

# PRELIMINARY BRIDGE REPORT

## SR-12 REALIGNMENT / RIO VISTA BRIDGE PRELIMINARY STUDY

04-Sol-12-PM 19.17 to 03-Sac-12-PM 5.8  
EA 04-4A490K

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**September 2010**



04-SOL-12 PM 19.3/10-SAC-12 PM 5.8  
Program Code XX.XX.XXX.XXX  
EA 04-4A490K  
September 2010

## **Preliminary Engineering Report**

**To**

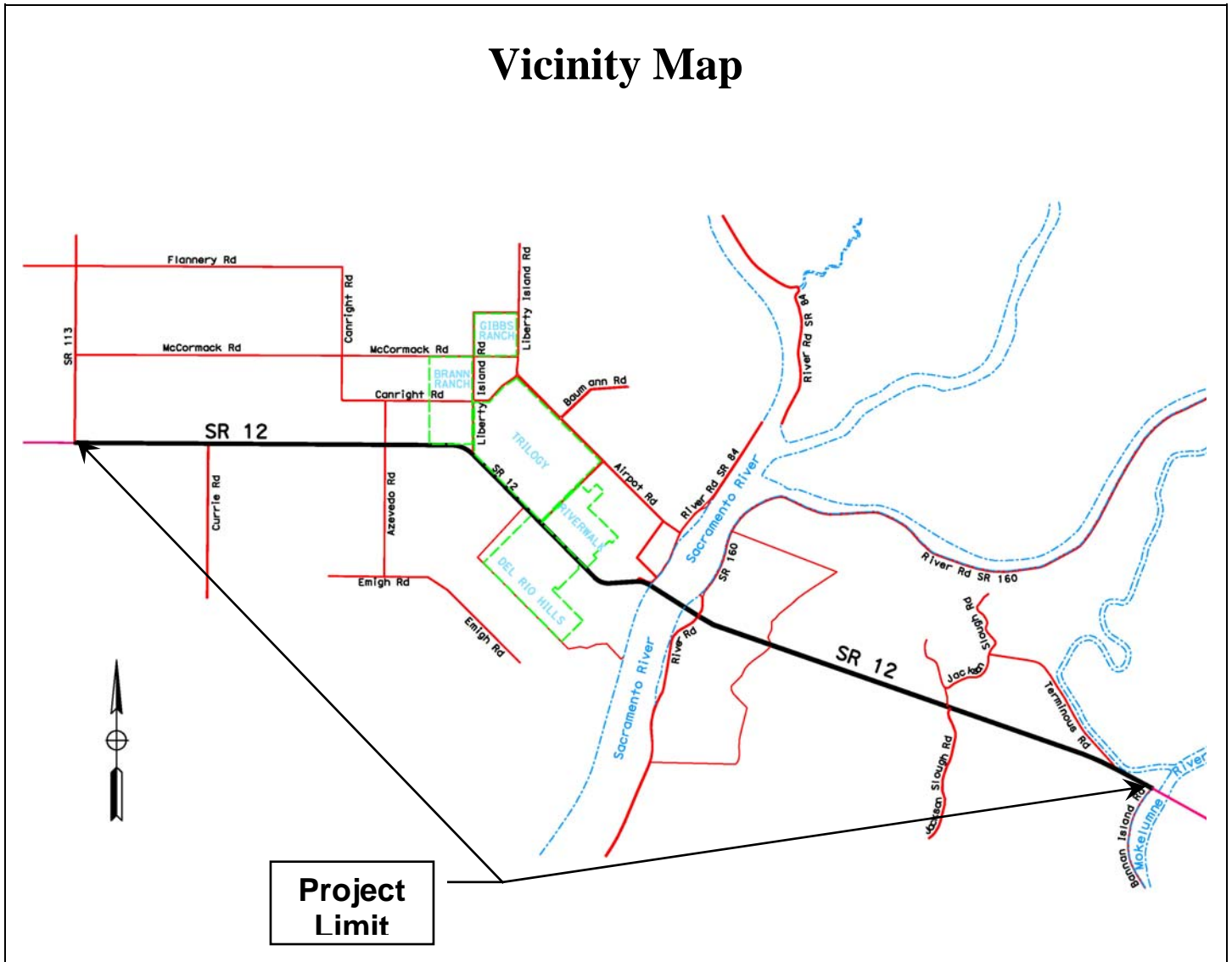
### **Supplement Request of Programming in 2012 for Capital Support (Project Approval and Environmental Document Phase) In the 2012 STIP**

On Route 12 in Solano County

Between Route 113

And Moklumne River Crossing





On Route 12 in Solano County

Between 0.0 mile east of Route 113

And 0.0 mile west of Mokelumne River Crossing



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



September 1, 2010

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STEPHEN J. MISLINSKI  
REGISTERED CIVIL ENGINEER

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DATE







## Table of Contents

EXECUTIVE SUMMARY .....	5
1. INTRODUCTION .....	11
2. BACKGROUND .....	12
3. PURPOSE AND NEED.....	13
4. DEFICIENCIES.....	15
4.1 CURRENT AND FORECAST TRAFFIC .....	16
Table 1 - Roadway Level of Service – Existing Condition .....	16
Table 2 - Intersection Level of Service – Existing Condition .....	17
Table 3 – 2030 Forecasted Traffic Volumes.....	18
Table 4 - Roadway Level of Service – 2030 No Project Condition .....	19
Table 5 - Roadway Level of Service – 2030 Mid-Level Bridge Condition.....	19
Table 6 - Roadway Level of Service – 2030 High-Level Bridge Condition .....	20
Table 7 - Intersection LOS – 2030 No Project Condition .....	20
Table 8 - Intersection LOS – 2030 Mid-Level Bridge Condition.....	20
Table 9 - Intersection LOS – 2030 High-Level Bridge Condition .....	21
4.2 NAVIGATION ISSUES.....	21
4.3 AIRSPACE ASSESSMENT.....	23
4.4 ACCIDENT RATES.....	24
5. CORRIDOR AND SYSTEM COORDINATION.....	24
6. ALTERNATIVES.....	25
7. COMMUNITY INVOLVEMENT .....	39
8. ENVIRONMENTAL DETERMINATION/ DOCUMENT .....	41
9. FUNDING.....	45
9A. CAPITAL AND CAPITAL SUPPORT COST ESTIMATE.....	46
10. SCHEDULE.....	47
11. FHWA COORDINATION .....	47
12. DISTRICT CONTACTS .....	47
13. PROJECT REVIEWS.....	48
14. ATTACHMENTS.....	48
A. Vicinity Map	
B. Previously Studied Alternatives Exhibit	
C. Potential Corridor Alternatives Exhibit	
D. Structure Advanced Planning Study (APS)	
E. Tunnel Design Memorandum	
F. Cost Estimates	
G. Preliminary Environmental Study	
H. Traffic Forecasting Memorandum	
I. Hydraulics Analysis Memorandum	
J. Public Comments	



## **EXECUTIVE SUMMARY**

This study was initiated by the Solano Transportation Authority (STA) at the request of the City of Rio Vista with funding provided by the City through Federal Demonstration funds. This report documents the first step in identifying feasible corridor alternatives for an improved State Route 12 (SR-12) through Rio Vista and across the Sacramento River. In addition, the study reassesses alternatives that were considered as part of a 1994 Project Study Report (PSR) level study with respect to potential impacts on existing and planned development as well as to environmental, river navigation and engineering constraints, and investigates revised routes to minimize these impacts.

The project study limits extend easterly from State Route 113 (Sol-19.3) west of Rio Vista to the Mokelumne River (Sac-5.8) as shown in the vicinity map in Attachment A. The section of SR-12 within the study limits, along with the existing river bridge, provide an important link along Route 12 between Interstate 80 in the North Bay Area of Solano County and the Interstate 5 corridor servicing Sacramento and San Joaquin Counties, as well as the Central Valley Region. The existing roadway alignment carries large volumes of traffic through the City of Rio Vista adjacent to the City's central business district, and between the Central Valley, Solano County and the Bay Area and also serves as a direct route for truck traffic, including trucks serving Travis Air Force Base in Fairfield. The river crossing is considered to be a "gateway" to both Solano County and the Bay Area due to its significance within the larger regional transportation system. As such, the route facilitates inter- and intra-regional traffic, as well as traffic between counties.

### **Deficiencies**

The existing facility is a 2-lane road that is undersized for projected growth and currently operates at or near capacity. In addition, there are safety issues due to narrow shoulders and lack of turning lanes at many intersections. The existing Rio Vista Bridge has limited vertical clearance between the waterway and the structure which presents a navigation hazard and requires that the bridge be operated to allow passage of nearly all water vessels. Based on Caltrans bridge operation records, frequent bridge openings currently occur more than 10 times per day on average during peak months and routinely cause long backups through Rio Vista as opening and closing the bridge takes 10 minutes for small boats and 25 minutes for large vessels.

### **Need & Purpose**

Based on traffic projections, the SR-12 corridor needs to be a four lane facility with four lanes across the Sacramento River. To address traffic congestion and backups through Rio Vista, the river crossing needs to be upgraded to minimize or eliminate conflict between road and river traffic.

To address the corridor deficiencies and meet the corridor needs, this study was initiated to establish feasible corridor alternatives that address future corridor needs,

account for planned development and incorporate community and stakeholder concerns. Identification of feasible corridors will allow the City to update its General Plan if necessary to preserve right-of-way by addressing future land use issues that may preclude currently viable corridors. In addition to feasible corridors, this study has considered future shipping plans on the Sacramento River and has outlined future project phases, updated estimated project cost and identified potential funding sources and strategies.

### **River Navigation**

The project team consulted with the United State Coast Guard (USCG), San Francisco Bar Pilots and the Port of West Sacramento to identify potential navigation issues and future shipping plans for the Port or West Sacramento. Physical location and geometry of the ship channel, including locations of potential bridge openings, types of bridges (high level/fixed vs mid-level moveable), and skew angle of the bridge alignment compared to the ship channel alignment were discussed.

Based on Coast Guard and Bar Pilot input, there are potential issues with a bridge crossing located to the north of the existing bridge near the point where the shipping channel, the Sacramento River and Steamboat Slough converge due to difficulty navigating large vessels in the turbulence resulting during high flows.

The Port of West Sacramento currently receives approximately 45 ships per year and is permitted to receive as many as 120. In the past, they have received as many as 110 per year and have plans to expand operations to over 120 ships per year in addition to increasing the size of ships they receive.

The project team submitted a request to the USCG to provide preliminary horizontal and vertical clearance requirements for each of the four alternative crossings. The USCG is in the process of reviewing potential crossing locations and will provide preliminary horizontal and vertical clearance requirements with input from the San Francisco Bar Pilots and the Port of West Sacramento.

### **Preliminary Airspace Assessment**

The project team has reviewed current airport operations and future expansion plans and has identified potential conflicts between alternatives and airspace requirements. Each alternative studied in future phases will need to be reviewed and assessed by the Solano County Airport Land Use Commission and the preferred and ultimately the selected alternative will need to be approved by the commission.

### **Alternatives**

The 1994 study considered eight (8) alternatives with alignments in three (3) parallel corridors (see Attachment B) that included the existing SR-12 corridor running through the City of Rio Vista; a corridor north of the City on a new alignment near the Rio Vista Airport; and along a corridor that would follow SR-12 west of the City and then would turn southeast along a new alignment to a river crossing south of the City. Based on current engineering, environmental and land use constraints, four

corridors were identified for further study as shown in Attachment C and outlined as follows:

- Alternative 1 – No Build Alternative
- Alternative 2 – Existing SR-12 corridor. Mid-level moveable lift bridge and bored tunnel options were considered. Attachment D provides Advance Planning Study (APS) level information for the mid-level bridge option, and Attachment E outlines the preliminary tunnel study. This alternative would maintain similar access to town and similar appearance to the existing bridge but would potentially impact businesses and residences requiring relocations. A mid-level bridge option would not eliminate road/river traffic conflict; however a tunnel option would eliminate this conflict and would reduce right-of-way impacts. A tunnel option, however, may not provide ideal access into the town center.
- Alternative 3 – Airport Road corridor. This alternative is considered as an expressway and includes a high level fixed bridge (see Attachment D). With a fixed bridge road/river traffic conflict would be eliminated; however this alternative would have noise impacts to Trilogy and other planned developments and will need to be further assessed and reviewed to ensure that a high bridge along this corridor does not conflict with future airport expansion plans.
- Alternative 4 – North of Airport corridor. This alternative is a bypass to the north of the airport that would take truck traffic out of the town center and would eliminate road/river traffic conflicts with a high level bridge. The corridor is not consistent with current City General Plan language, future airport expansion, current airport approach flight tracks, river navigation, provides for limited access to town and impacts wetlands. As such, it is recommended that this alternative be eliminated from consideration.
- Alternative 5 – Southern Corridor. This alternative is a freeway bypass to the south of town and includes a high level bridge (see Attachment D). This alternative would eliminate road/river traffic conflict and would move truck traffic out of town. However, it is not consistent with current City General Plan language, would provide limited access to town, and has potential conflicts with the planned Shiloh III wind farm.

