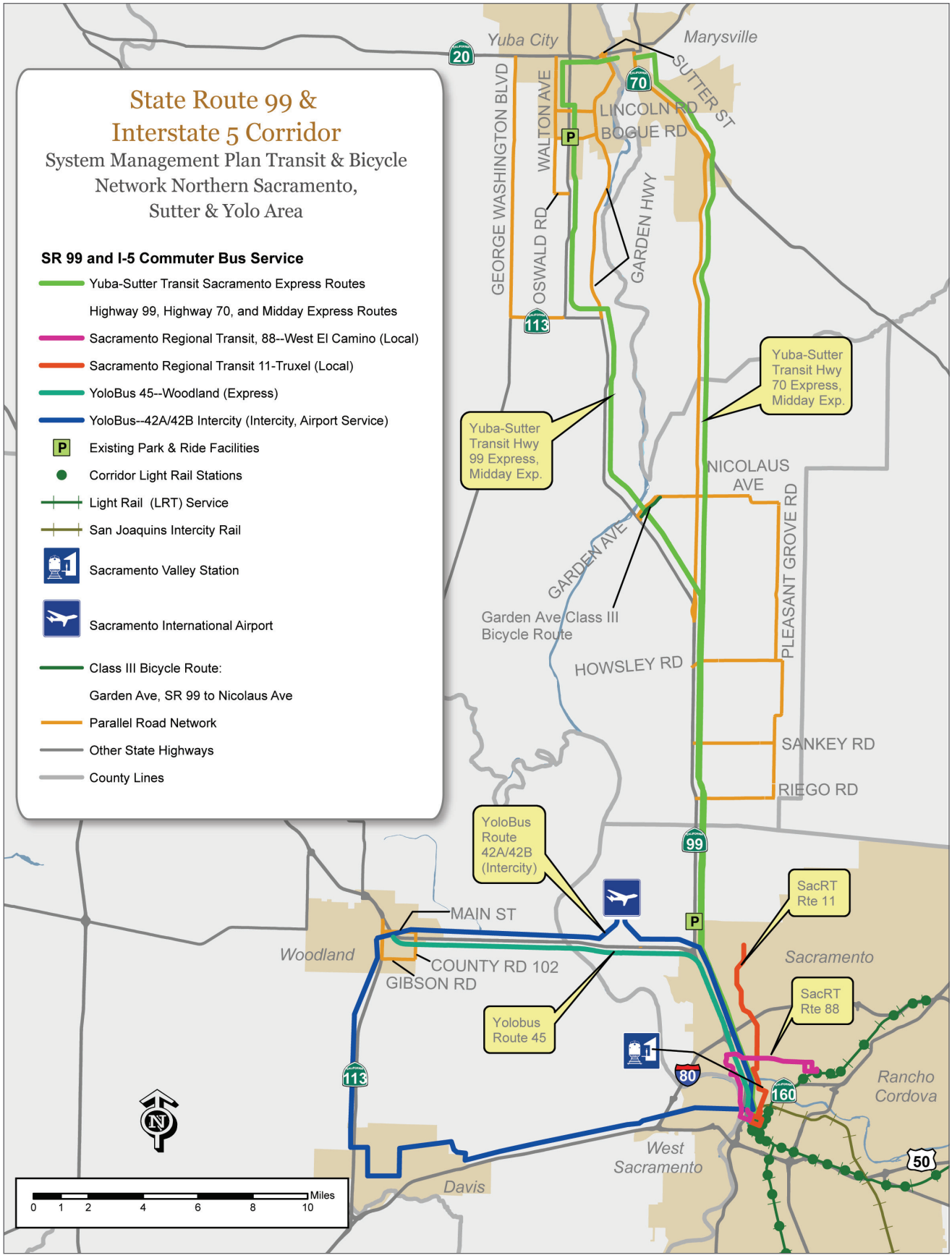


Figure 7: Southern CSMP Corridor Transit and Bike Routes

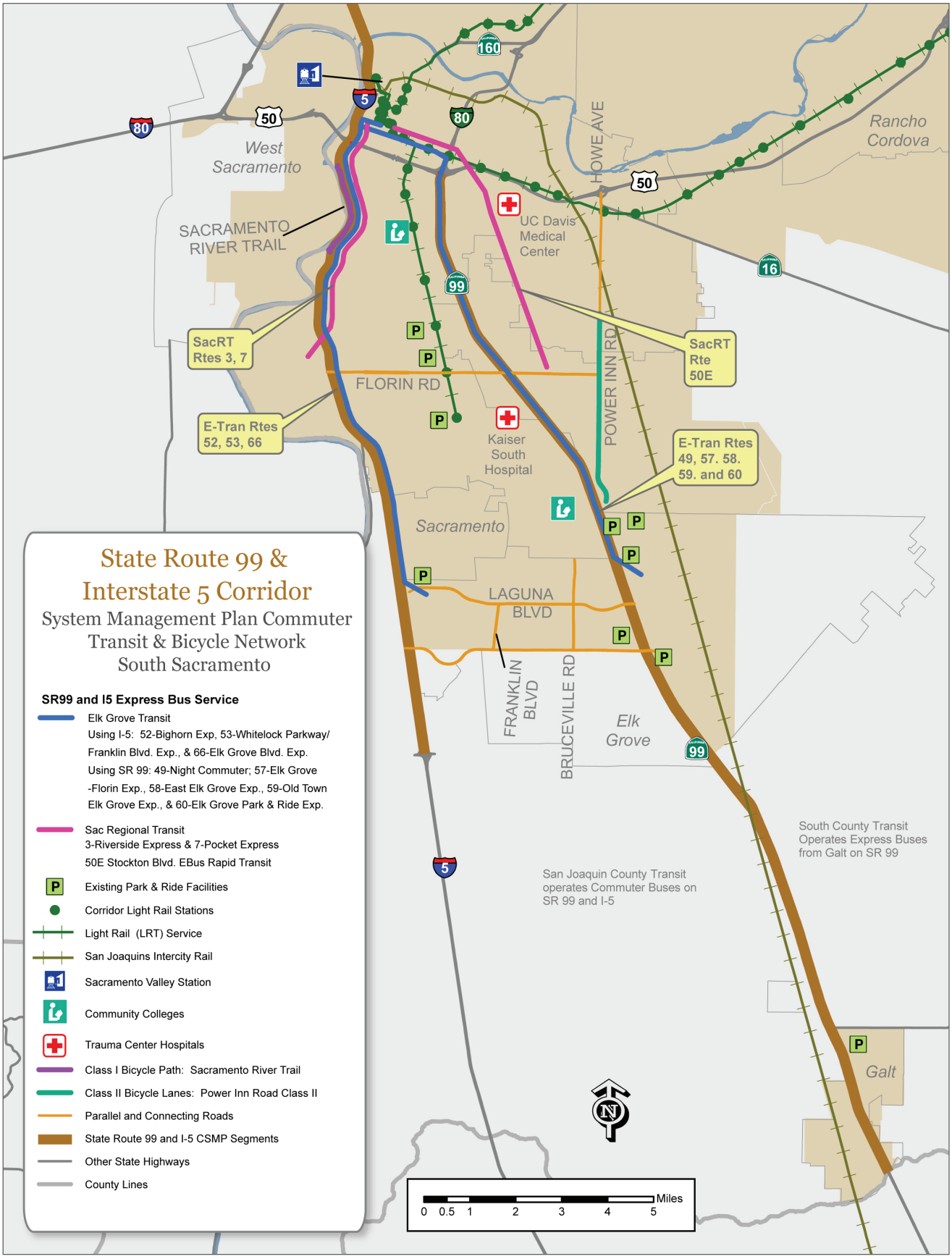


TABLE 3: PARK AND RIDE LOTS

County	Location/ PM	Facility Name Description	Lot Use			Transit Connection/ Provider and Route No.
			Spaces	Spaces Occupied	Occupancy Rate (%)	
SUT	SR 99/ 27.7	Bogue Road near SR 99 – North of the Service Station on the NE Corner	88	88	100%	Yuba-Sutter Transit Commuter Service
SAC	SR 99/ 12.8	Stockton Boulevard – ½ block South of Elk Grove Boulevard – East of SR 99	98	9	9%	E-Tran 52, 155, 156, 160, Highway 99 Express
SAC	SR 99/ 12.8	Wal-Mart Lot Elk Grove Boulevard west of SR 99	21	10	48%	E-Tran 66, 152, 156, 162
SAC	SR 99/ 14.9	Southeast corner of SR 99/Sheldon Road IC	100	44	44%	E-Tran 155, 160
SAC	SR 99/ 16.3	Old Calvine Road East of SR 99	248	37	15%	E-Tran 58, 59, 60, 154, 155
SAC	SR 99/ 33.40	N/W Corner of Elkhorn at SR 99 Interchange	22	8	36%	NA
SAC	Local Road	Florin Road Light Rail Station	1076	205	19%	SacRT Blue Line
SAC	Local Road	Meadowview Light Rail Station	690	547	79%	SacRT Blue Line
SAC	Local Road	47th Avenue Light Rail Station	423	122	29%	SacRT Blue Line
SAC	Local Road	Bruceville Road/Laguna Boulevard	UA	UA	UA	E-Tran
SAC	Local Road	Franklin Boulevard/Laguna Boulevard	UA	UA	UA	SacRT & E-Tran
SAC	Local Road	Laguna Boulevard/Big Horn	9	6	67%	E-Tran
SAC	Local Road	Power Inn Road/Calvine Road	25	24	96%	E-Tran
SAC	Local Road	SR 99/Twin Cities Road	80	21	26%	South County Transit
SAC	Local Road	Harbour Point & Laguna	74	71	95%	

2005 Caltrans Park and Ride Survey, SacRT 2008 Route Map & 2006 Amtrak CC Park and Ride Survey, City of Elk Grove
UA – Unavailable
NA-Not Applicable

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major corridor mobility challenges

High demand for mobility services, especially during peak commute periods, is creating significant traffic congestion and impairing mobility in the corridor. Heavy congestion and stop-and-go traffic contributes to increased vehicle emissions and added travel costs. Many transit services are operating at maximum passenger carrying capacity, and buses often must contend with the same congestion as autos. In many locations, bicyclists have to compete for space on these same facilities.

Much of the congestion can be attributed to population growth, residential and commercial development, job/housing imbalances, work schedules that require commute trips during peak travel times, recreational trip generators, and truck traffic.

Downtown Sacramento is one of the region's largest employment centers. Over 150,000 workers travel daily into, and back from downtown Sacramento. SR 99 and I-5 provide access into the Central City, and are significant commute corridors for the region.

The overall amount of travel in the corridor has increased substantially over the past ten years and is expected to continue to increase as the **region adds approximately one million new residents over the next 25 years** per the current SACOG MTP 2035. Traffic congestion per household is expected to increase 18 percent over 2005 levels by the year 2035. Current and forecasted data is depicted in Tables 4 and 5.

Traffic congestion per household is expected to increase 18 percent over 2005 levels by the year 2035.

Richards Boulevard Onramp to Interstate 5

SR 99 in the Sutter County area has not yet been fully completed to freeway or expressway standards. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) designated the section of SR 99 from Bakersfield to Sacramento as a potential future Interstate. It is not clear how the existing non-standard features on this part of SR 99 would be treated if it were added to the Interstate system or how upgrades would be funded.

