

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

To

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

On Route 37

Between 0.25 mile west of SR 121 Intersection (SON 3.5)

And 0.25 mile east of Mare Island Interchange (SOL R7.4)

APPROVAL RECOMMENDED:



Kevin Chen,  
Metropolitan  
Transportation  
Commission

James Cameron,  
Sonoma County  
Transportation  
Authority

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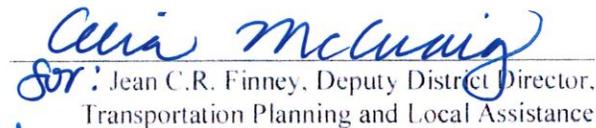
PROJECT SPONSOR. *Accepts risks identified in this PSR-PDS and attached risk register*

APPROVAL RECOMMENDED:



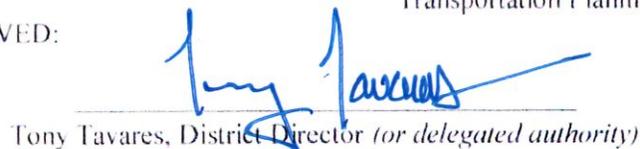
Kelly Hirschberg, Caltrans Project Manager

APPROVAL RECOMMENDED:



for: Jean C.R. Finney, Deputy District Director,  
Transportation Planning and Local Assistance

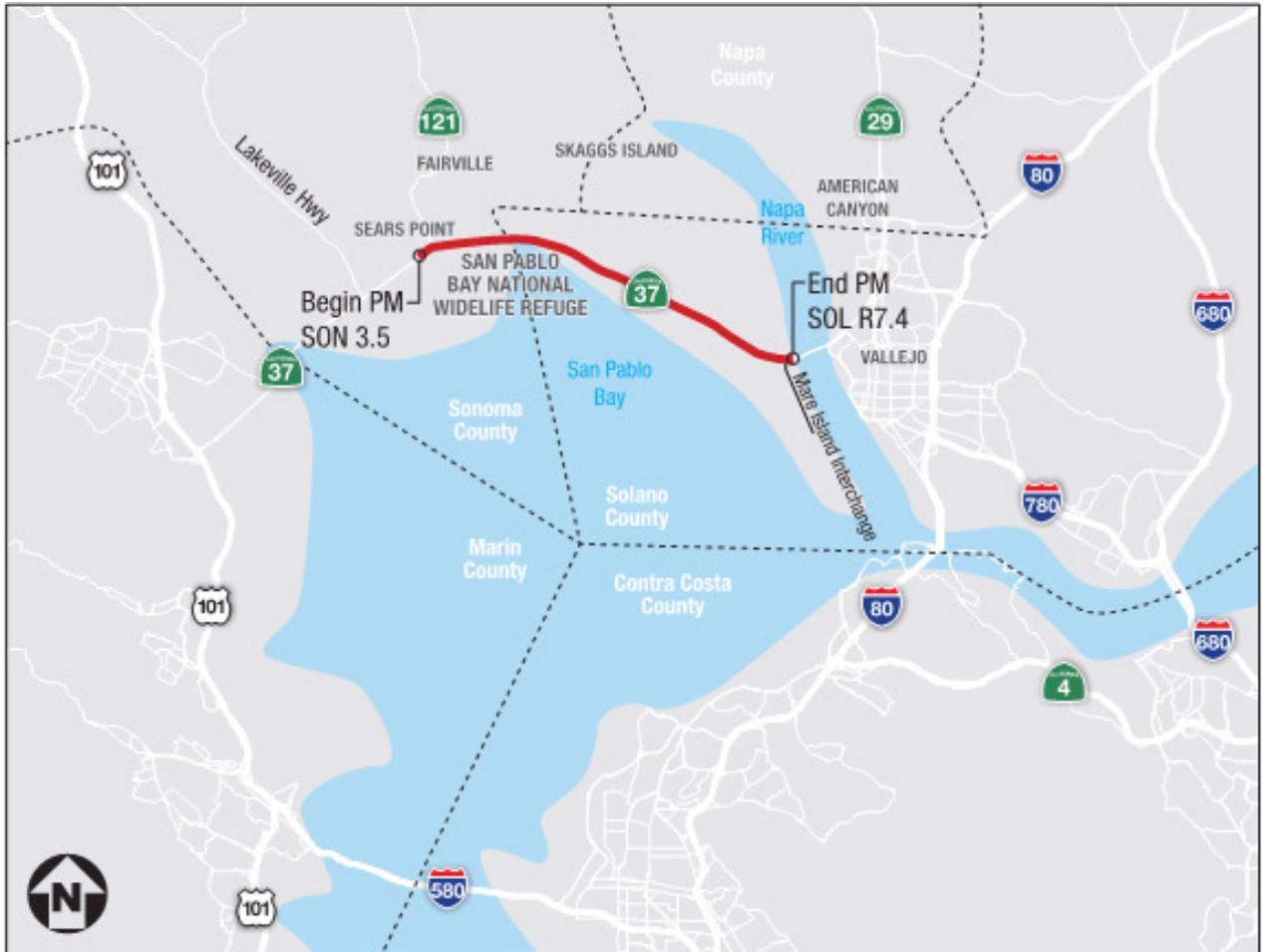
APPROVED:



Tony Tavares, District Director (or delegated authority)

12/28/18  
Date

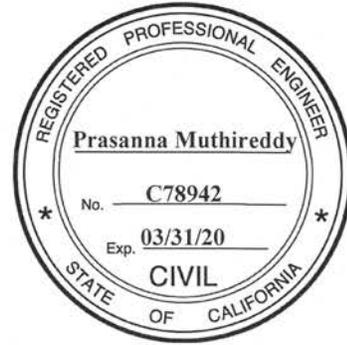
## Vicinity Map



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

  
REGISTERED CIVIL ENGINEER

12/27/18  
DATE



Reviewed by:

  
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## 1. INTRODUCTION

### *Project Description:*

California State Route 37 (SR 37) is an important regional connection linking the north, east, and west San Francisco Bay Area sub-regions. It serves commute, freight, and recreational traffic on weekdays and weekends. The SR 37 corridor currently experiences severe traffic congestion with extensive delays in the morning and evening weekday peak traffic periods and on weekends. The corridor has experienced flooding during winter storms and the flooding frequency and severity are expected to increase with Sea Level Rise (SLR).

The Metropolitan Transportation Commission (MTC), Caltrans, and its four north bay partners from Bay Area County Transportation Agencies —the Solano Transportation Authority (STA), the Sonoma County Transportation Authority (SCTA), the Transportation Authority of Marin (TAM), and the Napa Valley Transportation Authority (NVTa) —undertook a high-level assessment of key current and anticipated issues on SR 37. *The SR 37 Transportation and Sea Level Rise Corridor Improvement Plan* (SR 37 Corridor Plan) was completed in June 2018 and identified near-, and long-term improvements to help address such issues.

This Project proposes Interim (near-term) and Ultimate (long-term) improvements on SR 37 from 0.25 mile west of the SR 121 intersection (SON 3.5) to 0.25 mile east of the Mare Island interchange (SOL R7.4), to address traffic congestion and the threat of SLR. The Interim Project would be an initial step in addressing traffic congestion. The Interim Project proposes limited improvements at the existing roadway elevation and within the existing roadway footprint to provide additional capacity during peak periods to improve traffic flow while minimizing environmental impacts. The Ultimate Project would serve to further improve traffic flow and provide multimodal facilities, resiliency of SR 37 to SLR and flooding, and ecologic and hydrologic enhancements to facilitate adaptation of the corridor to SLR. The Project Study Report-Project Development Support (PSR-PDS) is a first step in proactively identifying opportunities and solutions to the transportation, ecosystem, and SLR concerns for the entire SR 37 corridor. The proposed Interim and Ultimate Projects under consideration are as follows:

### **Interim Project Alternatives:**

**Alternative I1:** 3-Lane Facility with Contra Flow Lane: Provide three lanes on SR 37 between SR 121 and the Mare Island interchange with a contra-flow median high-occupancy vehicle (HOV)/managed lane via moveable barrier at existing elevation.

**Alternative I2:** Shoulder Conversion to Travel Lane: Convert existing shoulders to HOV/managed lane during peak periods in peak direction.

**Ultimate Project Alternatives:**

**Alternative U1 - Hybrid Section:** Construct a new four-lane facility on SR 37 between SR 121 and the Mare Island interchange at SLR Design Elevations placed partly on embankment and partly on bridge structure.

**Alternative U2 - Causeway Section:** Construct a new four-lane facility on SR 37 between SR 121 and the Mare Island interchange at SLR Design Elevations on bridge structure.

Both the ultimate build alternatives include ecologic and hydrologic enhancements and reconfiguring the SR 37/SR 121 intersection and SR 37/Mare Island interchange.

The scope, schedule, and support costs necessary to complete needed studies and work during the Project Approval and Environmental Document (PA&ED) phase for Interim and Ultimate project are identified. The Interim and Ultimate improvements are intended to be processed separately in the PA&ED phase and would have their own Environmental Document and Project Report.

Total construction costs, capital outlay support costs (for PA&ED, PS&E, and construction management) and capital outlay right-of-way costs for both the Interim and Ultimate build alternatives are listed in the table below. Anticipated sources of funding include federal, state, and local funds.

<b>Project Limits</b>	04-SON-37-PM 3.5/6.2 04-SOL-37-0.0/R7.4
<b>Number of Alternatives</b>	Interim: Two Ultimate: Two
<b>Escalated Capital Outlay Support Estimate for PA&amp;ED</b>	Interim: \$3,510,000 - \$6,665,000 Ultimate: \$53,782,000 - \$66,361,000
<b>Escalated Capital Outlay Construction Cost Range</b>	Interim: \$104,216,000 - \$163,485,000 Ultimate: \$2,987,067,000 - \$3,876,757,000
<b>Capital Outlay Right-of-Way Cost Range</b>	Interim: \$3,000,000 - \$8,000,000 Ultimate: \$175,028,000 - \$246,833,000
<b>Funding Source</b>	Local, State, and Federal funding sources
<b>Type of Facility</b>	Conventional Highway
<b>Number of Structures</b>	Interim: Widen 1 Structure Ultimate: Construct Several New Structures
<b>Anticipated Environmental Determination or Document</b>	Interim: Initial Study (IS)/Environmental Assessment (EA) Ultimate: Environmental Impact Report (EIR)/Environmental Impact Statement (EIS)
<b>Legal Description</b>	In Sonoma and Solano Counties; from 0.25 mile west of SR 121 to 0.25 mile east of Mare Island Interchange
<b>Project Development Category</b>	Interim Alternatives: Category 3 Ultimate Alternatives: Category 2A

The capital outlay support, right-of-way, and construction components of the Project are preliminary estimates and are not suitable for the full Project's programming purposes. The intent of this PSR-PDS is to provide a scoping document for the PA&ED phase and is intended to be the authorizing document to execute a cooperative agreement between Caltrans and the lead agency for PA&ED. The Project Report will serve as the formal programming document for the remaining support and capital components of the Project. A Project Report will also serve as approval of the "preferred" alternative, and program construction and right-of-way costs. Caltrans is providing Independent Quality Assurance (IQA) for the Project, and it is anticipated that Caltrans would be the lead agency for required National Environmental Policy Act (NEPA) approval and California Environmental Quality Act (CEQA) approval.

## 2. BACKGROUND

### *Facility Description:*

SR 37 extends from United States Highway 101 (US 101) in Novato, Marin County to I-80 in Vallejo, Solano County. It is an important regional connection linking the north, east, and west San Francisco Bay sub-regions. Additionally, the highway is a parallel route north of the Richmond-San Rafael Bridge (I-580), functions as a State Recovery Route 3, and is part of the Interregional Roads System (IRRS) between US 101 and I-80. SR 37 connects job markets and housing within Marin, Sonoma, Napa, and Solano Counties and provides access to the popular wine growing regions of Napa and Sonoma Counties, the San Pablo Bay National Wildlife Refuge, the Sonoma Raceway in Sonoma County, as well as Six Flags Discovery Kingdom, and Mare Island in Solano County. The commute, freight movement, and recreational functions of SR 37 require efficient traffic management on both weekdays and weekends. Between US 101 and SR 121, SR 37 is a four-lane expressway. It transitions to a 2-lane conventional highway between SR 121 and the Mare Island interchange. East of the Mare Island interchange, SR 37 is a four-lane freeway facility.

Relevant studies completed on this corridor include: The Highway 37 Stewardship Study (July 2013), the State Route 37 Integrated Traffic, Infrastructure, and Sea Level Rise Analysis (UC Davis Study, February 2016), and the Caltrans Transportation Concept Report (TCR) (2015). As concluded in the SR 37 Corridor Plan and these studies listed above, SR 37 between SR 121 and the Mare Island interchange was identified as a priority segment for capacity enhancement to close the gap between the two four-lane segments on either end, as well as to address the vulnerability and risks associated with impacts to costs of improvements, recovery time, public safety, transit routes, recreational activities, economic impacts on commuters and transport of goods, and proximity to Communities of Concern.

This PSR-PDS addresses improvements on SR 37 between the SR 121 intersection and the Mare Island interchange. Within these limits, SR 37 is a two-lane

conventional highway facility with a median barrier. This segment of the corridor is 9.3 miles long with 2.3 miles located in Sonoma County and 7.0 miles located in Solano County. The Sonoma-Marin Area Rapid Transit (SMART) rail line tracks cross SR 37 at-grade, about 550 feet east of SR 121. Within the Project limits, the road elevation varies from 8 to 13 feet, NAVD88. SR 37 between SR 121 and Sonoma Creek Bridge (Br. No. 23-0063) is protected by levees between Tolay Creek and Sonoma Creek. There is no bayfront levee protecting SR 37 from east of Sonoma Creek to Mare Island. The following existing structures are within the Project limits from west to east:

- Tolay Creek Bridge (Bridge No. 20-0090)
- Sonoma Creek Bridge (Bridge No. 23-0063)
- Walnut Avenue Overcrossing at Mare Island interchange (Bridge No. 23-0109)

The most critical issues for the study corridor are recurrent traffic congestion, soft ground conditions, potential impacts of SLR on highly sensitive environmental resources adjacent to the corridor, and vulnerability to flooding—which will likely grow more frequent with SLR. Peak congestion occurs in the westbound direction in AM and eastbound direction in the PM. The primary cause of congestion is vehicular demand exceeding the capacity of the 2-lane conventional highway between SR 121 and the Mare Island interchange. The vehicular throughput of this segment is also unusually low, about 1200 vehicles per hour per lane versus 1600 vehicles on a similar facility. The lower throughput is primarily due to the short merge distances at the lane drops east of SR 121 and west of Mare Island interchange, high truck volumes, roadway settlement at the railroad crossing, and steeper grades at the Sonoma Creek Bridge (Br. No. 23-0063). The high traffic demand combined with the lower capacity in this segment results in severe congestion for both weekday peak period and weekend traffic.

