04 - NAP - 29 – PM 0.69/PM 2.05
EA 04-4Q010K – 0419000297
November 2022

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

To

Request Approval for a Locally Funded Project to Proceed to Project Approval and Environmental Document (PA&ED Phase)

On Route 29

Between American Canyon Road

And Napa Junction Road

APPROVAL RECOMMENDED:

Kate Miller, Napa Valley Transportation Authority, Project Sponsor, Accepts risks identified in this PSR-PDS and attached risk register

APPROVAL RECOMMENDED:

Amani Meligy

Amani Meligy, Regional Project Manager

APPROVAL RECOMMENDED:

Celia McCuaig

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

APPROVED:

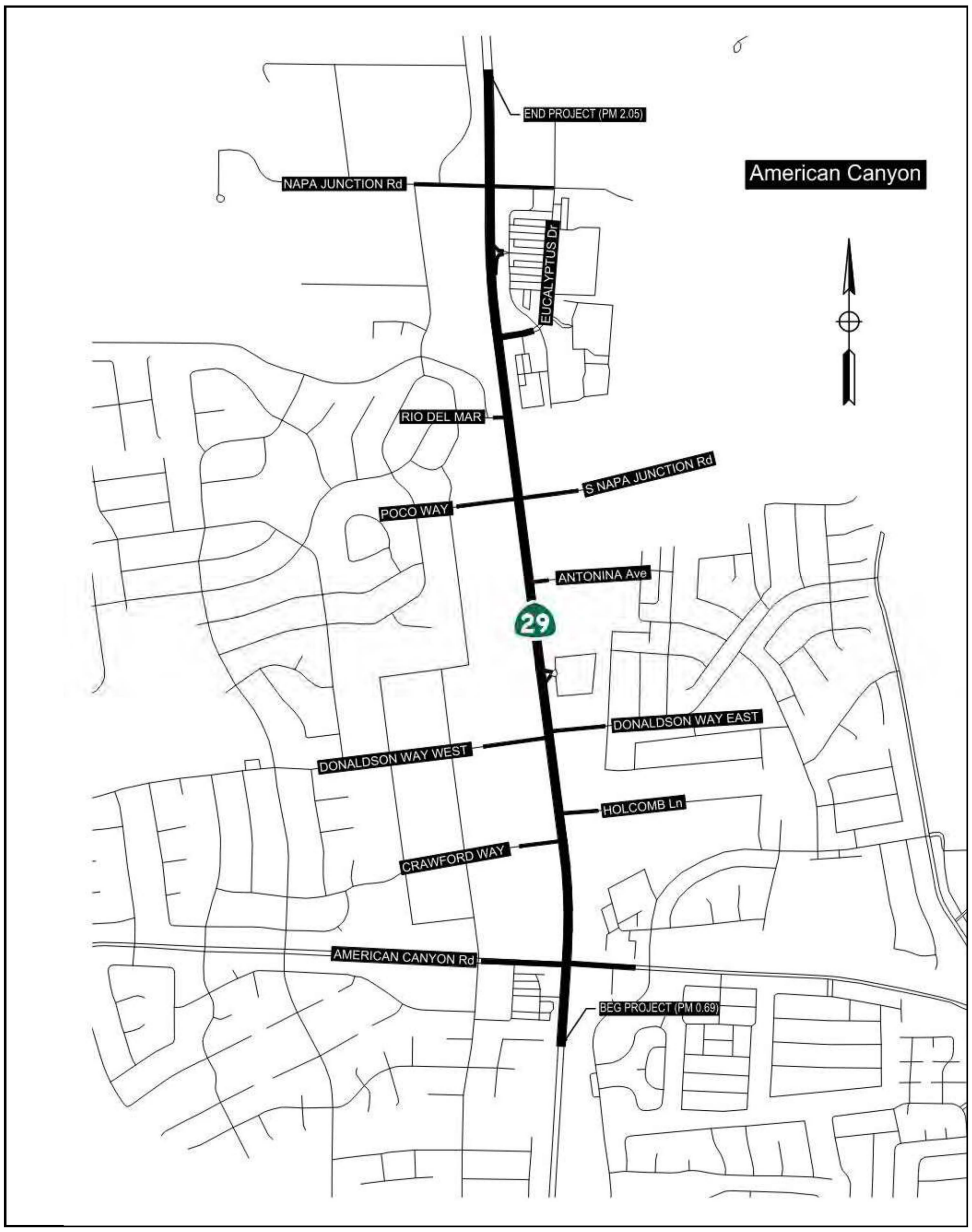
Dina El-Tawansy

Dina El-Tawansy, District Director

02/03/2023

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.

11/14/2022

REGISTERED CIVIL ENGINEER *DATE*

GHD, Inc

REVIEWED BY:

Celia McCuaig, Office Chief - Advanced Planning

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1. INTRODUCTION

The Napa Valley Transportation Authority (NVTA), in cooperation with the California Department of Transportation (Caltrans) and the City of American Canyon (City), proposes roadway improvements along State Route 29 (SR 29) within much of the City limits to address various operational and safety needs along the SR 29 corridor. These improvements are needed to improve and increase multimodal transportation opportunities within the City. Collectively these improvements are referred to herein as the American Canyon SR 29 Corridor Improvement Project (Project). The Project is located along SR 29 in Napa County, California between Post Miles (PM) 0.69 and 2.05. See Attachment A for the Project Location Map.

NVTA has begun evaluating various alternatives that: 1) maximize efficiency and safety; 2) achieve acceptable operating conditions relative to projected future demand; 3) improve air quality, economic development, and social equity; 4) are context sensitive in accord with SR 29's rural and scenic character; and 5) minimize potential impacts to the natural environment. These alternatives are:

- Alternative 1: Multimodal improvements along the SR 29 corridor from American Canyon Road to Napa Junction Road. Improvements include Class I bikeways (shared use paths) on both sides of SR 29, reconstruction of the roadway to provide consistent median width, 11-foot lanes, 12-foot shoulders on SR 29 allowing for part time bus on shoulder, and buffer areas to separate the Class I bikeways from the roadway. The project would include enhanced multimodal crossings, separating bicycle crossings from pedestrian crossings and high visibility demarcations. The project will also include signal upgrades, potentially including transit signal priority for the queue jump lanes. The existing 4-lane roadway configuration would be maintained.
- Alternative 2: Construct roundabouts along SR 29 at all major intersections except American Canyon Road. Due to high turning and side street volumes, American Canyon Road will remain a traffic signal. Alternative 2 proposes to maintain the 4-lane corridor with the same multimodal improvements as Alternative 1. At the roundabout intersections, the corridor will be widened to 6 lanes approaching the intersections, allowing necessary circulation. Locations with close intersection spacing will maintain 6 lanes along the corridor. The wider medians at roundabout approaches, necessary for speed control and deflected entries allow for multiple additional improvements including large pedestrian refuges between roadway directions. Crossings would also contain additional improvements to increase pedestrian visibility within the intersections. Roundabouts are proposed to increase overall circulation whilst providing traffic calming and enhanced intersection safety for all users.
- Both build alternatives will construct enhanced transit stops where feasible, underground existing overhead utility lines, and replace/construct new curb ramps in accordance with Caltrans Design Information Bulletin (DIB) 82-06 and construct new planter and landscape areas to improve the overall aesthetic

of the roadway. All alternatives will include bus-on-shoulder facilities to the maximum extent practicable. As currently proposed, drivers would have to yield to buses, while entering and exiting the roadway at driveways, and bus only signal phases are proposed to incorporate queue jump movements utilizing the shoulder, where right-turn movements are restricted. Inclusion of these facilities will be studied further in the Project Approval & Environmental Document (PA&ED) phase.

- No-build: the no build alternative eliminates all proposed improvements and leaves SR 29 in its current condition.

Project Limits	04-NAP-29, 0.69/2.05
Number of Alternatives	3 (2 Build, 1 No-build)
Current Capital Outlay Support Estimate for PA&ED	$3,964,000-$5,003,000
Current Capital Outlay Construction Cost Range	$44,155,900-$63,937,117
Current Capital Outlay Right of Way Cost Range	$4,884,416-$10,700,000
Funding Source	TBD
Type of Facility	Multi-lane Conventional Highway
Number of Structures	1-2
Anticipated Environmental Determination or Document	CEQA – Initial Study/Mitigated Negative Declaration NEPA – Categorical Exclusion
Legal Description	In Napa County in American Canyon, From 0.1 mile south of American Canyon Rd to 0.1 mile north of Napa Junction Rd
Project Development Category	Category 4B (Alternative 1) Category 4A (Alternative 2)

This Project is sponsored by NVTA. The remaining capital outlay support, right of way, and construction components of the project are preliminary estimates and are not suitable for programming purposes. A project report will serve as approval of the "selected" alternative. Type text here

Other approvals required during the PA&ED phase are:

- Detailed Project Alternative (Geometric Approval Drawings)
- Design Standards Decision Document
- Right of Way Data Sheet
- Storm Water Data Report
- Traffic Management Plan
- Draft and Final Environmental Document
- Cooperative Agreement (for the PS&E Phase) between all parties

A Cooperative Agreement will be required prior to the initiation of the PA&ED Phase.

2. BACKGROUND

Existing Highway

The existing SR 29 is an approximately 107-mile-long State Highway with varying functional classification. Various segments act as a conventional highway or expressway, while others, particularly through the City of Napa, feature freeway access control and interchanges. SR 29 begins at Interstate 80 in Vallejo then proceeds north through Napa County, ultimately terminating approximately 52 miles into Lake County at the SR 20 Junction. Throughout the project area, the corridor is classified as a multilane conventional highway, providing access to businesses and residents through multiple side streets as well as numerous driveways. Driveway access style varies, however larger commercial, or high-volume driveways possess short, substandard deceleration and acceleration lanes approaching and exiting the driveway. The corridor possesses a relatively linear alignment, with gentle curves transitioning into American Canyon and out of American Canyon. Currently, within the project limits, the SR 29 is posted at 55 miles per hour with an assumed design speed of 60 miles per hour. The route is maintained by Caltrans within the project area.

Project Background

In 2014 NVTA completed the SR 29 Gateway Corridor Improvement Plan (SR 29 Gateway Plan). In 2019, NVTA continued the outreach, analysis, and findings from NVTA's SR 29 Gateway Plan and undertook the development and delivery of the SR 29 Comprehensive Multimodal Corridor Plan (SR 29 CMCP). The SR 29 CMCP evaluated the most constrained portion of SR 29, which is the 11.5-mile portion that stretches from Imola Avenue (designated SR 121 east of SR 29) in the City of Napa to SR 37 in the City of Vallejo. The limits of this project are included within the SR 29 CMPC study limits. The SR 29 CMCP was created utilizing plans, policy documents, and community outreach efforts completed along the SR 29 corridor.

The objective of the SR 29 CMCP was to develop a comprehensive multimodal package of prioritized improvements that address the corridor's preeminent issues, including:

- Traffic congestion and delay
- Increased crash risks for all users
- Lack of low-stress multimodal connectivity
- Increased travel time and Reduced transit reliability

The goal of the SR 29 CMCP was to identify a package of multimodal improvements that are feasible, equitable, cost-effective, have community support, and guide future SR 29 corridor programming decisions over a 20-year timeframe based on available funding. Enhancements for multimodal travel, parallel capacity, operational, and telecommunication strategies were a key focus of the SR 29 CMCP.

The SR 29 CMCP examined the existing and future operational and safety performance of SR 29 using the Caltrans Smart Mobility Framework approach. The results of the performance analysis were combined with substantial input from the public to inform the ultimate selection of the SR 29 preferred corridor concept recommendation.

Upon review of past planning and other corridor-related documents and establishment of evaluation performance metrics, the public was again engaged for their input, and a thorough assessment of existing conditions was conducted. These combined efforts led to the identification and evaluation of a focused group of corridor solutions.

The performance metrics selected for the SR 29 CMCP were informed by the six Smart Mobility Framework objectives to ensure that the resulting improvement recommendations provide a balanced, sustainable, and multimodal assessment of current and forecasted corridor conditions. Analysis and evaluation of corridor solutions included:

- Planning level opinions of probable cost
- Mode shift and vehicle miles travelled (VMT)
- Level of traffic stress scores
- Vehicular delay and buffer time reductions
- Collision reduction benefit
- Health and air quality benefit
- Societal cost and benefit monetization factors
- Return on investment

Equal attention was given to document the beneficial outcomes of measures not directly reflected in the benefit-cost assessment. These include: Plan Consistency (with existing plans); Policy Consistency (NVTA, the City and County of Napa, City of American Canyon and Caltrans); Environmental/Institutional Sensitivity; Adaptation; Economic Development and, Community Acceptance.

The CMCP, completed in early 2020, resulted in a Preferred Corridor Plan. This Project will be the second portion of the overall corridor plan to move forward and build upon the work done in the CMCP. This Project will continue to build upon these previous studies to deliver a context sensitive solution for SR 29 within American Canyon.

Cooperative Agreement

A cooperative agreement for the PA&ED phase will be agreed upon between Caltrans and NVTA prior to the start of the PA&ED phase. Funding for the PA&ED phase has not yet been obtained, however is being actively pursued. This report will serve as the authorizing document for the cooperative agreement.

3. PURPOSE AND NEED

Purpose

Provide a multimodal and complete streets corridor that:

- Improves mobility for all users
- Improves safety for all users by incorporating Vision Zero concepts, which include strategies to eliminate all traffic fatalities and severe injuries through a systematic approach that believes traffic deaths are preventable
- Eliminates overhead utility poles
- Improves corridor aesthetics
- Reduces Vehicle Miles Traveled (VMT) by encouraging transportation mode shift, which will help to reduce regional traffic on residential streets
- Improves customer access to businesses adjacent to SR 29
- Provides improved accessibility for all modes of transportation along SR 29 between American Canyon Road and Napa Junction Road

Need

Regionally, State Route (SR) 29 provides a direct connection between counties along Interstate 80 (I-80) and I-580 and counties along US 101 in the North Bay. Locally, SR 29 is also the lifeblood of access into and out of Napa County.

Notwithstanding their disparate local context, vehicular volumes on SR 29 are comparable to other nearby state highways (SR 12 and SR 37). However, because the SR 29 Corridor functions as American Canyon's "Main Street", it experiences significant safety, aesthetic, and operational deficiencies between American Canyon Road and Napa Junction Road during weekday and weekend AM and PM peak hour conditions. The most pronounced issues in the corridor include:

- Lack of multimodal connectivity - particularly for bicycle and pedestrian access - along and across SR 29;
- Lack of low-stress routing options for bicyclists and pedestrians along SR 29;
- Lack of public transit lanes, facilities and pull outs for stops
- Lack of aesthetic benefits of landscaping along the corridor to help define American Canyon's "Main Street";
- Unprotected overhead utility poles in the State Right of Way are within the clear recovery zone
- Regional traffic congestion hinders customer access to American Canyon's "Main Street" Commercial businesses;
- Constraints at intersections cause extensive queuing and delays, and bottlenecks resulting in unreliable travel times for both motorists and public transit and traffic diverting to residential streets;
- Compromised feasibility to provide enhanced transit service due to travel time unreliability;
- Increased safety risk and conflicts between motorists and active transportation users due to unseparated facilities and high speed differentials; and

- Increased response times for public safety vehicles.

4. TRAFFIC ENGINEERING PERFORMANCE ASSESSMENT

A Traffic Engineering Performance Assessment (TEPA) was prepared for this project. It analyzed four conditions: No Build, and the 2 alternatives described earlier in this report. Additionally, the TEPA analyzed a third build alternative. This alternative, after analysis was rejected. For more information, see the Considered but Rejected Alternative section. The TEPA was submitted to Caltrans for review on March 8, 2021. The TEPA is included as Attachment B. A summary of the findings in the TEPA is provided below:

Traffic Volumes

Traffic Volumes were derived from traffic counts used in the Watson Ranch Environmental Impact Report (EIR) These counts were used to form a basis for existing traffic conditions. The Napa-Solano Regional Traffic Demand Model (TDM) was used to develop future year forecasts. The TDM projects a growth rate of approximately 40% in the AM peak hour and 20% in the PM Peak.
A summary of traffic volumes can be found in **Table 4.1**.

Table 4.1 Average Mainline Volumes

SR 29 Mainline (PM 0.7 to 2.1)	Existing Year Volume	Design Year Volume			
		No Build	Alt 1	Alt 2	Alt 3 (Rejected)
Average AM Peak Hour Throughput	3484	3643	3567	3756	3908
Average PM Peak Hour Throughput	4039	4204	4385	4537	4340

Collision Data

Collision data was provided through Caltrans Traffic Accident Surveillance and Analysis System (TASAS) - Traffic Systems Network (TSN) Reports. Data was provided for the study period from January 1, 2018 to December 31, 2020 for postmiles 0.69 to 2.05. Data showed a total of 125 collisions during this period, with 92 injury collisions and no fatalities. The Fatal and Injury collision rate was 1.1, over double the statewide average of 0.40. The total collision rate was 2.34, well over the statewide average of 0.90. Most collisions were classified as rear end (70.9%), and most collisions were attributed to speeding. See Table 4.2 for TASAS “Table B” report. Additionally, there were two collisions involving pedestrians.