There are few existing bridge crossings of the American River in the Sacramento region. The SACOG MTP for 2035 states that the American River represents a geographic barrier to transportation connectivity in the Sacramento

region, where over 200,000 workers commute across the river daily. The I-5 crossing is the primary facility connecting the Natomas area to downtown. The MTP includes new river crossing projects that would potentially reduce the travel demand placed on the I-5 bridge.

The sections of SR 99 and I-5 with particularly severe traffic congestion are depicted in Figures 8, 9, 10, and 11. These are also summarized in greater detail in Tables 15, 16, 17, and 18 located in Section 7. I-5 northbound and southbound bottlenecks are summarized in Tables 15 and 16, while the tables that follow discuss each bottleneck. These include location and possible causality. SR 99 northbound and southbound bottlenecks are summarized in Tables 17 and 18, while the tables that follow discuss each bottleneck. These include location and possible causality. Minor or hidden bottlenecks are those that are not as defined (or severe) as the major bottlenecks. Please note that the graphics accompanying the bottlenecks are not to scale.

A critical component of identifying and resolving corridor mobility challenges is the need for detailed data, analysis, and communication regarding system performance. Data collection is insufficient to fully meet these needs but still provides useful information as detailed in the following pages. Improving data gathering, analysis, and dissemination of information is a major challenge for this corridor and is a component of Intelligent Transportation Systems planning.

Challenges along the corridor include:

- severe, recurrent highway and roadway traffic congestion,
- an incomplete bus/carpool lane system,
- an incomplete set of freeway auxiliary lanes,
- loss or dropping of freeway lanes at specific locations,
- incomplete ramp metering,
- limited parallel roadway capacity,
- lack of signal coordination on key arterials, and freeway ramp intersections,
- transit facilities approaching capacity,
- inadequate transit capital and operations funding needed to grow transit ridership,
- light rail at-grade crossings,
- lack of adequate access to transit across SR 99/I-5,
- poor pavement and road and bicycle route maintenance/sweeping,
- lack of sufficient bicycle activated signal change devices,
- motorist driving behavior,
- inadequate bicycle storage,

Tower Bridge Connecting the City of West Sacramento and the City of Sacramento

TABLE 4: SR 99 CURRENT AND FORECASTED TRAFFIC DATA

Location		Current Traffic Data—2007					Future Traffic Data — 2027 (No Build)			Future Traffic Data — 2027 (Build)		
County	Description and Location	% of Trucks	Peak Directional Split[1]	Peak Hour Traffic	Average Annual Daily Traffic[2]	Volume over Capacity[3]	Peak Hour Traffic	Average Annual Daily Traffic[2]	Volume over Capacity[3] (No-Build)	Peak Hour Traffic	Average Annual Daily Traffic[2]	Volume over Capacity[3] (Build)
SAC	San Joaquin -Sacramento County Line to Elk Grove Boulevard	14%	55%	5,400	66,000	0.70	8,870	108,400	1.15	8,910	108,900	1.15
SAC	Elk Grove Blvd to Mack Road	8%	55%	11,400	149	1.02	15,590	203,730	1.36	17,100	223,500	1.12
SAC	Mack Road to Fruitridge Road	6%	53%	17,000	189	1.02	23,090	256,740	1.38	23,800	264,600	1.43
SAC	Fruitridge Road to Junction SR 51	5%	54%	16,100	221	1.01	21,400	293,780	1.34	21,735	298,350	1.37
SAC	Junction I-5 to Sacramento - Sutter County Line	12%	70%	5,500	54	0.92	8,780	86,230	1.43	9,350	91,800	0.99
SUT	Sacramento - Sutter County Line to South of Feather River Bridge	11%	70%	3,950	39,500	0.68	5,990	59,900	1.18	8,295	82,950	0.90
SUT	South of Feather River Bridge to Passing Lanes North of Sacramento Avenue	9%	69%	1,800	17,600	0.64	2,730	26,700	0.97	3,240	31,680	0.62
SUT	Passing Lanes North of Sacramento Avenue to Wilson Road	9%	69%	1,800	17,600	0.28	2,730	26,700	0.51	3,240	31,680	0.62
SUT	Wilson Road to North of Junction SR 113	13%	68%	1,650	17,500	0.59	3,160	33,550	1.13	2,970	31,500	0.56
SUT	North of Junction SR 113 to Lincoln Road	10%	54%	2,350	26,500	0.37	3,170	35,710	0.56	3,525	39,750	0.42
SUT	Lincoln Road to SR 20	10%	54%	3,150	36,000	n/a	3,970	45,420	n/a	4,725	54,000	n/a

[1] Peak Directional Split: The percentage of total traffic in the heaviest traveled direction during the peak hour.
[2] Average Annual Daily Traffic (AADT): The average number of vehicles per day in both directions.
[3] Volume over Capacity (V/C): The volume of traffic compared to the capacity of the roadway.
[4] Volume over Capacity does not determine LOS for two- or three-lane facilities, or segments with intersection delay.
[5] Reported Collision Rate Index (% Compared to State Average): The percentage by which each segment's reported collisions rate (fatal, injury, and property damage only) is above or below the statewide average reported collisions rate on comparable facilities. Source: 3-Year Caltrans Traffic Accident Surveillance and Analysis System data.

TABLE 5: I-5 CURRENT AND FORECASTED DATA

Location		Current Traffic Data—2007					Future Traffic Data — 2027 (No Build)			Future Traffic Data — 2027 (Build)		
County	Description and Location	% of Trucks	Peak Directional Split[1]	Peak Hour Traffic	Average Annual Daily Traffic[2]	Volume over Capacity[3]	Peak Hour Traffic	Average Annual Daily Traffic[2]	Volume over Capacity[3] (No-Build)	Peak Hour Traffic	Average Annual Daily Traffic[2]	Volume over Capacity[3] (Build)
SAC	Hood-Franklin Boulevard to Elk Grove Boulevard	14%	57%	6,800	60,000	0.88	12,444	109,800	1.62	12,580	111,000	1.09
SAC	Elk Grove Boulevard to Laguna Boulevard	11%	57%	6,700	76,000	0.88	11,859	134,520	1.60	12,395	140,600	1.12
SAC	Laguna Boulevard to Pocket Road	11%	66%	9,100	100,000	0.92	12,740	140,000	1.28	15,470	170,000	1.17
SAC	Pocket Road to US 50 ramps south of I-5/US 50 Interchange	8%	66%	12,200	156,000	1.01	16,958	211,280	1.27	18,300	228,000	1.10
SAC	US 50 ramps south of I-5/US 50 Interchange to Richards Boulevard	7%	58%	16,900	194,000	1.49	24,674	275,940	2.18	26,195	292,590	1.74
SAC	Richards Boulevard to I-5/80 Interchange	7%	66%	18,400	197,000	1.44	29,256	303,690	2.27	30,360	315,150	1.89
SAC	I-5/80 Interchange to I-5/SR 99 Interchange	6%	52%	12,300	152,000	0.91	18,327	226,480	1.35	20,910	258,400	1.23
SAC	I-5/SR 99 Interchange to Sacramento/Yolo County Line	13%	52%	6,200	81,000	0.74	8,122	106,110	1.01	9,610	125,550	0.79
YOL	Yolo/Sacramento County Line to County Road 102	14%	53%	4,700	54,000	0.60	7,285	83,700	0.93	7,520	86,400	0.64
YOL	County Road 102 to I-5/SR 113 Junction	14%	52%	4,100	45,000	0.52	6,396	70,200	0.84	6,970	76,500	0.61

[1] Peak Directional Split: The percentage of total traffic in the heaviest traveled direction during the peak hour.
[2] Average Annual Daily Traffic (AADT): The average number of vehicles per day in both directions.
[3] Volume over Capacity (V/C): The volume of traffic compared to the capacity of the roadway.
[4] Volume over Capacity does not determine LOS for two- or three- lane facilities, or segments with intersection delay.
[5] Reported Collision Rate Index (% Compared to State Average): The percentage by which each segment's reported collisions rate (fatal, injury, and property damage only) is above or below the statewide average reported collisions rate on comparable facilities. Source: 3-Year Caltrans Traffic Accident Surveillance and Analysis System data.

Figure 8: SR 99/I-5 AM Bottleneck Locations

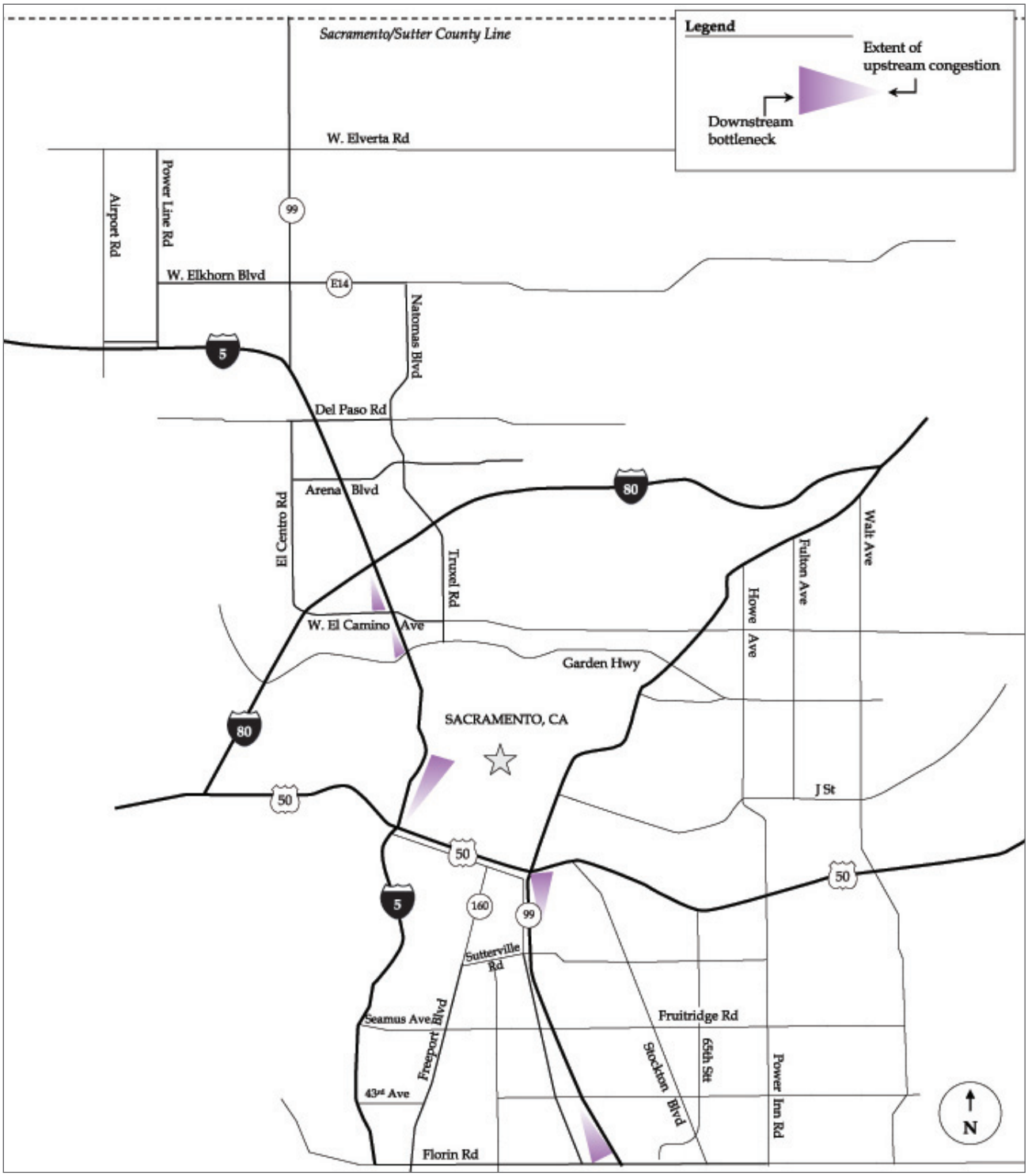


Figure 9: SR 99/I-5 AM Bottleneck Locations (continued)

