



Solano Transportation Authority

# SOLANO TRANSPORTATION AUTHORITY

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## ARTERIALS, HIGHWAYS & FREEWAYS AGENDA

1:30 p.m., Monday, September 28, 2009  
Solano Transportation Authority  
One Harbor Center, Suite 130  
Suisun City, CA 94585

<u>ITEM</u>	<u>STAFF PERSON</u>
I. CALL TO ORDER	Len Augustine, Chair
II. APPROVAL OF AGENDA	Len Augustine, Chair
III. APPROVAL OF LAST COMMITTEE MEETING MINUTES: December 13, 2008	Len Augustine, Chair
IV. ACTION ITEMS	
A. Arterials, Highways, and Freeways State of the System Report <u>Recommendation:</u> <i>Forward a recommendation to the STA Board to approve the         Arterials, Highways, and Freeways, State of the System Report</i> Pg. 4	Robert Macaulay, Director of Planning
V. INFORMATION ITEMS	
A. I-80/I-680/I-780 Corridor Operations Improvements Plan <u>Informational</u> Pg. 52	Sam Shelton, Project Manager
VI. ADJOURNMENT	

### ARTERIALS, HIGHWAYS & FREEWAYS COMMITTEE MEMBERS

Elizabeth Patterson	Jack Batchelor, Jr.	Harry Price	Jan Vick	Pete Sanchez	Len Augustine (Chair)	Mike Reagan	Paul Wiese
City of Benicia	City of Dixon	City of Fairfield	City of Rio Vista	City of Suisun City	City of Vacaville	County of Solano	TAC Member

The complete STA Arterials, Highways, and Freeways Agenda is available on STA's website:  
[www.solanolinks.com](http://www.solanolinks.com)

# **SOLANO TRANSPORTATION AUTHORITY**

Arterials, Highways, and Freeways Committee

Draft Minutes for Meeting

December 11, 2008

## **I. CALL TO ORDER**

Chair Augustine called the meeting to order at 1:30 p.m. A quorum was confirmed. Chair Augustine welcomed the City of Rio Vista Mayor, Jan Vice and City of Dixon Mayor, Jack Batchelor as the newest participants on the Arterials, Highways, and Freeways Committee.

MEMBERS PRESENT:	Mayor Len Augustine (Chair)	City of Vacaville
	Mayor Harry Price (Vice-Chair)	City of Fairfield
	Mayor Pete Sanchez	City of Suisun City
	Mayor Jack Batchelor, Jr.	City of Dixon
	Mayor Jan Vick	City of Rio Vista
	Mayor Elizabeth Patterson	City of Benicia
	Supervisor Mike Reagan	County of Solano (arrived 1:40 p.m.)
	Paul Wiese	Technical Advisory Committee
MEMBERS ABSENT:	None.	
STA STAFF PRESENT:	Janet Adams	Deputy Executive Director/Director of Projects
	Robert Macaulay	Director of Planning
	Robert Guerrero	Senior Planner
	Sara Woo	Planning Assistant
	Karen Koelling	Administrative Assistant
ALSO PRESENT:	Barry Eberling	Daily Republic

## **II. APPROVAL OF DECEMBER 11, 2008 ARTERIALS, HIGHWAYS AND FREEWAYS AGENDA**

On a motion by Committee Member Jack Batchelor, Jr. and a second by Vice Chair, Harry Price, the Committee unanimously approved the Arterials, Highways and Freeways agenda.

## **III. APPROVAL OF THE SEPTEMBER 10, 2008 ARTERIALS, HIGHWAYS AND FREEWAYS MEETING MINUTES**

On a motion by Vice Chair, Harry Price and a second by Committee Member Jack Batchelor, Jr., the Committee unanimously approved the Arterials, Highways and Freeways meeting minutes.

## **IV. ACTION ITEMS**

### **A. Solano Routes of Regional Significance**

Robert Guerrero, STA summarized the primary function of the STA's Routes of Regional Significance. Mayor Patterson indicated that the routes located in Benicia was difficult to read in Attachment C and requested STA staff to revise.

The committee discussed briefly the term "significant" in context with the Routes of Regional Significance. Mayor Price requested that STA staff define the term "significant" clearly in the staff report to the STA Board. Mayor Price further noted that Hillborn Road and Waterman Road are appropriate to be considered as Routes of Regional Significance.

Mayor Patterson requested that the current E. 5<sup>th</sup> Street route identified in the Routes of Regional Significance be extended. Mayor Jan Vick expressed her support for the routes identified in the City of Rio Vista and the unincorporated County Area near the city. Mayor Augustine supported the consideration of Fry Road to 113 as it leads to Central County, and is heavily traveled.

Paul Wiese, Solano County commented that the county roads as shown in the attachment are folded in the cities roads. Either list the county separately or change title where the county is not listed as an "Agency".

Robert Macaulay, STA agreed with the changes requested by the committee and indicated that the changes will be reflected in the STA Board report.

Mayor Patterson expressed her support for listing the Routes of Regional Significance Criteria.

On a motion by Committee Member Jack Batchelor, Jr. and a second by Committee Member Elizabeth Patterson, the Committee unanimously approved forwarding a recommendation to approve the revised Routes of Regional Significance to the STA Board with the requested changes.

## **V. DISCUSSION ITEMS**

### **A. State of the System Report: Arterials, Highways and Freeways**

STA staff member Robert Macaulay reviewed the purpose of the Comprehensive Transportation Plan (CTP) and its elements.

Mayor Patterson suggested that the State of the System report address how current facilities can withstand possible flooding and environmental changes.

Paul Wiese, Solano County suggested listing all funding sources related to the local streets and roads maintenance. Mr. commented that the Federal Local, Streets and Roads funds are not the only source of funding as shown in the report. Mr. Wiese also indicated that the total of county miles should be 1174 miles.

The committee discussed briefly the inclusion of private roads in the State of the System Report. However, the committee decided not to include these facilities because the STA is not responsible for private road.

**VII. COMMITTEE MEMBER COMMENTS**

Harry Price thanked STA staff for the construction notification signs on the highway. STA staff Robert Macaulay commended both Sam Shelton, STA and Sara Woo, STA on the maps provided for the Routes of Regional Significance. Committee Member Jack Batchelor requested that the criteria work sheet be larger in future iterations.

**VIII. NEXT MEETING DATE**

The Committee unanimously agreed to schedule the next Arterials, Highways and Freeways Committee meeting for February the same date of the Transit Consolidation meeting. Chairman Len Augustine asked that the members be e-mailed with the date and time. It was noted that some members will be unable to meet the first week in February.

**IX. ADJOURNMENT**

The Arterials, Highways and Freeways Committee meeting was adjourned at 2:10 p.m.



DATE: September 18, 2009  
TO: Arterials, Highways, and Freeways Committee  
FROM: Robert Macaulay, Director of Planning  
Robert Guerrero, Senior Planner  
RE: Comprehensive Transportation Plan (CTP) Update – Arterials, Highways  
and Freeways State of the System Report

**Background:**

The STA Board has initiated an update of the Solano Comprehensive Transportation Plan (CTP). The CTP is the STA's primary long-range planning document. The CTP consists of three main elements: Alternative Modes; Arterials, Highways and Freeways; and, Transit).

One of the most important tasks for the CTP update is to identify the gap between the current county-wide transportation system and the goals for the system at the end of the time period covered by the CTP (2035). Each of the three CTP steering committees has adopted a Purpose Statement and Goals. Each of the Committees will also be asked to review and adopt a State of the System report for the CTP Element they review.

The STA has not previously prepared comprehensive State of the System reports for any of its CTP elements. Each report will address three areas: what is the "system" being reported on; what are the physical facilities that make up the system; and what are the programs and/or operational characteristics of the system.

**Discussion:**

The State of the System – Arterials, Highways, and Freeways report examines Solano County's Routes of Regional Significance roadway network. The report is divided into three sections:

1. Interstate Corridors
2. State Route Corridors
3. Local Roads

Each section has a physical description of the roadway facility, a discussion on traffic conditions and safety. The roadway information was taken directly from recent studies or reports. Caltrans' Traffic Safety Data Branch Traffic Counts and CHP Statewide Integrated Traffic Report Survey (SWITRS) data was used for corridors that did not have recent studies or plans. However, there were State Routes with outdated, conflicting or little data to report. STA staff noted these in the State of the System for further discussion and direction at the Arterials, Highways and Freeways Subcommittee as the CTP Element is further developed. STA staff is proposing the upcoming discussions with the Arterials, Highways and Freeways Subcommittee include objectives/policies

regarding standardized data collection (including regular data updates) and corridor studies and plans for all freeways and State Routes in Solano County.

**Fiscal Impact:**

None.

**Recommendation:**

Forward a recommendation to the STA Arterials, Highways, and Freeways Subcommittee to approve the Draft “State of the System – Arterials, Highways, and Freeways” Report included as Attachment A.

Attachments:

- A. Draft “State of the System – Arterials, Highways, and Freeways” Report

Draft  
State of the System:  
Arterials, Highways,  
and Freeways

Existing Conditions Report  
September 2009



## **INTRODUCTION**

The Solano Transportation Authority (STA), as the Congestion Management Agency (CMA) for Solano County, works with the County of Solano and the seven cities, the California Department of Transportation (Caltrans), the Metropolitan Transportation Commission (MTC), Federal Highway Administration (FHWA) and other agencies to coordinate planning, funding and construction of improvements to Solano County's major roadway systems.

In September 2007, the STA Board has initiated an update of the Solano Comprehensive Transportation Plan (CTP). The CTP is the STA's primary long-range planning document and consists of three main elements: Alternative Modes Element; Arterials, Highways and Freeways Element; and Transit Element.

On January 14, 2009, the STA Board approved a list of highway, freeway and roadway segments throughout the county that collectively formed a network of priority roadways called the Solano County Routes of Regional Significance. The Routes of Regional Significance are routes deemed critical for maintaining existing mobility between the County and through the cities. The STA's countywide transportation planning and funding activities are prioritized for roadway segments included in the Solano County Routes of Regional Significance. A map of the Solano County Routes of Regional Significance is included as Figure 1 on page 2. A complete list of roadway segments included in the Routes of Regional Significance is included as Appendix A of this report. In addition, Appendix A includes the criteria used by the STA to identify the roadway segments for inclusion in the Routes of Regional Significance.

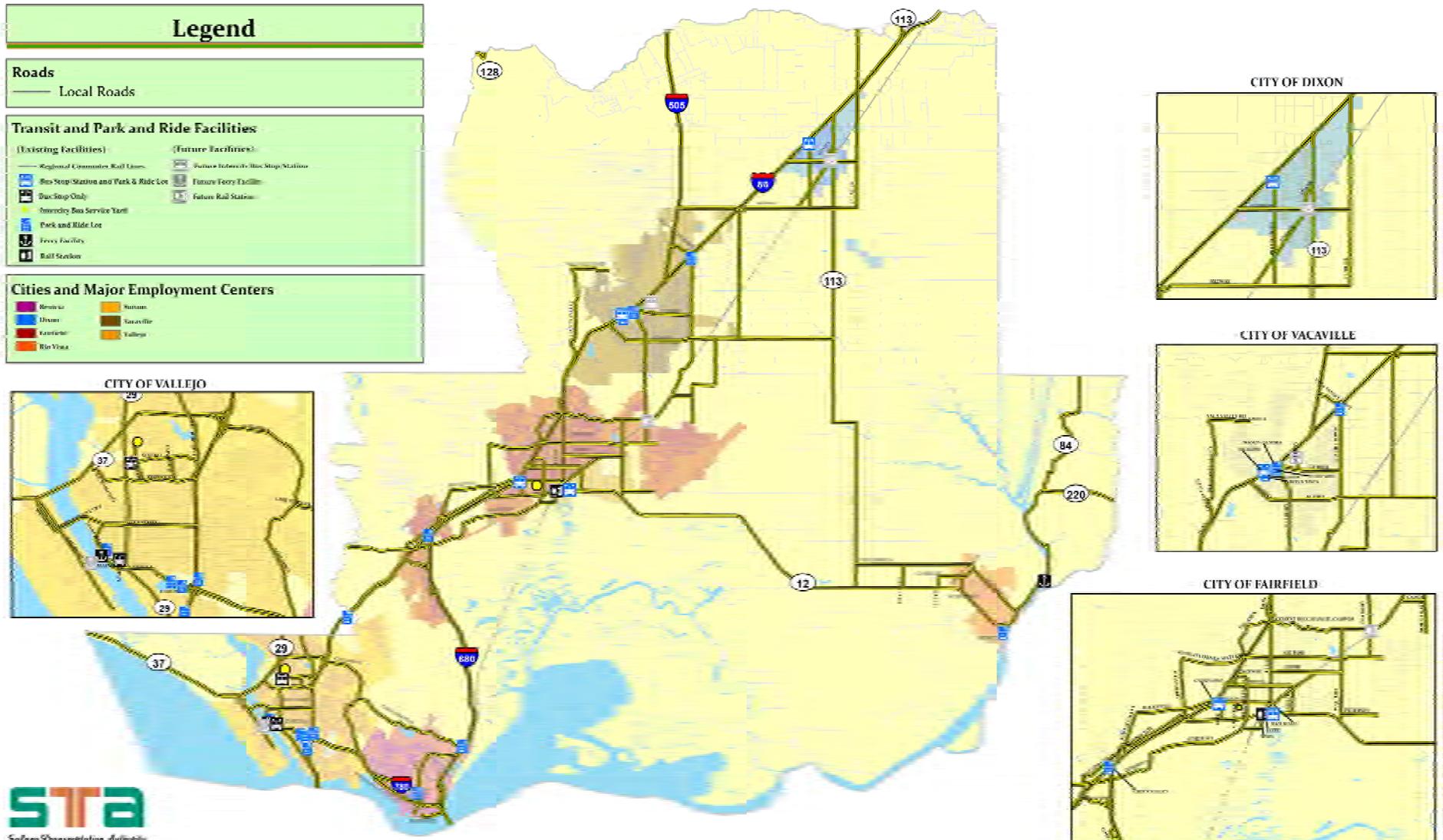
The purpose of this report is to provide general information on the state of Solano County's roadway system included in the STA's Routes of Regional Significance. The report is divided into three sections: 1) Corridors, 2) State Routes and 3) Local Connector Routes, Streets and Roads. Each section provides general information from related studies and plans; however, some corridors, state routes, and local roads are incomplete and will need further analysis.

### **Existing Conditions by Corridor**

Solano County has four Interstate corridors, seven state-highway routes, and numerous arterials providing intra- and inter-county connections. Interstate corridors are a network of freeways of national defense importance. These freeway routes were created by Congress and constructed with Federal-aid Interstate System Funds. In Solano County, these include Interstate 80, 505, 680, and 780.



# Solano County Routes of Regional Significance (2009)



Map Prepared by STA staff, Sara Woo, (707) 399-3214, swoo@sta-anci.com 06/08/09

Figure 1. Solano County Routes of Regional Significance

State highway routes are state highways that serve intrastate and interstate travel. State Route (SR) 12, SR 29, SR 37, SR 84, SR 113, SR 220 and a brief segment of SR 128 run through Solano County.

Table 1 summarizes the Average Annual Daily Traffic (AADT) for trips coming in and out of Solano County. Caltrans AADT Data is generally developed by electronic counting instruments moved from location throughout the State in a program of continuous traffic count sampling. The AADT is the total volume for the year divided by 365 days. The traffic count year is from October 1st through September 30th. Very few locations in California are actually counted continuously. The resulting counts are adjusted to an estimate of annual average daily traffic by compensating for seasonal influence, weekly variation and other variables which may be present.

Table 1. 2008 AADT for trips coming in and out of the county Summary

	County Line	Total
I-80	CARQUINEZ BRIDGE	234,000
	JCT. RTE. 113 NORTH	230,000
I-680	CONTRA COSTA/SOLANO COUNTY LINE (MARTINEZ-BENICIA BRIDGE)	200,000
I-505	SOLANO/YOLO COUNTY LINE	45,000
SR 12	SOLANO/NAPA COUNTY LINE	62,000
	SOLANO/SACRAMENTO COUNTY LINE	42,000
SR 37	SONOMA/SOLANO COUNTY LINE	65,000
SR 29	SOLANO/NAPA COUNTY LINE	63,000
SR 84	SOLANO/YOLO COUNTY LINE	700
SR 220	SOLANO-SACRAMENTO COUNTY LINE	540
SR 128	NAPA COUNTY-SOLANO COUNTY	5,200
	SOLANO -YOLO COUNTY LINE	5,200

Over the last six years, Solano County has had major transportation improvements constructed on its highways and freeway network:

1. Al Zampa Bridge Project (Carquinez Bridge). The new bridge span was constructed with three westbound lanes, a High Occupancy Vehicle (HOV) lane and a pedestrian/bicycle lane. The project was completed on time and within budget. It was funded entirely with local Regional Measure 1 funds passed by Bay Area voters in 1988. Completed in 2003.
2. I-80/680 Interchange Auxiliary Lane Project. The I-80/I-680 Auxiliary Lane project added a fifth through-lane in each direction on I-80 between I-680 and State Route 12 (east), as well as expanded the existing connector ramp to lanes between I-80 and I-680 from one to two lanes in both directions. Completed in 2004.
3. SR 37/29 Interchange Project. Caltrans improved State Route 37 to a four-lane freeway in each direction from the Napa River Bridge to Diablo Street in Vallejo. A cloverleaf interchange was also constructed at the SR 37/29 Interchange. Completed in 2005.

4. George Miller Bridge Project (Benicia Martinez Bridge). The bridge improvement project was constructed to include five northbound lanes, four southbound lanes, a bicycle pedestrian lane, and capacity to add future light rail service. Project was funded by voter approved Regional Measure 1 and 2. New bridge span completed in 2007. Retrofit of original bridge under construction.
5. SR 12 Safety Improvements. Caltrans completed several safety projects on SR 12 in 2007 and 2008. These included an installation of a temporary median concrete barrier east of Walters Road in Suisun City to Shiloh Rd, rumble strips and centerline channelizers, safety changeable signs, shoulder widening and speed radars on the both the east and west sections of SR 12.

The STA in coordination with the County of Solano, seven cities, member agencies, Caltrans and MTC anticipates 13 additional major construction improvements over the next four years. Figure 2 provides a summary of these projects including anticipated completion dates as of April 2007. A total of \$633 million in construction funds have been secured for safety projects on SR 12, I-80 pavement rehabilitation projects and HOV/Carpool lanes, California Highway Patrol's Truck Scale relocation, road improvements along the Jepson Parkway, and access improvements to Travis Air Force Base.

The STA, Caltrans, MTC and other partnering agencies have completed several corridor studies and transportation plans for Solano County's major freeway corridors. Existing conditions for I-80, I-680, I-780, SR 113, SR 12, and SR 29 provided in this Report was provided directly from the following studies and plans:

- a. MTC's Freeway Performance Initiative (2008)

The Solano County I-80 and Draft I-680 North Freeway Performance Initiative (FPI) studies served as the primary sources for the existing conditions related to both corridors in this report. The FPI program was funded by MTC and examined a number of freeway corridors within the Bay Area. The objective of the FPI was to develop freeway strategic plans for each corridor by performing a technical assessment that included identification of major bottlenecks, determination of the causes of traffic congestion, development of potential mitigation strategies, and an assessment of their effectiveness.

- b. SR 12 Major Investment Study (2001 and 2006)

The State Route (SR) 12 Major Investment Study assessed the physical improvements and management practices necessary to appropriately serve future travel demand on SR 12 between Interstate 80 and the Rio Vista Bridge. The initial SR 12 Major Investment Study was completed in 2001 followed by a technical update completed in 2006. There are currently several Caltrans safety improvement projects underway along the corridor between east of Shiloh Road and the City of Rio Vista. The SR 12 MIS was an instrumental planning study that provided technical data for prioritizing safety projects along the SR 12 corridor. The SR 12 MIS remains the most comprehensive document for SR 12 east; however, an update of the traffic data, travel forecast, and project prioritization is planned through a joint partnership with Caltrans, MTC, San Joaquin Council of Governments (SJCOG) and the STA in 2010.

c. SR 113 Major Investment and Corridor Study (2009)

The purpose of the SR 113 MIS is to identify the current and future traffic and transportation needs in the corridor and to develop an implementation plan that identifies the operational and safety improvement needs. The report reviewed traffic operations, safety, goods movement, financing, railroad crossings, traffic signals, and other transportation planning issues in this corridor, which is located in eastern Solano County. The study is focused on the portion of SR 113 between SR 12 and the Solano/Yolo County line in Davis.

d. I-680/I-780/I-80 Major Investment and Corridor Study (2004)

The I-80/I-680/I-780 Major Investment and Corridor Study was the first major comprehensive study developed by the STA for the three major freeway corridors in Solano County. The purpose of the document is to evaluate the existing and future transportation networks within the study corridors, and to develop a long range prioritization list of multi-modal improvements necessary to serve existing and future transportation needs.

e. Draft I-80/I-680/I-780 Corridors Highway Operations and Implementation Study (2009)

The Draft I-80/I-680/I-780 Corridors Highway Operations and Implementation Study is phase two of the original Major Investment Study for the three corridors. The focus of this study was to develop operational improvements and recommendations for a long range Intelligent Transportation System (ITS) including ramp metering, closed circuit television cameras (CCTV), vehicle detection, and highway advisory radios.

f. MTC's 2008 State of the System Report (2008)

Since 2001, MTC and Caltrans have annually gathered data and statistics summarizing the performance of the Bay Area transportation system. The report summarizes key facts and performance indicators for freeways, local roadways, transit, goods movement, and bicycle and pedestrian travel in the region on an annual basis.

g. Napa County Transportation and Planning Agency's South County SR 29 Corridor Study Report (2005)

The South County SR 29 Corridor Study represents the initial analysis effort by the Napa County Transportation Planning Agency to address long-range transportation planning in the area. This study is intended to be a planning-level analysis that examines roadway volume demand and capacity levels at a broad link-based approach.

h. Solano Travel Safety Plan (2005)

The purpose of the Solano Travel Safety Plan is to identify travel safety deficiencies in Solano County and recommend a program of cost-effective travel safety programs and projects. The Safety Plan includes a funding strategy for each proposed program or project that addresses the criteria for the applicable funding sources.

i. Solano Congestion Management Program (CMP) (2007)

The Solano CMP is a mobility monitoring and planning tool for California counties that contain an urbanized area with a population of 200,000 or more. As the Congestion Management Agency for Solano County, the STA has revised the Solano County CMP once every two years since 1991. Major components of the CMP included the CMP Network, LOS standards for Solano County and city's roadway and transit system, and a discussion on traffic model forecasts.

The remaining highway and freeway segment information was developed from data provided by Caltrans traffic counts, California Highway Patrol's Statewide Integrated Traffic Reporting System (SWITRS) and the Solano Napa Travel Demand Model where available.

