04-SOL-80-40.7/R44.7; 03-YOL-80-0.00/R11.72; 03-YOL-50-0.00/3.12; 03-SAC-50-0.00/L0.617;
03-SAC-80-M0.00/M1.36
EA 03-3H900K - Project ID No. 0318000085 –PPNO 8922
Program Code XX.XX.075.651
July 2019

Project Study Report-Project Development Support (PSR-PDS)

To

Request Programming for Capital Support (Project Approval and Environmental Document Phase)

On Route Solano 80/ Yolo 80/ Yolo 50/ Sacramento 50/ Sacramento 80

Between Kidwell Road in Solano

And US50/I-5 Interchange & I-80/West El Camino Interchange

APPROVAL RECOMMENDED:

Marlon Flournoy, Deputy District Director,
Planning, Local Assistance, and Sustainability

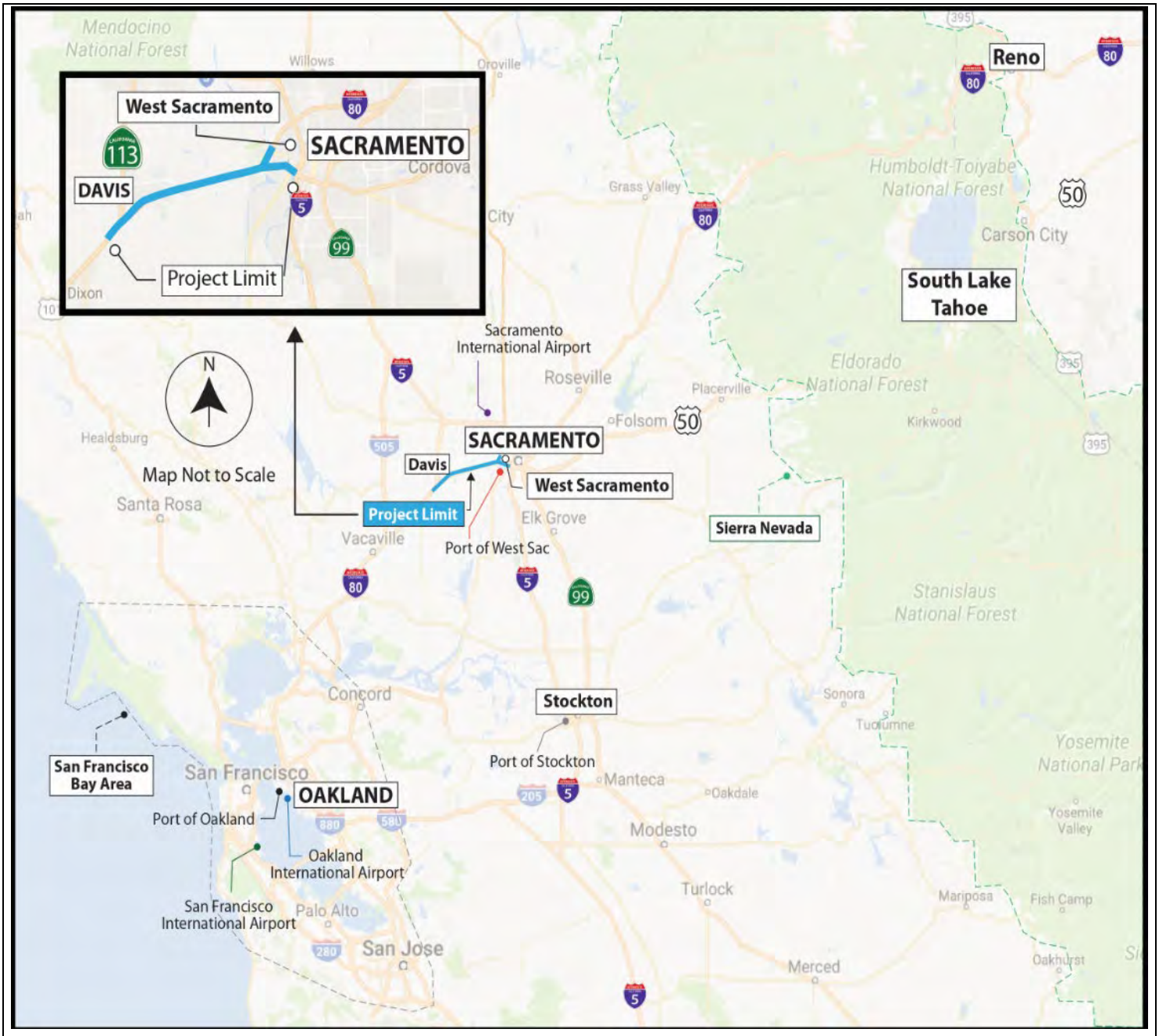
APPROVAL RECOMMENDED:

Jess Avila, Project Manager

APPROVED:

Amarjeet S. Benipal, District Director — *Date* 9/24/19

Vicinity Map



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

R. Salah 7-29-2019

RABAH SALAH
REGISTERED CIVIL ENGINEER *DATE*

Table of Contents

1. INTRODUCTION

The California Department of Transportation (Caltrans) District 3, in collaboration with a variety of stakeholders, proposes to construct improvements consisting of Managed lanes, pedestrian/bicycle facilities, and Intelligent Transportation System (ITS) elements along Interstate 80 (I-80) and United States Route 50 (US 50) from Kidwell Road near the eastern Solano County boundary (near Dixon), through Yolo County, and to West El Camino Avenue on I-80 and Interstate 5 (I-5) on US 50 in Sacramento County. For illustration purposes, the project consists of the following three segments:

- Segment 1 stretches from Kidwell Road in eastern Solano County, through Davis, to the eastern end of the Yolo Causeway just west of Enterprise Boulevard in West Sacramento;
- Segment 2 starts just west of Enterprise Boulevard and continues on I-80 to West El Camino Avenue; and
- Segment 3 starts at the I-80/US 50 Separation and continues east along US 50 to I-5 near downtown Sacramento (see Figure 1).

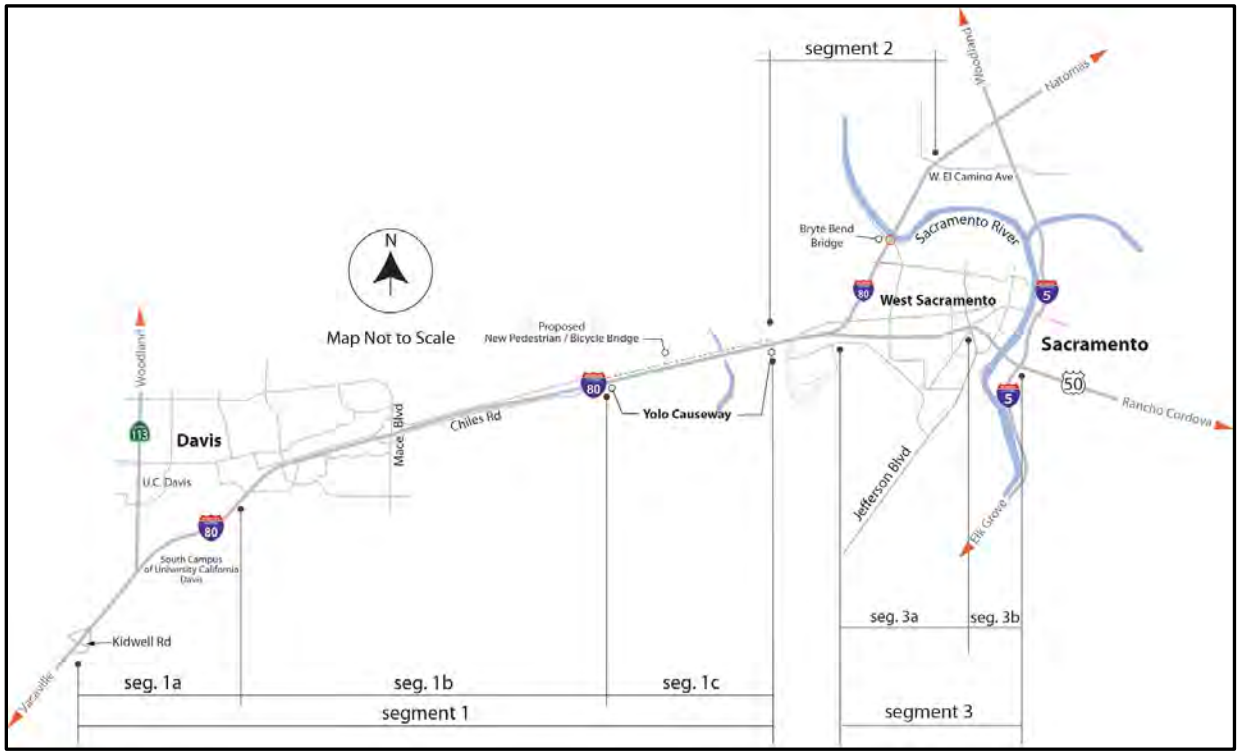


Figure 1 Project Limits.

This Project Study Report – Project Development Support (PSR-PDS) is for programming the capital outlay support cost through the Project Approval and Environmental Document (PA&ED) phase only. The remaining capital outlay support, right-of-way, and construction components of the project are preliminary estimates and are not suitable for programming purposes.

Table 1.1 – Project Information

Project Limits	*04-SOL-80-40.7/R44.7* *03-YOL-80-0.00/R11.72* *03-SAC-80-M0.00/M1.36* *03-YOL-50-0.00/3.12* *03-SAC-50-0.00/L0.617*
Number of Alternatives	*7*
Current Capital Outlay Support Estimate for PA&ED	$6,000,000
Current Capital Outlay Support Estimate for PS&E, RW, and Construction	$39,000,000
Current Capital Outlay Construction Cost Range	$100,000,000 – $610,000,000
Current Capital Outlay Right-of-Way Cost Range	$2,000,000 – $21,000,000
Funding Source	*STIP, SHOPP, RSTP, CMAQ, TCIP*
Funding Year	*2023/2024*
Type of Facility	*Multi-lane Freeway*
Number of Structures	*16*
Anticipated Environmental Determination or Document	*NEPA: Environmental Assessment (FONSI)* *CEQA: Environmental Impact Report (NOD)*
Legal Description	*On I-80 just west of Davis in both directions from the Kidwell Rd IC in Solano County (District 4) to the US-50/I-5 interchange and I-80 West El Camino interchange in Sacramento County*
Project Development Category	*4A*

The following table displays the State Highway and Operation Protection Program (SHOPP) Project Output that may be achieved on this project. The District 3 10-Year Book includes a proposed project (ID 11365) on Yol-80 between post miles 0.5 and 5.9.

Table 1.2 – Asset Performance

Asset Performance Measures - Output	
SHOPP Project Output	25.8 Lane miles (Pavement Class 1)

See **Attachment O**, *Asset Management*, for the SHOPP Project Performance Measures Benefits sheet.

2. BACKGROUND

The corridor serves as a primary connection for east-west travel in Solano, Yolo and Sacramento Counties, and is part of a major transportation route between the state capital and the San Francisco bay area to the west. The corridor also provides north-south connections to State Route (SR) 113 in Yolo County and I-5 and SR 99 in Sacramento County. Because of its designation as a primary east-west route, the corridor accommodates a wide range of transportation modes, some of which includes park-and-ride users, bicyclists, personal vehicles, and freight trucks.

I-80 is the primary freeway serving the movement of people and goods between Northern California and the eastern United States. Within the Sacramento region, the route serves local and commute traffic, traffic to/from the San Francisco Bay Area, recreational traffic to and from the Lake Tahoe Basin, and is a primary corridor for goods movement. Within the corridor, the Yolo Bypass Wildlife Area and floodplain limits east-west linkages, funneling many modes and forms of transportation into the narrow I-80 corridor between the cities of Davis and West Sacramento.

3. PURPOSE AND NEED

Purpose:

The purpose of this project is to improve multimodal mobility on the I-80 and US-50 corridors in Solano, Yolo, and Sacramento Counties. This project will decrease congestion through the corridor and the effects congestion has on transit and freight. It will improve transit headway times, reliability, access, and viability through the corridor. This project will also increase people throughput by increasing transit, bicycle/pedestrian, and carpool use. The project will also address non-recurrent congestion caused by incidents, including collisions, by improving incident detection, verification, response and clearing.

Need:

I-80 and US-50 corridors experience high travel demand, especially during peak commute periods and weekends. The demand has created severe traffic congestion and impaired mobility along the route. Congestion at various locations, specifically I-80 through Davis and along the Yolo Bypass Causeway between Davis and West Sacramento, can be especially severe and is caused by a combination of high demand and bottleneck design. Traffic congestion along the I-80 and US-50 corridor within the project limits has impacted public transit headway times and reliability, especially during peak commute periods which are critical times for ridership. There is need to improve transit access and viability for Yolo Bus, Solano Transit and upcoming electric buses between University of California, Davis (UCD) campus and UCD Medical Center. The congestion also has impacts to freight headway times which can have negative effects on shipments such as produce which is prevalent along this corridor. Additionally, collision

patterns and collision time of day is typical for a freeway segment with heavy congestion and stop and go conditions, affecting transit headway times and reliability, movement of freight and commute times.

4. TRAFFIC ENGINEERING PERFORMANCE ASSESSMENT (TEPA)

TRAFFIC DATA AND ANALYSIS

The I-80/US 50 corridor is a vital component of the transportation system in Northern California. The corridor is an important connection between the San Francisco Bay Area and the Sacramento area, serving both substantial commute trips and recreational traffic. I-80/US 50 is also an essential cog in the good movement system, connecting major ports from the San Francisco Bay Area/Sacramento region to the eastern United States.

The I-80/US 50 corridor experiences heavy congestion during the commute periods due to high vehicular demand. The corridor has infrastructure deficiencies, such as short weaving and merging areas, lane drops that create bottlenecks, incomplete ramp metering and auxiliary lane systems, and inadequate ITS elements. The corridor also experiences heavy recreational traffic, leading to heavy congestion on weekends and holidays. Table 4.1 illustrates the daily vehicle hours of delay on I-80 and US 50 through the proposed project area.