Figure 10: SR 99/I-5 PM Bottleneck Locations

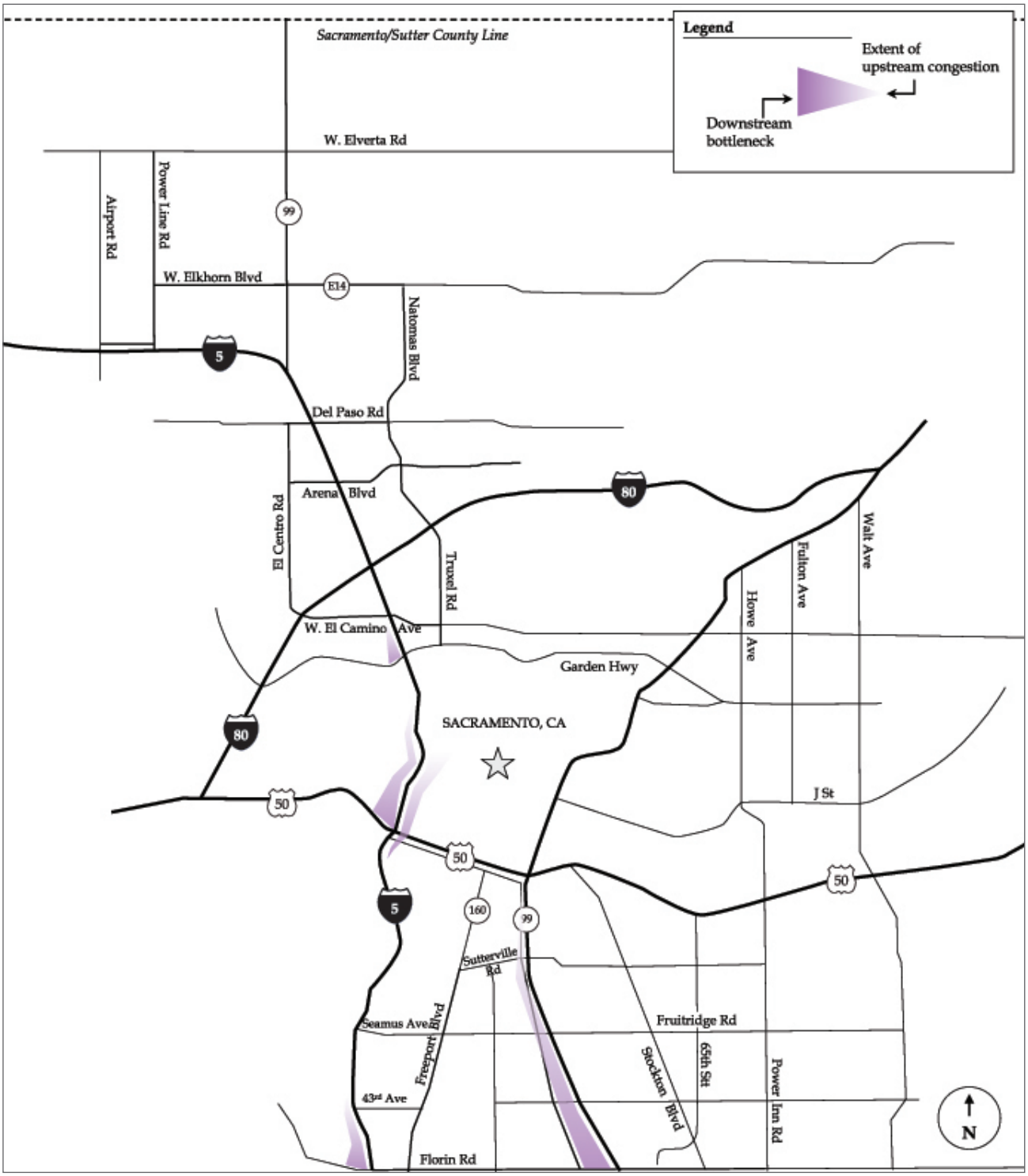
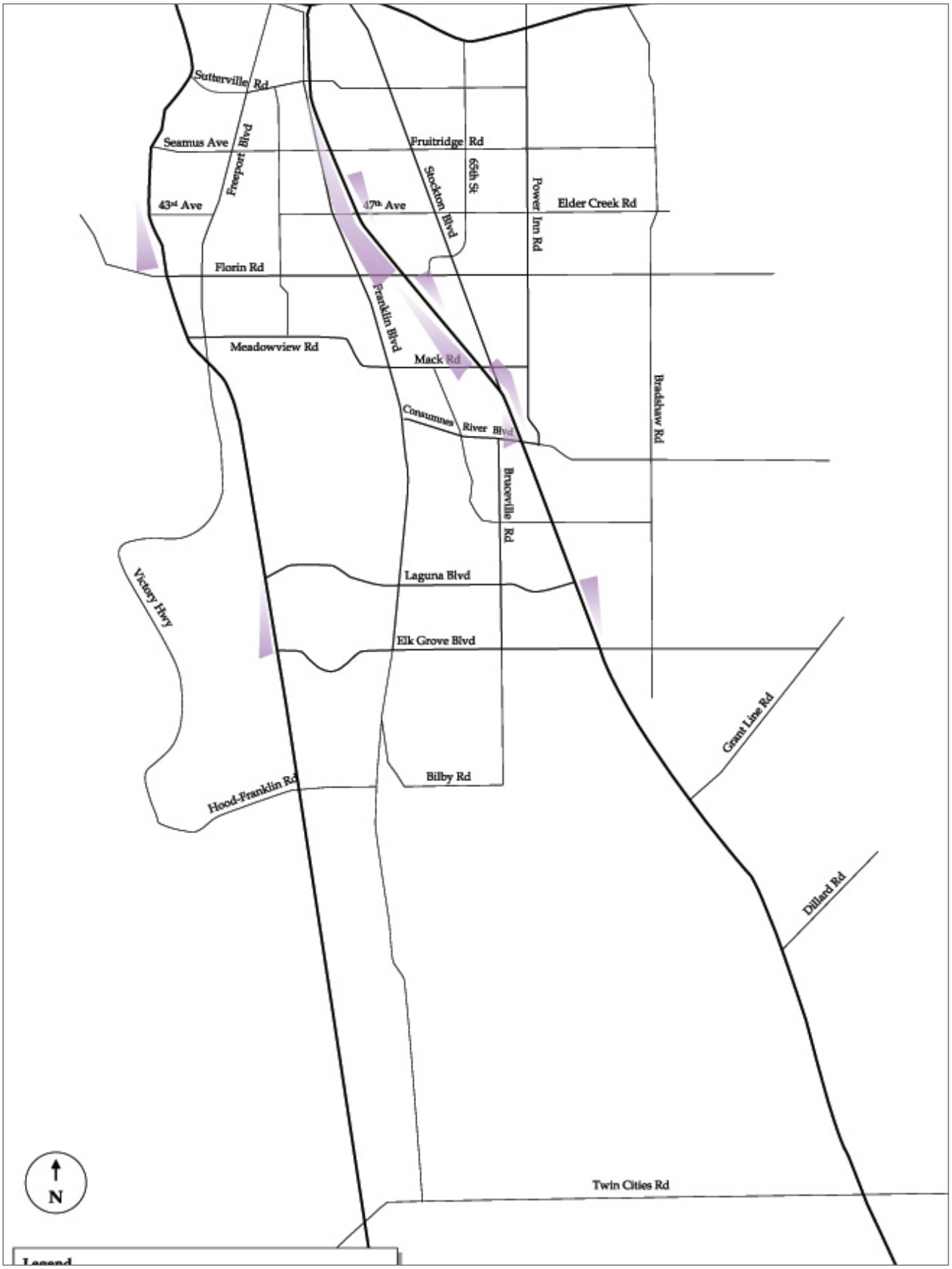


Figure 11: SR 99/I-5 PM Bottleneck Locations (continued)



performance measures

Continuing corridor monitoring and performance measures are an integral part of corridor management and investment decision making and help identify, efficient, and effective system operational strategies and capital improvements. Performance measures provide **dynamic information needed to rapidly address operational problems caused by recurrent and non-recurrent traffic congestion.** Measures are also used to identify the best improvement actions to generate the desired results.

Table 6 identifies the performance measures to be used as part of the corridor system management process.

BASELINE DATA FOR PERFORMANCE MEASURES

Tables 7, 8, and 9 display baseline data for the performance measures for the CSMP transportation network.

The performance data was primarily compiled from the SACMET demand based traffic model, the year 2007 edition of the Traffic Volumes Manual, the year 2000 edition of the Highway Capacity Manual, Caltrans Traffic Accident Surveillance and Analysis System (TASAS), the 2007 Caltrans Division of Maintenance Pavement Summary Report, and ridership records provided by the transit providers.

Additional performance data was derived from the Performance Measurement System (PeMS) tool, an Internet based tool used to host, process, retrieve, and analyze road traffic conditions information from real-time and historical data. PeMS obtains 30-second loop detector data in real-time from detectors installed along the highway corridor.

Performance Measures provide dynamic information needed to rapidly address operational problems caused by recurrent and non-recurrent traffic congestion.

It should be noted that Average Daily Traffic (ADT) and LOS for some Parallel/Connecting Roadways segment locations in Table 8 was not available. These are noted, “No Data.”

Data collection for non-auto modes is not as robust as what is needed for active system management. Subsequent updates of this CSMP will seek to expand availability of transit and bicycle performance data collection.