Planning level cost estimates have been identified for the four corridor alternatives and are shown in the following table. Capital costs have been escalated 3% per year to an assumed mid-point of construction in year 2022 and include estimated construction and right-of-way costs that consist of direct right-of-way acquisition and environmental mitigation costs. Environmental mitigation costs have been assumed at 10% of construction cost. Capital support costs have been assumed as approximately 3%, 10% and 15% of construction cost for PA&ED, Design and Construction Administration & Engineering respectively. In addition, a program contingency of 15% on the escalated project capital outlay costs has been included. As the project is developed in the following phases with more refined engineering

studies and cost estimates, life cycle costs will need to be included if Federal funding is utilized.

	Capital Costs	Capital Support Costs			Total Estimated Costs to Delivery
		PA&ED (0) Phase*	Design (1) Phase	Construction Admin & Engineering	
Alternative 1 "No Build"					
Alternative 2- Bridge	\$1,165,000	\$20,810	\$83,200	\$124,700	\$1,393,863
Alternative 2- Tunnel	\$1,848,651		\$138,300	\$207,450	\$2,215,211
Alternative 3	\$1,137,407		\$80,400	\$120,600	\$1,359,217
Alternative 4	\$1,453,810		\$104,200	\$156,300	\$1,735,120
Alternative 5 - Cable Stay	\$1,255,595		\$87,900	\$131,900	\$1,496,205
Alternative 5 - Segmental	\$1,170,033		\$81,200	\$121,800	\$1,393,843

With regard to project scope and cost, Caltrans District 4 has provided input (see Attachment J) noting that this project has the potential to take a large share of the Bay Area's transportation funding without meeting the MTC's current strategies for the 2035 Regional Transportation Plan (RTP) and its SB 375 goal of significantly reducing inward commuting into the Bay Area. In light of this potential for inconsistency with the MTC's RTP strategies, District 4 has suggested that a 2-lane river crossing project that is expandable to a 4-lane crossing should be considered.

### Community Involvement

In developing potential corridor alternatives, stakeholder and local community input has been solicited through a stakeholder outreach program that included interviews of key stakeholders, informational presentations with question and answer periods during City of Rio Vista Council meetings, public workshops and presentations at local stakeholder group meetings.

In addition to Project Team public outreach efforts, the City of Rio Vista held a public workshop on October 20, 2009 with the local community. The workshop was held to discuss the potential alternatives presented by STA and the consultant team, as well as to document advantages and disadvantages for the potential corridor alternatives from the local community perspective.

From the public outreach events, significant input was obtained from the City, local community members, businesses and other stakeholders. Key feedback is summarized as follows:

- There is a concern that something needs to be done to improve SR-12 and the river crossing to facilitate safe travel on Highway 12 and continuing support for improved use of the Sacramento River as a "marine highway" of the future.

- There is a significant concern from the local business community as outlined in a letter from the Rio Vista River Crossing Committee (see Attachment J), a local group of business, commercial and industrial owners, that alternatives to relocate the route may adversely impact local businesses and ultimately the viability of Rio Vista as a City.
- Realignment Vs. use of the existing SR-12 route – realignment supporters are concerned with community safety and the split between the two halves of the City that will be worsened with a busy 4-lane arterial through the center of town while existing route supporters are concerned with the potential adverse impact to local business that could occur if the route were moved out of town.
- There are questions concerning funding, how a project of this magnitude can be funded, particularly with respect to a toll bridge and how that would impact local residents and businesses.

Additional comments on the Draft Preliminary Bridge Report were received from several agencies, including the City of Rio Vista City Council, the Solano County Department of Resource Management, the Sacramento County Department of Transportation and Caltrans Districts 4 and 10. Full comment letters received from these agencies and comments received via email from other sources are included in Attachment J.

### **Environmental Determination/Document**

The preliminary environmental investigation anticipates the environmental document needed for this project is an Environmental Impact Report (EIR) under CEQA and an Environmental Impact Statement (EIS) under NEPA. It is anticipated that STA will be the lead for CEQA and Caltrans will be the lead for NEPA. Joint preparation of CEQA and NEPA environmental documentation is anticipated. The environmental phase will need to document studies for hazardous waste/materials, air & noise, greenhouse gas emissions, water quality, biological resources, wetlands, visual effects, cultural resources, paleontology, community impact – including potential social and economic impacts, section 4(f) evaluation, floodplain encroachment, farmlands, coastal zone and wild and scenic river.

### **Funding Evaluation**

A preliminary funding evaluation has been completed to assist in identifying potential funding sources for the project. The funding evaluation investigated numerous potential funding sources from traditional public funds typically used for delivery of public works projects to more non-traditional sources, such as toll and private financing. Traditional sources include Federal, State and local programs which are programmed through the Metropolitan Transportation Commission (MTC) for the Bay Area cities and counties.

Although the traditional public financing mechanism is the most straight forward funding option for transportation projects, transportation fund availability from Federal, State and Local sources is limited due to budgetary issues and the high degree of competition between transportation projects for the limited funds.

Furthermore, financing a project of this magnitude through traditional public financing would require the re-allocation of already programmed funds. An important aspect of non-traditional funding, such as toll or private financing, is that significant study would be needed to assess the financial feasibility, including potential impacts on the community and the ability to develop a sufficient revenue stream to fund the project. In addition, legal and legislative hurdles would also need to be cleared.

### **Schedule**

The following preliminary schedule outlines project delivery assuming funding is available to begin the environmental phase in July 2012 and then proceed directly into the design phase after environmental certification.

<b>HQ Milestones</b>	<b>Delivery Date (Month, Day, Year)</b>
Begin Environmental	July 2012
Notice of Intent (NOI)	August 2012
Circulate DED	August 2015
PA & ED	January 2016
Regular Right of Way	July 2016
Project PS&E	January 2020
Right of Way Certification	February 2020
Ready to List	April 2020
Approve Contract	November 2020
Contract Acceptance	December 2020
End Project	December 2025

### **Recommendations**

It is recommended that the Project proceed with study of the following alternatives in the environmental phase:

- Alternative 2 – Existing SR-12 Route considering mid-level bridge and bored tunnel options.
- Alternative 2A – Existing SR-12 Route deviating to the north at Church Road through the planned Riverwalk development, along an existing drainage floodway and across the river on a high level bridge to the north of the existing bridge and connecting back to the existing SR-12 alignment as soon as practical on the east side of the river.
- Alternative 3 – Airport Road corridor with a high level bridge option.
- Alternative 5 – Southern corridor with a high level bridge option.



## 1. INTRODUCTION

### **Brief Project Description**

This study was initiated by the Solano Transportation Authority (STA) at the request of the City of Rio Vista with funding provided by the City through Federal Demonstration funds. Oversight by Caltrans District 4 was terminated, as the project is not currently in the Regional Transportation Plan.

The project study limits extend easterly from State Route 113 (Sol-19.3) west of Rio Vista to the Mokelumne River (Sac-5.8) as shown in the vicinity map. The section of SR-12 within the study limits, along with the existing river bridge, provide an important link along Route 12 between Interstate 80 in the North Bay Area of Solano County and the Interstate 5 corridor servicing Sacramento and San Joaquin Counties, as well as the Central Valley Region. The existing roadway alignment carries traffic through the City of Rio Vista adjacent to the City's central business district, and the river crossing is considered to be a "gateway" to both Solano County and the Bay Area due to its significance within the larger regional transportation system. As such, the route facilitates inter- and intra-regional traffic, as well as traffic between counties. For example, east Contra Costa County commuters use the bridge as a link to Solano County, while residents of Solano County (including Rio Vista) use the bridge in the opposite direction, commuting to Contra Costa County and the Central Valley. In effect, commuters and commercial truck traffic use the bridge and Highway 12 as a direct link between the Central Valley and the Bay Area.

This report documents the first step in identifying feasible corridor alternatives for an improved State Route 12 (SR-12) through Rio Vista and across the Sacramento River. In addition, the current study reassesses alternatives that were considered as part of a 1994 Project Study Report (PSR) level study with respect to potential impacts on existing and planned development as well as to environmental, river navigation and engineering constraints, and investigates revised routes to minimize these impacts.

Background information regarding previous studies undertaken to investigate improvements to SR-12 and the Sacramento River crossing at Rio Vista are provided, and proposed corridor alternatives to be further investigated during the Project Approval and Environmental Documentation (PA&ED) phase are summarized. This study will serve as a supplement to the SR-12 Major Investment Study from Interstate 80 to Interstate 5 which is being lead by the Metropolitan Transportation Commission and is proposed to fulfill the Project Initiation Document (PID) requirement for authorization to proceed with PA&ED for the section of SR-12 in the defined project study limits. With the combined documents as stated above serving as the PID, this report will be used to program the support costs needed from State Transportation Improvement Plan (STIP) to conduct the PA&ED phase.

See the following Cost estimate for specific work items included in this project.

<b>Project Limits</b> (Dist., Co., Rte., PM)	04-SOL-12-PM 19.3/10-SAC-12-PM 5.8
<b>Number of Alternatives:</b>	5, including "No Build"
<b>Alternative Recommended for Programming:</b>	Alternatives 2-Bridge, 2-Tunnel, 3 & 5.
<b>Programmed or Proposed Capital Construction Costs</b>	\$1,278,702,000
<b>Programmed or Proposed Capital Right of Way Costs:</b>	\$227,015,000
<b>Funding Source:</b>	Local, State, Federal and Potentially Private
<b>Type of Facility (conventional, expressway, freeway):</b>	Expressway/ Freeway
<b>Anticipated Environmental Determination/Document</b>	Environmental Impact Report (EIR) - CEQA Environmental Impact Statement (EIS) - NEPA
<b>Project Category</b>	4A

The remaining support, right of way and construction components of the project are preliminary estimates and are not suitable for programming purposes. It is anticipated that the Project Report will serve as the programming document for the remaining support and capital components of the project. A project report will serve as approval of the "selected" alternative.

Other approvals required are: Environmental Documents as stated in the above table.

## 2. BACKGROUND

Information contained in this section was taken from the October, 1994 Sacramento River Crossing at Rio Vista Project Feasibility Report (1994 PSR level document) and supporting documents; the October, 2001 Highway 12 Major Investment Study (2001 MIS); and from the 2001 City of Rio Vista General Plan.

Route 12 is functionally classified as an Other Principal Arterial and is on the National Highway System (NHS). In addition, the road is a Terminal Access Route on the FHWA designated STAA Truck Route System and has a relatively high (9.54% - 13.3% of the traffic) number of trucks within the project limits.

The Rio Vista Bridge was renamed in August, 1998 as the Helen Madere Memorial Bridge to pay tribute to the work performed by Helen Madere as the President of the Highway 12 Association to improve safety along Route 12. The original bridge was designed by Joseph Strauss and was constructed in 1944. The Bridge was subsequently realigned, and a vertical lift span was added in 1960 to allow passage of cargo ships en route to the Port of Sacramento.

The 2001 City of Rio Vista General Plan documents the need to improve SR-12 through Rio Vista and to add capacity to the river crossing to meet demands that will be generated over the next 10 to 20 years by planned developments. The principal source of information used to support the traffic circulation element of the General Plan is the traffic studies performed in support of the 2001 MIS. The traffic study used the Solano county Travel Demand Model to assess existing and future roadway conditions, including levels of service (LOS) at key intersections and along segments of the SR-12 corridor leading up to the Rio Vista Bridge. Traffic forecasting studies addressed Base Cases for years (2010) and (2025) in addition to a High Rio Vista Bridge Alternative for each of these two target years.