Table 4.2 TASAS "Table B"

Segment	TOTAL No. of Crashes	ACTUAL Rates (per million vehicle miles)			AVERAGE Rates (per million vehicle miles)		
		Fatal Crashes	Fatal + Injury Crashes	Total(1)	Fatal Crashes	Fatal + Injury Crashes	Total(1)
NAP 29 0.69-2.05	125	0.000	**1.10**	**2.34**	0.009	0.40	0.90

(1) All reported crashes (includes Property Damage Only (PDO) Crashes)

Collision Analysis

The proposed improvements are anticipated to improve the fatal + injury crashes, by slowing down traffic, and potentially changing intersection control to roundabouts. The improved demarcations for both alternatives, as well as the improved lighting will increase overall performance of the intersections and reduce collisions. The improved pedestrian and bicycle facilities will help eliminate the vehicular collisions involving pedestrians reported.

If the roundabout alternative is selected, immediately after opening, the intersections may experience minor (PDO) collisions, such as sideswipe and rear end collisions, as drivers learn to navigate the roundabouts. As documented in a study by the Insurance Institute for Highway Safety (IIHS) in 2019, the PDO collisions can be common with multilane roundabouts as drivers learn how to navigate lanes and yield to traffic, however, once accustomed to the intersection, PDO collisions reduce. Because of multiple number of roundabouts in the area, these initial impacts are anticipated to be minor and the overall collision potential of the corridor will drop significantly. The Highway Safety Manual (HSM) contains numerous Crash Modification Factors (CMFs) that estimate the impact of certain changes along the corridor. Roundabouts range in effectiveness based on location, size etc. but collision reductions of 1% to 52% can be anticipated. As part of the next phase of the project, the roundabout alternative may explore adding turbo roundabout elements or a full turbo design to minimize PDO collisions.

Intersection Operations

Within the study area, SR 29 is a multilane conventional highway, with two lanes in either direction. Numerous turn pockets are placed along the corridor, accommodating turning storage and movements. The Traffic Engineering Performance Assessment (TEPA) analyzed the proposed alternatives using microsimulation software throughout the project area. **Table 4.3**, and **Table 4.4** present a summary of the design year (2045) Level of Service (LOS) and delay (seconds per vehicle) at each study intersection analyzed.

Table 4.3 Intersection Operations Summary Alternative 1 - Multimodal Improvements (2045)

Intersection	No Build LOS	No Build Delay	Alternative 1 LOS	Alternative 1 Delay
American Canyon Rd	F (F)	277.9 (120.1)	F (F)	189.0 (107.4)
Crawford Way	E (A)	36.1(8.7)	A (A)	6.3 (7.5)
Donaldson Way	F (D)	81.4 (53.9)	D (D)	52.7 (45.7)
Poco Way	A (A)	6.1 (3.8)	F (A)	58.6 (5.5)
Rio Del Mar	D (D)	49.0 (38.4)	E (C)	66.8 (30.8)
Eucalyptus Dr.	D (E)	35.1 (63.4)	C (D)	25.5 (50.3)
Napa Junction Rd	F (F)	104.3 (109.9)	F (C)	91.7 (28.4)

1) Delay is measured in seconds
2) Values in parentheses are PM Peak hour values.

Table 4.4 Intersection Operations Summary Alternative 2 – Roundabouts (2045)

Intersection	No Build LOS	No Build Delay	Alternative 2 LOS	Alternative 2 Delay
American Canyon Rd	F (F)	277.9 (120.1)	No Change	No Change
Crawford Way	E (A)	36.1(8.7)	A (B)	6.4 (11.7)
Donaldson Way	F (D)	81.4 (53.9)	B (B)	14.1 (19.8)
Poco Way	A (A)	6.1 (3.8)	A (A)	6.1 (7.3)
Rio Del Mar	D (D)	49.0 (38.4)	B (B)	13.1 (10.1)
Eucalyptus Dr.	D (E)	35.1 (63.4)	B (C)	11.1 (27.8)
Napa Junction Rd	F (F)	104.3 (109.9)	B (B)	10.9 (11.6)

1) Delay is measured in seconds
2) Values in parentheses are PM Peak hour values.

TEPA Findings

The TEPA analyzed the project study location with VISSIM, a microsimulation software. It found that the alternative which performed the best at intersections was Alternative 2. The efficiency of roundabouts along the corridor provided significant delay improvements with the worst-case intersection performing at an LOS C in the PM peak hour.

Operational improvements of the PM peak hour are more drastic than the improvements for the AM peak hour due to an anticipated diversion away from SR 29 to Newell Drive in the PM Peak. The Newell Drive Extension is anticipated to be constructed within a similar time period to this project and thus will have major traffic impacts. The TEPA used the Newell Drive traffic report to coordinate the effect of the projects.

Transit Improvements

NVTA, the countywide transit operator, utilizing proposed geometry and improvements to the corridor analyzed improvements anticipated to transit operations through the project area.

Currently, Vine transit operates three regional routes through the project area: 11, 11x and 29. The analysis was performed on all three routes. The Vine also operates American Canyon Transit, an on-demand shuttle that has limited fixed route during school bell times. This service mainly operates east and west of the corridor. Intersection improvements along the corridor will increase travel time reliability for the Shuttle.

The basis of the analysis was the assumption that reasonable fixed time improvements can be applied for enhancements along the corridor and could be applied to travel times throughout the corridor. These fixed time improvements were determined using this project's TEPA and a separate Express Bus Corridor Study, prepared in December 2017.

Table 4.5 Transit Travel Time Improvements – Alternative 1(2022)

Direction	Travel Time Reduction from Transit Signal Priority	Travel Time Reduction from Queue Jumps	Travel Time Reduction from Moving Stops on System	Total Travel Time Reduction
Northbound	1:25	1:15	2:00	4:40
Southbound	1:25	1:15	1:30	4:10

1. Units for Travel Time are in Minutes:Seconds

For Alternative 2, utilizing modeled vehicular travel times established within the TEPA, moving stops on system, predicted travel time reductions were established as follows:

Table 4.6 Transit Travel Time Improvements – Alternative 2(2022)

Direction	Existing Vehicle Travel Time	Travel Time from Moving Stops on System	Total Travel Time Reduction
Northbound AM	6:31	4:40	1:51
Northbound PM	4:33	3:20	1:13
Southbound AM	4:08	2:51	1:17
Southbound PM	9:00	4:39	4:21

1. Units for Travel Time are in Minutes:Seconds

Overall, both alternatives provide significant improvements to travel times throughout the corridor, shaving off as much as 50% off travel times for certain routes and directions. Alternative 1, however, with the dedicated queue jump lanes and potential for signal priority, provides a more consistent reduction in transit travel time.

TRANSPORTATION PLANNING SCOPING INFORMATION SHEET (TPSIS)

In discussions with the Office of Advance Planning (OAP), it has been determined that TPSIS will not be required for this project since this project is a multimodal focused project. Many of the issues typically covered by the TPSIS will be addressed by the project itself.

INTERSECTION CONTROL EVALUATION (ICE)

Pursuant to Caltrans Traffic Operations Policy Directive 13-02, an Intersection Control Evaluation has been developed for this project. The draft ICE determined that while roundabouts may pose immediate challenges to drivers, they would subside quickly, as the intersections were laid out in such a way that would ease use. Additionally, it noted that existing roundabouts at the First Street Interchange in Napa and the future roundabouts at Soscol Junction (EA 04-28120) will have been in place long enough to reduce the learning curve necessary for local traffic. The ICE also determined that the roundabout alternative would ultimately provide a superior flow of traffic during peak hours and would increase intersection safety for not only motorists, but for all users. The ICE Step I title sheet can be found in Attachment C. A more detailed ICE Step II will be prepared in subsequent phases.

5. DEFICIENCIES

Traffic

Existing traffic conditions along SR 29 are already congested, with more growth planned in the coming years. Many intersections already operate at substandard levels of service, with more intersections declining as traffic demand rises. Throughout the project limits, SR 29 shows signs of moderately congested and congested travel. Speed studies show that during the AM peak hour, northbound speeds average less than 60% of the free-flow speeds. The southbound averaged between 60% and 80% of free-flow speeds. During the PM peak hour, all of SR 29 in the southbound direction from American Canyon Road extending past the project limits to the intersection of SR 29 and SR 221, experiences heavy congestion, resulting in speeds below 60% of the free-flow speed. Northbound experiences slightly better conditions with much of the roadway being moderately congested or uncongested.

Weekly Travel Time Reliability is also of concern. Both AM and PM peak hours experience some form of Travel Time Reliability issues, with the Buffer Travel Indices averaging between 0.25 and 0.50.

Multimodal

There are numerous multimodal deficiencies within the project corridor. There is a notable lack of pedestrian facilities and while there is a usable shoulder, there is a

lack of dedicated bicycle facilities with separation from vehicle traffic appropriate for the speeds and volumes on SR 29. Due to these conditions, bicyclists experience a significant level of traffic stress (LTS). The entire corridor from the county line to the City of Napa is rated an LTS 4, indicating the highest level of stress on bicyclists.

Collisions

Caltrans TASAS Collision data indicates a significant number of collisions within the project area. Between January 2018 and December 2020, 125 collisions were reported on SR 29 in the project area. Through this period, the fatal collision rate and fatal + injury crash rate were 0.000 and 1.10 collisions per million vehicle miles, respectively. While the fatal collision rate was below the statewide average of 0.009 collisions per million vehicle miles, for similar facilities, the combined Fatal + Injury rate for the corridor was 1.10 collisions per million vehicle miles, which is 2.75 times the statewide average of 0.40 collisions per million vehicle miles. Additionally, the corridor experienced a total collision rate (Fatal+ Injury+ Property Damage Only) of 2.34, which is 2.6 times the statewide average of 0.90 collisions per million vehicle miles, for similar facilities.

Most collisions (70.4%) reported were rear end collisions. The second most common collision type was the broadside ("T-bone") collision (13.6%). Both types of collisions are common at intersections and often lead to higher severity ratings.

The most common Primary Collision Factors (PCFs) recorded in the project were: Speeding, Other Violations, Failure to Yield, Influence of Alcohol, Improper Turn, and Following too Close.

Table 5.1 Collision Data and Statewide Average Comparison

Segment	TOTAL No. of Crashes	ACTUAL Rates (per million vehicle miles)			AVERAGE Rates (per million vehicle miles)		
		Fatal Crashes	Fatal + Injury Crashes	Total(1)	Fatal Crashes	Fatal + Injury Crashes	Total(1)
NAP 29 0.69-2.05	125	0.000	**1.10**	**2.34**	0.009	0.40	0.90

(1) All reported crashes (includes Property Damage Only (PDO) Crashes)

Table 5.2 Corridor Collision Type

Collision Type	Number of Collisions	Percentage
Rear End	88	70.4%
Broadside	17	13.6%
Sideswipe	10	8.0%
Hit Object	4	3.2%
Head On	2	1.6%
Auto vs Pedestrian	2	1.6%
Other	2	1.6%

6. CORRIDOR AND SYSTEM COORDINATION

SR 29 is a north-south running multilane conventional highway, spanning approximately 107 miles, from Interstate 80 in Vallejo, California to its northern terminus at the intersection of SR 20 in Upper Lake. Throughout the project limits, SR 29 is classified as an "Other Principal Arterial", within the State Highway System. SR 29 is currently a Surface Transportation Assistance Act (STAA) Terminal Access Route from its beginning through postmile 36.893, allowing STAA trucks to navigate the roadway through this Project, but limiting the maximum semitrailer length to 48 feet.

This project proposes numerous multimodal improvements including transit operational enhancements, bicycle lanes and shared use paths. This project is consistent with Deputy Directive DD-64-R2 and Director Policy DP-37 which established policy of mandating context specific improvements that would improve all modes of transportation along the state system.

This project is also consistent with other regional and corridor plans including Plan Bay Area 2050, the regional transportation plan (RTPID 21-T06-034) and the SR29 CMCP, which proposed various improvements along SR 29 throughout Napa County. The basis of this project was the CMCP Segment 1.

While this project is not directly consistent with the Napa County Countywide Plan Vision 2040 which outlined various improvements and considerations that should be made during planning, it expands upon it, providing other alternatives of relieving traffic congestion, while achieving the overall goal of better circulation and safer roadways for all users.

Caltrans Office of Advanced Planning has determined that, due to the multimodal scope of this project, a Transportation Planning Scoping Information Sheet (TPSIS) is not necessary.

7. ASSET MANAGEMENT

This project currently does not have any funding from the State Highway Operation and Protection Program (SHOPP). Currently, there is no requirement to track the assets in this project since there is no SHOPP funding. In the future, if this project receives SHOPP funding, it will be subject to the Asset Management requirements for the SHOPP.

8. ALTERNATIVES

Three build alternatives and one no build alternative were identified and evaluated during development of this report. As stated above, one alternative has been removed from further consideration. Therefore, only two build alternatives and the no build alternative are discussed below.

No Build

This alternative assumes existing lane geometrics and traffic control will remain and no project or new infrastructure, trail, or roadway, will be constructed.

Alternative 1

This alternative is largely consistent with the SR 29 CMCP and includes the construction of multimodal improvements adjacent to the shoulders of SR 29. Overall improvements are as follows:

- Maintain SR 29 at 4 lanes, reducing lane widths to 11 feet
- Construct separated Class I bikeways that parallel the right shoulders of SR 29, in both directions. Island width is 5 feet for both directions. A separation width of 3 feet (not including the 2-foot Class I bikeway shoulder) will be utilized in right of way restrictive situations
- Construct 18-foot paved median (14-foot island and two 2-foot left shoulders)
- Widen right shoulders to 12 feet (including 2-foot gutter pan) to allow for part time bus on shoulder
- Improve intersections along the corridor, as described in Table 8.1
- Reduce speed limit to 35 mph (40 mph design speed) to calm traffic (Speed limit analysis will be done in PA&ED Phase)

This alternative incorporates a combination of widening, rehabilitation, and reconstruction of the existing SR 29, limiting right of way impacts where possible.

Table 8.1 Alternative 1 - Intersection Improvements

Postmile	Minor Street	Existing Intersection Controls	Proposed Intersection Controls	Multimodal Improvement
0.69	American Canyon Rd	Signal	Signal	Queue jump Enhanced bike and pedestrian features
0.93	Crawford Way	Side Street Stop	Side Street Stop	Enhanced bike and pedestrian features
0.97	Holcomb Ln	Side Street Stop	Side Street Stop	Enhanced bike and pedestrian features
1.11	Donaldson Way	Signal	Signal	Queue jump Enhanced bike and pedestrian features
1.52	Poco Way / S Napa Junction Rd	Side Street Stop	Side Street Stop	Enhanced bike and pedestrian features
1.66	Rio Del Mar	Signal	Signal	Queue jump Enhanced bike and pedestrian features
1.79	Eucalyptus Dr	Signal	Signal	Queue jump Enhanced bike and pedestrian features
2.05	Napa Junction Rd	Signal	Signal	Queue jump Enhanced bike and pedestrian features

Proposed intersections were designed considering the recommendations of the TEPA, previous studies, and local/regional plans. Special considerations were made to meet standard intersection design standards, where possible, and improve overall safety for all users of the roadway. Intersections were designed to accommodate the swept path of STAA vehicles and 45-foot buses for applicable turning and thru movements.

Alternative 2

Alternative 2 was developed as an expansion on the SR 29 CMCP. This alternative focuses on improving both multimodal capabilities and vehicular circulation throughout the corridor. Alternative 2 maintains many of the key design features in Alternative 1, along with intersection control improvements. **Table 8.2** outlines the intersection improvements proposed under Alternative 2.

Table 8.2 Alternative 2 - Intersection Improvements

Postmile	Minor Street	Existing Intersection Controls	Proposed Intersection Controls	Multimodal Improvement
0.69	American Canyon Rd	Signal	Signal	Queue jump Enhanced bike and pedestrian features
0.93	Crawford Way	Side Street Stop	Multilane Hybrid Roundabout[1] (Potential to restrict intersection to Right in Right out movements only)	High Visibility Crossing with Median Refuge
0.97	Holcomb Ln	Side Street Stop	Multilane Hybrid Roundabout[2]	High Visibility Crossing with Median Refuge
1.11	Donaldson Way	Signal	Multilane Hybrid Roundabout[2]	High Visibility Crossing with Median Refuge
1.52	Poco Way / S Napa Junction Rd	Side Street Stop	Multilane Hybrid Roundabout[2]	High Visibility Crossing with Median Refuge
1.66	Rio Del Mar	Signal	Multilane Hybrid Roundabout[2]	High Visibility Crossing with Median Refuge
1.79	Eucalyptus Dr	Signal	Multilane Hybrid Roundabout[2] (Potential to restrict intersection to Right in Right out movements only)	High Visibility Crossing with Median Refuge
2.05	Napa Junction Rd	Signal	Multilane Hybrid Roundabout[2]	High Visibility Crossing with Median Refuge

Notes:
1. Roundabout lane configuration is 2 x 1.
2. Roundabout lane configuration is 3 x 1.