# Interstate Corridors

I-80, I-680, I-780, I-505

## I-80 Corridor

Responsible Agency:	Caltrans
Length of facility:	44 miles
Number of lanes :	3-4 lanes each direction
Median Barrier:	Yes
HOV Lane:	No (under construction)
No. of Interchanges:	38



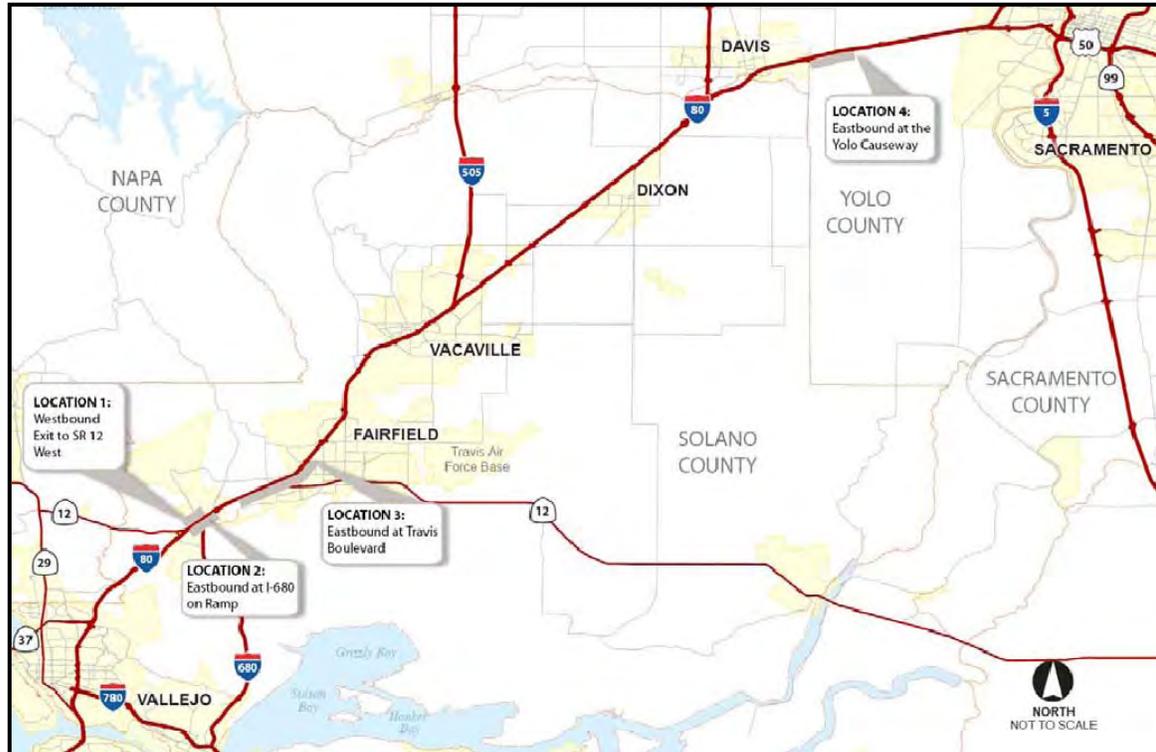
I-80 extends 44 miles in Solano County from Carquinez Bridge to the Solano/Yolo County line. According to MTC's I-80 Corridor Freeway Performance Initiative 2008 report, the I-80 Corridor supports several travel markets including freight and goods movements, recreational trips, interstate trips, intrastate/regional trips, and intercity/local travel. It is the major freeway facility serving a significant amount of locally-generated traffic in cities located along the corridor such as Vallejo, Fairfield, Vacaville, Dixon, Davis and Sacramento. The I-80 Corridor connects the Bay Area and the Sacramento Valley to the northern United States as it extends eastward from San Francisco to New Jersey. In addition to serving the needs of local travel, I-80 is an important route for intrastate and interstate commerce. It also serves as a route to major recreational destinations such as Six Flags Discovery Kingdom in Vallejo, the Sacramento Delta, Lake Tahoe and Napa Valley.

### I-80 Traffic Conditions

MTC's I-80 Corridor Freeway Performance Initiative reported the average daily traffic volumes (two-way) along the I-80 Corridor range from 78,000 to 240,000 vehicles per day.

A trip from the Al Zampa/Carquinez Bridge to I-5 in Sacramento takes 55 minutes during off-peak times when traffic is free flowing. On weekdays during the PM peak, this same trip could take nearly twice the time, or 1 hour and 40 minutes when congestion delay and buffer time are added to the journey time to ensure on time arrival. On Friday afternoon this same trip takes as much as 2 hours and 11 minutes due to these same factors. Based on the recurrent congestion locations, total annual delay on the I-80 Corridor is approximately 6.1 million vehicle hours.

The I-80 Corridor Freeway Performance Initiative defined traffic congestion as segments operating at or under 35 mph for a period of 15 minutes or more. Four segments of I-80 were identified as operating under these conditions as described below and shown in Exhibit 1.



*Exhibit 1. High Congestion Locations (Source: 2008 MTC I-80 Freeway Performance Report)*

AM Peak:

- Location 1: Westbound from SR 12 West exit ramp to west of the westbound I-80/southbound I-680 connector

PM Peak:

- Location 2: Eastbound from I-680 on ramp to just west of the SR 12 West on ramp
- Location 3: Eastbound between the Travis Boulevard on ramp and the Airbase Parkway off ramp to near the Cordelia truck scale
- Location 4: Eastbound from the Yolo Causeway and CR 32-A/32-B interchange to just west of the Mace interchange in Yolo County

The FPI reports that during the AM peak, congestion occurs at the SR 12 exit as a result of the high exiting volumes, high percentage of truck traffic (the westbound Cordelia truck scale is located just in advance of the exit ramp) and steep grades on westbound SR 12 after the exit. The FPI report used traffic count data that was prior to the SR 12 truck climbing lane project.

In the PM peak, congestion at the I-680 on ramp is due to merging traffic from I-680 joining a heavily traveled section of I-80 eastbound. The eastbound queue extends approximately 1.55 miles to just west of the SRR 12 West on weekdays, but on Friday afternoons the queue extends 2.55 miles to west of Red Top Road Interchange.

A bottleneck also occurs between the Travis Boulevard on ramp and the Airbase Parkway off ramp due to high demand and ramp merge and diverge movements between these ramps. The queue in this area extends for approximately 4 miles to near the Cordelia truck scale during weekdays.

Finally, PM peak congestion occurs for 4.55 miles from the Yolo Causeway and CR 32-AA/32-B interchange to just west of the Mace interchange as well in Yolo County. The congestion occurs when high traffic demand approaching the causeway is combined with traffic entering I-80 from the CR 32-AA/32-B interchanges and to a lesser extent at the Mace interchange.

Of the studies and plans surveyed, an origin and destination analysis for vehicles travelling on the I-80 corridor is lacking. However, STA staff is currently utilizing the Solano Napa Travel Demand Model would be able to provide this information in a follow up report.

**I-80 Truck Traffic**

According to MTC’s I-80 FPI Report, I-80 is the second longest interstate route in the U.S. extending nearly 3,000 miles from San Francisco to Teaneck, New Jersey. As such it is a major route for interstate commerce originating from and destined to the Bay Area. Along this section of the I-80 Corridor there is a truck weigh station and inspection facility at Cordelia (just south of Fairfield) which serves both directions of travel. Truck and heavy vehicle traffic is around 9 percent of daily vehicle trips from Sacramento County to Solano County and the San Francisco Bay Area.

**I-80 Safety Information**

Accident data from September 1, 2003 to August 31, 2006 were collected for the MTC’s I-80 FPI Report at six different segments of the I-80 Corridor in each direction and are summarized in Exhibit 2. During this three year period there was a total of 4,941 accidents reported along the I-80 Corridor. During this time, 3,626 were reported as multi-vehicle accidents, 1,321 were reported as injury accidents and 36 were reported as fatalities. Based on this data, there is an average of 4.5 accidents per day along the I-80 Corridor. Of all the segments analyzed, only the 7.8 mile westbound segment between Air Base Parkway and Red Top Road had an overall accident rate that is greater than the statewide average for similar facilities.

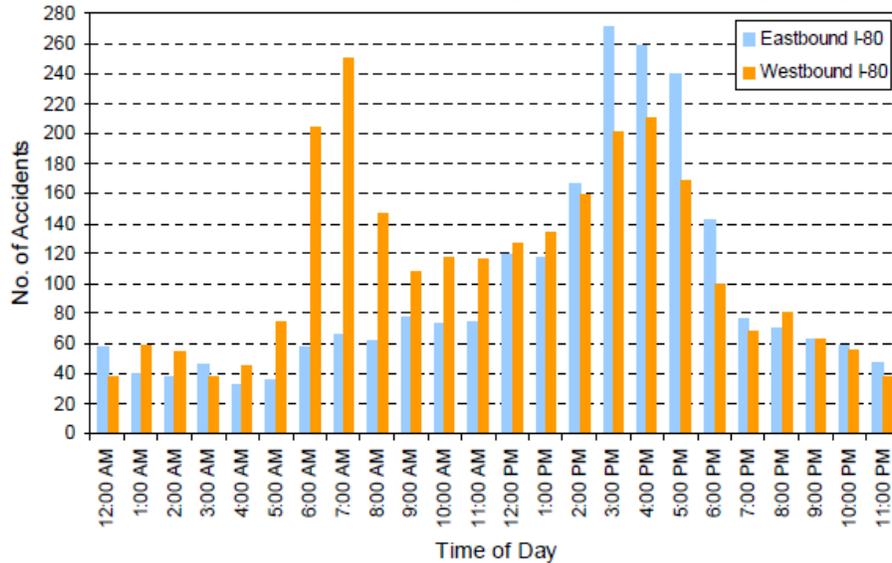
Exhibit 2: Accident Summary – September 2003 through August 2006

I-80 Segment in Solano County				Dir	Segment Length (Miles)	No. of Accidents					Total Persons		
						Total	Fat	Inj	Mult. Veh.	Wet	Dark	Killed	Injured
Bridge Toll Plaza	to	RT 37/1-80 Interchange		EB	5.04	347	1	110	283	69	98	1	182
RT 37/1-80 Interchange	to	American Canyon		EB	2.42	74	1	22	47	21	28	1	34
American Canyon	to	Air Base Parkway		EB	11.07	899	4	225	719	112	210	5	336
Air Base Parkway	to	Leisure Town		EB	10.68	457	4	134	278	77	170	5	193
Leisure Town	to	Kidwell Rd		EB	11.40	385	6	99	237	51	133	9	148
Kidwell Rd	to	Richards Blvd		EB	3.46	125	1	38	75	19	35	1	63
Richards Blvd	to	Kidwell Rd		WB	3.46	89	2	29	52	11	44	2	50
Kidwell Rd	to	Leisure Town		WB	11.40	325	3	84	203	31	124	6	132
Leisure Town	to	Air Base Parkway		WB	10.68	657	5	177	468	121	198	5	278
Air Base Parkway	to	Red Top Road		WB	7.78	1017	4	251	851	165	224	7	432
Red Top Road	to	Columbus Parkway		WB	10.83	202	4	59	115	52	73	4	106
Columbus Parkway	to	Carquinez Bridge		WB	5.68	364	1	93	298	69	114	1	156
Estimated Total on I-80 Corridor						4941	36	1321	3626	798	1451	47	2110

Accidents on I-80 in Solano County by time of day and direction of travel are shown in Exhibit 3. The pattern of accidents closely correlates to the pattern of hourly traffic volumes along the

corridor. In other words, more accidents occur during those hours when the traffic flows are peaking in the morning and afternoon than during other hours of the day. Overall, about 45% of the accidents on the I-80 in Solano County over the last 3 years have occurred during the six hours of the morning (6:00 to 9:00 am) and afternoon (3:00 to 6:00 pm) peak periods indicating that high traffic volumes is contributing factors.

Exhibit 3. Accidents by Time of Day – September 2003 through August 2006



Eastbound and Westbound accidents by type and by segment for I-80 in Solano County are shown in Exhibit 4 and 5. At several of the segments along the corridor rear-end collisions are the predominate type of accident. Accidents of this type are typically associated with congested conditions where stop and go driving takes place either due to recurrent congested conditions, or incidents along the corridor. Each of these locations with high occurrences of rear-end collisions is discussed briefly as follows:

Exhibit 4. Eastbound Accidents by Type- September 2003 through August 2006

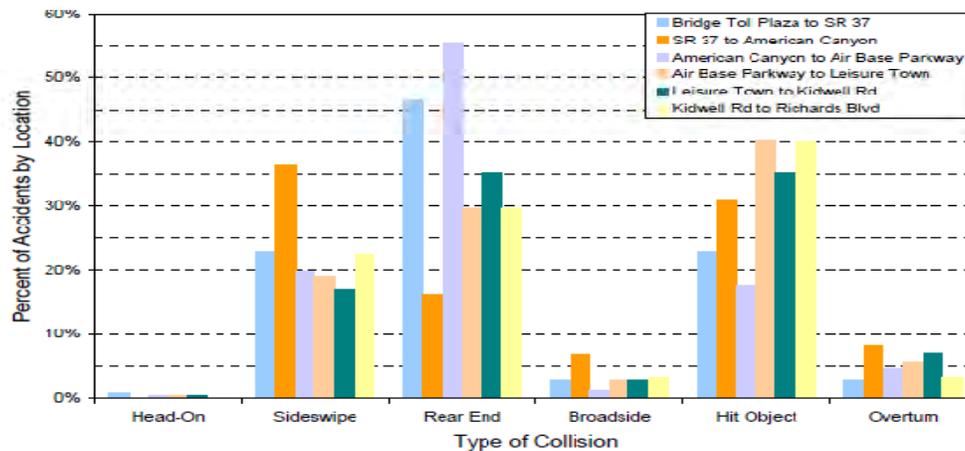
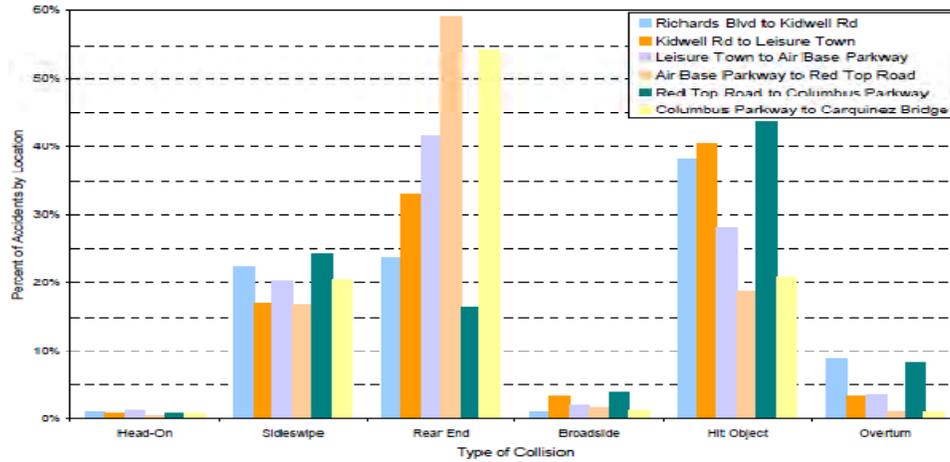


Exhibit 5. Westbound Accidents by Type – September 2003 through August 2006



**Current Project on I-80: I-80 Roadway Rehabilitation and Final HOV Lane Paving Project**

This project is to resurface, restore and rehabilitate the highway along Interstate 80 in Solano County in Fairfield from 0.4 mile west of Route 12 overcrossing to 0.8 mile east of Air Base Parkway overcrossing. The project will incorporate roadway rehabilitation with completion of final paving for the HOV lanes project along I-80, from Route 12 East to Putah Creek in Solano County. It is the first American Reinvestment and Recovery Act (Recovery Act)-funded highway project in California. The project is expected to be completed by December 2009.

## I-680 Corridor

Responsible Agency:	Caltrans
Length of facility:	11.5 miles
Number of lanes :	2 lanes each direction (not including Benicia Martinez Bridge Plaza)
Median Barrier:	Yes
HOV Lane:	None in Solano County. Contra Costa County has HOV Lane up to the Benicia Martinez Bridge
No. of Interchanges:	7



The I-680 corridor in Solano County connects the City of Fairfield to the City of Benicia and extends 11.5 miles from I-80 to the Benicia-Martinez Bridge at the Solano/Contra Costa County Line. According to MTC's I-680 FPI Report, a major feature of I-680 is the Benicia-Martinez Bridge that links Solano and Contra Costa Counties and is located just south of the I-780 interchange. The Benicia-Martinez Bridge is a toll facility that includes a toll plaza for northbound traffic. Until August 2007, the bridge was three lanes in each direction, with nine lanes at the toll plaza, including two "wavethrough" toll booths/lanes for 3+ HOVs. The new Benicia-Martinez Bridge Project features the construction of a new five-lane bridge east of the existing bridge. The new span accommodates northbound traffic with four mixed-flow lanes and one slow-vehicle lane. With completion of this span in August 2007, the toll plaza is located at the south end of the bridge with 9 booths, one carpool bypass lane and two open road tolling lanes. The existing bridge is being modified to accommodate four mixed-flow lanes of southbound traffic and a two-way bicycle/pedestrian lane.

### I-680 Traffic Conditions

As part of the I-80, I-680, I-780 Operational Improvement Plan, DKS consultants summarized the existing traffic congestion based on MTC's Draft I-680 FPI Report as follows.

The existing conditions assessment conducted as part of the Draft I-680 North FPI study was performed prior to the opening of the new northbound span and toll plaza at the Benicia-Martinez Bridge. Since the opening, congestion has decreased in the area around the bridge and toll plaza. As such, follow-up observations in this area were performed for this report and used to update the existing conditions assessment presented below.

Within Solano County, one segment of I-680 currently experiences congestion during the AM peak period while two were identified during the PM peak period as listed below.

#### AM Peak:

- Location 5: Southbound I-680/Eastbound I-780 Interchange approaching the north end of the Benicia-Martinez Bridge

PM Peak:

- Location 6: Northbound from the I-80 interchange to south of the Cordelia Road off-ramp
- Location 7: Southbound approaching the north end of the Benicia-Martinez Bridge

During the AM peak, southbound traffic approaching the north end of the Benicia-Martinez Bridge slows to below 40 miles per hour. This is due to the bridge approach geometry including the horizontal curve on the mainline and the limited sight distance for the merge with I-780. It should be noted that this approach will be improved as part of the Benicia-Martinez Bridge project.

Prior to the opening of the new northbound span and toll plaza, congestion also occurred in the northbound direction extending from the toll plaza south due to the toll plaza operations. Since the opening of the new bridge, the level of congestion associated with the toll plaza has decreased significantly. Also, because the new toll plaza is located at the south end of the bridge, any queuing occurs within Contra Costa County only.

During the PM peak period, congestion occurs in the northbound direction between south of the I-80 interchange and south of the Cordelia Road off ramp is due to the capacity constraints at the merge onto I-80. In the southbound direction, traffic approaching the north end of the Benicia-Martinez Bridge slows to below 40 miles per hour due to the bridge approach geometry including the horizontal curve on the mainline and the limited sight distance for the merge with I-780.

MTC’s Draft I-680 FPI Report provided a traffic origin and destination analysis based on a select link analysis using the Contra Costa Countywide Travel Demand Model. The select link analysis provides a snap shot of where the traffic from a specific roadway segment (or link) is coming from and going to. The analysis was conducted using 2000 AM peak hour model data for eight locations on I-680 that stretched from Solano County to Alameda County. Exhibit 5 displays the results of this analysis.

Exhibit 5. I-680 Origin and Destination Summary

Origin	Destination							
	N/O Benicia Bridge	SR 4 E/O SR 242	SR 4 W/O I-680	Central County <sup>1</sup>	West on SR 24	South County	S/O Alcosta (AC County)	Other
I-680 N/O I-780 Interchange		4%	0%	41%	3%	6%	22%	24%
I-680 at Benicia Bridge		6%	0%	61%	3%	7%	23%	0%
Westbound SR 4 (E/O SR 242)	7%		9%	39%	25%	8%	12%	0%
Eastbound SR 4 (W/O I-680)	1%	18%		72%	0%	5%	4%	0%
Central County (Martinez to Walnut Creek)	7%	6%	5%		27%	30%	26%	0%
Eastbound on SR 24 (W/O Pleasant Hill)	9%	6%	0%	50%		22%	12%	0%
South County (Alamo to San Ramon)	2%	2%	0%	44%	16%		36%	0%
Northbound I-680 (S/O Alcosta)	11%	6%	0%	46%	2%	35%		0%

Notes:  
<sup>1</sup> Central County includes the cities of Martinez, Concord, Pleasant Hill, Walnut Creek, and Clayton and surrounding communities

### I-680 Truck Traffic

MTC’s I-680 FPI Report provided a brief analysis of truck traffic on I-680. The report obtained data from Caltrans 2005 Truck Traffic report; however, data sampled for this report was mostly derived from locations in 2000. The Draft I-680 FPI Report indicated that the segment of I-680 south of Lake Herman Road truck traffic constituted 5.33% of the total Average Annual Daily Traffic count for that segment. This percentage of truck traffic was fairly consistent throughout the corridor locations surveyed in Contra Costa and Alameda County.

### I-680 Safety Information

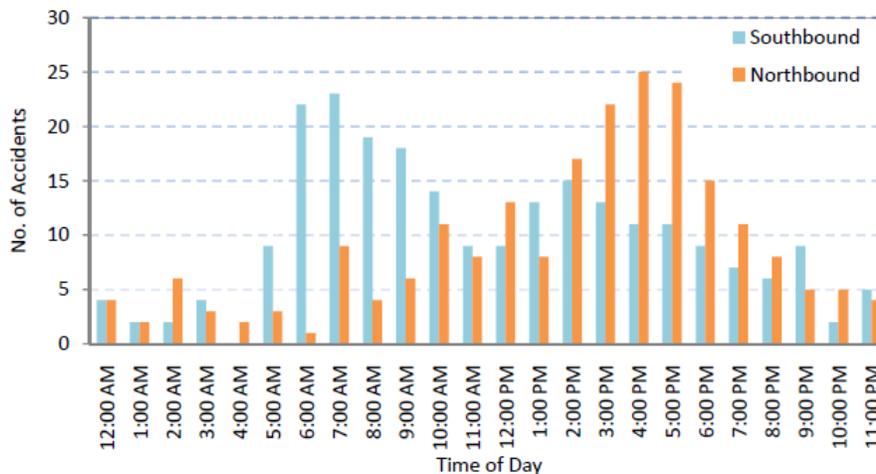
The I-80/I-680/I-780 Operations Improvement Plan summarized accident data for the segment between the Benicia-Martinez Bridge toll plaza and the interchange with I-80. Data was collected in each direction from September 1, 2003 to August 31, 2006. As shown in Exhibit 6, during this three year period there was a total of 453 accidents reported along the I-680 corridor in Solano County for an average of 1.2 accidents per day. Of these, 127 were reported as injury accidents and 3 were reported as fatalities. Shown in Exhibit 6, accident rates for both directions of I-680 in Solano County are below the statewide average accident rates for similar facilities and area types. This may be due to the relatively low level of congestion, on the whole, along I-680 through the county.

Exhibit 6: I-680 Accident Summary – September 2003 through August 2006

Direction				Segment Length (Miles)	No. of Accidents			Accident Rates (No. of Accidents per Million Vehicle Miles)					
					Segment Quantity			Segment Rates		Statewide Rates			
					Total	Fat	Inj	Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total
Bridge Toll Plaza	to	I-680/I-80 Interchange	NB	13.12	216	1	69	0.002	0.16	0.51	0.014	0.32	0.83
I-680/I-80 Interchange	to	Bridge Toll Plaza	SB	13.12	237	2	58	0.004	0.12	0.49	0.014	0.32	0.84
<b>Total</b>					<b>453</b>	<b>3</b>	<b>127</b>						

Accidents on I-680 in Solano County by time of day and direction of travel are shown in Exhibit 7 where it can be seen that the pattern of accidents closely correlates to the pattern of hourly traffic volumes along the corridor. In other words, more accidents occur during those hours when the traffic flows are peaking in the morning and afternoon than during other hours of the day. Overall, about 41% of the accidents on I-680 in Solano County over this 3 year period occurred during the six hours of the morning (6:00 to 9:00 AM) and afternoon (3:00 to 6:00 PM) peak periods indicating that high traffic volumes are contributing factors.

Exhibit 7: I-680 Accident Summary – September 2003 through August 2006



Northbound and Southbound accidents by type and by direction for I-680 in Solano County are shown in Exhibit 8 and Exhibit 9. Along the corridor, hit-object collisions are the predominate type of accident that occurs. Accidents of this type are typically associated with poor sight line conditions or high vehicle speeds.