Table 4.1 – Average Daily Delay (Veh-Hrs)

Location	Direction	Daily Delay (Veh-Hrs)	
		Delay < 60 mph	Delay < 35 mph
I-80	EB	3,715	1,344
	WB	3,485	1,244
US 50	EB	374	178
	WB	85	21

Source: Caltrans Performance Measurement System, Jan - Oct 2018, Mon-Fri data only. Observed data between 50% and 65%

Both freeway segments experience delay throughout the day, with congestion at its maximum during the PM peak period. Data analysis shows that the peak hour and direction occurs during the 5:00-6:00 pm hour in the eastbound direction. Significant AM peak period delay on westbound I-80 occurs between 8:00-10:00am when travel demand volumes are at their peak because of commute related trips. Westbound US 50 does not experience as much congestion as the other freeway segments in the project area. The projected traffic in the project area will further exacerbate delay on each freeway segment listed above.

The I-80/US 50 corridor primarily operates at LOS F during the AM and PM peak hours within the proposed project limits. The LOS F conditions will worsen due to the projected traffic growth in the area. The I-80/US 50 corridor has several significant bottlenecks that occur during both AM and PM peak periods, as well as on the weekends.

Figures 4.1 and 4.2 show the locations of the existing weekday and weekend bottlenecks in the area and Tables 4.2 and 4.3 quantify the impact of the bottlenecks.

Figure 4.1 – Project Area Weekday Bottleneck Map

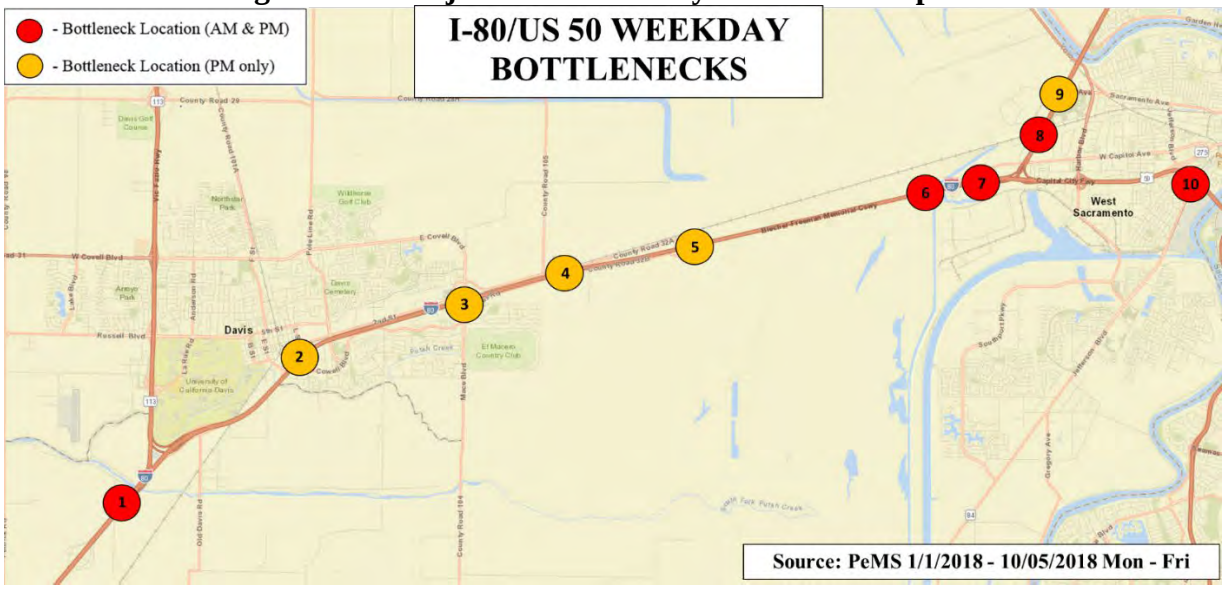


Table 4.2 – Project Area Weekday Bottleneck Summary

Map Ref #	Name	VDS	Rte	Dir	Time Period	% Days Active	Avg Delay (veh-hrs < 35mph)	Causality
1	N. of University Ave	421503/ 421492	I-80	WB	AM	74%	100	Downstream lane drop. Heavy demand. Merging traffic from SB SR 113. Heavy Recreational Traffic. Unmetered connectors/ramps
				WB	PM	58%	50	Downstream lane drop. Heavy demand. Merging traffic from SB SR 113. Heavy Recreational Traffic. Unmetered connectors/ramps
				EB	PM	73%	434	Downstream lane drop at Richards Blvd. Heavy demand. Merging traffic from SB SR 113. Heavy Recreational Traffic. Unmetered connectors/ramps
2	Richards Blvd	318113	I-80	EB	PM	57%	221	Heavy demand. Horizontal curve. Unmetered onramp
3	NB Mace Blvd	314025	I-80	EB	PM	75%	166	Heavy demand. Horizontal curve. Heavy merge from onramp
4	E of CR 105d	318076	I-80	EB	PM	48%	193	Heavy demand. Slight Horizontal Curve. Downstream Bottleneck

5	W of Webster UC	318053	I-80	EB	PM	31%	164	Heavy demand. Heavy merge from onramp. Bottleneck reduced with addition of temporary ramp meter at Chiles Rd onramp
6	Enterprise Blvd	318126	I-80	WB	AM	62%	49	Heavy Demand. Lane drop from I-80/US 50 connector. Merge from Enterprise onramp.
					PM	49%	27	Heavy Demand. Lane drop from I-80/US 50 connector. Merge from Enterprise onramp.
7	E. of Enterprise Blvd	318142	I-80	WB	AM	44%	83	Weaving issues from I-80/US 50 connectors/ Enterprise Blvd. Heavy Demand
					PM	31%	91	Weaving issues from I-80/US 50 connectors/ Enterprise Blvd. Heavy Demand.
8	W. of Reed Ave	316822/ 316817	I-80	WB	PM	31%	30	Heavy Demand. Congestion from downstream Enterprise bottlenecks
				EB	AM	60%	117	Heavy downstream demand. Weaving issues. Unmetered onramp downstream
9	Reed Ave	317884	I-80	EB	PM	47%	44	Heavy downstream demand. Unmetered onramp downstream
10	Jefferson Blvd	313840	US 50	EB	PM	36%	299	Heavy Demand. Short Merge. Downstream Weaving bottleneck (2016/2017 Data)
					AM	12%	100	Heavy Demand. Short Merge. Downstream Weaving bottleneck (2016/2017 Data)

Figure 4.2 – Project Area Weekend Bottleneck Map

Table 4.3 – Project Area Weekend Bottleneck Summary

Map Ref #	Name	VDS	Route	Dir	Time Period	% Days Active	Avg Delay (veh-hrs < 35mph)
1	N. of University Ave	421503/ 421492	I-80	WB	Noon	76%	390
				WB	PM	75%	386
				EB	Noon	31%	170
				EB	PM	29%	93
2	NB Mace Blvd	314025	I-80	EB	Noon	39%	54
					PM	31%	56
3	E. of Enterprise Blvd	318142	I-80	WB	Noon	50%	122
					AM	40%	20
4	Enterprise Blvd	318126	I-80	WB	Noon	79%	99
					PM	45%	40
5	W. of Reed Ave	316817	I-80	EB	Noon	83%	342
					PM	43%	218
					AM	36%	38

The most severe bottlenecks in the project area occur in the eastbound direction during the PM peak period. The addition of the HOV/Managed lane and HOV to HOV direct connectors, in conjunction with the operational and ITS improvements proposed in this project, will help alleviate the mobility impacts due to these bottlenecks. Table 4.4 lists the operational and ITS improvements currently being analyzed for inclusion in the project area. Some of these elements are currently in design or proposed to be included in other projects.

Table 4.4 – Potential Operational and Safety Improvements Within the Project Limits

Type	Freeway	Direction	Location	Project Priority
Ramp Meters	I-80	EB	Richards Blvd	1
	I-80	EB	SB SR 113/Old Davis Rd	2
	I-80	WB	West Capitol Ave	3
	I-80	WB	Enterprise Blvd	4
	I-80	EB	Mace Blvd (HOV Bypass Lanes)	5
	US 50	EB	Jefferson Blvd*	6
	US 50	EB	South River Rd*	7
	US 50	WB	Jefferson Blvd/SR 275*	8
	I-80	WB	Mace Blvd	9
	I-80	WB	Richards Blvd*	10
	I-80	WB	Chiles Road	11
	US 50/I-80	EB	I-80/US 50 Connector	12

	US 50/I-80	WB	I-80/US 50 Connector	13
CMS	I-80	WB	1 mile east of I-80/US 50 Junction	1
	US 50	WB	1 mile east of I-80/US 50 Junction	2
	I-80	EB	1 mile west of I-80/US 50 Junction	3
	I-80	EB	1 mile west of I-80/SR113 Junction	4
	I-80	WB	1 mile east of I-80/SR113 Junction	5
	I-80	WB	1 mile east of Mace Blvd	6
	I-80	WB	1 mile east of Enterprise Blvd	7
CCTV	I-80	Both	I-80/SR113 Junction	
	I-80	Both	Richards Blvd	
	I-80	Both	Mace Blvd	
	I-80	Both	Causeway	
	I-80	Both	Reed Ave	
	I-80	Both	W. El Camino	
	US 50/I-80	Both	I-80/US 50 Junction	
Fiber Optics and Conduit	Throughout project limits			
Maintenance Vehicle Pullouts	Select locations within project limits			
Auxiliary Lanes	US 50	WB	SR 275 to Harbor Blvd	

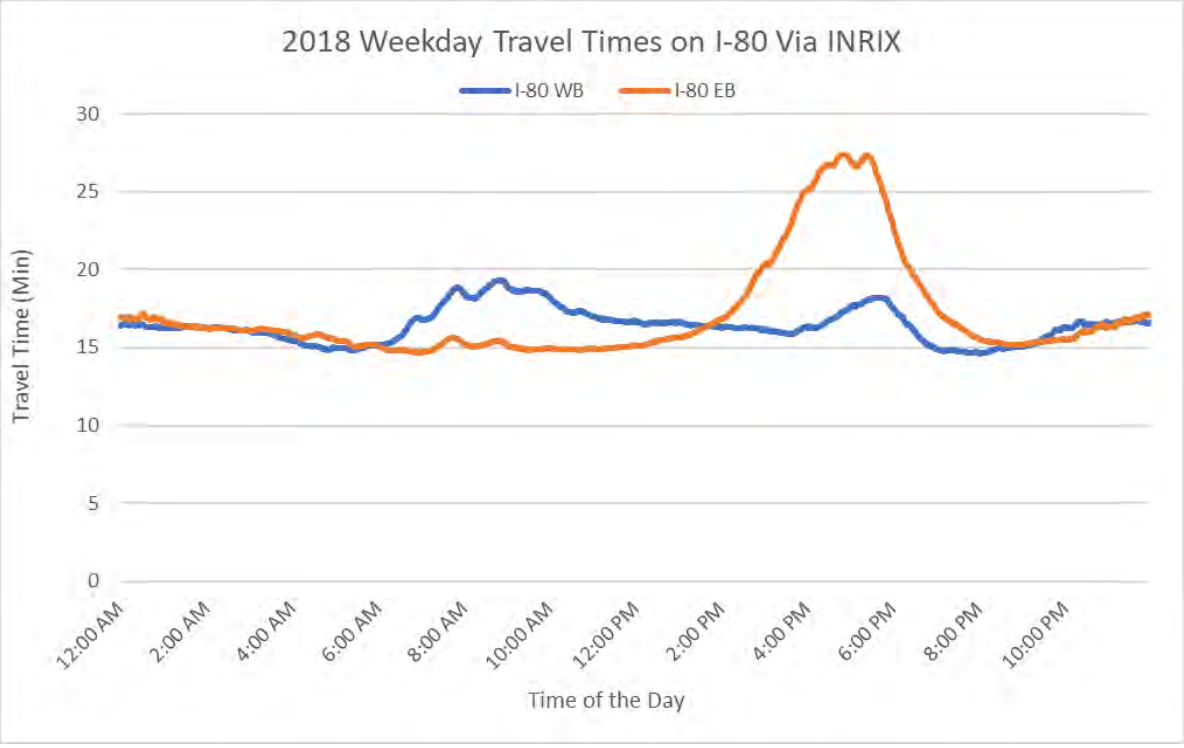
* Meter may be included in other projects

The potential ramp meter locations are being evaluated to help relieve congestion at bottleneck locations throughout the project area. Additionally, Caltrans District 3 recently field tested a new Coordinated Ramp Metering System (CRMS) along SR 99 through the Sacramento Area. The new centralized system used real time field data to make localized ramp metering adjustments in order to provide corridor wide improvements to travel time and delay during recurring congestion. The CRMS can improve speeds by up to 10 percent during the most congested hours of the day. This system can be implemented along the I-80/US 50 corridor as a part of the proposed project to maximize capacity throughout the corridor while reducing congestion.

TRAVEL TIME EVALUATION

INRIX[1] was used to evaluate travel times in both directions of I-80 in Yolo County from Kidwell Rd to West El Camino Blvd, a span of 16.8 miles. This congestion experienced on this route leads to longer travel times for many users. In free flow conditions when there is little to no congestion, vehicles can typically experience 14 to 16-minute travel times eastbound from Kidwell Rd to West El Camino or driving the same route westbound. On any typical weekday the peak commuting period is from 7:30 AM to 10 AM where speeds drop below 55 mph and travel times are 2 to 4 min longer than those during free flow conditions. Eastbound experiences heavy PM peak period congestion from 3:00 PM to 6:30 PM where speeds are below 50 mph and travel times are greater than 20 minutes. The longest travel times experienced are around 5:00 PM, travel times can climb over 27 minutes. The PM peak travel time for eastbound I-80 is almost double the amount of time it would take to drive the route during free flow conditions.