Proposed intersections were designed considering the recommendations of the TEPA, previous studies, and local/regional plans. Widening of the roadway to three approach lanes at all roundabout intersections, except Crawford Way, will be necessary to provide adequate roundabout throughput volumes and prevent excessive congestion during peak hours. Special considerations were made to meet intersection design standards, where possible, and improve overall safety for all users of the roadway. Intersections were designed to accommodate the swept path of STAA vehicles and 45-foot city buses for applicable turning and thru movements.

Because of the large Inscribed Circle Diameter (ICD) necessary to accommodate three lanes while maintaining crucial performance metrics, queue jumps are not practical for this alternative. Shoulders have been designed to accommodate part time use of the shoulder, allowing buses to bypass excessive queues. These shoulders are terminated approximately 150 feet prior to the Roundabout yield line.

Three lane roundabouts also may be difficult for pedestrians to navigate. In order to avoid crossings at higher speed exits, mid-block crossings, or pedestrian hybrid beacons may be considered to ensure pedestrian and bicyclist safety while crossing SR 29. Signalization or the addition of Rectangular Rapid Flashing Beacons may be used to bring awareness and better influence speed reduction through the roundabout. The wider island widths at roundabouts allow for pedestrian refuges within the splitter and vane islands proposed. Crossings with pedestrian refuges do shorten the overall roadway distance pedestrians must cross—in total as well as in each individual crossing leg.

Eucalyptus Dr will be restricted to right-in-right-out access due to the close spacing of the Rio Del Mar and the Eucalyptus Dr roundabouts, and a future development project currently in design. Left turn and thru movements on Eucalyptus Dr will be redirected along Main St, which will be extended south to connect to the new Rio Del Mar extension. Additionally, due to lower volumes, future analysis will consider restricting Crawford Way to right-in-right-out access as well.

Preliminary Layouts and Typical Cross Sections for both Alternative 1 and Alternative 2 can be found in Attachment D.

It is recommended that the inclusion of turbo roundabout elements (i.e. raised lane dividers or rumble strips) or the turbo roundabouts be analyzed, in subsequent phases, to determine their viability in future project phases.

Nonstandard Design Features

Utilizing existing, readily available information, the following nonstandard design features have been identified as likely to occur or will potentially be needed to reduce extensive impacts to right of way, buildings and more. The existing right of way varies in width, with a minimum width of 135.7 feet. Because of its suburban location, many businesses and other structures lie adjacent to SR 29, with varying setbacks. Additionally, in multiple locations, existing BMPs lie adjacent to the

roadway, if these are classified as regulated areas, increased environmental mitigation will be required. Further examination will be required in future phases as more information is gathered. All standards documented are for an assumed design speed of 40 mph, consistent with the proposed speed limit reduction to 35 mph.

Table 8.3 Design Standard Risk Assessment

Design Standards Risk Assessment					
Alternative	Design Standard from Highway Design Manual Tables 82.1A & 82.1B	Design Standard	Proposed Nonstandard Feature	Probability of Nonstandard Design Feature Approval (None, Low, Medium, High,)	Justification for Probability Rating
1 & 2	202.2 Standards for Superelevation	R.C. (2%)	N.C. (-2%)	Medium	Nonstandard superelevation matches existing slopes which provide a maximum comfortable speed of 72 mph, exceeding the design speed (40 mph).
1 & 2	203.2 Standards for Curvature – Minimum Radius	R=5520 feet	R=4500 feet	Medium	Nonstandard radius allows for conform prior to the intersection and maintains existing slopes.
1 & 2	301.1 Lane width	12 feet	11 feet	Low	Nonstandard lane widths match alternatives proposed for speed control in planning documents. Dimensions may be altered to provide standard pavement dimensions
1 & 2	405.2 Left Turn Channelization – Lane Width	12 feet	11 feet	Low	The Left Turn Pocket width provided is 11', consistent with the thru lanes. The 2' shoulder is maintained.
1 & 2	405.3 Right Turn Channelization – Lane and Shoulder Width	12 feet	11 feet	Low	The Right Turn Pocket width provided is 11', consistent with the thru lanes. The 12' shoulder is maintained.
1 & 2	206.3 Pavement Reductions- Through Lane Drops	440 feet	Var. Match Exist	Medium	Lane drop lengths are being maintained and improved where possible.
1 & 2	1003.1(16) Bikeway Shoulder Slope	Shlds slope away from ETW	One Shoulder Drains Across	High	Necessary to provide effective drainage, directing into state drainage systems.

A Design Standards Decisions Document (DSDD) will be required in the PA&ED phase for the project so adequate documentation of the nonstandard features listed above may be performed. Proposed improvements, outside the reduction in lane widths are maintained or modified. The nonstandard lane widths are anticipated to be mitigated through lighting, speed reduction and marking improvements. Therefore, it is assumed that the build alternatives will have minimal effect on vehicle-versus-vehicle collisions and will decrease pedestrian and bicycle related collisions.

Life-Cycle Cost Analysis

A pavement Life-Cycle Cost Analysis (LCCA) was prepared for each of the three alternatives. Traffic Index values were determined using traffic volumes prepared for the TEPA and truck percentages from Caltrans' Traffic Census Program Data. The Traffic Index was calculated to be 13.0. An assumed Soil R value of 20 was chosen, consistent with R values measured in relatively close proximity (<5 miles). Consistently, Continuously Reinforced Concrete Pavement (CRCP) was determined to have a slight advantage for Agency Cost over Hot Mix Asphalt (HMA) but proved significantly more costly to users.

Pavement unit costs were determined by analyzing Caltrans Contract Cost Data for projects with relatively similar quantities. The unit prices did not account for constructability concerns and the materials' effect on other bid items. It is believed that the complexity of construction and differing material types from the existing pavement would increase costs to CRCP, potentially reversing the presented results. Because of the increase cost uncertainty of CRCP, especially with respect to a roundabout alternative (Alternative 2), HMA is anticipated to be the preferred pavement alternative and Cost Estimates have been prepared using this anticipated preferred pavement. More detailed LCCA analyses and results can be found in Attachment H.

9. CONSIDERED BUT REJECTED ALTERNATIVES

Alternative 3

During the preliminary analysis conducted at the start of the Project Initiation Document phase, there was an additional alternative considered. Alternative 3 proposed to expand SR 29 to 6 lanes and construct bicycle and pedestrian facilities similar to those in Alternative 1. A paved median island would be constructed along SR 29 to better separate the directions of traffic along the corridor. Due to overall roadway widths, certain transit improvements were not feasible with this alternative, as six lanes already exceed the available right of way and further widening will encroach on existing private infrastructure, including buildings.

Alternative 3 was analyzed along with Alternatives 1 and 2, however this analysis concluded Alternative 3 would result in the likely increase in VMT and has the potential to increase capacity on SR 29. Based upon this analysis, which is included in various technical reports included as attachments to this document, Alternative 3

has been removed from further consideration and is considered to be a rejected alternative as it is inconsistent with the California State Transportation Agency's Climate Action Plan for Transportation Infrastructure (CAPTI), does not align with the requirements of Senate Bill (SB) 743, and other State policies and goals.

10. RIGHT OF WAY

Alternative 1

The narrower cross section limits the necessary right of way impacts required for Alternative 1. Minor right of way acquisitions are anticipated for properties adjacent to southbound SR 29, with widths varying between 0 and 30 feet between American Canyon Rd and Donaldson way. Widths generally are limited to under 10 feet with the larger amounts needed at the intersections. Past the Donaldson Way intersection, right of way along SB is anticipated to be sufficient. However, the NB direction possesses numerous driveways with acceleration and deceleration lanes, requiring the acquisition of right of way. This acquisition along northbound SR 29 is anticipated from Donaldson Way to Eucalyptus Dr, where the Class I trail conforms to existing infrastructure.

Current Layouts for this alternative are designed at worst case for right of way. Cross sectional optimization may be considered in future stages to reduce right of way impacts.

Alternative 2

Alternative 2 will require similar right of way needs along the corridor as Alternative 1 but will require more acquisitions at the intersections. Due to the larger size of roundabout intersections, an increased amount of right of way is required. Additionally, this will require the complete acquisition of various properties along the corridor.

Utilities

Utility impacts are likely with each of the alternatives. Known utilities within the project location include:

- Water: City of American Canyon
- Reclaimed Water: City of American Canyon
- Sewer: City of American Canyon
- Electric (Transmission and Distribution): PG&E
- Gas (High Pressure Distribution): PG&E
- Telephone: AT&T
- Cable: Comcast Communications

Utility easements will be required for relocation of above ground facilities. The right of way needs for utility relocations and utility relocation efforts will be established and performed in future phases. Currently, positive location and depth of existing

underground utilities are not known. If existing utilities are located at shallow depths, relocation laterally and/or vertically may be required. Positive location in accordance with Chapter 17 of the Caltrans Project Development Procedures Manual will be completed in subsequent phases.

K Phase Right of Way Conceptual Cost Estimate form can be found in Attachment F.

Railroad

Immediately east of SR 29 there is an active rail line owned by California Northern Railroad, a subsidiary of Genesee and Wyoming Inc. Due to the proximity of the project to the rail, coordination with the rail company and the California Public Utilities Commission (CPUC), through the GO-88B application will be required.

11. STAKEHOLDER INVOLVEMENT

The alternatives for this Project were developed in conjunction with NVTA, Napa County, City of Napa, City of American Canyon, and Caltrans District 4. The alternatives were developed primarily utilizing the SR 29 CMCP, the SR 29 Gateway Plan and the Broadway Specific Plan.

The SR 29 CMCP outreach effort, which included the limits of this Project, was robust in its focus on reaching the diverse communities. This outreach effort included two community workshops, a Staff Working Group comprising of all the partner agencies, and a robust online public engagement campaign including an interactive mapping tool. The mapping tool was made available on the project website beginning in early November 2019 and remained “live” through March 2020. A summary of the outreach is presented below.

- Napa County residents have long expressed concerns about congestion and safety on SR 29. Most respondents reported that driving was their most frequent mode traveled on the SR 29 corridor. Few people said they walk or bicycle on the corridor currently, citing concerns about safety and a lack of dedicated paths. Transit on the corridor is not commonly used by attendees, due to concerns about travel time.
- Workshop attendees rated improving safety for people walking and driving as their highest priority for the corridor, followed by improving safety for transit and then people bicycling. Most that choose not to walk cited safety concerns or lack of designated paths. Similarly, the reason most often cited for not biking was fear for safety at 52.38%, followed by lack of paths/connections at 28.57%.
- Reducing vehicle congestion and improving signal timing were also identified as top priorities, in addition to improved connectivity for bicyclists.
- This project has also been presented in various American Canyon City Council meetings. Additionally, a project public workshop was held on October 4, 2021.

12. ENVIRONMENTAL COMPLIANCE

To identify environmental issues, constraints, costs, and resource needs, a Preliminary Environmental Assessment Report (PEAR) was prepared for the project and included as Attachment G. Potential staging areas have been included in the study area, as shown on Figure 2, and will occur within Caltrans right-of-way, a Caltrans-owned parcel, and a City of American Canyon-owned parcel. Field studies were not conducted, and technical studies have been deferred to the Project Approval and Environmental Documentation (PA&ED) phase.

The PEAR indicates that an Initial Study/Mitigated Negative Declaration (IS/MND) is the anticipated document to be prepared under the California Environmental Quality Act (CEQA). As federal funding may be used for the project, National Environmental Policy Act (NEPA) documentation may be required and is anticipated to be a Categorical Exclusion with supporting technical studies. It is currently anticipated that NVTA, as the sponsoring agency, will serve as the environmental lead agency with approximately 19 months needed to complete the CEQA/NEPA environmental process.

Refer to Attachment A of the PEAR for a complete list of technical studies anticipated to be required. The following provides a summary of each key environmental topic anticipated to be further investigated as a technical study during PA&ED.

Land Use/Planning

Temporary construction easements (TCE) and acquisition of right of way would be required from the adjacent parcels along the length of the project footprint under both build alternatives. Alternative 2 would likely require additional acquisition of right of way compared to Alternative 1 to accommodate the roundabouts proposed. Therefore, it is assumed that a land use memo would be prepared during PA&ED.

It is not expected that the project would affect any Section 4(f) resources. It is anticipated that a no use determination memo would be prepared during PA&ED.

Visual

The visual character of the site under each alternative would remain a heavily trafficked highway. Therefore, it is anticipated that the proposed improvements are largely consistent with the existing visual environment. A brief memorandum or a minor Visual Impact Assessment (VIA) addressing visual issues should be prepared. The VIA Questionnaire is included as Attachment C to the PEAR.

Air Quality

This project could include the use of federal funds; as such, it is assumed that the Federal Transportation Conformity Rule applies. However, the project may be

exempt from Transportation Conformity analysis requirements as per 40 CFR §93.126 (Exempt Projects). The project may qualify as exempt as it consists of:

1. Safety
2. Mass Transit
3. Air Quality
4. Other, including transportation enhancement activities

The project should go through the Interagency Consultation (IAC) process to determine if the project meets the exemption categories or otherwise is considered not a Project of Air Quality Concern (POAC).

In comparison to Alternative 1, Alternative 2 would most likely result in greater construction air quality impacts as the new roundabout improvements would extend the duration of construction. In terms of operational air quality impacts, Alternative 2 would most likely reduce travel time and, therefore, the associated idling with the removal of traffic signals. Alternative 2 would widen approaches to roundabouts to three lanes where needed to improve congestion and traffic flow. The additional lane would not be constructed along the entirety of the alignment and therefore would not be considered capacity enhancing.

Noise

A noise analysis may be needed to evaluate noise levels during construction at residences in the immediate vicinity of the project site or if there would be proposed travel lanes closer to noise sensitive land uses (homes) than under existing conditions. The other surrounding land uses are commercial or industrial in nature and are not considered sensitive noise receptors.

Cultural Resources

Alternative 2 would result in a greater area of disturbance in comparison to Alternative 1. This would increase the possibility of encountering unknown cultural or historical resources present within the construction footprint, and would result in potential increased impacts to cultural resources. Alternative 1 would reduce potential impacts to cultural resources to the extent feasible.

It is anticipated that an Archaeological Survey Report (ASR) and an Historic Property Survey Report (HSPR) would be prepared during the PA&ED phase, as well as Section 106 Consultation. AB 52 Tribal consultation will also be required per state law. This additional research and consultation will be provided during the PA&ED phase.

Biological Resources

Alternative 1 may impact a drainage channel or other sensitive resources as some portions of the roadway would need to be widened. Alternative 2 would most likely have the greatest impact to habitat and wildlife in the area as the intersections would need to be widened more in comparison to Alternative 1 and may also encroach into a

drainage channel and adjacent riparian habitat. A wetland delineation and Natural Environment Study would have to be prepared during PA&ED.

The project will likely require an US Army Corps of Engineers Clean Water Act Section 404 permit and 1602 CDFW Lake and Streambed Alteration Agreement.

Greenhouse Gas Emissions and Climate Change

Construction activities for Alternative 1 would be limited in scope and duration, consisting of improvements to approximately 1.7 mile of roadway and lasting less than a year. In addition, the project does not include construction activities associated with higher greenhouse gas (GHG) emissions such as the use of significant amount of heavy construction equipment, substantial earth-moving activities, or import/export of a significant amount of material. Alternatives 1 and 2 would be similar with respect to the duration of construction and use of heavy equipment. However, quantification of construction emissions is required and should be prepared for the project file. The same emissions analysis can be used for both GHG and Air Quality.

The project is anticipated to improve traffic operations and safety, as well as provide some reduction in traffic delay and existing and projected long-term traffic congestion. Alternative 1 would not increase the operational GHG emissions above existing operations, and would not result in a significant GHG impact if the following criteria are met:

- The project is not capacity-enhancing, and
- The project would improve, or reduce, operational emissions as a result of increased efficiency and decreased delay.

However, as a congestion relief project, a quantitative analysis for operational and construction GHG emissions would be required. Quantification of operational GHG emissions was included as part of the ICE report prepared for the project and should be identified in a Climate Change Memorandum. Fuel consumption estimates for all alternatives would be calculated for each alternative. Measures to reduce GHG emissions will be necessary and should be accounted for in the cost estimate for all project alternatives.

The proposed project site is outside the coastal zone and not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected. The project location is just outside of the area identified as ‘moderate’ level of concern for wildfire exposure in the 2025, 2055, and 2085 Representative Concentration Pathways (RCP 8.5) climate change scenario. However, given the recent history of wildfires in Napa and Sonoma Counties, it is acknowledged that wildfires are an ever-present risk throughout the general project vicinity.

Construction of both alternatives would generate GHG emissions; however, Alternative 2 results in slightly greater GHG impacts from inclusion of roundabouts

and associated approach lanes. Operational GHG impacts may be reduced under Alternative 2 compared to Alternative 1, as the addition of travel lanes approaching the roundabouts would reduce the travel times of vehicles.