The frequency of flooding associated with anticipated SLR is expected to increase to a point at which most of the existing roadway would become permanently inundated by 2050. The flooding could significantly alter critical habitats for protected species, wetlands, and baylands. In such an event, vehicular traffic on the corridor would have no option other than to divert to other already congested routes.

As projects are defined and advanced for consideration, they must have logical termini and independent utility. The SR 37 Corridor Plan identifies the issues, potential strategies and implementation plans for the entire corridor. The final plan is available for download at [http://scta.ca.gov/wp-content/uploads/2018/06/SR-37-Corridor-Plan\\_Final\\_June2018\\_wAppendices.pdf](http://scta.ca.gov/wp-content/uploads/2018/06/SR-37-Corridor-Plan_Final_June2018_wAppendices.pdf). The Corridor Plan identified the westernmost portion of SR 37 (US 101 to approximately SR 121) as subject to flood risk and in need of flood protection. The central portion of SR 37 (SR 121 to the Mare Island interchange) is defined by the lane drop from four to two lanes in each direction that causes traffic congestion, and is also prone to flood risk and sea level rise. The easternmost segment (east of the Mare Island interchange) was identified for mid- to long-term flooding risk. The studies done to date therefore provide a

preliminary basis for establishing logical termini. The three identified highway segments can also be advanced independently, as each segment provides one or more benefits related to flood protection, traffic congestion relief, and/or climate change adaptation. The recommendations from the SR 37 Corridor Plan identified priorities for these various segments, including a high priority for the SR 121 to Mare Island interchange. This priority segment was further refined to develop both the interim and ultimate alternatives proposed in this PSR-PDS. MTC, SCTA and STA are the sponsoring agencies working in partnership with Caltrans for completion of this PSR-PDS.

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

#### ***Interim Project***

The purpose of the Interim Project is to improve traffic flow and peak travel times, and increase vehicle occupancy (the number of people moved per vehicle) within the travel corridor between Mare Island and SR 121 (the Project limits).

The Interim Project is needed because the corridor already experiences severe traffic congestion that needs to be addressed in the near-term. The corridor experiences limited flooding and a more comprehensive Ultimate Project will be advanced in parallel through planning, environmental review, and design to address the complexities of SLR.

- 1) SR 37 is four lanes in each direction except where it merges to two lanes between the SR 37/SR 121 intersection and the Mare Island interchange. Weekday traffic congestion forms at these bottleneck locations and occurs for approximately 6 hours in the westbound direction while the eastbound congestion occurs for approximately 7 hours. On weekends, congestion occurs throughout most of the day.
  - a. Based on the MTC's regional travel demand model, traffic growth is estimated at 0.8 percent per year through 2040 and is expected to result in increased peak period congestion and longer travel times. Westbound AM peak hour travel time is expected to increase from 47 minutes to 58 minutes by 2022. Eastbound PM peak hour travel time is expected to increase from 100 minutes to 139 minutes by 2022.
  - b. Options to promote carpooling and bus ridership, such as HOV lanes and shuttle/bus services, are not operating in the corridor. These facilities and services can encourage mode shift from single occupant vehicles, thereby reducing traffic demand and decreasing corridor congestion while increasing person throughput.

### *Ultimate Project*

The purpose of the Ultimate Project is to address the following within the travel corridor between Mare Island and SR 121:

- 1) Improve traffic flow and peak travel times, and increase vehicle occupancy (the number of people moved per vehicle);
- 2) Provide accommodation for multimodal use;
- 3) Improve resiliency of transportation infrastructure to sea level rise and flooding; and
- 4) Provide ecological and hydrologic enhancements to facilitate adaptation of the corridor landscape to sea level rise.

The Ultimate Project is needed because:

- 1) As described above, projected traffic growth is expected to further exacerbate congestion within the corridor, and the Interim Project is limited to use of the existing roadway to facilitate its near-term implementation.
- 2) There is minimal multi-modal and public access along the corridor. People can drive to access points along the corridor that allow for wildlife viewing and other shoreline recreation; however, public access is limited and fragmented, and there are no pedestrian or dedicated bicycle facilities to allow for safe travel between the access points. Lack of separation from motor vehicles, rumble strips and debris in the road shoulders cause most cyclists to avoid this route, even though it is the shortest route between Novato and Vallejo and is the access to recreational destinations in the vicinity.
- 3) Highway flooding occurs during winter rain and high tide events, causing delays and closures. Sea level rise is expected to increase the frequency of these events. At its lowest elevations at Mare Island and Tolay Creek, the existing road bed is below typical king tide elevations under current conditions, and the frequency and severity of temporary flooding will increase in the future with even low amounts of sea level rise. Based on recent California state sea level rise guidance (OPC 2018), San Francisco Bay sea levels are likely to rise by 1.6 to 3.4 feet by 2100 under a high emissions scenario, with a high-range projection of 6.9 feet (83 inches). Over time, the existing road could be eroded and eventually permanently inundated, resulting in loss of a key regional travel corridor. In addition, continual settling of the roadway occurs due to unstable soils and heavy truck traffic. The roadway settling is an annual maintenance issue which requires ongoing repairs. This settling could worsen with sea level rise as the road and supporting fill become more water-saturated, making the roadway very susceptible to seismic failure from liquefaction.

- 4) SR 37 serves as a hydrologic and ecological barrier between San Pablo Bay that limits the ability of corridor wetlands to serve as a buffer to flooding and increased sea levels. Wetlands absorb and slowly release surface water, rain, and flood waters. This combined water storage and braking action lowers flood heights and reduces shoreline erosion. The holding capacity of wetlands also helps prevent the saturation of agricultural and vinicultural lands from flooding. Therefore, the ability of the corridor wetlands to function properly is critical to protection of area land uses from the effects of flooding and sea level rise.

#### 4. TRAFFIC ENGINEERING PERFORMANCE ASSESSMENT

The Traffic Engineering Performance Assessment (TEPA) was prepared for the Project using available traffic data and VISSIM traffic software analysis results from the SR 37 Corridor Plan for existing and future year traffic conditions. The full TEPA is presented in Attachment F and identifies existing and future operational deficiencies and scoping recommendations for the PA&ED efforts. The following are key findings from the TEPA:

##### *Existing Conditions:*

The existing conditions summary presented below is based on data collected in April 2017 for the SR 37 Corridor Plan. Subsequently, Caltrans implemented a State Highway Operation and Protection Program (SHOPP) designated project at the intersection of SR 37 and SR 121 that includes revised striping for the eastbound approach at this intersection. This revised striping and its impacts on traffic conditions will be evaluated in the PA&ED phase.

**AM Peak Period:** During the weekday AM peak period, a bottleneck was observed on westbound SR 37 between the lane drop west of the Mare Island interchange and the SR 121 intersection. The longest queue associated with this bottleneck extended approximately 6,500 feet east to the Wilson Avenue interchange ramps. The bottleneck section for westbound SR 37 had a mainline throughput traffic volume between 1,100 and 1,400 vehicles per hour per lane, which is well below the expected one-way capacity for a conventional 2-lane highway. The maximum midweek travel times from Fairgrounds Drive to US 101 were approximately 45 to 47 minutes, about 22 to 25 minutes longer than travel times during uncongested periods, and occurred at approximately 6:30 AM. Survey data showed that the maximum travel time on Saturday was approximately 30 minutes for the same segment and occurred at 1:00 PM. During the AM peak period, trucks account for approximately 9 percent of the vehicles on westbound SR 37. This is significant because heavy vehicles can negatively impact bottleneck throughput. Also, in the AM peak period, vehicles eligible to use the High Occupancy Vehicles (HOV) lane (with 2+ passengers) account for approximately 11 percent of the total vehicle composition.

**PM Peak Period:** During the weekday PM peak period, a major bottleneck was observed on eastbound SR 37 between the lane drop east of the SR 121 intersection and the Mare Island interchange. The mainline queue approaching this bottleneck was observed to extend as far west as the Petaluma River Bridge, which is approximately 4 miles west of the SR 121 intersection. On a typical weekday, the mainline bottleneck throughput for the single eastbound lane peaks at Noble Road at approximately 1,400 vph at 2:00 PM and was observed to be as low as 1,100 vph. The maximum midweek travel time from US 101 to Fairground Drive is approximately 100 minutes and occurs at approximately 5:00 PM. During the PM peak period, trucks account for approximately 5 percent of the vehicles on eastbound SR 37. This is significant because heavy vehicles can potentially slow down traffic, especially on the one lane eastbound section of SR 37. Furthermore, during the PM peak period, vehicles eligible to use the HOV lane account for approximately 22 percent of the total vehicle composition.

**2022 Conditions:**

Future 2022 forecast volumes were estimated from the MTC Travel Model One, Plan Bay Area 2040 version. From 2015 to 2040, the average annual growth rate within the study area is projected to be approximately 0.8 percent per year.

**2022 SR 37 Travel Time and Performance Measures:**

The SR 37 Corridor Plan analyzed the traffic operations of the study corridor. A VISSIM model was developed for the study limits between US 101 and SR 29 and calibrated to replicate the existing (2017) field conditions collected for the SR 37 Corridor Plan. Once calibrated, the VISSIM model was then applied to evaluate the future conditions and Project alternatives.

Peak direction travel times for the existing conditions, No Build, 3-lane Alternative (Alternative I1), and 4-lane Alternative (Alternatives I2, U1 and U2) are summarized in the Table 4-1. The 2022 No Build average travel times are expected to increase by 43 percent during the AM peak and 47 percent during the PM peak compared to the existing travel times.

**Table 4-1: SR 37 Peak Direction Travel Time Comparisons  
 (Between US 101 and SR 29)**

Westbound SR 37 Travel Time -AM Peak Period						
Time Interval	Existing AM Field Travel Time (min)	2022 AM No Build Travel Time (min)	2022 AM-3-Lane Alt Travel Time (min)		2022 AM-4-Lane Alt Travel Time	
			HOV Lane	GP Lane	HOV Lane	GP Lane
5 to 6 AM	27.7	42.2	21.4	22.4	21.4	22.4
6 to 7 AM	45.3	57.8	21.8	22.8	21.8	22.8
7 to 8 AM	42.9	57.1	21.6	22.6	21.6	22.6
8 to 9AM	39.6	57.6	21.5	22.5	21.6	22.6
9 to 10AM	34.4	53.3	21.5	22.5	21.8	22.5
10 to 11 AM	33.3	51.4	21.4	22.4	21.4	22.4

Westbound SR 37 Travel Time -AM Peak Period						
Time Interval	Existing AM Field Travel Time (min)	2022 AM No Build Travel Time (min)	2022 AM-3-Lane Alt Travel Time (min)		2022 AM-4-Lane Alt Travel Time	
			HOV Lane	GP Lane	HOV Lane	GP Lane
Average	37.2	53.2	21.5	22.5	21.6	22.5
Eastbound SR 37 Travel Time-PM Peak Period						
Time Interval	Existing PM Field Travel Time (min)	2022 PM No Build Travel Time (min)	2022 PM-Interim 3-Lane Travel Time (min)		2022 PM-4-Lane Travel Time (min)	
			HOV Lane	GP Lane	HOV Lane	GP Lane
2 to 3 PM	30.5	44.6	22.7	23.7	21.6	22.6
3 to 4 PM	59.2	89.5	24.2	26.2	23.2	27.2
4 to 5 PM	83.2	138.6	25.2	27.2	23.9	29.9
5 to 6 PM	85.9	121.3	22.5	23.5	21.5	23.5
6 to 7 PM	65.8	86.5	22.3	23.3	21.3	22.3
7 to 8 PM	38.5	62.2	22.3	23.3	21.3	22.3
8 to 9 PM	26.0	28.4	22.3	22.3	21.3	22.3
Average	55.6	81.6	23.1	24.2	22.0	24.3

HOV/Express lane travel times under both the 3-lane and 4-lane Alternatives are expected to be approximately 60 percent less and 73 percent less than the general purpose lane travel time in the 2022 No Build condition travel times during the AM peak and PM peak, respectively. Under both the 3-lane and 4-lane Alternatives, the general-purpose lane travel times are expected to decrease by approximately 58 percent during the AM peak and 70 percent during the PM peak compared to the 2022 No Build conditions.

The corridor-wide mobility performance results for Existing Conditions and Year 2022 were extracted from VISSIM for each alternative. The summary of results comparing the existing conditions, base conditions (No Build), and proposed alternatives on SR 37 are shown in Table 4-2.

**Table 4-2: SR 37 System Performance Comparisons  
(Between US 101 and SR 29)**

Performance Measures	Existing AM	2022 AM Peak Period			Existing PM	2022 PM Peak Period		
		No Build	3-Lane Alt	4-Lane Alt		No Build	3-Lane Alt	4-Lane Alt
VMT	275,076	283,090	288,365	288,345	336,874	371,037	371,825	371,455
Total Delay (Veh-hours)	2066	4103	887	865	11,569	12,161	759	727
Average Running Speed (mph)	40	32	48	48	33	24	52	52
Percentage Differences (%) - Compare to No Build								
VMT	n/a	n/a	2%	2%	n/a	n/a	0%	0%
Total Delay (Veh-hours)	n/a	n/a	-78%	-79%	n/a	n/a	-94%	-94%
Average Running Speed (mph)	n/a	n/a	50%	50%	n/a	n/a	117%	117%

Source: Kimley-Horn 2017

Vehicle Miles Traveled (VMT) in the 2022 No Build scenario increase by approximately 3 percent during the AM peak and by approximately 10 percent during the PM peak when compared to Existing Conditions. Average travel speeds are

expected to be reduced by 20 percent during the AM peak and by 27 percent during the PM peak from existing conditions to 2022 No Build conditions.