The City of Rio Vista has historically been an economically balanced community with a self-sufficient economy that has provided nearly as many jobs as its number of working residents. Unlike many municipalities in eastern Contra Costa and Solano Counties, the city has not yet transformed into a “bedroom” community for the Bay Area or Sacramento. The City is a commercial center for the surrounding agricultural region, natural gas production and related businesses.

In addition to planned growth within the City that will result in increased traffic volumes throughout Rio Vista and along SR-12, increasing commuter traffic passing through Rio Vista between the Bay Area and the Central Valley Region coupled with frequent bridge lift operations that are expected to increase as the Port of West Sacramento expands its operations with increases in both the number and size of ships received will serve to worsen already poor levels of service along SR-12.

To address these issues, this study was initiated to reassess alternatives developed by the previous 1994 PSR level study and to develop feasible corridor and river crossing alternatives to improve congestion caused by the Sacramento River crossing at Rio Vista, as well as to plan for expected growth within the City of Rio Vista and the increasing regional traffic along SR12.

### **3. PURPOSE AND NEED**

#### **Need:**

The existing SR-12 facility carries large volumes of traffic through the City of Rio Vista, between the Central Valley, Solano County and the Bay Area and also serves as a direct route for truck traffic, including trucks serving Travis Air Force Base in Fairfield. The existing facility is a 2-lane road with narrow shoulders and lacks turning lanes at intersections. The existing Rio Vista Bridge on SR-12 at the Sacramento River has limited vertical clearance between the waterway and the structure which presents a navigation hazard and requires that the bridge be operated to allow passage of nearly all water vessels. Based on Caltrans bridge operation records, frequent bridge openings currently occur more than 10 times

per day on average during peak months and routinely cause long backups through Rio Vista as opening and closing the bridge takes 10 minutes for small boats and 25 minutes for large vessels. These circumstances form a basis of need for increasing highway capacity through Rio Vista and across the Sacramento River, relieving waterway traffic conflicts with the bridge, and improving traffic operational safety.

**Purpose:**

The purpose of the project is to:

- **Improve Traffic Capacity**

As indicated by previous and recent traffic studies, future traffic projections demonstrate that additional capacity along SR-12 and across the Sacramento River is needed. The widening of SR-12 from two to four-lanes within the project limits will be necessary to serve future traffic volumes. Improvement to the bridge traffic capacity will significantly improve traffic conditions along the SR-12 corridor, provided that conflict between road and river traffic is minimized or eliminated. Based on the Traffic Forecasting Memorandum compiled for this study (see Attachment H), it is concluded that the planned transportation improvements at the roadway segments and study intersections along SR-12 will improve traffic operations at these locations. The intersections will operate at LOS D or better for the 2030 Mid-Level Bridge Conditions compared to LOS F for the 2030 No Project Conditions. Widening SR-12 through Rio Vista and across the Sacramento River will improve the route operational characteristics at this location by providing the planned four (4) lanes divided roadway segment.

- **Minimize Navigation Hazards and Surface/River Transportation Conflicts**

Based on Caltrans Maintenance and Operations records for 2008/2009, the lift span of the existing Rio Vista Bridge has been recently raised as many as 302 times per month to provide clearance for recreational and commercial boat traffic. Currently, the Port of West Sacramento is receiving approximately 45 ships per year which accounts for 90 bridge openings. In the past, the Port has had as many as 110 ships within a year, and the Port is currently permitted to receive up to 120 ships per year. The number of ships allowed to travel to the Port is expected to increase beyond the currently permitted number of 120 ships per year as future river traffic is expected to increase with planned Port expansion. The size of ships traveling to the Port is also anticipated to increase with the largest ships expected to be auto vessels. The congestion on SR-12 within Rio Vista, currently at a level of service (LOS) E/F, is largely due to surface/river transportation conflicts at the Sacramento River Bridge, especially in the summer and early fall months. The Coast Guard has provided input regarding the shipping corridor and has indicated that moveable bridges are acceptable, although they pose a higher navigation

hazard. Because moveable bridges must be manned continuously for operation, there is potential for human error that can result in the bridge not being open when a ship arrives. In addition, the Coast Guard has indicated that leaving the existing bridge in place if a new bridge is constructed would result in a potential navigational hazard as ships would need to line up for two navigation openings that will have different opening dimensions and could appear to not line up depending on the ship's approach angle. Ship approach angle could be at a skew due to a bend in the river channel to the south of the existing bridge.

- **Preserve Travel Safety**

Proposed new alignments for SR-12 will greatly improve travel safety along the corridor. As proposed under the 2001 MIS, SR-12 will be widened to 4 lanes and 6 lanes along various sections. New passing lanes and turning lanes will also be added. Not only will traffic capacity increase, but more importantly, safety will be improved along SR-12. Median Barriers will be installed and shoulders will be widened to standard width whenever possible to reduce risk of head-on collisions and enhance safety. Rumble strips and median separation will also be introduced at suitable locations. Geometric improvements, such as providing roadway curve radii and superelevations in accordance with the latest design standards will effectively preserve travel safety. Intersections will also be improved to provide proper sight distances, turning pockets, curb returns, pedestrian crossings, signalization and lighting to enhance operation and reduce traffic conflicts at intersections.

#### 4. DEFICIENCIES

Based on the Caltrans Peak Hour Traffic Volume Data Report dated 05/14/2009, the existing 2008 peak volumes combined for both westbound and eastbound directions on SR-12 from Summerset Road to SR 160 exceeds the 2-lane roadway capacity of 1,800 vph in the PM hour. The traffic volume is projected to increase as the Metropolitan Bay area expands, and areas connected by SR-12 continue to grow in population. The internal trip generation alone, resulting from the current planned local City of Rio Vista development, according to the City General Plan, is expected to approach 21,500 trips per day by the year 2025. This growth in internal trip generation combined with traffic generated by regional growth is projected to approach 61,600 vpd with peak hour traffic approaching 5,500 vph by the year 2025. Traffic volumes of this magnitude require additional lanes through or around Rio Vista and across the River.

The existing bridge carries a current ADT of 20,600 vehicles per day on two lanes over the Sacramento River per Caltrans 2008 Traffic Data. The structure is a through truss with a lift span over the main river navigation channel. Limited clearance between the bridge and the waterway requires the lift span to be operated to allow passage of modest recreational watercraft, and as many as 10

lifts per day, on average, is common during peak recreational periods based on Caltrans operation logs for 2008/2009. Bridge operation, which take approximately 10 minutes and 25 minutes to open and close for small boats and large vessels respectively, frequently results in significant traffic backups and unacceptable levels of service E/F. Traffic back-ups in each direction associated with bridge openings involve as many as 175 vehicles when the bridge opens for a small boat and as many as 440 vehicles when the bridge opens for a large vessel.

#### 4.1 CURRENT AND FORECAST TRAFFIC

A Traffic Forecasting Memorandum (*AECOM-LAN, May 2008*) was prepared to develop traffic forecast and to assess the impact on traffic conditions of the proposed improvement.

This Traffic Forecasting Memorandum presents the results of traffic analysis performed by the City of Fairfield using the Solano Napa Traffic Demand Model to assess the number of traffic lanes required for an SR-12 facility located along the existing route and for a bypass for the year 2030. This analysis examines traffic volumes and levels of service at intersections and roadway segments along SR-12 and a bypass under the following conditions:

- 2030 Future Forecast (No Project) Conditions
- 2030 Future Forecast (Existing Route w/Mid-Level Bridge) Conditions
- 2030 Future Forecast (Bypass w/High-Level Bridge) Conditions

Traffic operations were conducted at the studied roadway segments along SR-12 and intersections between SR 113 and SR 160. Table 1 and 2 summarize the results of the existing traffic condition.

**TABLE 1 - ROADWAY LEVEL OF SERVICE – EXISTING CONDITION**

Roadway Segment	Existing Conditions				
	Lanes	Type	Volume	V/C	LOS
SR 12 – SR 113 to Summerfield	2	Arterial (3)	16,900	0.85	D
SR 12 – Summerfield to Church	2	Arterial (3)	18,900	<b>0.95</b>	<b>E</b>
SR 12 – Church to Main St	2	Arterial (2)	18,600	<b>1.03</b>	<b>F</b>
SR 12 – Main St to River Rd	2	Arterial (2)	18,800	<b>1.04</b>	<b>F</b>
SR 12 – River Rd to SR 160	2	Arterial (3)	21,000	<b>1.05</b>	<b>F</b>
(2) = 2 lane moderate access controlled arterial (3) = 2 lane high access controlled arterial					

**TABLE 2 - INTERSECTION LEVEL OF SERVICE – EXISTING CONDITION**

Intersection	Existing Conditions				
	Control	AM		PM	
		Delay	LOS	Delay	LOS
SR 12 / SR 113	TWSC	34	D	>50	F
SR 12 / Summerfield	SIGNAL	7	A	8	A
SR 12 / Church Rd	TWSC	18	C	>50	F
SR 12 / Main St	SIGNAL	21	C	27	C
SR 12 EB / River Rd	TWSC	13	B	30	D
SR 12 WB / River Rd	TWSC	17	C	20	C
SR 12 / SR 160	SIGNAL	28	C	45	D

Traffic volume forecasts for the studied scenarios were developed by the City of Fairfield and are based on volumes from the City's forecasting. In general, the forecasting methodology included the development of "through traffic" growth using the Solano Napa Traffic Demand model. Table 3 presents the forecasted traffic volumes for the daily, am & pm for 2030 Scenarios:

**TABLE 3 – 2030 FORECASTED TRAFFIC VOLUMES**

Location		2030 Forecasted Volumes (2) (No Project)		2030 Forecasted Volumes (2) (High-Level Bridge)		2030 Forecasted Volumes (2) (Mid-Level Bridge)	
		vph		vph		vph	
		AM	PM	AM	PM	AM	PM
SR 12, SR 113 to Summerfield	EB	977	1662	2005	2668	2725	2760
	WB	1651	1112	2297	1954	2901	2477
SR 12, Summerfield to Church Rd	EB	1495	1777	1981	2068	2414	2167
	WB	1557	1550	1946	1961	2193	2187
SR 12, Church Rd to Main St	EB	1544	1697	1894	1879	3033	2438
	WB	1500	1568	1817	1885	2498	2761
SR 12, Main to River Rd	EB	1132	1261	1702	1660	3033	2438
	WB	1062	1231	1704	1842	2498	2761
SR 12, River Rd to SR 160	EB	1284	1411	2388	2341	2685	1649
	WB	1222	1430	2034	2264	1687	2364
(2) Source: City of Fairfield, Traffic Forecast Model, March, 2008.							

Traffic Operation analyses were performed along the roadway segments of SR-12 between SR 113 and SR 160 for the future conditions using the forecasted volumes. The analyses were performed based the HCM 2000 Methodology and based on the daily volume thresholds for various highway facility types presented in the City's forecasting. Table 4 summarizes the results of the analysis for the roadway segments of SR-12 for the No Project Scenario.



**TABLE 4 - ROADWAY LEVEL OF SERVICE – 2030 NO PROJECT  
CONDITION**

Roadway Segment	2030 No Project Conditions					
	Lanes	Direction	AM		PM	
			V/C	LOS	V/C	LOS
SR12 – SR113 to Summerfield	1	EB	0.61	B	1.04	F
	1	WB	1.03	F	0.69	B
SR12 – Summerfield to Church Rd	2	EB	0.83	D	0.99	E
	2	WB	0.86	D	0.86	D
SR12 – Church Rd to Main St	2	EB	0.86	D	0.94	E
	2	WB	0.83	D	0.87	D
SR12 – Main St to River Rd	2	EB	0.63	B	0.70	C
	2	WB	0.59	A	0.68	B
SR12 – River Rd to SR 160	1	EB	1.43	F	1.57	F
	1	WB	1.36	F	1.59	F

Tables 5-6 summarize the results of the analysis for the roadway segments of SR-12 for the year 2030 studied scenarios.