Exhibit 8: I-680 Northbound Accidents by Type – September 2003 through August 2006

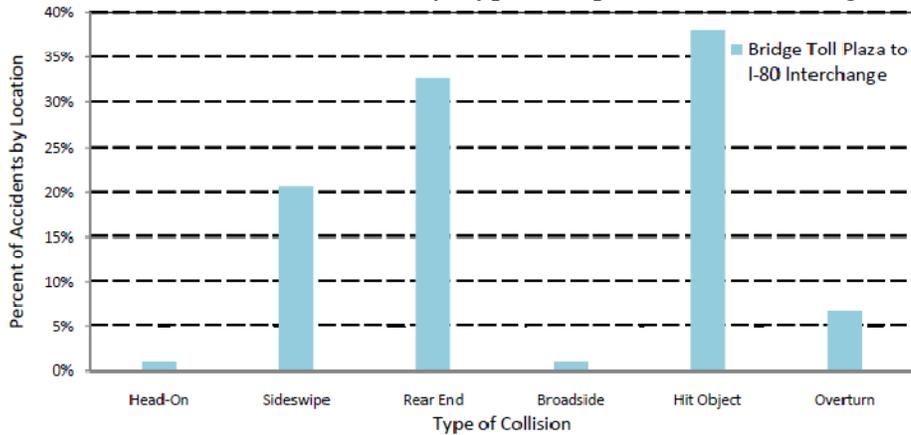
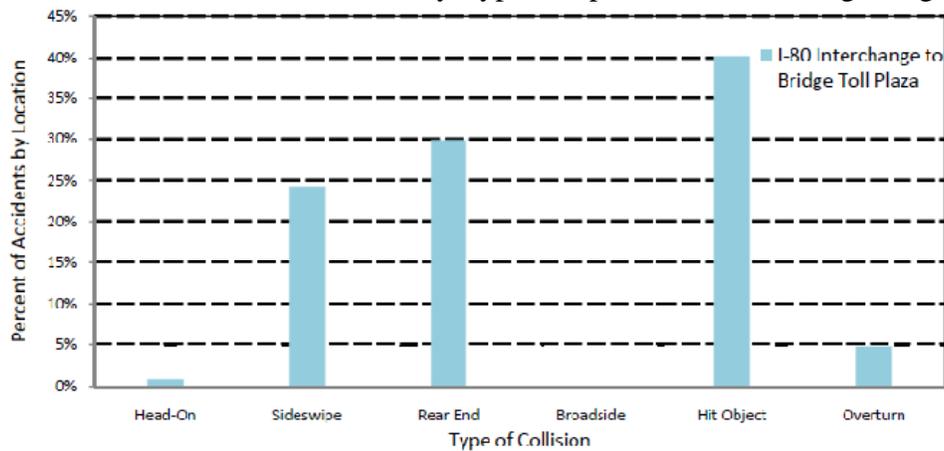


Exhibit 9: I-680 Southbound Accidents by Type – September 2003 through August 2006



## I-780 Corridor

Responsible Agency:	Caltrans
Length of facility:	6.5 miles
Number of lanes :	2 lanes each direction
Median Barrier:	Yes
HOV Lane:	No
No. of Interchanges:	8

The I-780 Corridor in Solano County extends 6.5 miles from I-680 at the Benicia/Martinez Bridge to I-80. The corridor provides a direct freeway connection to the cities of Vallejo and Benicia. I-780 transitions into Curtola Parkway at the City of Vallejo. I-780



### I-780 Traffic Conditions

The surveyed plans and studies provided limited data for the existing conditions on I-780. For the STA's 2009 I-80/I-680/I-780 Operational Improvement Plan, DKS developed a model simulation for existing conditions along I-780 using 2005 or 2006 traffic volumes from Caltrans. In a few cases, the most recent traffic volumes were from 2002 or 2003. Field observations along I-780 were also performed during the fall of 2008.

The model analysis indicated that there would be no mainline bottlenecks on I-780 queues in either direction for either the AM or PM peak periods. Field observations along I-780 confirmed the model results. However, these observations also revealed slowing at both ends of I-780 as traffic transitions from I-780 to I-80 at the west end and to I-680 at the eastern end. In the westbound direction, high exiting volumes to I-80 combined with high traffic on I-80 result in slowing on the off-ramps that extends back to the right lane on the I-780 mainline. During the AM peak, this occurs primarily at the loop off-ramp to westbound I-80, while during the PM peak the diagonal off-ramp to eastbound I-80 is most affected. At the eastern end of I-780, eastbound traffic heading to southbound I-680 slows due to the bridge approach geometry including the horizontal curve on the mainline and the limited sight distance for the merge with I-680. It should be noted that this approach will be improved as part of the Benicia-Martinez Bridge project. It should also be noted that Columbus Parkway in the cities of Vallejo and Benicia will serve as a bypass in the event of an emergency closure of I-780.

### I-780 Truck Traffic

Based on data provided by Caltrans in 2002, the I-80/I-680/I-780 Corridor Study reported that the I-780 corridor has an Average Annual Daily Truck Traffic of 4.6%. This percentage is slightly lower than I-80 and I-680.

### I-780 Safety Information

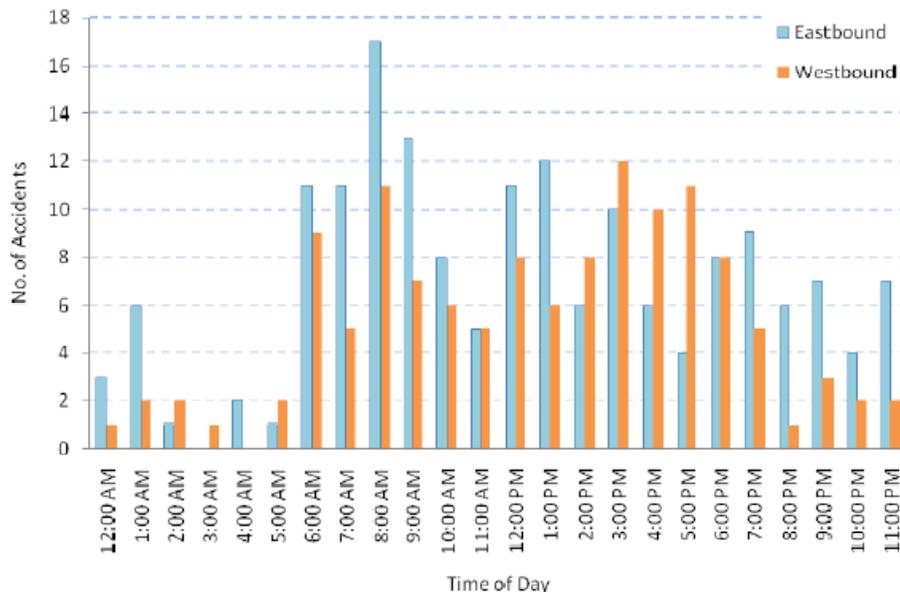
For I-780, accident data for the segment between the Benicia-Martinez Bridge toll plaza and the interchange with I-80 were collected in each direction from April 11, 2005 to March 31, 2008. As shown in Exhibit 10, during this three year period there was a total of 296 accidents reported along the I-780 corridor in Solano County for an average of 0.8 accidents per day. Of these, 109 were reported as injury accidents and 3 were reported as fatalities. As shown in Exhibit 10, accident rates for both directions of I-780 in Solano County are below the statewide average accident rates for similar facilities and area types. This may be due to the relatively low level of congestion the short length of I-780.

Exhibit 10: I-780 Accident Summary – April 2005 through March 2008

Direction				Segment Length (Miles)	No. of Accidents			Accident Rates (No. of Accidents per Million Vehicle Miles)					
					Segment Quantity			Segment Rates			Statewide Rates		
					Total	Fat	Inj	Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total
I-780/I-80 Interchange	to	Bridge Toll Plaza	EB	6.51	169	1	60	0.005	0.30	0.83	0.011	0.36	0.98
Bridge Toll Plaza	to	I-780/I-80 Interchange	WB	6.51	127	2	49	0.010	0.25	0.62	0.011	0.36	0.98
<b>Total</b>					<b>296</b>	<b>3</b>	<b>109</b>						

Accidents on I-780 by time of day and direction of travel are shown in Exhibit 11 where it can be seen that the pattern of accidents closely correlates to the pattern of hourly traffic volumes along the corridor. More accidents occur during those hours when the traffic flows are peaking in the morning and afternoon than during other hours of the day. Overall, about 40% of the accidents on I-780 over this 3 year period occurred during the six hours of the morning (6:00 to 9:00 AM) and afternoon (3:00 to 6:00 PM) peak periods indicating that high traffic volumes are contributing factors.

Exhibit 11: I-780 Accidents by Time of Day – April 2005 through March 2008



Eastbound and Westbound accidents by type and by direction for I-780 are shown in Exhibit 12 and Exhibit 13. Along the corridor, hit-object collisions are the predominate type of accident that occurs. Accidents off this type are typically associated with poor sight line conditions or high vehicle speeds.

Exhibit 12. I-780 Eastbound Accidents by Type- April 2005 through March 2008

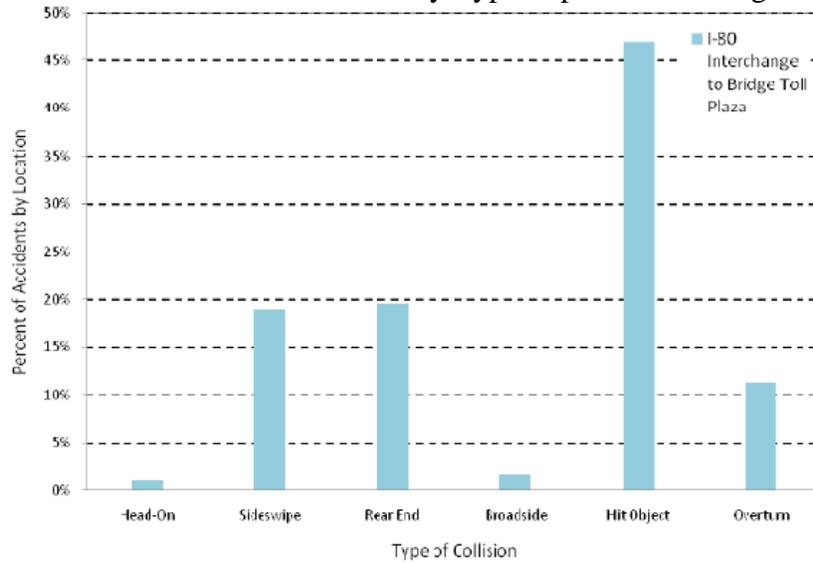
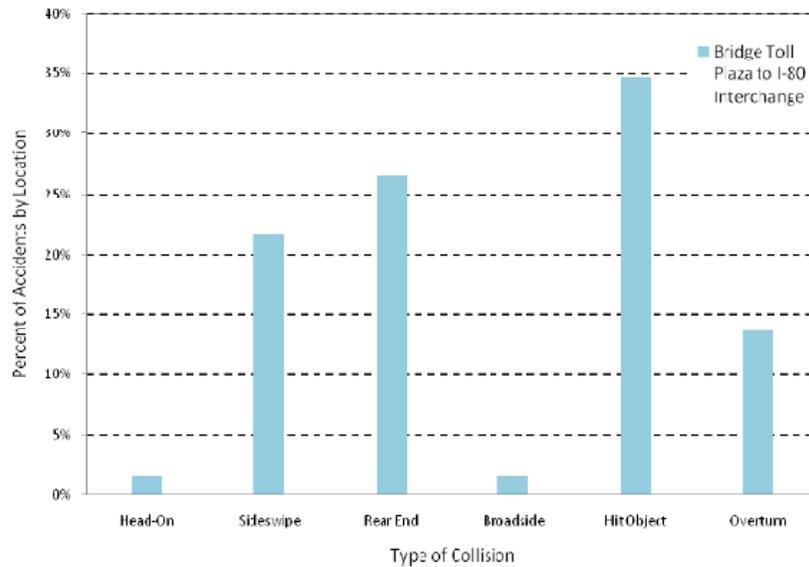


Exhibit 13: I-780 Westbound Accidents by Type - April 2005 through March 2008



## **I-505 Corridor**

Responsible Agency:	Caltrans
Length of facility:	10 miles
Number of lanes :	2 lanes each direction
Median Barrier:	Yes
HOV Lane:	No
No. of Interchanges:	2

The I-505 Corridor in Solano County begins and ends at I-80 in Vacaville and the Yolo Solano County Line near the City of Winters. I-505 is a four lane 10 mile freeway facility in Solano County. The Corridor is primarily rural and serves as a bypass corridor to Sacramento for those travelling to and from I-5 and I-80.



Unlike the prior three Interstate corridors (I-680, I-780, and I-80), STA has not conducted a detailed study on I-505. To assess a snap shot of the current level of congestion, traffic counts were obtained from Caltrans Traffic Data Branch. The peak hour counts were compared to the I-505 freeway capacity to determine the current level of service. Lastly, the California Highway Patrol's Statewide Integrated Traffic Records System (SWITRS) data provided collision data for accidents that occurred between 2006 to 2009.

### **I-505 Traffic Conditions**

Figure 14 displays the Average Annual Daily Traffic (AADT) Northbound Peak Hour Counts for the years between 2006 and 2008 over four segments. Figure 15 displays the AADT Southbound Peak Hour Counts for the same years and segments, with exception to the southbound Vacaville I-80 segment. The southbound Vacaville I-80 segment was a break point in the traffic data. The it had a large number of traffic counts, a difference of around 5,000 counts presumably from I-80 traffic mingled in.

The Northbound and Southbound peak hour counts for 2006 to 2008 do not show a dramatic difference in AADT. The highest counts occur around the I-505/I-80 Interchange and the Vaca Valley Parkway. The other segments with the lower traffic counts are located in the rural and agriculture areas that continue into the northern segment of the corridor.

Figure 14. I-505 Northbound Peak Hour AADT

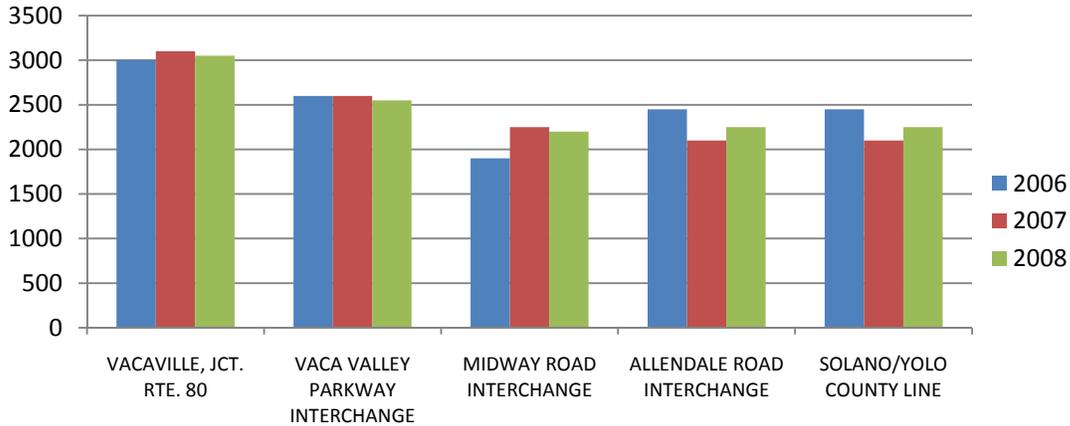
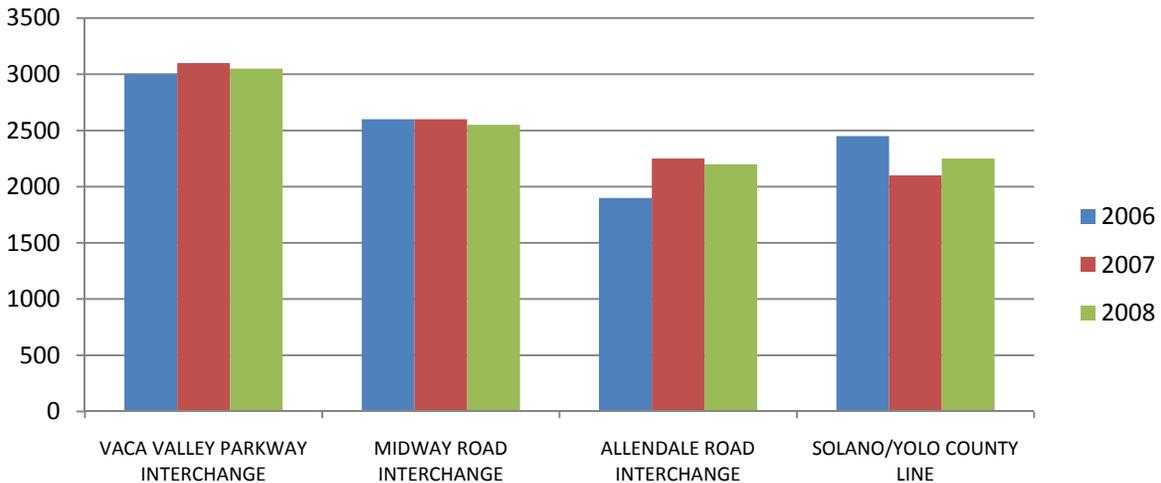


Figure 15. I-505 Southbound Peak Hour AADT



The 2008 Level of Service (LOS) for the I-505 corridor was based on the capacity of the freeway facility and the 2008 Peak Hour Count provided by Caltrans Traffic Data Branch. The I-505 lane capacity is consistent with the current Napa Solano Travel Demand Model. The LOS result provides a quantitative measure of transportation system operations with LOS A representing free-flow conditions and LOS F representing gridlock conditions. Table 2 provides the LOS for the five segments along the I-505 corridor. Overall, the I-505 corridor has a free flow of traffic with minimal delays and moderate volumes at the I-80/I-505 interchange.

Table 2. I-505 Northbound 2008 Level of Service (LOS) Summary

Segment	No. of Lanes	Capacity	Peak Hour Count	LOS
VACAVILLE, JCT. RTE. 80	2	4000	3050	C
VACA VALLEY PARKWAY INTERCHANGE	2	4000	2550	B
MIDWAY ROAD INTERCHANGE	2	4000	2200	A
ALLENDALE ROAD INTERCHANGE	2	4000	2250	A
SOLANO/YOLO COUNTY LINE	2	4000	2250	A

### I-505 Safety Information

The CHP's State Wide Integrated Records System (SWITRS) collision data for I-505 indicated a total of 97 reported accidents with a collisions resulting in fatalities. Table 3 provides a summary of I-505 Collisions between 2003 to 2007. Reports collected from SWITRS included data with information limited to number of collisions, collision location, date of collision and number of injuries or fatalities.

Table 3. I-505 Collision Summary 2003 to 2007

Segment	Segment Length	Collisions	Fatalities
Wolfskill Road to Solano Yolo CL	2.1 miles	14	2
Allendale Rd to Wolfskill Rd	2.9 miles	29	2
Vacavalley to Allendale Road	4.1 miles	25	2
I-80 to Vacavalley Pkwy	1.5 miles	29	3

### I-505 Truck Traffic

Average Annual Daily Truck Traffic Data between the years 2007 and 2002 was provided by Caltrans Traffic Data Branch. Truck traffic was counted or estimated for I-505 at I-80 and at the Solano Yolo County Line. Overall, during this five year time period truck traffic was estimated to be an average of 10.7% northbound and 11.4% southbound of the total Average Annual Daily Traffic counts.

# **State Route Corridors**

SR 12, SR 113, SR 29, SR 37, SR 84, SR 128 and SR 220

## **SR 12 Corridor**

Responsible Agency:	Caltrans
Length of facility:	26.4 miles
Number of lanes :	Primarily 2 lanes. 4 lanes each direction from I-80 to Walters Road.
Median Barrier:	Channelizers and temporary median barrier under construction
HOV Lane:	No



State Route (SR) 12 is an important east-west route connecting Solano, Napa, Solano, Sacramento, San Joaquin and Calaveras Counties. SR 12 is a two to four-lane roadway east of I-80 through Fairfield, Suisun City, County of Solano and Rio Vista. West of I-80, SR 12 is a two-lane facility directly connecting Solano County to Napa County and beyond. The facility serves many different users, including:

- Regional through trips and goods movement;
- Intercity travel;
- Commute traffic;
- Agricultural truck trips; and
- Recreational traffic, both local and regional in nature.

SR 12 has at grade crossings and minor collector intersections for property owners and other travelers on the east and west end of I-80. This presents challenges for through traffic and traffic entering or exiting from SR 12.

### **SR 12 East Traffic Conditions**

The STA, in partnership with Caltrans completed a Major Investment Study (MIS) for SR 12 in October 2001. An update to the SR 12 MIS was completed in January 2006. The update focused on a review of priorities for facility improvement projects along SR 12. The 2006 report was called SR 12 East Prioritization and Implementation Strategy. Both documents studied SR 12 from I-80 in Fairfield to the Solano County/Sacramento County Line east of Rio Vista. Existing conditions presented in this section largely reflects data obtained through these two documents. According to the SR 12 East Prioritization and Implementation Strategy, the westbound traffic flow is higher during the AM peak hour and PM traffic higher in the eastbound traffic flow. This reflects prevailing commute patterns.

The SR12 East Prioritization and Implementation Strategy Traffic conditions reported a Level of Service (LOS) C or lower for the majority of the corridor during the PM Peak Hour traffic heading eastbound. The SR 12 segment through Rio Vista was the only exception with a LOS E between Church Road and SR 84. The report also highlights the majority of the corridor operates at LOS C for the westbound AM Peak Hour traffic. The only exception again is a small segment through Rio Vista between Hillside Terrace to SR 84. These LOS conditions and other traffic measurements are planned to be re-evaluated as part of a comprehensive corridor MIS

scheduled to begin Fall 2009. The upcoming MIS will evaluate the entire SR 12 corridor between I-80 in Solano County and I-5 in San Joaquin County. The study will be coordinated in partnership with Caltrans District 4, 10, and 7 as well as other stakeholders including STA, SJCOG, SACOG, NCTPA and MTC.

### SR 12 West/ Jameson Canyon Traffic Conditions

Existing conditions for the Corridor was detailed in the SR 12 Jameson Canyon Road Widening and SRs 29/12 Interchange Project Initial Study. The Initial Study was published with a Proposed Mitigated Negative Declaration (CEQA) and Environmental Assessment (NEPA) August 2007.

The Study indicates that on an average annual daily basis (counted at Kelly Road in 2003), SR 12 Jameson Canyon carries between 24,700 and 32,500 motorists, in either direction, between the southern Napa Valley and the Fairfield/Suisun Valley areas. Many of the motorists using this portion of SR 12 live in Solano County and work in Napa County. As more jobs have been established in Napa County and more residences built in Solano County, traffic volumes, congestion, and travel times have increased on this portion of SR 12. This portion of SR 12 is mostly a two-lane conventional highway set in a rural landscape with flat to rolling terrain.

According to MTC's Regional Transportation Plan, "T-2030," daily person trips from year 2000 to year 2030 between Napa and Solano Counties on SRs 12 and 29 are projected to increase 68%, which is exceeded in the Bay Area only by trips between San Benito/ Monterey/ Merced-Santa Clara at 120%, Lake/Colusa-Napa at 102%, and Mendocino/Sonoma at 83%.

### SR 12 Safety Information

Safety on SR 12 has been a priority for the STA Board for a number of years, but recent accidents and fatalities have increased the urgency to take immediate action. The STA, working closely with law enforcement agencies and Caltrans, has developed a multi-faceted strategy for improving safety and mobility on this important interregional highway route from Rio Vista to Suisun City and Fairfield. The four key elements of the program are **enforcement, legislation, public education** and signage, and **engineering**.

There were 6 fatalities on SR 12 in March 2007 alone. As of October 1, 2007, there have been a total of 9 fatalities on SR 12 between I-80 in Solano County and I-5 in San Joaquin County that year. The rate of fatalities and injury crashes is more than one and a half times the state average. The STA-sponsored **Assembly Bill 112 (Wolk)** creating a Safety Enhancement Double Fine Zone (DFZ) on this same stretch of SR 12 was approved by the legislature and signed into law on October 1, 2007. In addition to creating a DFZ on SR 12 beginning January 1, 2008, the law defines criteria for similar roadways throughout the state to qualify for designation as a Double Fine Zone.

The accident rates (from January 1, 2003 to December 31, 2005) for SR 12 through Jameson Canyon are comparable to the statewide average for similar facilities. The accident rates for SRs 29 and 12 at the SRs 29/12 intersection in Napa are two to four times the statewide average for similar facilities and intersections. The higher than average rate of accidents at the intersection indicates a potential need to separate vehicle movements between the two routes.

### **SR 12 Truck Traffic**

Average Annual Daily Truck Traffic Data between the years 2007 and 2005 was provided by Caltrans Traffic Data Branch. Truck traffic on the SR 12 corridor between Napa and San Joaquin Counties is estimated at 9.8% of the total traffic. The higher volumes of trucks were concentrated on SR 12 east between SR 113 westbound through Scally Road at 11% and 17% truck volume on average respectively. The truck volume tapers off at 7.2% truck volume average at I-80. Truck traffic volumes were also significant at SR 12 eastbound at 10% through Rio Vista.

## **SR 113 Corridor**

Responsible Agency:	Caltrans
Length of facility:	22.4 miles
Number of lanes :	2 lanes.
Median Barrier:	No
HOV Lane:	No



SR 113 corridor is an important transportation facility for the movement of people and goods in eastern Solano County. This mainly rural highway serves a mixture of local, interregional, and tourist traffic. With few north-south highways in the area, SR 113 serves as a critical connector between communities of metropolitan Sacramento, the eastern Bay Area, and the Central Valley.