VMT is similar for all alternatives in 2022 because all traffic demand would be served within the analysis periods. The 3-lane Alternative and 4-lane Alternative have nearly identical performance results in the Year 2022 because they both have two lanes in the peak direction of travel, and off-peak direction traffic congestion is not expected to develop by Year 2022. The total delay would improve by approximately 78 percent during the AM peak period and 94 percent during the PM peak period when compared to the 2022 No Build conditions. In addition, travel speeds would increase by 50 percent in the AM peak period and by 117 percent in the PM peak period compared to the 2022 No Build conditions.

***Recommended Scope for PA&ED:***

The following are identified as the scope of the future traffic study:

**Study Limits:** The recommended Project study limits for the traffic operations analysis model is the segment of SR 37 from US 101 to SR 29, including impacted portion of SR 121. These study limits are established based on the extent of the existing congestion along the corridor. These limits may need to be adjusted during PA&ED to fully account for existing and expected future corridor congestion.

**Traffic Data Collection:** Data was collected in April 2017 for the mainline volumes, ramp volumes, intersection volumes, mainline heavy vehicle percentages, mainline vehicle occupancy, mainline travel times and speeds, and ramp queue observations. Due to restriping on eastbound SR 37 at SR 121 in April 2018, the existing conditions have changed from when data was collected in April 2017. Therefore, it is recommended that new eastbound SR 37 data be collected for the PA&ED phase. No significant changes occurred to the westbound direction, and therefore no new existing data would need to be collected as long as the data used for the PA&ED phase is less than three years old. Additional truck percentages on SR 37 during the fall will be needed since the fall harvest season is the peak truck usage for the study corridor and truck percentages were not collected for the SR 37 Corridor Plan.

**Analysis Tool and Study Periods:** The microscopic simulation software VISSIM is recommended as the analysis tool because it is a full-featured microscopic simulation software with the capability to assess HOV and managed lane facilities as well as intersection and interchange operations that are required needed for this complex study corridor.

To fully capture the duration of traffic congestion, traffic operations analysis should be, at a minimum, conducted from 4:00 AM to 11:00 AM during the AM peak period and from 1:00 PM to 10:00 PM during the PM peak period. If future 2045 conditions show longer periods of congestion, the analysis hours will need to be extended. In addition, the non-peak directions will also be analyzed to include eastbound during the AM peak and westbound during the PM peak.

**Existing Conditions:** The calibrated VISSIM model from the SR 37 Corridor Plan will be made available for the PA&ED phase of the Project and will need to be updated, calibrated and validated based on the new traffic data to be collected. An Existing Conditions Report will be submitted to Caltrans for review and comment.

**Traffic Forecasting:** Future forecast demands on SR 37 will be developed for the Opening Year and the Design Year (20 years after the opening year) using the latest version of the MTC's travel demand model. The Interim Project opening year is expected to be 2025, and the design year would be 2045. For purposes of scoping the analysis for the Ultimate Project, the opening year is assumed to be 2030, and the design year is assumed to be 2050. A traffic forecasting report will be submitted for Caltrans' review and comment.

**Traffic Safety Analysis and Collision Analysis:** The safety analysis will focus on the safety impact of the proposed improvements on operating conditions and collision potential by utilizing traffic and collision data and analytical tools and processes. Any mitigation measures such as lighting, additional signing etc. that could be required because of potential increase in accident rate would be analyzed in PA&ED phase. These mitigation measures, their footprint, location, electrical supply logistics etc. would need to be coordinated with environmental studies in the next phase.

Traffic operational analysis will be conducted for the Opening Year (short-term) and the Design Year (long-term). The findings of the PA&ED traffic analysis will be documented in a Traffic Operational Analysis Report (TOAR), which will be used to select the preferred alternative and support the Project purpose and need based on the following measures of effectiveness (MOEs):

- Vehicle and Person Miles Traveled (VMT & PMT)
- Vehicle and Person Hours of Delay (VHD & PHD)
- Average Travel Speed (mph)
- Travel Time (minutes)
- HOV/Managed Lane Time Savings (minutes)
- Person and Vehicle Throughput
- Travel Time Reliability

## 5. DEFICIENCIES

Based on the previous studies, the traffic analysis, and as described in the previous sections, SR 37 corridor deficiencies include significant congestion in the peak directions, seasonal flooding, SLR threat and inadequate bicycle and pedestrian accommodation.

**Traffic Congestion:** Currently, westbound SR 37 traffic typically experiences congestion approaching the lane drop west of the Mare Island interchange for about 6 hours during the weekday AM peak period and throughout much of the day on weekends. Eastbound SR 37 congestion occurs approaching the lane drop east of the

SR 121 intersection for about 7 hours during the weekday PM peak period as well as much of the day on weekends. On typical weekdays, the maximum westbound delay in the morning peak period is about 27 minutes, and the maximum eastbound delay in the afternoon peak period is about 80 minutes. The forecasted conditions indicate that the traffic congestion would increase to a level that is expected to escalate user delay costs, degrade air quality, and increase the collision rate in the corridor.

**Accidents:** SR 37 mainline accident data within the Project limits was collected between SON PM 2.0 to R6.245 and SOL PM 0.0 to R7.9 for a three-year period beginning January 1, 2015 and ending December 31, 2017. A summary of the Traffic Accident Surveillance and Analysis System (TASAS) Table B data is presented in Table 5-1 below.

**Table 5-1: SR 37 Accident History –  
 January 1, 2015 through December 31, 2017**

SR 37/ Location	Number of Accidents			Accident Rates (Accidents per million vehicle miles)					
				Actual Rate			Statewide Average		
	Total	Fatal	F+I	Total	Fatal	F+I	Total	Fatal	F+I
SR 37 Mainline – SON	430	1	167	2.43	0.006	0.94	0.65	0.014	0.27
SR 37 Mainline – SOL	227	2	66	0.70	0.006	0.20	0.64	0.013	0.27

Note: Shading denotes locations that exceed the statewide average for similar facilities.

Types of collisions within Sonoma County limits include rear-end (64.9%), sideswipe (24.7%), hit object (5.3%), broadside (3.7%), overturn (1.2%) and head-on (0.2%). Types of collisions within Solano County limits include rear-end (49.1%), sideswipe (27.0%), hit object (13.5%), overturn (4.3%), broadside (3.0%), other (2.6%) and head-on (0.4%). The SR 37 mainline within the Project limits has a total accident rate that exceeds the statewide average for similar facilities during the study period. These rates are identified in the shading in Table 5-1. A majority of the accidents are rear-end collisions, suggesting that they are congestion related. It is anticipated that both the Interim and Ultimate proposed Project improvements would decrease congestion related accidents within the corridor.

**Inadequate Multimodal Accommodation:** There is minimal multimodal or public access along the corridor. There are no pedestrian or dedicated bicycle facilities to allow for safe travel between various access points along the corridor. Lack of separation from motor vehicles, rumble strips and debris in the road shoulders cause most cyclists to avoid this route, even though it is the shortest route between Novato and Vallejo and provides access to recreational facilities. The Caltrans District 4 Bike Plan (2018) shows that the SR 37 corridor has a high Level of Traffic Stress (LTS) due to high speeds and a lack of separation of bicycles from motor vehicles.

**SLR and Flooding:** The UC Davis Stewardship Study identified SR 37 within the Project limits as the most at risk segment to SLR impacts when considering factors such as capital improvement costs, economic impacts on commuters and goods movement, impacts to public recreational activities, and impacts to alternate routes. Periodic flooding currently occurs near the eastbound off-ramp at the Mare Island

interchange. A review of the UC Davis study and subsequent field surveys confirmed an additional low area in the vicinity of Tubbs Island. These weak links make portions of this highway segment more vulnerable to short-term flooding and eventual SLR. Additionally, the frequency of flooding will increase in conjunction with SLR.

The State Route 37 Integrated Traffic, Infrastructure and Sea Level Rise Analysis study found that SR 37 within the Project limits will be completely inundated with a 36-inch SLR scenario by 2100. SLR projections derived from previous studies show that the area from SR 121 to Sonoma Creek (area of Tubbs Island) will flood between the 25-year and 50-year storm surge events and will be permanently inundated around 2050 with roadway flooding depths up to 2 feet. The segment of SR 37 between Sonoma Creek and the Mare Island interchange will be permanently inundated around 2100 with the majority of roadway depths of approximately 0.5 feet. The previous studies were based on the 2013 version of the State of California Sea-Level Rise Guidance Document. An update to this document was released in 2018. The latest available SLR guidelines will be used to develop alternatives in the PA&ED phase.

The Project corridor lies within an ecologically sensitive area containing wetlands and baylands, including San Pablo Bay National Wildlife Refuge, which provide habitat for several special-status species. SR 37 between SR 121 and the Sonoma Creek Bridge (Br. No. 23-0063) has wetlands and waterways present, however, it is largely upland habitat. From the Sonoma Creek Bridge (Br. No. 23-0063) to the eastern Project limit, the study corridor is largely dominated by wetland and bayland habitats that are along the edge of SR 37. Wetland habitat types in the study corridor include freshwater wetlands such as drainages, springs and seeps and tidal wetlands, such as bayland mudflats, open water, and tidal ditches. Ongoing restoration of historic wetlands, the preservation of existing open space, and further related efforts are in various planning and implementation stages. Various local, state, and federal agencies, private, and non-profit groups are investing considerable resources in marshland and habitat restoration and endangered species recovery efforts. Any improvements within the Project corridor to address traffic or SLR deficiencies need to consider the environmentally sensitive nature of the corridor.

## **6. CORRIDOR AND SYSTEM COORDINATION**

### ***6A. Corridor Overview***

SR 37 is an east-west corridor that runs 21 miles along the northern shore of the San Pablo Bay. The route runs from US 101 in Novato, Marin County, through the southern tip of Sonoma County, to Interstate 80 (I-80) in Vallejo, Solano County. SR 37 crosses SR 29 in the City of Vallejo. Although SR 37 does not run through Napa County, it serves as a vital connection, serving job markets and housing between the four counties of the North San Francisco Bay Area: Marin, Sonoma, Solano, and Napa. It also provides access to popular destinations such as the Golden Gate

National Recreation Area in Marin County, San Pablo Bay National Wildlife Refuge, Sonoma Sears-Point Raceway, Six Flags Discovery Kingdom Amusement Park, the Napa and Sonoma wine regions, and the North Coast.

Through Solano County, SR 37 navigates as a two to four arterial or Freeway/Expressway, with no HOV lanes. The corridor currently functions as a motor vehicle route with no transit or passenger rail service, and very little bicycle or pedestrian use.

This PSR-PDS addresses improvements on SR 37 between the SR 121 intersection and the Mare Island interchange. The following phases of this Project would closely coordinate with relevant projects listed in the sections below. As discussed in Section 6F, the Project would require additional coordination and collaboration with the SHOPP projects located at the SR 37 and SR 121 intersection and at the Mare Island interchange.

### ***6B. Federal Planning***

The Fixing America's Surface Transportation Act (FAST Act) signed into law in December 2015 and provides funding for surface transportation programs. Setting the course for transportation investment in highways, the FAST Act improves mobility on America's highways, creates jobs and supports economic growth and accelerates project delivery and promotes innovation.

California and federal government agencies, as well as private organizations, are invested in restoring marshlands in the North San Francisco Bay (North Bay). The proposed Project will consider, and study impacts to tidal marshes.

### ***6C. State Planning***

The Highway 37 Stewardship Study (2012) led by UC Davis' Road Ecology Center was completed in 2 phases. Phase I was completed in 2012, funded by the Transportation Research Board, Strategic Highway Research Program 2. It identified five possible improvement scenarios for SR 37 between US 101 and the Mare Island interchange, ranging from "no expansion" to "expanded footprint," "causeway," "strategic co-alignment," and "tunnel". Phase II was funded by Caltrans SP&R Grant, and was developed in 2015/2016. It included analysis of three improvement options: a roadway elevated on a levee, on a "monopod" concrete post causeway, and on wood or concrete "trellis". Public multimodal access to the resources in the corridor and the potential for appropriate transit options were also identified for study in the following Project phases. This study formed the basis for other subsequent corridor planning documents.

The State of California Sea-Level Rise Guidance Document (2013) recommends considering a range of SLR values and planning for the "worst case scenario" for critical infrastructure with long lifespans. Based on these recommendations, long-term alternatives would be required to plan for the 100-year storm plus 66-inch SLR scenario. An update to the State of California Sea-Level Rise Document was released

in 2018. The latest available SLR guidelines will be used to develop alternatives in the PA&ED phase.

The SR 37 TCR (2015) evaluated current and projected conditions along the route and presented a vision for the development of the route over a 25-year planning horizon. The 25-year concept for SR 37 is to remain a four-lane expressway in Solano County. The TCR identifies future strategies for the route, including elevating the roadway to protect the facility from SLR and flooding, building the facility to maximize benefits to marshland restoration, providing continuous bicycle facilities and multimodal services, and adding marshland access points. The TCR is developed with the goals of increasing safety, improving mobility, providing excellent stewardship, and meeting community and environmental needs along the corridor through integrated management of the transportation network, including the highway, transit, pedestrian, bicycle, freight, operational improvements, and travel demand management components of the corridor. The TCR also incorporated the goals of *Plan Bay Area 2040*, the regional transportation and land use plan created to address emissions and climate change. The concept identified in the TCR included the two-lane conventional segment between SR 121 (Sears Point) and Mare Island (Vallejo) as a candidate for widening from two to four lanes in order to close the gap between the two four-lane segments on either end. The TCR recognized the significance of the marshland environment and the presence of threatened and endangered species and habitats. Thus, the objective established for concept development and future roadway improvements would minimize impacts on these natural resources, as well as to develop projects that would maximize both transportation and environmental objectives.

Route	Functional Classification	California Freight Mobility Plan (CFMP)	Trucking Designation	National Highway System (NHS)	Scenic Highway	Interregional Road System (IRRS)
SR 37	Other Principal Arterial, Sonoma County Line to PM 6.4, Other Freeways or Expressways, PM 6.4 through terminus	Not part of CFMP	STAA Terminal Access Route	No	No	Part of IRRS, from SOL PM 0.0 to PM 7.0

The California Transportation Plan (CTP) 2040 (2016) is a long-range policy framework strategic approach to address California's future transportation trends and opportunities. It outlines goals and recommendations to achieve a vision for a safe, sustainable, universally accessible, and globally competitive transportation system that provides reliable and efficient mobility for people, goods, and services, and information, while meeting the State's GHG emission reduction goals and preserving the unique character of California's communities. CTP 2040 recommendations emphasize the importance of "partnership" to develop and implement future

transportation policies, programs, and major statewide investments in transportation, the economy, and the environment that support a sustainable California.