**TABLE 5 - ROADWAY LEVEL OF SERVICE – 2030 MID-LEVEL BRIDGE  
CONDITION**

Roadway Segment	2030 Mid-Level Bridge Conditions					
	Lanes	Direction	AM		PM	
			V/C	LOS	V/C	LOS
SR12 – SR113 to Summerfield	2	EB	0.72	C	0.95	E
	2	WB	0.82	D	0.70	C
SR12 – Summerfield to Church Rd	2	EB	1.10	F	1.15	F
	2	WB	1.08	F	1.09	F
SR12 – Church Rd to Main St	2	EB	1.05	F	1.04	F
	2	WB	1.00	F	1.05	F
SR12 – Main St to River Rd	2	EB	0.95	E	0.92	E
	2	WB	0.95	E	1.02	F
SR12 – River Rd to SR 160	2	EB	1.33	F	1.30	F
	2	WB	1.13	F	1.26	F

**TABLE 6 - ROADWAY LEVEL OF SERVICE – 2030 HIGH-LEVEL BRIDGE CONDITION**

Roadway Segment	2030 High-Level Bridge Conditions					
	Lanes	Direction	AM		PM	
			V/C	LOS	V/C	LOS
I-515 (SR12) – SR113 to Summerfield	2	EB	0.68	B	0.82	D
	2	WB	0.73	C	0.70	C
I-515 (SR12) – Summerfield to Church Rd	2	EB	0.60	B	0.66	B
	2	WB	0.55	A	0.62	B
I-515 (SR12) – Church Rd to SR 160	2	EB	0.76	C	0.74	C
	2	WB	0.62	B	0.78	C
I-515 (SR12) – SR 160 to SR 12	2	EB	0.67	B	0.51	A
	2	WB	0.42	A	0.67	B

Tables 7-9 summarize the results of the analysis for the intersections along SR-12 for year 2030 studied scenarios.

**TABLE 7 - INTERSECTION LOS – 2030 NO PROJECT CONDITION**

Intersection	2030 No Project Conditions				
	Control	AM		PM	
		Delay	LOS	Delay	LOS
SR 12 / SR 113	SIGNAL	141.0	F	138.8	F
SR 12 / Summerfield	SIGNAL	14.6	B	23.1	C
SR 12 / Church Rd	SIGNAL	128.7	F	173.9	F
SR 12 / Main St	SIGNAL	83.2	F	158.5	F
SR 12 / SR 160	SIGNAL	134.8	F	120.7	F

**TABLE 8 - INTERSECTION LOS – 2030 MID-LEVEL BRIDGE CONDITION**

Intersection	2030 Mid-Level Bridge Conditions				
	Control	AM		PM	
		Delay	LOS	Delay	LOS
SR 12 / SR 113	SIGNAL	19.1	B	41.5	D
SR 12 / Summerfield	SIGNAL	29.3	C	31.6	C
SR 12 / Church Rd	SIGNAL	35.7	D	37.8	D
SR 12 / Main St	SIGNAL	37.6	D	33.0	C
SR 12 EB Ramps/River Rd	SIGNAL	12.4	B	14.6	B
SR 12 WB / SR 160	SIGNAL	25.3	C	38.1	D
SR 12 EB Ramps / SR 160	SIGNAL	41.7	D	30.4	C

**TABLE 9 - INTERSECTION LOS – 2030 HIGH-LEVEL BRIDGE CONDITION**

Intersection	2030 Mid-Level Bridge Conditions				
	Control	AM		PM	
		Delay	LOS	Delay	LOS
SR 12 EB Ramps / SR 113	SIGNAL	8.5	A	7.8	A
SR 12 WB Ramps / SR 113	SIGNAL	4.5	A	19.3	B
SR 12 EB Ramps / Church Rd	SIGNAL	5.1	A	5.7	A
SR 12 WB Ramps / Church Rd	SIGNAL	5.8	A	3.3	A
SR 12 Ramps / SR 160	SIGNAL	28.8	C	4.9	D

The forecasting memorandum concluded that the planned transportation improvements at the roadway segments and study intersections along SR-12 will improve traffic operations at these locations. The intersections will operate at LOS D or better for the 2030 Mid-Level Bridge Condition compared to LOS F for the 2030 No Project Conditions. However, SR-12 will experience unacceptable level of service for the 2030 Mid-Level Bridge Condition for all the SR-12 roadway segments from SR 113 to SR 160. Widening SR-12 at the Sacramento River Bridge will improve the operational characteristics at this location by providing the planned four (4) lanes divided roadway segment. This roadway segment will continue to operate at unacceptable Level of Service for both 2030 Scenarios (No Project and Mid-Level Bridge), however, the Volume to Capacity (v/c) ratio will drop by 21% (1.59 to 1.26) due to the added capacity to this roadway segment within the project limits. It is anticipated that the SR-12 roadway segments will continue to operate unsatisfactory at LOS E and F with the planned improvements for the 2030 Mid-Level Bridge Conditions.

The analysis for the 2030 Bypass with High Level Bridge shows that all intersections at freeway ramp intersections and the freeway segments will operate at LOS D or better for this scenario. For both alternatives analyzed, a Mid-level Bridge along the existing route and a Bypass with a High Level Bridge, the forecasting indicates that a facility of at least four lanes is required.

#### 4.2 NAVIGATION ISSUES

In a meeting with the United State Coast Guard (USCG), San Francisco Bar Pilots and the Port of West Sacramento on June 18, 2009, several potential navigation issues were discussed with respect to physical location and geometry of the ship channel, including locations of potential bridges openings, types of bridges (high level/fixed vs mid-level moveable), and skew angle of the bridge alignment compared to the ship channel alignment.

Just south of the existing bridge, there are shoals extending from the eastern river bank toward the Rio Vista bank and downriver from the existing bridge which cause a bend in the ship channel. This bend requires that ships jog toward the west bank before turning back to line up with the existing bridge opening. In general, locating a crossing adjacent to a bend in the channel makes navigation more difficult. Relocating or straightening the ship channel was discussed, and it was agreed that a straighter channel would improve navigation safety. A potential issue associated with straightening or relocating the ship channel toward the eastern river bank include an increase in sedimentation that may naturally occur as evidenced by the presence of the existing shoals. Nonetheless, it is considered reasonable to investigate relocation of the ship channel during the PA&ED phase as moving it to the opposite side of the river would allow a bridge crossing high point and west approach touchdown point to be shifted as much as 1000 feet to the east. This shift would help to reduce right-of-way impacts on the Rio Vista side of the river for high level bridge and tunnel alternatives.

Based on Coast Guard and Bar Pilot input, there are potential issues with a bridge crossing located to the north of the existing bridge near the point where the shipping channel, the Sacramento River and Steamboat Slough converge. During events when these channels are experiencing high flows, there are strong currents and eddies that are formed that make navigating a large vessel challenging. Locating a bridge crossing in or near that area of channel convergence would increase navigation difficulty and pose a navigation hazard.

Additionally, the skew angle of the bridge with respect to the ship channel presents a challenge for navigation as the navigation opening appears narrower due to the ship approach angle. Moreover, it is difficult to ascertain whether the ship is properly lined up with the middle of a skewed opening. The option for building a 2-lane mid-level moveable bridge alongside the existing bridge and deferring replacement of the existing structure for a later project was discussed with respect to navigation. It was agreed that the offset bridge towers that would be present due to the larger opening of the newer bridge would likely present a challenge to vessels for lining up with the center of the two openings; however, it was suggested if this option moves into subsequent project phases, the USCG, Bar Pilots and Port could test the layout by placing buoys at proposed tower locations which would allow ship captains to get a visual of the potential opening before taking a position on the alternative.

### **Bridge Clearance**

The existing Rio Vista Bridge on SR-12 at the Sacramento River has limited vertical clearance between the waterway and the structure. In general, navigation clearances for each bridge along a navigable waterway are considered independently due to differences in channel geometry, ship speed limits, tides, ship size and other factors. The minimum clearance downstream would not necessarily govern for the Rio Vista Bridge. However, it was suggested by the USCG that the new Carquinez and Benicia Martinez bridges would likely serve as

the basis for vertical clearance requirements at Rio Vista. Other bridges along the waterway with less clearance will likely be replaced during the lifetime of a new Rio Vista Bridge, and as such, would not necessarily be considered in determining clearance requirements for Rio Vista.

The USCG is in the process of reviewing potential crossing locations and will provide preliminary horizontal and vertical clearance requirements with input from the San Francisco Bar Pilots and the Port of West Sacramento and based on the following factors:

Vertical Clearance – based on mean high water elevation, the depth of the shipping channel and the size of the largest ship planned to navigate to the Port of West Sacramento.

Horizontal Clearance – based on location of the crossing with respect to bends in the shipping channel; the ship speed limit (thought to be 10 mph); the largest single vessel passing alone; and skew angle of the bridge – horizontal clearance will be measured normal to the channel centerline and minimization of the bridge skew angle to the channel is encouraged.

#### **4.3 AIRSPACE ASSESSMENT**

A preliminary airspace assessment has been completed to identify potential issues related to airspace obstruction potential for proposed bridge crossings and crossing locations with respect to current airport operations and future expansion plans. Airport operations information and future expansion plans are contained in the Rio Vista Airport Master Plan.

Based on current operations with defined airport approach and departure flight tracks and Solano County Airport Land Use Commission (ALUC) Compatibility Zones, the proposed river crossing bridge for the route to the north of the airport (Alternative 4) intersects with an airport approach flight path and may be classified as an obstruction.

With respect to future airport expansion plans, both the northern and Airport Road alternatives (Alternatives 4 and 3 respectively) are potential obstructions in the region around the airport defined as a horizontal surface at elevation 172 feet above ground level (AGL) where, ideally, no object should extend above. The bridge decks for these two alternatives would be at or near this surface and the bridge lighting would extend approximately 30 feet or more above. It is also important to note that Alternative 4 may directly impact airport expansion plans.

For alternatives advanced for further study in the environmental documentation phase, it will be necessary to forward all alternatives to the Solano County ALUC for review. The commission has jurisdiction over land use adjacent to and around the airport and must approve plans for construction of any building or structure

that extends beyond 200 feet AGL. It is anticipated, regardless of alternative, the bridge structure attachments, such as lighting, or bridge towers for a mid-level moveable bridge alternative will extend close to or above 200 feet AGL.

#### 4.4 ACCIDENT RATES

Accident rates for the study area, for the three-year period starting April 1st, 2006 and ending March 31st, 2009, were obtained from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) Table B. Actual accident rates, when compared to the statewide average, indicate this section of road has a lower accident rate than the statewide average for a similar type facility for both Fatal + Injury and Total categories. Nonetheless, there are total of 170 reported accidents with 5 fatal and 73 involving injuries. The data indicates that within the above time period, 42.4% of the accidents were rear end type, 43.5% of the accidents had a primary collision factor of “Speeding” and 72.9% occurred during daylight hours.

**Table 1 - Accident Rates**

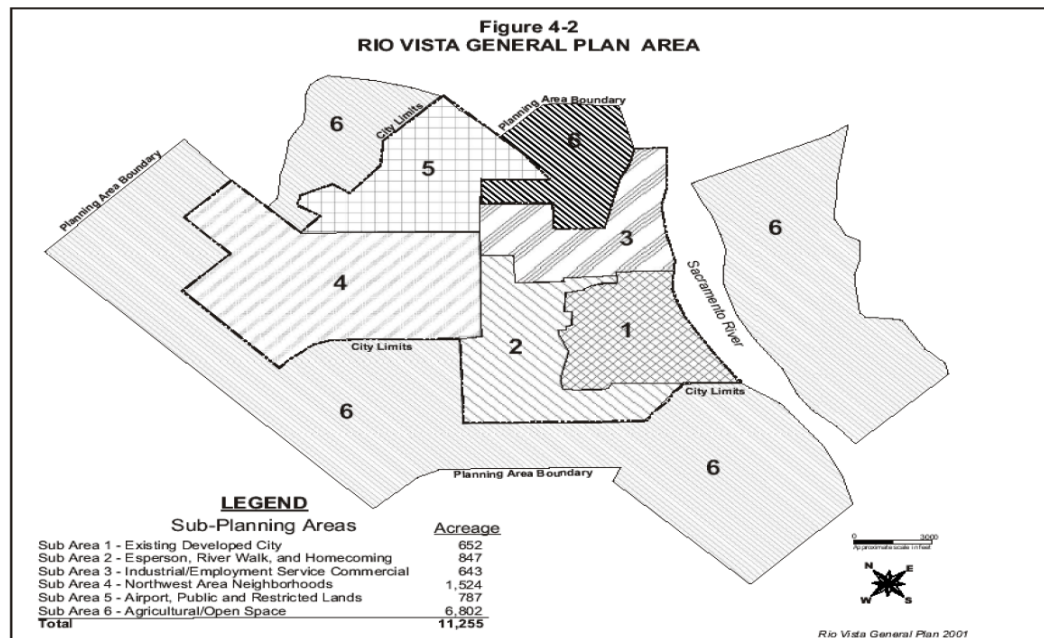
Accident Rates (per Million Vehicle Miles)						
Location	Actual			Average		
	Fatal	Fatal + Injury	Total	Fatal	Fatal + Injury	Total
04-SOL 012-19.30 To 03-SAC 012- 5.80	0.019	0.30	0.66	0.024	0.40	0.95

## 5. CORRIDOR AND SYSTEM COORDINATION

The portion of SR-12 between I-80 in District 4 and Route 99 in District 10 has been in the State Highway System (SHS) since 1919 and was added to the Freeway and Expressway (F&E) System in its entirety when the F&E System was established in 1959. There is a valid adopted freeway route for the section of SR-12 between Fairfield and Liberty Island Road west of Rio Vista. This freeway route generally follows the existing highway and the adoption dates back to the late 1950's and early 1960's, with the section between Denverton and Liberty Island Road adopted in 1962.