Chart 1. Weekday Travel Times on Yolo I-80

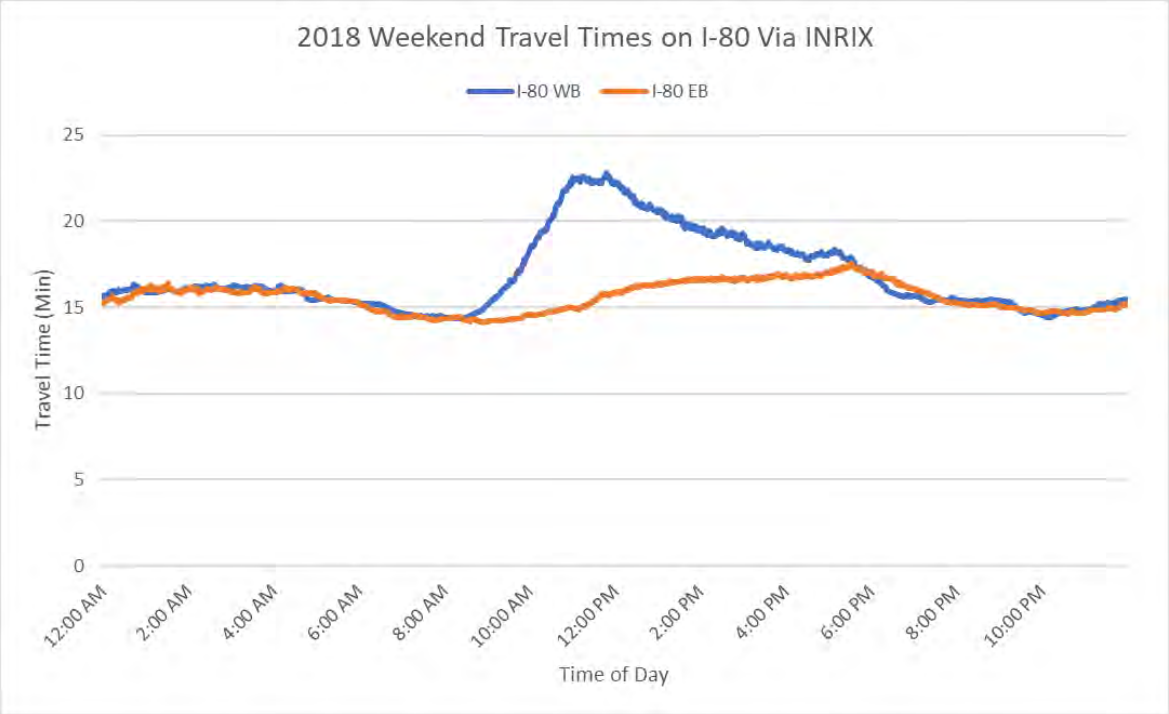


In general, weekdays experience more congestion than weekends, but it is still important to analyze the impact that congestion has on weekend travel times. Chart 2 shows I-80 weekend travel times for 2018. The free flow travel time for both directions on Yolo I-80 is the same as it is on weekdays at 14 to 16 minutes. The peak period for travel on westbound I-80 is from 10:30 AM to 1:30 PM where drivers can expect travel times to

[1] INRIX is a 3rd party traffic data collection company that provides location-based crowd-sourced traffic data and analytics via a cloud-based platform.

exceed 20 minutes. The maximum weekend travel times is roughly 23 minutes at noon, which is about 7 to 9 minutes longer than free flow travel conditions.
The analysis on eastbound showed that the maximum weekend travel time that drivers experience is around 17.5 minutes at around 5:30 PM. This means that the average driver is only delayed around 2 to 3 minutes because of congestion. The projected future traffic on weekdays and weekends in the project area will further exacerbate delay experienced on the freeway.

Chart 2. Weekend Travel Times on Yolo I-80



Areas of congestion identified in INRIX are likely caused by the following deficiencies mentioned earlier coupled with high travel demand during peak periods and contribute to significant recurring congestion:
EB I-80

- SB 113 connector and Richards Blvd on-ramps (not metered)
- 3 lane drops between SR 113 connector ramp and Richards Blvd on-ramp.
- Reed Ave on-ramp (not metered)
- Mace Blvd (1 of 2-lanes metered)

WB I-80

- The I-80/US50 interchange merge.
- West Capitol/Industrial Blvd slip and loop onramps (not metered).
- Lane drop just west of Kidwell Rd in Davis.

POTENTIAL PROJECT BENEFITS

In 2013, Caltrans District 3 conducted a preliminary analysis of the I-80/US 50 corridor with similar study limits as this proposed project. The *Interstate 80/US 50 Davis to Downtown Sacramento Preliminary Investigation* examined the existing conditions of the corridor and analyzed potential solutions to the existing and projected traffic congestion problems. The alternative analysis included the addition of an HOV lane on I-80 from the Solano/Yolo County Line to the US 50/I-5 Interchange. The microsimulation analysis tool Vissim[2] showed that with the addition of an HOV lane through the project area, the corridor would experience **a 53 percent reduction in delay during the AM peak period and 38 percent delay reduction in the PM peak period.** While the scope of the Preliminary Investigation analysis differs slightly to what is being proposed for this project, the overall delay savings of the proposed project should be very similar.

This project will extend to the existing HOV lanes at the I-80/ West El Camino IC. Project 03-3F360 will construct HOV lanes on US 50 from the existing HOV lanes at Watt Ave to the Pioneer Bridge, connecting to the eastern limit of the proposed I-80/US 50 HOV lanes project. Additionally, project 03-3C001 will construct HOV lanes on I-5, south of Pioneer Bridge and the I-5/US 50 IC and provide an HOV connection to the south. This proposed project will have added HOV connectivity by constructing HOV lane to HOV lane direct connectors for I-80 at the I-80/US 50 interchange. These connectors will improve flow and help ease the weave/merge bottleneck between the I-80/US 50 and Enterprise Blvd interchanges.

The proposed project will have significant multimodal benefits. Project features will help promote transit usage and increase travel time reliability, bicycle/pedestrian access and safety, and potential mode shift away from single occupancy vehicles. Benefits of this mode shift include less vehicle miles traveled, increased person throughput, and delay savings. These multimodal benefits will be further analyzed during the PA&ED project phase.

This project will also have significant freight benefits as I-80 is designated as a Primary Highway Freight Network and Surface Transportation and Assistance Act (STAA) Route and is a key component of the transcontinental trucking network. Goods movement throughout District 3 relies heavily upon trucks, the primary mode of transport in the region. According to the 2015 District 3 Goods Movement Study, “trucks carry virtually all goods (96 percent) that both originate and are consumed in the district.” The I-80 corridor is northern California’s main conduit for goods movement between the northeastern US to the San Francisco Bay Area and intersects the I-5 corridor which serves as California’s main conduit for goods movement between Mexico and Canada. This project will enable freight trucks to move more freely through the corridor by relieving congestion, ensuring goods are transported in a more efficient and cost-effective manner. These freight benefits will be further analyzed during the PA&ED project phase.

[2] Vissim - A traffic simulation modeling and analysis software, capable of modeling field-like conditions through calibration on a microscopic level.

ADDITIONAL PROJECT BENEFITS

Freight Benefits to the State

I-80 is a vital component of the world economy as it provides direct linkages between agricultural and manufacturing industries in the Central Valley, San Francisco Bay Area, and the Ports of Oakland, Richmond, Stockton, West Sacramento and beyond. The segment of I-80 within the project limits also serves daily commuters from Sacramento and surrounding cities and is the primary access route to the Port of West Sacramento, Sacramento International Airport (SMF), and large distribution centers such as Amazon.

This project will facilitate the movement of goods to California's western counties and to seaports, including the ports of Oakland, Richmond and West Sacramento, which are key for exporting U.S. commodities to Asia, Australia and Africa.

Approximately 113.5 million tons of goods pass through District 3 from other origins with 78 percent of commodity tons produced in District 3 destined for other areas. Freight trucks travel through and throughout the region 24 hours a day, 7 days a week transporting large quantities of rice, prunes, walnuts, and other goods. The California Department of Food and Agriculture reports:

- 95% of the rice production in California comes from District 3 (2013)
- 80% of the prune production in California comes from District 3 (2016)
- California walnut production accounts for 99% of the commercial U.S. supply with about 1/3 exported (2016)

The tonnage of goods expected to travel via the I-80 corridor is expected to increase to 199.5 million tons by 2035. It is vital to the California and U.S. economy that freight is transported more freely to ensure timely delivery of goods to distributors and consumers.

This project reduces congestion, increases person throughput, provides multimodal access, promotes ridesharing, improves mobility and travel time reliability, and improves traffic operations using ITS. Innovative transportation management technologies help promote opportunities and support economic development. This project will enable freight trucks to move more freely through the corridor ensuring goods are transported in a more efficient and cost-effective manner while also reducing Greenhouse Gas (GHG) emissions.

Bike/Pedestrian Facility Benefits

This proposed project will have significant bike and pedestrian benefits.
General benefits include:

- Encourages active transportation modes on the causeway
- The causeway bikeway provides an alternative option to single occupancy vehicle use, which is a major contributor to congestion issues, injuries and deaths caused by vehicle collisions, increased pollution (GHG), and decreased air quality on the causeway

- Encourages safer long-range travel options for active transportation users travelling between Davis and Sacramento
- Bicycling saves commuters money, lends to health and productivity, and is sustainable/environmentally friendly
- Shared use paths and bikeways make places more valuable. In the context of the causeway, the value is interregional connectivity (between cities/residential areas/job centers in Yolo and Sacramento Counties).
- A valuable regional resource in need of current and future infrastructure investments to ensure upkeep and improvement, in order to ensure safe, comfortable, and equitable access in the years and decades to come.

Context-specific benefits:

- Having a raised shared use path on or adjacent to the causeway deck is an important aspect to ensuring a year-round option for bicyclists and pedestrians. Without it, these roadway users could not cross the causeway using an at-grade path because the land under the causeway sees seasonal flood events.

SCOPE OF FUTURE TRAFFIC ENGINNERING STUDIES

The purpose of the TEPA process is to develop an initial traffic scope of work for more detailed traffic analyses to be completed during the PA&ED phase. The following are identified as the potential scope of future traffic engineering studies:
Project Study Limits: The limits for the freeway and ramp traffic operations include I-80 (east-west freeway) from east of W. El Camino Avenue to west of Kidwell Road and US 50 (east-west freeway) from the US 50/I-80 Interchange to the US 50/I-5 Interchange. All ramps and connectors within the limits will be evaluated with each build and no-build alternative. Ramp termini and arterial traffic analysis may be included based on need and potential impacts.
Traffic Data Collection: At the time of the PA&ED traffic study, current vehicle, pedestrian and bicycle traffic counts (weekday, morning and afternoon peak period) on the existing facility will be obtained. The data collection will include freeway mainline, ramp, and some cross-street peak period traffic volumes at intersections and interchanges. Daily and peak period pedestrian and bicycle counts will be collected, focusing on travelers across the Causeway.
Traffic Forecasting: Develop future design year forecasting on all freeway mainline, ramps and local streets in the project study limits using SACOG's SACSIM Travel Demand Model. Forecasts will be developed for construction year, interim year, and cumulative year. Additional traffic forecasting tools may be needed to analyze external trips within the project area.
Freeway and Ramp Capacity and Operational Analysis: Detailed operational analysis will be completed for existing conditions, and all future year conditions for each alternative with and without the project, and any proposed project construction phasing. Vissim microsimulation modeling software will be used to:

- Create a calibrated base year model.

- Model all years and alternatives and produce performance measures which will be used to make project alternative determinations.
- Evaluate the operational and ITS improvements associated with this project.

Highway Capacity Manual methodologies and procedures will be used to calculate performance measures for all freeway mainline and ramps. Synchro/SimTraffic may be used to supplement the microsimulation modeling for any signals and arterials. The findings of the PA&ED traffic study will be used to select the preferred alternative and support the project purpose and need. It may be determined that some of the aspects mentioned in this section may be modified or omitted upon changes in project scope and input from stakeholders.

In addition to the traffic study for the proposed project, a supplemental traffic analysis focused on the District 4 segment of I-80, between west of Kidwell Road and the Solano/Yolo County line, will be conducted to determine the feasibility of converting 1 of the 4 mixed flow lanes to an HOV lane. Other alternatives for the segment will also be evaluated. The traffic analysis will be conducted with input from District 4 and Solano Transportation Authority regarding scope
and methodology. It is anticipated that the supplemental traffic analysis will use similar traffic analysis tools and methodologies as the PA&ED traffic study.

Traffic Volumes

The traffic data is listed below. The highway has a directional split of 52% to 59% and 2% to 7% truck traffic (mainline peak hour). The Traffic Index (TI) design periods are 10, 20, and 40-year projections.