The STA, in partnership with Caltrans, the City of Dixon, the County of Solano and other agencies developed and adopted a Major Investment and Corridor Study for SR 113 in 2009. The existing conditions reported in the following sections are taken directly from the SR 113 MIS.

## **SR 113 Traffic Conditions**

Daily AM and PM peak hour counts were assembled for SR 113 at the following locations between 2001 through 2004 and adjusted to represent 2008 conditions:

- North of SR 12 Junction
- North of the Fry Road Junction
- North of Cherry Street Junction in downtown Dixon
- North of A Street in downtown Dixon
- North of Adams Street in downtown Dixon
- South of the I-80 junction in Dixon
- Solano/Yolo county line in Davis

Traffic adjustment factors were developed using growth estimates from the Caltrans Traffic and Vehicle Data Systems Unit over a 10-year period (1996 to 2006). A consistent growth factor was not used for the entire corridor as different segments have experienced varying degrees of growth over the period. Once the counts were factored to represent 2008 conditions, the traffic counts were balanced to ensure traffic movement continuity in the corridor. The results of this balancing process are shown in Figures 16, 17, and 18, which display Daily, and AM, and PM peak hour bi-directional traffic flows on SR 113.

Figure 16. SR 113 Bi-Directional Daily Traffic Volumes

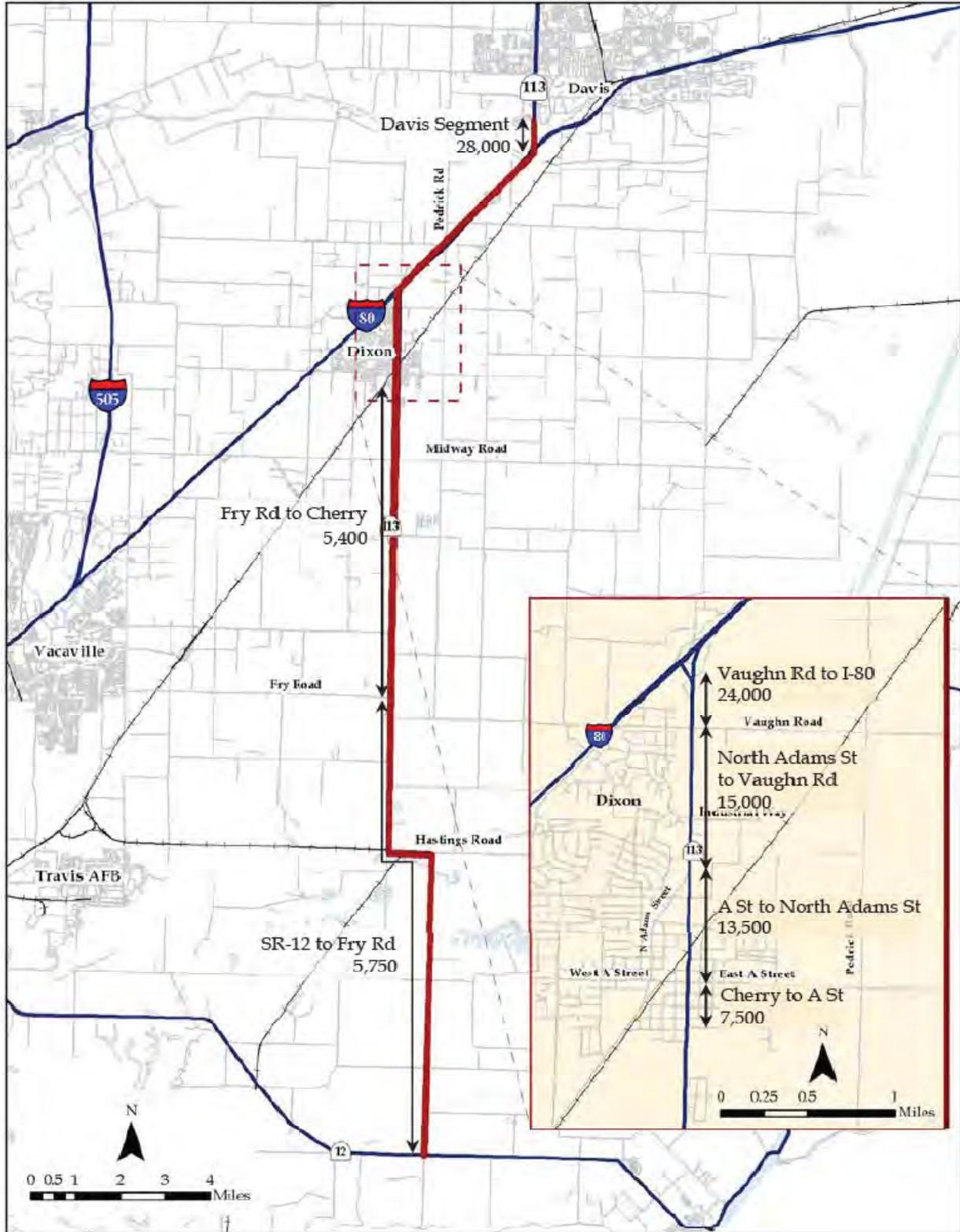


Figure 17. SR113 Bi-Directional AM Peak Hour Traffic Volumes

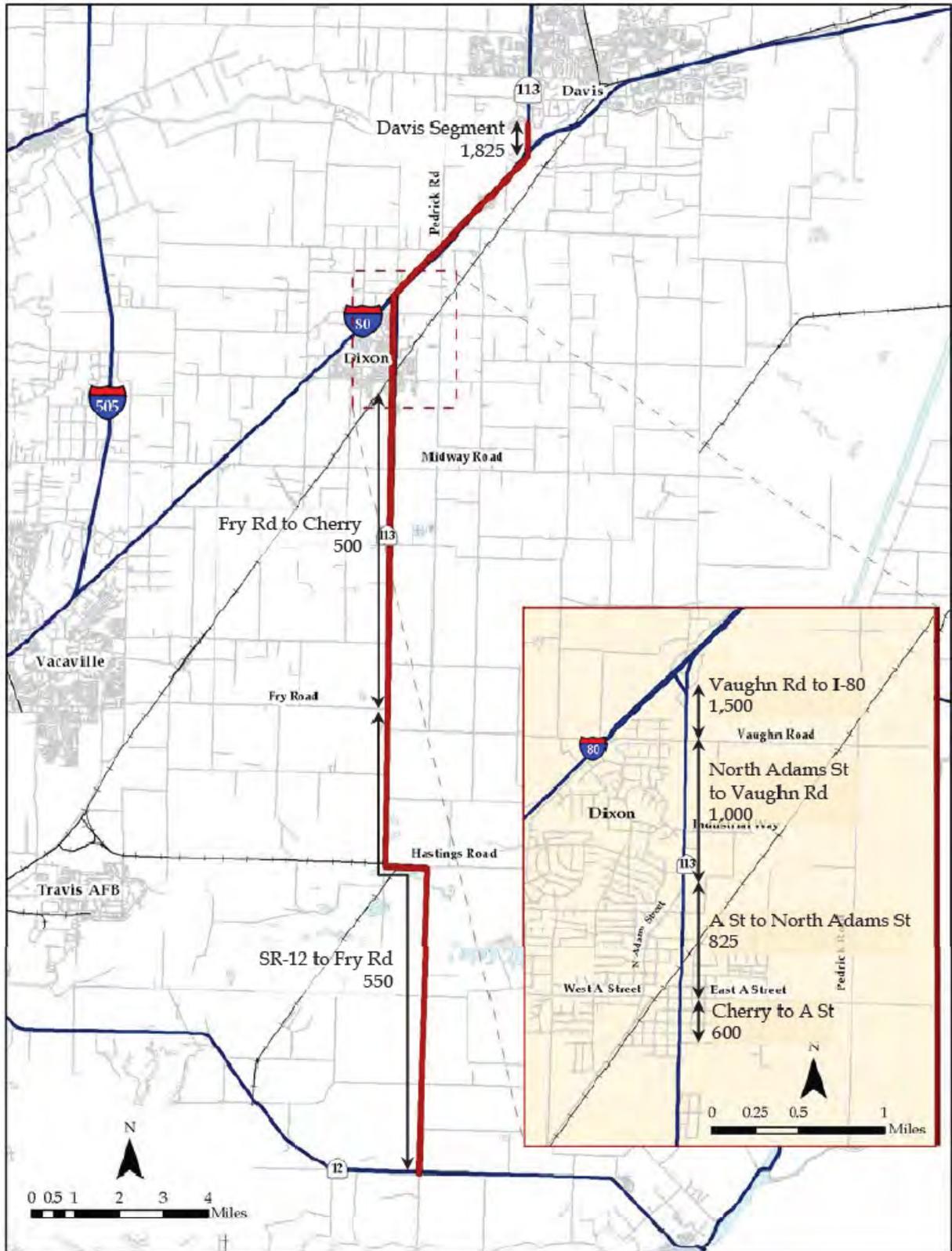
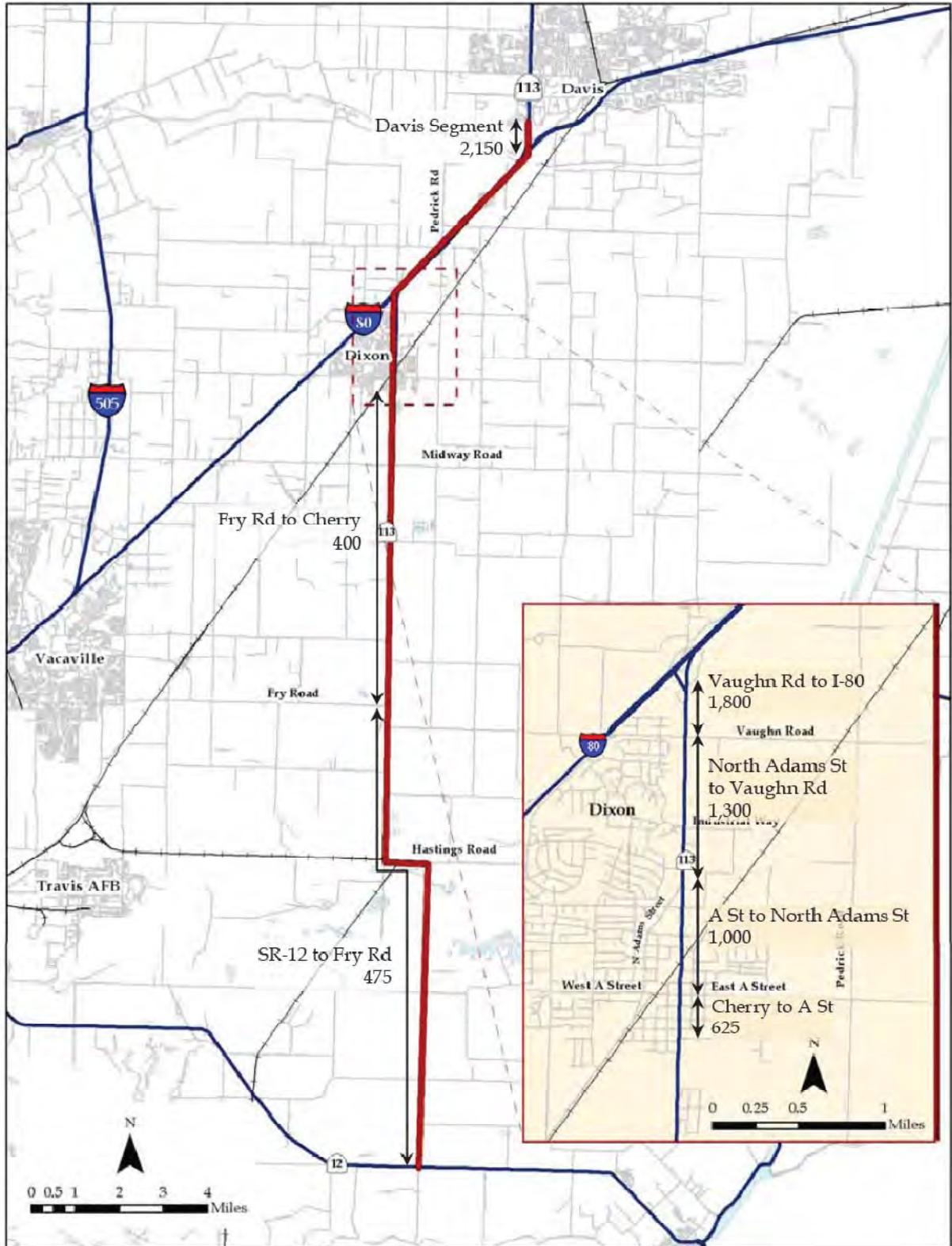


Figure 18. SR 113 Bi-Directional PM Peak Hour Traffic Volumes



On a daily basis, the highest volumes in the SR 113 corridor are located north of I-80, where SR 113 operates as a divided freeway. This portion of the corridor bisects the University of California, Davis campus. The segments with the next highest traffic volumes are located within the urban area of the City of Dixon. SR 113 within this area is an urban arterial that serves as a major thoroughfare for local traffic. In the rural areas south of Dixon, traffic volumes are significantly lower, mostly comprised of regional travel, with a mix of through regional and interregional traffic. SR 113 serves as a detour from I-80 during cases of incident response. Based on the Caltrans traffic data and the Dixon Downs Draft Environmental Impact Report (EIR), truck percentages along SR 113 ranges between five and eight percent.

Table 4 shows the LOS values for SR 113 for both the a.m. and p.m. peak hours. It should be noted that the segment of SR 113 between North Adams and A Street is approaching unacceptable LOS levels as a result of the high volume of traffic on this two-lane segment.

Table 4. Peak-Hour Level of Service for SR 113 Highway Segments

SR 113 Segment	Functional Class	Bi-Direction Traffic Volume					
		AM Peak		PM Peak		Daily	
		Volume	LOS	Volume	LOS	Volume	LOS
Solano/Yolo Line – I-80	Freeway	1,825	B	2,150	B	28,000	N/A
I-80 – Vaughn	4-lane Arterial	1,500	C	1,800	C	24,000	D
Vaughn – North Adams	4-lane Arterial	1,000	C	1,300	C	15,000	C
North Adams – A	2-lane Arterial	825	C	1,000	D	13,500	E
A – Cherry	2-lane Arterial	600	C	625	C	7,500	C
Cherry – Fry	Rural Minor Arterial	500	B	400	B	5,400	N/A
Fry – SR 12	Rural Minor Arterial	525	B	475	B	5,700	N/A

Source: Cambridge Systematics, Inc., 2008.

### SR 113 Safety Information

The 2009 SR 113 MIS cites several key safety findings:

- The entire corridor south of I-80 exhibits overall crash rates that are higher than the statewide average for similar facilities.
- Combined fatal and injury rates are slightly higher than the state average in the rural segment and is below the state average for the other two segments.
- Speeding is the predominant issue cited as the “primary collision factor” in the SR 113 corridor. High speeds are particularly problematic along the corridor since:
  - Posted speed limits within the urban segment are lower than in adjacent segments;
  - The relatively narrow road width along the rural segment combined with a high-speed limit leaves little room for error while driving;
  - Agricultural vehicles increase the need for passing and increases accident potential; and
  - Truck collision rates are high when compared to the composition of trucks in the overall traffic stream.

- Clearance gap time is a problem at the intersection of SR 113/SR 12/Birds Landing Road as indicated by the number of broadside collisions and the number of collisions during morning and afternoon peak periods.
- Speeding is a major collision factor at the s-curves at Hastings Road and Cook Lane.
- It should be noted that approximately ten percent of collisions in the corridor occur during periods of rain or fog; all other collisions occur during clear or cloudy conditions.

### **SR 113 Truck Traffic**

The truck classification counts, performed as part of the Dixon Downs Draft EIR, indicate that truck traffic along SR 113 in the vicinity of I-80 in Dixon represents approximately five to eight percent of total traffic in the p.m. peak hour. As a comparison, trucks represent three to six percent of total traffic on I-80 in the Dixon area. Data from the Caltrans Traffic and Vehicle Data Systems Unit for 2007 indicate that trucks represent approximately six to seven percent of traffic on the rural segments of SR 113 south of Dixon. This proportion is lower than that of SR 12, which 11 percent of its traffic has classified as trucks.

## SR 37 Corridor

Responsible Agency:	Caltrans
Length of facility:	<b>TBD</b>
Number of lanes :	4 lanes
Median Barrier:	Yes
HOV Lane:	No



SR 37 is a two lane highway with a concrete divider that heads west from I-80 in Vallejo to Napa County at the northern edge of San Pablo Bay. SR 37 becomes a freeway on Mare Island, approaching northern Vallejo. After it crosses over the Napa River Bridge, it continues as a freeway, overlapping the old highway alignment and passing north of the old road known as Marine World Parkway (due to its proximity to the Six Flags Discovery Kingdom, previously known as Marine World). SR 37 travels in a northeasterly direction along the White Slough before turning east as it cross over State Route 29 and heads to its eastern terminus at I-80. In the early 1990s, the stretch between Fairgrounds Drive, which serves as the entrance to Discovery Kingdom, and Mini Drive was upgraded to a freeway. In 2004 and 2005, following over fifty years of complications, the remaining non-freeway section in Vallejo was upgraded as well.

## SR 29 Corridor

Responsible Agency:	Caltrans
Length of facility:	<b>TBD</b>
Number of lanes :	2 lanes.
Median Barrier:	No
HOV Lane:	No



SR 29 traverses Solano, Napa, and Lake Counties. It directly connects the City of Vallejo and I-80 in Southern Solano County to the major cities of Napa County. SR 29 is a four-lane conventional highway as it intersects with SR 37 near the Solano County from Napa County Line north of Vallejo. SR 29 becomes a major arterial through Vallejo before it intersects with I-80 near the Al Zampa Bridge. Traffic controlled devices are prevalent on SR 29 in Vallejo for cross street traffic and non-motorists to enter or cross the State Route.

The STA and the City of Vallejo has not conducted a recent study of this corridor in Solano County; however, Napa County Transportation and Planning Agency, in coordination with Caltrans, Vallejo and other agencies completed a corridor study focusing on SR 29 in Napa County between the City of Napa and American Canyon. The information provided in the following paragraph was taken directly from the NCTPA study. The report did not go into details regarding current level of service or other existing conditions that assess the performance of the corridor. The STA is planning to undertake a Major Investment Study (MIS) in Fiscal Year 2009-10 for the SR 29 Corridor within Solano County.

NCTPA's SR 29 Corridor Study reported that in 2003, at the Napa/Solano County line, SR 29 carried 1,405 northbound vehicles and 1,195 southbound vehicles in the AM peak hour. This same location carried 1,295 northbound and 1,615 southbound vehicles in the PM peak hour. North of SR 12/Jameson Canyon Road, SR 29 carried 1,885 southbound and 1,490 northbound vehicles in the AM peak hour in 2003. During the PM peak hour, the southbound traffic is 1,730 vehicles and the northbound traffic was 1,870 vehicles. The report Truck traffic on SR 29 constitutes a fairly large portion of the traffic volumes. Within the study area truck traffic constitutes approximately 7 percent of the overall traffic volume.

## SR 84, SR 128 and SR 220 Corridors



SR 84



SR 128



SR 220

State Routes 84, 128 and 220 are the Solano County's smaller, less traveled State Routes. These corridors run briefly through rural areas of the County as two lane highways. Caltrans is responsible for all three state routes. In fact, Caltrans operates a unique ferry service in Solano County on SR 84, just north of Rio Vista, for travelers crossing the Cache Slough near the Sacramento River. There has not been a recent study or data gathering effort on all three corridors.

# **Local Connector Routes, Streets and Roads**

## Community and Intercity Connector Routes

The STA partnered with cities and the County to plan and upgrade intercity connector routes. These routes provide options for local traffic to travel instead of utilizing the Interstate or highway system. These connector routes encourage a cohesive link between land use and transportation and include aspects such as transit facilities, and bicycle and pedestrian options with land use policies to support these improvements. The benefits to the reliever routes are that they decrease traffic on the mainline freeway/highway corridors and provide focused transit and traffic safety improvements to major arterials connecting communities and cities in Solano County. Solano County's current connector routes being developed are the Jepson Parkway and the North Connector Project.

### 1. The Jepson Parkway

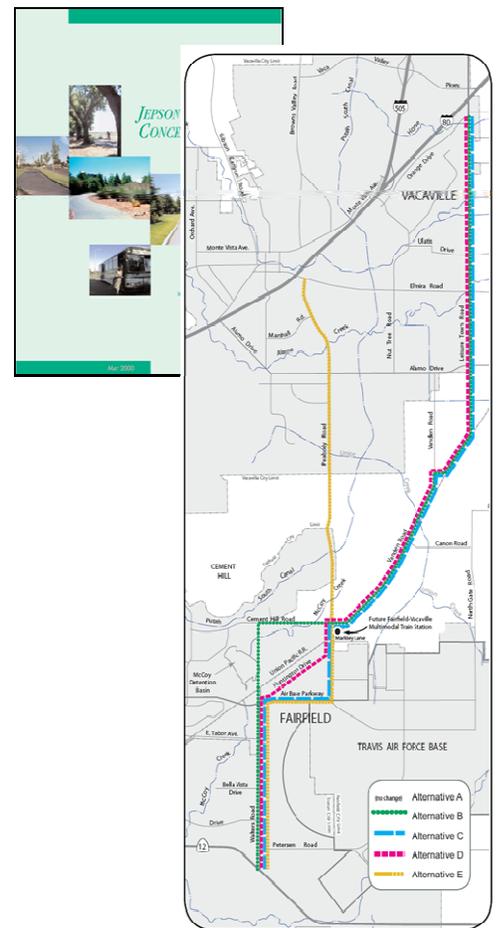
The Jepson Parkway Concept Plan was completed in 2000 by the Solano Transportation Authority (STA) in partnership with the City of Fairfield, the City of Suisun City, the City of Vacaville and Solano County. The 12-mile Jepson Parkway project will improve intra-county mobility for Solano County residents and provide traffic relief for I-80.

As envisioned by the Concept Plan, the Jepson Parkway would improve safety at various locations and along various road segments; offer relief from existing and anticipated traffic congestion on north-south routes in Solano County; provide improved and new transit, bicycle, and pedestrian facilities; and include a crossing of the Union Pacific Railroad (UPRR) tracks at Peabody Road.

The Jepson Parkway project is divided into 10 segments for design and construction purposes. Roadways proposed for improvements in the corridor could include Peabody Road, Leisure Town Road, Vanden Road, Cement Hill Road, Huntington Drive, Air Base Parkway, and/or Walters Road.

Four (4) construction projects within the Jepson Parkway project have been completed:

- The extension of Leisure Town Road from Alamo to Vanden-Vacaville/County;
- The relocation of the Vanden/Peabody intersection- Fairfield;
- Improvements to Leisure Town Road bridges- Vacaville;
- The Walters Road Widening- Suisun City;
- and the I-80/Leisure Town Road Interchange- Vacaville



2001 Jepson Parkway Concept plan

## 2. North Connector

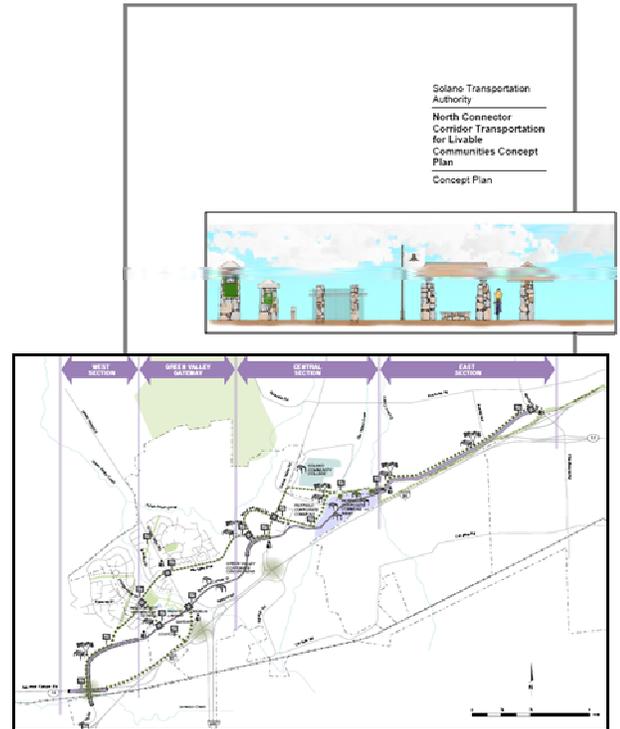
Similar to the Jepson Parkway, The North Connector is envisioned to have design improvements with TLC concepts, which include alternative modes connections, such as bicycle and pedestrian, to residential, employment, civic and retail land uses throughout the corridor. The North Connector project area is between Abernathy Road and SR 12/Jameson Canyon in Suisun Valley and Green Valley located in south western edge of the City of Fairfield. The North Connector corridor travels through two separate jurisdictions: the County of Solano and the City of Fairfield. The STA partnered with both agencies to develop two separate, but related efforts for the North Connector Corridor:

- North Connector Transportation for Livable Communities (TLC) Corridor Concept Plan
- North Connector Project

The North Connector TLC Corridor Concept Plan recognized alternative modes concepts and land use linkages for the entire corridor. These concepts identified bicycle, pedestrian and transit facility networks that could be constructed as part of future road improvements, new development, or as funding becomes available.