As documented in the 2001 MIS approved by STA, long-term and near-term physical improvements and management practices have been identified to serve future traffic demands and improve safety along the SR-12 corridor. The 2001 MIS study corridor includes the portion of SR-12 between Interstate 80 and the Rio Vista Bridge.

In the City of Rio Vista, the large parcels (Riverwalk, Gibbs, and Brann Ranches) that constitute the majority of the future residential and commercial growth extend from Church Road westerly to the city limits and north of Highway 12. This area, as shown in Figure 4-2 in the City General Plan and following, contains several specific plan areas under previously adopted development agreements, including the Trilogy (formerly Summerset) planned development, Gibbs Ranch, and Brann Ranch. The Trilogy senior housing project has been completed. The planned Riverwalk Development, located on the north side of SR-12 and east of Church Road, is a master planned community that has recently executed a development agreement with the City. In addition to residential, the anticipated mix of uses includes neighborhood retail, commercial, service commercial, and limited industrial/employment uses.



Other planned developments, currently in the environmental documentation phase include the Del Rio Hills Master Planned Community, located along SR-12 opposite the Riverwalk Development and the Shiloh III Wind Turbine Farm located to the south and west of the SR-12/Church Road intersection. The Del Rio Hills project has been analyzed in a Draft EIR that has been circulated for public review, and the project is currently on hold pending economic feasibility analysis being undertaken by the developer.

## 6. ALTERNATIVES

This preliminary corridor assessment documents the first phase for the SR-12 Realignment/Rio Vista Bridge Preliminary Study and establishes recommendations for feasible corridor alternatives to be studied in more detail during the environmental documentation phase. The study has assessed various corridor alternatives based on current and planned land use, as well as

environmental and engineering constraints. The study includes a reassessment of alignment alternatives considered as part of the Preliminary Site Selection Study that was completed in December, 1992 and the subsequent Project Feasibility Report (1994 PSR level document) that was completed in October, 1994, both of which were initiated by the City of Rio Vista and overseen by Caltrans District 10.

### **PREVIOUSLY STUDIED ALTERNATIVES**

In 1991, study for replacement/realignment of the Rio Vista Bridge was initiated at the request of the City of Rio Vista which culminated in the Sacramento River Crossing at Rio Vista Project Feasibility Report, a PSR level document that was developed under Caltrans District 10 oversight. The document is comprised of several studies with components as follows:

- Preliminary Site Selection Report (December 1992).
- Rio Vista High Bridge Study (March 1993).
- Funding Evaluation Rio Vista Bridge Project (July 1993).
- Preliminary Geotechnical Engineering Review (August 1993).
- Project Feasibility Report (October 1994).
- Preliminary Environmental Analysis Report (November 1994).

Many of the alignment alternatives studied were eliminated during development of the Preliminary Site Selection Report (1992) due to impacts on existing or planned developments, poor soil conditions, increased required bridge length/cost and/or impacts on wetlands. Attachment B provides an overview of the 1992 site selection study which examined eight (8) alternatives with alignments in three (3) parallel corridors that included the existing SR-12 corridor running through the City of Rio Vista; a corridor north of the City on a new alignment near the Rio Vista Airport; and along a corridor that would follow SR-12 west of the City and then would turn southeast along a new alignment to a river crossing south of the City. The approach roadways included 13 approach structures, and the Rio Vista High Bridge Study investigated river crossing alternatives comprised of a mid-level movable bridge or submersed tube tunnel for the alignment following the existing SR-12 corridor and high level bridges for the alternatives passing to the north and south of the City.

Final recommendations of the 1992 Site Selection Report were limited to further study of two alignments. These two alignments are identified in Attachment B as Alternates 2 and 6. Alternate 2 follows the existing SR-12 alignment and was proposed as a rural expressway configuration outside the developed areas and an urban expressway within the City. At-grade intersections would be provided at a spacing of approximately 1 mile to match existing County roads. Along the rural expressway, control of access would be maintained. Alternate 6 was planned as a freeway and follows the existing SR-12 alignment west of the City and deviates to the southeast approximately one mile west of Azevedo Road on a new alignment two miles to the south where it runs just north of and parallel to Emigh Road,



through the Montezuma Hills and across the Sacramento River. The alignment then follows an easterly route to rejoin SR-12 east of Jackson Slough.

Following is a description of each alternative studied as part of the 1992 Site Selection Study along with the final disposition previously reached.

***Alternative 1***

No build option, with the bridge remaining unchanged. Although the no build option would not address the need for increased capacity across the bridge, it considered Caltrans projects, such as the relocation and signalization of the Route 160 intersection to the east, and the proposed widening of Route 12 from the bridge west to P.M. 22.4.

***Alternative 2***

An expressway along the existing SR-12 alignment with a new bridge adjacent to the existing bridge. The new crossing will be a mid-level movable bridge with approximately 50' of vertical clearance in the down position over the shipping channel and 300' horizontal clearance. There will be two lanes in each direction with the existing bridge carrying the westbound traffic. The existing bridge, with its 10' vertical clearance and 300' horizontal clearance, will remain in place until some future date when it will be retrofitted using the existing bridge section, or replaced as a mid-level movable bridge.

**Disposition:**

The 1992 Preliminary Site Selection Report noted that the results of the study were presented to the Rio Vista Steering committee and this alternative was selected for further consideration after discussion with representatives from Caltrans, the City, the Coast Guard, the community and developers.

***Alternative 2A***

An expressway with a mid-level crossing alongside and to the north of the existing bridge. It departs from the existing Route 12 alignment approximately one mile east of the Sacramento River, passing north of the existing alignment and trailer park, and south of the old airport, matching the existing alignment east of Azevedo Road. This alternative will utilize the existing bridge until funding will allow it to be replaced or retrofitted.

**Disposition:**

This alternative was eliminated from consideration due to the impacts to the existing trailer park, the River Walk East development, and the Falls at Rio Vista development (formerly Mark's Ranch).

***Alternative 2B***

An expressway with a mid-level crossing alongside and to the north of the existing bridge. Departing from the existing alignment approximately one mile east of the Sacramento River, it will pass north of the existing alignment and

trailer park, and south of the old airport, matching the existing alignment of Route 12 at the Church Road intersection. This alternative will utilize the existing bridge until funding will allow it to be replaced or retrofitted.

**Disposition:**

This alternative was eliminated from consideration due to the impacts to the existing trailer park and the River Walk East development.

***Alternative 3***

An expressway with a mid-level crossing north of Alternatives 2A and 2B, departing from the existing Route 12 alignment approximately one mile east of the Sacramento River and matching the existing alignment near the Church Road intersection. This alternative will utilize the existing bridge until funding will allow it to be replaced or retrofitted.

**Disposition:**

This alternative was eliminated from consideration due to the impact to the River Walk East development and existing industrial development.

***Alternative 4***

A freeway with a high-level crossing north of Rio Vista. It has a 150' vertical clearance and a 440' horizontal clearance. The alignment departs from the existing approximately four miles east of the Sacramento River, runs north of the new airport and matches the alignment of McCormack Road west of Liberty Island Road, about one mile north of existing Route 12. This alternative would require about 3.5 miles of new roadway west of Route 113 to connect with existing Route 12.

**Disposition:**

This alternative was initially selected for additional study but was later presented to the Rio Vista Steering committee and was not selected for further consideration after discussion with representatives from Caltrans, the City, the Coast Guard, the community and developers. Concerns were raised regarding access to Rio Vista, impacts to wetlands and development and poor foundation soils along the west bank of the river.

***Alternative 4B***

A freeway with a high-level crossing north of Rio Vista. This alignment departs from the existing SR-12 approximately four miles east of the Sacramento River and runs north of the new airport and connects back into the existing alignment of Route 12 east of Azevedo Road.

**Disposition:**

This alternative was eliminated from consideration due to impacts to development at Gibbs Ranch.

***Alternative 4C***

A freeway with a high-level crossing north of Rio Vista. This alignment departs from the existing SR-12 approximately four miles east of the Sacramento River and passes south of the new airport before connecting back into the existing Route 12 alignment east of Azevedo Road.

**Disposition:**

This alternative was eliminated from consideration due to the impacts to development at Gibbs Ranch.

***Alternative 5***

A freeway with a high-level crossing south of Rio Vista. This alignment departs from the existing alignment approximately one mile east of the Sacramento River and passes between the marina and the U.S. Army Depot on the west side of the Sacramento River. The alignment connects back into the existing Route 12 alignment east of Azevedo Road.

**Disposition:**

This alternative was eliminated from consideration due to the impacts to the marina, the Army Depot and the Del Rio Hills development.

***Alternative 6***

A freeway with a high-level crossing south of Rio Vista. This alignment departs from the existing SR-12 alignment approximately four miles east of the Sacramento River, passes south of the Coast Guard Reserve and the picnic and boat launch area at Sandy Beach Park on the west side of the river and follows the alignment of Emigh Road south of Rio Vista before connecting back into the existing Route 12 alignment west of Azevedo Road.

**Disposition:**

The Preliminary Site Selection Report noted that the results of the study were presented to the Rio Vista Steering committee and this alternative was selected for further consideration after discussion with representatives from Caltrans, the City, the Coast Guard, the community and developers.

***Alternative 6A***

A freeway with a high-level crossing south of Rio Vista. This alignment departs from the existing SR-12 alignment approximately two miles east of the Sacramento River and passes south of the Coast Guard Reserve through Sandy Beach Park on the west side of the Sacramento River and then traverses northerly to connect back into the existing Route 12 alignment east of Azevedo Road.

**Disposition:**

This alternative was eliminated from consideration due to cost concerns and impacts to the Del Rio Hills development and Sandy Beach Park.

***Alternative 6B***

A freeway departing from the existing alignment approximately two miles east of the Sacramento River with a high-level crossing south of Rio Vista, the Coast Guard Reserve, and the picnic and boat launch area, this alignment matches the alignment of Emigh Road south of Rio Vista and the Route 12 alignment west of Azevedo Road. It crosses the river to the north of Alternative 6.

**Disposition:**

After a site visit, this alternative was modified to the alignment shown as Alternative 6 to take advantage of the bluffs on the west side of the river and to shorten the river bridge length. This alternative was then eliminated from further consideration.

***Alternative 7***

A freeway with a high-level crossing north of Rio Vista. This alternative departs from the existing alignment approximately four miles east of the Sacramento River and passes south of the airport along Airport Road before matching the existing McCormack Road west of Liberty Island Road. The alignment crosses SR113 and requires approximately 3.5 miles of new roadway to connect back into the existing Route 12 alignment.

**Disposition:**

This alternative was initially selected for additional study but was later presented to the Rio Vista Steering committee and was not selected for further consideration after discussion with representatives from Caltrans, the City, the Coast Guard, the community and developers. Concerns were raised regarding access to Rio Vista, impacts to wetlands and development and poor foundation soils along the west bank of the river.

**UPDATED ALTERNATIVES**

Based on review of the previously studied alignments and assessment with respect to current constraints, the issues outlined above in the dispositions for the previously studied routes, such as impacts to wetlands and existing and planned developments, the presence of poor foundation soils, and increased bridge lengths to minimize environmental impacts are still valid. From assessment of the thirteen (13) 1992 Site Selection Study alignments, five (5) alternatives, including the No Build Alternative, have been further assessed and refined, and three (3) of the five (5) corridor alternatives shown in Attachment C (Alternative 2, 3, & 5), along with Alternative 2A, a variation of Alternative 2, are recommended to be further developed and assessed in more detail during the project environmental phase. While each of these alternatives has assumed a new 4-lane Sacramento River crossing, Caltrans District 4 has commented with regard to project scope and cost, (see Attachment J). Caltrans District 4 has noted that this project has the potential to take a large share of the Bay Area's transportation funding without meeting the MTC's current strategies for the 2035 Regional Transportation Plan

(RTP) and its SB 375 goal of significantly reducing inward commuting into the Bay Area. In light of this potential for inconsistency with the MTC's RTP strategies, District 4 has suggested that a 2-lane river crossing project that is expandable to a 4-lane crossing should be considered.