#### ***6D. Regional Planning***

The Metropolitan Transportation Commission (MTC) functions as both the State-designated Regional Transportation Planning Agency (RTPA) and federally-designated Metropolitan Planning Organization (MPO). As such, it is responsible for the update of the Regional Transportation Plan (RTP), a financially constrained long-range programming report for the region.

Under Senate Bill (SB) 375, along with an updated RTP, each region in California must develop a Sustainable Communities Strategy (SCS) that promotes pedestrian and bicycle-oriented mixed-use commercial and residential development located close to mass transit, jobs, schools, shopping, parks, recreation, and other amenities. MTC's Plan Bay Area (PBA), adopted in July 2013 and updated in July 2017, serves as the San Francisco Bay Area's RTP and SCS. MTC is currently undertaking the Horizon Initiative, a scenario planning exercise that will shape Plan Bay Area 2050, the next RTP/SCS update.

PBA includes a multi-county project/program known as Highway 37 Improvements and Sea Level Rise Mitigation PSR with RTP ID 17-10-0037.

#### ***6E. Local Planning***

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

STA is in the process of updating its 2005 Comprehensive Transportation Plan (CTP). The CTP will identify and prioritize the transportation needs and funding throughout Solano County through the year 2040. The current CTP 2030 was finalized in 2005.

#### ***6F. Future Projects***

##### **SHOPP**

The projects listed below are in the Project vicinity and are included in SHOPP, the State's "fix-it-first" program that funds the repair, safety improvements, some highway operational improvements, and preservation of the State Highway System (SHS). The next phase of the Project would closely coordinate with relevant projects listed in this section.

County	Route	Target Program	EA	Description	Cost <sup>1</sup>	Construction Date
SON	37	2018 SHOPP	2J500	In Sonoma County, Near Novato, Petaluma River Bridge Storm Damage Repair: Settlement Restoration.	\$1.8M	2020
SON	37	2019 Ten-Year SHOPP Plan	1A210	In Sonoma County, Near Novato, At 0.6 PM East of Lakeville Highway: Install Traffic Census Station with Weight-In -Motion.	\$2.2M	2019
SON	37	2018 SHOPP	0P760	In Solano County on various route (Rte 37, 80 & 780) at various location - Install Rectangular Rapid Flashing Beacons (RRFB)	\$7.6M	2019
SON	37	2017 Ten-Year SHOPP Plan	1Q480	In Sonoma County on Route 37 Construct a roundabout at the intersection of SR-37 and SR-121	\$30.0M	2022
SON	37	2017 Ten-Year SHOPP Plan	2Q200	Extend 2 lane section on eastbound SR-37 and improvement railroad crossing from SR-37/121 intersection to 1000 ft past Tolay Creek Bridge.	\$7.0M	2027
SON	37	2017 Ten-Year SHOPP Plan	NA	In the City of Sonoma – New Weight-in-Motion site	NA	NA
SON	37	2017 Ten-Year SHOPP Plan	NA	Improve Drainage from Railroad Avenue. To Lakeville Road.	NA	NA
SON	37	2017 Ten-Year SHOPP Plan	NA	Pavement Improvement- Marin County Line to Solano County Line	NA	NA
SOL	37	2020 SHOPP	1Q400	Pavement CAPM from Son/Sol County line to Sage Street UC	\$10.7	NA
SOL	37	2018 SHOPP	0P330	In Solano County, in Vallejo, at the Route 29 separation, and in Vacaville, at Ulatis Creek,	0.6M	2024

<sup>1</sup> Cost and proposed construction date are subject to change.

County	Route	Target Program	EA	Description	Cost <sup>1</sup>	Construction Date
				reconstruct joint seals and elastomeric bearing pads		
SOL	37	2017 Ten-Year SHOPP Plan	NA	In Solano County, near Vallejo, from 1.3 miles west of Railroad Avenue to Railroad Avenue, raise highway with imported borrow	NA	NA
SOL	37	2017 Ten-Year SHOPP Plan	NA	Install Ramp Metering on WB SOL37 from Route 80 to Railroad-Walnut. Install TOS on WB/EB SOL 37.	NA	NA
SOL	37	2017 Ten-Year SHOPP Plan	NA	improve westbound SR-37 lane merge from 500' east of to 1500' west of SR-37 /Walnut Avenue interchange	NA	NA
SOL	37	2017 Ten-Year SHOPP Plan	NA	Fairgrounds Drive to Columbus Parkway - Replace Box Beam Structures	NA	NA
SON/SOL	37	2017 Ten-Year SHOPP Plan	IQ760	Traffic Operations and Sea Level Rise Improvements. SR 37 between and including improvements to the Mare Island interchange in Vallejo and SR 121/37 intersection at the Sears Point	2.5M	2026

<sup>1</sup> Cost and proposed construction date are subject to change.

### District 4 Bike Plan

The projects listed below are in the Project vicinity and are included in Caltrans District 4 Bike Plan. The Plan expands upon the 2017 California State Bicycle and Pedestrian Plan, *Toward an Active California*, which identifies policies, strategies, and actions for Caltrans and its partners intended to improve the safety and comfort of pedestrians and bicyclists throughout the State.

Project ID	County	Route	City	Location	Description	Cost <sup>2</sup>
SOL-37-C01	SOL	37	Vallejo	Wilson Ave. -	Corridor Improvement- Class I	\$\$

<sup>2</sup> \$ - Under \$250,000  
 \$\$ - \$250,000 to \$1,500,000  
 \$\$\$ - \$1,500,000 to \$7,000,000  
 \$\$\$\$ - Over \$7,000,000

Project ID	County	Route	City	Location	Description	Cost <sup>2</sup>
				Sacramento St.		
SOL-37-X01	SOL	37	Vallejo	Sacramento St.	Minor Interchange Improvements-Class II	\$
SOL-37-X02	SOL	37	Vallejo	Fairgrounds Dr.	Minor Interchange Improvements-Class II	\$
SOL-29/37-X01	SOL	37	Vallejo	Route 29/37 Separation	Interchange reconstruction - ramps only- Class IIB	\$\$\$\$
SOL/SON/MAR-37-C01	SOL/SON/MAR	37	Vallejo	US 101 to SR 29	Corridor Improvement Class I	\$\$\$\$

**PBA 2040**

The following projects are in the Project vicinity and are included in PBA 2040, the Bay Area's RTP.

County	Route	Description	Cost	Proposed Completion Year	RTP ID
SON	Var	Bicycle and Pedestrian Program. Modernize Multimodal and Bike/Ped	\$173.0M	2040	17-09-0001
SON	Var	Roadway Operations: Planning, Local Road Operations and Safety Improvements	\$272.0M	2040	17-09-0005
SON	Var	Enhance bus service frequencies in Sonoma County. Transit Efficiency and Service Improvements	\$409.0M	2040	17-09-0017
SON/SOL	Var	Regional State Highways – Existing Conditions. Highway and Bridge Preservation.	\$1.30B	2040	17-10-0025
SON/SOL	Var	Regional Transportation Emergency Management Program. Planning, Local Road Operations and Safety Improvements.	\$57.0M	2030	17-08-0011
SON/SOL	37	Highway 37 Improvements and Sea Level Rise Mitigation PSR	\$24.0M	2030	17-10-0037
SOL	Var	Access and Mobility Program. Regional and County Access Initiatives.	\$113.0M	2040	17-08-0019
SOL	Var	Bicycle and Pedestrian Program. Modernize Multimodal and Bike/Ped	\$20.0M	2040	17-08-0002
SOL	Var	Climate Program: TDM and Emissions Reduction Technology	\$23.0M	2040	17-08-0003

## Complete Street Context Sensitive Solutions

MTC's Complete Streets policy (Resolution No. 3765) is intended to ensure that the accommodation of non-motorized travelers is considered at the earliest conception or design phase. Other state policies include Caltrans Complete Streets Policy Deputy Directive 64-R2. The proposed Project alternatives address safety and include provisions for bicyclists, pedestrians, and transit users to the maximum extent feasible; therefore, the Project improvements are consistent with the Complete Street policies.

## 7. ALTERNATIVES

Alternatives were developed to address near-term traffic congestion and long-term resiliency to SLR based on the existing information and previous studies of this corridor including the SR 37 Corridor Plan. Preliminary layout plans and typical cross sections for the alternatives are included in Attachments B and C, respectively, and include the following:

- No build
- Interim build alternatives
  - o 3-lane Movable Median Barrier (MMB) and
  - o Shoulder Conversion to Travel Lane during Peak Hour
- Ultimate Build alternatives
  - o Hybrid Section
  - o Causeway

The Interim and Ultimate Projects are intended to be developed in as separate projects and will be processed parallelly in the next phase. The viability and effectiveness in meeting the purpose and need of the Project for these alternatives is discussed below. A brief discussion of alternatives that have been considered but determined not viable is also included for reference.

### *7A. Viable Alternatives*

**No-Build:** The No-Build alternative assumes that no Project improvements would be constructed, and therefore traffic congestion along SR 37 would continue to deteriorate in the foreseeable future. Additionally, vulnerability to flooding, which would likely grow more frequent and become more severe with SLR, and the potential impacts of SLR on highly sensitive environmental resources adjacent to the corridor would not be addressed by this alternative. However, the No-Build Alternative does provide a basis of comparison with the Build Alternatives that meets the purpose and need of the Project.

**Build Alternatives:** The following Interim alternatives are proposed for SR 37 to reconfigure the existing highway within the Project limits without major reconstruction and minimal environmental impacts.

**Alternative I1:** This alternative proposes to use the existing highway and convert the existing two-lane highway to a three-lane highway with a MMB separating the two directions of traffic. The MMB would provide for two lanes during the peak period in the peak direction and a single lane in the non-peak direction. It is proposed that the additional lanes be managed lanes to provide an incentive for mode shift from single occupant vehicles. The managed lanes system details would be studied further during the PA&ED phase.

This alternative includes the following:

- Three 12-foot wide lanes directionally divided to provide for two lanes in the peak direction, by a 2 feet movable barrier with no inside shoulders and 8-foot wide outside shoulders that would provide for bicycle usage;
- Replacement of approximately 47,600 linear feet (9.02 miles) of the existing median barrier and install moveable barrier system Reconstruct the median from east of the SMART at-grade rail crossing near SR 121 to approximately 1500 feet west of the Walnut Avenue overcrossing structure at Mare Island interchange;
- Widening the exiting roadway section by approximately 2 feet in each direction along the corridor to provide for a total roadway width of 54 feet; and
- Widening Tolay Creek Bridge (Bridge No. 20-0090) approximately 7 feet in each direction for a total bridge width of approximately 57.5 feet.

The existing Sonoma Creek Bridge (Bridge No. 23-0063) provides for a 50-foot roadway width (between bridge railings). This alternative proposes a 3-lane section with narrower shoulder and lane widths on the Sonoma Creek Bridge to avoid widening of the bridge. A design exception is needed for narrower shoulders and travelled way. Otherwise, bridge widening would be required. For the purpose of cost estimating, the conceptual pavement section for a lane section is assumed to be 0.75' Hot Mix Asphalt (HMA) underlain with 1' aggregate base (AB). Shoulder pavement section is assumed to be 1.0' HMA underlain with 0.50' AB. HMA overlay thickness is assumed to be 0.17' thick.

All existing driveways along SR 37 within the Project limits would be maintained; however, turn movements at a few of these driveways would be limited to right-in, right-out only. The feasibility of allowing left turns from some of the driveways would be evaluated based on allowing a break in the movable median barrier, sight distances, and ability for vehicles to make this maneuver – during the PA&ED phase.

This alternative is associated with additional operations and maintenance elements related to both short-term and long-term MMB configuration. Short-term elements can include installation of special signage, maintenance facility construction, personnel training, installation procedures, and equipment requirements. Long-term

elements can include twice-a-day transfer of the MMB, Barrier Transfer Machine storage and maintenance, routine inspections, field investigations, barrier maintenance and repair, and Changeable Message Signs for MMB transfer activities.

All of the improvements proposed in this alternative would be entirely within existing state right-of-way. Other minor variations of the features of this alternative were considered, compared and would be further studied during the PA&ED phase. These include the construction of a minor retaining wall system in lieu of fill slope to minimize construction disturbance and environmental impacts, consideration of 11-foot inside lane or outside lanes to minimize impacts, and different shoulder/lane widths at the Sonoma Creek Bridge.

Construction staging for Alternative I1 is anticipated to occur in 4 stages. The stage construction is as follows:

- Stage 1 - Relocate existing conflicting utilities
- Stage 2 - Widen outside shoulder and Tolay Creek Bridge. Construct managed lane infrastructure.
- Stage 3 - Remove existing concrete barrier and reconstruct median pavement
- Stage 4 - Place moveable barrier and perform systems integration for managed lanes.
- Stage 5 - Open new facility.

This alternative is considered to be viable because it relieves existing traffic congestion and delays by eliminating the existing lane drops and increasing the roadway capacity for peak direction traffic, while minimizing environmental impacts.

**Alternative I2:** This alternative proposes to convert the existing outside shoulders into a traffic lane during the peak periods in the peak direction. During peak hours in the peak direction, the outside shoulder is proposed to act as a traffic lane for HOV lane/managed lane users while in the non-peak direction, it would act as a shoulder. Intelligent Transportation Systems (ITS) are proposed as part of the Project to manage the part-time traffic lanes on shoulder. This alternative includes the following:

- Two, 12-foot wide lanes, separated by a 2 feet median barrier with no inside shoulders and 12-foot wide outside shoulders that will be used as part time traffic lanes during peak periods for a total roadway width of 50 feet;
- Reconstruction or conversion of approximately 47,200 feet (8.94 miles) of outside shoulder pavement section to a travel lane pavement section in each direction.
- Replacement of existing median barrier with standard concrete barrier for approximately 45,000 linear feet; and
- Widening of Tolay Creek Bridge (Bridge No. 20-0090) by approximately 5 feet in each direction to accommodate proposed roadway cross-section for this alternative.