The separate North Connector Project focused primarily on road improvements for local circulation near the I-80/I-680/SR 12 Interchange. The North Connector Project was originally identified in the I-80/I-680/I-780 Major Investment Study (MIS) as one of the alternatives to address the congestion on I-80/I-680/SR 12 Interchange. The North Connector project involves constructing two segments of a two to four-lane arterial connection in the City of Fairfield and Solano County, north of I-80 between Abernathy Road on the east and State Route 12/Red Top Road on the west. The first phase of the project is under construction and involves construction of the east end from Abernathy Road to west of Suisun Creek. The purpose of the project is to address existing and future traffic congestion on local streets and I-80 in Solano County and the City of Fairfield, and to provide a better local circulation network for transit users, bicyclists, and pedestrians.

Collectively, both documents provide the North Connector Corridor with a comprehensive coordinated strategy developed in partnership with Solano County and the City of Fairfield. As a result, the North Connector Corridor will be a multi-modal corridor that links land use and transportation to support the use of alternative travel modes, and protect existing and future residential neighborhoods.



North Connector TLC Concept Plan

### 3. Future Connector Route- Columbus Parkway

Another opportunity for a connector route is Columbus Parkway between the cities of Vallejo and Benicia. Columbus Parkway directly links both cities and is an alternative route to I-780 for local traffic. This connector has the potential for focused multi-modal improvements, including bicycle, pedestrian, and transit facilities.

## Local Streets and Roads

The Metropolitan Transportation Commission (MTC) reported in the 2008 State of the System Report that as of 2007 Solano County and the seven cities maintain a total of 3,563 lane miles of local streets and roads. The County of Solano maintains the most lane miles with a total of 1,168 miles of unincorporated streets and roads. The City of Vallejo has the second most lane miles of local roadways to maintain with 657 miles. Table 5 provides a list of the total lane miles as of 2007 maintained by each STA member agency as listed in MTC's 2008 State of the System Report.

Table 5. Total Lane Miles by Agency.

Agency	Total Lane Miles
Benicia	190
Dixon	129
Fairfield	702
Rio Vista	45
Solano County	1168
Suisun City	145
Vacaville	527
Vallejo	657
Total	<b>3563</b>

MTC's Street Saver Program (formally known as the Pavement Management System) tracks the conditions of the streets and roads for the Bay Area by surveying the Pavement Condition Index (PCI) throughout the Bay Area. The PCI is based on a point system that ranges from 0 to 100 that measures the type and severity of the pavement distress through road survey samples. PCI scores are rated as follows:

<u>Pavement Condition</u>	<u>PCI Score</u>
Poor	25-49
At-Risk	50-59
Fair	60-69
Good	70-79
Very Good	80-89

Pavement with a PCI score below 25 is in severe distress; in contrast, pavement with a PCI score above 89 is in optimal condition. For illustrative purposes, the Figure 19 on page 40 provides photo examples of pavement conditions.

The cities and the County of Solano annually report the condition of their roadways electronically through MTC’s Street Saver Program. In some cases, MTC estimates the PCI score based on prior year PCI reports if an agency does not report their pavement conditions. In addition to measuring the pavement quality for streets and roads, the PCI is a factor in determining federal funding levels for local agencies streets and roads maintenance. Other factors include population and lane miles.

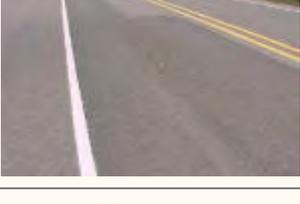
MTC’s 2008 State of the System Report shows Solano County and the seven cities collectively have an average unweighted score of 65 with a Fair rating. Table 6 below summarizes MTC’s report for Solano County and the seven cities.

Table 6. 3-Year PCI Agency Ratings for Solano County

Agency	Total Lane Miles	PCI Survey Year				Rating
		2004	2005	2006	2007	
Benicia	190	72	70	70	68	Fair
Dixon	129	76	79	81	77	Good
Fairfield	702	80	78	77	75	Good
Rio Vista	45	58	55	51	48*	Poor
Solano County	1168	61	59	58	61	Fair
Suisun City	145	60	56	53	50	At-Risk
Vacaville	527	76	76	78	79*	Good
Vallejo	657	55	54	54	54	At-Risk
	Average PCI	66.0	66.1	65.8	65.2	Fair

\* Three-year moving average score is an estimate based on inspections done in 2006.

Figure 19. Example of PCI Pavement Conditions

<p><b>Very Good</b></p>	<p>Pavement Structure is stable, with no cracking, no patching, and no deformation evident. Roadways in this category are usually fairly new. Riding qualities are excellent. Nothing would improve the roadway at this time.</p>		
			
<p><b>Good</b></p>	<p>Stable, minor cracking, generally hairline and hard to detect. Minor patching and possibly some minor deformation evident. Dry or light colored appearance. Very good riding qualities. Rutting less than 1/2".</p>		
			
<p><b>Fair</b></p>	<p>Pavement structure is generally stable with minor areas of structural weakness evident. Cracking is easier to detect. The pavement may be patched but not excessively. Although riding qualities are good, deformation is more pronounced and easily noticed. Rutting less than 3/4".</p>		
			
<p><b>At Risk</b></p>	<p>Areas of instability, marked evidence of structural deficiency, large crack patterns (alligatoring), heavy and numerous patches, deformation very noticeable. Riding qualities range from acceptable to poor. Rutting greater than 3/4".</p>		
			
<p><b>Poor</b></p>	<p>Pavement is in extremely deteriorated condition. Numerous areas of instability. Majority of section is showing structural deficiency. Riding quality is unacceptable (probably should slow down).</p>		
			

Photos courtesy of the Oregon Department of Transportation

### **Local Streets and Roads included in Routes of Regional Significance**

In January 2009, the STA surveyed the seven cities and County of Solano as well as Caltrans for information related to their roadway segments included in the Routes of Regional Significance.

Solano County has the most roadway segments included in the Routes of Regional Significance roadway network with a total of 156 total lane miles of Routes of Regional Significance roadways to maintain. Solano County's roadway segments include several intercity connections and frequently intermix with other member agency street segments included in the Routes of Regional Significance. All of the survey respondents indicated they primarily use state and federal gas tax funds to maintain their Routes of Regional Significance Roadways. The city of Rio Vista and the County of Solano also use funding from Transportation Development Act (TDA) in addition to gas tax funds to maintain their roads.

The County of Solano and the City of Vallejo currently have the most active maintenance/improvement projects for their Routes of Regional Significance roadway segments. The County of Solano reported several chip seal and overlay projects on their roads in addition to planned widening for Pitt School Road and the North Connector in Green Valley. The City of Vallejo also has several overlay projects as well as improvements related to development projects underway near the waterfront and Touru University. Almost all of Suisun City's Routes of Regional Significance road segments have a maintenance or improvement project underway or planned as part of future development. The City of Suisun City's primary improvement project is currently underway on Sunset Drive in the vicinity of Railroad Ave and Suisun City Limits.

The City of Benicia reported that their most recent project on their Routes of Regional Significance road segments was the widening of Columbus Parkway in 2008 between I-780 and Benicia/Vallejo City Limits. The City of Rio Vista indicated that the only project they recently completed on their Routes of Regional Significance segments was a slurry seal project in 2008 Front Street from Main Street to SR 84. Rio Vista's Front Street and Suisun City's Sunset Drive are included on the Routes of Regional Significance roadway network.

The City of Vallejo and the City of Benicia reported that a few of their Routes of Regional Significance segments have signal pre-emption devices primarily used for faster response times for emergency vehicles. The technology can also be used for prioritizing transit vehicles that are running late on their route.

### **Local Streets and Roads Funding**

Over the last two years, Solano County received a little over \$3.462 million in Federal Surface Transportation Project (STP) funding for the County unincorporated area and cities' local street and roads maintenance. On October 12, 2005, the STA Board approved streets and roads funds in the amounts listed on Table 7 for FY 2007-08 and FY 2008-09.

Table 7. Streets and Roads Allocations for Solano County

Agency	3 <sup>rd</sup> Cycle Local (FY 2007-08 and FY 2008-09) Streets and Roads Allocation
Solano County	\$ 1,055,954*
Benicia	\$ 202,371
Dixon	\$ 131,089
Fairfield	\$ 544,822
Rio Vista	\$ 77,332
Suisun City	\$ 206,088
Vacaville	\$ 531,837
Vallejo	\$712,678
Total	\$ 3,462,171

\* Includes Federal Aid Secondary set-aside requirement for County streets and roads funding

## **Solano Routes of Regional Significance Criteria**

**(Approved by Arterials, Highways, and Freeways Committee  
on September 10, 2008)**

---

The STA selected roadway segments that will be included in the Solano Routes of Regional Significance based on the following criteria:

1. Solano County Congestion Management Program (CMP) Network

The Solano County CMP includes a defined roadway system used for monitoring mobility in the county. The system consists of all State highways and principal arterials, which provide connections from communities to the State highway system and between the communities within Solano County. The STA monitors Level of Service (LOS) impacts to the CMP system from proposed development projects considered by each of the seven cities and the County of Solano. The STA has the authority to withhold gas tax subvention funds for the agency responsible for LOS impacts if the impacts are not addressed in a CMP deficiency plan.

Roadway segments included in the Solano CMP Network are Routes of Regional Significance.

2. Access to Existing and Planned Transit Centers Serving Intercity Trips

Intercity transit services enhance travel mobility to/from and within Solano County as well as providing increased transportation capacity. The Association of Bay Area Governments (ABAG) anticipates a significant increase in population and employment within Solano County and throughout the Bay Area over the next 25 years. The expected increase in Solano County commuters will add pressure on already congested roads. Without added investment in intercity transit services, regional roadways will become increasingly congested thereby adversely impacting the quality of life in Solano County and also its economic vitality.

Prioritizing transportation funding for roadway segments that provide access to existing and planned intercity transit services is an important option to address congestion. Therefore, roadway segments that provide access to intercity transit services can be considered Routes of Regional Significance. Examples of existing/planned transit centers serving intercity trips include:

- Fairfield Transportation Center
- Vacaville Transportation Center
- Existing Amtrak/Capitol Corridor Station in Suisun City and planned stations for Dixon and Fairfield/Vacaville
- Vallejo Ferry Terminal

### **3. Access to a Major Employment Center with Higher Traffic Volumes**

According to the 2005 Bay Area Commuter Profile, Solano County commuters have the longest average commute trip compared to any other Bay Area County. Approximately 40% of Solano County residents commute outside the county for employment purposes. Efforts to attract and maintain major employers for economic and employment opportunities for Solano County residents are ongoing. Providing sufficient roadway facilities will support major employment centers to be located in Solano County. Major employment centers located in Solano County will take advantage of employees currently commuting long distances and will add to the economic vitality of the County.

Roadway segments that provide access to major Solano County based employment centers with existing or projected traffic volumes on arterials that justify a separated 2-lane roadway can qualify as a Route of Regional Significance. Employment centers should take into account the total amount of traffic generated by employee trips or patron trips utilizing services within the employment center. Examples of existing major employment centers in Solano County are:

- Kaiser Permanente- Vallejo and Vacaville
- Six Flags Discovery Kingdom- Vallejo
- Genetech (Vacaville and Dixon Facilities)
- Westfield Shoppingtown- Fairfield
- Travis Air Force Base
- Benicia Industrial Park

### **4. Intercity and Freeway/Highway Connection**

Improving intercity mobility is one of the overall goals of the Solano Comprehensive Transportation Plans. Roadways that accommodate intercity trips, freeway to freeway trips, and freeway to highways connections can qualify as a Route of Regional Significance. These include roadway facilities with existing or projected traffic volumes arterials that justify a separated 2-lane roadway. Examples of roadways that provide intercity and freeway/highway connections are:

- Jepson Parkway
- North Connector
- Columbus Parkway

## 5. Improves Countywide Emergency Response

In case of emergency, emergency vehicles need to have adequate alternative access to respond to incidents. Solano County has experienced major incidences of grass fires, flooding, and traffic accidents that were extreme enough to close a freeway or highway corridor for hours. It is important to maintain frontage roads and parallel routes that are alternative options if freeway or highway corridor remains closed for long periods of time. Examples of roads that fit this description are:

- Lyon Road (Solano County near I-80)
- Lopes Road (Solano County near I-680)
- McCormick Road (Solano County near SR 12)
- McGary Road (Fairfield and Solano County near I-80)
- Future North Connector (near I-80 and SR12)

## **Comprehensive Transportation Plan (CTP) Overall Goals Related to Routes of Regional Significance**

On February 13, 2008, the STA Board adopted an overall purpose statement with several corresponding goals as part of the new CTP update.

*CTP Goal #5: The Solano CTP will seek to maintain regional mobility while improving local mobility.*

*CTP Goal #7: Encourage Projects and programs that maintain and use existing systems more efficiently before expanding infrastructure.*

*CTP Goal #8: The Solano CTP will include priority lists and funding strategies for projects and programs.*

## **Arterials, Highways and Freeways (AHF) Goals Related to Routes of Regional Significance**

*AHF Goal #1: Invest available funds in maintaining a minimum Pavement Conditions Index (PCI) of 63 on the STA's Routes of Regional Significance.*

*AHF Goal #4: Support funding improvements identified in the STA's Routes of Regional Significance to accommodate transit routes and bicycle and pedestrian facilities included in the Solano Countywide Bicycle and Pedestrian Plans that is consistent with MTC's Routine Accommodations for Non-Motorized Vehicles.*

*AHF Goal #5: Develop and maintain an arterials, highways and freeways system that facilitate and encourage carpool, vanpools and multi-modal transportation through the use of seamless High Occupancy Vehicle (HOV) lane network, connections to regionally significant transit facilities, and park and ride lots.*

*AHF Goal #6: Update Solano County's Routes of Regional Significance to implement the STA's 50/50 policy.*



DATE: September 18, 2009  
TO: STA Arterials, Highways and Freeways Committee  
FROM: Sam Shelton, Project Manager  
RE: Final Draft I-80/I-680/I-780 Corridors Highway Operations Study & Implementation Plan

**Background:**

Caltrans annually provides grant opportunities through the State Transportation Planning Grant Program for several categories including a Partnership Planning Grant program where corridor studies are eligible. In October 2006, STA staff, in partnership with the Metropolitan Transportation Commission (MTC), submitted a Partnership Planning Grant for a "I-80/I-680/I-780 Corridors Study Highway Operations Plan" to follow up on the STA's previous "I-80/I-680/I-780 Corridor Major Investment and Corridor Study" and MTC's "Freeway Performance Initiative (FPI)." In the Spring of 2007, the Caltrans awarded \$250,000 for this grant project.

On January 9, 2008, the STA Board Authorized the Executive Director to:

1. Issue a Request for Proposals for consultant services for the I-80/I-680/I-780 Corridors Highway Operations Implementation Study; and
2. Execute a consultant contract for an amount not to exceed \$300,000 for the I-80/I-680/I-780 Corridors Highway Operations Implementation Study.

To develop the "I-80/I-680/I-780 Corridors Highway Operations Study & Implementation Plan" the STA and MTC created the Solano Highway Partnership (SoHIP) with the cities of Benicia, Dixon, Fairfield, Vacaville and Vallejo, and Caltrans Districts 3 & 4 to develop operational improvements and policy recommendations relating to a long range Intelligent Transportation System (ITS), ramp metering, High Occupancy Vehicle (HOV) network/lane extensions, and hardscape improvements that visually link corridor segments to areas of Solano County.

The scope of work tasks focus on the "Operational Improvement Analysis", "Landscape and Hardscape Recommendations" and "Public Outreach" tasks.

1. The Operations Improvement Analysis task requires analyzing recurrent (bottlenecks, poor operations infrastructure, etc.) and non-recurrent (Traffic Incidents, Special Events, etc.) causes of current and future corridor performance through the use of MTC's FPI recommendations, accident statistics, and the Napa-Solano Travel Demand Model results.

2. The Landscape and Hardscape Recommendations task require reviewing currently installed visual elements along the highway corridors, drafting concept drawings of potential visual elements, and recommending additional policies for landscape and hardscape improvements that promote a sense of place and quality of life as travelers drive through Solano County.
3. The Public Outreach task requires conducting at least two public meetings and the development of a multimedia “Operations Improvement Toolbox” to help educate the public about the recommended operations improvements (e.g, Ramp Metering educational website materials and pamphlets, ITS explanations, etc.).

The Solano Highways Partnership (SoHIP) met five times between June 2008 and April 2009 to review and approve the draft materials. Caltrans staff from various planning, operations, and maintenance units attended the SoHIP meetings, providing valuable feedback. MTC staff from their operations unit critiqued the accuracy of the modeling by comparing STA results with MTC FPI results.

Both Caltrans and MTC staff have showed preliminary support for adopting the study’s findings and implementation plan as part of their future project planning and funding priorities. Additional meetings with STA, MTC, and Caltrans on May 21<sup>st</sup> and June 8<sup>th</sup> respectively helped develop the details of this multiple agency adoption process.

On July 8, 2009, the STA Board released the Draft I-80/I-680/I-780 Corridor Highway Operations Study & Implementation Plan for public comment. Comments from the public and partner agencies were due to the STA by August 12, 2009.

**Discussion:**

As part of the public outreach process, the STA held two public meetings and posted the website online. The release of the study was cover by all local newspapers in Solano County and was featured in four news articles prior to two public meetings on July 28 and July 29. Follow up meetings were held with Caltrans and MTC staff to coordinate each agency’s work on similar studies (e.g., Caltran’s Corridor System Management Plans and MTC’s draft FPI for I-680).

Attached is a Final Draft “Solano Highways Operation Study” executive summary, displaying tracked changes based on comments collected. The complete Final Draft is available upon request. The Operation Study was the primary source for existing conditions data related to the Arterials, Highways and Freeways State of the System Report for I-80/680/780 Corridors.

This item is scheduled for STA Board Action on October 14<sup>th</sup> and is currently being reviewed by the STA Technical Advisory Committee for a recommendation at their September 30<sup>th</sup> meeting.

**Recommendation:**

Informational.

Attachments:

- A. Final Draft I-80/I-680/I-780 Corridor Highway Operations Study & Implementation Plan, Executive Summary

## Acknowledgments

This report was made possible by a Partnership Planning Grant awarded by the California Department of Transportation.

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# ~~I-80/I-680/I-780 Corridors~~ SOLANO HIGHWAY OPERATIONS IMPLEMENTATION STUDY

## EXECUTIVE SUMMARY

This Executive Summary provides an overview of the ~~I-80/I-680/I-780 Corridors~~ Solano Highway Operations ~~Implementation~~ Study. The overall study consisted of four main parts: Background Research and Literature Review, Operations Improvement Analysis, Visual Design Guidelines and Public Outreach.

## BACKGROUND

The Solano Transportation Authority's planning, programming and project delivery duties are guided by the Comprehensive Transportation Plan (CTP), which plans for all forms of transportation and prioritizes projects, identified in the following CTP plan elements:

- Arterials, Highways and Freeways
- Transit
- Alternatives Modes

Using the goals of the CTP for direction, STA staff completed studies and plans to identify priority transportation projects that will achieve those goals. The goal of the Arterials, Highways, and Freeways element is to *"Develop a balanced transportation system that reduces congestion and improves access and travel choices through the enhancement of roads"*.

Caltrans annually provides grant opportunities through the State Transportation Planning Grant program for several categories including a Partnership Planning Grant where corridor studies are eligible. The STA has completed the ~~I-80/I-680/I-780 Corridors Study~~ Solano Highway Operations ~~Study Plan~~ to follow up ~~and update on~~ the STA's previous I-80/I-680/I-780 Corridor Major Investment and Corridor Study (2004) and MTC's Freeway Performance Initiative (FPI) (2007). The ~~I-80/I-680/I-780 Corridors Study~~ Solano Highway Operations ~~Study Plan~~ was developed cooperatively under the direction of the Solano Highways Partnership (SoHIP) consisting of representatives from STA, MTC, Caltrans (Districts 3 and 4), and the cities of Benicia, Dixon, Fairfield, Vacaville and Vallejo. Under this study, operational improvements and recommendations for a long range Intelligent Transportation System (ITS) including ramp metering, closed circuit television cameras (CCTV), vehicle detection and highway advisory radios (HAR) are presented.

## OPERATIONS IMPROVEMENT ANALYSIS

The Solano County I-80 and I-680 North Freeway Performance Initiative (FPI) studies served as the primary source for the operational improvement assessment. The objective of the FPI was to develop freeway strategic plans for each corridor by performing a technical assessment that included identification of major bottlenecks, determination of the causes of traffic congestion, development of potential mitigation strategies, and an assessment of their effectiveness. ~~In addition, an ITS implementation plan was prepared to supplement the FPI studies focusing on the installation of ITS elements as part of the operational improvements.~~

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The Solano I-80 FPI study encompassed the 44-mile section of I-80 throughout Solano County from the Carquinez Bridge to the Solano/Yolo County line, and the I-680 North FPI study focused on the portion of I-680 located between the I-80 interchange in Solano County and the Alameda/ Contra Costa County line. Both FPI studies included an assessment of existing (2006/2007), future 2015 and future 2030 conditions. The existing conditions assessment relied on observed data from numerous sources including the Caltrans HICOMP reports, archived travel speed data from the MTC 511 Predict-a-Trip system, [the Freeway Performance Monitoring System](#) (PeMS), and a limited number of floating vehicle travel time runs. For the future 2015 and 2030 analysis, the Solano Transportation Authority (STA) countywide travel demand model was used to develop forecasts, and a macroscopic simulation model ([FREQ](#)) was used to assess operating conditions. Accident data was derived from the TASAS database to assess safety concerns within the study corridor.

It is important to note that the existing conditions assessment conducted as a part of the I-680 North FPI study was performed prior to the opening of the new northbound span and toll plaza at the Benicia-Martinez Bridge. Since the opening, congestion has decreased in the area around the bridge and toll plaza. Subsequently, follow-up observations in this area were performed and used to update the existing conditions assessment presented in the FPI studies.

Because no FPI study was conducted for the I-780 corridor, additional primary analysis was undertaken as part of this study. This included the development of AM and PM peak period traffic operations models covering I-780 between I-80 and I-680. Existing Condition models were developed using freeway and ramp traffic count data available from the Caltrans Traffic Census and PeMS. The STA countywide travel forecasting model was used to determine traffic growth levels for use in the development of the traffic operations models reflecting projected 2015 and 2030 conditions. Accident data was derived from the TASAS database to assess safety concerns within the study corridor.

The FPI studies [\(I-80 and I-680\) and the I-780 operations analysis conducted as part of this Solano Highway Operations Study](#) identified mitigation strategies that were organized into improvement “packages” ~~for the Solano I-80 and I-680 corridors~~ which included operational and system management improvements. Some of these improvement packages that were identified included auxiliary lanes, HOV lanes, ITS strategies, general purpose lanes, interchange intersection improvements and ramp metering.

Because the FPI studies only identified ITS deployments as a strategy measure, a Corridor-Level ITS Architecture and Implementation Plan was also developed as part of this study. This Architecture and Plan provides recommendations for policies and agreements that are necessary to ensure that ITS deployments are incorporated into operational improvements programmed along the three freeway corridors in Solano County. It also provides guidance for the design and deployment of specific ITS elements along the freeway corridors including any coordination and information sharing with the local cities, the County and the regional agencies.

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OPERATIONAL IMPROVEMENT IMPLEMENTATION PLAN

Based on the findings of the FPI studies, the I-780 operations analysis and the ITS Architecture and Implementation Plan, an overall Operations Improvement Implementation Plan was developed. This Plan started with a review of the improvement packages developed as part of the operational analysis and the ITS Implementation Plan, and then combining or bundling the packages into discrete projects that could be funded and constructed separately. Once the project bundling was developed, each project was prioritized using several factors including the ability to improve congestion, cost and overall feasibility.