### **Alternative 1**

Alternative 1 is the no build option. Although the no build option would not address the need for increased capacity along SR-12 and across the river, it is included for comparison purposes. For the no build alternative, the existing 2-lane corridor and river bridge would remain in place, and road/river traffic conflicts will continue to occur and will worsen over time as local and regional growth and Port of West Sacramento expansion takes place.

### **Alternative 2**

This alternative is a refined version of the previously studied *Alternative 2*. The corridor is located within the existing SR-12 corridor and matches the existing SR-12 alignment except near and over the river where it is offset to the north to allow space for staging that will be required to keep the existing route and bridge open during construction.

Feasible structures for the river crossing for this alternative include a mid-level, moveable bridge (See Attachment D for Bridge Advanced Planning Study (APS) Memorandum and Bridge APS drawing) and a tunnel (See Attachment E for Tunnel Design Memorandum). The proposed bridge option uses a mid-level lift bridge similar to the existing bridge, except with 50 feet of clearance in the closed position and a wider navigation opening. The proposed tunnel is a twin-bore with one-direction of traffic in each bore. There are two 12-foot wide travel lanes in each direction, plus shoulders. The resulting clearance envelope measures 28.5 feet in width and 16.5 feet in height. The tunnel size used as a basis for this study has a 35-foot internal diameter to be excavated by an approximately 40 foot diameter Tunnel Boring Machine (TBM). Walkway space along the sidewalls and space above the roadway for lights, ventilation fans and signs is available due to the curvature of the circular tunnel section.

For the mid-level moveable bridge option, the estimated project capital cost (without support cost) is \$710,620,700, which includes \$583,037,000 construction cost and \$127,583,700 right of way cost. The project capital cost escalated at 3% annually to the assumed mid-point of construction in year 2022 with a 15% contingency fund is estimated at \$1,165,153,000. Additional costs for capital support for environmental clearance, design and construction administration and engineering is estimated at \$228,710,000 assuming that this alternative is selected, designed and constructed.

For the tunnel option, the estimated project capital cost (without support cost) is \$1,127,483,400, which includes \$970,014,000 construction cost and \$157,469,400 right of way cost. The project capital cost escalated at 3% annually

to the assumed mid-point of construction in year 2022 with a 15% contingency fund is estimated at \$1,848,651,000. Additional costs for capital support for environmental clearance, design and construction administration and engineering is estimated at \$366,560,000 assuming that this alternative is selected, designed and constructed.

### ***Alternative Advantages***

This corridor has several advantages which include use of the existing SR-12 route which takes advantage of existing state right-of-way, maintenance of similar access to the City and for a mid-level bridge alternative, similar appearance to the existing bridge. Maintaining the regional traffic through the existing commercial center may minimize impacts to the existing highway commercial and downtown area commercial retail base compared to a bypass alternative. With regard to environmental factors, this alternative limits impact to the primary delta zone and new agricultural land impacts.

Although a tunnel would require a depressed roadway approach, local access across SR-12 between the two halves of Rio Vista could be enhanced with lid(s) on the depressed roadway that could be used for local road crossings, parking and recreational use. In addition, a tunnel would avoid construction in the river and associated environmental impacts, and backups associated with road/river traffic conflict would be eliminated. Moreover, a tunnel option in this location would reduce right-of-way impacts compared to the mid-level bridge option.

Based on updated City of Rio Vista guidance (see Attachment J), the City currently supports a new river crossing along the existing alignment of Highway 12 with a preferred crossing comprised of a 4-lane tunnel or an interim project with a 2-lane tunnel to augment the existing bridge until a second 2-lane tunnel can be constructed.

### ***Alternative Challenges***

A high level bridge is not considered feasible at this location due to the adverse visual impact of an elevated roadway/viaduct through the center of Rio Vista, as well as the associated impacts to local access and local access points. Challenges also include implementing design elements consistent with current City General Plan language that discusses facilitation of bicycle and pedestrian safety, as well as realization of the City's trail system linkage. Design features would need to be adequately addressed and implemented to alleviate the concerns associated with safety for the crossing of a 4-lane arterial carrying all local and through traffic through the center of town.

Construction of this alternative would require new right-of-way on the west approach north of the existing alignment to allow continued use of the existing route and bridge during construction of the new facility. The right-of-way requirements would impact existing businesses, residences and potentially the

entire West Wind Mobile Home Park. Relocation of residences and businesses would be required.

Although the proposed mid-level moveable bridge would reduce the number of bridge openings required compared to the existing bridge, this option would require the bridge approach to be raised approximately 30 feet on the west approach in Rio Vista and would still conflict with river traffic. The mid-level bridge would need to be opened for some recreational craft and all larger shipping traffic. Using the projected year 2030 peak traffic volume of 5531 vehicles per hour, the amount of time necessary to open and close the bridge (per Caltrans Operations Records) is 25 minutes for large vessels. Using the proposed 4 lane facility as a basis for vehicle storage, a bridge opening for a large ship during peak traffic times could result in backups stretching more than 2 miles with as many as 1150 vehicles backed up in each direction.

For the tunnel option, significant challenges include developing access points to Rio Vista, large risks associated with uncertainty in soil types and conditions, costs associated with required drainage systems, long term maintenance and continuous operations and monitoring, and satisfying permitting agency requirements that may include construction of a large containment berm on the Brannan Island approach to prevent flooding of Brannan Island in the event that water infiltrates and floods the tunnel.

#### **Alternative 2A**

This alternative is a modified version of the previously studied *Alternative 2B* and was initially dropped from consideration due to impacts on the Riverwalk development which is now fully entitled. Based on input from the City and local community, however, it has been re-added to the preliminary study for consideration. This corridor is located within the existing SR-12 corridor west of Church Road where it departs to the north across the planned Riverwalk development and then proceeds to the east by way of an existing drainage floodway to the north of the West Wind Mobile Home Park. The river crossing is located north of the existing bridge, and the corridor connects back into the existing SR-12 route east of SR-160.

This alternative was considered as a mid-level bridge crossing as part of the 1992 study but could be assessed as a high level bridge option. Feasible structure types at this location include segmental concrete and orthotropic steel. Towers for a cable stayed bridge could pose issues with airport operations.

Because this alternative was initially eliminated from consideration and has been added for consideration at the end of the preliminary study, a detailed cost estimate has not been developed. However, based on costs developed for other alternatives, it is anticipated that this alternative would have total costs similar to Alternative 2, but certainly within the range of costs shown for all bridge alternatives.

***Alternative Advantages***

This corridor would take advantage of the undeveloped drainage floodway located to the north of Rolling Green Drive and the West Wind Mobile Home Park. This corridor would keep through traffic close to the City center compared to the bypass alternatives and would allow construction of a high level bridge to eliminate road/river traffic conflicts.

***Alternative Challenges***

Although this corridor would maintain through traffic close to the City center compared to the bypass alternatives, businesses located directly along the existing SR-12 facility east of Church Road may be adversely affected, as this route would still tend to serve as a bypass of the existing commercial and retail base. Additionally, the route crosses terrain that may support seasonal wetlands which may require increased bridge length on the west approach through Rio Vista to minimize impacts. Moreover, this corridor significantly impacts the Riverwalk development which has recently executed a development agreement with the City. Securing needed right-of-way through this entitled development would pose challenges and would ideally be initiated before the developer begins construction to avoid impacts to residences and the need for relocations.

This alternative does follow the existing SR-12 alignment, however, it would require a realignment of the route to the north between Church Road and connection back to the existing route on the east side of the Sacramento River. Based on review of the Draft Preliminary Bridge Report, Solano County has provided comment (see Attachment J) stating that any realignment of SR-12 would be inconsistent with the current Airport Land Use Compatibility Plan (ALUCP) which shows the highway in its present location. The ALUCP would need to be updated by the Solano County Airport Land Use Commission to depict this realignment for the corridor to be considered favorably.

**Alternative 3**

This alternative is a refined version of the previously studied ***Alternative 7*** and follows a route to the north of the existing SR-12. The alignment takes a northerly departure from SR-12 east of Azevedo Road and then turns southeasterly following the Airport Road alignment to the south of the airport before crossing the river and connecting back into the existing SR-12 west of the Mokelumne River.

This alternative would include a high level bridge. Feasible structure types at this location include segmental concrete and orthotropic steel. Towers for a cable stayed bridge could pose issues with the airport operations. A planning level bridge study was completed for this alternative and is provided in Attachment D.

The estimated project capital cost (without support cost) for this alternative is \$693,698,400, which includes \$564,044,000 construction cost and \$129,654,400 right of way cost. The project capital cost escalated at 3% annually to the assumed



mid-point of construction in year 2022 with a 15% contingency fund is estimated at \$1,137,407,000. Additional costs for capital support for environmental clearance, design and construction administration and engineering is estimated at \$221,810,000 assuming that this alternative is selected, designed and constructed.

#### ***Alternative Advantages***

This corridor is has several advantages that include consistency with current City General Plan language, removal of truck traffic from the town center, utilization of an existing corridor, the ability to provide the opportunity for multiple access points with an expressway facility, and the elimination of the road/river traffic conflict with a high level bridge. Compared to the other bypass alternatives to the north of the airport and to the south of town, this alternative is also the shortest bypass length with the least impact to the primary delta zone and agricultural lands. Based on current cost estimates, this is also the least cost alternative. With respect to current General Plan language, it is stated that, “The City shall support an alignment along Airport Road as the preferred alternative, until further information is obtained.” For access, the route would directly serve the airport and the City’s industrial district.

#### ***Alternative Challenges***

Challenges associated with this alternative include noise impacts, potential economic impacts and the potential need for a change in land use planning along Airport Road. Because this corridor passes through the planned Brann and Gibbs Ranch developments and directly adjacent to the existing Trilogy development, noise impacts would be anticipated and would need to be mitigated. In addition, there is concern that relocation of SR-12 to this corridor would result in significant economic impact to the existing highway commercial and downtown area commercial retail base. Furthermore, relocation of the route may result in relocation of commercial development to the new route which could adversely impact and/or displace existing industrial businesses currently located along Airport Road. With regard to the airport expansion plans, although the bridge for this alternative is not located within the airport approach or departure flight paths, the proposed bridge would extend above the inner 172 feet horizontal airspace surface defined in the Airport Master Plan for airport expansion. As such, the bridge would be considered an obstruction. Although classification as an obstruction would not preclude this alternative, it would need to be reviewed and approved by the Solano County Airport Land Use Commission (SCALUC).

Although the current City General Plan identifies this route as the City’s Preferred Alternative, the City of Rio Vista has provided updated guidance (see Attachment J) stating that this alternative is no longer preferred due to adverse impacts on local business, the existing residences and industrial businesses along Airport Road, the missed approach zone and future airport expansion plans.

Moreover, Solano County has provided comment (see Attachment J) stating that any realignment of SR-12 would be inconsistent with the current ALUCP which

shows the highway in its present location. The ALUCP would need to be updated by the Solano County Airport Land Use Commission to depict this realignment for the corridor to be considered favorably.

#### **Alternative 4**

This alternative is located in the northern corridor and follows the previously studied *Alternative 4B* alignment. Like Alternative 3, this corridor takes a northerly departure from SR-12 east of Azevedo Road; however, it passes to the north of the airport before turning southeasterly to cross the river and connect back in to SR-12 west of the Mokelumne River.

Similar to the other bypass alternatives, this alternative would include a high level bridge. Feasible structure types at this location include segmental concrete, and orthotropic steel bridges. Towers for a cable stayed bridge would pose issues with airport operations.

The estimated project capital cost (without support cost) of this alternative is \$886,671,700, which is the total of \$730,747,000 construction cost and \$155,924,700 right of way cost. The project capital cost escalated at 3% annually to the assumed mid-point of construction in year 2022 with a 15% contingency fund is estimated at \$1,453,810,000. Additional costs for capital support for environmental clearance, design and construction administration and engineering is estimated at \$281,310,000 assuming that this alternative is selected, designed and constructed.