Table 4.5 Traffic Data – SOL 80 PM 41.4/R44.00

Year		Annual ADT	Peak Hour	TI (Lane 1)	TI (LANE 2-4)
Base Year	2016	142,000	12,900	N/A	N/A
Construction Year	2023	159,900	14,600	7.0	9.5
10 - Year	2033	185,500	16,900	11.0	13.0
20 - Year	2043	211,000	19,200	12.0	14.0
40 - Year	2063	262,100	23,900	13.0	15.0

Directional = 52%**;** Truck = 4.0%

Table 4.6 Traffic Data – YOL 80 PM 0.0/9.179

Year		Annual ADT	Peak Hour	TI (Lane 1)	TI (LANE 2-4)
Base Year	2016	146,500	13,000	N/A	N/A
Construction Year	2023	165,000	14,700	7.0	10.0
10 – Year	2033	191,300	17,000	11.5	13.5
20 – Year	2043	217,700	19,400	12.5	14.5
40 – Year	2063	270,400	24,100	13.5	15.5

Directional = 52%**;** Truck = 6.0

Table 4.7 Traffic Data – YOL 80 PM 9.179/9.905

Year		Annual ADT	Peak Hour	TI (Lane 1)	TI (LANE 2-4)
Base Year	2016	155,300	12,300	N/A	N/A
Construction Year	2023	174,900	13,800	7.0	10.0
10 - Year	2033	202,800	16,000	11.0	13.0
20 - Year	2043	230,800	18,200	12.0	14.0
40 - Year	2063	286,700	22,600	13.0	15.5

Directional = 57%**;** Truck = 5.0%

Table 4.8 Traffic Data – YOL 80 PM 9.905/R11.718 and SAC 80, PM M0.0 / M1.6

Year		Annual ADT	Peak Hour	TI (Lane 1)	TI (LANE 2-4)
Base Year	2016	92,200	7,470	N/A	N/A
Construction Year	2023	103,800	8,410	7.0	9.0
10 - Year	2033	120,400	9,750	10.5	12.5
20 - Year	2043	137,000	11,100	11.5	13.5
40 - Year	2063	170,200	13,800	12.5	14.5

Directional = 59%**;** Truck = 7.0%

Table 4.9 Traffic Data – YOL 50 0.0/3.156

Year		Annual ADT	Peak Hour	TI (Lane 1)	TI (LANE 2-4)
Base Year	2016	129,000	11,000	N/A	N/A
Construction Year	2023	142,500	12,100	6.5	9.0
10 - Year	2033	161,900	13,800	10.0	12.0
20 - Year	2043	181,200	15,400	11.0	13.0
40 - Year	2063	219,900	18,700	12.0	14.0

Directional = 57%**;** Truck = 4.0%

Table 4.10 Traffic Data – SAC 50 PM 0.0/L0.617

Year		Annual ADT	Peak Hour	TI (Lane 1)	TI (LANE 2-4)
Base Year	2016	232,300	20,700	N/A	N/A
Construction Year	2023	253,400	22,600	6.0	9.0
10 - Year	2033	283,600	25,200	10.0	12.0
20 - Year	2043	313,800	27,900	11.0	13.0
40 - Year	2063	374,200	33,300	12.0	14.0

Directional = 57%**;** Truck = 2.0%

See **Attachment F**, *Traffic Data & Designation*, for more information

Truck Volumes

- SOL-80 PM 41.4/R44.00: 6.7% Truck Volumes
- YOL-80 PM 0.0/9.179: 8.8% Truck Volumes
- YOL-80 PM 9.179/9.905: 7.4% Truck Volumes
- YOL-80 PM 9.905/R11.718 and SAC-80 PM M0.0/M1.6: 10% Truck Volumes

Bike/Pedestrian Volumes

The bike/pedestrian data is listed below. The total is for average weekday trips (Monday-Friday).

Table 4.11 Bike/Ped Data – Yolo Causeway

Time of Day	Bike Trips	Pedestrians Trips
Early AM (12am-6am)	0	4
Peak AM (6am-10am)	1	2
Mid-Day (10am-3pm)	2	4
Peak PM (3pm-7pm)	4	3
Late PM (7pm-12am)	1	3

Average Daily Bike Trip: 8 (33%)
Average Daily Pedestrian Trip: 16 (67%)

Traffic Collisions

The tables below show the Traffic Accident Surveillance and Analysis System (TASAS) from January 1, 2014 to December 31, 2016.

Table 4.12 Collision History - SOL 80 PM 40.899/R44.720

Collision History													
County	Route	PM	DIR	TOT	FAT	INJ	F+I	Actual			Average (Statewide)		
								FAT	F+I	TOTAL	FAT	F+I	TOTAL
SOL	80	40.899/ R44.720	WB & EB	188	3	63	66	0.004	0.12	0.35	0.006	0.18	0.51

Table 4.13 Collision History - YOL 80 PM 0.0/9.552

Collision History													
County	Route	PM	DIR	TOT	FAT	INJ	F+I	Actual			Average (Statewide)		
								FAT	F+I	TOTAL	FAT	F+I	TOTAL
YOL	80	0.0/ 9.552	WB & EB	754	3	261	264	0.002	0.18	0.52	0.009	0.30	0.86

Table 4.14 Collision History - YOL 80 PM 9.552/R11.718

Collision History													
County	**Route**	**PM**	**DIR**	**TOT**	**FAT**	**INJ**	**F+I**	**Actual**			**Average (Statewide)**		
								FAT	**F+I**	**TOTAL**	**FAT**	**F+I**	**TOTAL**
YOL	80	9.552/ R11.718	WB & EB	214	2	73	75	0.009	0.33	0.93	0.005	0.30	0.91

Table 4.15 Collision History - SAC 80 M0.0/M3.156

Collision History													
County	**Route**	**PM**	**DIR**	**TOT**	**FAT**	**INJ**	**F+I**	**Actual**			**Average (Statewide)**		
								FAT	**F+I**	**TOTAL**	**FAT**	**F+I**	**TOTAL**
SAC	80	0.0/ M3.156	WB & EB	217	1	71	72	0.003	0.21	0.64	0.005	0.22	0.66

Table 4.16 Collision History - YOL 50 PM 0.0/3.156

Collision History													
County	**Route**	**PM**	**DIR**	**TOT**	**FAT**	**INJ**	**F+I**	**Actual**			**Average (Statewide)**		
								FAT	**F+I**	**TOTAL**	**FAT**	**F+I**	**TOTAL**
YOL	50	0.0/ 3.156	WB & EB	402	4	151	155	0.010	0.38	0.99	0.003	0.23	0.72

Table 4.17 Collision History - SAC 50 PM 0.0/L0.617

Collision History													
County	**Route**	**PM**	**DIR**	**TOT**	**FAT**	**INJ**	**F+I**	**Actual**			**Average (Statewide)**		
								FAT	**F+I**	**TOTAL**	**FAT**	**F+I**	**TOTAL**
SAC	50	0.0/ L0.617	WB & EB	107	2	24	26	0.016	0.21	0.88	0.004	0.30	0.94

TASAS shows that accident rates for 2 of the 6 project segments described by the tables above in the three-year period between January 1, 2014 and December 31, 2016 have been higher than the statewide average for similar locations.

There were 1,882 recorded collisions throughout the project area, 15 of which were fatal and 650 that resulted in injury. Sixty-seven (67) percent of the total number of accidents are congestion related including rear-end and sideswipe. Fifty-three (53) percent of collisions happened during the AM and PM peak periods, including 22 percent of the collisions occurred during the most congested part of the commute period (4:00-6:00 pm). This collision pattern and collision time of day is typical for a freeway segment with heavy congestion and stop and go conditions.

The proposed improvements would increase capacity, improve mobility and traffic operations, and reduce congestion and delay. As a result, a reduction in the congestion type accidents and the overall accident rate would be expected.

5. DEFICIENCIES

The Yolo Bypass causeway is the only direct route for connecting the Davis area to West Sacramento and beyond. Heavy congestion and stop-and-go traffic have contributed to increased vehicle emissions, increased travel costs, increased emergency tie response, and reduced travel time reliability. The congestion has been created by multiple factors, including high traffic volumes, short weaving and merging areas, lane drops, limited sight distances, and incomplete bus/carpool, ramp metering, and auxiliary lane networks.

The termini to the bike and pedestrian crossing on each side of the causeway is deficient which increases safety and mobility issues. These deficiencies preclude average riders from using the bikeway and is generally used by more advanced riders, consequently ridership suffers and is much lower than it might otherwise be. Currently there are three entrance and exit points to the Yolo 80 bikeway (see Figure 5). The configuration of the eastern terminus requires that east/west bike and pedestrian traffic traverse around the backside of two gas stations in order to avoid several driveways of ingress and egress for automobile and commercial truck traffic. Bike and pedestrian traffic then has to cross four lanes of traffic in order to proceed eastbound on West Capitol Avenue. North/south bike and pedestrian traffic has to negotiate a freeway acceleration lane in order to get to the preferred north/south route.

Figure 5: Bikeway Termini

6. CORRIDOR AND SYSTEM COORDINATION

6A. Corridor Overview

Interstate 80 (I-80)
I-80 is a transcontinental interstate facility that is critical to regional and interregional traffic. I-80 serves as the only freeway connection between the San Francisco Bay Area and the Sacramento metropolitan region. The route also links the Bay Area with recreational destinations in the Sierra Nevada Mountains and points north via I-505 to I-5. As a result, I-80 is one of the most congested freeway facilities.

Primary providers of bus and rail transit include Amtrak, Fairfield/Suisun Transit, Vallejo Baylink Ferry, Solano Express Bus, Yolobus, and Greyhound Bus.

Bicycle and pedestrian accessbility is provided via the surrounding arterial network.

6B. Federal and State Planning

Route	Functional Classification	California Freight Mobility Plan (CFMP)	Trucking Designation	National Highway System (NHS)	Scenic Highway	Interregional Road System (IRRS)
I-80	1 – Interstate	Tier 1	STAA National Network	Interstate	No	Yes

I-80
Solutions for Congested Corridor Program (SCCR) Congested Corridor Plans (CCP's) represent a cooperative commitment to develop a corridor management vision for State owned and operated facilities. The I-80 East CCP identifies the 2040 corridor concept as an eight to 12-lane freeway with HOV/High Occupancy Toll (HOT) lanes.

6C. Regional Planning

The Sacramento Area Council of Governments (SACOG) is the federally designated Metropolitan Planning Organization (MPO) over Yolo County. The SACOG Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS) for the Sacramento region pro-actively links land use, air quality, and transportation needs. The MTP/SCS prioritizes investments that maintain, preserve, and make more efficient use of existing road and transit assets to help defer, or even eliminate, the need for some road capacity expansions. This emphasis on lower-cost operational improvements and right-sizing of road expansion projects is an important component of an MTP/SCS that achieves strong performance benefits with lower funding levels. The result is a more

multimodal transportation system that makes better use of existing capacity and supports the fix-it-first initiative of this plan.

The MTP/SCS invests approximately $2 billion of the road capacity budget in projects that will primarily be carried out by Caltrans. The investment focus is on strategic new carpool lanes, auxiliary lanes, and interchanges along the freeway system. Collectively, these investments serve travel between activity centers and accommodate trucks for inter-regional goods movement. Fixing bottlenecks along trucking corridors is important for effective movement of goods throughout the region and for traffic management.

As part of the 2020 SACOG MTP/SCS update, SACOG is prioritizing economic growth by promoting strong housing and jobs growth, and multiple transportation options to connect people with places. As a result, the plan will be forecasting less time spent in congestion, cleaner air, fewer GHG emissions per capita, a modernized, more productive transit system, and more ways for residents to choose walking or cycling for some of their daily trips. To accomplish this vision, SACOG is promoting four major policy topics, along with strategies, that are supported by their Board of Directors.

1. New Mobility and Transit
2. Transportation Revenues and Pricing
3. Growth and Land Use Pattern
4. Investment Priorities

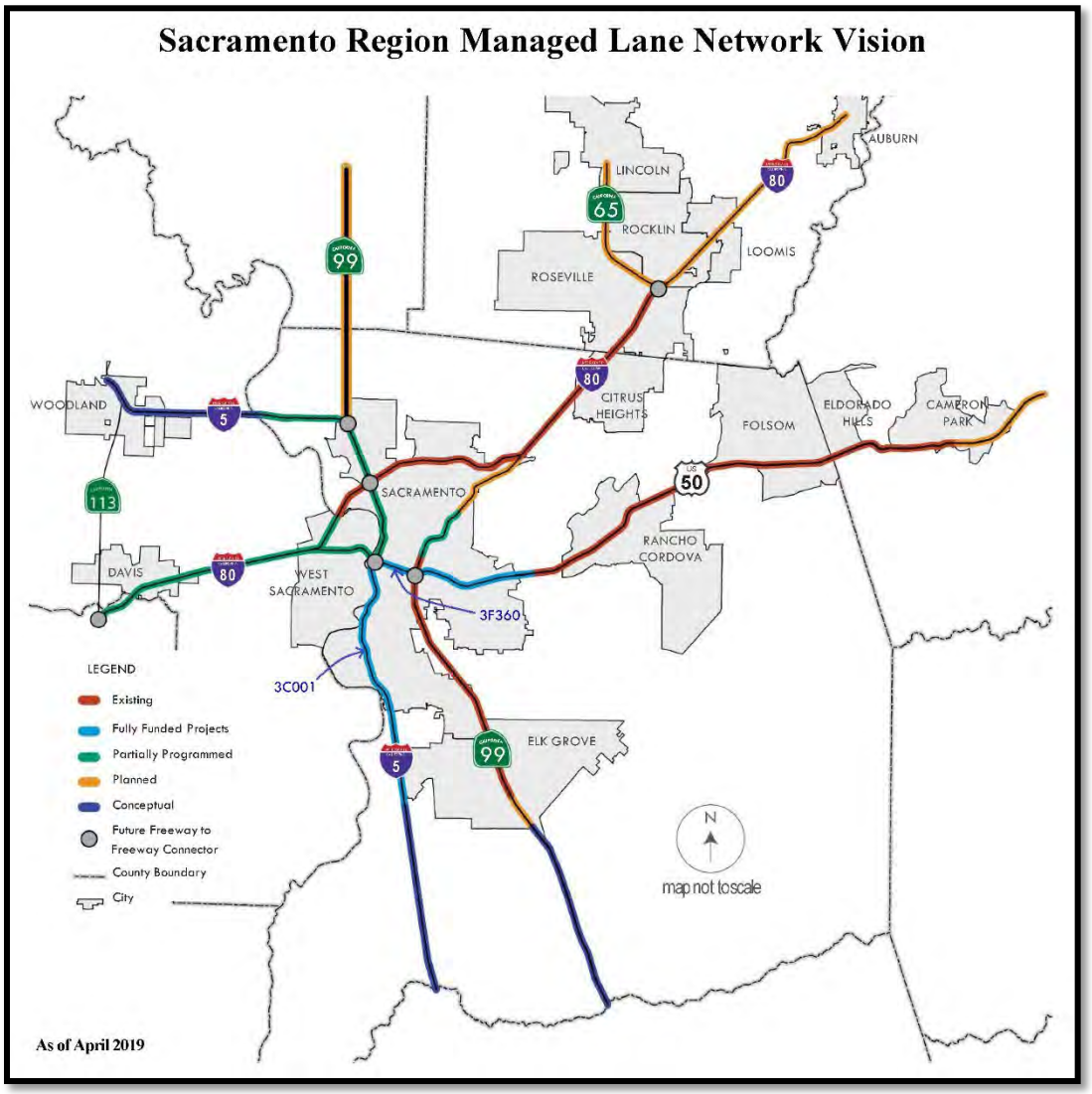
Specifically, for the transportation revenues and pricing, SACOG is looking at Caltrans' managed lane projects to lead the revenue and pricing effort. SACOG sees the pricing mechanisms as a critical component of the regional strategy to raise revenue sufficient to build and maintain the region's transportation system, provide mobility benefits to residents, managed traffic and congestion, and help to achieve the state-mandated GHG reduction targets. The full scope of the Yolo County section of the project is anticipated to be included in the fiscally constrained section of the 2020 MTP/SCS.