The costs for the operational improvements are significantly higher than other system management strategies (e.g., ITS). Moreover, the use of system management strategies greatly reduces the impacts due to non-recurring congestion. Using costs as one of the factors for the bundling and sequencing of projects. Thus, system management strategies such as ITS improvements were deemed to be more practical improvements as either standalone projects or embedded within other operational improvements.

Figures E-1 to E-4 provides a graphical summary of the prioritized projects. Tables E-1 and E-2 provide a summary description of each of the projects and their order of magnitude costs under the horizon year 2015 and 2030, respectively.

In Figure E-2, the truck climbing lane has been constructed, and the HOV on I-80 is currently under construction. In Figure E-3, the Year 2015 roadway network includes all of the programmed improvements as shown in Figure E-2. In Figure E-5, the Year 2030 roadway network includes all of the programmed improvements as shown in Figure E-2.

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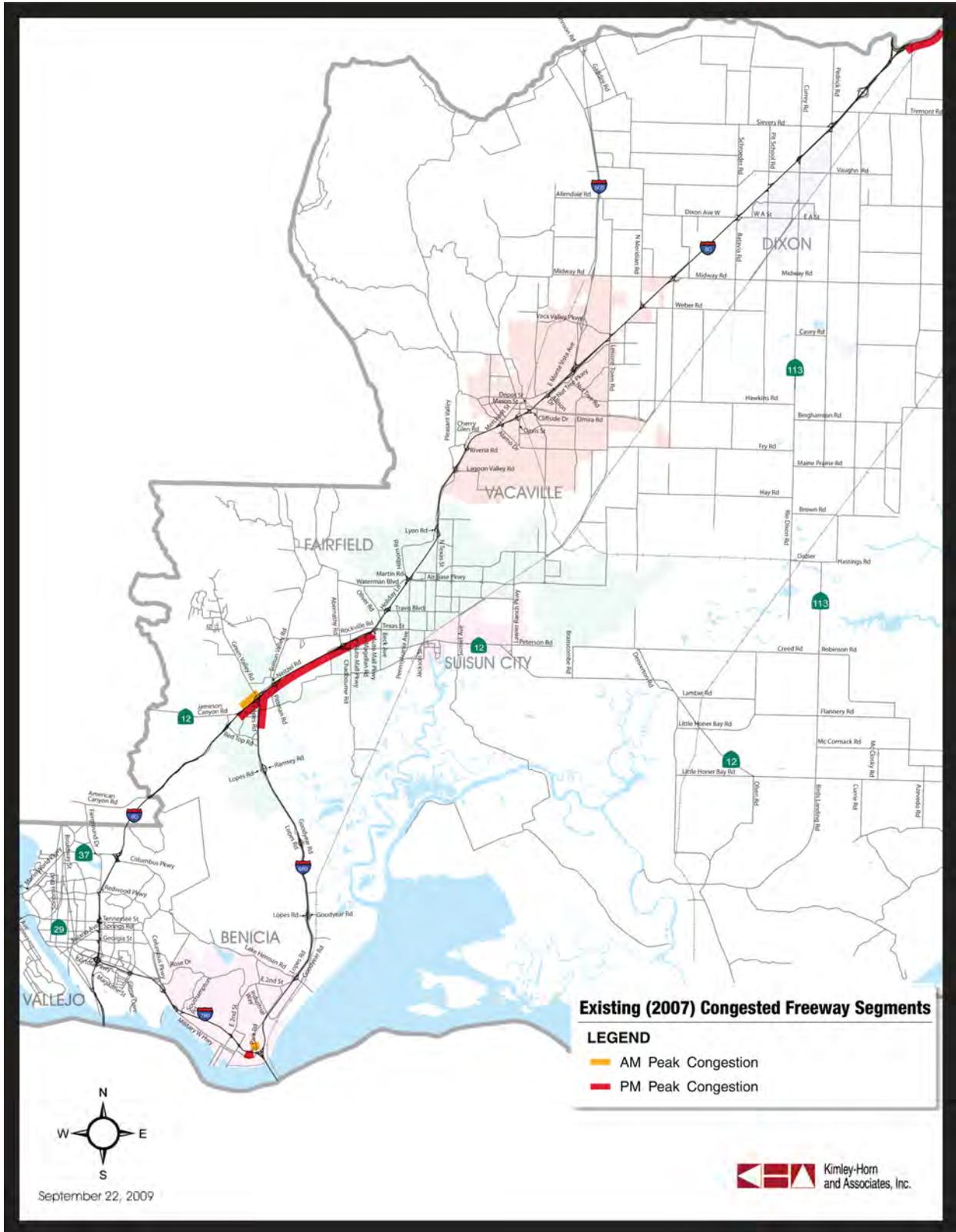


Figure E-1: Existing Congestion

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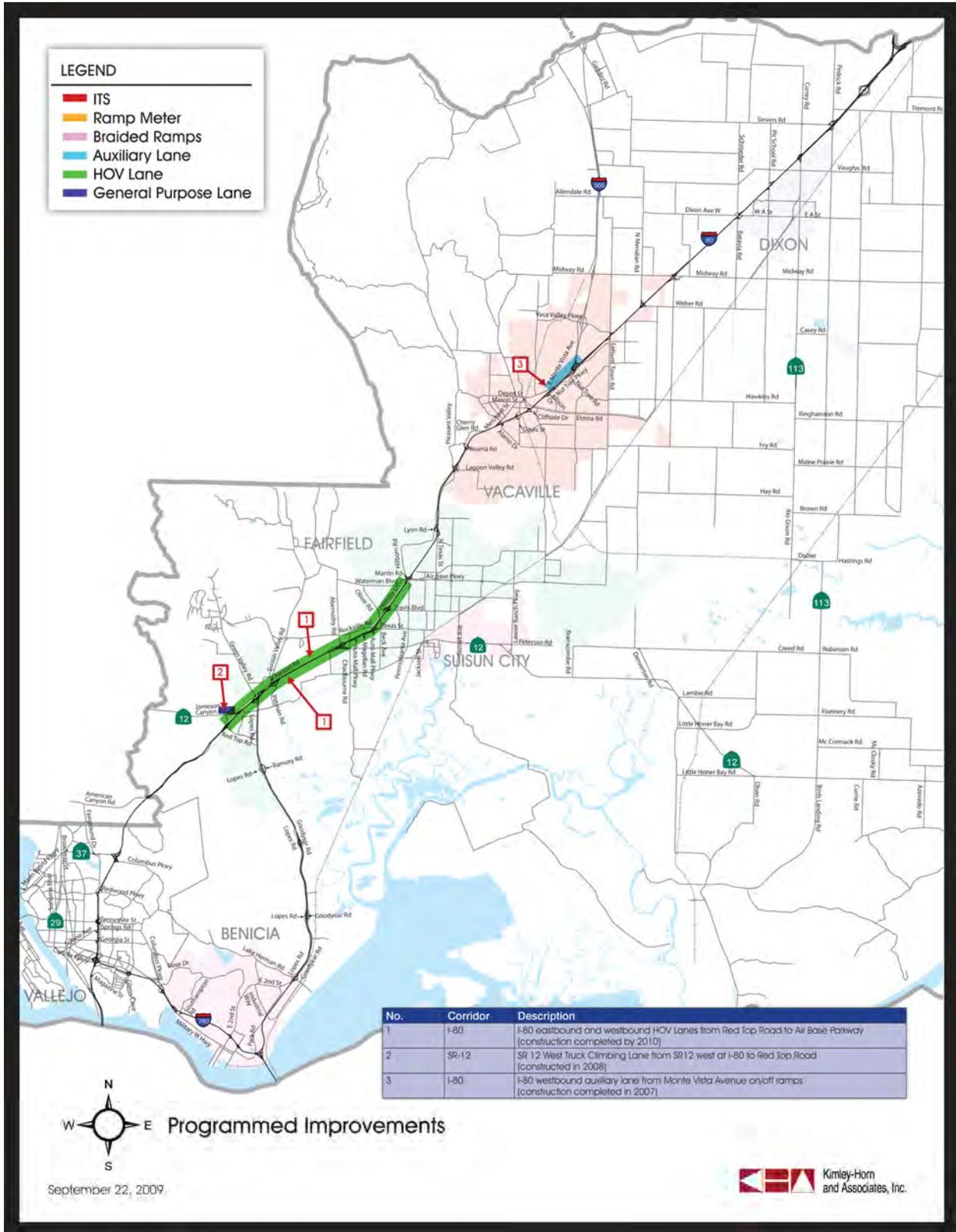


Figure E-2: Programmed Improvements

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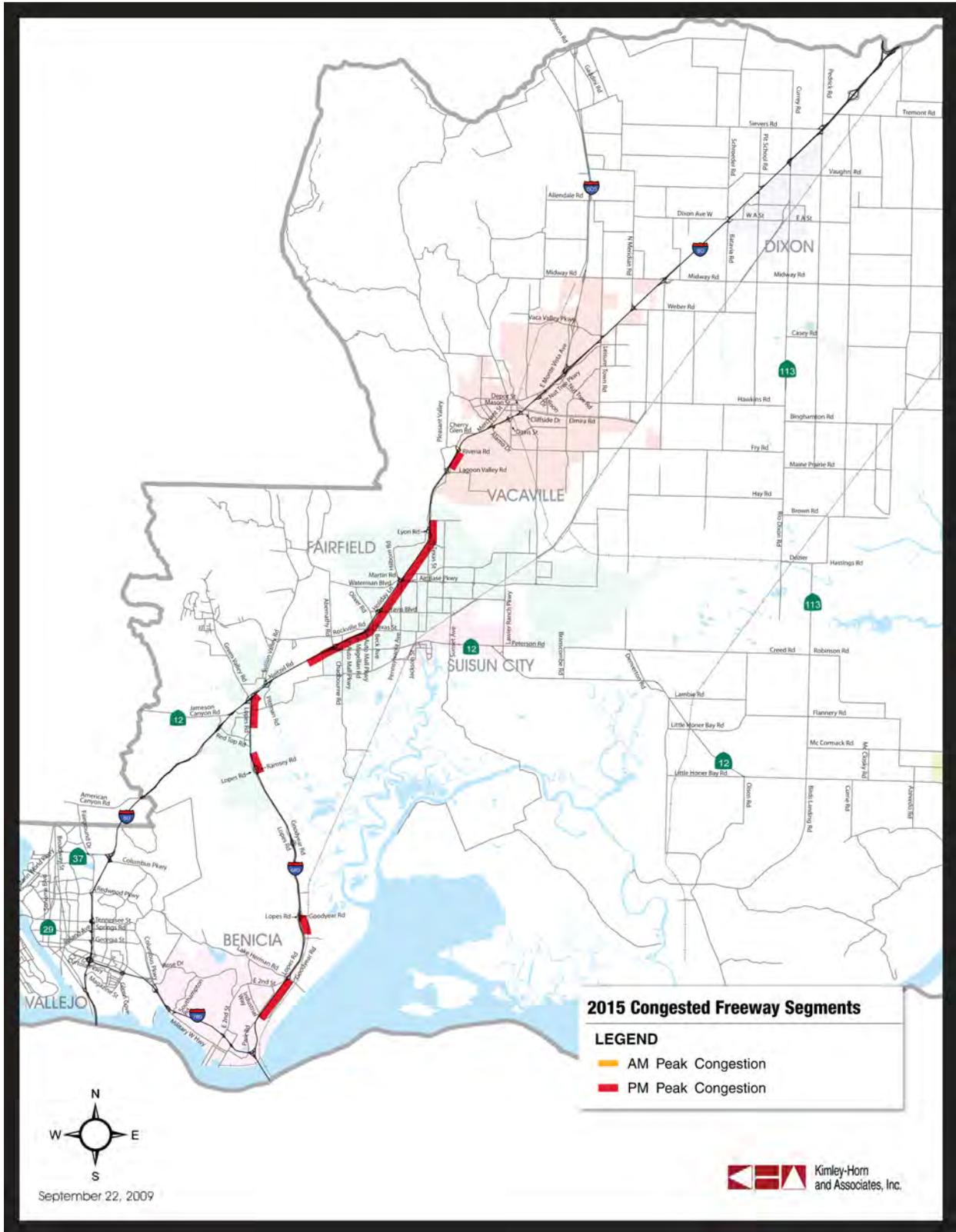


Figure E-3: Year 2015 Congestion

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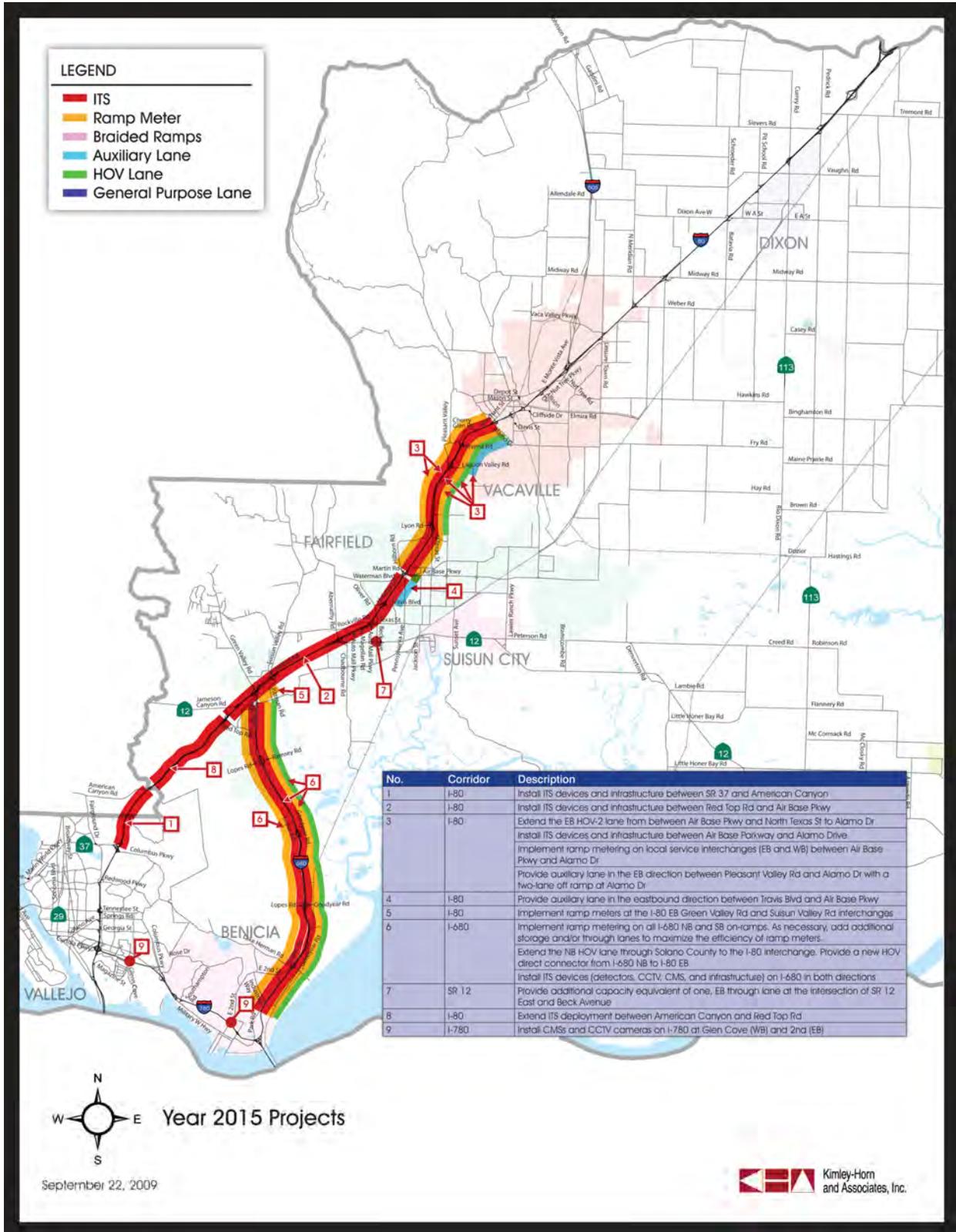


Figure E-4: Year 2015 Proposed Improvements

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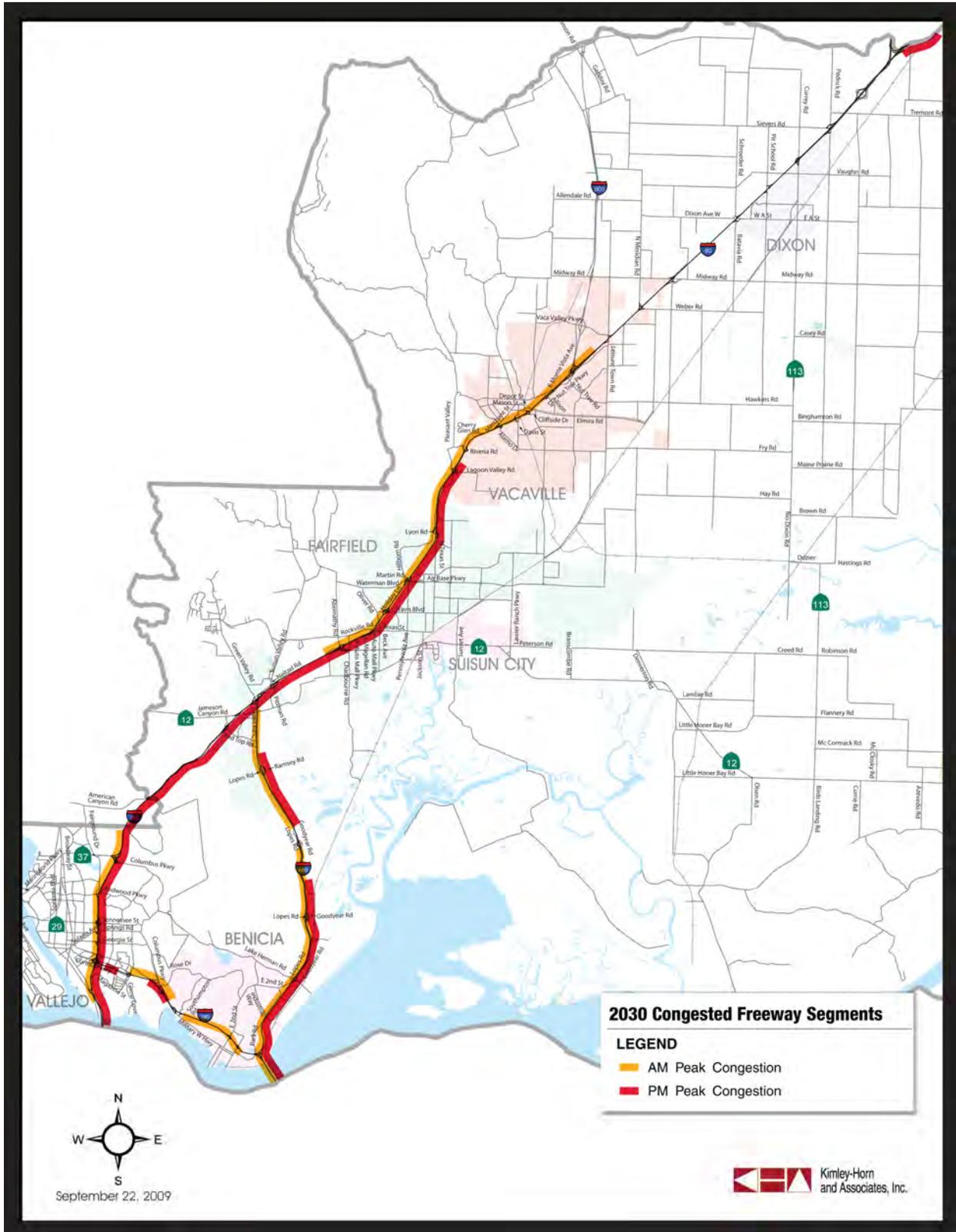


Figure E-5: Year 2030 Congestion

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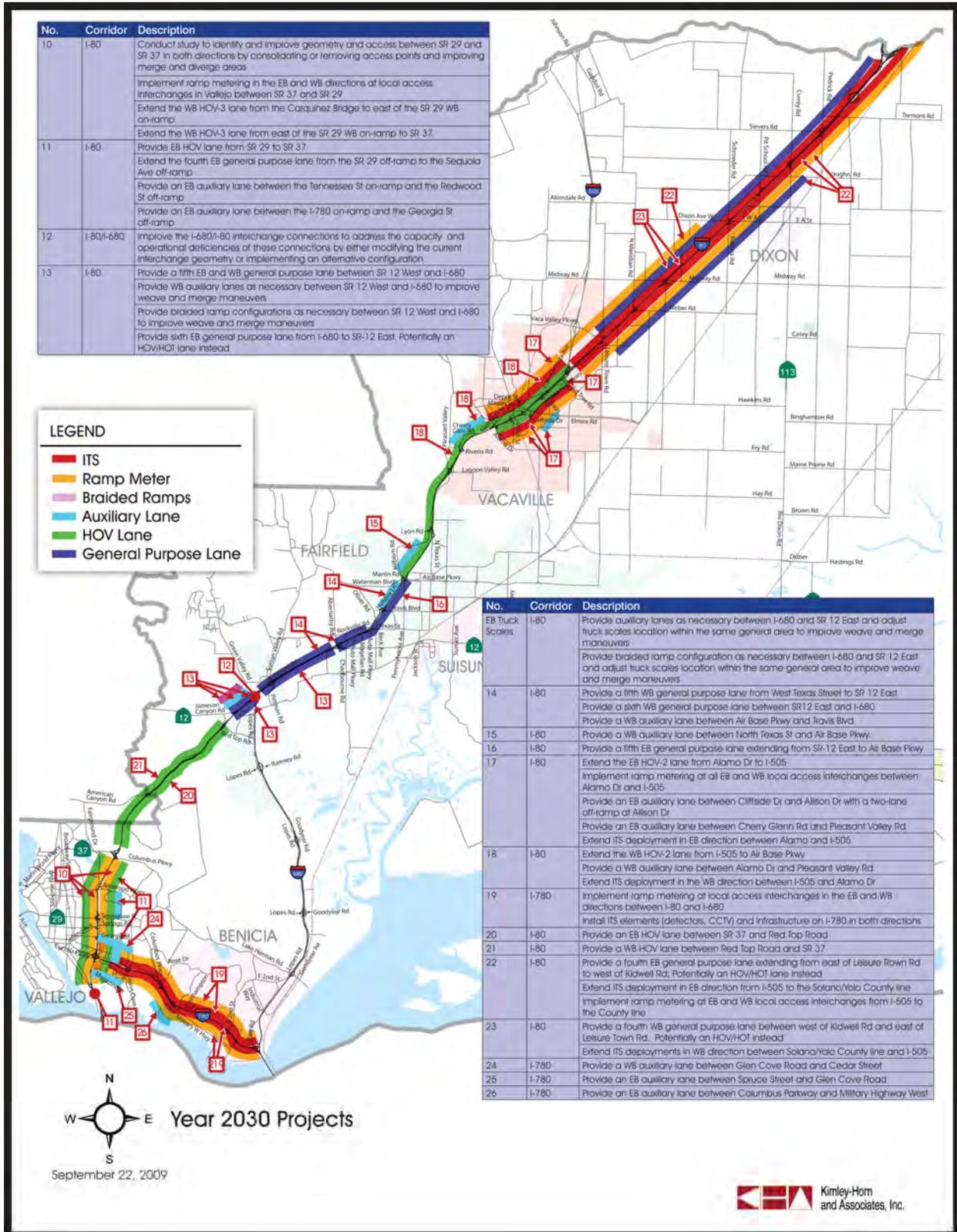