#### ***Alternative Advantages***

This corridor, similar to Alternative 3, has the advantage of removing through truck traffic from the town center and eliminating the road/river traffic conflict with a high level bridge. This route also crosses mostly undeveloped land and has the potential for less noise impact compared to Alternative 3.

#### ***Alternative Challenges***

Challenges associated with this alternative include an inconsistency with current City General Plan language and impacts and constraints that would pose significant difficulties in funding, environmental and agency permitting and constructing a bypass along this corridor. Current City General Plan language demonstrates concern with the potential for significant economic impact to the existing highway commercial and downtown area commercial retail base if the existing route were to be relocated outside of the City. Input received from local businesses as outlined in Section 7 and Attachment J of this report echo this concern. Furthermore, the General Plan points out that a route in this area is inconsistent with the policies of the Delta Protection Commission with significant impacts to the Primary Delta Zone, and that a bypass outside of the City may induce growth outside the current and proposed urban limits.

With respect to planned airport land use, an alignment along the north side of the airport would effectively constrain the airport and would preclude future airport expansion. Based on preliminary airspace assessment, the elevated approach embankment and bridge for this alternative are directly in the airport landing flight path. Furthermore, the proposed bridge would extend above the inner 172 feet horizontal airspace surface defined in the Airport Master Plan for airport expansion. As such, the bridge would be considered an obstruction and would need to be reviewed and approved by the SCALUC. Because this corridor alternative directly impacts planned airport expansion, it is not reasonable to expect that this route would be reviewed favorably by the SCALUC.

Other challenges include environmental impacts associated with the crossing of wetlands on the west side of the river. Compared to other alternatives, this route would result in greater environmental impact. To minimize those impacts, the river bridge would need to be extended beyond the wetlands, resulting in a significantly longer bridge and higher associated cost. Furthermore, as discussed in Section 4.2, a bridge along this alignment would cross the river very close to the confluence of the Deep Water Channel, the Sacramento River and Steamboat Slough. The turbulent flows that occur in this vicinity of the river combined with a bridge crossing/navigational opening would pose a navigation hazard due to the increased difficulty of navigating large ships through this area. Other issues associated with this alternative include potential for poor foundation soils on the west side of the river that are not ideal for supporting a large structure and challenges in providing access to the City. An alignment to the north of the airport would result in limited access to the City due to the presence of wetlands and the airport which form a barrier between the City and the road alignment.

The proximity of a high level bridge to the airport flight path, coupled with environmental impacts, significant impact to airport expansion plans and potential impacts to ship safety could pose significant challenges in obtaining environmental clearance and permits needed to construct this alternative. As such, it is recommended that this alternative be eliminated from further consideration.

### **Alternative 5**

This corridor alternative is located to the south of the City and is a refined version of the previously studied *Alternative 6*. The corridor departs from the existing SR-12 alignment west of Azevedo Road and turns southeasterly passing to the south of the planned Del Rio Hills development along an alignment parallel to Emigh Road. The alignment crosses the City of Rio Vista waste-water treatment plant before crossing the river, passing to the south of the Duck Island RV Park and connecting back into the existing SR-12 alignment west of the Mokelumne River.

Like Alternatives 3 and 4, this alternative would include a high level bridge. Feasible structure types at this location include segmental concrete, orthotropic

steel and cable bridges. A planning level bridge study was completed for this alternative and is provided in Attachment D.

For the cable stay bridge option, the estimated project capital cost (without support cost) is \$765,780,800 which includes \$616,648,000 construction cost and \$149,132,800 right of way cost. The project capital cost escalated at 3% annually to the assumed mid-point of construction in year 2022 with a 15% contingency fund is estimated at \$1,255,595,000. Additional costs for capital support for environmental clearance, design and construction administration and engineering is estimated at \$240,610,000 assuming that this alternative is selected, designed and constructed.

For the concrete segmental bridge option, the estimated project capital cost (without support cost) is \$713,597,900 which includes \$569,209,000 construction cost and \$144,388,900 right of way cost. The project capital cost escalated at 3% annually to the assumed mid-point of construction in year 2022 with a 15% contingency fund is estimated at \$1,170,033,000. Additional costs for capital support for environmental clearance, design and construction administration and engineering is estimated at \$223,810,000 assuming that this alternative is selected, designed and constructed.

#### ***Alternative Advantages***

This corridor, similar to Alternatives 3 and 4, has the advantage of removing through truck traffic from the town center and eliminating the road/river traffic conflict with a high level bridge. This route also avoids impacts to existing and planned developments.

#### ***Alternative Challenges***

Challenges associated with this alternative include an inconsistency with current City General Plan language, as well as impacts to the planned Shiloh III Wind Farm, environmental resources and agricultural lands. Similar to the northern bypass, Alternative 4, Current City General Plan language demonstrates concern with the potential for significant economic impact to the existing highway commercial and downtown area commercial retail base if the existing route were to be relocated outside of the City. Input received from local businesses as outlined in Section 7 and Attachment J of this report echo this concern. Furthermore, the General Plan points out that a route through the Montezuma Hills would impact large dryland farming operations, as well as sensitive habitat areas along the Sacramento River. Similar to the other bypass alternatives, a route outside of the City may induce growth outside the current and proposed urban limits. In addition, the Solano Land Trust acquired a conservation easement on the 1,842 acre Anderson and 1,865 acre McCormack Ranches from the California Farm and Ranch Lands Protection Program and through donations from land owners. This large tract of land helps to ensure its future agricultural viability. Information from Solano Land Trust indicates that these lands are protected and that private non-agricultural construction of any kind on the property, including

structures, paved roads and bridges are prohibited. With respect to a public road, preliminary review of parcels covered by the conservation easement (see Attachment J) indicates that the conservation easement can be avoided and is not currently within the alternative corridor as shown. In addition, should conflict occur, construction of a public road may not be precluded, but will likely be strongly opposed and may require mitigation to replace lands impacted by the project. Another challenge is posed by the planned wind farm. The route would need to pass through or near future wind turbines and work would need to be done soon to ensure that a roadway through this area is compatible with the wind farm and that sufficient set-back can be provided from the wind turbines to the highway. The wind farm project is progressing ahead of this project and is currently in the environmental phase. Because the road project is not as far along in project development compared to the wind farm, a corridor alternative through this area may need to conform to the wind farm plans.

With regard to access, a route to the south would accommodate limited access points. As a freeway, access points would be limited to 1-mile spacing to satisfy Caltrans interchange spacing requirements. As such, only two access points would be provided into Rio Vista: one at the point the bypass would depart from the existing SR-12 route west of Azevedo, and one at Church Road. In discussions with the City, a main access point that would use 2<sup>nd</sup> Street is not considered acceptable as 2<sup>nd</sup> Street pass the elementary school and through a residential neighborhood.

Based on updated City of Rio Vista guidance (see Attachment J), the City has stated that this alternative would adversely impact access to the City, existing conservation easements and existing and planned residential developments. Because of these impacts and because of limited local support for this alternative, the City has requested that this route be eliminated from consideration.

Moreover, Solano County has provided comment (see Attachment J) stating that any realignment of SR-12 would be inconsistent with the current ALUCP which shows the highway in its present location. The ALUCP would need to be updated by the Solano County Airport Land Use Commission to depict this realignment for the corridor to be considered favorably. In addition, the County has confirmed that the Shiloh III Wind Farm Project is currently being processed through the County, and it is anticipated that action on the Conditional Use Permit and accompanying Environmental Impact Report will be completed in late 2010. The County further stated that the proposed turbine layout would preclude Alternative 5 as currently shown, but could be adjusted to connect back to SR-12 farther to the east to avoid the wind turbine project.

## **7. COMMUNITY INVOLVEMENT**

In developing potential corridor alternatives, stakeholder and local community input has been solicited through a stakeholder outreach program that included interviews of key stakeholders, informational presentations with question and

answer periods during City of Rio Vista Council meetings, public workshops and presentations at for local stakeholder groups. Following are public outreach activities that were undertaken:

- Summer 2008: Stakeholder Interviews: Nine stakeholders were interviewed and four other were attempted.
- September 24, 2008: Special Meeting of the Rio Vista City Council – presentation of project overview and feedback from stakeholder interviews and solicited input/comment from the City Council and local community in attendance.
- May 21, 2009: Rio Vista Soroptimists Luncheon
- May 28, 2009: First Public Workshop – presented project overview, project history, purpose and objectives; introduced project web site and ways to obtain project information. Solicited input through a breakout session.
- August 26, 2009: Special Meeting of the Rio Vista City Council – provided a progress update, presented alternative comparisons and solicited input/comment.
- February 25, 2010: Second Public Workshop – presented project update and held an open comment and question period to provide the local community with the opportunity to ask questions and comment publicly.
- April 22, 2010: Rio vista Chamber of Commerce Meeting – presented the latest project information in a setting that allowed local business/chamber members the opportunity to discuss the project from the local business’ perspective.
- May 17, 2010: Rio Vista Airport Commission Meeting – presented project issues related to potential impacts on the airport and obtained input from the commission.
- May 20, 2010: Rio Vista City Council Meeting – presented project update and solicited input from the Council and numerous local community members and businesses.

In addition to Project Team public outreach efforts, the City of Rio Vista held a public workshop on October 20, 2009 with the local community. The workshop was held to discuss the potential alternatives presented by STA and the consultant team, as well as to document advantages and disadvantages for the potential corridor alternatives from the local community perspective.

From the public outreach events, significant input was obtained from the City, local community members, businesses and other stakeholders. Key feedback is summarized as follows:

- There is a concern that something needs to be done to improve SR-12 and the river crossing to facilitate safe travel on Highway 12 and continuing

support for improved use of the Sacramento River as a “marine highway” of the future.

- There is a significant concern from the local business community as outlined in a letter from the Rio Vista River Crossing Committee (see Attachment J), a local group of business, commercial and industrial owners, that alternatives to relocate the route may adversely impact local businesses and ultimately the viability of Rio Vista as a City.
- Realignment Vs. use of the existing SR-12 route – realignment supporters are concerned with community safety and the split between the two halves of the City that will be worsened with a busy 4-lane arterial through the center of town while existing route supporters are concerned with the potential adverse impact to local business that could occur if the route were moved out of town.
- There are questions concerning funding, how a project of this magnitude can be funded, particularly with respect to a toll bridge and how that would impact local residents and businesses.

Summaries of public meetings are provided in Attachment J along with summaries of comments received via the project web site and emails, and letters from the Rio Vista River Crossing Committee and committee member businesses.

A Draft Preliminary Bridge Report was officially released by the STA Board on June 9, 2010 for public review and comment. The public comment period extended from June 10, 2010 through August 9, 2010. Official comments were received from several agencies, including the City of Rio Vista City Council, the Solano County Department of Resource Management, the Sacramento County Department of Transportation and Caltrans Districts 4 and 10. Full comment letters received from these agencies and comments received via email from other sources are included in Attachment J.

## **8. ENVIRONMENTAL DETERMINATION/ DOCUMENT**

The preliminary environmental investigation anticipates the environmental document needed for this project is an Environmental Impact Report (EIR) under CEQA and an Environmental Impact Statement (EIS) under NEPA. It is anticipated that STA will be the lead for CEQA and Caltrans will be the lead for NEPA. Joint preparation of CEQA and NEPA environmental documentation is anticipated.

The following discusses the anticipated environmental technical studies needed for the project:

### **Hazardous Waste/ Materials**

An Initial Site Assessment will be required to assess the potential presence of hazardous wastes within the study area for the proposed alternatives. A government records search and site survey will be required. Pesticides, herbicides,

and insecticides used on agricultural lands may have left residual hazardous wastes in the soil. Aerially deposited lead in soil, lead paint on structures, asbestos components on the existing structures, and other potential hazardous waste should also be investigated.

### **Air**

Potential air quality issues are expected from the roadway realignment and construction. Projects must conform to the federal Clean Air Act to gain U.S. Department of Transportation approval. The significant increase in traffic volumes to meet Year 2025 conditions or beyond could cause violations of local carbon monoxide (CO) concentration standards. Sensitive receptors for air quality impacts are currently located in the vicinity. An air quality analysis will be required to determine project-specific impacts, conformity and mitigation. In addition, the air quality analysis will include an analysis of Mobile Source Air Toxics, based on FHWA guidance. Short-term mitigation measures may be necessary to mitigate construction-related emissions.