TABLE 6: PERFORMANCE MEASURES — DEFINITIONS AND APPLICABILITY		
Performance Measure	**Definition of Performance Measure**	**Applicability to Corridor**
STATE HIGHWAY SYSTEM		
LOS	A "report card" measurement with "A" being the least amount of congestion and "F" being the most congestion.	LOS is a relatively simple and widely used measure, which offers comparison opportunities.
Total Vehicle Hours of Delay	The additional travel time in hours experienced by all vehicles on the highway segment per day or at peak hour due to congestion.	This measurement is used to determine the cost, in time, which congestion can add to the regular travel time that it takes to traverse a segment of road, and is useful in quantifying the performance of a particular roadway in an understandable format.
Total Person Minutes of Delay	The additional travel time in minutes experienced by all persons in vehicles on the highway segment per day or at peak hour due to congestion.	This measurement is used to determine the cost, in time, which congestion can add to the regular travel time that it takes to traverse a given segment of road, and is useful in quantifying the performance of a particular roadway in an understandable format and for comparison of improvement options.
Minutes of Delay per Vehicle	The additional travel time in minutes experienced by each vehicle on the highway segment at peak hour due to congestion.	This measurement is used to determine the cost, in time, which congestion can add to the regular travel time that it takes to traverse a given segment of road.
Minutes of Delay per Person	The additional travel time in minutes experienced by each person in vehicles on the highway segment at peak hour due to congestion.	This measurement is used to determine the cost, in time, which congestion can add to the regular travel time that it takes to traverse a given segment of road.
Vehicle Travel Time (Minutes)	The average time spent by vehicles traversing between two points on a road or highway.	Travel time is a measure used to quantify travel time deficiencies and provide a personal indicator of congestion impacts.
Distressed Pavement	Pavement that rides rougher than established maximums and/or exhibits substantial structural problems as determined by the Pavement Condition Survey.	This measurement provides a ride quality indicator and an indicator for structural roadway problems.
Reported Collision Rate	Comparison of the actual total collision rate (%) along a highway segment above, or below, the statewide average for fatal, injury, and property damage-only collisions on comparable facilities.	Comparing the total collision and rate with statewide average rate provides an opportunity to assess safety conditions through the corridor.
Reliability	Identifies day-to-day variation in travel time for the same trip at the same time of day. Focuses on the predictability of travel time, particularly for repetitive trips.	Estimates reliability by defining the extra time travelers must add to their average travel time when planning trips to ensure on-time arrival (0 percent: no day-to-day variations, 100 percent: double allotted travel time).
Lost Productivity	Measures the capacity of the corridor to accommodate vehicle or person throughput and is calculated as actual volume divided by the capacity of the highway.	As traffic volumes increase to roadway capacity, speeds decline rapidly and vehicle throughput drops dramatically, which increases traffic congestion and delay, and results in lost productivity.

TABLE 6: PERFORMANCE MEASURES — DEFINITIONS AND APPLICABILITY *(CONTINUED)*		
Performance Measure	**Definition of Performance Measure**	**Applicability to Corridor**
PARALLEL AND CONNECTING ROADWAYS		
LOS	A "report card" measurement with "A" being the least amount of congestion and "F" being the most congestion.	LOS is a relatively simple and often used measure, which offers comparison opportunities.
TRANSIT		
Available Capacity	Ratio (%) of available transit capacity alternatives within the corridor.	This measure indicates the available capacity to accommodate diverted travelers from single occupant vehicles.

TABLE 7: SR 99/I-5 PERFORMANCE MEASURES

County	Mode Description and Location	Post Miles	Distance (Miles)	Average Annual Daily Traffic[1]	Performance Measures													
					LOS[1]	Total Vehicle Hours of Delay[2]		Total Person Minutes of Delay[2]		Minutes of Delay per Vehicle[2]	Minutes of Delay per Person[2]	Vehicle Travel Time (Minutes)[2]	Distressed Pavement (Lane Miles)[4]	Reported Collision Rate Comparison (%)[5]	Reliability[6]		Lost Productivity[7]	
						Daily	Peak Hour[3]	Daily	Peak Hour[3]	Peak Hour[3]	Peak Hour[3]	Peak Hour[3]			Northbound	Southbound	Lost Lane Miles AM Peak Period	Lost Lane Miles PM Peak Period
STATE HIGHWAY SYSTEM																		
SR 99																		
SAC	San Joaquin -Sacramento County Line to Elk Grove Blvd	0.00/12.76	12.76	66,000	D	446	111	29,424	7,356	1.04	0.95	13.80	4	-27%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	Elk Grove Blvd to Mack Road	12.76/17.66	4.90	149,000	F	1,171	293	99,629	24,907	1.54	1.09	6.44	0	-13%	212%	109%	10	0.6
	Mack Road to Fruitridge Rd	17.66/21.94	4.28	189,000	F	3,509	561	298,523	47,764	1.98	1.40	6.26	0	46%	170%	318%	3.9	12.4
	Fruitridge Rd to Jct SR 51	21.94/24.35	2.41	221,000	F	1,945	408	165,468	34,748	1.33	0.94	3.74	0	-46%	240%	563%	9.4	13.2
	Jct I-5 to Sacramento - Sutter County Line	32.12/36.86	4.74	54,000	E	343	86	22,634	5,658	0.94	0.85	5.68	0	-9%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
SUT	Sacramento - Sutter County Line to South of Feather River Bridge	0.00/11.50	11.50	39,500	C	408	122	26,910	8,073	1.86	1.69	14.40	7	-56%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	South of Feather River Bridge to Passing Lanes North of Sacramento Ave	11.50/14.00	2.50	17,400	E	40	12	2,610	783	0.38	0.35	3.11	0	-49%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	Passing Lanes North of Sacramento Ave to Wilson Rd	14.00/17.77	3.77	17,600	A	0	0	0	0	0.00	0.00	3.77	0	-85%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	Wilson Rd to North of Jct SR 113	17.77/22.99	5.22	17,500	E	89	27	5,864	1,759	0.97	0.88	6.66	6	1%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	North of Jct SR 113 to Lincoln Rd	22.99/28.67	5.68	26,500	B	85	21	5,606	1,402	0.54	0.49	6.74	2	-9%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	Lincoln Rd to SR 20	28.67/30.63	1.96	36,000	E	1,197	180	79,012	11,852	3.42	3.11	6.03	8	20%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	Total	**–**	**59.72**	**–**	**–**	**9,233**	**1,821**	**735,680**	**144,302**	**14.00**	**11.75**	**76.63**	**27**	**–**	**–**	**–**	**–**	**–**
I-5																		
SAC	Hood-Franklin Boulevard to Elk Grove Boulevard	8.49/10.83	2.34	60,000	D	0	0	0	0	0	0	2.15	7	-51%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	Elk Grove Boulevard to Laguna Boulevard	10.83/12.04	1.21	76,000	D	110	6	9,000	364	0.05	0.04	1.26	4	-45%	251%	109%	10.1	0
	Laguna Boulevard to Pocket Road	12.04/16.15	4.11	100,000	E	981	49	80,028	3,236	0.32	0.29	4.43	7	-61%	146%	113%	6	0
	Pocket Road to US 50 ramps south of I-5/US 50 Interchange	16.15/22.00	5.85	156,000	F	2,737	309	223,370	20,415	1.39	1.26	7.24	6	-32%	170%	235%	8	11.9
	US 50 ramps south of I-5/US 50 Interchange to Richards Blvd	22.00/24.65	2.65	194,000	F	5,325	969	434,499	63,961	3.44	3.13	6.09	5	32%	152%	191%	5.1	10.3
	Richards Boulevard to I-5/80 Interchange	24.65/26.69	2.04	197,000	F	2,488	435	203,029	28,737	1.37	1.25	3.42	0	-39%	104%	329%	0	9.2
	I-5/80 Interchange to I-5/SR 99 Interchange	26.69/29.91	3.21	152,000	E	935	106	76,328	6,976	0.52	0.47	3.73	0	-53%	101%	164%	0	0
	I-5/SR 99 Interchange to Sacramento/Yolo County Line	29.91/34.65	4.74	81,000	C	131	39	10,686	2,593	0.38	0.35	5.12	0	-56%	113%	115%	0	0
Yolo	Yolo/Sacramento County to County Road 102	0.00/5.53	5.53	54,000	C	64	19	5,185	1,258	0.24	0.22	5.77	0	-22%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	County Road 102 to I-5/State Route 113 Junction	5.53/8.26	2.73	45,000	B	0	0	0	0	0	0	2.59	0	-30%	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable	PeMS Data Unavailable
	Total	**–**	**34.41**	**–**	**–**	**12,771**	**1,932**	**1,042,125**	**127,540**	**7.71**	**7.01**	**41.80**	**29**	**–**	**–**	**–**	**–**	**–**

[1] Source: Average Annual Daily Traffic and Level of Service (LOS) calculated is based on 2007 Caltrans Traffic Volumes on California State Highways and Highway Capacity Manual and Cambridge Systematics from 2008.

[2] Source: Delay is the average additional travel time by vehicles/persons traveling under 60 mph. Data derived from 2007 HICOMP report, SACMET Travel Demand Model, PeMSs traffic data, and Caltrans District 3 Traffic Operations Probe vehicle Tach.runs.

[3] Peak Hour is during PM.

[4] Source: 2007 Caltrans Division of Maintenance Pavement Summary Report

[5] Source: 2004 through 2007 Caltrans Traffic Accident Surveillance and Analysis System summary data of the percentage above, or below, the statewide average for fatal, injury, and property damage-only collisions on comparable facilities.

[6] Reliability: Data taken from April 2007 PeMS covering a 24-hour period of time on Tuesday, Wednesday, and Thursday and aggregated into a single average 24-hour day. Data analyzed to determine highest average AM and PM travel time. That average was compared to the best possible average travel time to determine additional travel time spent traveling the segment. The difference between the best average travel time and the highest average travel time is the additional time necessary to add to a trip to arrive on time.

[7] Lost Productivity: Data taken April 2007 PeMS. As traffic increases to the capacity of the highway, speeds decline, throughput drops dramatically, and the efficiency of the highway to provide mobility decreases. This decline in the potential carrying-capacity of the freeway is expressed in terms of how many equivalent lane miles of roadway are lost.

TABLE 8: PARALLEL AND CONNECTING ROADWAYS PERFORMANCE MEASURES

County	Mode Description and Location		Average Daily Traffic[1]	Performance Measures								
				LOS[1]	Total Vehicle Hours of Delay[2]		Total Person Minutes of Delay		Minutes of Delay per Vehicle	Minutes of Delay per Person	Vehicle Travel Time (Minutes)	Distressed Pavement (Lane Miles)
					Daily	Peak Hour	Daily	Peak Hour	Peak Hour	Peak Hour	Peak Hour	
PARALLEL AND CONNECTING ROADWAYS												
SR 99 AND I-5: SACRAMENTO AND YOLO COUNTY SEGMENTS												
Yolo	County Road 102: East Main Street to East Gibson Road		Not Available	Data is unavailable for these performance measures at this time, however will be pursued in the next phase of the CSMP.								
SAC	Franklin Boulevard: Laguna Boulevard to Elk Grove Boulevard		22,515	Not Available								
	Bruceville Road: Sheldon Road to Elk Grove Boulevard		31,661	Not Available								
	Power Inn Road: US 50 to Calvine Road	Folsom Boulevard to Fruitridge Road	36,600	F								
		Elder Creek Road to Weyand Avenue	29,900	D								
		Sacramento City Limits to Florin Road	30,400	F								
		Florin Road to Gerber Road	33,600	E								
		Gerber Road to Elsie Avenue	36,200	F								
		Elsie Avenue to Stockton Boulevard	27,700	C								
		Stockton Boulevard to Calvine Road	27,300	C								
Yolo	East Main Street: SR 113 to County Road 102		Not Available									
	East Gibson Road: SR 113 to County Road 102		Not Available									
SAC	Florin Road: I-5 to Power Inn Road	Freeport Boulevard to 24th Street	26,400	C								
		24th Street to Franklin Boulevard	36,900	F								
		Franklin Boulevard to Bowling Drive	48,900	E								
		Bowling Drive to SR 99	66,100	F								
		SR 99 to 65th Street	72,300	F								
		65th Street to Stockton Boulevard	46,000	D								
		Stockton Boulevard to Power Inn Road	30,600	D								
	Laguna Boulevard: I-5 to SR 99		34,697	Not Available								
	Elk Grove Boulevard: I-5 to SR 99		36,595	Not Available								
SR 99: SUTTER COUNTY SEGMENTS												
SUT	George Washington Boulevard: SR 20 to SR 113		Not Available	Data is unavailable for these performance measures at this time, however will be pursued in the next phase of the CSMP.								
	Walton Avenue: SR 20 to Oswald Road											
	Garden Highway: Sutter Street to SR 99											
	Pleasant Grove: Nicholas Avenue to Riego Road											
	Lincoln Road: George Washington Boulevard to Garden Highway											
	Bogue Road: George Washington Boulevard to Garden Highway											
	Oswald Road: George Washington to SR 99											
	Nicholas Avenue/Garden Highway: SR 99 to SR 70											
	Howsley Road: SR 99 to Pleasant Grove											
	Sankey Road: SR 99 to Pleasant Grove											
	Riego Road: SR 99/SR 70 to Pleasant Grove											

[1] Source: Average Daily Traffic and Level of Service (LOS) calculated are based on City of Elk Grove between 2007 and 2008 and Sacramento County between 2005 and 2008.