Half of California's GHG emissions are generated by the transportation sector, therefore, reducing Vehicle Miles Traveled (VMT) is considered an effective strategy in pursuing California's long-term climate goals. Projects that are capacity-enhancing, such as the addition of through lanes on existing or new highways, would likely lead to a measurable and substantial increase in vehicle travel (OPR 2018). While Alternative 2 improves corridor and intersection operations, it is not anticipated to significantly enhance capacity, as the additional travel lanes would not be implemented along the entirety of the project, only at the approaches to each of the roundabouts. Alternative 1 would not provide any additional capacity and therefore is unlikely to result in an impact related to VMT. A Vehicle Miles Traveled Decision Document (VMTDD) is included as Attachment L.

Direct impacts from the environmental effects of climate change (i.e., sea-level rise, wildfire) would be the same for both alternatives.

Hazards and Hazardous Materials

Hazardous waste created by sign posts, guardrail posts and Aerially Deposited Lead (ADL) are likely to be encountered during construction of this project. This project was constructed prior to the 1960s. Due to the age and the use of leaded gasoline in the past, lead deposits due to vehicular emissions along the corridor are likely adjacent to the highway. A site investigation and soil analysis will be required in the PA/ED phase to determine concentrations of lead. Depending on concentration, soils containing ADL, may be able to be deposited on site, under the pavement section or under ample cover. However, this soil may not be placed less than 5 feet above the groundwater table. In the event that concentrations exceed minimum limits or that ample cover cannot be provided, additional cost will be incurred to dispose of contaminated soils off site.

Hydraulics

The project site, inclusive of the extent of the larger footprint of Alternative 2, is not located within a Federal Emergency Management 100-year flood zone (FEMA 2020).

Water Quality

The project site is not located within or immediately adjacent to a body of water such as a river or creek. However, there are several riverine drainages located adjacent to SR 29 (National Wetlands Inventory, USFWS 2020). Because Alternative 1 may require the roadway be widened marginally to allow for the additional bus queues, lanes, and multi-use paths, the project has the potential to impact these drainages. Alternative 2 would widen the roadway significantly more than under Alternative 1, which may result in increased impacts to adjacent drainages.

An aquatic resource delineation will need to be conducted to determine if these drainages are jurisdictional and their extent. If they are determined to be jurisdictional, regulatory agency permits may be required to ensure potential impacts to these jurisdictional features are minimized to the extent feasible and adequately mitigated. At this time, it is assumed that a 401 Certification will be required from the Regional Stormwater Quality Control Board.

The project is also subject to water quality standards set by the Regional Water Quality Control Board and the Bay Area Stormwater Management Agencies Association (BASMAA). Water quality and treatment measures will be required to comply with these regulations as well as Caltrans' National Pollutant Discharge Elimination System (NPDES) Permit.

An evaluation of potential water quality impacts would be prepared during PA&ED.

Paleontology

The project would include construction-related excavation; however, the project area is not known for having a high sensitivity for paleontological resources or resources on the National Registry of Natural Landmarks. Paleontological resources are not anticipated at the project site and a clearance memo will be prepared during the PA&ED phase.

13. FUNDING

It has been determined that this project would be eligible for Federal-aid funding if funding became available. No federal funding source has been identified at this time.

NVTA, the project sponsor, is actively pursuing funding for this project, through state and federal discretionary grant programs. To date, NVTA has applied for One Bay Area Grant (OBAG) funds to provide funding for the Project Approval and Environmental Document (PA/ED) phase. Once PA/ED is complete, it is anticipated additional funding sources/agencies will become accessible to move the project into the Plans, Specifications, and Estimate (PS&E) and construction phases. Current identified potential funding sources include: Future Safe Streets for All, Rebuilding American Infrastructure with Sustainability and Equity (RAISE), the Reconnecting Communities and Rural Transportation Program under Bipartisan Infrastructure Law. Additionally, this project is likely competitive for Solutions for Congested Corridor and Local Partnership Program Funding under California Senate Bill 1 (SB1).

Capital Outlay Project Estimate

	Range of Estimate		STIP Funds		Other Funds	
	Construction	Right of Way	Construction	Right of Way	Construction	Right of Way
Alternative 1	$44,155,900-$53,147,808	$4,884,416-$6,000,000	TBD	TBD	TBD	TBD
Alternative 2	$53,119,800-$63,937,117	$8,916,667-$10,700,000	TBD	TBD	TBD	TBD

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

Capital Outlay Support Estimate

Capital outlay support estimate for programming PA&ED in the 2023 Fiscal Year for this project: $5,003,000

14. DELIVERY SCHEDULE

Project Milestones		Scheduled Delivery Date (Month/Day/Year)
PROGRAM PROJECT	M015	12/30/2022
BEGIN ENVIRONMENTAL	M020	4/03/2023
CIRCULATE DPR & DED EXTERNALLY	M120	1/08/2024
PA & ED	M200	06/28/2024

The anticipated funding fiscal year for construction is 2025/26.

15. RISKS

There are 21 risks identified in the Level 3 risk register, which is included as Attachment I. Most of the risks are associated with environmental, project management, right of way, utilities, design, and construction. The top 5 identified risks are as follows: Utility Verification, Discovery of Hazardous Materials, Condemnation Required, Right of Way Capital and Project Funding/Timing.

16. EXTERNAL AGENCY COORDINATION

This Project is considered to be a delegated project in accordance with the Stewardship and Oversight Agreement between the United States Federal Highway Administration, California Division (FHWA) and the State of California Department of Transportation (Caltrans) approved on May 28, 2015. Therefore, no FHWA coordination or approval requirements are anticipated.

Although this project does not require the coordination of the FHWA, the project does lie along the national highway system. As such, it should be designed to minimum AASHTO standards to the maximum extent possible.

The project requires the following coordination:

US Army Corps of Engineers
Department of the Army Permit for:
Clean Water Act Section 404

California Department of Fish and Wildlife
Lake and Streambed Alteration Agreement

General Permits
Standard Permits (Individual Permit or Letter of Permission)

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

Local Agency
Cooperative Agreements with City of American Canyon and Napa Valley Transportation Authority
Maintenance Agreement with Napa Valley Transportation Authority
Maintenance Agreement with City of American Canyon

Railroads
Railroad Agreement for at-grade or separated-grade crossings with California Northern Railroad, a subsidiary of Genesee and Wyoming Inc

California Public Utilities Commission
Railroad coordination through GO-88B application.

17. PROJECT REVIEWS

Field Review Lindsey Van Parys Date 06/02/2020
District Maintenance Monique Nguyen Date 10/24/2021
District Traffic Safety Engineer Bahman Zarechain Date 10/24/2021
Headquarters Project Delivery Coordinator Armando Lee Date 10/24/2021
Project Manager Ricky Gao Date 06/30/2022
Project Manager Amani Meligy Date 06/30/2022
FHWA Lanh Phan Date 10/14/2021
District Safety Review Haixiong Xu Date 03/29/2022
Constructability Review Jeff Hupe Date 10/14/2021
Other Date

18. PROJECT PERSONNEL

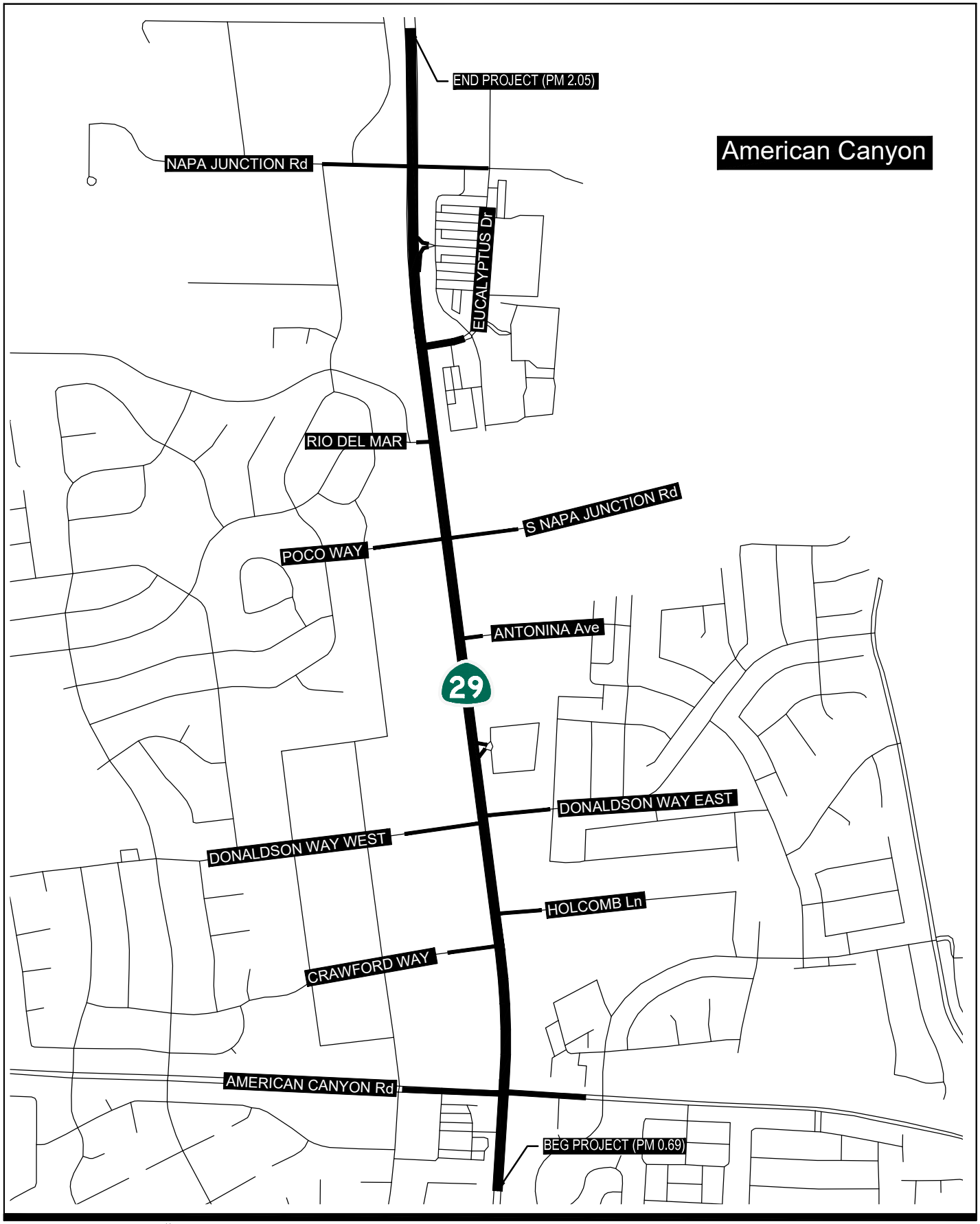
Name	Title/Division	Representing	Phone
Danielle Schmitz	Project Manager	NVTA	(707) 259-5968
Mimy Hew	Advance Planning Senior	Caltrans	(510) 960-0917
Amani Meligy	Project Manager	Caltrans	(510) 715-8393
Evelyn Gustavo	Freeway &Highway Operations	Caltrans	(510) 867-6036
Stephen Haas	Design Office Chief	Caltrans	(510) 407-8396
Solomon Tesfe	District Design Liaison	Caltrans	(510) 418-7743
James Chuang	Advance Planning Oversight	Caltrans	(510) 421-8348
Kathleen Reilly/ Andy Do	Hydraulics	Caltrans	(510) 286-4860
Celia McCuiag	Advance Planning Office Chief	Caltrans	(510) 508-5708
Michael O'Callaghan	Right of Way Local Programs	Caltrans	(510) 529-5881
Tom Rosevear	Environmental	Caltrans	(510) 506-1508
Lindsey Van Parys	Project Manager	GHD	(916) 245-5220

19. ATTACHMENTS (NUMBER OF PAGES)

A. Location Map (1)
B. Traffic Engineering Performance Assessment (48)
C. Intersection Control Evaluation (Step I) Title Sheet (1)
D. Design Alternatives Exhibits (14)
E. Preliminary Cost Estimates (20)
F. K Phase Right of Way Conceptual Cost Estimate (8)
G. Preliminary Environmental Analysis Report (24)
H. Life-Cycle Cost Analysis Memo (24)
I. Risk Register (2)
J. Complete Streets Decision Document (5)
K. Stormwater Data Report (47)
L. Vehicle Miles Traveled Decision Document (5)
M. TMP Data Sheet (4)
N. Quality Management Plan (12)
O. Design Scoping Index (15)

ATTACHMENT A

Location Map



N

0 1000 2000

1 inch = 1000 ft.

GHD

NVTA
ROUTE 29 IN AMERICAN CANYON
COMPLETE STREETS IMPROVEMENTS PROJECT

PROJECT LOCATION MAP

Project No. 0419000297
Date 9/7/2021

Attachment 1

Filename: N:\US\Roseville\Projects\561\11187559\00-SR 29 Am Can PID Project\Design- CAD\Project Location Map.dwg
Plot Date: 10 September 2021 2:56 PM

ATTACHMENT B

Traffic Engineering Performance Assessment

Memorandum

April 27, 2021

To:	Rebecca Schenck, NVTA	Project:	SR 29 PID
From:	Kenneth Isenhower III, EIT Lindsey Van Parys, PE	Ref/Job No.:	11187559
CC:		File No.:	C2641MEM006 - TEPA.DOCX

Subject: Traffic Engineering Performance Assessments

1. Introduction

A Traffic Engineering Performance Assessment (TEPA) was prepared for State Route 29 (SR 29) between American Canyon Rd (PM 0.69) to Napa Junction Rd (PM 2.05). This TEPA provides analysis that can be used as the basis for the State Route 29 Multimodal Improvements Project and other future traffic studies to be prepared for this project.

The SR 29 corridor was studied recently within the SR 29 Comprehensive Multimodal Corridor Plan (CMCP). This CMCP studied corridor improvements along SR 29 from SR 37 in the south to just past the Imola Avenue (SR 121) interchange in the north, a stretch of approximately 11.5 miles.

This study focuses on SR 29 through the City of American Canyon, south of American Canyon Road to north of Napa Junction Road. This encompasses a more narrowed focus of the 1.6 miles of SR 29.

2. Traffic Operations

SR 29 experiences severe congestion during the AM and PM peak hours and with expected growth in the area, conditions are not anticipated to improve. SR 29 is the key roadway connecting SR 37 and the City of Vallejo in the south to SR 221, SR 12, and communities to the north. SR 29 also provides local circulation within American Canyon. There are currently no approved and funded improvements to address the congestion issues the highway experiences through American Canyon.

The purpose of this project would be to identify potential mode shifting improvements for the SR 29 corridor through American Canyon that will, in particular, provide enhanced and safer modal travel alternatives, including walking, bicycling and transit, for localized trips within the American Canyon community. Such shifting of travel modes will accomplish two specific goals within the corridor, including reducing motor vehicle travel on SR 29 and providing residents with alternative travel options who are frustrated with the current congested conditions on SR 29. The improvements considered during the analysis include the following:

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- Multi-Modal improvements along SR 29, including Class I shared use path, pedestrian refuge islands, etc.
- Intersection Control Improvements (i.e. roundabouts and enhanced signals)
- Roadway widening

2.1 Study Locations

The following intersections were analyzed for Existing, Year 2045 No Build Conditions, and all Year 2045 alternatives conditions:

- Napa Junction Road & SR 29
- Eucalyptus Drive & SR 29
- Rio Del Mar & SR 29
- Poco Way/S Napa Junction Road & SR 29
- Donaldson Way & SR 29
- Crawford Way & SR 29
- American Canyon Rd & SR 29

2.2 Alternatives

The existing conditions of SR 29 do not meet the needs of all users for the corridor. SR 29 lacks pedestrian, bicycle, and transit facilities along the entire study corridor. The following alternatives provide combinations of vehicular and non-motorized improvements:

Year 2045 No Build Conditions

Year 2045 is considered the base condition with approximately 20 years of growth in the study vicinity. No roadway improvements along SR 29 are assumed to be constructed. Under Year 2045 No Project conditions, two new connections to SR 29 have been identified via Eucalyptus Drive and Rio Del Mar. Both of these roadways would form four-legged intersections. Additionally, the Newell Drive Extension, as proposed within the Watson Ranch Specific Plan, is assumed to have been constructed, extending Newell Drive to South Kelly Road. This extension will provide an alternative route for commuters entering the City of American Canyon from the east via American Canyon Road and from the south via Flosden Road. Southbound commuters could access the Newell Drive Extension via Paoli Loop Road or South Kelly Road, bypassing SR 29, relieving some demand.

Alternative 1 – Multi Modal Improvements Alternative

Alternative 1 builds upon Year 2045 No Build Conditions, adding improvements identified in the SR 29 CMCP. Alternative 1 proposes the construction of multimodal improvements along the SR 29 corridor south of American Canyon Road to north of Napa Junction Road. This alternative would maintain the existing four-lane roadway configuration and add median separated Class I shared use paths on both sides of the roadway, eight foot shoulders, pedestrian refuge islands at intersections, and landscaped planting strips to separate the Class I paths from vehicle traffic. Transit improvements include queue jump lanes and traffic

signal priority. Queue jump locations were proposed at Napa Junction Road, Donaldson Way, and American Canyon Road and identified the use of shoulder running to increase efficiency and improve transit service.