### **Greenhouse Gas Emissions**

A Climate Change and Energy analysis will be conducted to evaluate the project's impacts on energy resources as well as evaluate the project's conformity to the State's global climate change requirements. This analysis will be conducted in accordance with Caltrans' guidelines including the *Climate Action Program at Caltrans* and the latest available Air Quality Report templates on the Caltrans Standard Environmental Reference (SER) website. Proposed project development would generate GHGs through construction activities, vehicle trips, and maintenance activities. Although project development would not result in a significant effect on global climate change by itself, it could contribute to global climate change on a cumulative basis, including the potential for rising sea levels. The analysis will also be consistent with the analysis requirements of the 2010 CEQA Guidelines.

### **Noise**

Potential noise issues are expected from the alternatives. Sensitive receptors for noise impacts are currently located in the vicinity of all alternatives. A technical noise analysis will be required. Noise mitigation will be necessary to protect sensitive receptors.

### **Water Quality**

The project site is located within a large drainage shed where numerous drainages convey surface runoff that ultimately discharges runoff into the Sacramento River. Hydraulic/hydrologic studies will need to be conducted to determine the amount of runoff generated from new paved surfaces and the effect on existing drainage facilities. Also, studies will need to be conducted to determine the effects of the new bridge/support foundations (piers/piles) and their effect on the Sacramento River hydraulics and water surface elevation. While additional runoff will be generated by the new bridge and roadway, the additional runoff can be



addressed through the application of standard water quality measures and Best Management Practices. A Water Quality Assessment Report will need to be prepared.

### **Biological Resources**

A Natural Environment Study will be required to address general biological resources, including both plant and wildlife species. Existing ground squirrel burrows should be inspected for the presence of burrowing owls (surveys can be conducted throughout the year). Swainson's hawk preconstruction surveys should be conducted based on tree removal activities (surveys between March-September). Bird surveys should be completed in the spring/summer season. Valley elderberry longhorn beetle (VELB) species is known to occur within the project area and will need to be surveyed. Giant garter snake habitat is likely present and will require surveys during the spring/summer season. Some of the large expanses of annual grasslands may contain vernal pool habitat. Vernal pools provide habitat for State listed and federally listed fairy shrimp, vernal pool tadpole shrimp, Conservancy shrimp and special status plant species. These pools and the associated upland habitat may also provide suitable habitat for federally listed California tiger salamander. Reaches of the Sacramento River provide migratory habitat for special status species including green sturgeon, delta smelt, steelhead, and chinook salmon. Formal Section 7 consultation with the United States Fish and Wildlife Service (USFWS) and the National Marine Fisheries Service (NMFS) would be necessary concluding in the issuance of Biological Opinions (BO). Several native trees occur along the alternative alignment and may be removed. Special status plants species may occur in, and along the banks of, the water features in the study area. CNDDDB records document occurrences of Mason's lilaeopsis, delta tule pea, and Suisun marsh aster, along the east bank of the Sacramento River. Regulatory permits will be required for this project. A formal delineation should be conducted to verify the status of jurisdictional waters in the project area. If it determined jurisdictional waters occur in the project area and will be impacted by the project, regulatory permits from the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and California Department of Fish and Game may be required.

### **Wetlands**

Pursuant to Executive Order 11990, an avoidance alternative analysis is required for wetland losses unless there is no practicable alternative available. A wetlands delineation will be necessary to identify potential impact areas. Field verification will be required to confirm the absence of these resources.

### **Visual Effects**

Visual impact assessment is anticipated. Some or all of the alternative alignments will modify the existing natural conditions and/or established urban environment. The project could have an adverse affect on designated visual or scenic resources should they be present within or adjacent to the project area. Farmland impacts and tree losses (native oak and non-native) along the roadways are expected. The

impact may be a local community concern (in addition to biological), and tree replacement options should receive input from the community. It should also be noted that the City of Rio Vista's General Plan specifies the preservation of views and aesthetics along SR-12 within the area that includes the project site. Contemplated improvements to implement this objective include a significant urban treescape, traffic calming measures, landscaped median strips, and a pedestrian overpass and/or underpass at the multiuse pathway crossing planned for the open space corridor on SR-12. Accordingly, a Scenic Resources Evaluation should be prepared to document the status of scenic resources in the project area.

### **Cultural Resources**

Cultural resource studies may be needed to address requirements of Section 106 of the National Historic Preservation Act. A Historic Property Survey Report (HPSR), an Archaeological Survey Report (ASR), and a Historic Resources Evaluation Report (HRER) should be prepared (including Native American consultation) to address the potential for impacts to historic and pre-historic resources. Background research identified a number of resources in the study area. These include the potential for a historical cultural landscape associated with agriculture and recreation, numerous buildings in the older section of Rio Vista, the Rio Vista Army Reserve Center, various historical archaeological sites, cemeteries, subdivisions older than 50 years, historic farms/farmhouses, and sunken historic vessels (shipwrecks) in the Sacramento River. During the PA/ED phase, a determination will be made regarding exemption of properties in consultation with Caltrans Professionally Qualified Staff (PQS).

### **Paleontology**

Unique paleontological resources have been identified in Quaternary-aged alluvial deposits in the Rio Vista area. Although no specific paleontological resources have been identified on the project site, a Paleontological Identification Report (PIR) would be prepared and certified by a qualified paleontologist to document the identification efforts for paleontological resources and the need for paleontological monitoring during construction activities based on the alternative being reviewed.

### **Community Impact**

The project is expected to have an impact on the local community or the economy. At present, there are several existing businesses and commercial uses in the study area that will be impacted by some alternatives. Proposed improvements will cause direct or indirect effects on an established neighborhood or community and could affect group that might be subject to issues involving environmental justice. Also, alternatives serving as bypass roadways will have some impact on the economic health of the existing businesses. Likewise, alternatives that increase traffic through downtown Rio Vista could also impact the business community either by increasing congestion and degrading commercial access, or by providing additional exposure and improving business

opportunities. A Community Impact Assessment (including Environmental Justice and economic assessments) and a Draft Relocation Impact Study will be required.

#### **Section 4(f)**

If the project has an impact on National Register eligible properties, a Section 4(f) Evaluation may be needed. A Section 4(f) Evaluation could impact the project schedule if the project is considered controversial by the local community, or if the reviewing agencies disagree with the findings and require additional review and evaluation.

#### **Floodplain Encroachment**

The project will involve encroachments into the Sacramento River's 100-year floodplain, and as such, a Floodplain Encroachment Report will be necessary.

#### **Farmlands**

The study area includes a substantial amount of farmlands. These farmlands could be affected by all alternatives, particularly on the east side of the river. A Farmland Conversion Study will be necessary to assess the effects from loss of any prime, unique or local importance farmlands as well as land under Williamson Act Contracts.

#### **Coastal Zone**

This project is not within the coastal jurisdiction.

#### **Wild and Scenic Rivers**

This project may affect a federally designated wild and scenic river.

## **9. FUNDING**

A preliminary funding evaluation has been completed to assist in identifying potential funding sources for the project. The funding evaluation investigated numerous potential funding sources from traditional public funds typically used for delivery of public works projects to more non-traditional sources, such as toll and private financing. Traditional sources include Federal, State and local programs which are programmed through the Metropolitan Transportation Commission for the Bay Area cities and counties.

Although the traditional public financing mechanism is the most straight forward funding option for transportation projects, transportation fund availability from Federal, State and Local sources is limited due to budgetary issues and the high degree of competition between transportation projects for the limited funds. Furthermore, financing a project of this magnitude through traditional public financing would require the re-allocation of already programmed funds. As such, non-traditional funding sources were considered as part of the funding evaluation. An important aspect of non-traditional funding, such as toll or private financing,

is that significant study would be needed to assess the financial feasibility, including potential impacts on the community and the ability to develop a sufficient revenue stream to fund the project. In addition, legal and legislative hurdles would also need to be cleared.

**9A. CAPITAL AND CAPITAL SUPPORT COST ESTIMATE**  
**Capital and Capital Support Cost Estimates for the Alternative**  
**Identified for Programming in the 2012 STIP**

**Capital and Capital Support Outlay Estimate (in \$1,000's)**

	Capital Costs	Capital Support Costs			Total Estimated Costs to Delivery
		PA&ED (0) Phase*	Design (1) Phase	Construction Admin & Engineering	
Alternative 1 "No Build"					
Alternative 2- Bridge	\$1,165,000	\$20,810	\$83,200	\$124,700	\$1,393,863
Alternative 2- Tunnel	\$1,848,651		\$138,300	\$207,450	\$2,215,211
Alternative 3	\$1,137,407		\$80,400	\$120,600	\$1,359,217
Alternative 4	\$1,453,810		\$104,200	\$156,300	\$1,735,120
Alternative 5 - Cable Stay	\$1,255,595		\$87,900	\$131,900	\$1,496,205
Alternative 5 - Segmental	\$1,170,033		\$81,200	\$121,800	\$1,393,843

The level of detail available to develop these capital cost estimates is only accurate to within the above ranges and are useful for long-range planning purposes only. The capital costs should not be used to program or commit capital funds. The Project Report will serve as the appropriate document from which the remaining support and capital components of the project will be programmed.

\* PA&ED Capital Support Cost of \$20.81 million covers the environmental phase capital support costs for the study of all alternatives combined except for Alternative 4. It is assumed that Alternative 4 will be eliminated and not included in the environmental study.

Capital costs have been escalated at 3% per year to an assumed mid-point of construction in the year 2022 and include construction, right-of-way and environment mitigation costs. Environmental mitigation costs have been assumed at 10% of construction cost. Capital support cost have been estimated at approximately 3%, 10% and 15% of construction cost for PA&ED, Design and Construction Administration & Engineering respectively. In addition, a program contingency of 15% on the escalated project capital outlay costs has been included. As the project is developed in the following phases with more refined engineering studies and cost estimates, life cycle costs will need to be included if Federal funding is utilized.

**10. SCHEDULE**

<b>HQ Milestones</b>	<b>Delivery Date (Month, Day, Year)</b>
Begin Environmental	July 2012
Notice of Intent (NOI)	August 2012
Circulate DED	August 2015
PA & ED	January 2016
Regular Right of Way	July 2016
Project PS&E	January 2020
Right of Way Certification	February 2020
Ready to List	April 2020
Approve Contract	November 2020
Contract Acceptance	December 2020
End Project	December 2025

**11. FHWA COORDINATION**

To be edited prior to PA/ED phase when Caltrans will provide oversight.

This Report has been reviewed by *(Name and title of the FHWA Liaison Engineer)* reviewing on *(date)*. Per *(latest federal Transportation Act)*, this project is eligible for federal-aid funding and is considered to be *(STATE-AUTHORIZED or FULL-OVERSIGHT)* under current FHWA-Caltrans Stewardship Agreements. *(If either no federal-aid funding will be used or no FHWA approval required, delete the above statement and replace with the statement: "No federal-aid funding anticipated or no FHWA action required for this project.")*.

Federal engineering and operational acceptability determination was received on \_\_\_\_\_. *(Delete this statement if not applicable.)*

Submittal of an unsigned PSR or an unsigned Project Report to FHWA is required to request federal "engineering and operational acceptability" determination of a new or modified access to the Interstate. Federal "engineering and operational acceptability" determination must be obtained prior to circulation of the environmental document. *(Delete this statement if not applicable.)*

CMAQ Eligibility \_\_\_\_\_ *(Delete this statement if not applicable.)*

**12. DISTRICT CONTACTS**

To be added prior to PA/ED phase when Caltrans will provide oversight.

**13. PROJECT REVIEWS**

To be added during the PA/ED phase when Caltrans will provide oversight.

Field Review _____	Date _____
District Maintenance _____	Date _____
District Safety Review _____	Date _____
HQ Design Coordinator _____	Date _____
Project Manager District Safety Review _____	Date _____
Constructability Review _____	Date _____

**14. ATTACHMENTS**

- A. Vicinity Map**
- B. Previously Studied Alternatives Exhibit**
- C. Potential Corridor Alternatives Exhibit**
- D. Structure Advanced Planning Study (APS)**
- E. Tunnel Design Memorandum**
- F. Cost Estimates**
- G. Preliminary Environmental Study**
- H. Traffic Forecasting Memorandum**
- I. Hydraulics Analysis Memorandum**
- J. Public Comments**