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TABLE 9: TRANSIT PERFORMANCE MEASURE

County	Mode Description and Location	Route	Performance Measure Available Daily Capacity (%)[1] / Available Peak Hour Capacity[1]
TRANSIT			
SAC	**E-Tran (Bus)**	Route 49	Operates Peak Hour Only /67%
		Route 52	Operates Peak Hour Only /Exceeds Capacity
		Route 53	Operates Peak Hour Only /Exceeds Capacity
		Route 57	Operates Peak Hour Only /Exceeds Capacity
		Route 58	Operates Peak Hour Only /Exceeds Capacity
		Route 59	Operates Peak Hour Only /Exceeds Capacity
		Route 60	Operates Peak Hour Only /Exceeds Capacity
		Route 66	Operates Peak Hour Only /Exceeds Capacity
SAC	**Sac RT (Bus)**	Route 37	75% / Not Available
		Route 50E	58% / 41%
		Route 11	63% / 35%
		Route 88	67% / 27%
SAC	**Sac RT (Light Rail)**	Blue Line	60% / 16%
Yolo/ SAC	**YCTD**	Route 42A	61%/ Not Available
		Route 42B	66%/ Not Available
		Route 45	Operates Peak Hour Only /25%
Yuba/ SAC	**Yuba-Sutter**	Highway 99	Operates Peak Hour Only /38%
		Highway 70	Operates Peak Hour Only /38%
BIKE[2]			

[1] Source: Average Daily and Peak Hour Available Capacity calculated from each transit provider's route ridership data.
[2] Bicycle performance measure(s) will be identified, applied, and included in the subsequent CSMPs.

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planned corridor system management strategies

CONCEPT LOS AND CONCEPT FACILITY

"Concept LOS" and "Concept Facility" have traditionally been used in Caltrans TCCRs to reflect the minimum level or quality of operations acceptable for each route segment within the 20-year planning period and the highway facility needed in the next 20 years to maintain the Concept LOS.

Typical Concept LOS standards in Caltrans District 3 are LOS "D" in rural areas and LOS "E" in urban areas. However, some heavily congested route segments now have a Concept LOS "F" because the improvements required to bring the LOS to "E" are not feasible due to environmental, right of way, financial, and other constraints. The application of multi-modal corridor management strategies should reduce the severity and duration of congestion and provide viable travel options and information that will enable a traveler to avoid severe freeway congestion.

The Concept LOS and Concept Facility for SR 99 and I-5 are shown in Tables 10 and 11. Many segments are forecasted to operate under LOS "F" conditions in 20 years under the No-Build and Build scenarios.

CORRIDOR MANAGEMENT STRATEGIES

The SR 99/I-5 CSMP proposes specific strategies to enhance corridor mobility (see Table 12), based on the following principles:

- Manage all modes and facilities in the corridor as a single system, beginning with the transportation network defined in this CSMP.
- Implement comprehensive and dynamic multimodal monitoring and reporting for the system and for all modes.
- Develop and use micro-simulation modeling to identify mobility challenges and to evaluate proposed solutions.
- Complete the projects included in the regional transportation plans, with an emphasis on the completion of the key mobility improvement projects identified in this CSMP (see Table 13).
- Implement the specific strategies outlined in this CSMP.

KEY CAPITAL PROJECTS

Table 13 contains key capital projects that have been identified as the most critical to corridor mobility. These are also included in the SACOG MTP for 2035 and are either planned without any funding yet programmed, are partially programmed, or are entirely programmed. SACOG conducted significant public attitude research for the MTP for 2035 to complement comprehensive outreach efforts through community workshops, the TALL Order: Moving the Region Forward event, the televised town hall Road Map for the future, and associated public polling. The results of the SACOG analyses and public outreach for the MTP were used when selecting the key projects for identification in the CSMP and to ensure consistency. Not all corridor projects in the MTP are included in the CSMP since the CSMP focuses on the managed network and the SACOG MTP

The SR 99/I-5 CSMP proposes specific strategies to enhance corridor mobility.

considers all streets and roads, bike routes, and transit services in the corridor.

VISIONARY PROJECTS

Visionary projects are not yet included in the SACOG MTP, but appear to offer considerable corridor mobility benefits and merit further analysis and consideration for inclusion in the next MTP. These are displayed in Table 14.

The "Plus 10% List" in the SACOG MTP identifies projects that are attractive from a performance standpoint, but could not be included in the Final Project Lists because of financial constraint. The "Plus 10% List" element offers the opportunity to include projects that would not be affordable without additional funding. Some projects identified in the Visionary Projects list were analyzed by SACOG during development of the current MTP. Some of these are included in the "Plus 10% List."

TABLE 10: SR 99 CONCEPT LOS AND FACILITY TYPE

Location				Forecasted Level of Service[1] (LOS) and Facility Type					
County	Description and Location	From Post Mile	To Post Mile	Current LOS[1]	20-Yr No Build LOS[1,2]	20-Yr Concept LOS[1,3]	Existing Facility[4]	Concept Facility[4,5,6,8]	Ultimate Facility[4,5,7,8]
SAC	San Joaquin -Sacramento County Line to Elk Grove Boulevard	0.00	12.76	D	F	F	4F	4F + 2HOV	6F + 2HOV
SAC	Elk Grove Blvd to Mack Road	12.76	17.66	F	F	F	4F + 2HOV, 4F + 2HOV + 2AUX from Consumnes River Blvd. to Stockton Blvd., 4F + 2HOV from Stockton Blvd.	4F + 2HOV, 4F + 2HOV + 2AUX from Consumnes River Blvd. to Stockton Blvd., 4F + 2HOV from Stockton Blvd.	6F + 2HOV
SAC	Mack Road to Fruitridge Road	17.66	21.94	F	F	F	4F + 2HOV to Florin, then 6F + 2HOV to Fruitridge	4F + 2HOV to Florin, then 6F + 2HOV to Fruitridge	8F + 2HOV
SAC	Fruitridge Road to Junction SR 51	21.94	24.35	F	F	F	8F + 2HOV	8F + 2HOV	8F + 2HOV
SAC	Junction I-5 to Sacramento - Sutter County Line	32.12	36.86	E	F	E	4F, then 4E (from Elverta Rd)	4F + 2HOV	8F + 2HOV
SUT	Sacramento - Sutter County Line to South of Feather River Bridge	0.00	11.50	C	F	E	4E, 2C from SR 70	4F + 2 HOV (to SR 70), 4E (from SR 70)	6F + 2HOV (to SR 70), 4E (from SR 70)
SUT	South of Feather River Bridge to Passing Lanes North of Sacramento Avenue	11.50	14.00	E	F	C	2C	4E	4E
SUT	Passing Lanes North of Sacramento Avenue to Wilson Road	14.00	17.77	A	C	C	4E + TWLTL	4E + TWLTL	4E + TWLTL
SUT	Wilson Road to North of Junction SR 113	17.77	22.99	E	F	C	2C	4E + TWLFT on New Alignment, 2C on old	4E + TWLTL on Future Alignment
SUT	North of Junction SR 113 to Lincoln Road	22.99	28.67	B	C	B	4E	4E, then 6E (from Bogue Road)	6E (with possibility of bypass)
SUT	Lincoln Road to SR 20	28.67	30.63	E	F	E	4E	6E	6E (with possibility of bypass)

[1] Level of Service (LOS): A "report card" for evaluating traffic flow with "A" being the best and "F" being the worst.
[2] 20-Year LOS (No Build): The LOS that would be expected at 20 years with no improvements.
[3] 20-Year Concept LOS: The minimum acceptable LOS over the next 20 years.
[4] Facility Type Codes: C=Conventional Highway; E=Expressway; F=Freeway; HOV=High Occupancy Vehicle Lanes; Aux=Auxiliary Lanes, TWLTL=Two Way Left Turn Lane.
[5] Operational Improvements are included in future facilities for all segments. Examples of operational improvements include TOS improvements and Auxiliary lanes.
[6] Concept Facility: the future roadway with improvements needed in the next 20 years. If LOS "F," no further degradation of service from existing "F" is acceptable, as indicated by delay performance measurement.
[7] Ultimate Facility: The future roadway with improvements needed beyond a 20 year timeframe.
[8] Auxiliary lanes will be located between major interchanges as needed.

TABLE 11: I-5 CONCEPT LOS AND FACILITY TYPE

Location				Forecasted Level of Service[1] (LOS) and Facility Type					
County	Description and Location	From Post Mile	To Post Mile	Current LOS[1]	20-Yr No Build LOS[1,2]	20-Yr Concept LOS[1,3]	Existing Facility[4]	Concept Facility[4,5,6,8]	Ultimate Facility[4,5,7,8]
SAC	Hood-Franklin Boulevard to Elk Grove Boulevard	8.49	10.83	D	F	F	4F	4F + 2HOV	6F + 2HOV
SAC	Elk Grove Boulevard to Laguna Boulevard	10.83	12.04	D	F	F	4F	4F + 2HOV	6F + 2HOV
SAC	Laguna Boulevard to Pocket Road	12.04	16.15	E	F	F	6F	6F + 2HOV	8F + 2HOV
SAC	Pocket Road to US 50 ramps south of I-5/US 50 Interchange	16.15	22.00	F	F	F	8F	8F + 2HOV	8F + 2HOV
SAC	US 50 ramps south of I-5/US 50 Interchange to Richards Boulevard	22.00	24.65	F	F	F	6F 8F (from UPRR mainline)	6F + 2HOV 8F + 2HOV (from UPRR mainline)	6F + 2HOV 8F + 2HOV (from UPRR mainline)
SAC	Richards Boulevard to I-5/80 Interchange	24.65	26.69	F	F	F	8F	8F + 2HOV	8F + 2HOV
SAC	I-5/80 Interchange to I-5/SR 99 Interchange	26.69	29.91	E	F	F	8F	8F + 2HOV	8F + 2HOV
SAC	I-5/SR 99 Interchange to Sacramento/Yolo County Line	29.91	34.65	C	F	D	4F	4F + 2HOV	6F + 2HOV
YOLO	Yolo/Sacramento County Line to County Road 102	0.00	5.53	C	E	C	4F	4F + 2HOV	6F + 2HOV
YOLO	County Road 102 to I-5/SR 113 Junction	5.53	8.26	B	D	C	4F	4F + 2HOV	6F + 2HOV

[1] Level of Service (LOS): A "report card" for evaluating traffic flow with "A" being the best and "F" being the worst.
[2] 20-Year LOS (No Build): The LOS that would be expected at 20 years with no improvements.
[3] 20-Year Concept LOS: The minimum acceptable LOS over the next 20 years.
[4] Facility Type Codes: C=Conventional Highway; E=Expressway; F=Freeway; HOV=High Occupancy Vehicle Lanes; Aux=Auxiliary Lanes.
[5] Operational Improvements are included in future facilities for all segments. Examples of operational improvements include TOS improvements and Auxiliary lanes.
[6] Concept Facility: the future roadway with improvements needed in the next 20 years. If LOS "F," no further degradation of service from existing "F" is acceptable, as indicated by delay performance measurement.
[7] Ultimate Facility: The future roadway with improvements needed beyond a 20 year timeframe.
[8] Auxiliary lanes will be located between major interchanges as needed.