The Solano County section of the project is located within the Metropolitan Transportation Commission (MTC). MTC functions as both the State designated Regional Transportation Planning Agency (RTPA) and federally designated Metropolitan Planning Organization (MPO). As such, it is responsible for the update of the Regional Transportation Plan (RTP), a financially constrained long range programming report for the region. Under Senate Bill (SB) 375, along with an updated RTP, each region in California must develop a Sustainable Communities Strategy (SCS) that promotes walk and bike-friendly mixed-use commercial and residential development that is found close to mass transit, jobs, schools, shopping, parks, recreation, and other amenities. The 2017 RTP does not include managed lanes between the Kidwell Road interchange and the Yolo County line. We will need to work with Caltrans District 4 and MTC to include the Solano County portion of the project in their 2019 RTP update.

MTC is scheduled to begin their next RTP update in late 2019, also referred as Plan Bay Area 2050, which will provide a roadmap and transportation investment strategy to accommodate projected household and employment growth in the nine-county Bay Area.

This freeway segment is identified as requiring capital improvements in the Corridor System Management Plans (CSMPs), the SACOG's MTP/SCS, the Sacramento Region Managed Lane Network Vision, and the I-5 Transit Corridor Report (TCR).

Figure 6: Sacramento Region Managed Lane Network Vision



6D. Local Planning

Three of the District 3 major Planning documents that validate the Corridor and System coordination for this project are the I-80 Corridor System Management Plan (CSMP), Transportation Corridor Concept Report (TCCR) and the 2017 Metropolitan Transportation Plan/Sustainable Communities Strategy (MTP/SCS). All three of these documents are recognized, significant and certified Planning documents that confirm the necessity to build this project.

The Solano Transportation Authority (STA) is the Congestion Management Agency for the Solano area. STA is responsible for countywide transportation planning, programming transportation funds, managing and providing transportation programs and services, delivering transportation projects, and setting transportation priorities.

Caltrans District 3 will be working with Solano Transportation Authority (STA), Metropolitan Transportation Commission (MTC), and Caltrans District 4 to amend the Solano County bus/carpool lane section into the MTC's MTP, approximately 3.4 miles of the proposed 21.3 miles of bus/carpool lanes. Caltrans District 3 is working with SACOG to amend the full project scope into the 2020 MTP/SCS.

6E. Future Projects

This section is divided into three sections – District 3 Projects, Project Funded by Others, and District 4 projects.

Adjacent Projects
The following projects are within or near the project vicinity.

District 3 Projects

<u>03-4F650 YOL-80, 50-PM 4.3/11.4, 0.0/2.5</u>
This project will improve the safety and reliability of the existing facility. Improvements include rehabilitation of pavement and drainage, and operational improvements, including fiber optic communications, Changeable Message Signs (CMS), Closed Camera Television (CCTV), Ramp Metering (RM), and detection. The work is expected to require right of way acquisition in the form of Temporary Construction Easements from industrial and commercial properties. There are Union Pacific Railroad Company tracks under the Lake Washington OH that will be affected by the widening of the bridge. A Temporary Construction Easement or Right of Entry from the railroad may also be needed.

This project also proposes to widen 3 structures along the median: (1) West Capital Ave UC (Yol 80 PM 10.16), (2) Lake Washington OH (Yol 80 PM 10.62), and (3) Reed Ave UC (Yol 80 PM 11.21).

It is intended to combine this project with the Managed Lanes project (03-3H900). This project is programmed for construction in Year 2024.

03-0F250 YOL/SAC -80-R11.1/11.72, M0.00/M0.5
This project is to rehabilitate the Sacramento River Bridge and Overhead (BOH), Br.# 22-0026 L/R, on Interstate 80 at the Yolo/Sacramento County Line in West Sacramento about three miles west of Interstate 5. The project will also restripe the bridge to provide 2' inside shoulder and 10' outside shoulder. Features to accommodate project 03-3H900 will be incorporated on the 03-0F250 project. Those features include drainage system improvements, barrier pedestals for lights, overhead signs, reduced lane width, and a further narrowing of the shoulder width to help accommodate the managed lanes. This project is programmed for construction in Year 2020.

03-3H330 SAC-50-80-PM L0.0/17.5, 9.2/R9.522
This project is on US 50 in and near the cities of Sacramento, Rancho Cordova, and Folsom, from the Yolo/Sacramento County line to Folsom Boulevard; and in Yolo County in West Sacramento along US 50, from I-80/US 50 interchange to the Yolo/Sacramento County line (PM 0.0 to 3.156), and on I-80 from Enterprise Boulevard to US 50 (PM 9.2 to R9.552). Install Transportation Management System (TMS) field elements. This project is programmed for construction in Year 2021. Project 03-4F650 and 03-3H330 overlapping project scope will be coordinated.

03-3F360 SAC-50-PM 0.2/6.1
This project will construct High Occupancy Vehicle (HOV) lanes on US 50 from the existing HOV lanes at Watt Ave to the Pioneer Bridge, connecting to the eastern limit of the proposed Managed Lanes project on I-80/US 50 (03-3H900). This project is programmed for construction in Year 2020.

03-3C001 SAC-5-PM 9.7/24.9
This project will rehabilitate the roadway, construct HOV lanes, and install fiber optic cable on I-5, south of Elk Grove Overcrossing to US 50 at the American River Bridge (Br.# 24-0068. This project has been combined for construction in the 03-0H10U4. This project is programmed for construction in Year 2018.

See **Attachment R**, *List of Projects*, for more information on Caltrans projects within project vicinity.

Projects Funded by Others

City of Davis – West Davis Active Adult Community Project

- The City of Davis is annexing Land from Yolo County and rezoning land from Agricultural intensive to Medium density residential, high density residential, residential greenspace overlay, urban agriculture transition area, and mixed use. This will pave the way for 325 single family homes, 260 of which are for senior citizens, and an additional 150 are affordable senior apartments. The project also includes an approximately 3-acre activity and wellness center. The project is on a site north of Covell Blvd., west of SR 113, at the intersection of Shasta Drive and West Covell Blvd.

- The City of Davis, in cooperation with Caltrans, has completed a PSR-PDS that evaluates the safety and operational functions of the interchange at Richards Blvd. and I-80. The City of Davis proposes to reconfigure the westbound ramps to a tight diamond (L-1 configuration), improve the operations at the Olive Drive intersection by adding turn lanes and increasing the intersection spacing, and providing a safer and more user-friendly route through the interchange by eliminating the free traffic movements from the existing cloverleaf ramps and converting the existing 5-foot sidewalk to a barrier separated by a 12-foot two-way pathway. The westbound Olive Drive off-ramp is proposed to be closed as part of this project.

- The Nishi Project (700 residential units) was proposed for development adjacent to Highway 80 and the railroad, but was voted down by the residences of Davis recently. Similarly, the Mace Ranch Innovation Center Project (2,654,000 square feet of innovation center uses north of the UPR tracks and East of Mace Blvd) was withdrawn. However, these two projects are expected to be resurfaced in the next 5 years. It is hard to speculate what they will look like at that point though.

City of Woodland – Woodland Research & Technology Park Specific Plan

The City of Woodland is pursuing a specific plan detailing a commercial mixed-use town center with 2.15 million sq ft of non-residential building space for approx. 6,100 employees and 1,600 housing units. The project is located in the southern portion of the City's planning area, adjacent to the existing City limits, in an area bound by Farmers Central Road to the north, County Road 101 to the east, SR 113 to the west, and County Road 25A to the South.

UC Davis – UC Davis Long Range Development Plan (LRDP)

The proposed 2017 LRDP EIR functions as a program Environmental Impact Report (EIR) that can be used in the environmental review of subsequent campus development projects during implementation of the LRDP. The EIR will provide a project-specific analysis of the potential effects associated with the development of housing for approximately 1,625 students within West Village and 500 net new employee housing units.

City of West Sacramento -- Sycamore Trail Pedestrian Overcrossing.
The City of West Sacramento is proposing to construct a pedestrian overcrossing connecting Joey Lopes Park to the north of US 50 with the Westmore Oaks Elementary School to the south of Highway 50. The work within the State right-of-way would include construction of a single reinforced concrete pier supported on a large diameter cast-in-drilled-hole concrete pile in the median of US 50. The planned overcrossing is halfway between Harbor Blvd (to the west) and West Acre Road (to the east). There have been numerous community meetings in regard to this project.

City of West Sacramento – West Sacramento Rail Realignment

- The Yolo Rail Realignment Project proposes to relocate the existing rail access from the Union Pacific Railroad Mainline from its current alignment along the eastern edge of West Sacramento to a new location west of the I-80/US-50 split. The project will allow for the West Sacramento riverfront to fully realize its redevelopment potential, alleviate significant traffic impact from the existing freight rail alignment, and provide for the opportunity to expand freight rail service to West Sacramento's industrial areas with minimum community impact.

- It has been proposed to combine a new railroad overhead under I-80, as part of the combined projects 03-4F650 and 03-3H900 between the Yolo Causeway and Enterprise Boulevard to tie in to existing tracks leading to/from the Port of West Sacramento. This will be discussed further of its practicality during the environmental phase. The Port of West Sacramento will provide plans, specifications, and estimate for the railroad overhead. Any exchange of services with the Port of West Sacramento will require cooperative agreement.

Potential Active Transportation Project
This potential project includes the construction of active transportation elements on County Road (CR) 32A to improve bike path connectivity between CR 105 (just east of the City of Davis) and the western terminus of the proposed new bicycle/pedestrian structure of the Managed Lanes project (03-3H900). Funding contribution for this proposed project would be through a Cooperative Agreement with the local agency pursuing this scope of work.

See **Attachment K**, *Transportation Planning Scoping Information Sheet*, for more information.

District 4 SHOPP Projects

The listed projects below are located in the project's vicinity and included in the State Highway Operation and and Protection Program (SHOPP), the State's "fix-it-first" program that funds the repair, safety improvements, some highway operational improvements, and preservation of the State Highway System (SHS).

County	Route	Target Program	EA	Description	Cost	Construction Date
SOL	80	2020Rehabililitate pump elements and controls SHOPP	0J600	In and near Vallejo, Dixon and Vacaville, at Route 80/29 Separation Bridge No. 23-0087, McCune Creek Bridge No. 23-0084L/R and Horse Creek Bridge No. 23-0077L. Bridge preventative maintenance.	$4.6M/$$$	2019
SOL	Var	2020 SHOPP	0P760	In Solano County on various route (Rte. 37, 80 & 780) at various location - Install Rectangular Rapid Flashing Beacons (RRFB)	$1.6M/$$$	2022/23
SOL	Var	2020 SHOPP		Install best management practices (storm water mitigation) at Route 37, 80, 780, 101, 121	$9.5M/$$$$	2023/24
Var	Var	2020 SHOPP		Rehabilitate pump elements and controls at Sr 13 North/I-80 Separation (Pump ID 23-0185W)	$1.1M/$$	2022/23

7. ALTERNATIVES

There are 7 alternatives proposed for this project. Technical Memorandum will be prepared to document scope decisions made on the project.

The Yolo 80 Corridor Improvement Project Steering Committee convened the first meeting on May 30, 2019 in the West Sacramento City Hall. The steering committee was briefed on the project and the group provided input to the project that will be considered during the PA&ED phase of the project. The input consisted of the following:

- Auxiliary lane from southbound 113 to eastbound I- 80 and Richards Blvd
- Convert one existing general-purpose lane in each direction to managed lanes
- Westbound 80 Auxiliary Lane from Jefferson Blvd to Harbor Blvd

- Transit connectivity to mainline

Alternative 1A:
This alternative proposes to construct approximately 21 miles of Managed Lanes in both directions from the Kidwell Road overcrossing in Solano County to the US 50/I-5 and I-80/West El Camino Ave. interchanges in Sacramento County to alleviate bottlenecks and address an increase in travel demand. This alternative also proposes to construct a new separate, bicycle/pedestrian structure adjacent to and north of the existing Yolo Causeway structure. The proposed separate bicycle/pedestrian structure lacks access in case of emergency and regular maintenance.

Segment 1 (Kidwell Road in eastern Solano County, through Davis, to the eastern end of the Yolo Causeway just east of Enterprise Boulevard in West Sacramento)

Segment 1a (Kidwell Road to Solano/Yolo County Line)

Segment 1a includes the following:
- Convert one existing inside lane in each direction to Managed Lanes. Restripe using 6" thermoplastic stripes;
- Upgrading and/or install ITS elements, such as fiber optics, detection, changeable message signs to enhance mobility conditions and incident management strategies between jurisdictions;
- Culvert rehabilitation and extension;
- Upgrading overhead sign structures; and
- Edge of pavement to edge of pavement overlay using 0.1' RHMA-O.