The existing Sonoma Creek Bridge (Bridge No. 23-0063) is 50 feet wide (between bridge railings) and can accommodate the proposed lane configuration. It is proposed that the additional part time lanes on the shoulder be managed lanes to provide an incentive for mode shift from single occupant vehicles. For the purpose of cost estimating, the conceptual pavement section for a lane/shoulder section is assumed to be 0.75' HMA underlain with 1' aggregate base. HMA overlay thickness is assumed to be 0.17' thick.

The existing SR 37 allows bicycles on shoulders and this alternative cannot accommodate bicyclists on the shoulder since it is converted to a full lane in the peak direction. Thus, a bicycle shuttle service is proposed for peak periods. All existing driveways along SR 37 within the Project limits would be maintained; however, turn movements at driveways would be limited to right-in, right-out only. Allowable turn movements from existing driveways would be evaluated during the PA&ED phase. All of the improvements proposed in this alternative would be entirely within existing State right-of-way.

Construction staging for Alternative I2 is anticipated to occur in 4 stages. The stage construction is as follows:

- Stage 1 - Relocate existing utilities in conflict
- Stage 2 - Reconstruct outside shoulder pavement to lane pavement and widen Tolay Creek Bridge. Construct managed lane infrastructure.
- Stage 3 - Reconstruct existing concrete median barrier
- Stage 4 - System integration for managed lane systems
- Stage 5 - Open new facility.

Long term maintenance requirements for this alternative include active signing for the open/closed lanes with the help of ITS elements, pre-opening inspection of the shoulders, clearing of any broke-down vehicles from the shoulder, etc. These maintenance requirements would be further evaluated, compared and documented in the next phases of the Project.

This alternative is considered to be viable because it relieves existing traffic congestion and delay by eliminating lane drops and increasing capacity for peak direction traffic while minimizing environmental impacts.

The following ultimate alternatives are proposed.

**Alternative U1:** This alternative proposes to construct a raised roadway that is above the projected SLR elevation. It is proposed that this new roadway would be built on embankment and viaduct segments. This alternative includes the following:

- A raised roadway consisting of four 12-foot wide lanes, a 12-foot wide median with a 2 feet median barrier, and 10-foot wide outside shoulders with a 12-foot wide barrier-separated Class I path with a total roadway width of 94 feet;
- Approximately 4.8 miles of raised roadway on embankment segments;

- Bridge segments with lengths ranging from 500 to 8900 feet including viaducts over the Tolay Creek and Sonoma Creek for a combined length of 4.7 miles;
- Raising and reconstruction of Tolay Creek Bridge (Bridge No. 20-0090) as part of a viaduct segment;
- Raising and reconstruction of Sonoma Creek Bridge (Bridge No. 23-0063) as part of a viaduct segment;
- Reconstruction of Walnut Avenue Overcrossing (Bridge No. 23-0109) for approximately 700 feet;
- Reconstruction of SR 121 intersection which includes a grade separation over the SMART rail line; and
- Reconstruction of Mare Island interchange at Walnut Avenue which includes approximately 2,400 linear feet of ramps on structure.

At the Mare Island interchange, the existing westbound off-ramp is proposed to be realigned as a loop off-ramp. The westbound on-ramp is proposed to follow a new alignment that meets the new SR 37 alignment as a diagonal on-ramp. In the eastbound direction, SR 37 at Mare Island is proposed to have a loop off-ramp and a diagonal on-ramp. The proposed plan layout for this interchange is shown in Attachment B. The intersection alternative for SR 121 and interchange alternative for Mare Island interchange would be further evaluated during the PA&ED phase.

For the purpose of cost estimating, the mainline conceptual design pavement section is assumed to be 0.5' HMA underlain with 1.5' aggregate base. The approach roadway pavement section at intersections is assumed to be 0.33' HMA underlain with 0.75' aggregate base.

Based on the preliminary environmental review, SLR and access factors, the proposed horizontal alignment would run parallel to and north of the existing SR 37 alignment between SR 121 and the Skaggs Island Road intersection, and south of the existing SR 37 alignment east of Skaggs Island Road to the eastern Project limits before conforming to the western approach of the Napa River Bridge. The proposed alignment intends to minimize construction impacts on traffic as it allows for traffic to operate on the existing SR 37 during construction. Based on preliminary SLR analysis completed as part of the UC Davis Study and the SR 37 Corridor Plan, the minimum design elevation was determined based on using 66 inches of SLR at year 2100 and includes freeboard and wave run-up. The minimum design elevation relates to the elevation at the edge of the roadway or the lowest element of the structure. The UC Davis Study and the SR 37 Corridor Plan were based on the 2013 State of California Sea-Level Rise Document. An update to the document was released in 2018. The minimum design elevation would be further evaluated during the PA&ED phase per the latest available SLR guidelines.

Construction of new bridges with longer spans to allow for hydrologic and ecologic connectivity are proposed at Tolay Creek and Sonoma Creek. The embankment sections are proposed at the existing driveways locations. The proposed embankment section at the driveways would allow for a wider roadway cross section to provide for

adequate intersection design. This alignment would be further evaluated to enhance environmental benefit during the PA&ED phase. The new roadway would include managed lanes to incentivize mode shift from single occupant vehicles. The existing driveways to and from SR 37 would be maintained and would be further evaluated during the PA&ED phase. The ultimate disposition of the existing SR 37 will also be determined during the PA&ED phase.

Construction staging for Alternative U1 is anticipated to occur in 5 major stages. The stage construction is as follows:

Stage 1 - Relocate existing utilities in conflict

Stage 2 - Construct new embankment, viaduct and roadway north or south of existing except for fill slope in conflict with existing SR37. Construct managed lane infrastructure.

Stage 3 - Shift existing 2 lane traffic onto newly constructed embankment, viaduct and roadway

Stage 4 - Complete remaining embankment and roadway to the south and north of the newly constructed section. Construct remaining managed lane infrastructure.

Stage 5 - System integration for managed lane systems.

Stage 6 - Open completed 4-lane highway facility.

This alternative is considered to be viable because it meets the purpose and need of the Project.

**Alternative U2:** This alternative proposes to construct a raised roadway primarily on viaduct causeway that is above the projected SLR elevation. This alternative includes the following:

- A raised roadway consisting of four 12-foot wide lanes, a 12-foot wide median with a 2 feet median barrier, and 10-foot wide outside shoulders with a 12-foot wide barrier-separated Class I path with a total roadway width of 94 feet;
- Approximately 9 viaduct segments with lengths ranging from 2,400 to 8,900 feet including viaducts over Tolay Creek and Sonoma Creek for a combined length of 8.5 miles;
- Raising and reconstruction of Tolay Creek Bridge (Bridge No. 20-0090) as part of a viaduct segment;
- Raising and reconstruction of Sonoma Creek Bridge (Bridge No. 23-0063) as part of a viaduct segment;
- Reconstruction of Walnut Avenue Overcrossing (Bridge No. 23-0109) for approximately 700 feet;
- Approximately 1.0 miles of raised roadway on embankment segments that are proposed at existing driveways/intersections (not including SR 121);
- Reconstruction of the SR 121 intersection which includes a grade separation over the SMART rail line; and

- Reconstruction of Mare Island interchange at Walnut Avenue which includes approximately 2,400 linear feet of ramps on structure.

At the Mare Island interchange, the existing westbound off-ramp is proposed to be realigned as a loop off-ramp. The westbound on-ramp is proposed to follow a new alignment that meets the new SR 37 alignment as a diagonal on-ramp. In the eastbound direction, SR 37 at Mare Island is proposed to have a loop off-ramp and a diagonal on-ramp. The proposed plan layout for this interchange is shown in Attachment B. The intersection alternative for SR 121 and interchange alternative for Mare Island interchange would be further evaluated during the PA&ED phase. The horizontal and vertical geometry along the corridor would be similar to Alternative U1. These driveways and the need to maintain access at them would also be further evaluated during the PA&ED phase. The ultimate disposition of the existing SR 37 will also be determined during the PA&ED phase.

For the purpose of cost estimating, the mainline conceptual design pavement section is assumed to be 0.5' HMA underlain with 1.5' aggregate base. The approach roadway pavement section at intersections is assumed to be 0.33' HMA underlain with 0.75' aggregate base, based on available information. The construction year Average Daily Traffic (ADT) of 24,168 vehicles per day, future year (2040) ADT of 33,763 vehicles per day and two-way Design Hourly Volume (DHV) of 3,157 vehicles per hour is used, based on available traffic data. The percentage of DHV in the direction of the heavier flow is 0.67 and the truck traffic volume expressed as a percent of the DHV is 0.05. The climate region is central cost and the design speed for the facility is 55 miles per hour. These design designations would need to be verified and any missing information would need to be provided in the PA&ED phase as new data is gathered.

It is proposed that the additional lanes be managed lanes to provide an incentive for mode shift from single occupant vehicles. Based on preliminary SLR analysis completed as part of the UC Davis Study and the SR 37 Corridor Plan, the minimum design elevation was determined based on using 66 inches of SLR at year 2100 and includes freeboard and wave run-up. The minimum design elevation relates to the elevation at the edge of the roadway or the lowest element of the structure. The UC Davis Study and the SR 37 Corridor Plan were based on the 2013 State of California Sea-Level Rise Document. An update to the document was released in 2018. The minimum design elevation would be further evaluated during the PA&ED phase per the latest available SLR guidelines.

Construction staging for Alternative U2 is anticipated to occur in 5 major stages. The stage construction is as follows:

Stage 1 - Relocate existing utilities in conflict

Stage 2 - Construct new embankment, viaduct and roadway north or south of existing except for fill slope in conflict with existing SR37. Construct managed lane infrastructure.

- Stage 3 - Shift existing 2 lane traffic onto newly constructed embankment, viaduct and roadway
- Stage 4 - Complete remaining embankment and roadway to the south and north of the newly constructed section. Construct remaining managed lane infrastructure.
- Stage 5 - System integration for managed lane systems.
- Stage 6 - Open completed 4-lane highway facility.

This alternative is considered to be viable because it meets the Project’s purpose and need. It relieves traffic congestion, has a smaller footprint, and addresses long term effects of SLR while considering and minimizing environmental impacts.

***Design Standards Risk Assessment***

Tables 7-1 and 7-2, below, identify the exceptions to Boldface (B) and Underlined (U) type design standards that are associated with the Interim and Ultimate Alternatives and provides a risk assessment for each exception.

**Table 7-1: Design Standards Risk Assessment – Interim Alternatives**

Alternative	Design Standard from Highway Design Manual Tables 82.1A & 82.1B	Location/Description	Probability of Design Exception Approval (None, Low, Medium, High,)	Justification for Probability Rating
I1/ I2	B: 201.1 Stopping Sight Distance	<ul style="list-style-type: none"> <li>a. Just east of Tolay Creek Br R=1685’ (rt), SSD=260’, V=38mph</li> <li>b. Just east of Tolay Creek Br R=1679’ (rt), SSD=434, V=52 mph</li> <li>c. Just west of Sonoma Creek Br R=2000’ (rt), L=500’ SSD=290’, V=40mph</li> <li>d. Just east of Sonoma Cr Br, R=2000’ (rt), L=750’ SSD=290’, V=40mph</li> <li>e. Est of Sonoma Creek Br (621+00 to 625+00)</li> </ul>	<ul style="list-style-type: none"> <li>a. L</li> <li>b. M</li> <li>c. L</li> <li>d. L</li> <li>e. L</li> <li>f. M</li> </ul>	<p>The standard stopping sight distance for the proposed 60mph design speed is 580’. The proposed SR 37 alignment in both the interim Project alternatives maintains the existing alignment. Maintaining existing alignment and adding a second lane for these interim alternatives decreases the existing median width and introduces non-standard stopping sight distances at these locations. This exception to standard is requested so as to minimize</p>

		<p>R=1995' (let), L=400', SSD=290', V=40mph</p> <p>f. 645+00 to 648+00 R=4003' (rt), L=300', SSD=410', V=49mph</p> <p>g. 660+00 to 671+70 R=4503' (rt), L=1170', SSD=450', V=51mph</p> <p>h. 695+00 to 710+00 R=5000' (lt), L=1500', SSD=460', V=53 mph</p> <p>i. 715+00 to 725+00 R=5000'(rt), L=1000', SSD=460', V=53 mph</p> <p>j. 730+00 to 733+00 R=5000' (lt), L=300', SSD=460', V=53 mph</p> <p>k. 762+00 to 770+00 R=5000' (lt), L=800', SSD=460', V=53 mph</p> <p>l. 776+00 to 781+00 R=5100' (lt), L=500', SSD=460', V=53 mph</p> <p>m. Just west of Mare Island IC 915+00 to 941+00 R=5000' (lt), L=2600' SSD=460', V=54 mph</p> <p>n. Sonoma Creek Bridge along 1300' crest VC SSD=465', V=53mph</p> <p>o. Sonoma Creek Bridge along 400' sag VC (at each approach) SSD=430', V=50mph</p>	<p>g. M</p> <p>h. M</p> <p>i. M</p> <p>j. M</p> <p>k. M</p> <p>l. M</p> <p>m. M</p> <p>n. M</p> <p>o. M</p>	<p>widening, environmental disturbance associated with widening and expedite project delivery.</p>
I1	B: 301.1 Traveled Way Width	<p>11' wide WB &amp; EB – Sonoma Creek Br (Br. No. 23- 0063) L=1822' if widening is not proposed</p>	H	<p>Width of travel lanes is proposed to be 11 feet at the Sonoma Creek Bridge and deviates from the standard 12' lane width for a conventional highway. This deviation from standard is proposed to avoid bridge reconstruction and/or widening, thus avoiding environmental impacts and expedite project delivery.</p>

I2	B: 301.1 Traveled Way Width	11' wide WB & EB, 480+00 to 950+00 (L=9.0 miles)	H	Width of travel lanes is proposed to be 11 feet within the Project limits, and deviates from the standard 12' lane width for a conventional highway. This deviation from standard is proposed to minimize widening. This Interim Project alternative proposes minimal widening to avoid environmental impacts and expedite project delivery.
I1	B: 302.1 Shoulder Widths for Conventional Highways	Outside (Right) Shoulders WB&EB – Sonoma Creek Bridge (L=1822') if widening is not proposed, W=6'	M	Width of outside shoulders is proposed to be 6 feet at the Sonoma Creek Bridge, and deviates from the standard shoulder width of 8 feet. This deviation from standard is proposed to avoid bridge reconstruction and/or widening, thus avoiding environmental impacts and expedite project delivery.
I2	B: 302.1 Shoulder Widths for Conventional Highway	Outside (Right) Shoulders WB&EB, L=8.9 miles, W=0' during the time shoulder is used as a lane.	L	It is proposed that there are no outside shoulders during peak hours in peak while the standard shoulder width is 8 feet. This deviation from standard is proposed to avoid bridge reconstruction and/or widening, thus avoiding environmental impacts and expedite project delivery.
I1	B: 302.1 Shoulder Widths	Inside (Left) Shoulders – WB&EB (L=9.0 miles), W=0	M	It is proposed that there are no inside shoulders during peak hours in peak direction, while the standard shoulder width is 5 feet. This exception to standard is proposed to utilize the existing pavement width and avoid widening, thus avoiding environmental impacts and expedite project delivery.