TABLE 12: SR 99 AND I-5 CSMP STRATEGIES		
Strategy	**Description**	**Implementation Challenges**
Maintain and operate the existing corridor multi-modal transportation infrastructure.	Maintain the existing investment in all modes of the transportation system and provide adequate resources for daily operations, including operating revenues for transit services.	Funding availability, funding competition within the region.
Fully coordinate the delivery of transportation services and facilities in the corridor, including daily operations and system planning for enhancements.	Interagency operational coordination to maximize the efficiency and effectiveness of all modes operating in the corridor with a focus on the CSMP transportation network defined in this CSMP. Use of an existing group or committee to provide initial oversight for this strategy.	Diverse interests and competing priorities and limited resources.
Construct planned and programmed corridor capital improvement projects.	Implementation of the capital improvements in the corridor included within the approved Metropolitan Transportation Plan and Regional Transportation Plan for all transportation modes within the scope, schedule, and cost specified.	Funding availability, funding competition within the region.
Comprehensive daily monitoring of the status of all modes providing service on the CSMP transportation network.	Full deployment of multimodal transportation service status detection systems for all CSMP network components.	Funding availability, funding competition within region.
Provide traveler information to the public.	Provide the public with real-time easily accessible information regarding the status of all CSMP transportation system components so as to allow travelers to make informed decisions about trip mode, time, and routing options.	Funding availability, funding competition within region.
Continually monitor and analyze the CSMP transportation network to improve system performance.	Monitor transportation performance measures and make system modifications, as appropriate, on a frequent and timely basis.	Staff resources and data availability.
Decrease the duration of non-recurrent traffic congestion.	Expand and enhance the Freeway Service Patrol to respond to automobile accidents and vehicle break-downs.	Funding availability, funding competition within the region.
Timely implementation of STARNET.	Expedite the implementation of the STARNET operators of transportation facilities and emergency responders in the Sacramento region through real-time sharing of data and live video, and refinement of joint procedures pertaining to the operation of roadways and public transit, and public safety activities as well as enhance the region's 511 web site and interactive telephone service to provide more traveler information.	Developmental time, acceptance by agencies and integration into daily use, and identification of maintenance and operations funding.
Enhance transit and rail service.	Increase transit service frequency, provide express transit services, implement bus rapid transit routes, reduce headways for light rail and buses, and construct planned light rail line extensions.	Funding availability, funding competition within the region.
Complete Bus/Carpool lane network.	Complete the regional bus/carpool lane network, including freeway-to-freeway HOV lane connectors.	Funding availability, funding competition within the region. Public agency and public acceptance of network.

TABLE 12: SR 99 AND I-5 CSMP STRATEGIES *(CONTINUED)*		
Strategy	**Description**	**Implementation Challenges**
Enhance Transportation Demand Management strategies.	Encourage employers to provide telecommuting and flexible working hour options to employees.	Acceptance by employers and resources to participate.
Optimize the timing and synchronization of traffic signals.	Coordinate the optimization and timing of traffic signals on freeway ramps and along parallel and connecting roadways within and between jurisdictions to improve traffic flow and reduce congestion. Provide signal priority systems for transit vehicles.	Funding availability and coordination among cities, counties, and Caltrans.
Improve access management of freeways and parallel/connecting roadways.	Develop and implement access management strategies to maintain the operational efficiency of freeways and parallel/connecting roadways.	Agreement between responsible jurisdictions as to where increased access control is needed. Increased access control on some parallel/connecting roadways may increase traffic volumes on non-corridor roads.
Develop innovative use of CMSs (e.g.; travel times).	Potential uses of CMSs to improve system efficiency include the use of CMSs along portions of all corridors near transit station to indicate travel times based on real-time existing traffic conditions on the freeway as well as on parallel roadways and express bus and light rail services. CMS can also be used to identify the number of parking spaces that are still available at the light-rail stations.	Funding availability, funding competition within the region.
Implement & expand Transit AVL/Transit status information enhancements for system users.	Expand the use of AVL systems utilizing GPS technology to track in real-time the location of transit vehicles, monitor transit schedules, dispatch transit vehicles, and provide real-time passenger information such as “next bus” or “next train” arrival times.	Funding availability, funding competition within the region.
Expand Park-and-Ride lots at key locations.	Add additional capacity to existing park-and-ride lots near transit stations and other locations that are approaching capacity.	Funding availability, funding competition within the region, and available land.
Improve bike-pedestrian access in the CSMP transportation network.	Plan and program for construction of additional bicycle paths / lanes, and related improvements for access and connectivity to transit, park and ride lots, and destination points.	Funding availability, funding competition within the region.
Provide “Bike-Sharing”/”Car-Sharing” to/from transit (“Carlink”), and from neighborhoods.	Expand the Regional Rideshare and Spare-the-Air programs to include bicycle and car sharing opportunities.	Funding availability and coordination between SACOG, TMA, Air Districts, employers, developers, property managers, and local government officials.
Provide parking management strategies in interested jurisdictions, where applicable, to discourage use of single-occupant vehicles.	In higher-density areas, provide preferential parking for carpools and vanpools, require residential parking permits, remove on-street parking, and/or provide graduated parking fees for metered on-street parking based on vehicle type and time of day for SOV spaces to encourage transit use.	Acceptance by businesses, local officials, and the general public.
Expand bicycle commute & transit fare strategies/ subsidies	Increase participation by large employers in programs that subsidize transit fares for employees during peak-hour commute times and provide bicycling to work incentives.	Voluntary participation by large employers to pay subsidy to transit providers.

TABLE 13: KEY CAPITAL PROJECTS

County/Lead Agency	Route/ Roadway	From	To	Project Description	Programmed Funds	Additional Funding Needed	Total Cost Estimate (x $1,000)	Comp Year (FFY)
ROADWAYS								
SAC/ Caltrans	I-5	US 50	Elk Grove Blvd.	Construct Bus / Carpool Lanes	$200,000	$0	$200,000	2016
SAC/ Caltrans	SR 99	Mack Road	Calvine Road	Operational Improvements and Auxiliary Lanes	$7,605	$0	$7,605	2012
SAC/ Caltrans	SR 99	US 50		Oak Park Interchange Improvements	$0	$150,000	$150,000	2027
SAC/ Caltrans	I-5	US 50		Riverfront Interchange Improvements including bus/carpool lane connectors	$30,000	$170,000	$200,000	2029
SAC	New bridge	I-5	SR 51	Construct new crossing of the American River between I-5 and SR 51	$218,900	$0	$218,900	2019
SAC/ Caltrans	I-5	I-80	Garden Highway	Add Bus / Carpool Lanes and Connectors	$22,000	$278,000	$300,000	2022
SAC/ Caltrans	I-5	SR 99		Interchange reconfiguration	$0	$125,000	$125,000	2023
SAC/ Caltrans	SR 99	I-5	Elkhorn	Construct HOV lanes	$0	$69,940	$69,940	2021
SAC/ Caltrans	SR 99	Elverta		Construct Interchange	$29,600	$0	$29,600	2013
SUT	SR 99	Riego Road		Construct Interchange – Phase 1 (5 lanes)	$31,000	$0	$31,000	2013
SUT	SR 99	Riego Road		Interchange Improvements – Phase 2 (from 5 to 8 lanes)	$0	$41,065	$41,065	2035
SUT/ Caltrans	SR 99	Nicholas Ave. / Garden Hwy.	Sacramento Ave.	SR 99 widening and Feather River Bridge Construction Project	$88,726	$0	$88,726	2012
YOL/ Woodland	I-5	SR 113		SR 113 NB IC, Phase 2	$14,000	$47,000	$61,000	2018
YOL/ Woodland	I-5	SR 113		SR 113 NB IC, Phase 3	$0	$66,374	$66,374	2032

TABLE 13: KEY CAPITAL PROJECTS *(CONTINUED)*

County/ Lead Agency	Route/ Roadway	From	To	Project Description	Pro-grammed Funds	Additional Funding Needed	Total Cost Estimate (x $1,000)	Comp Year (FFY)
TOS / TMS								
VAR/ SACOG	Not Applicable			STARNET Integration	$5,345	$0	$5,345	2011
SAC	Not Applicable			County Traffic Operations System Center – Stage 2	$10,400	$5,600	$16,000	2015
SAC	Not Applicable			City Traffic Operations Center – communications & ITS expansion	$1,522	$0	1,522	2010
TRANSIT								
SAC / SacRT	South Line Light Rail	Meadowview	Cosumnes River College	South Sacramento Light Rail Extension, Phase 2 – w/ 4 new stations and 3 park & ride facilities	$114,561	$117,168	$231,729	2013
Sacramento City of Sacramento DOT	Sacramento Valley Station	Not Applicable	Not Applicable	Sacramento Intermodal Transportation Facility (Phase 1) - Develop intermodal trans-portation terminal for heavy rail, light rail and bus service	$77,799	$0	$77,799	2010
Sacramento City of Sacramento DOT	Sacramento Valley Station	Not Applicable	Not Applicable	Sacramento Intermodal Transportation Facility (Phase 2) - Develop intermodal trans-portation terminal for heavy rail, light rail and bus service	$24,101	$1,000	$25,101	2014
SAC / SacRT	Downtown, Natomas, Airport Line	Downtown	Richards Blvd.	DNA Light Rail Extension Phase 1 (MOS1A)	$36,648	$0	36,648	2012
	Downtown, Natomas, Airport Line	Richards Boulevard	Natomas Town Center	Light Rail Extension –Phases 2	$0	$410,000	$410,600	2017
	Downtown, Natomas, Airport Line	Natomas Town Center	Sacramento International Airport	Light Rail Extension – Phases and 3	$0	$196,400	$196,400	2020

TABLE 14: VISIONARY PROJECTS

County	Route/ Roadway	From	To	Project Description
SAC	I-5	Elk Grove	SJ County Line	Construct HOV lanes
SAC	I-5	I-80	Sacramento Airport	Construct HOV lanes
SAC-YOL	I-5	Sacramento Airport	SR 113	Construct HOV lanes
SUT	SR 99	Near Bogue Road	Sutter County Line	Construct Yuba City Bypass
SUT	SR 99	SR 113		Construct New Interchange

congestion and bottleneck analysis

The 2000 Highway Capacity Manual defines a bottleneck as "a road element on which demand exceeds capacity." The bottleneck analysis evaluates specific causes of existing recurrent traffic congestion in the corridor. Freeway bottleneck locations that create mobility constraints are identified and documented, and their relative contribution to corridor-wide congestion is reported. The bottleneck locations were determined based on a combination of the use of 2006 PeMS data, HICOMP report, probe vehicle tach runs, and field observations.