Figure E-6: Year 2030 Proposed Improvements

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Table E-1: Year 2015 Prioritization of Projects			
Priority	Corridor	Description	Order of Magnitude Cost
<del>1</del>	<del>I-80</del>	<del>Install ramp meters at the I-80 eastbound EB Green Valley Road and Suisun Valley Road interchanges</del>	<del>\$400,000</del>
<del>12</del>	I-80	Install ITS devices and infrastructure between SR 37 and American Canyon Road. This will consist of CCTV cameras, changeable message signs and communications infrastructure.	<del>\$6,530,000</del>
<del>32</del>	I-80	Install ITS gap between Red Top Road and Air Base Parkway. This will consist of CCTV cameras, Highway Advisory Radio and communications infrastructure.	<del>\$64,080,000</del>
<del>34</del>	I-80	Extend the <del>programmed EB</del> eastbound HOV-2 lane from between Air Base Parkway and North Texas Street to Alamo Drive.	\$19,000,000
		Install ITS devices and infrastructure between Air Base Parkway and Alamo Drive	<del>\$76,830,000</del>
		<del>Implement</del> Install ramp metering on local service interchanges ( <del>EB and W</del> eastbound and westbound) between Air Base Parkway and Alamo Drive. This will include four interchanges with eight on-ramps.	<del>\$21,260,000</del>
		Provide an <del>EB</del> eastbound auxiliary lane between Pleasant Valley Road and Alamo Drive. Provide a two-lane off-ramp at Alamo Drive. This includes the <del>EB</del> eastbound auxiliary lane between Cherry Glen Road and Pleasant Valley Road.	\$7,200,000
		Subtotal No. 4:	<del>\$364,210,000</del>
<del>45</del>	I-80	Provide auxiliary lane in the <del>eastbound EB</del> direction between Travis Boulevard and Air Base Parkway. Install ITS devices and infrastructure.	\$18,000,000
<del>5</del>	<del>I-80</del>	<del>Implement ramp meters at the I-80 EB Green Valley Road and Suisun Valley Road interchanges</del>	<del>\$550,000</del>
6	I-680	<del>Implement</del> Install ramp metering on all I-680 NB <del>and SB</del> on-ramps. <del>As necessary</del> Where practical, add additional storage and/or through lanes to maximize the efficiency of ramp meters.	<del>\$21,070,000</del>
		Install ITS elements (detectors, CCTV, CMS & Infrastructure) on I-680 in both directions	<del>\$79,270,000</del>
		Extend the <del>NB</del> northbound HOV lane through Solano County to the I-80 interchange. Provide a new HOV direct connector from I-680 NB to I-80 EB.	<del>\$443,120,000</del>
		Subtotal No. 6:	<del>\$561,090,000</del>
7	SR 12	Provide additional capacity equivalent of one, <del>eastbound EB</del> through lane at the intersection of SR 12 East and Beck Avenue	\$2,900,000
8	I-80	Extend ITS deployment between American Canyon and Red Top Road	<del>\$32,680,000</del>
9	I-780	Install CMS and CCTV cameras on I-780 at Glen Cove (WB) and 2nd Street (EB)	\$1,400,000
<b>Total Year 2015 Improvements:</b>			<b>\$1321,1650,000</b>

**I-80/I-680/I-780 CORRIDORS SOLANO HIGHWAY OPERATIONS IMPLEMENTATION**  
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<b>Table E-2: Year 2030 Prioritization of Projects</b>			
<b>Priority</b>	<b>Corridor</b>	<b>Description</b>	<b>Order of Magnitude Cost</b>
10	I-80	Conduct study to identify and improve geometry and access between SR 29 and SR 37 in both directions by consolidating or removing access points and improving merge and diverge areas.	\$500,000
		<del>Implement install</del> ramp metering in the <del>EB and westboundWB</del> directions at local access interchanges in Vallejo between SR 37 and SR 29	<del>\$31,560,000</del>
		Extend the <del>WB westbound</del> HOV-3 lane <del>from to</del> the Carquinez Bridge to east of the SR 29 <del>westboundWB</del> on-ramp	\$3,800,000
		Extend the westbound HOV-3 lane from east of the SR 29 westbound on-ramp to SR 37	\$14,900,000
		Subtotal No. 10:	\$22,700,000
11	I-80	Provide an <del>an eastboundEB</del> HOV lane from SR 29 to SR 37	\$15,200,000
		Extend the fourth <del>eastboundEB</del> general purpose lane from the SR 29 off-ramp to the Sequoia Avenue off-ramp	\$3,000,000
		Provide an <del>eastboundEB</del> auxiliary lane between the Tennessee Street on-ramp and the Redwood Street off-ramp	\$13,800,000
		Provide an <del>eastboundEB</del> auxiliary lane between the I-780 on-ramp and the Georgia Street off-ramp	\$9,200,000
		Subtotal No. 11:	\$41,200,000
12	I-80/I-680	Improve the I-680/I-80 interchange connections to address the capacity <del>and operational</del> deficiencies of these <del>connectionsramps</del> by either modifying the current interchange geometry or implementing an alternative configuration	\$100M (allocated)
13	I-80	Provide a fifth <del>EB and WB eastbound and westbound</del> general purpose lane between SR 12 West and I-680.	<del>\$2310,080,000</del>
		Provide WB auxiliary lanes as necessary between SR 12 West and I-680 to improve weave and merge maneuvers	\$2,600,000
		Provide <del>WB</del> braided ramp configurations as necessary between SR 12 West and I-680 to improve weave and merge maneuvers	\$4,200,000
		<del>Provide sixth EB general purpose lane from I-680 to SR 12 East. Potentially an HOV/HOT lane instead.</del>	<del>\$36,800,000</del>
		Subtotal No. 13:	<del>\$6612,6200,000</del>
<del>EB</del> Truck Scales	I-80	Provide <del>EB</del> auxiliary lanes as necessary between I-680 and SR 12 East and adjust truck scales location within the same general area to improve weave and merge maneuvers	(Part of EB Truck Scales Project)
		Provide <del>EB</del> braided ramp configuration as necessary between I-680 and SR 12 East and adjust truck scales location within the same general area to improve weave and merge maneuvers	(Part of EB Truck Scales Project)

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**Table E-2: Year 2030 Prioritization of Projects**

Priority	Corridor	Description	Order of Magnitude Cost
14	I-80	Provide a fifth <del>westboundWB</del> general purpose lane from West Texas Street to SR 12 <del>EastWest</del>	\$9,000,000
		Provide a sixth <del>westboundWB</del> general purpose lane from SR 12 East to I-680	\$11,500,000
		Provide a <del>westboundWB</del> auxiliary lane between Air Base Parkway and Travis Boulevard	\$125,000,000
		Subtotal No. 14:	\$32,500,000
15	I-80	Provide a <del>westboundWB</del> auxiliary lane between North Texas Street and Air Base Parkway.	\$203,000,000
<del>16</del>	<del>I-80</del>	<del>Provide a fifth EB general purpose lane extending from SR 12 East to Air Base Parkway</del>	<del>\$40,300,000</del>
<del>17</del>	I-80	Extend the <del>eastboundEB</del> HOV-2 lane from Alamo Drive to I-505	\$19,200,000
		<del>Implement Install</del> ramp metering at all <del>eastboundEB and WB</del> local access interchanges between Alamo Drive and I-505	<del>\$21,800,000</del>
		Provide an <del>eastboundEB</del> auxiliary lane between Cliffside Drive and Allison Drive with a two-lane off-ramp at Allison Drive	<del>\$32,590,000</del>
		Provide an <del>eastboundEB</del> auxiliary lane between Cherry Glenn Road and Pleasant Valley Road	\$9,200,000
		Extend ITS in <del>eastboundEB</del> direction between Alamo Drive and I-505	\$2,300,000
		Subtotal No. 17:	\$37,000,000
<del>18</del>	<del>I-80</del>	<del>Provide sixth eastboundEB general purpose lane from I-680 to SR 12 East. Potentially an HOV/HOT lane instead.</del>	<del>\$36,800,000</del>
<del>19</del>	<del>I-80 (Fairfield)</del>	<del>Provide a fifth eastboundEB general purpose lane extending from SR 12 East to Air Base Parkway</del>	<del>\$40,300,000</del>
<del>18</del>	I-80	Extend the <del>westboundWB</del> HOV-2 lane from I-505 to Air Base Parkway	\$32,800,000
		Provide a <del>westboundWB</del> auxiliary lane between Alamo Drive and Pleasant Valley Road	\$4,400,000
		<del>Extend ITS in the WB direction between I-505 and Alamo Drive</del>	<del>\$2,000,000</del>
		Subtotal No. 20:	\$39,200,000
<del>19</del>	I-780	<del>Implement Install</del> ramp metering at local access interchanges in the <del>eastboundEB</del> and <del>westboundWB</del> directions between I-80 and I-680	<del>\$43,400,000</del>
		Install ITS elements (detectors, CCTV and infrastructure) on I-780 in both directions	\$65,740,000
		Subtotal No. 21:	\$11,100,000
<del>20</del>	I-80	Provide an <del>eastboundEB</del> HOV lane between SR 37 and Red Top Road	\$36,000,000
<del>21</del>	I-80	Provide a <del>westboundWB</del> HOV lane between Red Top Road and SR 37	\$36,000,000

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<b>Table E-2: Year 2030 Prioritization of Projects</b>			
Priority	Corridor	Description	Order of Magnitude Cost
<b>2224</b>	I-80	Provide a fourth <b>eastboundEB</b> general purpose lane extending from <b>east of Leisure Town Road</b> to <b>west of Kidwell RoadSR-113</b> . <i>Potentially an HOV/HOT lane instead.</i>	\$78,000,000
		Extend ITS in <b>eastboundEB</b> direction from I-505 to the Solano County line	<b>\$86,120,000</b>
		<b>Implement Install</b> ramp metering at <b>eastboundEB and WB</b> local access interchanges from I-505 to the County line	<b>\$41,780,000</b>
		Subtotal No. 24:	\$90,800,000
<b>2325</b>	I-80	Provide a fourth <b>westboundWB</b> general purpose lane between <b>west of Kidwell Road</b> and <b>east of Leisure Town Road</b> . <i>Potentially an HOV/HOT lane instead.</i>	\$132,300,000
		Extend ITS in <b>westboundWB</b> direction between Solano/Yolo County line and I-505	<b>\$86,010,000</b>
		Subtotal No. 25:	\$140,300,000
<b>2426</b>	I-780	Provide a <b>westboundWB</b> auxiliary lane between Glen Cove Road and Cedar Street	\$2,900,000
<b>2527</b>	I-780	Provide an <b>eastboundEB</b> auxiliary lane between Spruce Street and Glen Cove Road	\$2,900,000
<b>2628</b>	I-780	Provide an <b>eastboundEB</b> auxiliary lane between Columbus Parkway and Military Highway West	\$2,900,000
<b>Total Year 2030 Improvements:</b>			<b>\$62205,4900,000</b>

**PROJECT IDENTIFICATION AND PRIORITIZATION PROCESS**

The project identification and prioritization process involved packaging the list of strategy packages identified in the FPI studies and the Corridor Level ITS Architecture and Implementation Plan ~~and~~, developing specific projects and organizing them in priority order. The purpose of developing the specific projects is to combine strategies as appropriate in order to realize the potential synergies when constructing the projects. In addition, combining or bundling the packages into discrete projects will enable each project to be funded and constructed separately. For example, ITS strategies were combined with operational improvement strategies where practical. One suchIn-one case is where, the installation of an auxiliary lane lends itself well to the installation of ITS devices including communications infrastructure, CCTV cameras and vehicle detection.

System management strategies in the short-term scenarios (Year 2015) were left as individual projects. Under these cases, keeping these strategies as individual projects provides the ability to prioritize them in earlier years instead of combining them with an operational improvement that is slated for installation over the long-term (Year 2030).

Once the project bundling was developed, each project was prioritized using several factors including:

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- Impact on ~~reducing~~improving congestion;
- ~~Cost~~;
- Balancing corridor improvements; and
- Overall Feasibility

Each project's impact on ~~reducing~~improving congestion during the horizon year forecasts was documented in the FPI studies. Thus, the prioritization of the projects focused more on the timing and location of the projects within those horizon years.

The prioritization for the most part followed the order of the improvement packages identified in the FPI studies. Where there were deviations, these included ranking projects such that other freeway corridors would receive improvements in order to balance the order of the improvements (e.g., Project #6 versus Project #8). Additionally, ITS improvements were combined with other FPI packages (e.g., Projects #17 and #18) in order to realize synergies when constructing the projects. Other HOV gap filling projects were ranked lower except in those cases where they would provide a level of continuity (e.g., Project #11).

ITS coverage alone does not relieve congestion. Thus, the project identification and prioritization process attempted to combine ITS elements with operational improvements. The prioritization also attempted to order the installation of the projects such that meaningful segments of the freeways are covered with successive projects. Additionally, the order of improvements along the different freeway corridors was prioritized such that a balance of improvements could be maintained across the three corridors.

The estimates of costs of each project and subset of each project was based on a high level estimate of quantities for each type of project. The items for the development of the 'Order of Magnitude' cost estimates included, where appropriate, widening, roadway and pavement sections, median and bridge modifications, overhead signs, communications infrastructure, lighting, pavement delineation, CCTV cameras, changeable message signs, and ramp meters. Each project cost includes allowances for project management, engineering, environmental, traffic control and a contingency.

### Year 2015

The installation of system management strategies for the short-term was deemed the highest priority for the corridors, particularly for I-80. This was done, as system management are the most cost effective strategies for the corridor under the Year 2015 – this is supported by the mitigation strategies listed in the I-80 FPI report. These types of strategies reduce the amount of non-recurrent congestion as they provide the tools and means to identify, respond to and clear incidents in a timely manner before the incident ~~causes~~has a severe impact on congestion.

The operational improvements for the short term (2015) focused on relieving congestion in the Fairfield and Vacaville areas along I-80. Additionally, the forecast of a series of congested

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locations and bottlenecks on I-680 in the northbound direction resulted in the need for operational improvements. The I-80 operational improvements ranked higher than the I-680 improvements due to the levels of congestion and cost. With the goal of maintaining a balance between corridors in terms of the order of project priorities, improvements along I-680 (Project #6) were ranked slightly higher than one system management strategy along I-80 (Project #8).

Under Projects #3 and #6, ITS improvements were combined with other operational improvements including HOV lanes, auxiliary lanes and ramp metering. Additionally, ramp metering implementations were packaged such that both directions at each interchange would be combined. As an example, I-680 (Project #6) includes SB ramp metering, even though the implementation of ramp metering along I-680 in the SB direction is not recommended until Year 2030 in the FPI.

The other projects in Year 2015 consisted of standalone ITS improvements along I-80 and I-780, and improvements at the intersection of SR12 East and Beck Avenue. For I-780, the installation of CMS and CCTV cameras at two locations near I-80 and I-680 are intended to provide some form of system management coverage in the short-term until such time as ITS improvements can be combined with other operational improvements.

For Year 2015, nine projects are recommended for deployment totaling approximately \$131,000,000. Under this year, full ITS coverage along I-680 in the County and on I-80 from the Carquiniez bridge to Alamo Drive would be achieved.

### Year 2030

Following the same process as Year 2015, the projects identified for Year 2030 were derived from bundling the improvement packages from the FPI and including system management strategies. As an example, Project #17 includes HOV lanes, auxiliary lanes, and ramp metering taken from the I-80 FPI Package F plus the implementation of ITS improvements.

For ramp metering, the projects were bundled such that both directions of the freeway corridors would implement ramp metering. Using Project #17 as an example, ramp metering in the WB direction was added to this project even though it was not part of FPI Package F.

The prioritization of projects was generally divided into segments along the freeway corridors. The areas through Vallejo were ranked the highest followed by areas through Fairfield and Vacaville (I-80 and I-680), through Benicia along I-780 and finally along I-80 to the county line.

The operational improvements along I-80 through Vallejo (Projects #10 and #11) were prioritized ranked highest partly primarily to balance the set of improvements along I-80 to the west along with due to the cost and amount of congestion forecast for this segment. Additionally, the corridor has been studied at length and based on the level of planning, it is anticipated that this segment may be the most prepared for the installation of the operational improvements. There is already ITS coverage including CCTV cameras, CMS and vehicle detection along this segment. The projects include HOV lanes as part of the project bundle mainly for continuity and synergy

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of projects, e.g., since auxiliary lanes and ramp metering are recommended, adding in the EB HOV lane (Project #11) would provide continuity of the HOV lane from the Carquinez Bridge.

The improvements ~~at~~ of the I-80/680/~~SR12780~~ interchange (Project #12), while ~~prioritized~~ ranked lower than the I-80 segment through Vallejo, ~~the improvements to the interchange is~~ are currently being analyzed and developed ~~largely unknown~~, and the overall cost is anticipated to be significantly higher in comparison.

The improvements in the vicinity between SR 12 West and SR 12 East (Projects #13 and #14) are forecast to have significant congestion such that additional general purpose and auxiliary lanes are needed in both directions of I-80. This influenced the high ranking of projects along this segment. The recommendations from the I-80 FPI were modified based on direction in order to account for the segment of I-80 EB that is currently being designed as part of the EB truck scales relocation project. Under this project, auxiliary lanes and braided ramps will be included. However, a sixth EB general purpose lane is not part of the current design.

The operational improvements and ITS installations along I-80, east of Alamo Drive (Projects #17 and #18), round out the recommended priority projects. The HOV lanes in both directions along I-80 between SR 37 and Red Top Road were identified as gap filling projects and thus were prioritized accordingly (Projects #20 and #21).

Along I-780, the installation of ramp metering ~~and auxiliary lanes (Project #19)~~ were ranked lower in priority as the levels of congestion forecast along this corridor are substantially less than the other corridors. However, this project, which includes full ITS coverage was prioritized ahead of the HOV gap filling projects along I-80 (Projects #20 and #21). Auxiliary lanes along I-780 at three locations round out the list of projects (Projects #24, #25 and #26).

For Year 2030, 17 projects are recommended for deployment totaling approximately \$622,000,000. Under this year, full ITS coverage would be achieved along all three freeway corridors in the County.

### HOV LANE IMPLEMENTATION

The implementation of HOV (HOV-2 and HOV-3) lanes along the three corridors will take place in phases over the short and long term. The first HOV-2 lane implementation will open in 2009 between Red Top Road and Air Base Parkway. Figure E-7 illustrates the planned implementation of HOV lanes by corridor segment, horizon year and occupancy.

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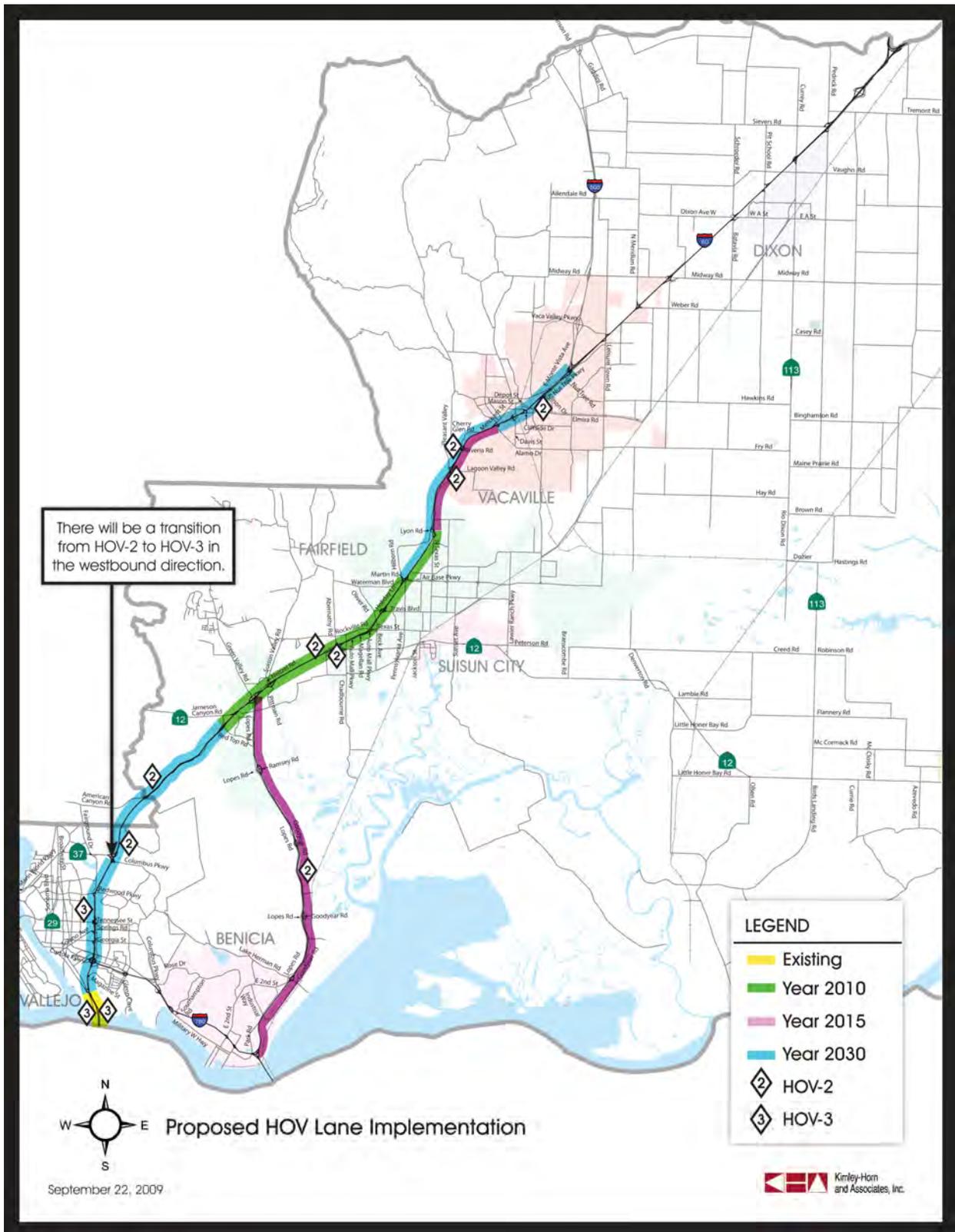


Figure E-7: HOV Lane Implementation

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### VISUAL DESIGN GUIDELINES

The Visual Design Guidelines document ~~are~~ is intended as a guide for use by the Cities along the corridor and engineering/design consultants responsible for preparing visual and aesthetic treatments ~~designs~~ along the corridors. The guidelines provide direction to design efforts so that the corridors maintain a strong sense of identity and character throughout phased development ~~of~~ and construction projects. The guidelines are not intended as specifications therefore state and local codes and standards shall be followed by the designers, however, if a standard is specified in this document, it shall prevail.

Goals are broad recommendations that form the baseline for the design theme. Objectives refine the intent of goals by making specific recommendations. Together they help guide ~~direct~~ the design effort. The goals for the I-80/680/780 Corridor Design are:

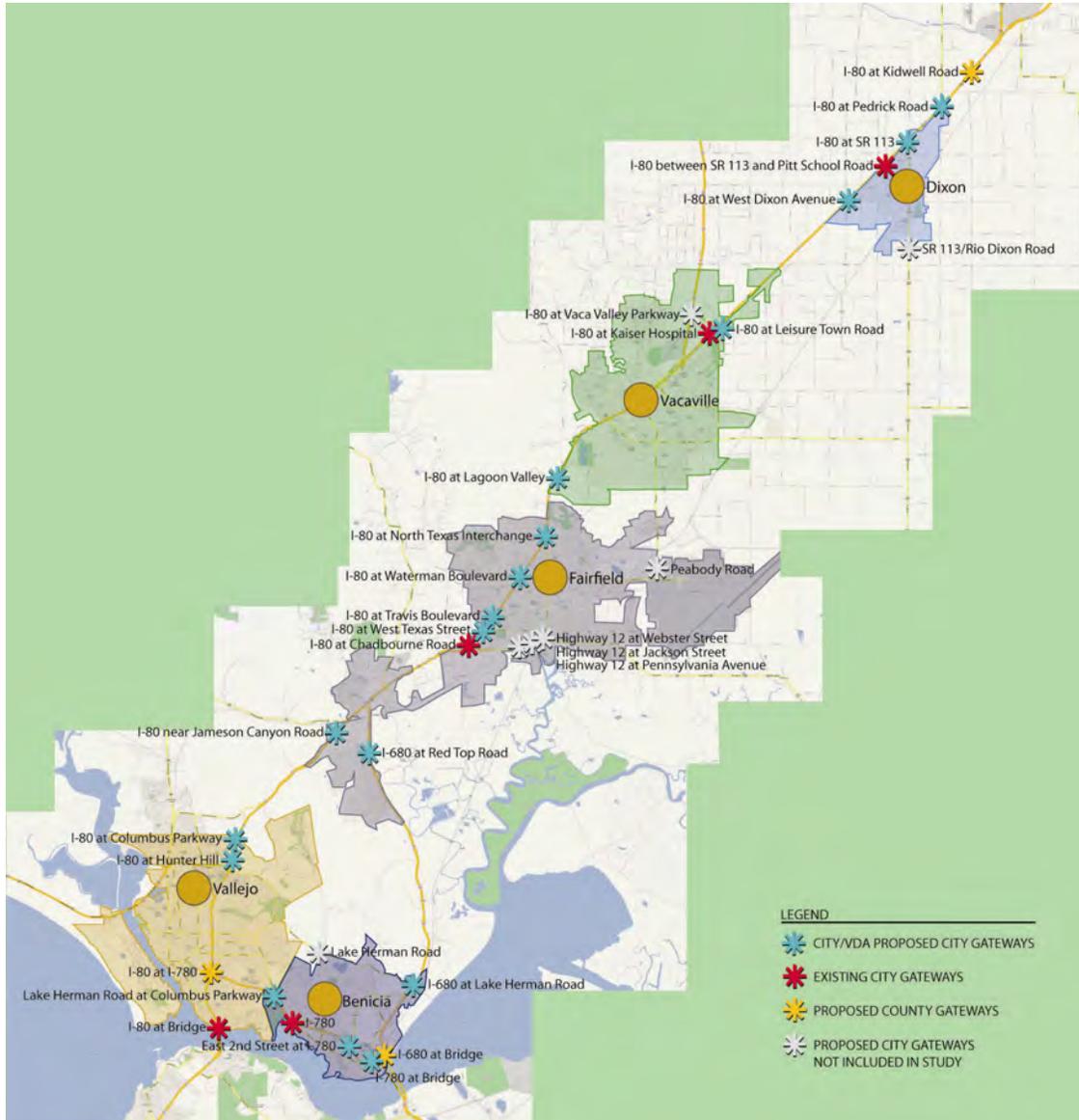
- Develop a cohesive landscape and hardscape program for the entire project area
- Develop a gateway, landscape and hardscape palette that is unique and expresses the identity of each city, yet fits into the overall program
- Create a landscape and hardscape program using sustainable, environmentally friendly and maintenance friendly plants and materials

### Gateways

The design of the landscape and other design elements will create a continuous impression throughout the I-80/680/780 Corridors. Again, repetition of colors, shapes, materials, textures, key plants and site improvements within each theme will create accents at gateway locations while relating to each other to create a cohesive impression along the interstates. Each gateway location highlights a city's entry point and unique plantings are used to accent main points of interest in each city along the interstate. In many locations, a sign accompanies the unique planting scheme.