I2	B: 302.1 Shoulder Widths	Inside (Left) Shoulders – WB&EB (L=9.0 miles), W=1’	M	It is proposed that there are no inside shoulders during peak hours in peak direction, while the standard shoulder width is 5 feet. This exception to standard is proposed to utilize the existing pavement width and avoid widening, thus avoiding environmental impacts and expedite project delivery.
I1	B: 305.1 (2) Median Standards for conventional highways	*480+00 to 950+00 (L=9.0 miles), 1.5-2’ depending on type of MMB used	H	It is proposed that the median width within the project limits is less than the standard 12 feet for conventional highways. This exception to standard is proposed to utilize the existing pavement width and avoid widening, thus avoiding environmental impacts and expedite project delivery.
I2	B: 305.1 (2) Median Standards for conventional highways	*480+00 to 950+00 (L=8.9 miles), W=4’	H	It is proposed that the median width within the project limits is less than the standard 12 feet for conventional highways. This exception to standard is proposed to utilize the existing pavement width and avoid widening, thus avoiding environmental impacts and expedite project delivery.
I1	B: 309.1 Horizontal Clearance	*480+00 to 950+00 (L=9.0 miles), clearance = 0’ (next to MMB)	L	It is proposed that there is no clearance to the proposed movable median barrier. This exception to standard is proposed to utilize the existing pavement width and avoid widening, thus avoiding environmental impacts and expedite project delivery.

I2	B: 309.1 Horizontal Clearance	<p>a. *480+00 to 950+00 (L=9.0 miles), clearance = 1' (next to median barrier) EB &amp; WB</p> <p>b. *480+00 to 950+00 (L=9.0 miles), clearance = 0' (next to outside barrier during the time shoulder is used as a lane) EB &amp; WB</p>	<p>a. L</p> <p>b. L</p>	<p>A nonstandard clearance is proposed next to the median barrier within the Project limits. This exception to standard is proposed to utilize the existing pavement width and avoid widening, thus avoiding environmental impacts and expedite project delivery.</p>
I1	B: 309.1 Horizontal Clearance	Sonoma Creek Bridge (L=1822'), clearance = 6'	M	<p>A nonstandard 6 feet clearance to the outside barrier is proposed at the Sonoma Creek Bridge. This exception to standard is proposed to avoid bridge widening, thus avoiding environmental impacts and expedite project delivery.</p>
I1 /I2	U: 204.3 Standards for Grade, Minimum Grade	Various Locations throughout length of Project, less than 0.3%	H	<p>The existing grades along SR 37 within the project limits are less than the standard minimum 0.3% that is recommended. This exception to standard is proposed to avoid profile changes and major pavement reconstruction, environmental impacts associated with pavement construction and to expedite project delivery.</p>
I1/ I2	U: 304.1 Side Slope Standards, 4:1 or flatter	480+00 to 950+00 (L=9.0 miles) 1:1 to 5:1 sideslopes	M	<p>The existing sideslopes along SR 37 within the project limits are vary from 1:1 to 5:1, while the standard is 4:1 or flatter. This exception to standard is proposed to avoid impacts to the environmentally sensitive existing sideslopes and to expedite project delivery.</p>

**Table 7-2 Design Standards Risk Assessment – Ultimate Alternatives**

Alternative	Design Standard from Highway Design Manual Tables 82.1A & 82.1B	Location/Description	Probability of Design Exception Approval (None, Low, Medium, High,)	Justification for Probability Rating
U1/ U2	B: 201.1 Stopping Sight Distance	a. At Mare Island IC R=1176' (lt), L=667' along WB direction outside lane, SSD=388', V=43 MPH b. At Mare Island IC R=1200' (lt), L=691' along EB direction, inside lane, SSD=341', V=42 MPH c. At Napa River Bridge, along 500' vertical curve, SSD=400', V=48 mph	a. M  b. M  c. M	The standard stopping sight distance for the proposed 60mph design speed is 580'. The proposed SR 37 alignment in the ultimate alternatives is constrained at the Mare Island interchange with the Napa river bridge right adjacent to the interchange. The stopping sight distance at Napa River Bridge is existing deficiency that is proposed to remain so as to avoid major bridge reconstruction and environmental impacts associated with it.

\*Includes Tolay Creek Bridge and Sonoma Creek Bridge

The detailed studies of the proposed alternatives will include a development of design standard decision document during the PA&ED phase.

The viable build alternatives to the proposed Project would consist of site preparation including necessary excavation and grading. Standard stormwater Best Management Practices (BMPs) would be implemented during construction to eliminate water pollution, excessive erosion and/or sedimentation, during and after construction activities. Attachment J of this document outlines the stormwater data, stormwater treatment, construction and permanent BMPs, and stormwater quality documentation.

Preliminary geotechnical investigations to include subsurface soil and groundwater conditions and geologic and seismic aspects of the project will be conducted during the PA & ED phase, and a Preliminary Geotechnical Report will be prepared to document the geotechnical findings and to provide preliminary geotechnical recommendations for further evaluation of the proposed build alternatives during the PA & ED phase.

The Project would require temporary night lane closures of SR 37 and the establishment of working zones for construction. The location of the construction staging would be within the right-of-way limits for the Interim alternatives. Construction would need to be staged and/or phased for the ultimate alternatives, details of which are deferred to the PA&ED phase. The roles and responsibilities of the general operations and maintenance matters for the movable barrier and managed lanes would be discussed during the next phase.

Approval of this document represents approval of the purpose and need and of the range of alternatives to be studied. Approval of this document does not signify approval of a conceptual alternative.

### ***7B. Alternatives Considered but Determined Not Viable***

The following alternatives were developed during the course of study or identified through stakeholder interaction. The alternatives were evaluated and have been removed from further study. A brief description of each alternative and the reason it was removed from consideration as a viable alternative is provided below.

#### ***Interim Improvements***

**Alternative I3: 4-Lane Standard Section:** This alternative proposes widening the current two-lane SR 37 to a full standard four-lane facility at the existing elevation. The proposed addition of one lane in each direction would provide sufficient capacity to prevent the existing bottle necks between within the Project limits from developing and relieve traffic congestion experienced in this corridor. Per Caltrans conventional highway standards, the proposed lane configuration includes two 12-foot lanes, a 5-foot left shoulder, and a 10-foot right shoulder. This alternative proposes to widen the existing 50-foot roadway section to a 74-foot section, thereby significantly impacting environmentally sensitive areas along the existing corridor. This alternative also proposes to widen both the Sonoma Creek and Tolay Creek bridges. The significant area of environmental disturbance would mean longer approval periods with involvement from various regulatory agencies. High costs, a larger environmental footprint, and a longer project approval timeframe make this alternative not viable as an Interim alternative.

**Alternative I4: 3-Lane Reversible Lane Section.** This alternative proposes a fixed barrier and a separated reversible lane section that consists of a 12-foot reversible lane for peak directional traffic, 2-foot left shoulders, and 10-foot right shoulders. Given the 2-foot width of each of the two fixed permanent barriers, the roadway footprint (72 feet) for this alternative is similar to the full four lane (74-foot) configuration that is proposed in Alternative I3. Similar to Alternative I3, this alternative proposes significant widening into the environmentally sensitive areas along the existing corridor. In addition to the widening cost, this alternative would also have ongoing operational and maintenance costs for the reversible lane operations. High costs, a larger environmental footprint, and longer project approval timeframes make this alternative not viable as an Interim alternative.

### ***Ultimate Improvements***

Through the alternative development process, the Project team evaluated a number of alternatives for the Ultimate Project within the vicinity of the existing SR 37 alignment. These alternatives were screened for environmental feasibility, constructability, maintenance and costs<sup>3</sup>. The following Ultimate Project alternatives within the existing vicinity of SR 37 were deemed not viable:

#### **Alternative U3: Alignment to the North or South of the Existing SR 37**

**Alignment.** This alternative proposes to construct the new highway with a raised roadway parallel to the existing roadway and is evaluated as part of State Route 37 Alternative Assessment for the Ultimate Project Summary Memorandum, December 2018. As part of this report, locating the SR 37 alignment to both the south and to the north of the existing alignment within the Project limits was considered. The proposed roadway section would consist of four 12-foot wide lanes, a 12-foot wide median with a median barrier, and 10-foot wide outside shoulders with a 12-foot wide barrier-separated Class I path. Total roadway width for this alternative would be approximately 94 feet. It was proposed that the new roadway alignment (in both variations) be part on fill and part on structure. Based on the environmental sensitivity of the surrounding area, an entire alignment to either the north or the south of the existing roadway would have significant environmental impacts. This alternative and its north and south alignment variations were rejected in favor of alternatives under consideration to minimize environmental impacts.

**Alternative U4: Embankment Section.** This alternative proposes to construct the new raised roadway entirely on embankment except for the two existing crossings, Tolay Creek and Sonoma Creek, at SLR elevation. This alternative follows an alignment that is parallel to the existing roadway, shifting from north to south of the existing alignment near Sonoma Creek. The proposed alternative would provide for four 12-foot wide lanes, a 12-foot wide median with a median barrier, and 10-foot wide outside shoulders with a 12-foot wide barrier-separated Class I path with a total roadway width of approximately 94 feet. The embankment section would have a significantly larger footprint, given the fill slopes. The embankment option would not allow hydrological and ecological connectivity in this environmentally sensitive corridor. In addition, the soft bay mud soil condition would require light weight material fill for the entire 9 mile segment. This alternative was rejected due to lack of hydrologic and ecologic connectivity, significantly higher environmental impact and higher construction cost.

**Alignments Considered Further to the North (Overland) and Further to the South (over the water).** Through the alternative development process, the Project team conducted environmental outreach via technical working group meetings and large environmental stakeholder workshops. The purpose of these meetings and

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<sup>3</sup> State Route 37, Alternative Assessment for the Ultimate Project Summary Memorandum Segment B. Prepared by AECOM. December 2018.

workshops was to offer a science-based approach to providing technical information, which informed the roadway design and identified ecological enhancement opportunities within the current roadway alignment. From these meetings, alternative alignments further to the north (Northern, overland) and further to the south (Southern, over the water) were explored.

A State Route 37 Alternative Assessment for the Ultimate Project Summary Memorandum (December 2018) was prepared and documented a high-level screening that included both quantitative and qualitative measures to evaluate these alternatives. This analysis provided a comparative assessment of Ultimate Project alternatives for a range of factors that included those related to congestion relief, right-of-way impacts, system performance, safety, design feasibility, SLR adaptation, environmental feasibility, and preliminary cost estimates. Based on the evaluation matrix included in the memorandum, the following three alternatives were not considered viable.

**Alternative U6: Southern Alignment Close to Existing SR 37.** The proposed Southern Alignment 1 would begin at the Napa River Bridge west approach touchdown and cross westward over existing marshland into the San Pablo Bay before turning northwest and running in parallel with the existing SR 37 alignment over the shoreline. The roadway would then cross back onto land at Tubbs Island and tie into the existing SR 37/SR 121 interchange. This alignment would be located roughly parallel to the existing SR 37 alignment but would be located several hundred feet south over the tidal mudflats of the San Pablo Bay. This alternative would be comprised of a new four-lane elevated causeway structure for its entire length. The new alignment would have dedicated bicycle lanes.

The proposed Southern Alignment 1 would be a total of 9.9 miles long and would include 9.3 miles of viaduct sections. Based on the alternatives evaluation, this alternative would have impacts similar to the hybrid existing and causeway existing alignments, however, the impacts would occur primarily to offshore and tidal mudflat habitats. It would require 147 acres of right-of-way acquisition and reduce available public access opportunities. Consequently, the alternative was not preferred by public focus groups<sup>4</sup> and, as a result, it is not being further considered as an alternative in this PSR-PDR.

**Alternative U7: Southern Alignment – Away from Existing SR 37.** The proposed Southern Alignment 2 would begin at the Napa River Bridge west approach touchdown and cross westward over existing marshland into the San Pablo Bay. The roadway would continue westward across San Pablo Bay to an overwater interchange with two segments: a western segment (SR 37) that would continue westward over the San Pablo Bay and tie into US 101 in Marin County; and the northern segment, SR 121 extension, that would extend northward over Tubbs Island and tie into the existing SR 121 near the existing SR 37/SR 121 intersection. This SR 121 extension

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<sup>4</sup> Moore Iacofano Goltsman, Inc. (MIG). 2018. *State Route 37 Improvement Plan – Summary of SR 37 Focus Groups Potential Conceptual Alternatives*. July 2018.

is approximately 3.5 miles long. The existing SR 37/SR 121 intersection would be reconstructed as an interchange. The proposed Southern Alignment 2 would cross over approximately 11 miles of San Pablo Bay. This alternative would be comprised of a new four-lane elevated viaduct its entire length. The new alignment would have dedicated bicycle lanes.

The proposed Southern Alignment 2 would be a total of 18.1 miles long, including 8.0 miles of the eastern segment, 6.6 miles of the western segment, and 3.5 miles of the SR 121 Extension. It would include 17.2 miles of viaduct sections. Based on the alternatives evaluation, this alternative would have the lowest travel times for the entire corridor and would result in increased demand, thereby increasing VMT and greenhouse gas emissions compared to alternatives along the existing alignment. This alternative would require a high right-of-way acquisition at 264 acres and would impact offshore habitats. Potential land use conflicts were also identified during the alternatives evaluation and the alternative would reduce available public access opportunities and received mixed feedback by public focus groups<sup>1</sup>. As a result, it is not being considered as an alternative in this PSR-PDR.