Traffic congestion can be categorized as either recurrent or non-recurrent.

Recurrent congestion occurs repeatedly at the same place and time of day in a predictable pattern. Recurrent congestion is often associated with facility capacity limitations, changes in capacity, conflicting vehicle movements such as lane merges, inadequate number of transit vehicles to handle passenger loads, or other persistent physical conditions of the transportation facility.

Non-recurrent congestion is usually attributed to collisions, equipment malfunction, community events, weather, construction projects and other occasional occurrences. When transportation systems are close to their maximum carrying capacity, non-recurrent congestion is more likely to occur as there is little excess capacity in the system.

The location and extent of the bottlenecks in the AM and PM peak periods are summarized in Tables 15 - 18. Northbound and southbound bottlenecks on I-5 are shown in Tables 15 and 16. The tables that follow discuss each bottleneck, including location and possible causality. Northbound and southbound bottlenecks on SR 99 are shown on Tables 17 and 18. The tables that follow discuss each bottleneck, including location and possible causality. Minor or hidden bottlenecks are those that are not as defined (or severe) as the major bottlenecks. Please note that the graphics accompanying the bottlenecks are not to scale.

Freeway bottleneck locations that create mobility constraints are identified and documented, and their relative contribution to corridor-wide congestion is reported.

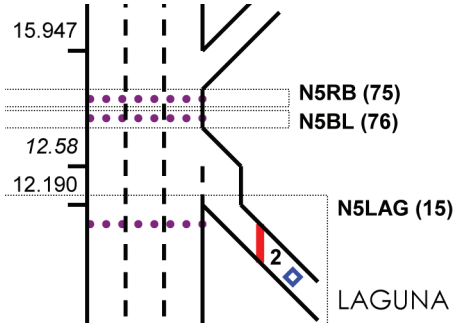
Causalities for these bottlenecks range from high traffic demand (congestion), heavy weaving/merging areas, or physical constraints such as lane drops, lack of ramp meters, incomplete High Occupancy Vehicle (HOV) network, and incomplete auxiliary lane network. The primary causes of bottlenecks on the Sacramento sections of I-5 and SR 99 are merging vehicles on to highway, lane drops on the highway, and weaving activity of drivers.

TABLE 15: I-5 NORTHBOUND BOTTLENECK SUMMARY

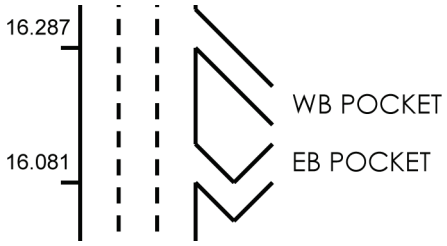
Source: PeMS, Caltrans tach runs, and Cambridge Systematics field observations.

Bottleneck Location	PeMS Speed Contours		Caltrans Probe Vehicle Runs		Cause
	AM	PM	AM	PM	
A. Laguna Boulevard PM 507	Major		Major		Merging traffic
B. Pocket Road PM 512	Major		Minor		Merging traffic
C. Seamas Avenue PM 515	Major		Major	Minor	Merging traffic
D. I Street PM 519	Minor	Major	Minor	Major	Lane drop and merging traffic

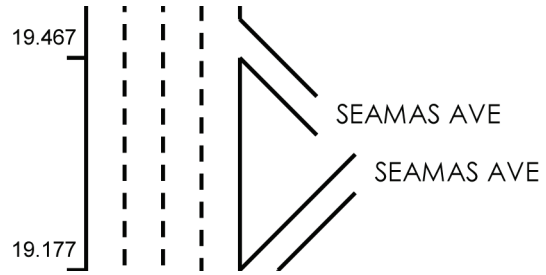
A. Laguna Blvd Bottleneck
The bottleneck, approximately located at the Laguna Blvd on-ramp, is due to the traffic merging from Laguna Blvd. This bottleneck is only present in the AM peak period when the on-ramp volume is large.



B. Pocket Rd Bottleneck
The bottleneck, approximately located at the Pocket Rd on-ramp, is due to the traffic merging from Pocket Rd. This bottleneck is only present in the AM peak period when the on-ramp volume is large.



C. Seamas Ave Bottleneck
The bottleneck approximately located at the Seamas Ave on-ramp is due to the traffic merging from Seamas Ave. This bottleneck is only present in the AM peak period when the on-ramp volume is large.



D. I St Bottleneck
The bottleneck at I St is due to the combination of a few physical characteristics. I St has a two-lane on-ramp which combines after merging with I 5, and then becomes the Richards Blvd off-ramp. Upstream, the L St on-ramp initiates the bottleneck.

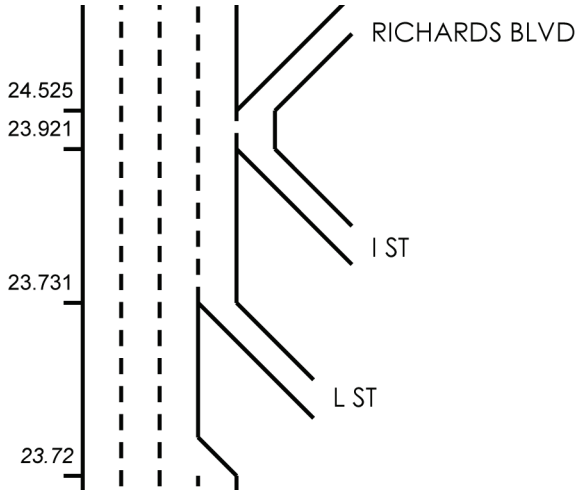
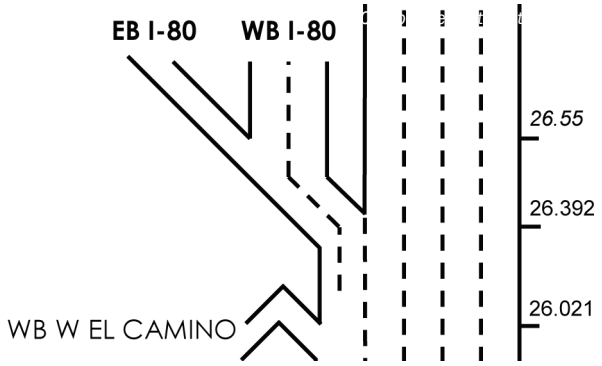


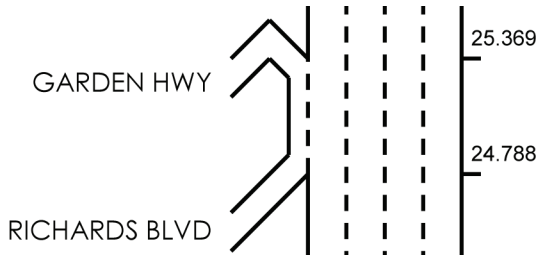
TABLE 16: I-5 SOUTHBOUND BOTTLENECK SUMMARY

Bottleneck Location	PeMS Speed Contours		Caltrans Probe Vehicle Runs		Cause
	AM	PM	AM	PM	
A. El Camino Avenue PM 521	Major		Major		Merging traffic
B. Garden Highway PM 520		Minor	Major		Merging and traffic
C. US 50 PM 517		Major		Major	Merging traffic
D. Florin Road PM 512				Major	Lane drop
E. Elk Grove Boulevard PM 506		Minor			Lane drop

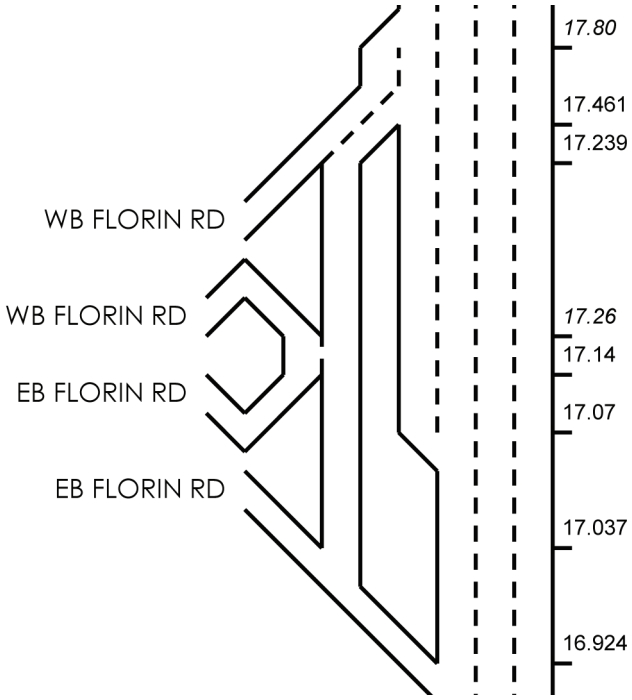
A. El Camino Ave Bottleneck
The bottleneck at El Camino Ave is caused by the traffic entering from El Camino Ave and I 80, which is the previous upstream interchange. This bottleneck only appears in the AM peak period.



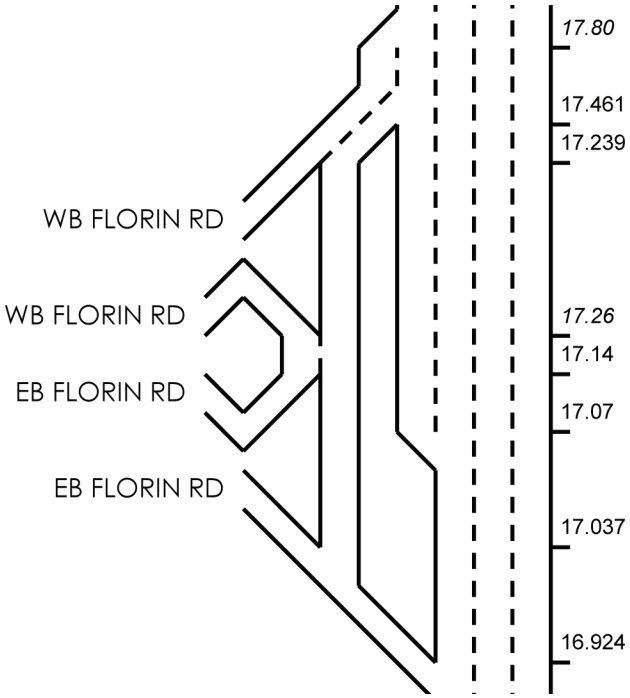
B. Garden Hwy Bottleneck
The bottleneck at Garden Hwy is caused by traffic entering from Garden Hwy weaving with the traffic exiting at Richards Blvd, ½ mile downstream.



C. US 50 Bottleneck
The bottleneck caused by traffic entering from the US 50 does not dissipate until after the auxiliary lanes end, which is approximately located at Vallejo Way, ½ mile downstream.



D. Florin Rd Bottleneck
The bottleneck at Florin Rd does not appear in the PeMS analysis, but appears consistently in the probe vehicle runs. The likely cause is the lane drop located at Florin Rd.