Alternative 2 – Roundabout Alternative

Alternative 2 proposes construction of roundabouts at all major intersections with the exception of the intersection of American Canyon Road as well as the improvements identified in Year 2045 No Build. The roundabouts were analyzed to provide acceptable delays and minimal queuing to ensure effective corridor operations. The roundabouts were determined to need three circulation lanes in the northbound and southbound direction and would require expansion of SR 29 from a four lane facility to a six lane facility. This alternative proposes limited multimodal improvements, including median separated Class 1 shared use paths and staged crossings through the splitter islands at each roundabout. Additional improvements such as pedestrian signals at mid-block locations or Rapid Rectangular Flashing Beacons at intersections may also be added.

This alternative will identify a preliminary understanding of the required lane geometrics and right-of-way if roundabouts are chosen to be constructed.

Alternative 3 – Six Lane Alternative

Alternative 3 proposes one additional lane in the northbound and southbound directions along SR 29 as well as the improvements identified in Year 2045 No Build. This alternative would increase vehicular capacity by expanding SR 29 from a four-lane corridor to a six-lane corridor. With the additional lane in either direction, the multi-modal improvements would be limited to bicycle and pedestrian only. Due to right-of-way constraints, transit improvements including queue jump lanes and part-time shoulder running would not be accommodated in this alternative. Multi-modal improvements for this alternative would consist of one of the following combinations:

- Class I shared use path

OR

- Class IV bikeway, six-foot sidewalk

OR

- Class II bike lanes, six-foot sidewalk

All improvements would be added to both sides of the corridor to maximize comfort and ease of travel for users.

3. Existing Conditions

Access to the City of American Canyon is restricted to SR 29 from the north, American Canyon Road from the east, and SR 29 and Flosden Road from the south. The limited connections are due to the topographical constraints of the City of American Canyon. American Canyon is situated in between a mountain range to

the east and the Napa River to the west. SR 29 provides the only continuous route from Vallejo to the Napa Valley to the north.

Existing traffic counts used in this study originate from the Watson Ranch EIR which were conducted in May 2017. Existing counts were not able to be collected due to the current pandemic and stay-at-home order as well as the guidance put out by Caltrans in the TOPD 20-04 stating that new counts should be supplemented with historical data to determine “existing” (pre-pandemic) conditions. This will be further explored using “big data” platforms in discussions with Caltrans Highway Operations during the PA&ED.

Existing conditions as well as all Year 2045 conditions were analyzed using the VISSIM micro-simulation software. Existing lane geometrics and existing signal timings were placed within the VISSIM models to replicate existing traffic pattern conditions. The VISSIM model was then calibrated to within 5% of existing intersection throughputs as well as within 2 minutes of travel time to ensure a representative model. Vehicle throughput is based on the total turning movements within a specific study intersection. Travel time limits are defined as Kimberley Drive to Napa Junction Road.

Table 1 presents the existing conditions level of service (LOS) as determined by the VISSIM model.

Table 1 – Existing Conditions Level of Service (2017)

#	Intersection	Control Type[1,2]	VISSIM AM PH		VISSIM PM PH	
			Delay	LOS	Delay	LOS
1	Napa Junction Rd & SR 29	Signal	75.4	E	146.4	F
2	Eucalyptus Dr & SR 29	Signal	12.7	B	4.1	A
3	Rio Del Mar & SR 29	Signal	24.8	C	81.4	F
4	Poco Way/S Napa Junction Rd & SR 29	TWSC	4.9	A	23.6	C
5	Donaldson Way & SR 29	Signal	66.4	E	62.9	E
6	Crawford Way & SR 29	TWSC	12.2	B	35.1	E
7	American Canyon Rd & SR 29	Signal	60.0	E	10.8	B

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC, average of all approaches for Signal

As presented in Table 1, five of the seven study intersections are currently operating at LOS E or LOS F. LOS E is consider the point at which unstable flow starts to occur, the volume starts to reach the available capacity, the limit of acceptable delay is reached, and long cycle lengths with poor progression is experienced.

Table 2 presents the existing conditions vehicle throughput.

Table 2 – Existing Conditions Vehicle Throughput

#	Intersection	Intersection Total Throughput							
		AM Peak Hour				PM Peak Hour			
		-5%	Count	VISSIM	5%	-5%	Count	VISSIM	5%
1	Napa Junction Rd & SR 29	3,570	3,759	3,570	3,947	3,788	3,987	3,954	4,186
2	Eucalyptus Dr & SR 29	3,474	3,657	3,516	3,840	3,768	3,966	3,880	4,164
3	Rio Del Mar & SR 29	3,490	3,674	3,540	3,858	3,795	3,995	3,910	4,195
4	Poco Way/S Napa Junction Rd & SR 29	3,296	3,469	3,339	3,642	3,695	3,889	3,789	4,083
5	Donaldson Way & SR 29	3,526	3,712	3,553	3,898	3,940	4,147	4,166	4,354
6	Crawford Way & SR 29	2,657	2,797	2,822	2,937	3,605	3,795	3,703	3,985
7	American Canyon Rd & SR 29	3,880	4,084	4,051	4,288	4,773	5,024	4,870	5,275

As presented in Table 2, all study intersections were calibrated within 5% of the Watson Ranch EIR turning movement counts. Throughput was used as the main determiner of calibration. If a micro-simulation model is simulating too much traffic, the congestion and slowdowns experienced in the field are not accurately represented and improvements could be over designed. If not enough traffic throughput is accounted for, the network could incorrectly calculate intersection performance and overlook locations requiring improvement.

A root mean square percentage error (RMSPE) was calculated for the corridor as a guide on the effectiveness of the calibration effort and acceptance target range based on the flow of the corridor. A RMSPE provides a comparison of modeled volumes to a physical count. Calibration acceptance targets, that are implemented by numerous other state Department of Transportations as well as the Federal Highway Administration, have been established to be within 15% of the flow rate for corridors. The RMSPE for SR 29 was determined to be 3.7% for the AM and 3% for the PM peak hour. Thus, the existing VISSIM model is determined to be calibrated and effectively represent the AM and PM peak hour conditions.

National Performance Management Research Data Set (NPMRDS) data was used as a basis for travel time reliability. NPMRDS data was compiled for weekday (Tuesday to Thursday) AM (7 to 8 am) and PM (4:30 to 5:30 pm) peak hours for an entire year. This allows for any possible seasonal variations to be smoothed out and an average user experience to be established.

Table 3 presents Existing Conditions travel times along the SR 29 corridor.

Table 3 – Existing Conditions Calibrated to NPMRDS Travel Time (Minutes:Seconds)

Existing Calibrated Travel Time (Minutes)			Google Maps Travel Estimates	
Source	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
Northbound				
NPMRDS	06:27	04:30	3-8 minutes	3-8 minutes
VISSIM	06:31	04:33		
Difference	00:05	00:03	-	-
Southbound				
NPMRDS	03:53	07:15	3-6 minutes	5-14 minutes
VISSIM	04:08	09:00		
Difference	00:15	01:45	-	-

As presented in Table 3, VISSIM travel times were calibrated to within 15 seconds of NPMRDS data for northbound AM and PM and southbound AM peak hours. Southbound PM was calibrated to within 1 minute and 45 seconds. The existing network was deemed calibrated. Google maps travel time estimates the travel time to be approximately three to eight minutes for the NB direction in the AM and PM peak hours and three to six minutes in the AM peak hour and five to 14 minutes in the SB direction for the PM peak hour. The estimated travel times from NPMRDS and VISSIM both fall within these ranges.

4. Future Conditions and Alternatives

The Napa-Solano Regional Travel Demand Model (NSR TDM) was used to develop the Future Year forecast (Year 2045). Year 2045 was determined to be the forecasted year as this is approximately 20 years into the future when the current General Plan Build-Out is expected to occur in the study area. A growth projection was obtained using a straight line evaluation from the TDM. The evaluation captured all links contributing as an input volume into the study area from the north and south. These inputs include SR 29, American Canyon Road, and Flosden Road via American Canyon Road from the south and SR 29 only from the north as there are currently no other routes into the City. The TDM projects a net growth rate of approximately 40% in the AM peak hour and 20% in the PM peak hour. A review of existing volumes indicates that the AM volume on SR 29 in the project area is approximately 20% lower than the PM volume, which is not consistent with the growth projections. Based on the NSR TDM and for the purpose of the PSR, an average growth rate of 30% was utilized in the AM and PM to reflect the base Year 2045 conditions. This needs to be further investigated during the PAED phase and any adjustments for model anomalies need to be made at that time.

For the PAED phase, we recommend the following:

Forecasting Methodology

Two methods are typically used for forecasting: 1) Delta Method and 2) Factor Method. Sensitivity testing with the two methods is utilized and the findings presented to the Caltrans Office of Forecasting. The

appropriate method for forecasting should then be established based on the input and feedback from the Caltrans Office of Forecasting.

Conversion of Peak Period Inbound Link Volumes to Peak Hour Inbound Link Volumes and Turning Movement Volumes

It is our understanding that the available travel demand models will provide link/approach volumes for the peak period. These volumes need to be converted into peak hour. One of the methods utilized typically is to determine the ratio of the peak hour volumes to peak period volumes obtained thru counts or other data. Following the determination of the peak hour approach link volumes, Year 2045 turning movement counts were computed using techniques provided in the National Cooperative Highway Research Program (NCHRP 765) Report - Analytical Travel Forecasting Approaches for Project-Level Planning and Design. This can be accomplished using the directional method, which is most commonly used when the existing turning movement counts and directional link volume data are available. Prior to finalizing the forecasts, these techniques should be reviewed with Caltrans Office of Forecasting.

4.1 Year 2045 No Build Conditions

Year 2045 No Build conditions were simulated using existing signal timings and intersection controls. Two roadway extension projects are projected to occur in the next 20 years at the intersections of Eucalyptus Road/SR 29 and Rio Del Mar/SR 29. These two intersections were analyzed as four-legged intersections compared to their existing three-legged configurations. All other intersections were assumed to have the same lane geometrics as existing conditions. The Newell Drive Extension is projected to be completed prior to 2045 and thus has been factored within this analysis. The projected growth was applied to all turning movement counts as described in the previous section. Table 4 presents the LOS results of the VISSIM micro-simulation analysis of the Year 2045 No Build conditions. Table 5 presents the Year 2045 No Build conditions throughput at all study intersections. Table 6 presents the Year 2045 No Project conditions travel time along the SR 29 corridor.

Table 4 – Year 2045 No Build Conditions Level of Service

#	Intersection	Control Type[1,2]	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Napa Junction Rd & SR 29	Signal	104.3	F	109.9	F
2	Eucalyptus Dr & SR 29	Signal	35.1	D	63.4	E
3	Rio Del Mar & SR 29	Signal	49.0	D	38.4	D
4	Poco Way/S Napa Junction Rd & SR 29	TWSC	6.1	A	3.8	A
5	Donaldson Way & SR 29	Signal	81.4	F	53.9	D
6	Crawford Way & SR 29	TWSC	36.1	E	8.7	A
7	American Canyon Rd & SR 29	Signal	277.9	F	120.1	F

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC, average of all approaches for Signal

As presented in Table 4, four of the seven are projected to operate at LOS E or F in the AM peak hour and three in the PM peak hour are projected to operate at LOS E or F. Further breakdown of intersection operations and increase in delay is projected due to intersections reaching or exceeding the available capacity by the Year 2045.

Table 5 – Year 2045 No Build Conditions Vehicle Throughput

#	Intersection	AM Peak Hour		PM Peak Hour	
		Existing	Yr 2045	Existing	Yr 2045
1	Napa Junction Rd & SR 29	3,570	3,560	3,954	4,168
2	Eucalyptus Dr & SR 29	3,516	3,682	3,880	4,009
3	Rio Del Mar & SR 29	3,540	3,805	3,910	4,368
4	Poco Way/S Napa Junction Rd & SR 29	3,339	3,525	3,789	3,798
5	Donaldson Way & SR 29	3,553	3,801	4,166	4,117
6	Crawford Way & SR 29	2,822	2,887	3,703	3,734
7	American Canyon Rd & SR 29	4,051	4,240	4,870	5,235

As presented in Table 5, the corridor is projected to accommodate an average of 6.5% more vehicles in the AM and PM peak hours. However, the increase in growth is primarily from side street growth and not mainline or northbound/southbound through movements. The northbound and southbound movement could grow but with the Newell Drive Extension providing a bypass route, a diversion of vehicles is expected to occur.

Table 6 – Year 2045 No Build Conditions Travel Time (Minutes:Seconds)

Scenario	AM Peak Hour	PM Peak Hour
Northbound		
Existing	06:31	04:33
Yr 2045 NB	12:16	08:21
Difference	05:45	03:48
Southbound		
Existing	04:08	09:00
Yr 2045 NB	04:18	07:06
Difference	00:10	01:54

As presented in Table 6, travel times through the corridor are expected to increase in the northbound direction by almost six minutes in the AM peak hour and almost four minutes in the PM peak hour. Southbound is not expected to increase substantially as there is not much congestion today for the AM peak hour as commuters predominantly head into Napa for work. Southbound PM peak hour is expected to decrease due to the traffic diversion from SR 29 to Newell Drive. This would subsequently reduce demand for the southbound left turn movement at American Canyon Road/SR29. The southbound left has heavy flows today but with the bypass route of Newell Drive, this movement is projected to lighten resulting in additional split allocation to other phases.

4.2 Alternative 1 – Multi-Modal Improvements Alternative

Alternative 1 provides multi-modal additions to the SR 29 corridor. Currently, there is a lack of multi-modal connection or facilities along the study corridor of SR 29. With the lack of facilities, SR 29 is not currently an inviting roadway for alternative modes of travel. Alternative 1 looks at the addition of pedestrian and bicycle facilities coupled with an improved transit system. The pedestrian and bicycle facilities would include a Class I path on either side of the SR 29 corridor, while the transit improvements would provide queue jump lanes and permit part-time shoulder use for buses to access during heavy congestion. The amount of traffic shifted from auto to alternative modes is detailed in the SR 29 CMCP Appendix F.

Table 7 presents the Year 2045 LOS conditions with Alternative 1 improvements. Table 8 presents the Year 2045 Alternative 1 conditions throughput at all study intersections. Table 9 presents the Year 2045 Alternative 1 conditions travel time along the SR 29 corridor.

Table 7 – Year 2045 Alternative 1 Conditions Level of Service

#	Intersection	Control Type[1,2]	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Napa Junction Rd & SR 29	Signal	91.7	F	28.4	C
2	Eucalyptus Dr & SR 29	Signal	25.5	C	50.3	D
3	Rio Del Mar & SR 29	Signal	66.8	E	30.8	C
4	Poco Way/S Napa Junction Rd & SR 29	TWSC	58.6	F	5.5	A
5	Donaldson Way & SR 29	Signal	52.7	D	45.7	D
6	Crawford Way & SR 29	TWSC	6.3	A	7.5	A
7	American Canyon Rd & SR 29	Signal	189.0	F	107.4	F

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC, average of all approaches for Signal

As presented in Table 7, four of the seven study intersections are projected to operate at LOS E or LOS F in the AM peak hour but only one intersection in the PM peak hour is projected to operate at LOS F.

Table 8 – Year 2045 Alternative 1 Conditions Vehicle Throughput

#	Intersection	AM Peak Hour		PM Peak Hour	
		No Build	Alt 1	No Build	Alt 1
1	Napa Junction Rd & SR 29	3,560	3,683	4,168	4,382
2	Eucalyptus Dr & SR 29	3,682	3,659	4,009	4,221
3	Rio Del Mar & SR 29	3,805	3,582	4,368	4,343
4	Poco Way/S Napa Junction Rd & SR 29	3,525	3,334	3,798	4,052
5	Donaldson Way & SR 29	3,801	3,623	4,117	4,528
6	Crawford Way & SR 29	2,887	2,872	3,734	3,904
7	American Canyon Rd & SR 29	4,240	4,218	5,235	5,269

As presented in Table 8, the throughput is projected to remain flat in the AM peak hour but increase in the PM peak hour. The reason for the constant projection in the AM and increase in the PM peak hour of traffic volumes could be due to the unserved demand that is unable to be served under the Year 2045 No Build

conditions. With the reduction of mainline volumes, cycle length and the current allocation to each phase may be adjusted to accommodate more side street traffic that is unserved in the Year 2045 No Build conditions.

Table 9 – Year 2045 Alternative 1 Conditions Travel Time (Minutes:Seconds)

Year 2045 Scenario	AM Peak Hour	PM Peak Hour
Northbound		
No Build	12:16	08:21
Alt 1	09:01	05:36
Difference	03:15	02:45
Southbound		
No Build	04:18	07:06
Alt 1	03:50	05:02
Difference	00:28	02:04

As presented in Table 9, the travel times are projected to decrease between 11% and 33% from Year 2045 No Build when compared to Alternative 1. The greatest amount of time saved is projected for the northbound AM peak hour with over three minutes in travel time savings followed by northbound PM peak hour with approximately 2 minutes and 45 seconds saved.