**Alternative U8: New Northern Alignment.** The proposed northern alignment begins at the existing SR 37 and SR 29 interchange, runs north on the existing SR 29 alignment to Napa Junction, then west on new alignment parallel to the existing SMART rail line to SR 121. It would then run south on existing SR 121 and connect to SR 37 to continue west at the SR 121 intersection. This alternative would require converting the existing SR 29 from a conventional highway to an expressway accommodating six lanes of through traffic with frontage roads on either side for local circulation. This segment of SR 29 would be grade separated at the four existing local roadway intersections. The new alignment section parallel to the SMART rail line is proposed to have a 4-lane standard highway section with dedicated bicycle lanes at an elevation that would provide for resiliency against anticipated SLR. This segment of the new alignment would have significant elevated structure sections for crossing over the Napa River, two railroad tracks and crossings over existing creeks and wetland areas. This alternative proposes to widen SR 121 from two lanes to six lanes to accommodate SR 37 traffic volumes.

The new northern alignment would be a total of 18.3 miles long and has 5.5 miles of causeway/bridge section. Based on this alternative evaluation, the proposed northern alignment would require acquisition of 428 acres of new right-of-way. According to the evaluation, this alternative has the longest travel times and highest right-of-way impacts. It also increases VMT and greenhouse gas emissions and disrupts existing communities when compared to the other alternatives. Other drawbacks of this alternative are that it transects more sensitive habitat types than the other alternatives, has greater potential impacts to cultural resources, has potential to induce growth, and decreases public access. This alternative was not well received by public focus

groups<sup>5</sup>. For these reasons, it is not being further considered as a viable alternative in this PSR-PDS.

## **8. RIGHT-OF-WAY**

The Interim alternatives would require mitigation, which could be completed in partnership with other agencies. For the Ultimate alternatives, mitigation could be completed in partnership with other agencies, and property acquisition along the realigned roadway would be required. A Conceptual Cost Estimate - Right of Way Component sheet for the proposed alternative's improvements has been prepared and is shown in Attachment H.

### ***Utilities:***

It is anticipated that the build alternatives would have impacts requiring relocation of utilities along the corridor. During the PA&ED phase of the Project, the design team would confirm any impacts with the utility owners through the utility verification process. No formal utility coordination procedures were conducted as part of this PSR-PDS. For preliminary planning and estimating purposes, where impacts or conflicts of utilities with the proposed improvements were observed, the utility was assumed to be relocated or replaced in-kind.

It is anticipated that the Interim alternatives would have utility impacts at the SR 121 and SR 37 intersection improvement location and at the Mare Island interchange improvements. For the Ultimate alternatives, it is anticipated that some of the existing PG&E transmission towers paralleling SR 37 would be impacted.

### ***Railroad:***

The Northwestern Pacific Railroad (NWP) (owned by SMART) currently has an at-grade crossing immediately east of the SR 121/SR 37 intersection. Railroad coordination and agreements are required for both the Interim and Ultimate alternatives. Railroad coordination on this project would include NWP, SMART, the North Coast Railroad Authority (NCRRA) and the California Public Utilities Commission (CPUC). At-grade modifications to the crossings, as proposed in the Ultimate Alternative will require a formal application for the CPUC General Order 88-B.

## **9. STAKEHOLDER INVOLVEMENT**

A Technical Advisory Committee (TAC) was established as part of the SR 37 Corridor Plan/SR 37 Design Alternative Assessment (DAA), which consisted of representatives from MTC, Caltrans, STA, SCTA, TAM, and NVTA. There is also an

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<sup>5</sup> Moore Iacofano Goltsman, Inc. (MIG). 2018. State Route 37 Improvement Plan – Summary of SR 37 Focus Groups Potential Conceptual Alternatives. July 2018.

established SR 37 Policy Committee, which is a multi-county committee with policy makers participating from Marin, Napa, Sonoma and Solano counties. The SR 37 Policy Committee was formed in 2015 as part of a Memorandum of Understanding (MOU) to discuss joint County efforts in improving the SR 37 Corridor to address issues such as SLR, traffic congestion, transit options and recreational activities. The policy committee meets every other month or quarterly as needed. The TAC team provides updates to the Policy Committee on a regular basis.

In addition, a series of workshop and working group meetings were held with key environmental stakeholders in the development of alternatives. Attendees to these workshops and meetings include TAC members, and representatives from the San Francisco Bay Conservation and Development Commission (BCDC), California Coastal Conservancy, the SR 37 Baylands Group, Ducks Unlimited, Greenbelt Alliance, Marin Audubon Society, Point Blue Conservation Science, San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Joint Venture, San Francisco Bay Trail, San Francisco Estuary Institute (SFEI), SMART, Sonoma Land Trust, the Nature Conservancy, US Army Corps of Engineers, US Fish and Wildlife Service, California Department of Fish and Wildlife (CDFW), and Vallejo Sanitation and Flood Control District.

Caltrans also led a public engagement process as part of the DAA and corridor improvement development. These efforts included:

- Between September 20, 2017 and October 2, 2017, Caltrans, MTC, TAM, SCTA, NCTA and STA conducted a series of four open houses to inform the public about the State Route 37 Improvement Plan. The attendance at the open houses ranged from approximately 30 to about 100 members of the public. Staff and management from Caltrans, MTC and the four transportations authorities were in attendance, as well as elected officials from the local counties and cities.
- An online user survey was conducted to better understand the travel patterns of regular SR 37 users and to collect feedback about major concerns and priorities for improvements along the highway. The survey was open to the public between December 1, 2017 and January 16, 2018 and over 3,750 responses were collected.
- Two rounds of focus group meetings were held in 2018 throughout the four North Bay Counties. Six focus groups were conducted between January and February, and five were conducted between May and June. These focus groups were conducted to gain a better understanding of travel patterns on SR 37 from daily commuters in the four-county area; to identify specific locations on the route where travelers have key issues and concerns; to identify improvements along the corridor; and to obtain feedback for alternatives being considered.

MTC Bay Trail Project, Sonoma County Regional Parks, Sonoma County Transportation and Public Works as well as the Sonoma County Bicycle Coalition were all involved in corridor concepts and implementation of Caltrans Deputy Directive (DD-64-R2) Complete Streets - Integrating the Transportation system. A maps of the latest concepts approved by all organizations is available on Exhibit 18a

(page 25) of the corridor plan located at: [http://scta.ca.gov/wp-content/uploads/2018/06/SR-37-Corridor-Plan\\_Final\\_June2018\\_wAppendices.pdf](http://scta.ca.gov/wp-content/uploads/2018/06/SR-37-Corridor-Plan_Final_June2018_wAppendices.pdf). The appendices of the corridor plan reflect the details of the interactions and letters that impacted the final version that is guiding this PSR/PDS.

During the PA&ED Project phase, a detailed stakeholder and public involvement plan would be developed and implemented to outreach to the local communities, including stakeholders of the Bay Trail Sears Point Connector Project in Sonoma County.

## **10. ENVIRONMENTAL COMPLIANCE**

The Project team conducted a preliminary environmental analysis to identify the potential environmental impacts of the Interim and Ultimate Projects. A summary of the preliminary environmental analysis for the Interim Project and Ultimate Project is provided below.

The Interim and Ultimate Projects are located in a relatively rural area, but within sensitive environmental habitat. Extensive coordination has been conducted during the planning of this Project with federal, state, regional, and local agencies as well as with stakeholder groups that have a strong interest in the protection and enhancement of the North Bay ecological environment. Consideration of climate change effects, especially SLR, is also an important factor in maintaining a long-term viable transportation route that will continue to serve this area. As a result of this preliminary work and consultation, the Interim and Ultimate Projects were defined as the most viable approach to addressing both short-term and long-term purpose and needs.

### **Interim Project**

The Interim Project is intended to generally stay within the existing footprint of SR 37, including roadway, shoulders, and disturbed areas. It would add up to approximately 8 feet of pavement widening along the highway and minimize disturbance to areas alongside the existing alignment. Retaining walls may be required to maintain the widened highway within a minimal footprint. However, the Tolay Creek Bridge would likely require widening, and the Sonoma Creek Bridge may or may not require widening depending on the alternative. Storage and maintenance needs for a movable barrier have not been fully defined but would require space alongside SR 37. Construction access needs would need to be defined alongside the highway, especially where bridges would require reconstruction. By maintaining construction alongside the existing highway, impacts to sensitive environmental resources can be minimized, but cannot be avoided. Mitigation will be required to offset impacts related to grading, and fill related to shoulder widening, placement of retaining walls, bridge abutments, piers, or other features. Because the Interim Project has been specifically defined to minimize impacts to adjacent sensitive resources, a CEQA Mitigated Negative Declaration/Initial Study (MND/IS) and NEPA Finding of No Significant Impact/Environmental Assessment (FONSI/EA)

were identified as the appropriate environmental documentation. An option to elevate the CEQA document to an Environmental Impact Report can be considered if technical studies indicate the potential for significant impacts, or if public review identifies areas of controversy or concern related to environmental impacts or the alternatives considered.

### **Ultimate Project**

The Ultimate Project would be constructed in a new alignment adjacent to the existing highway and would require additional right-of-way acquisition. Alternatives for the Ultimate Project involving alternate alignments to the north and south of the existing SR 37 roadway were evaluated for environmental feasibility, constructability, maintenance and costs and were deemed not viable (refer to Section 7B). The proposed Ultimate Project would provide long-term benefits, by elevating the highway to accommodate future SLR and passage of floodwaters, while enhancing wildlife and habitat connectivity. It also represents a greater investment in transportation funding, therefore requiring a longer planning horizon. Widening and bridge reconstruction would be more substantial. Fill would be necessary where the roadway is on elevated section, but new bridges would also allow existing sections of the at-grade highway to be removed, providing opportunities for restoration and enhancement. The elevated structure would also be more visible in comparison to the existing at-grade highway. An Environmental Impact Report/Environmental Impact Statement (EIR/EIS) was identified as the appropriate environmental document because of these anticipated higher levels of resource disturbance and off-setting mitigation requirements, and because of the potential for the Ultimate Project, due to its scope, to result in one or more significant and unavoidable (i.e., unmitigable) impacts or present a significant impact on the environment (in terms of overall context and intensity). A longer time frame for environmental review will be necessary to establish agreements and approvals from regulatory agencies.

Important consultation and environmental requirements that may apply to environmental review includes the following:

**Section 7 Consultation.** Section 7 of the federal Endangered Species Act requires all federal agencies to consult with the United States Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) if a project action may affect a listed endangered or threatened species or their habitat. Consultation may be “informal” or “formal,” but formal consultation is necessary if a project is likely to adversely affect a listed species or its habitat. A Biological Assessment is prepared and helps determine if a Biological Opinion is necessary. The Interim and Ultimate Projects would require consultation.

**Coastal Zone Management Act (CZMA) Federal Consistency.** Under the federal consistency provisions of the CZMA, federal agency actions involving projects affecting the coastal zone need to be determined to be consistent with the state’s coastal zone management program and policies (16 United States Code § 1456). The consistency determination is made by the lead federal agency, and concurrence is

sought from the CZMA managing agency, which has the ability to concur, condition the project to find consistency, or object to the project. For San Francisco Bay and the project area, the San Francisco Bay Conservation and Development Commission (BCDC) is the state's coastal zone management agency responsible for issuing consistency determinations under the CZMA. Consistency determination requirements for the Interim and Ultimate Projects would be determined in coordination with BCDC.

**Section 4(f).** The Interim and Ultimate Projects are within the San Pablo Bay National Wildlife Refuge, which would be evaluated with respect to Section 4(f). There are also public viewing and access locations at the Sonoma Creek Bridge and at Cullinan Ranch that would have to be considered if they meet Section 4(f) criteria. A Section 4(f) evaluation would be needed. The requirements of Section 4(f) would depend on the determination of potential "use" of the refuge area or publicly maintained access or recreation locations, avoidance, and consideration of alternatives that minimize any defined use.

**NEPA and Clean Water Act Section 404 Integration Process.** A Memorandum of Understanding (MOU) applies to federal aid surface transportation projects that have five or more acres of permanent impacts to waters of the U.S., and that require a NEPA EIS. The MOU process is designed to foster and achieve agreement at critical steps of the NEPA review process, such as defining the purpose and need, alternatives, and review of the drafts of the EIS. It has not been determined if this process would apply to this Project. Further evaluation of the potential impacts to waters of the U.S would help define this requirement.

**Assembly Bill No. 52 (AB 52).** Assembly Bill No. 52 (AB 52), resulted in modifications and amendments to the Public Resources Code (PRC), and creates a new category of environmental resources that must be considered under CEQA: "tribal cultural resources." The legislation imposes requirements for consultation regarding projects that may affect a tribal cultural resource and includes a broad definition of what may be considered to be a tribal cultural resource; it also includes a list of recommended mitigation measures.

AB 52 adds tribal cultural resources to the categories of cultural resources in CEQA, which had formerly been limited to historic, archaeological, and paleontological resources. "Tribal cultural resources" are defined as either:

- (1) "sites, features, places cultural landscapes, sacred places and objects with cultural value to a California Native American tribe" that are included in the state register of historical resources or a local register of historical resources, or that are determined to be eligible for inclusion in the state register; or
- (2) resources determined by the lead agency, in its discretion, to be significant based on the criteria for listing in the state register.

This requirement with respect to environmental review would be defined by Caltrans.

## **Interim and Ultimate Studies**

The Project team conducted preliminary screening during the identification of alternatives. As part of that process, the following technical studies were preliminarily identified that would likely be needed during the PA&ED phase. These would need to be confirmed when that work is initiated:

- Community Impact Assessment
- Section 4(f) Evaluation
- Visual Impact Assessment
- Archaeological Survey Report
- Archaeological Evaluation Report
- Historic Resources Evaluation Report
- Historic Property Survey Report
- Location Hydraulic Study
- Summary Floodplain Encroachment Report and/or Floodplain Evaluation Report
- Water Quality Study
- Stormwater Data Report
- Preliminary Geotechnical Report
- Paleontology Evaluation Report
- Air Quality Technical Report
- Greenhouse Gas Emissions Evaluation
- Noise Study Report
- Initial Site Assessment
- Preliminary Site Investigation<sup>6</sup>
- Natural Environment Study
- Wetland Delineation Report
- Species Crossing Study
- Biological Assessment

## **Permits and Approvals**

Due to the need for work in waterways, and the presence of sensitive biological resources, the Interim and Ultimate Projects would be subject to approvals and permits from regulatory agencies. The following regulatory permits and approvals may be required, but would require confirmation and/or updating once alternatives are further refined. The preparation of the applications and permits can be initiated during PA&ED, but cannot be approved by the agencies until the Preliminary Plans, Specifications, and Estimates (PS&E) phase.