Segment 1b (Solano/Yolo County Line to west end of the Yolo Causeway)

Segment 1b includes the following:
- Replace existing outside shoulder and widen to the outside of existing pavement from Solano/Yolo County line to Chiles Road and widen to the inside from Richards Blvd. to 1.5 miles east of Mace Blvd. to accommodate Managed Lanes in the westbound (WB) and eastbound (EB) directions. The new shoulders and widening areas are assumed to be AC material;
- Upgrade median barriers from MBGR to Concrete Barrier Type 60;
- Restripe with six-inch (6 in.) thermoplastic traffic stripe for three mixed-flow lanes and one Managed Lane in each direction (Westbound and Eastbound);
- Realign the beginning of the EB off ramp at Mace Boulevard in the City of Davis;
- Upgrade and/or install ITS elements, such as fiber optics, detection, changeable message signs to enhance mobility conditions and incident management strategies between jurisdictions.
- Culvert rehabilitation;
- Reconstruction of curb ramps to meet ADA standards at Mace Boulevard in the City of Davis;
- Construction of new maintenance vehicle pullouts;

- Upgrade overhead sign structures; and
- Edge of pavement to edge of pavement overlay using 0.1' RHMA-O except under Mace Blvd.

Segment 1c *(From the start of the* Yolo Causeway to east of Enterprise Boulevard)

Segment 1c includes the following:

- Bridge deck rehabilitation at locations where existing concrete median barrier is removed, which would include removing the existing bike lane and restriping to accommodate Managed Lanes;
- Remove existing concrete median barrier;
- Construct a new Type 60 concrete median barrier;
- Restripe with six-inch (6 in.) thermoplastic traffic stripe for three mixed-flow lanes and one Managed Lane in each direction (Westbound and Eastbound);
- Construction of a new separate, bicycle/pedestrian structure, measuring approximately 3.2 miles long and 18 feet wide, adjacent to and north of the existing Yolo Causeway structure;
- Construction of improvements at the bikeway/pedestrian eastern terminus at Enterprise Boulevard/West Capitol Avenue in West Sacramento. These improvements would consist of a new bike path overlay, lighting, drinking fountains, benches, etc.; and
- Edge of pavement to edge of pavement overlay using 0.1' RHMA-O.

Segment 2 (east of Enterprise Boulevard and continues on I-80 to West El Camino Avenue)

Segment 2 includes the following:

- Construct a new westbound and eastbound Managed Lane Connector at the US 50/I-80 Separation in West Sacramento;
- Restripe with six-inch (6 in.) thermoplastic traffic stripe for three mixed-flow lanes and one Managed Lane in each direction (Westbound and Eastbound);
- Restripe the Sacramento River Bridge and overhead (Bryte Bend Bridge) to accommodate an additional Managed Lane in each direction. This will be accomplished by striping a fourth lane on the Sacramento River Bridge (Bryte Bend) by reducing lane and shoulder widths. The bridge striping will change from 3 lanes (2-12' lanes and 1-11.5' lane) to 4 lanes (4-11' lanes) with 1' inside and 2.5' outside shoulders. The following measures will be considered during the PA&ED phase:

    - Bridge deck lighting with Type 21 Barrier-Rail-Mounted Lighting Standards, will be installed where warranted.
    - A Dynamic Lane Assignment System will be utilized as it relates to the Transportation System Management and Operation. A Dynamic Speed Limit may be utilized as warranted to enhance traffic safety. The Dynamic Lane Assignment and Dynamic Speed Limit could be activated when disabled vehicles are blocking lanes or during periods of extreme inclement weather.
    - Response management will be enhanced to reduce delays by warning/informing

motorists of real-time unexpected conditions on the Sacramento River Bridge by utilizing Closed-Circuit-Television (CCTV) and Advanced Warning Changeable Message Signs.

- Construct EB ramp improvements and a Park and Ride facility at Enterprise Boulevard;
- Relocate Utilities- if necessary; and
- Edge of pavement to edge of pavement overlay using 0.1' RHMA-O.

Segment 3 (starts at the I-80/US 50 Separation and continues east along US 50 to I-5 near downtown Sacramento)

Segment 3a (I-80/US 50 Separation to Jefferson Blvd. Undercrossing)

Segment 3a includes the following:
- Convert one mixed flow lane in each direction to Managed Lanes;
- Widen US 50 to the outside using AC material from PM 0.16 to PM 0.72 with AC material to accommodate Managed Lane in each direction of travel.

Segment 3b (Jefferson Blvd. Undercrossing to just east Interstate 5)

Segment 3b includes the following:
- Restriping to add a Managed Lane in each direction; and,
- Restriping the Jefferson Boulevard undercrossing (Br. No. 22-0106 L/R) and Sacramento River Viaduct (Br. No. 24-0014 R/L) between Jefferson Boulevard and the I-5/US 50 interchange to add an additional managed lane in each direction; and
- Upgrade overhead sign structures.

See **Attachment C**, *Typical Cross Sections*, for more information.

The current capital cost estimate for this alternative is approximately $450 M and will take three years to complete.

Alternative 1B:

This alternative is similar to Alternative 1A except the bicycle and pedestrian access across the Yolo Bypass will be provided by either widening the existing Yolo Causeway structures or attaching lightweight structure to them, in lieu of constructing a separate bicycle/pedestrian structure. This option would be more expensive than the structure in Alternative 1A due to the need to seismic retrofit the existing Yolo Causeway. Also, this would prove to have less environmental impact in the Yolo Bypass wetland area and address the safety / security / emergency access concerns. Additional earthwork would be needed on the westbound side of I-80 in the berm area within the Yolo Bypass between the two Causeway structures. This alternative will be examined more closely in the PA&ED phase.

See **Attachment C**, *Typical Cross Sections*, for more information.

The current capital cost estimate for this alternative is approximately $610 M and will take three years to complete.

Alternative 1C:
This alternative is similar to Alternative 1A except it does not include the construction of a new separate pedestrian/bicycle structure, adjacent to the north of the existing Causeway structure. The existing pedestrian/bicycle structure will remain unchanged. Restripe the Yolo Bypass Causeway with six-inch (6 in.) thermoplastic traffic stripe for three mixed-flow lanes and one Managed Lane in each direction (Westbound and Eastbound). This alternative would be the least expensive of the structures in Alternative 1A and Alternative 1B. Also, this would prove to have the least environmental impact in the Yolo Bypass wetland area and address the safety / security / emergency access concerns on the new bike/ped bridge.

See **Attachment C**, *Typical Cross Sections*, for more information.

The current capital cost estimate for this alternative is approximately $290 M and will take three years to complete.

Alternative 1D:
This alternative is similar to alternative 1A except it proposes to widen the roadway in the median instead of converting existing mixed flow lanes to managed lanes in Solano County (Segment 1a). This alternative will be examined more closely in the PA&ED phase. No cost estimate was developed.

Alternative 2:
This is an "interim" phase to help ease congestion until the necessary funding is available for the expansion and ultimate build-out of the corridor. This alternative proposes to construct a reversible managed lane from approximately 0.5 mile west of Solano/Yolo County Line west of the City of Davis to the Enterprise Blvd. in West Sacramento. It is also proposed to continue eastward and restripe the segment from Enterprise Blvd. to the US 50/I-5 in Sacramento County.

During the off-peak, a quick moveable barrier (QMB) will be deployed to convert the new eastbound lane into a barrier separated contraflow lane to accommodate westbound AM commute. After the morning commute, the barrier will be transferred back, and the lane will be returned for eastbound use. The lane would also be used on weekends to accommodate peak traffic flows.

Designated entrance areas will be provided to the thru traffic to enter the proposed reversible lane. Also, traffic in the reversible lane will be able to exit through designated exist areas. Buses will conveniently utilize access points east of Mace Blvd. to enter and exit the reversible lane. Location of those designated entrance and exist areas will be determined during the PA&ED phase.

This alternative includes the following:

Segment 1a (0.5 mile west of the Solano/Yolo County line to Solano/Yolo County Line)

Segment 1a includes the following work items:
- Replacing existing inside shoulder, widening to the inside in the eastbound direction, and restriping to accommodate a new reversible managed lane. The new shoulders and widening areas are assumed to be AC material;
- Removing existing MBGR and constructing Type 60 concrete median barrier;
- Upgrading and/or install ITS elements, such as fiber optics, detection, changeable message signs to enhance mobility conditions and incident management strategies between jurisdictions;
- Culvert rehabilitation and extension;
- Upgrading overhead sign structures; and
- Installing quick moveable barrier (QMB); and
- Edge of pavement to edge of pavement overlay using 0.1' RHMA-O.

Segment 1b (Solano/Yolo County Line to west end of the Yolo Causeway)

Segment 1b includes the following:
- Widen eastbound to the inside from Richards Blvd. to 1.5 miles east of Mace Blvd. to accommodate Managed Lanes in the WB and EB directions;
- Upgrade median barriers from MBGR to Reinforced Concrete Barrier;
- Restripe with six-inch (6 in.) thermoplastic traffic stripe for three mixed-flow lanes and one Managed Lane in eastbound direction;
- Upgrade and/or install ITS elements, such as fiber optics, detection, changeable message signs and ramp meters to enhance mobility conditions and incident management strategies between jurisdictions;
- Culvert rehabilitation and extension;
- Upgrade overhead sign structures; and
- Install quick moveable barrier (QMB).
- Edge of pavement to edge of pavement overlay using 0.1' RHMA-O except under Mace Blvd.

Segment 1c (Yolo Causeway area)

Segment 1c includes the following elements:
- Remove existing concrete median barrier;
- Bridge deck rehabilitation at locations where existing barrier is removed;
- Install quick moveable barrier (QMB); and
- Edge of pavement to edge of pavement overlay using 0.1' RHMA-O on berm section (PM 6.36 to 7.25).

Segment 2 (east of Enterprise Boulevard and continues on I-80 to West El Camino Avenue)

No work is proposed on this segment.

Segment 3 (starts at the I-80/US 50 Separation and continues east along US 50 to I-5 near downtown Sacramento)
Segment 3a (I-80/US 50 Separation to Jefferson Blvd. Undercrossing)

Segment 3a includes the following:
- Restripe to convert one mixed flow lane in each direction to Managed Lanes;

Segment 3b (Jefferson Blvd. Undercrossing to just east Interstate 5)

Segment 3b includes the following:
- Restriping to add a Managed Lane in each direction; and,
- Restriping the Jefferson Boulevard undercrossing (Br. No. 22-0106 L/R) and Sacramento River Viaduct (Br. No. 24-0014 R/L) between Jefferson Boulevard and the I-5/US 50 interchange to add an additional managed lane in each direction; and
- Upgrade overhead sign structures.

See **Attachment C**, *Typical Cross Sections*, for more information.

The current capital cost estimate for this alternative is $100 M and will take one year to complete. In addition, there will be a maintenance cost of $1 M annually.

Alternative 3:
This interim alternative would start from Solano/Yolo County Line west of the City of Davis to West El Camino Avenue on I-80 and Interstate 5 (I-5) on US 50 in Sacramento County, approximately 16 miles. This alternative proposes to construct managed lanes in both directions, eastbound and westbound. This would be accomplished by widening in the median from Solano/Yolo County line to west of the Yolo Causeway and continues eastward by restriping to West El Camino Avenue on I-80 and I-5 on US 50 in Sacramento County

This alternative includes the following:

Segment 1b (Solano/Yolo County Line to west end of the Yolo Causeway)

Segment 1b includes the following elements:
- Replacing existing inside shoulders and widen eastbound and westbound to the inside from Richards Blvd. to 1.5 miles east of Mace Blvd. to accommodate Managed Lanes in the WB and EB directions. The new shoulders and widening areas are assumed to be AC material;
- Upgrade median barriers from MBGR to Reinforced Concrete Barrier;
- Restripe with six-inch (6 in.) thermoplastic traffic stripe for three mixed-flow lanes and one Managed Lane in each direction (Westbound and Eastbound);

- Upgrade and/or install ITS elements, such as fiber optics, detection, changeable message signs to enhance mobility conditions and incident management strategies between jurisdictions;
- Culvert rehabilitation and extension;
- Upgrade overhead sign structures; and
- Edge of pavement to edge of pavement overlay using 0.1' RHMA-O except under Mace Blvd.

Segment 1c (Yolo Causeway area)

Segment 1c includes the following elements:

- Restripe with six-inch (6 in.) thermoplastic traffic stripe for three mixed-flow lanes and one Managed Lane in each direction (Westbound and Eastbound).

Segment 2 (east of Enterprise Boulevard and continues on I-80 to West El Camino Avenue)
Segment 2 includes the following:

- Restripe with six-inch (6 in.) thermoplastic traffic stripe for three mixed-flow lanes and one Managed Lane in each direction (Westbound and Eastbound);
- Restripe the Sacramento River Bridge and overhead (Bryte Bend Bridge) to accommodate an additional Managed Lane in each direction. This will be accomplished by striping a fourth lane on the Sacramento River Bridge (Bryte Bend) by reducing lane and shoulder widths. The bridge striping will change from 3 lanes (2-12' lanes and 1-11.5' lane) to 4 lanes (4-11' lanes) with 1' inside and 2.5' outside shoulders. The following measures will be considered during the PA&ED phase:

    - Bridge deck lighting with Type 21 Barrier-Rail-Mounted Lighting Standards, will be installed where warranted.
    - A Dynamic Lane Assignment System will be utilized as it relates to the Transportation System Management and Operation. A Dynamic Speed Limit may be utilized as warranted to enhance traffic safety. The Dynamic Lane Assignment and Dynamic Speed Limit could be activated when disabled vehicles are blocking lanes or during periods of extreme inclement weather.
    - Response management will be enhanced to reduce delays by warning/informing motorists of real-time unexpected conditions on the Sacramento River Bridge by utilizing Closed-Circuit-Television (CCTV) and Advanced Warning Changeable Message Signs.