4.3 Alternative 2 – Roundabout Alternative

Alternative 2 analyzed all the study intersections, except the intersection of American Canyon Road/SR 29, as a roundabout controlled intersection. The intersection of American Canyon Road/SR 29 was not analyzed as a roundabout due to the extremely heavy southbound left movement. This movement has too many conflicting circulating movements which would not allow northbound movements to occur resulting in severe delay and extensive queuing. Roundabouts were analyzed with the smallest footprint possible that provides acceptable operations. Study intersections were analyzed as a network as well as individual intersections using the SIDRA 9 software.

Table 10 presents the Year 2045 LOS conditions with Alternative 2 improvements. Table 11 presents the Year 2045 Alternative 2 conditions throughput at all study intersections. Table 12 presents the Year 2045 Alternative 2 conditions travel time along the SR 29 corridor.

Table 10 – Year 2045 Alternative 2 Conditions Level of Service

#	Intersection	Control Type[1,2]	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Napa Junction Rd & SR 29	RNDBT	10.9	B	11.6	B
2	Eucalyptus Dr & SR 29	RNDBT	11.1	B	27.8	C
3	Rio Del Mar & SR 29	RNDBT	13.1	B	10.1	B
4	Poco Way/S Napa Junction Rd & SR 29	RNDBT	6.1	A	7.3	A
5	Donaldson Way & SR 29	RNDBT	14.1	B	19.8	B
6	Crawford Way & SR 29	RNDBT	6.4	A	11.7	B

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC, average of all approaches for Signal

As presented in Table 10, all study intersections are projected to operate at LOS C or better during the AM and PM peak hours. All roundabouts have been preliminarily analyzed as three by one hybrid roundabouts except for the intersection of Crawford Way/SR 29 where a two by one roundabout would satisfy AM and PM peak hours. Three by one implies three circulating lanes for the northbound and southbound movements and one circulating lane for the eastbound and westbound movements. Two by one implies two circulating lanes for the northbound and southbound movements and one circulating lane for the eastbound and westbound movements

Table 11 – Year 2045 Alternative 2 Conditions Vehicle Throughput

#	Intersection	AM Peak Hour		PM Peak Hour	
		No Build	Alt 2	No Build	Alt 2
1	Napa Junction Rd & SR 29	3,560	3,955	4,168	4,394
2	Eucalyptus Dr & SR 29	3,682	4,070	4,009	5,009
3	Rio Del Mar & SR 29	3,805	4,170	4,368	4,809
4	Poco Way/S Napa Junction Rd & SR 29	3,525	3,547	3,798	4,256
5	Donaldson Way & SR 29	3,801	3,870	4,117	4,594
6	Crawford Way & SR 29	2,887	2,921	3,734	4,160

As presented in Table 11, throughput is projected to increase on average by 6% in AM and 12.5% in PM peak hours when compared to Year 2045 No Build conditions.

Table 12 – Year 2045 Alternative 2 Conditions Travel Time (Minutes:Seconds)

Year 2045 Scenario	AM Peak Hour	PM Peak Hour
Northbound		
No Build	12:16	08:21
Alt 2	06:40	05:20
Difference	05:36	03:01
Southbound		
No Build	04:18	07:06
Alt 2	04:21	06:09
Difference	00:03	00:58

As presented in Table 12, travel times are projected to decrease between 14% and 46% except for the southbound AM peak hour volume which is projected to remain relatively flat between Alternative 2 and Year 2045 No Build conditions. Southbound AM peak hour traffic is projected to be close to free-flow travel times through the study area thus resulting in little to no travel time difference. No improvements were identified for the intersection of American Canyon Road/SR 29 under this alternative.

4.4 Alternative 3 – Six Lane Alternative

Alternative 3 identifies the operational performance of additional capacity added to SR 29 in terms of an additional lane for northbound and southbound traffic. The improvements identified under Year 2045 No Build are assumed built for this alternative. Multi-modal improvements for this alternative would consist of one of the following combinations:

- Class I shared use path

OR

- Class IV bikeway, six-foot sidewalk

OR

- Class II bike lanes, six-foot sidewalk

All improvements would be added to both sides of the corridor to maximize comfort an ease of travel for the users.

Table 13 presents the Year 2045 LOS conditions with Alternative 3 improvements. Table 14 presents the Year 2045 Alternative 3 throughputs at all study intersections. Table 15 presents the Year 2045 Alternative 3 conditions travel time along the SR 29 corridor.

Table 13 – Year 2045 Alternative 3 Conditions Level of Service

#	Intersection	Control Type[1,2]	AM Peak Hour		PM Peak Hour	
			Delay	LOS	Delay	LOS
1	Napa Junction Rd & SR 29	Signal	78.2	E	20.4	C
2	Eucalyptus Dr & SR 29	Signal	22.9	C	52.2	D
3	Rio Del Mar & SR 29	Signal	46.9	D	30.6	C
4	Poco Way/S Napa Junction Rd & SR 29	TWSC	4.2	A	2.2	A
5	Donaldson Way & SR 29	Signal	31.5	C	21.4	C
6	Crawford Way & SR 29	TWSC	3.3	A	3.3	A
7	American Canyon Rd & SR 29	Signal	182.6	F	69.6	E

Notes:
1. TWSC = Two Way Stop Control
2. LOS = Delay based on worst minor street approach for TWSC, average of all approaches for Signal

As presented in Table 13, two of the seven study intersections are projected to operate at LOS E or LOS F in the AM peak hour but only one intersection in the PM peak hour is projected to operate at LOS E.

Table 14 – Year 2045 Alternative 3 Conditions Vehicle Throughput

#	Intersection	AM Peak Hour		PM Peak Hour	
		No Build	Alt 3	No Build	Alt 3
1	Napa Junction Rd & SR 29	3,560	3,859	4,168	4,377
2	Eucalyptus Dr & SR 29	3,682	4,053	4,009	4,180
3	Rio Del Mar & SR 29	3,805	4,079	4,368	4,377
4	Poco Way/S Napa Junction Rd & SR 29	3,525	3,818	3,798	3,925
5	Donaldson Way & SR 29	3,801	4,027	4,117	4,296
6	Crawford Way & SR 29	2,887	3,051	3,734	3,827
7	American Canyon Rd & SR 29	4,240	4,472	5,235	5,396

As presented in Table 14, the throughput is projected to increase on average 7% in the AM peak hour and 3% in PM peak hour when compared to Year 2045 No Build conditions.

Table 15 – Year 2045 Alternative 3 Conditions Travel Time (Minutes:Seconds)

Year 2045 Scenario	AM Peak Hour	PM Peak Hour
Northbound		
No Build	12:16	08:21
Alt 3	04:08	04:26
Time Saved	08:08	03:55
Southbound		
No Build	04:18	07:06
Alt 3	03:46	03:26
Time Saved	00:32	03:41

As presented in Table 15, travel times are projected to decrease between 13% and 66% when comparing Alternative 3 to Year 2045 No Build conditions. Travel times are projected to be at or close to free-flow speeds for the AM and PM peak hours under this alternative. This alternative provides the best travel time results but does not account for any multi-modal improvements.

As previously stated, the Newell Drive Extinction is anticipated to divert a significant amount of traffic away from SR 29 during the PM peak hour, thus creating a significant change in traffic operations for all alternatives.

5. Next Steps for PA&ED

The purpose of the TEPA process is to provide a series of alternatives that aide in the development of a final alternative for the PA&ED phase. The TEPA provides a preliminary and planning level analysis that will be further studied in detail during the PA&ED process. The following should be provided as part of the PA&ED phase:

- Existing Conditions
    - Traffic levels and pandemic effects on current traffic patterns
- Opening and Design Year Conditions
    - Traffic forecasts development utilizing the Napa-Solano Regional TDM
- Intersection Control Evaluation
    - Inclusive of alternative modes of transport
    - SIDRA software for roundabout analysis, VISSIM/Synchro for signalized alternatives
    - Preliminary VMT analysis

The analysis and results will be compiled into a Traffic Operations Analysis Report (TOAR) which will be a supporting document to the PA&ED. The TOAR will identify the preferred alternative. During the PA&ED process, a detailed VMT analysis will be performed while the ICE Step 1 will provide a preliminary VMT analysis.

LANE SUMMARY

Site: 201 [Napa Junction & SR 29 (Site Folder: Year 2045 AM - Alt 2)]

Network: N101 [Yr 2045 AM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	647	2.0	647	2.0	986	0.656	100	13.6	LOS B	8.8	223.6	Full	1200	0.0	0.0
Lane 2	647	2.0	647	2.0	986	0.656	100	13.6	LOS B	8.8	223.6	Full	1200	0.0	0.0
Lane 3[d]	807	2.0	807	2.0	1231	0.656	100	11.6	LOS B	8.9	227.3	Full	1200	0.0	0.0
Approach	2100	2.0	2100	2.0		0.656		12.8	LOS B	8.9	227.3				
East: WB - Napa Junction Rd															
Lane 1	90	2.0	90	2.0	298	0.302	100	18.8	LOS B	1.3	32.0	Full	300	0.0	0.0
Lane 2[d]	245	2.0	245	2.0	442	0.555	100	20.7	LOS C	3.3	84.7	Full	300	0.0	0.0
Approach	335	2.0	335	2.0		0.555		20.2	LOS C	3.3	84.7				
North: SB - SR 29															
Lane 1	348	2.0	348	2.0	1254	0.277	100	5.4	LOS A	1.8	45.1	Full	1600	0.0	0.0
Lane 2	348	2.0	348	2.0	1254	0.277	100	5.4	LOS A	1.8	45.1	Full	1600	0.0	0.0
Lane 3[d]	414	2.0	414	2.0	1494	0.277	100	4.7	LOS A	1.8	46.6	Full	1600	0.0	0.0
Approach	1110	2.0	1110	2.0		0.277		5.1	LOS A	1.8	46.6				
West: EB - Napa Junction RD															
Lane 1[d]	325	2.0	325	2.0	855	0.380	100	8.7	LOS A	1.7	42.3	Full	300	0.0	0.0
Lane 2	85	2.0	85	2.0	491	0.173	100	9.7	LOS A	0.5	13.4	Full	300	0.0	0.0
Approach	410	2.0	410	2.0		0.380		8.9	LOS A	1.7	42.3				
Intersection	3955	2.0	3955	2.0		0.656		10.9	LOS B	8.9	227.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	80	567	-	647	2.0	986	0.656	100	NA	NA

Lane 2	-	647	-	647	2.0	986	0.656	100	NA	NA
Lane 3	-	767	40	807	2.0	1231	0.656	100	NA	NA
Approach	80	1980	40	2100	2.0		0.656			

East: WB - Napa Junction Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	40	50	-	90	2.0	298	0.302	100	NA	NA
Lane 2	-	-	245	245	2.0	442	0.555	100	NA	NA
Approach	40	50	245	335	2.0		0.555			

North: SB - SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	100	248	-	348	2.0	1254	0.277	100	NA	NA
Lane 2	-	348	-	348	2.0	1254	0.277	100	NA	NA
Lane 3	-	294	120	414	2.0	1494	0.277	100	NA	NA
Approach	100	890	120	1110	2.0		0.277			

West: EB - Napa Junction RD

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	235	90	-	325	2.0	855	0.380	100	NA	NA
Lane 2	-	-	85	85	2.0	491	0.173	100	NA	NA
Approach	235	90	85	410	2.0		0.380			

	Total	%HV	Deg.Satn (v/c)
Intersection	3955	2.0	0.656

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: WB - Napa Junction Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: EB - Napa Junction RD Merge Type: **Not Applied**												

Full Length Lane	1	Merge Analysis not applied.

LANE SUMMARY

Site: 202 [Eucalyptus Rd & SR 29 (Site Folder: Year 2045 AM - Alt 2)]

Network: N101 [Yr 2045 AM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	727	3.0	727	3.0	1065	0.683	100	13.7	LOS B	10.3	263.3	Full	600	0.0	0.0
Lane 2	727	3.0	727	3.0	1065	0.683	100	13.7	LOS B	10.3	263.3	Full	600	0.0	0.0
Lane 3[d]	885	3.0	885	3.0	1296	0.683	100	11.9	LOS B	9.9	253.3	Full	600	0.0	0.0
Approach	2340	3.0	2340	3.0		0.683		13.1	LOS B	10.3	263.3				
East: WB - Eucalyptus															
Lane 1[d]	210	3.0	210	3.0	435	0.483	100	18.2	LOS B	2.7	69.7	Full	1600	0.0	0.0
Lane 2	55	3.0	55	3.0	274	0.201	100	17.5	LOS B	0.8	19.8	Full	1600	0.0	0.0
Approach	265	3.0	265	3.0		0.483		18.1	LOS B	2.7	69.7				
North: SB - SR 29															
Lane 1	363	3.0	363	3.0	1134	0.320	100	6.3	LOS A	2.3	57.9	Full	1200	0.0	0.0
Lane 2	363	3.0	363	3.0	1134	0.320	100	6.3	LOS A	2.3	57.9	Full	1200	0.0	0.0
Lane 3[d]	428	3.0	428	3.0	1337	0.320	100	5.6	LOS A	2.4	60.5	Full	1200	0.0	0.0
Approach	1155	3.0	1155	3.0		0.320		6.0	LOS A	2.4	60.5				
West: EB - Eucaluptus															
Lane 1[d]	270	3.0	270	3.0	735	0.367	100	9.6	LOS A	1.7	42.4	Full	1600	0.0	0.0
Lane 2	40	3.0	40	3.0	415	0.096	100	10.1	LOS B	0.3	7.7	Short	200	0.0	NA
Approach	310	3.0	310	3.0		0.367		9.6	LOS A	1.7	42.4				
Intersection	4070	3.0	4070	3.0		0.683		11.1	LOS B	10.3	263.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	717	-	727	3.0	1065	0.683	100	NA	NA

Lane 2	-	727	-	727	3.0	1065	0.683	100	NA	NA
Lane 3	-	550	335	885	3.0	1296	0.683	100	NA	NA
Approach	10	1995	335	2340	3.0		0.683			

East: WB - Eucalyptus

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	190	20	-	210	3.0	435	0.483	100	NA	NA
Lane 2	-	-	55	55	3.0	274	0.201	100	NA	NA
Approach	190	20	55	265	3.0		0.483			

North: SB - SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	40	323	-	363	3.0	1134	0.320	100	NA	NA
Lane 2	-	363	-	363	3.0	1134	0.320	100	NA	NA
Lane 3	-	398	30	428	3.0	1337	0.320	100	NA	NA
Approach	40	1085	30	1155	3.0		0.320			

West: EB - Eucaluptus

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	190	80	-	270	3.0	735	0.367	100	NA	NA
Lane 2	-	-	40	40	3.0	415	0.096	100	0.0	1
Approach	190	80	40	310	3.0		0.367			

	Total	%HV	Deg.Satn (v/c)
Intersection	4070	3.0	0.683

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: WB - Eucalyptus Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: EB - Eucaluptus Merge Type: **Not Applied**												

Full Length Lane	1	Merge Analysis not applied.

LANE SUMMARY

Site: 203 [Rio Del Mar & SR 29 (Site Folder: Year 2045 AM - Alt 2)]

Network: N101 [Yr 2045 AM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	648	3.0	648	3.0	896	0.723	100	17.4	LOS B	11.6	298.2	Full	600	0.0	0.0
Lane 2	648	3.0	648	3.0	896	0.723	100	17.4	LOS B	11.6	298.2	Full	600	0.0	0.0
Lane 3[d]	799	3.0	799	3.0	1106	0.723	100	14.9	LOS B	12.4	316.8	Full	600	0.0	0.0
Approach	2095	3.0	2095	3.0		0.723		16.4	LOS B	12.4	316.8				
East: WB - Rio Del Mar															
Lane 1[d]	155	3.0	155	3.0	388	0.399	100	17.4	LOS B	2.1	54.1	Full	1600	0.0	0.0
Lane 2	135	3.0	135	3.0	281	0.481	100	26.6	LOS C	2.4	61.5	Full	1600	0.0	0.0
Approach	290	3.0	290	3.0		0.481		21.7	LOS C	2.4	61.5				
North: SB - SR 29															
Lane 1	416	3.0	416	3.0	1181	0.352	100	6.5	LOS A	2.5	64.6	Full	600	0.0	0.0
Lane 2	416	3.0	416	3.0	1181	0.352	100	6.5	LOS A	2.5	64.6	Full	600	0.0	0.0
Lane 3[d]	489	3.0	489	3.0	1389	0.352	100	5.8	LOS A	2.6	67.2	Full	600	0.0	0.0
Approach	1320	3.0	1320	3.0		0.352		6.2	LOS A	2.6	67.2				
West: EB - Rio Del Mar															
Lane 1[d]	385	3.0	385	3.0	728	0.529	100	13.0	LOS B	3.1	78.6	Full	350	0.0	0.0
Lane 2	80	3.0	80	3.0	411	0.195	100	11.9	LOS B	0.6	16.0	Short	200	0.0	NA
Approach	465	3.0	465	3.0		0.529		12.8	LOS B	3.1	78.6				
Intersection	4170	3.0	4170	3.0		0.723		13.1	LOS B	12.4	316.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	35	613	-	648	3.0	896	0.723	100	NA	NA

Lane 2	-	648	-	648	3.0	896	0.723	100	NA	NA
Lane 3	-	719	80	799	3.0	1106	0.723	100	NA	NA
Approach	35	1980	80	2095	3.0		0.723			

East: WB - Rio Del Mar

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	130	25	-	155	3.0	388	0.399	100	NA	NA
Lane 2	-	-	135	135	3.0	281	0.481	100	NA	NA
Approach	130	25	135	290	3.0		0.481			

North: SB - SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	85	331	-	416	3.0	1181	0.352	100	NA	NA
Lane 2	-	416	-	416	3.0	1181	0.352	100	NA	NA
Lane 3	-	404	85	489	3.0	1389	0.352	100	NA	NA
Approach	85	1150	85	1320	3.0		0.352			

West: EB - Rio Del Mar

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	355	30	-	385	3.0	728	0.529	100	NA	NA
Lane 2	-	-	80	80	3.0	411	0.195	100	0.0	1
Approach	355	30	80	465	3.0		0.529			

	Total	%HV	Deg.Satn (v/c)
Intersection	4170	3.0	0.723

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: WB - Rio Del Mar Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: EB - Rio Del Mar Merge Type: **Not Applied**												

Full Length Lane	1	Merge Analysis not applied.