E. Elk Grove Blvd Bottleneck
The Elk Grove Bottleneck is caused by the lane drop just upstream of Elk Grove Blvd.

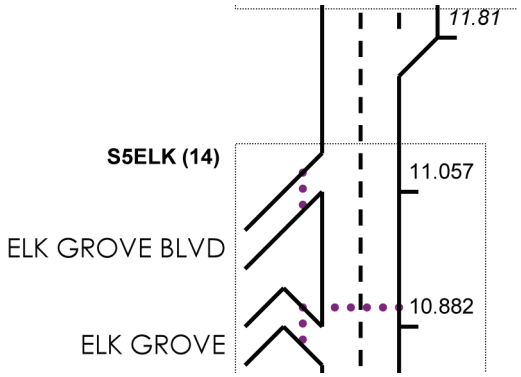


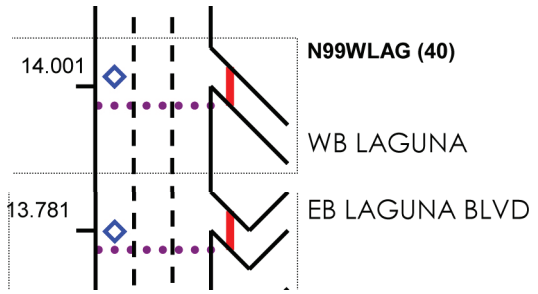
TABLE 17: SR 99 NORTHBOUND BOTTLENECK SUMMARY

Source: PeMS, Caltrans tach runs, and Cambridge Systematics field observations.

Bottleneck Location	PeMS Speed Contours		Caltrans Probe Vehicle Runs		Cause
	AM	PM	AM	PM	
A. El Camino Avenue PM 521	Major		Major		Merging traffic
B. Garden Highway PM 520		Minor	Major		Merging and traffic
C. US 50 PM 517		Major		Major	Merging traffic
D. Florin Road PM 512				Major	Lane drop
E. Elk Grove Boulevard PM 506		Minor			Lane drop
F. 47th Avenue PM 294	Major				Short merge and weaving traffic
G. Martin Luther King Boulevard PM 296		Major			Weaving traffic
H. US 50 PM 299			Major		Weaving traffic

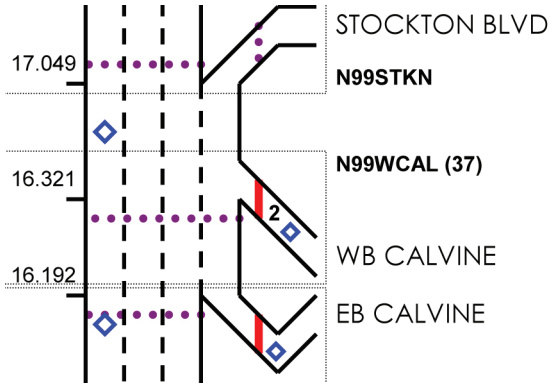
A. Laguna Blvd Bottleneck

The bottleneck at Laguna Blvd is caused by the traffic entering from Laguna Blvd. There are two merging lanes from Laguna and only two mixed-flow lanes on SR 99.

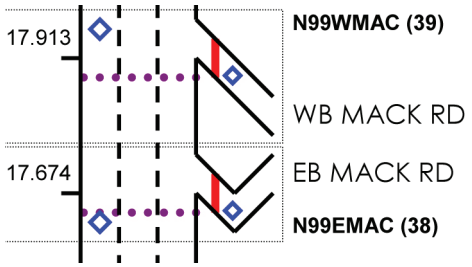


B. Stockton Blvd Bottleneck

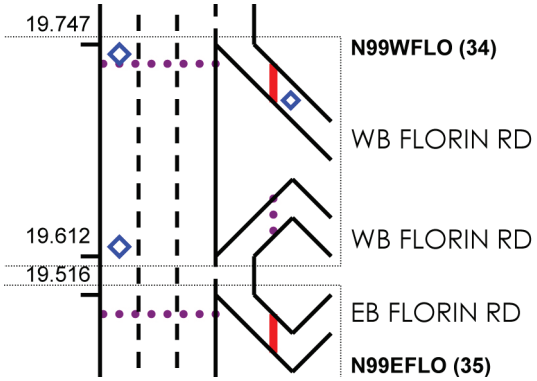
The auxiliary lane receiving traffic from the two on-ramps from Calvine Rd becomes the off-ramp for Stockton Blvd; therefore, there are weaving issues as these two traffic streams cross.



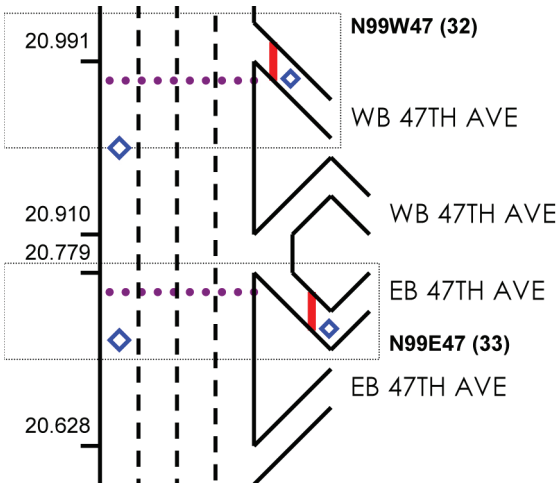
C. Mack Rd Bottleneck
The bottleneck at Mack Rd is due to the two on-ramps from Mack Rd.



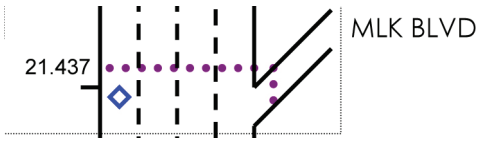
D/E. Florin Rd Bottleneck
The short weave segment between EB Florin Rd on-ramp and WB Florin off-ramp creates a scenario where vehicles entering the right mainline lane are not able to enter at an accelerated speed. This causes a bottleneck as mainline drivers change lanes to avoid the right lane.



F. 47th Ave Bottleneck
Similar to the Florin Rd bottleneck, the short weaving section causes drivers in the right lane to slow or change lanes, perpetuating the bottleneck.



G. Martin Luther King Blvd Bottleneck
The bottleneck at Martin Luther King Blvd is caused by weaving traffic entering from 47th Ave crossing exiting traffic at Martin Luther King Blvd.



H. US 50 Bottleneck
The bottleneck at US 50 is not shown in the PeMS data, but is consistently present in the probe vehicle runs. Queue from the U.S. 50 off-ramp spills back onto SR 99, limiting the number of through lanes.

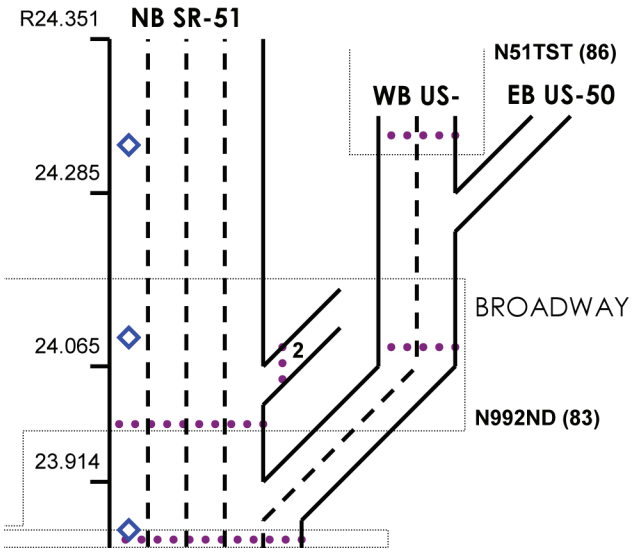
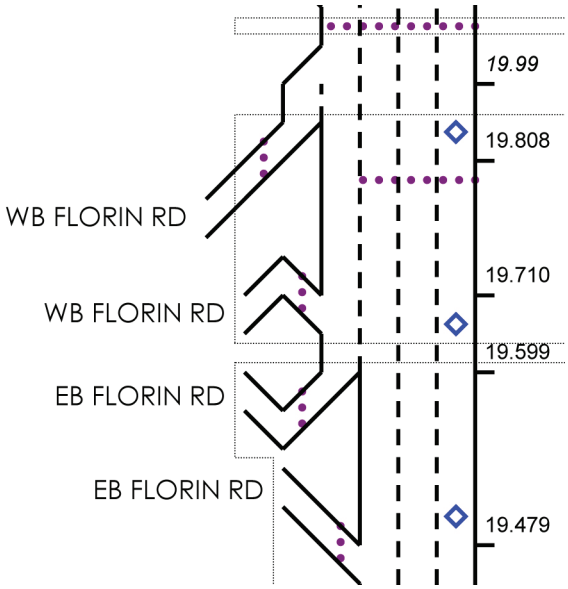


TABLE 18: SR 99 SOUTHBOUND BOTTLENECK SUMMARY

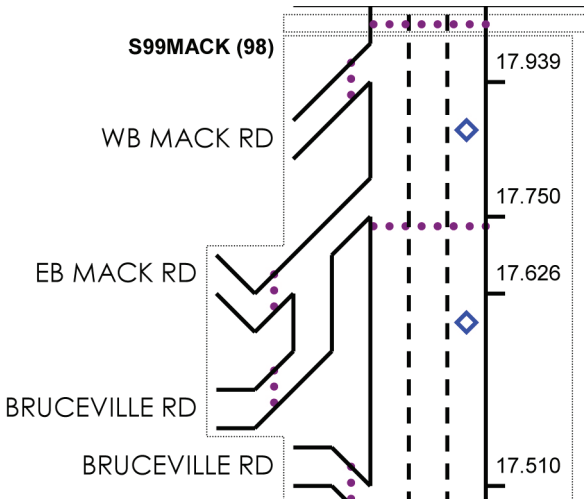
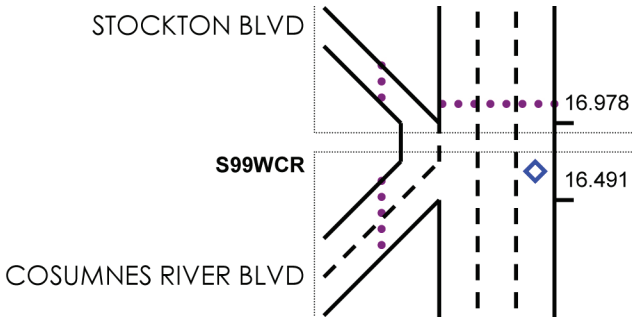
Source: PeMS, Caltrans tach runs, and Cambridge Systematics field observations.

Bottleneck Location	PeMS Speed Contours		Caltrans Probe Vehicle Runs		Cause
	AM	PM	AM	PM	
A. Florin Road PM 293.5	Minor	Minor		Major	Lane drop weaving
B. Mack Road PM 292		Minor			Weaving
C. Cosumnes River PM 289	Major	Major		Minor	Weaving

A. Florin Rd Bottleneck
The bottleneck at Florin Rd is caused by the termination of the auxiliary lane, as well as the short merge segment between the westbound on-ramp and the eastbound off-ramp.



B. Mack Rd Bottleneck
The Mack Rd bottleneck is an extension of the Florin Rd bottleneck. Vehicles traveling in the center and HOV lanes to avoid the Florin Rd weaving that wish to exit at Mack Rd or Bruceville Rd must weave with the vehicles entering from Florin Rd.



C. Cosumnes River Rd Bottleneck
The Cosumnes River Rd bottleneck is caused by the traffic exiting at Cosumnes River Rd weaving with the traffic entering from Stockton Blvd.