- Construct EB ramp improvements and a Park and Ride facility at Enterprise Boulevard;
- Relocate Utilities- if necessary; and
- Edge of pavement to edge of pavement overlay using 0.1' RHMA-O.

Segment 3 (starts at the I-80/US 50 Separation and continues east along US 50 to I-5 near downtown Sacramento)

Segment 3a (I-80/US 50 Separation to Jefferson Blvd. Undercrossing)

Segment 3a includes the following:

- Restripe to convert one mixed flow lane in each direction to Managed Lanes;

Segment 3b (Jefferson Blvd. Undercrossing to just east Interstate 5)

Segment 3b includes the following:

- Restriping to add a Managed Lane in each direction; and,
- Restriping the Jefferson Boulevard undercrossing (Br. No. 22-0106 L/R) and Sacramento River Viaduct (Br. No. 24-0014 R/L) between Jefferson Boulevard and the I-5/US 50 interchange to add an additional managed lane in each direction; and
- Upgrade overhead sign structures.

See **Attachment C**, *Typical Cross Sections,* for more information.

The current capital cost estimate for this alternative is approximately $120 M and will take two years to complete.

Alternative 4:

This interim alternative proposes to extend the HOV lanes from the I-80/West El Camino Interchange to west of Reed Avenue. This will be accomplished by striping a fourth lane on the Sacramento River Bridge (Bryte Bend) by reducing lane and shoulder widths. The bridge striping will change from 3 lanes (2-12' lanes and 1-11.5' lane) to 4 lanes (4-11' lanes) with 1' inside and 2.5' outside shoulders. This alternative will help to relieve traffic congestion at the Bryte Bend Bridge due to vehicles exiting at Reed Avenue in the westbound direction and vehicles entering at Reed Avenue in the eastbound direction during peak hour traffic.

Similar to Alternative 1A, the following measures will be considered during the PA&ED phase:

- Bridge deck lighting with Type 21 Barrier-Rail-Mounted Lighting Standards, will be installed where warranted.
- A Dynamic Lane Assignment System will be utilized as it relates to the Transportation System Management and Operation. A Dynamic Speed Limit may be utilized as warranted to enhance traffic safety. The Dynamic Lane Assignment and Dynamic Speed Limit could be activated when disabled vehicles are blocking lanes or during periods of extreme inclement weather.
- Response management will be enhanced to reduce delays by warning/informing motorists of real-time unexpected conditions on the Sacramento River Bridge by utilizing Closed-Circuit-Television (CCTV) and Advanced Warning Changeable Message Signs.

  The current capital cost estimate for this alternative is approximately $16 M and will take a year to complete.

Alternative 5:
This alternative is similar to Alternative 1A except it proposes to use the managed lanes exclusively for public transit use. This alternative will be examined closely at the PA&ED phase.

Alternative 6:
This alternative is similar to Alternative 1A except it proposes to construct two managed lanes in each direction. This alternative will be examined closely at the PA&ED phase.

Alternative 7: (No build)
This alternative does not meet project need and purpose.

LIFE-CYCLE COST ANALYSIS

A life-cycle cost analysis (LCCA) will be completed in the PA&ED phase of the project to study the pavement investment. LCCA is an analytical technique that uses engineering economic principles to evaluate long-term investment options. The analysis enables total cost comparison of competing pavement alternatives with equivalent benefits.

DESIGN EXCEPTIONS

Preparation and approval of the Fact Sheet for Exceptions to Design Standards (or the Design Decision Document), will be deferred until the PA&ED phase when more accurate topographic, utility, environmental, and right of way information is known. This project was approved by the approval authorities, Laurie Lammert, Chief, Office of Design South, Jesse Garcia, District 3 Design Liaison and Timothy Sobelman, Headquarters Project Delivery Coordinator.

Alternative	Standard (HDM index, DIB, TOPD, etc.)	Nonstandard Feature and its Risk Rating of Not Being Approved	Justification for the Approval Risk Rating and Additional Data/Studies needed for Approval
Alternative **1A, 1B, 1C, 1D, 4, 5, 6.**	**Topic 302 -Highway Shoulder Standards, HDM 302.1- Width: the shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulder on highways. Table 302.1 mandates that for freeways and expressways the paved shoulders shall be 10'.** **Note 1: Total number of lanes in both direction including separate roadways (see Index 305.6). If a lane is added to one side of a 4-lane facility (such as a truck climbing lane) then that shall have 10 feet left and right shoulders. See Index 62.1.**	**Nonstandard Feature:** It is proposed to narrow the existing shoulder in five locations: First location is on the Sacramento River BOH (Bryte Bend Br.) on Interstate 80 at the Yolo / Sacramento County Line. The existing net deck width is 49' per direction. It comprises of 3-12' lanes with 5' inside shoulder and 8' outside shoulder	**Justification for the Approval Risk Rating:** The proposed shoulder widths are nonstandard. According to Structures, widening the bridge is not structurally feasible because the existing structure could not handle the extra dead load – especially after the heftier barriers are built in project 03-0F2501. The added Managed Lane will improve Traffic Movements on the bridge deck. Beyond the bridge

	(First Location – Sacramento River BOH - aka., Bryte Bend Bridge)	shoulders. The proposed is 4-11' lanes with 1' inside shoulder and 2.5' outside shoulders. **Risk Rating of Not Being Approved:** **A Design Standard Decision Document for this location has been approved (9/26/18)**	deck, the shoulders would be the standard 10' width. The traffic data and accident analysis for the latest 3 years show head-on (1%), sideswipe (23%), rear end (41%), broadside (2%), hit object (26%), overturn (5%), auto-pedestrian (1%), and other collisions (1%). The data shows mostly rear end collisions, which non-standard shoulder widths have not been a contributing factor. To enhance safety, additional lighting may be added along the bridge. Dynamic Lane Assignment and Dynamic Speed Assignment strategies may be implemented to increase system reliability. In addition, Incident Response Management contract may be added to reduce delays and improve safety by warning/informing the motorist public of real-time unexpected conditions ahead. **Additional Data/Studies needed for Approval:** 1. Future Risk Analysis by Traffic Safety 2. Collision analysis and collision diagram at locations of proposed nonstandard shoulder. 3. Summary of constraints and support.
1A, 1B, 1C,1D, 5, 6.	**Topic 302 -Highway Shoulder Standards, HDM 302.1- Width: the shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulder on highways. Table 302.1 mandates that for freeway and expressways the outside paved shoulder shall be 10'.** **Note 1: Total number of lanes in both direction including separate roadways**	**Nonstandard Feature:** The second location is on the Sacramento River Viaduct (Pioneer Br.) on US 50 in West Sacramento. The net deck width of the Sacramento River Viaduct is 63 feet per direction, where	**Justification for the Approval Risk Rating:** The proposed shoulders are nonstandard. It is not reasonable to widen the highway through the structure limits to provide standard width at this location. The traffic data and accident analysis for the latest 3 years show

	(see Index 305.6). If a lane is added to one side of a 4-lane facility (such as a truck climbing lane) then that shall have 10 feet left and right shoulders. See Index 62.1. Second Location - Sacramento River Viaduct (Pioneer Br.)	there will be five 11' wide lanes. The shoulders will be changed from 5 feet to 2 feet wide on the inside and 10 feet to 6 feet on the outside, which does not meet current standards. **Risk Rating of Not Being Approved:** **LOW**	head-on (4%), sideswipe (38%), rear end (39%), broadside (1%), hit object (16%), and other collisions (2%). The data shows mostly rear end and sideswipe collisions, which non-standard shoulder widths have not been a contributing factor. **Additional Data/Studies needed for Approval:** 1. Future Risk Analysis by Traffic Safety 2. Collision analysis and collision diagram at locations of proposed nonstandard shoulder. 3. Summary of constraints and support.
1A, 1B, 1C, 1D, 5, 6.	**Topic 302 -Highway Shoulder Standards, HDM 302.1- Width: the shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulder on highways. Table 302.1 mandates that for freeways and expressways the outside paved shoulder shall be 10.'** **Note 1: Total number of lanes in both direction including separate roadways (see Index 305.6). If a lane is added to one side of a 4-lane facility (such as a truck climbing lane) then that shall have 10 feet left and right shoulders. See Index 62.1.** (Third Location – Jefferson Blvd UC)	**Nonstandard Feature:** The third location is on the Jefferson Blvd UC on US 50 in West Sacramento. The net deck width of the Jefferson Blvd UC is 51 feet per direction, where there will be four 11' wide lanes. The shoulders will be changed from 5 feet to 2 feet wide on the inside and 10 feet to 5 feet wide on the outside, which does not meet current standards. **Risk Rating of Not Being Approved:**	**Justification for the Approval Risk Rating:** The proposed shoulders are nonstandard. It is not reasonable to widen the highway through the structure limits to provide standard width at this location. The traffic data and accident analysis for the latest 3 years show sideswipe (13%), rear end (59%), broadside (2%), hit object (22%), overturn (1%), auto-pedestrian (1%), not stated (1%) and other collisions (2%). The data shows mostly rear end collisions, which non-standard shoulder widths have not been a contributing factor. **Additional Data/Studies needed for Approval:** 1. Future Risk Analysis by Traffic Safety 2. Collision analysis and collision diagram at locations of proposed nonstandard shoulder.

		LOW	3. Summary of constraints and support.
1A, 1B, 1C, 1D, 2, 3, 5, 6.	**Topic 302 -Highway Shoulder Standards, HDM 302.1- Width: the shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulder on highways. Table 302.1 mandates that for freeways and expressways the outside paved shoulder shall be 10.'** **Note 1: Total number of lanes in both direction including separate roadways (see Index 305.6). If a lane is added to one side of a 4-lane facility (such as a truck climbing lane) then that shall have 10 feet left and right shoulders. See Index 62.1.** (Fourth Location – Yolo Causeway)	**Nonstandard Feature:** The fourth location is on the Yolo Causeway on I-80. The net deck width of the Yolo Causeway is 64.5 feet per direction, where there will be four 12' wide lanes. Alternative 1A, 1B, 1D, 3, 5, 6: The inside shoulders will be changed from 10 feet to 6.5 feet wide, which does not meet current standards. The outside shoulder will be 10' wide. Alternative 2: Reversible lane traffic, there will be no inside and no outside shoulders. While mainline traffic will have 0' inside shoulder and the outside shoulder varies from 6' to 10'. Alternatives 1C: The inside shoulders will be changed from 10 feet to 2' shoulder, which does not meet current standards. The outside shoulder will be 10' **Risk Rating of Not Being Approved:** **LOW**	**Justification for the Approval Risk Rating:** The proposed shoulders are nonstandard. It is not reasonable to widen the highway through the structure limits to provide standard width at this location. The traffic data and accident analysis for the latest 3 years show rear end (55%), head-on (1%), sideswipe (17%), broadside (3%), overturn (1%) hit object (21%), not stated (1%) and other collisions (1%). The data show mostly rear end and hit object collisions, which shoulder widths have not been a contributing factor. **Additional Data/Studies needed for Approval:** 1. Future Risk Analysis by Traffic Safety 2. Collision analysis and collision diagram at locations of proposed nonstandard shoulder. 3. Summary of constraints and support.
2 & 3	**Topic 302 -Highway Shoulder Standards, HDM 302.1- Width: the shoulder widths given in Table 302.1 shall be the minimum continuous usable width of paved shoulder on highways. Table 302.1 mandates that for freeway and expressways the outside paved shoulder shall be 10'.**	**Nonstandard Feature:** The fifth location is on mainline Solano 80, PM 44.05 to Yolo 80 PM 9.17.	**Justification for the Approval Risk Rating:** The proposed shoulders are nonstandard. It is not reasonable to widen the highway through the

	Note 1: Total number of lanes in both direction including separate roadways (see Index 305.6). If a lane is added to one side of a 4-lane facility (such as a truck climbing lane) then that shall have 10 feet left and right shoulders. See Index 62.1. Alternative 4: Solano 80 PM 44.05 to Yolo 80 PM 9.17. Alternative 5; mainline Solano 80, PM 44.2 to 44.72 and Yolo 80, PM 0.00 to 4.3.	Alternative 2: Reversible lane traffic, inside and outside shoulders will be 1'. While mainline traffic will have 0' inside shoulder and 7.5' outside shoulder. Alternative 3: The inside shoulder will be changed from 10' wide to a range of 2' to 8' wide which does not meet current standards. The outside shoulder will remain 10' wide. **Risk Rating of Not Being Approved:** **LOW**	structure limits to provide standard width at this location. Solano 80 PM 44.05 - 44.72: "The traffic data and accident analysis for the latest 3 years shows rear end (46.3%), sideswipe (23.4%), broadside (1.6%), overturn (1.1%), hit object (26.6%), auto-pedestrian (0.5%), and other collisions (0.4%). The data shows mostly rear end and hit objects which shoulder widths have not been a contributing factor." Yolo 80 PM 0.00- 4.3 "The traffic data and accident analysis for the latest 3 years shows head-on (0.14%), rear end (58.84%), sideswipe (19.66%), broadside (1.54%), overturn (1.12%), hit object (18.00%), auto-pedestrian (0.14%), not stated (0.14%), and other collisions (0.42%). The data shows mostly rear end which shoulder widths have not been a contributing factor." **Additional Data/Studies needed for Approval:** 1. Future Risk Analysis by Traffic Safety 2. Collision analysis and collision diagram at locations of proposed nonstandard shoulder. 3. Summary of constraints and support.