LANE SUMMARY

Site: 204 [Poco Way/S Napa Junction Rd & SR 29 (Site Folder: Year 2045 AM - Alt 2)]

Network: N101 [Yr 2045 AM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	668	3.0	668	3.0	1443	0.463	100	6.9	LOS A	3.8	98.0	Full	2000	0.0	0.0
Lane 2	668	3.0	668	3.0	1443	0.463	100	6.9	LOS A	3.8	98.0	Full	2000	0.0	0.0
Lane 3[d]	784	3.0	784	3.0	1694	0.463	100	6.3	LOS A	3.8	98.4	Short	200	0.0	NA
Approach	2120	3.0	2120	3.0		0.463		6.7	LOS A	3.8	98.4				
East: WB - S Napa Junction Rd															
Lane 1	6	3.0	6	3.0	460	0.013	100	8.0	LOS A	0.0	1.1	Full	400	0.0	0.0
Lane 2[d]	15	3.0	15	3.0	676	0.022	100	5.6	LOS A	0.1	2.0	Full	400	0.0	0.0
Approach	21	3.0	21	3.0		0.022		6.3	LOS A	0.1	2.0				
North: SB - SR 29															
Lane 1	405	3.0	405	3.0	1336	0.303	100	5.4	LOS A	1.9	48.8	Full	600	0.0	0.0
Lane 2	405	3.0	405	3.0	1336	0.303	100	5.4	LOS A	1.9	48.8	Full	600	0.0	0.0
Lane 3[d]	471	3.0	471	3.0	1554	0.303	100	4.8	LOS A	1.9	49.4	Full	600	0.0	0.0
Approach	1280	3.0	1280	3.0		0.303		5.2	LOS A	1.9	49.4				
West: EB - Poco Way															
Lane 1	21	3.0	21	3.0	458	0.046	100	8.5	LOS A	0.1	3.3	Full	540	0.0	0.0
Lane 2[d]	105	3.0	105	3.0	816	0.129	100	5.7	LOS A	0.4	10.7	Full	540	0.0	0.0
Approach	126	3.0	126	3.0		0.129		6.2	LOS A	0.4	10.7				
Intersection	3547	3.0	3547	3.0		0.463		6.1	LOS A	3.8	98.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	90	578	-	668	3.0	1443	0.463	100	NA	NA

Lane 2	-	668	-	668	3.0	1443	0.463	100	NA	NA
Lane 3	-	774	10	784	3.0	1694	0.463	100	0.0	2
Approach	90	2020	10	2120	3.0		0.463			

East: WB - S Napa Junction Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	1	-	6	3.0	460	0.013	100	NA	NA
Lane 2	-	-	15	15	3.0	676	0.022	100	NA	NA
Approach	5	1	15	21	3.0		0.022			

North: SB - SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	15	390	-	405	3.0	1336	0.303	100	NA	NA
Lane 2	-	405	-	405	3.0	1336	0.303	100	NA	NA
Lane 3	-	456	15	471	3.0	1554	0.303	100	NA	NA
Approach	15	1250	15	1280	3.0		0.303			

West: EB - Poco Way

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	20	1	-	21	3.0	458	0.046	100	NA	NA
Lane 2	-	-	105	105	3.0	816	0.129	100	NA	NA
Approach	20	1	105	126	3.0		0.129			

	Total	%HV	Deg.Satn (v/c)
Intersection	3547	3.0	0.463

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: WB - S Napa Junction Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: EB - Poco Way Merge Type: **Not Applied**												

Full Length Lane	1	Merge Analysis not applied.

LANE SUMMARY

Site: 205 [Donaldson Way & SR 29 (Site Folder: Year 2045 AM - Alt 2)]

Network: N101 [Yr 2045 AM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	696	3.0	696	3.0	926	0.752	100	18.4	LOS B	13.3	340.3	Full	850	0.0	0.0
Lane 2[d]	864	3.0	864	3.0	1150	0.752	100	15.7	LOS B	14.1	362.2	Full	850	0.0	0.0
Approach	1560	3.0	1560	3.0		0.752		16.9	LOS B	14.1	362.2				
East: WB - Donaldson Way															
Lane 1	220	3.0	220	3.0	381	0.577	100	24.5	LOS C	3.8	97.5	Full	360	0.0	0.0
Lane 2[d]	315	3.0	315	3.0	536	0.588	100	18.8	LOS B	4.5	116.5	Full	360	0.0	0.0
Approach	535	3.0	535	3.0		0.588		21.1	LOS C	4.5	116.5				
North: SB - SR 29															
Lane 1	542	3.0	542	3.0	1107	0.490	100	8.8	LOS A	4.0	101.9	Full	2000	0.0	0.0
Lane 2[d]	652	3.0	652	3.0	1330	0.490	100	7.7	LOS A	4.2	107.2	Full	2000	0.0	0.0
Lane 3	246	3.0	246	3.0	957	0.257	52[6]	10.8	LOS B	1.6	41.7	Full	2000	0.0	0.0
Approach	1440	3.0	1440	3.0		0.490		8.7	LOS A	4.2	107.2				
West: EB - Donaldson Way															
Lane 1[d]	290	3.0	290	3.0	620	0.468	100	13.2	LOS B	2.6	65.4	Full	775	0.0	0.0
Lane 2	45	3.0	45	3.0	348	0.129	100	17.9	LOS B	0.4	11.1	Full	775	0.0	0.0
Approach	335	3.0	335	3.0		0.468		13.8	LOS B	2.6	65.4				
Intersection	3870	3.0	3870	3.0		0.752		14.1	LOS B	14.1	362.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	35	661	-	696	3.0	926	0.752	100	NA	NA

Lane 2	-	804	60	864	3.0	1150	0.752	100	NA	NA
Approach	35	1465	60	1560	3.0		0.752			

East: WB - Donaldson Way

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	80	140	-	220	3.0	381	0.577	100	NA	NA
Lane 2	-	-	315	315	3.0	536	0.588	100	NA	NA
Approach	80	140	315	535	3.0		0.588			

North: SB - SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	165	377	-	542	3.0	1107	0.490	100	NA	NA
Lane 2	-	652	-	652	3.0	1330	0.490	100	NA	NA
Lane 3	-	206	40	246	3.0	957	0.257	52[6]	NA	NA
Approach	165	1235	40	1440	3.0		0.490			

West: EB - Donaldson Way

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	100	190	-	290	3.0	620	0.468	100	NA	NA
Lane 2	-	-	45	45	3.0	348	0.129	100	NA	NA
Approach	100	190	45	335	3.0		0.468			

	Total	%HV	Deg.Satn (v/c)
Intersection	3870	3.0	0.752

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Priority**												
Exit Short Lane	3	200	0.0	652	671	3.00	2.00	251	1105	0.227	3.3	5.3
Merge Lane	2	-	100.0	Merge Lane is not Opposed				652	1800	0.362	0.0	0.0
East Exit: WB - Donaldson Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: EB - Donaldson Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 206 [Crawford Way & SR 29 (Site Folder: Year 2045 AM - Alt 2)]

Network: N101 [Yr 2045 AM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	751	3.0	751	3.0	1488	0.504	100	7.4	LOS A	4.8	123.3	Full	1000	0.0	0.0
Lane 2[d]	905	3.0	905	3.0	1795	0.504	100	6.6	LOS A	4.9	124.3	Full	1000	0.0	0.0
Approach	1656	3.0	1656	3.0		0.504		6.9	LOS A	4.9	124.3				
East: WB - Driveway															
Lane 1[d]	3	3.0	3	3.0	513	0.006	100	7.2	LOS A	0.0	0.6	Full	100	0.0	0.0
Approach	3	3.0	3	3.0		0.006		7.2	LOS A	0.0	0.6				
North: SB - SR 29															
Lane 1	540	3.0	540	3.0	1392	0.388	100	6.2	LOS A	2.7	69.9	Full	850	0.0	0.0
Lane 2[d]	636	3.0	636	3.0	1639	0.388	100	5.5	LOS A	2.7	70.3	Full	850	0.0	0.0
Approach	1176	3.0	1176	3.0		0.388		5.8	LOS A	2.7	70.3				
West: EB - Crawford Way															
Lane 1	26	3.0	26	3.0	610	0.043	100	6.4	LOS A	0.2	4.0	Full	700	0.0	0.0
Lane 2[d]	60	3.0	60	3.0	856	0.070	100	4.9	LOS A	0.3	7.1	Short	200	0.0	NA
Approach	86	3.0	86	3.0		0.070		5.3	LOS A	0.3	7.1				
Intersection	2921	3.0	2921	3.0		0.504		6.4	LOS A	4.9	124.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	65	686	-	751	3.0	1488	0.504	100	NA	NA
Lane 2	-	904	1	905	3.0	1795	0.504	100	NA	NA
Approach	65	1590	1	1656	3.0		0.504			

East: WB - Driveway										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	1	1	3	3.0	513	0.006	100	NA	NA
Approach	1	1	1	3	3.0		0.006			
North: SB - SR 29										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	539	-	540	3.0	1392	0.388	100	NA	NA
Lane 2	-	491	145	636	3.0	1639	0.388	100	NA	NA
Approach	1	1030	145	1176	3.0		0.388			
West: EB - Crawford Way										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	25	1	-	26	3.0	610	0.043	100	NA	NA
Lane 2	-	-	60	60	3.0	856	0.070	100	0.0	1
Approach	25	1	60	86	3.0		0.070			

	Total	%HV	Deg.Satn (v/c)
Intersection	2921	3.0	0.504

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
East Exit: WB - Driveway Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: EB - Crawford Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 201 [Napa Junction & SR 29 (Site Folder: Year 2045 PM - Alt 2)]

Network: N101 [Yr 2045 PM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	384	2.0	384	2.0	1105	0.348	100	6.7	LOS A	2.4	59.7	Full	1200	0.0	0.0
Lane 2	384	2.0	384	2.0	1105	0.348	100	6.7	LOS A	2.4	59.7	Full	1200	0.0	0.0
Lane 3[d]	466	2.0	466	2.0	1339	0.348	100	5.9	LOS A	2.5	62.7	Full	1200	0.0	0.0
Approach	1235	2.0	1235	2.0		0.348		6.4	LOS A	2.5	62.7				
East: WB - Napa Junction Rd															
Lane 1[d]	160	2.0	160	2.0	747	0.214	100	7.2	LOS A	0.8	20.3	Full	300	0.0	0.0
Lane 2	65	2.0	65	2.0	526	0.124	100	8.4	LOS A	0.4	10.3	Full	300	0.0	0.0
Approach	225	2.0	225	2.0		0.214		7.6	LOS A	0.8	20.3				
North: SB - SR 29															
Lane 1	865	2.0	865	2.0	1175	0.736	100	14.8	LOS B	13.3	338.0	Full	1600	0.0	0.0
Lane 2	865	2.0	865	2.0	1175	0.736	100	14.8	LOS B	13.3	338.0	Full	1600	0.0	0.0
Lane 3[d]	1055	2.0	1055	2.0	1433	0.736	100	12.8	LOS B	11.9	301.2	Full	1600	-0.2[N3]	0.0
Approach	2784	2.0	2784	2.0		0.736		14.0	LOS B	13.3	338.0				
West: EB - Napa Junction RD															
Lane 1[d]	110	2.0	110	2.0	411	0.268	100	13.3	LOS B	1.3	31.8	Full	300	0.0	0.0
Lane 2	40	2.0	40	2.0	277	0.144	100	15.9	LOS B	0.6	14.5	Full	300	-0.4[N3]	0.0
Approach	150	2.0	150	2.0		0.268		14.0	LOS B	1.3	31.8				
Intersection	4394	2.0	4394	2.0		0.736		11.6	LOS B	13.3	338.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach
N3 Capacity Adjustment due to downstream lane blockage determined by the program.

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	95	289	-	384	2.0	1105	0.348	100	NA	NA
Lane 2	-	384	-	384	2.0	1105	0.348	100	NA	NA
Lane 3	-	436	30	466	2.0	1339	0.348	100	NA	NA
Approach	95	1110	30	1235	2.0		0.348			

East: WB - Napa Junction Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	105	55	-	160	2.0	747	0.214	100	NA	NA
Lane 2	-	-	65	65	2.0	526	0.124	100	NA	NA
Approach	105	55	65	225	2.0		0.214			

North: SB - SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	185	680	-	865	2.0	1175	0.736	100	NA	NA
Lane 2	-	865	-	865	2.0	1175	0.736	100	NA	NA
Lane 3	-	550	505	1055	2.0	1433	0.736	100	NA	NA
Approach	185	2094	505	2784	2.0		0.736			

West: EB - Napa Junction RD

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	65	45	-	110	2.0	411	0.268	100	NA	NA
Lane 2	-	-	40	40	2.0	277	0.144	100	NA	NA
Approach	65	45	40	150	2.0		0.268			

	Total	%HV	Deg.Satn (v/c)
Intersection	4394	2.0	0.736

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: WB - Napa Junction Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: EB - Napa Junction RD												

Merge Type: **Not Applied**		
Full Length Lane	1	Merge Analysis not applied.

LANE SUMMARY

Site: 202 [Eucalyptus Rd & SR 29 (Site Folder: Year 2045 PM - Alt 2)]

Network: N101 [Yr 2045 PM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	538	3.0	538	3.0	1300	0.414	100	6.8	LOS A	3.2	82.7	Full	600	0.0	0.0
Lane 2	538	3.0	538	3.0	1300	0.414	100	6.8	LOS A	3.2	82.7	Full	600	0.0	0.0
Lane 3[d]	639	3.0	639	3.0	1544	0.414	100	6.0	LOS A	3.3	85.4	Full	600	0.0	0.0
Approach	1715	3.0	1715	3.0		0.414		6.5	LOS A	3.3	85.4				
East: WB - Eucalyptus															
Lane 1[d]	475	3.0	475	3.0	742	0.640	100	16.3	LOS B	4.6	117.5	Full	1600	0.0	0.0
Lane 2	55	3.0	55	3.0	421	0.131	100	10.5	LOS B	0.4	10.6	Full	1600	0.0	0.0
Approach	530	3.0	530	3.0		0.640		15.7	LOS B	4.6	117.5				
North: SB - SR 29															
Lane 1	821	3.0	821	3.0	847	0.970	100	45.9	LOS D	35.0	896.4	Full	1200	0.0	0.0
Lane 2	821	3.0	821	3.0	847	0.970	100	45.9	LOS D	35.0	896.4	Full	1200	0.0	0.0
Lane 3[d]	1022	3.0	1022	3.0	1053	0.970	100	40.7	LOS D	39.8	1020.1	Full	1200	0.0	0.4
Approach	2664	3.0	2664	3.0		0.970		43.9	LOS D	39.8	1020.1				
West: EB - Eucaluptus															
Lane 1[d]	80	3.0	80	3.0	230	0.347	100	25.5	LOS C	1.9	48.5	Full	1600	0.0	0.0
Lane 2	20	3.0	20	3.0	180	0.111	100	23.2	LOS C	0.5	13.0	Short	200	0.0	NA
Approach	100	3.0	100	3.0		0.347		25.1	LOS C	1.9	48.5				
Intersection	5009	3.0	5009	3.0		0.970		27.8	LOS C	39.8	1020.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	30	508	-	538	3.0	1300	0.414	100	NA	NA

Lane 2	-	538	-	538	3.0	1300	0.414	100	NA	NA
Lane 3	-	204	435	639	3.0	1544	0.414	100	NA	NA
Approach	30	1250	435	1715	3.0		0.414			

East: WB - Eucalyptus

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	445	30	-	475	3.0	742	0.640	100	NA	NA
Lane 2	-	-	55	55	3.0	421	0.131	100	NA	NA
Approach	445	30	55	530	3.0		0.640			

North: SB - SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	40	781	-	821	3.0	847	0.970	100	NA	NA
Lane 2	-	821	-	821	3.0	847	0.970	100	NA	NA
Lane 3	-	962	60	1022	3.0	1053	0.970	100	NA	NA
Approach	40	2564	60	2664	3.0		0.970			

West: EB - Eucaluptus

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	50	30	-	80	3.0	230	0.347	100	NA	NA
Lane 2	-	-	20	20	3.0	180	0.111	100	0.0	1
Approach	50	30	20	100	3.0		0.347			

	Total	%HV	Deg.Satn (v/c)
Intersection	5009	3.0	0.970

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: WB - Eucalyptus Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: EB - Eucaluptus Merge Type: **Not Applied**												

Full Length Lane	1	Merge Analysis not applied.