Both the Interim and Ultimate Projects would require similar permits because they would both involve work in waterways, sensitive habitats, and within the BCDC

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<sup>6</sup> If appropriate, the PSI can be delayed until the PS&E phase when design details are more developed.

shoreline band. The permits and coordination required for both Projects is listed below. These permits would be required prior to project construction.

- **U.S. Fish and Wildlife Service (USFWS)/National Marine Fisheries Service (NMFS):** Formal consultation for threatened and endangered species under Section 7 of the Federal Endangered Species Act would be required. Informal consultation or a Biological Opinion would be needed prior to approval of the final environmental document.
- **Federal Highway Administration (FHWA):** Concurrence that the Project conforms to the State Implementation Plan (SIP) in accordance with 40 CFR 93 would be required.
- **Interagency Air Quality Conformity Task Force:** Concurrence that the Project is not a Project of Air Quality Concern as defined by 40 CFR 93.123(b)(1), and conforms at the regional level to the Clean Air Act would be required. Consultation must be completed prior to applying to FHWA for air quality conformity determination.
- **State Historic Preservation Officer (SHPO):** There is a potential for adverse effects to cultural resources, and design options would be pursued that can avoid such effects. The Section 106 Programmatic Agreement between the Advisory Council on Historic Preservation, the FHWA, and the State Historic Preservation Officer (SHPO) requires SHPO concurrence on determinations of eligibility and findings of effect.
- **U.S. Army Corps of Engineers (USACE):** The Project would require a Preliminary Jurisdictional Determination identifying wetlands and other Waters of the United States within the Project footprint under Clean Water Act Section 404 and Section 10 of the Rivers and Harbors Act of 1899. Any work within jurisdictional areas would require a Section 404 Permit, and any work in, under, or over a navigable waterway would require a Section 10 permit. The expected timeframe is 6 to 12 months.
- **Regional Water Quality Control Board (RWQCB):** The USACE permit would require RWQCB approval of a Section 401 Water Quality Certification or Waiver. The RWQCB certification or waiver is approved following, or contingent upon, receipt of all federal permits, including the USACE authorization and agreement on wetland mitigation. Time required is a minimum of 3 to 6 months following USACE permit approval and agreement on mitigation. The Project would also require a Notice of Construction and Storm Water Pollution Prevention Plan agreement with RWQCB, which is typically obtained during the construction phase.
- **California Department of Fish and Wildlife (CDFW):** The CDFW may require a 1602 Agreement for a Streambed Alteration Agreement. Their jurisdiction would apply to the banks of a creek or waterway habitat affected by the Project. The definition of ‘stream’ does not generally include tidal sloughs or other tidally-influenced areas. They would require 6 months minimum following receipt of a complete application and agreement on mitigation. An Incidental Take Permit may be required for impacts.

- **San Francisco Bay Conservation and Development Commission (BCDC):** BCDC jurisdiction is located along the Bay shoreline, which occurs nearby to the south of the Project. Coordination with BCDC will also be necessary pursuant to Coastal Zone Management Act consistency requirements.
- **United States Coast Guard:** Bridge permit or approval that the existing Bridge Permit maintains vertical and horizontal clearances within the navigation channel.
- **California State Lands Commission:** A California Public Resources Code Division 6 Permit may be required.
- **Sonoma-Marín Area Rail Transit (SMART):** A railroad agreement may be required for at-grade or grade separated crossings.

## 11. FUNDING

### *Funding*

It is anticipated that the Project would be funded through a combination of federal, state, regional and local funding sources, including Senate Bill 1 (SB1), Regional Measure 3 (RM3), STP/CMAQ and STIP. One hundred million dollars is included as part of the RM3 Expenditure Plan, which would be used to advance improvements along the entire SR 37 corridor between I-80 in Solano County and US 101 in Marin County. It has not been determined if the Project is eligible for federal-aid funding. Federal-aid determination would occur at the PA&ED phase.

The Project's funding sources for environmental review include Regional Transportation Plan – Long Range Planning Funds (RTP-LRP) funds. Additional funding would be pursued during the Project development process. Individual projects with independent utility and logical termini, if identified, may proceed when funding sufficient to implement a Project is identified.

This PSR-PDS serves as a scoping document to program required funds for the next phase of the Project.

### *Capital Outlay Project Estimate*

A programming-level cost estimate was developed for the Project improvement alternatives to help define the scope of work, identify delivery options, manage risk, and support the implementation plan. The estimated total Project capital outlay cost for the Interim build alternative is approximately \$107 million to \$172 million, which includes \$103 million to \$145 million for roadway items, \$1 million to \$19 million in structures items, and \$3 million to \$8 million for right-of-way items. The estimated total Project capital outlay cost for the Ultimate build alternative is approximately \$3,234 million to \$4,052 million, which includes \$543 million to \$1,108 million for roadway items, \$1,879 million to \$3,334 million in structures items, and \$175 million to \$247 million for right-of-way items. The range of Project costs is based on potential Project alternatives and major areas of risk, with appropriate consideration

for contingency. Estimated costs are subject to change as new and more detailed information becomes available.

The Capital Outlay Project Estimate is included as Attachment D and the Right-of-Way Conceptual Cost Estimate Component is included as Attachment H. Anticipated sources of funding include federal, state (STIP), and local funds. Funding for the Project will be pursued.

Alternative	Range of Estimate*		STIP Funds		Other Funds	
	Construction	Right-of-Way	Construction	Right-of-Way	Construction	Right-of-Way
Alternative I1	\$164M	\$8M	TBD	TBD	TBD	TBD
Alternative I2	\$105M	\$3M	TBD	TBD	TBD	TBD
Alternative U1	\$2,987M	\$247M	TBD	TBD	TBD	TBD
Alternative U2	\$3,877M	\$175M	TBD	TBD	TBD	TBD

\* Costs shown are escalated values, per Attachment D.

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

***Capital Outlay Support Estimate***

The capital outlay support cost needed to complete the PA&ED phase is estimated to range from \$3.5 million to \$6.7 million for the Interim Projects and \$54 million to \$66 million for the Ultimate Project. Separate cooperative agreements would be executed between Caltrans and the lead agency for PA&ED prior to the start of the PA&ED phase. Separate future cooperative agreements for the PS&E and construction phases of the Project would be prepared before those phases begin.

**12. DELIVERY SCHEDULE**

Below is an anticipated delivery schedule for the Interim Project’s NEPA/CEQA work.

Project Milestones		Scheduled Delivery (Month/Day/Year)
PID Approval / Program Project	M015	12/31/2018
Begin Environmental (PA&ED) Phase	M020	03/04/2019
Circulate DPR & DED Externally	M120	08/30/2021
PA&ED Approval	M200	02/28/2022

The anticipated funding fiscal year for Interim Project construction is 2023.

Below is an anticipated delivery schedule for the Ultimate Project’s NEPA/CEQA work.

Project Milestones		Scheduled Delivery (Month/Day/Year)
PID Approval / Program Project	M015	12/31/2018
Begin Environmental (PA&ED) Phase	M020	09/02/2019
Circulate DPR & DED Externally	M120	12/31/2024
PA&ED Approval	M200	12/31/2025

The anticipated funding fiscal year for Ultimate construction is 2030.

### 13. RISKS

A risk register has been created as part of the Project Initiated Documents (PID) phase and is included as Attachment G. The risk register is an assessment of potential risks and project impacts that may occur in subsequent phases and would be updated throughout the project development process. In accordance with the Caltrans Risk Management Handbook, a level 3 risk register is required for projects with estimated costs greater than \$100 million. A quantitative assessment has been prepared for identified risks and assignment of cost and schedule impacts are based on risk evaluation for this phase of the Project. As additional studies are completed as part of the PA&ED phase, a more detailed and quantitative approach to define and describe the risks can be completed.

In summary, the main risks are as follows:

- Design risks include approval of design exceptions for nonstandard features, unexpected geotechnical issues for Ultimate alternatives, multimodal access limitations, change in SLR guidance, coordination with flooding related improvements, inadequate survey information and pavement condition information.
- Environmental risks include concurrence on proposed alternatives and mitigations, occurrence of unanticipated sensitive environmental resource, extensive mitigation requirements, legal challenges after approval of environmental document.
- Project Management risks include lack of funding.

### 14. EXTERNAL AGENCY COORDINATION

#### *Federal Highway Administration (FHWA)*

At this phase of the Project, this Project is considered to be a delegated project in accordance with the current Stewardship and Oversight Agreement signed between FHWA and Caltrans on May 28, 2015.

Since funding sources have not been determined at this phase of the Project, a Project of Division Interest (PoDI) determination would be made by MTC, the Caltrans Project Manager, and the FHWA representative once funding is determined or early in the PA&ED phase. If the Project is considered PoDI, a Project Action Responsibility Matrix would identify Federal-Aid Highway Program (FAHP) project approvals and related responsibilities required to identify FHWA and Caltrans project approval authorities.

The Project requires the following coordination:

US Army Corps of Engineers

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

United States Coast Guard

Rivers and Harbors Act of 1899 Section 9  
Bridge Permit

California Department of Fish and Wildlife

California Fish and Game Code Section 1602 Lake or Streambed Alteration  
Agreement  
2081 Incidental Take Permit

California State Lands Commission (potentially)

California Public Resources Code Division 6 Permit

Regional Water Quality Control Board

Clean Water Act Section 401  
Water Quality Certification

San Francisco Bay Conservation and Development Commission

California Government Code Title 7.2  
California Public Resources Code Division 19  
Major Permit, Administrative Permit, or Regionwide Permit  
Coastal Zone Management Act (CZMA) – Federal Consistency

Local Agency

Cooperative Agreements with STA, NVTA, SCTA, TAM

Local Agency

Agreements with Caltrans

Railroads

Railroad Agreement with SMART for at-grade or grade-separated crossings

Other

- State Historic Preservation Officer – Section 106 consultation and concurrence in National Register of Historic Places (NHRP) determinations of eligibility and effect
- Tribal Cultural Resources - Consultation with Tribes that have requested notification, per Assembly Bill 52 and CEQA requirements
- State Water Resources Control Board – Construction Stormwater General Permit compliance
- United States Fish and Wildlife Service – Section 7 of the Endangered Species Act consultation and concurrence in findings
- National Marine Fisheries Service – Section 7 of the Endangered Species Act consultation and concurrence in findings
- Federal Highway Administration (FHWA) – Concurrence that the project conforms to the State Implementation Plan (SIP) in accordance with 40 CFR 93
- Interagency Air Quality Conformity Task Force – Concurrence that the Project is not a Project of Air Quality Concern as defined by 40 CFR 93.123(b)(1), and conforms at the regional level to the Clean Air Act

**15. PROJECT REVIEWS**

District Maintenance \_\_\_\_\_ Leah Budu \_\_\_\_\_ Date \_\_\_\_\_  
 District Traffic Safety Engineer Katie Yim/Bahman Zarechian Date \_\_\_\_\_  
 Headquarters Project Delivery Coordinator Robert Effinger Date \_\_\_\_\_  
 Project Manager \_\_\_\_\_ Kelly Hirschberg \_\_\_\_\_ Date \_\_\_\_\_  
 FHWA \_\_\_\_\_ Lanh Phan \_\_\_\_\_ Date \_\_\_\_\_  
 District Safety Review \_\_\_\_\_ Haixiong Xu \_\_\_\_\_ Date \_\_\_\_\_  
 Constructability Review \_\_\_\_\_ Jeffrey Hupe (TBD) \_\_\_\_\_ Date \_\_\_\_\_  
 Other \_\_\_\_\_ Date \_\_\_\_\_

**16. PROJECT PERSONNEL**

**Table 16-1: Project Personnel**

Name	Role	Phone
Mimmy Hew	Caltrans Advance Planning Branch Chief	(510) 286-5578
Kelly Hirschberg	Caltrans Project Manager	(510) 286-4925
Dominic Chin	Caltrans Oversight Project Engineer	(510) 286-4858
Manny Caluya	Caltrans Chief Office of Design	(510) 286-4645
Thomas Rosevear	Caltrans Environmental Unit	(510) 286-5360
Wahida Rashid	Caltrans Environmental Unit	(510) 286-5935
Evelyn Gestuvo	Caltrans Highway Operations Branch Chief	(510) 286-4939
Katie Yim	Caltrans Traffic Safety Branch Chief	(510) 286-4578
Kristin L. Schober	Caltrans R/W Local Programs Branch Chief	(510) 286-5327

Vince Bonner	Caltrans Design Branch Chief	(510) 286-5648
Robert Effinger	Caltrans Headquarters Project Delivery Coordinator	(916) 653-4937
Kevin Chen	Metropolitan Transportation Commission – Project Manager	(415) 778-5338
Michael Kerns	Metropolitan Transportation Commission – Technical Traffic advisor	(415) 778-5206
Janet Adams	Director of Projects, STA	(707) 424-6075
James Cameron	Director of Projects and Programming, SCTA	(707) 565-5377
Parag Mehta	Kimley-Horn – Project Manager	(925) 965-7703
Prasanna Muthireddy	Kimley-Horn – Project Engineer	(925) 215-1565
Ramsey Hissen	AECOM – Project Advisor	(408) 961-8426
Joy Villafranca	AECOM – Project Engineer	(510) 874-3242

## 17. ATTACHMENTS

- A. Location Map
- B. Preliminary Layouts
- C. Typical Cross-Sections
- D. Cost Estimate
  - 1. Interim: Alternative I1
  - 2. Interim: Alternative I2
  - 3. Ultimate: Alternative U1
  - 4. Ultimate: Alternative U2
- E. Preliminary Environmental Analysis Report (PEAR)
- F. Traffic Engineering Performance Assessment (TEPA)
- G. Risk Register
- H. Right-of-Way Conceptual Cost Estimate Component
- I. Transportation Planning Scoping Information Sheet
- J. Stormwater Documentation.