1A, 1B, 1C, 1D, 3, 4, 5, 6.	**Topic 302.1–Geometric Design and Structure Standards, HDM 301.1 Narrow Lane Widths:** **"The basic lane width for new construction on two-lane and multilane highways, ramps, collector roads, and other appurtenant roadways shall be 12 feet."** Four locations: Sacramento River BOH (Bryte Bend Br.); Sacramento River Viaduct (Pioneer Br.); and Jefferson Blvd UC. Yolo Causeway	**Nonstandard Feature:** It is proposed to narrow the existing lane widths as follows: Bryte Bend: all lanes will be reduced from 12' to 11'. Pioneer Br.: all lanes will be reduced from 12' to 11'. Jefferson Blvd UC: all lanes will be reduced from 12' to 11'. Yolo Causeway: The two inside lanes will be reduced from 12' to 11'. **Risk Rating of Not Being Approved:** **LOW**	**Justification for the Approval Risk Rating:** Beyond the immediate bridge decks, the roadway would consist of four twelve-foot wide lanes and ten-foot wide inside and outside shoulders. Widening the Bryte Bend Bridge is not economically feasible. According to Structure Maintenance and Investigations (SM&I), widening to standard lane width is not structurally feasible and would amplify the stress state in fatigue-prone and fracture-critical members. The other structures would be unfeasible to widen as well. In addition, widening the Causeway might cause environmental damage to the Yolo Bypass and to the bats whose colonies are under the existing structure. **Additional Data/Studies needed for Approval:** 1. Future Risk Analysis by Traffic Safety 2. Collision analysis and collision diagram at locations of proposed nonstandard shoulder. 3. Summary of constraints and support.

1A, 1B, 1C, 1D, 2, 3, 5, 6.	**Topic 309 – Clearances,** **HDM 309.2 Vertical Clearances (a) Freeways and Expressways, all construction except overlay project – 16 feet 6 inches shall be the minimum vertical clearance over the roadbed of the State facility (e.g., main lanes, shoulders, ramps, collector-distributor roads, speed change lanes, etc.).**	**Nonstandard Feature:** It is proposed to perpetuate the existing non-standard vertical clearances on the following structure along Interstate 80 in Yolo County. Location: Mace Blvd OC (Br# 22-0042) has a vertical clearance of 16.33 feet. **Risk Rating of Not Being Approved:** **LOW**	**Justification for the Approval Risk Rating:** The existing vertical clearance is nonstandard. The traffic data and accident analysis for the latest 3 years show rear end (55.9%), head-on (0.3%), sideswipe (17.3%), broadside (2.8%), overturn (0.6%) hit object (22.3%), not stated (0.5%) and other collisions (0.3%). The data shows mostly rear end collisions. This type of collision shows that the nonstandard vertical clearance has not been a contributing factor. **Additional Data/Studies needed for Approval:** 1. Future Risk Analysis by Traffic Safety 2. Collision analysis and collision diagram at locations of existing nonstandard vertical clearance. 3. Summary of constraints and support

8. RIGHT OF WAY

Acquisition of fee parcels anticipated from agricultural, commercial and governmental agency property. Although the City of West Sacramento cut-and-cover tunnel project is presented on layouts between CT right-of-way, the strategy here is to potentially combine the Port of West Sacramento plans and specifications with our Caltrans project for construction. Any permanent or temporary real estate rights required to build the cut-and-cover tunnel will be the responsibility of the Port. This will require a cooperative agreement that addresses right-of-way, construction and maintenance of the tunnel; i.e. all Phase 2 work will be completed by the City. For the tunnel portion of this project, only Permits to Enter (PTE's) for environmental studies are to be obtained by Right of Way (RW). The long RW lead time is attributed to utility relocation at the I-80/US 50 Separation.

Utility companies will require verification and involvement. Overhead lines near the new Managed Lane Connector at the I-80/US 50 Separation in West Sacramento may have to be relocated.

See **Attachment H**, *Right of Way Data Sheet*, for additional information.

9. STAKEHOLDER INVOLVEMENT

Caltrans has been collaborating on this project with staff and management from District 4, City of West Sacramento, Sacramento Area Bicycle Advocates (SABA), and WALK Sacramento, City of Davis-City Council, City of Dixon, Yolo County Transit District (YCTD) Board, Solano County, Yolo County, Sacramento Transportation Authority (STA), Metropolitan Transportation Commission (MTC), and Solano Transportation Authority.

There are several elements of outreach that have been conducted which included neighborhood outreach via community workshops, pop-ups, neighbor association presentations, and chamber of commerce presentations.

There were many comments and suggestions from our partners as an outcome of the February 28, 2018 Stakeholder Outreach located at the West Sacramento City Hall. The nature of these comments was regarding the length of possible auxiliary lanes, pedestrian and bike access, traffic staging and general constructability issues. These comments and suggestions will be addressed during the PA&ED Phase.

Caltrans has conducted three open houses. The first open house was at the Davis Senior Center in the City of Davis on June 6, 2018. Another open house was held at the Civic Center Galleria in the City of West Sacramento on June 14, 2018. The last open house was conducted at the City Hall in the City of Sacramento on June 21, 2018.

The project team will use the feedback received through these community workshops to help inform the project plan. The input will be closely examined and considered as the team refines the project features. If deemed necessary, the team will follow-up with individuals or groups who provided comments to ask for clarification or to provide a response.

See **Attachment P**, *Public Workshops Summary*, for more information.

10. A. ENVIRONMENTAL COMPLIANCE

In order to identify environmental issues, constraints, costs, and resource needs, a Mini-PEAR was prepared for the project. It is anticipated that an Environmental Impact Report (NOD) (CEQA) and Environmental Assessment (FONSI) (NEPA) will apply to this project. Potential disposal, staging, and borrow sites will need to be identified in the

PA&ED phase for complete environmental review. Field studies were not conducted, and technical studies have been deferred to the PA&ED phase.

See **Attachment E**, *Mini-Preliminary Environmental Analysis Report,* for additional information.

10. B. LANDSCAPE ARCHITECTURE ASSESSMENT

A Landscape Architecture Assessment Sheet (LAAS) was prepared for this project. Impacts to existing roadside, including roadside with Landscape Freeway status, are anticipated. Impacts to Landscape Freeways along with project's capacity increasing improvements will result in Warranted Highway Planting along corridors, park and ride lot and bike facilities. Extent of Highway Planting to be determined in PAED phase.

Per Landscape Architecture Highway Planting General Policy, due to estimated cost of highway planting (more than $300,000) a separate project is required for highway planting. This project will address planting and irrigation and is requested during PA&ED phase. Both parent and highway planting projects will address erosion control and storm water pollution prevention items as required.

See **Attachment G**, *Landscape Architecture Assessment Sheet,* for more information.

11. FUNDING, PROGRAMMING AND ESTIMATE

Current Capital Outlay Project Estimate

Alternative	Construction	Right-of-Way	Total
Alternative 1A	$429,000,000	$21,000,000	$450,000,000
Alternative 1B	$589,000,000	$21,000,000	$610,000,000
Alternative 1C	$284,000,000	$6,000,000	$290,000,000
Alternative 2 (Interim)	$98,000,000	$2,000,000	$100,000,000
Alternative 3 (Interim)	$117,000,000	$3,000,000	$120,000,000

The level of detail available to develop these capital outlay project estimates is useful for long-range planning purposes only. The capital outlay project estimates should not be used to program or commit State-programmed capital outlay funds.

See Cost Estimate, *Attachment L,* for more information.

Capital Outlay Support Estimate

Capital outlay support estimate for programming PA&ED for this project is $6,000,000. This estimate assumes that this project is combined with 03-4F650 rehabilitation project.

See Programming Sheet, *Attachment S*, for more information.

12. DELIVERY SCHEDULE

The following schedule has been identified for preparation of preliminary engineering, environmental studies, and proposed design and construction documents for this project. The milestones shown below in Table 12.1 are used to indicate relative time frames for planning purposes only.

Table 12.1 – Delivery Schedule of Major Milestones

Project Milestones		Milestone Date (Month/Day/Year)	Milestone Designation (Target/Actual)
PROGRAM PROJECT	M015	07/31/2019	Target
BEGIN ENVIRONMENTAL	M020	10/01/2019	Target
CIRCULATE DPR & DED EXTERNALLY	M120	01/01/2021	Target
PA & ED	M200	01/01/2021	Target
PS&E TO DOE	M377	12/01/2023	Target
DRAFT STRUCTURES PS&E	M378	10/01/2023	Target
PROJECT PS&E	M380	11/01/2023	Target
RIGHT OF WAY CERTIFICATION	M410	12/01/2023	Target
READY TO LIST	M460	02/01/2024	Target
HEADQUARTERS ADVERTISE	M480	04/01/2024	Target
AWARD	M495	07/01/2024	Target
APPROVE CONTRACT	M500	11/01/2024	Target
CONTRACT ACCEPTANCE	M600	10/01/2027	Target
END PROJECT EXPENDITURES	M800	12/01/2029	Target
FINAL PROJECT CLOSEOUT	M900	09/01/2031	Target

See **Attachment S**, *Programming Sheet*, for more information.

13. RISKS

The nature of the risks associated with this project are design changes, environmental concerns, ownership and maintenance of the new bike / pedestrian structure, and additional ROW acquisition.

See **Attachment M**, *Risk Register,* for more information.

14. EXTERNAL AGENCY COORDINATION

Federal Highway Administration (FHWA)
This project is considered to be an Assigned Project in accordance with the current Federal Highway Administration (FHWA) and the Department of Transportation (Caltrans) Joint Stewardship and Oversight Agreement.

US Army Corps of Engineers
Department of the Army Permit for:
Clean Water Act Section 404
Rivers and Harbors Act of 1899 Section 9
Rivers and Harbors Act of 1899 Section 10

General Permits (Regional Permit, Nationwide Permit or Programmatic Permit)
Standard Permits (Individual Permit or Letter of Permission)
Section 9 Permit

United States Coast Guard
Rivers and Harbors Act of 1899 Section 9
Bridge Permit

United States Fish and Wildlife Service
Section 7 consultation for Threatened and Endangered Species

California Department of Fish and Wildlife
California Fish and Game Code Section1602
Lake or Streambed Alteration Agreement
Incidental Take Permit

Central Valley Flood Protection Board
California Water Code Division 5, Part 4
Encroachment Permit 408

Regional Water Quality Control Board
Clean Water Act Section 401
Water Quality Certification

Local Agency
Cooperative Agreements with Sacramento Area Council of Governments (SACOG) – Metropolitan Planning Organization (MPO)

Local Agency
Solano Transportation Authority, County Congestion Management Agency (CMA)

Local Agency
Metropolitan Transportation Commission – MPO

Local Agency
Agreements with Yolo County, University of Davis, Yolo Solano Air Quality Management District, Sacramento Area Bicycle Advocates (SABA), WALK Sacramento, Sacramento Area Air Quality Management District, Sac RT, Port of West Sacramento

Local Agency
Agreements with Cities of Davis, Sacramento, West Sacramento, and Woodland

Railroads
Coordinate with The Union Pacific Railroad and Amtrak.

Other
Reclamation Districts, Central Valley Water Control Board, State Lands Commissions, and advocacy groups

15. PROJECT REVIEWS

Scoping team field review Various dates Date Var
District Program Advisor John Welch, Shahna Thomas Date 3/1/2018
District Maintenance Sameh Hegazi Date 3/1/2018
Headquarters Project Delivery Coordinator Tim Sobelman Date 3/1/2018
Project Manager Jess Avila / Johny Tan Date 3/1/2018
District Safety Review Kevin Espinoza Date 3/1/2018
Constructability Review Anthony Thurman Date 3/1/2018
Other (60% Review) Sean Nguyen, Gail St. Jean, Lee Martin, Mohammed Khazari, Jasdeep Randhawa Date 3/1/2018
Other (90% Review) Mohammed Khazari, Shaun Rice, Lee Martin, Daniel Tillson-Rodriguez. Dianira Soto, James E. Graham Date 4/01/2018

16. PROJECT PERSONNEL

Name	Title	Phone #
Jesse Avila	District Project Manager	(530) 741-5120
Rabah Salah	District Project Engineer	(530) 740-4904
Nou Lor	Assistant Project Engineer	(530) 741-4908
Iris Bishop	Stormwater Coordinator	(530) 741-4320
Bill Webster	Engineering Geologist	(916) 227-1041
Gail St. John	Environmental Coordinator	(530) 741-7116
Lee Martin	Right of Way Coordinator	(530) 741-4074
Marlene Gibb	Hydraulics Coordinator	(530) 741-4437
John Fujimoto	Structure Coordinator	(916) 227-8757
Jacob Buffenbarger	Planner Coordinator	(916) 263-1625
Larry Brohman	Planner Coordinator	(530) 634-7618
Dianira Soto	Planner Coordinator	(530) 740-4905
Steve Block	Traffic Electrical	(530) 634-7619
Jeff Pietrzak	Landscape Architect	(530) 741-4436
Jasdeep Randhawa	Engineer, Traffic Operations	(916) 583-9064
Dean Campbell	Branch Chief, Electrical Systems	(916) 859-7960
Mary Ann Hudspeth	Branch Chief, Traffic Design	(530) 634-7622
Dan Roberts	Maintenance Supervisor	(916) 375-8343
Susan Zanchi	Branch Chief, Traffic Forecasting	(530) 741-4199
John Xu	Senior Transportation Planner, D-4	(510)286-5577
Cameron Oakes	Senior Transportation Planner, D-4	(510)622-5758
Paul Ma	Supervising Transportation Engr, D-4	(510)286-5675
Evelyn Gestuvo	Senior Transportation Engineer, D-4	(510)286-4939
Ron Moriguchi	Principal Transportation Engineer, D-4	(510)286-5073
John Mckenzie	Transportation Planner, D-4	(510)286-5556

17. ATTACHMENTS

A. Location map
B. Layouts
C. Typical Cross Sections
D. Preliminary Geotechnical Report
E. Mini-Preliminary Environmental Analysis Report
F. Traffic Data and Designation
G. Landscape Architecture Assessment Sheet
H. Right of Way Data Sheet
I. Transportation Management Plan Data Sheet
J. Storm Water Data Report
K. Transportation Planning Scoping Information Sheet
L. Cost Estimates
M. Risk Register
O. Asset Management
P. Public Workshops Summary
Q. Preliminary Floodplain Evaluation
R. List of Projects
S. Programming Sheet