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**Design Themes**

The design theme for the I-80/680/780 Corridors emphasizes strong planting schemes along the edges of the travel way as a unifying element and accents entry points to each City with gateway signage, overpass signage and/or special planting. The corridors were divided into three landscape themes: Nautical, Agricultural and Naturalistic. Within each area and jurisdiction, gateway locations have been identified along with identity colors for each jurisdiction that will be applied to site improvements.

**Nautical Theme**

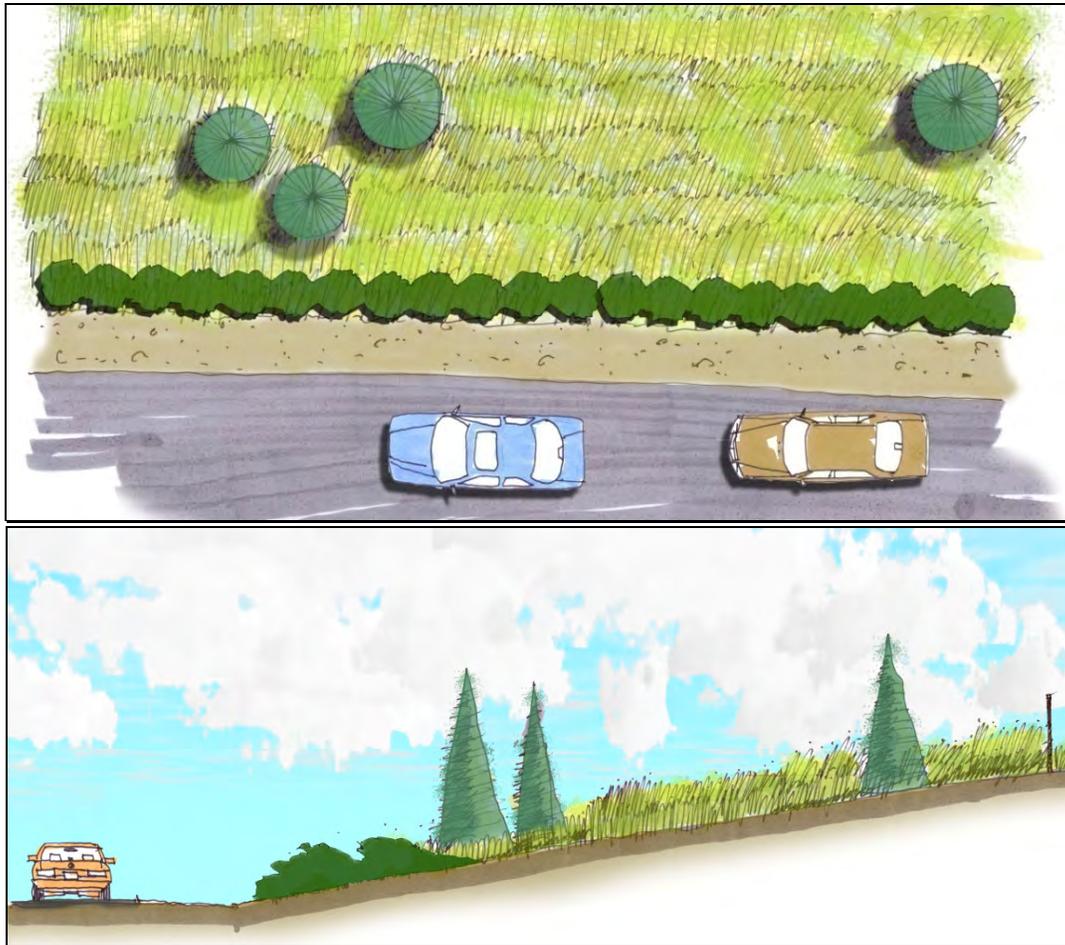
The nautical theme is inspired by the ocean and the patterns ships make in the water. Undulating grasses and drifts of soft branched shrubs represent ocean waves. The 'waves' are interrupted by

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triangular conifer trees resembling the pointed sails of boats and ships. The grasses and shrubs are slightly monochromatic in color and change with the season from grey, yellow and/or green or by fall or flower color. The planting scheme will be complimented by gateway signage and treatments that reflect the rich nautical history of both Vallejo, Benicia and Solano County.

The nautical theme is carried through the cities of Vallejo and Benicia. Accent bands or designs illustrate the City's identity color.



Nautical Theme

Agricultural Theme

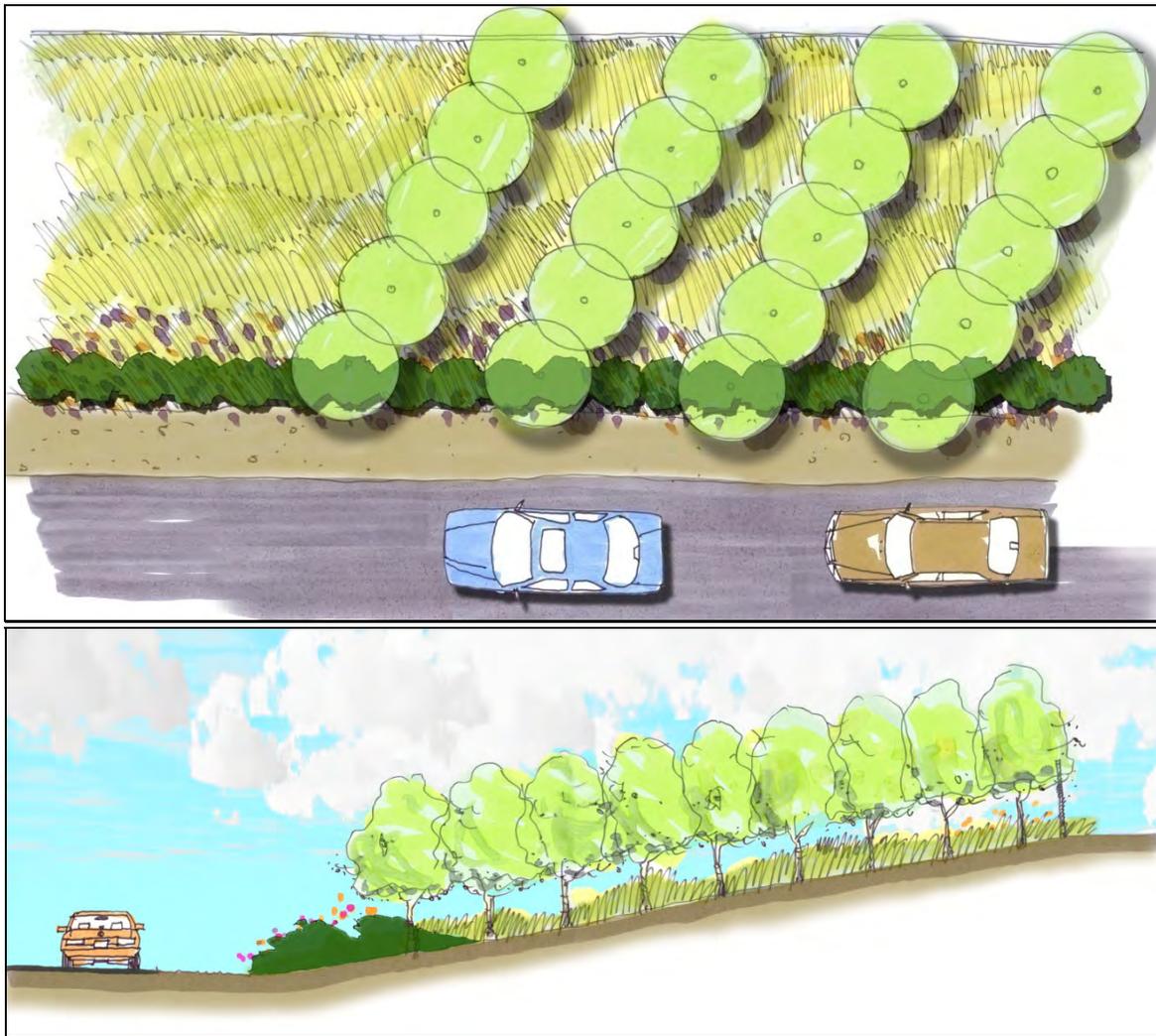
The agricultural theme is inspired by the fields of crops and orchards along the Solano corridor. An orchard effect is represented using multiple lines of colorful hedges and flowering trees. Linear patterns of plantings are meant to not only mimic the nearby fruit and vegetable fields, but the tree rows also act as a wind break and visual barrier. The majority of the ground cover planting is of a neutral palette. In specific locations throughout the corridor, accent plantings in a linear pattern with seasonal color can be applied. The planting scheme will be complimented

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by gateway signage and treatments that reflect the agricultural roots in Dixon, Vacaville, Fairfield and Solano County.

The agricultural theme is carried through the cities of Dixon and Vacaville. The agricultural themed gateways have a similar layout to the nautical themed gateways but differ due to variation in the planting palette and pattern.



Agricultural Theme

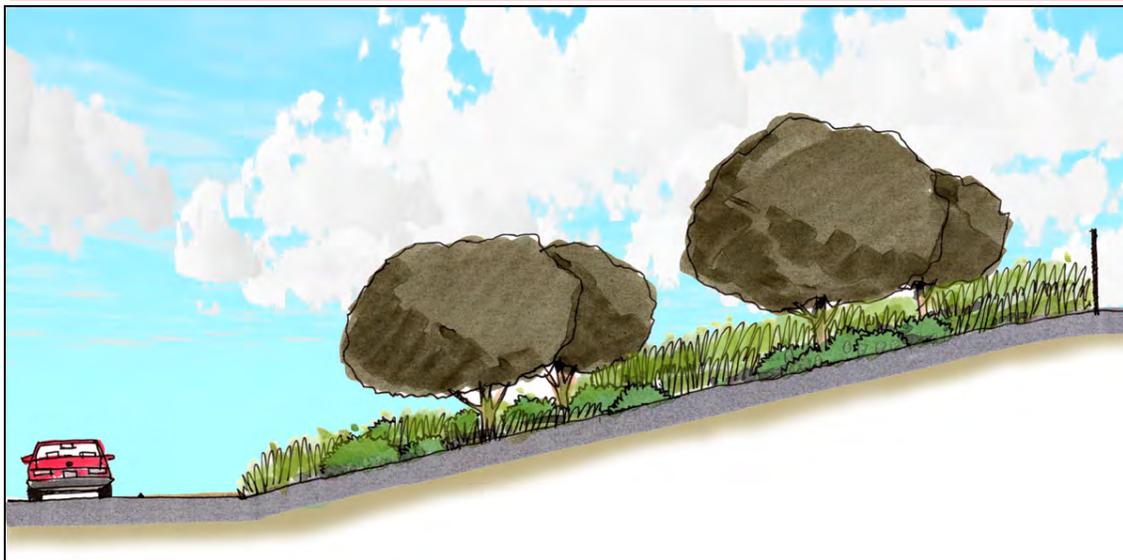
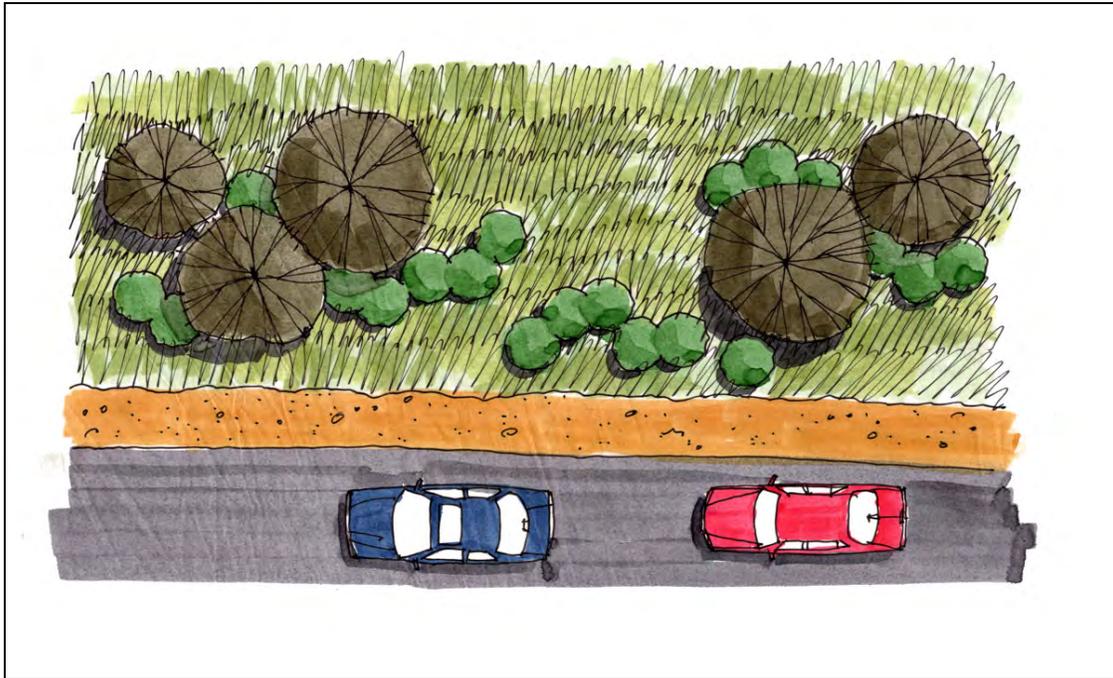
Naturalistic Theme

The naturalistic planting scheme is inspired by the native hillside landscape along the Solano corridor. A naturalistic arrangement of planting brings the hillside aesthetic to the road edge using native trees, shrubs, ground covers, wildflowers and grasses. The majority of the ground cover planting is of a neutral palette of drifts of native plants. The naturalistic theme is carried

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throughout unincorporated areas and in between the gateway landscaping locations in all jurisdictions along the corridors.



Naturalistic Theme

Solano County and City of Fairfield Gateways

The Solano County and Fairfield gateway are a combination of the nautical and agricultural themes. The Solano County gateway uses the stone wall, agricultural orchard planting and the nautical post with all the jurisdictional colors on it and metal cut out letters. The City of Fairfield

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gateway has an aeronautical theme with agricultural hedgerows planted in association with the gateway feature.

### Design Elements

Several elements occur within the I-80/680/780 Corridor that contribute to the overall themes and create a unified image. These elements become a readable visual sequence along the corridor and help create a coherent image and identity for motorists.

This section outlines the recommended treatment of each element to be incorporated into the design of the I-80/680/780 Corridor. Consultant engineers and designers responsible for design and construction documents for the corridor should consult these guidelines for the recommended treatment of each element. A few of the design elements include:

- Retaining Walls
- Sound Walls
- Underpass Treatments and Abutments
- Structure Treatments – Supports and Railings
- Highway Signage Support Structure

### Retaining Walls

Retaining walls are used to minimize grade or elevation changes that occur along the roadway. There will be two options for retaining walls:

- Cast in place concrete with typical panel of a fractured fin texture with a recessed accent band at the top of the wall or minimal design that is reflective of a community element such as the wall in Benicia
- Custom stamped design in retaining wall such as the walls in Vacaville

### Sound Walls

The sound walls are grey with split face block face and cap accented with two rows of blocks that protrude from the face of the wall every other block to make a dashed pattern at the top of the wall in the third and fifth row from the top. There is a smooth face block band below the cap block and each jurisdiction may paint the surface with their signature color to identify the area as being part of the City.

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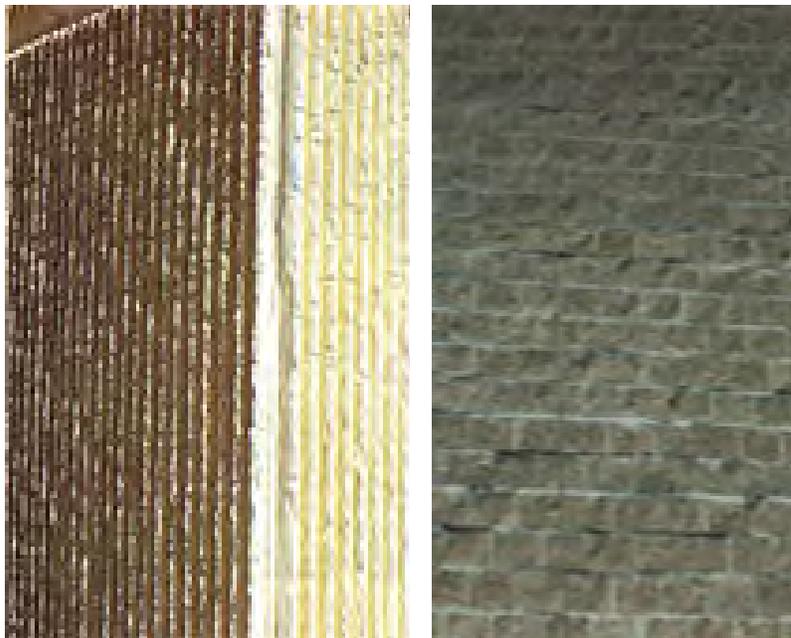


Sound Wall Treatment

Underpass Treatments

The split face texture will be surrounded by smooth concrete banding on all sides. Alternate treatment for the sloped paving may include artistic relief sculptures or designs for jurisdictional identity and enhancement. This would be done through special agreements with Caltrans.

The bridge abutment of the underpass when new will have the 'fractured fin' texture or the split face texture to match the retaining and sound walls. The fractured fin pattern is a standard Caltrans with a vertical pattern with  $\frac{3}{4}$ " relief. The color will match the sound walls and will be surrounded by smooth bands of concrete on all sides.



Fractured Fin and Split Face Concrete Underpass Treatments

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### Structure Treatments – Supports and Railings

Consistent treatment of overpasses, underpasses and crossings reinforce the I-80/680/780 Corridor theme. Typical new structures should be the same and are natural colored concrete with split face or fractured fin accents consistent with the retaining and sound wall treatments, which further strengthens the relationship between individual elements and the overall themes. The fractured fin pattern is a standard vertical ribbed pattern with  $\frac{3}{4}$ " relief. All structures shall have a smooth accent band running the length of the bridge parapet to allow for the application of identity colors. The pier column is to have rounded edges with an inset fractured fin accent band in the centre of the column on both sides.



Bridge Structure Treatment

### Highway Signage Support Structure

Highway signage support structures hold directional and informational signage pertinent to the driver. The recommended structure is the "arc type" and should be used for new and replacement structures as improvements occur so that within 15-20 years signage structures will be unified along the study corridor.



# I-80/I-680/I-780 CORRIDORS SOLANO HIGHWAY OPERATIONS IMPLEMENTATION STUDY

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### Freeway Signage Support Structure Treatment

#### PUBLIC OUTREACH STRATEGIES

#### Information/Education Tools

To provide a rich educational and informative reference on the various operational improvements that will be considered, an "operations improvement tool box" was developed. This toolbox provides a menu of operational improvements considered and/or recommended for the freeway corridors. In addition, fact sheets were developed for ITS management strategies that include a description of the improvement, a brief synopsis of the pros and cons, identification of the benefits, application of the improvement in other areas of California and the US with specific emphasis on areas similar to study area corridors.

#### Toolbox

The toolbox is designed to be an interactive tool that works hand in hand with the fact sheets. The types of operational improvements that are part of the toolbox include:

#### OPERATIONAL IMPROVEMENTS

- HOV lanes
- Auxiliary lanes
- Truck climbing lane

#### INTELLIGENT TRANSPORTATION SYSTEMS (ITS)

- Ramp Meters
- Closed Circuit Television (CCTV) cameras
- Vehicle Detection Systems (VDS)
- Changeable Message Signs (CMS)
- Highway Advisory Radio (HAR)
- Communications Network

#### OPERATIONAL STRATEGIES

- Traffic Incident Management
- Emergency Management
- Active Traffic Management
- Diversion Management
- Lane Management
- Speed Harmonization – Variable Speed Limits
- Adaptive Ramp Metering
- Express Lanes (High Occupancy Toll or HOT Lanes)

**MAKING BETTER USE OF OUR ROADS AND OUR TIME**

Freeway Lanes      Intelligent Transportation Systems (ITS)

Operational Strategies

**Closed Circuit Television Cameras**

**FREQUENTLY ASKED QUESTIONS ABOUT CLOSED CIRCUIT TELEVISIONS CAMERAS (CCTV)**

**Specific: Locations and Conditions:**  
Although there are currently over 500 CCTV cameras installed on the Bay Area freeway system, I-680 is the only freeway segment that has a substantial CCTV coverage in Solano County. I-680 has CCTV coverage from the Carquinez Bridge to SR 37.

**Cost:**  
CCTV cameras range from \$5,000 - \$15,000 each. The cost for purchase of the camera does not include the mounting of the device (i.e., concrete poles, light poles, etc.) or the communications. Mounting costs are based on whether the mounting option exists at the scene or if it has to be built. Communications costs depend on options available (i.e., microwave, hardware, etc.). The total cost is substantially higher once these additional costs are added to the camera cost.

**Are the CCTV cameras monitored 24/7?**  
Video images from the CCTV cameras are sent to the Oakland TMC where TMC operators and the California Highway Patrol have access to them 24 hours a day.

**Do the CCTV cameras record accidents and if so, how is the video used by Traffic Management Centers (TMC)?**  
Caltrans does not record or archive video images.

**Can CCTV cameras be used for "spying" on public forums or for recording vehicle speeds with license plates to issue citations to the public for speeding?**  
CCTV cameras are pointed away from private residences. Speeds cannot be legally documented using CCTV cameras for enforcement purposes unless there are posted signs advising the public that the signal is posted as an "enforcement sign".

**What are the challenges in successfully implementing appropriate use of CCTV cameras on the roadway?**  
The use of fiber is the preferred communications medium along freeway segments primarily for the transport of video images from CCTV cameras to the TMC in Oakland because it has the greatest data carrying capacity and longest transmission distance. Fiber communications are a challenge because there is sparse fiber coverage of the freeways in the County, but most of the CCTV cameras are communicated with using either a leased ISDN or ADN line. Funding is the main challenge.

**STra**  
Solano Transportation Authority

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The toolbox being an interactive tool will enable the STA to post it on the STA website and can also be provided to other agencies for posting on their websites and other public postings.

### Fact Sheets

The purpose of the fact sheets is to provide brief summary material on the key ITS strategies. The intended audience includes the public and other non-technical readers who want more information on what these types of system management strategies are. The fact sheets provide valuable information on what the Solano Transportation Authority can use in its system management set of strategies to manage congestion.