LANE SUMMARY

Site: 203 [Rio Del Mar & SR 29 (Site Folder: Year 2045 PM - Alt 2)]

Network: N101 [Yr 2045 PM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	540	3.0	540	3.0	1124	0.481	100	8.5	LOS A	3.6	92.6	Full	600	0.0	0.0
Lane 2	540	3.0	540	3.0	1124	0.481	100	8.5	LOS A	3.6	92.6	Full	600	0.0	0.0
Lane 3[d]	680	3.0	680	3.0	1416	0.481	100	7.3	LOS A	3.8	98.2	Full	600	0.0	0.0
Approach	1760	3.0	1760	3.0		0.481		8.0	LOS A	3.8	98.2				
East: WB - Rio Del Mar															
Lane 1	140	3.0	140	3.0	480	0.292	100	12.1	LOS B	1.2	30.2	Full	1600	0.0	0.0
Lane 2[d]	140	3.0	140	3.0	564	0.248	100	9.8	LOS A	1.0	25.6	Full	1600	0.0	0.0
Approach	280	3.0	280	3.0		0.292		10.9	LOS B	1.2	30.2				
North: SB - SR 29															
Lane 1	800	3.0	800	3.0	1226	0.652	100	11.5	LOS B	6.5	166.1	Full	600	0.0	0.0
Lane 2	800	3.0	800	3.0	1226	0.652	100	11.5	LOS B	6.5	166.1	Full	600	0.0	0.0
Lane 3[d]	990	3.0	990	3.0	1517	0.652	100	10.0	LOS A	6.6	169.0	Full	600	0.0	0.0
Approach	2589	3.0	2589	3.0		0.652		10.9	LOS B	6.6	169.0				
West: EB - Rio Del Mar															
Lane 1[d]	125	3.0	125	3.0	395	0.316	100	14.9	LOS B	1.5	38.0	Full	350	0.0	0.0
Lane 2	55	3.0	55	3.0	267	0.206	100	18.1	LOS B	0.8	20.4	Short	200	0.0	NA
Approach	180	3.0	180	3.0		0.316		15.9	LOS B	1.5	38.0				
Intersection	4809	3.0	4809	3.0		0.652		10.1	LOS B	6.6	169.0				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	75	465	-	540	3.0	1124	0.481	100	NA	NA

Lane 2	-	540	-	540	3.0	1124	0.481	100	NA	NA
Lane 3	-	510	170	680	3.0	1416	0.481	100	NA	NA
Approach	75	1515	170	1760	3.0		0.481			

East: WB - Rio Del Mar

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	130	10	-	140	3.0	480	0.292	100	NA	NA
Lane 2	-	-	140	140	3.0	564	0.248	100	NA	NA
Approach	130	10	140	280	3.0		0.292			

North: SB - SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	190	610	-	800	3.0	1226	0.652	100	NA	NA
Lane 2	-	800	-	800	3.0	1226	0.652	100	NA	NA
Lane 3	-	945	45	990	3.0	1517	0.652	100	NA	NA
Approach	190	2354	45	2589	3.0		0.652			

West: EB - Rio Del Mar

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	115	10	-	125	3.0	395	0.316	100	NA	NA
Lane 2	-	-	55	55	3.0	267	0.206	100	0.0	1
Approach	115	10	55	180	3.0		0.316			

	Total	%HV	Deg.Satn (v/c)
Intersection	4809	3.0	0.652

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: WB - Rio Del Mar Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: EB - Rio Del Mar Merge Type: **Not Applied**												

Full Length Lane	1	Merge Analysis not applied.

LANE SUMMARY

Site: 204 [Poco Way/S Napa Junction Rd & SR 29 (Site Folder: Year 2045 PM - Alt 2)]

Network: N101 [Yr 2045 PM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	518	3.0	518	3.0	1484	0.349	100	5.5	LOS A	2.5	62.8	Full	2000	0.0	0.0
Lane 2	518	3.0	518	3.0	1484	0.349	100	5.5	LOS A	2.5	62.8	Full	2000	0.0	0.0
Lane 3[d]	610	3.0	610	3.0	1748	0.349	100	4.9	LOS A	2.5	63.1	Short	200	0.0	NA
Approach	1645	3.0	1645	3.0		0.349		5.3	LOS A	2.5	63.1				
East: WB - S Napa Junction Rd															
Lane 1	6	3.0	6	3.0	610	0.010	100	6.0	LOS A	0.0	0.7	Full	400	0.0	0.0
Lane 2[d]	10	3.0	10	3.0	797	0.013	100	4.6	LOS A	0.0	1.0	Full	400	0.0	0.0
Approach	16	3.0	16	3.0		0.013		5.2	LOS A	0.0	1.0				
North: SB - SR 29															
Lane 1	806	3.0	806	3.0	1397	0.577	100	8.9	LOS A	5.2	133.4	Full	600	0.0	0.0
Lane 2	806	3.0	806	3.0	1397	0.577	100	8.9	LOS A	5.2	133.4	Full	600	0.0	0.0
Lane 3[d]	947	3.0	947	3.0	1641	0.577	100	8.0	LOS A	5.2	132.1	Full	600	0.0	0.0
Approach	2559	3.0	2559	3.0		0.577		8.6	LOS A	5.2	133.4				
West: EB - Poco Way															
Lane 1	6	3.0	6	3.0	374	0.016	100	9.9	LOS A	0.1	1.4	Full	540	0.0	0.0
Lane 2[d]	30	3.0	30	3.0	560	0.054	100	7.1	LOS A	0.2	5.5	Full	540	0.0	0.0
Approach	36	3.0	36	3.0		0.054		7.6	LOS A	0.2	5.5				
Intersection	4256	3.0	4256	3.0		0.577		7.3	LOS A	5.2	133.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	60	458	-	518	3.0	1484	0.349	100	NA	NA

Lane 2	-	518	-	518	3.0	1484	0.349	100	NA	NA
Lane 3	-	605	5	610	3.0	1748	0.349	100	0.0	2
Approach	60	1580	5	1645	3.0		0.349			

East: WB - S Napa Junction Rd

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	1	-	6	3.0	610	0.010	100	NA	NA
Lane 2	-	-	10	10	3.0	797	0.013	100	NA	NA
Approach	5	1	10	16	3.0		0.013			

North: SB - SR 29

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	10	796	-	806	3.0	1397	0.577	100	NA	NA
Lane 2	-	806	-	806	3.0	1397	0.577	100	NA	NA
Lane 3	-	922	25	947	3.0	1641	0.577	100	NA	NA
Approach	10	2524	25	2559	3.0		0.577			

West: EB - Poco Way

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	5	1	-	6	3.0	374	0.016	100	NA	NA
Lane 2	-	-	30	30	3.0	560	0.054	100	NA	NA
Approach	5	1	30	36	3.0		0.054			

	Total	%HV	Deg.Satn (v/c)
Intersection	4256	3.0	0.577

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
East Exit: WB - S Napa Junction Rd Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
West Exit: EB - Poco Way Merge Type: **Not Applied**												

Full Length Lane	1	Merge Analysis not applied.

LANE SUMMARY

Site: 205 [Donaldson Way & SR 29 (Site Folder: Year 2045 PM - Alt 2)]

Network: N101 [Yr 2045 PM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	639	3.0	639	3.0	1076	0.594	100	11.1	LOS B	6.4	163.0	Full	850	0.0	0.0
Lane 2[d]	806	3.0	806	3.0	1359	0.594	100	9.4	LOS A	5.7	145.6	Full	850	0.0	0.0
Approach	1445	3.0	1445	3.0		0.594		10.1	LOS B	6.4	163.0				
East: WB - Donaldson Way															
Lane 1[d]	205	3.0	205	3.0	591	0.347	100	11.0	LOS B	1.9	47.6	Full	360	0.0	0.0
Lane 2	150	3.0	150	3.0	454	0.331	100	13.5	LOS B	1.6	41.3	Full	360	0.0	0.0
Approach	355	3.0	355	3.0		0.347		12.1	LOS B	1.9	47.6				
North: SB - SR 29															
Lane 1	955	3.0	955	3.0	1139	0.839	100	21.2	LOS C	24.2	620.6	Full	2000	0.0	0.0
Lane 2[d]	1187	3.0	1187	3.0	1415	0.839	100	18.2	LOS B	24.2	619.3	Full	2000	0.0	0.0
Lane 3	447	3.0	447	3.0	1029	0.434	52[6]	45.7	LOS D	3.2	81.3	Full	2000	0.0	0.0
Approach	2589	3.0	2589	3.0		0.839		24.0	LOS C	24.2	620.6				
West: EB - Donaldson Way															
Lane 1[d]	150	3.0	150	3.0	249	0.603	100	37.4	LOS D	3.6	93.3	Full	775	0.0	0.0
Lane 2	55	3.0	55	3.0	164	0.335	100	75.9	LOS E	1.4	37.0	Full	775	0.0	0.0
Approach	205	3.0	205	3.0		0.603		47.7	LOS D	3.6	93.3				
Intersection	4594	3.0	4594	3.0		0.839		19.8	LOS B	24.2	620.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

6 Lane under-utilisation due to downstream effects
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	65	574	-	639	3.0	1076	0.594	100	NA	NA

Lane 2	-	706	100	806	3.0	1359	0.594	100	NA	NA
Approach	65	1280	100	1445	3.0		0.594			
East: WB - Donaldson Way										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	95	110	-	205	3.0	591	0.347	100	NA	NA
Lane 2	-	-	150	150	3.0	454	0.331	100	NA	NA
Approach	95	110	150	355	3.0		0.347			
North: SB - SR 29										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	190	765	-	955	3.0	1139	0.839	100	NA	NA
Lane 2	-	1187	-	1187	3.0	1415	0.839	100	NA	NA
Lane 3	-	402	45	447	3.0	1029	0.434	52[6]	NA	NA
Approach	190	2354	45	2589	3.0		0.839			
West: EB - Donaldson Way										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	60	90	-	150	3.0	249	0.603	100	NA	NA
Lane 2	-	-	55	55	3.0	164	0.335	100	NA	NA
Approach	60	90	55	205	3.0		0.603			
	Total	%HV	Deg.Satn (v/c)							
Intersection	4594	3.0	0.839							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

6 Lane under-utilisation due to downstream effects

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Priority**												
Exit Short Lane	3	200	0.0	1187	1222	3.00	2.00	457	525	0.870	6.9	41.5
Merge Lane	2	-	100.0	Merge Lane is not Opposed				1187	1800	0.659	0.0	0.0
East Exit: WB - Donaldson Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: EB - Donaldson Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 206 [Crawford Way & SR 29 (Site Folder: Year 2045 PM - Alt 2)]

Network: N101 [Yr 2045 PM - Alt 2 (Network Folder: Alternative 2)]

Site Category: Proposed Design 1
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	ARRIVAL FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: NB - SR 29															
Lane 1	692	3.0	692	3.0	1438	0.482	100	7.2	LOS A	4.7	120.1	Full	1000	0.0	0.0
Lane 2[d]	829	3.0	829	3.0	1720	0.482	100	6.4	LOS A	4.8	123.3	Full	1000	0.0	0.0
Approach	1521	3.0	1521	3.0		0.482		6.8	LOS A	4.8	123.3				
East: WB - Driveway															
Lane 1[d]	3	3.0	3	3.0	524	0.006	100	7.0	LOS A	0.0	0.6	Full	100	0.0	0.0
Approach	3	3.0	3	3.0		0.006		7.0	LOS A	0.0	0.6				
North: SB - SR 29															
Lane 1	1123	3.0	1123	3.0	1414	0.795	100	15.5	LOS B	12.4	316.6	Full	850	0.0	0.0
Lane 2[d]	1352	3.0	1352	3.0	1701	0.795	100	13.7	LOS B	13.0	333.4	Full	850	0.0	0.0
Approach	2475	3.0	2475	3.0		0.795		14.5	LOS B	13.0	333.4				
West: EB - Crawford Way															
Lane 1	41	3.0	41	3.0	262	0.156	100	17.1	LOS B	0.8	19.3	Full	700	0.0	0.0
Lane 2[d]	120	3.0	120	3.0	378	0.317	100	15.6	LOS B	1.8	47.1	Short	200	0.0	NA
Approach	161	3.0	161	3.0		0.317		16.0	LOS B	1.8	47.1				
Intersection	4160	3.0	4160	3.0		0.795		11.7	LOS B	13.0	333.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Network Data dialog (Network tab).
Roundabout LOS Method: Same as Signalised Intersections.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: NB - SR 29

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	65	627	-	692	3.0	1438	0.482	100	NA	NA
Lane 2	-	828	1	829	3.0	1720	0.482	100	NA	NA
Approach	65	1455	1	1521	3.0		0.482			

East: WB - Driveway										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	1	1	3	3.0	524	0.006	100	NA	NA
Approach	1	1	1	3	3.0		0.006			
North: SB - SR 29										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	1122	-	1123	3.0	1414	0.795	100	NA	NA
Lane 2	-	1272	80	1352	3.0	1701	0.795	100	NA	NA
Approach	1	2394	80	2475	3.0		0.795			
West: EB - Crawford Way										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	40	1	-	41	3.0	262	0.156	100	NA	NA
Lane 2	-	-	120	120	3.0	378	0.317	100	0.0	1
Approach	40	1	120	161	3.0		0.317			
	Total	%HV	Deg.Satn (v/c)							
Intersection	4160	3.0		0.795						

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: NB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
East Exit: WB - Driveway Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SB - SR 29 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: EB - Crawford Way Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

ATTACHMENT C

Intersection Control Evaluation (Step I) Title Sheet

Intersection Control Evaluation (Step I)

SR 29 in American Canyon Improvements Project

Napa Valley Transportation Authority

ATTACHMENT D

Design Alternatives Exhibits

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY; NOT FOR CONSTRUCTION

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RECOMMENDED FOR APPROVAL — DATE

PLANS APPROVAL DATE

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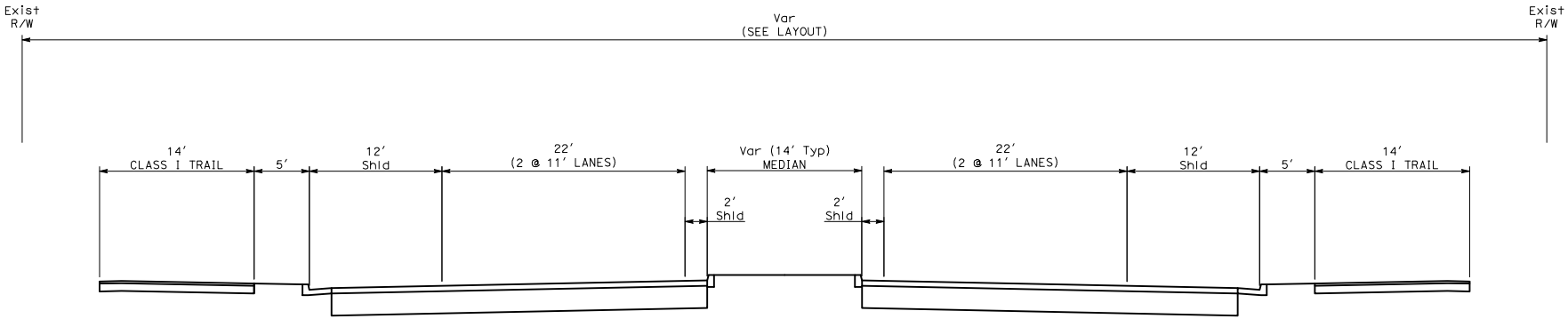

ROUTE 29

TYPICAL SECTIONS
NO SCALE

ALTERNATIVE 1

X-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	CALCULATED-DESIGNED BY	REVISED BY	DATE REVISED
Caltrans	RONALD G. BOYLE	MICHAEL PITCOCK	LINDSEY VAN PARYS	CHECKED BY

LAST REVISION 00-00-00 | DATE PLOTTED => 8-11-2022 | TIME PLOTTED => 15:11

BORDER LAST REVISED 7/2/2010 | USERNAME => mpitcock | DGN FILE => ALTERNATIVE1- 4 LANES.DWG | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE 0317000163

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

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LAYOUT
SCALE: 1" = 50'

ALTERNATIVE 1

L-1

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0317000163

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

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ALTERNATIVE 1

L-2

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ALTERNATIVE 1

L-3

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ALTERNATIVE 1

L-4

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04	Nap	29	0.6/2.2	--	--

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DATE REVISED

ALTERNATIVE 1

LAYOUT
SCALE: 1" = 50'

L-5

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0317000163

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

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DATE

PLANS APPROVAL DATE

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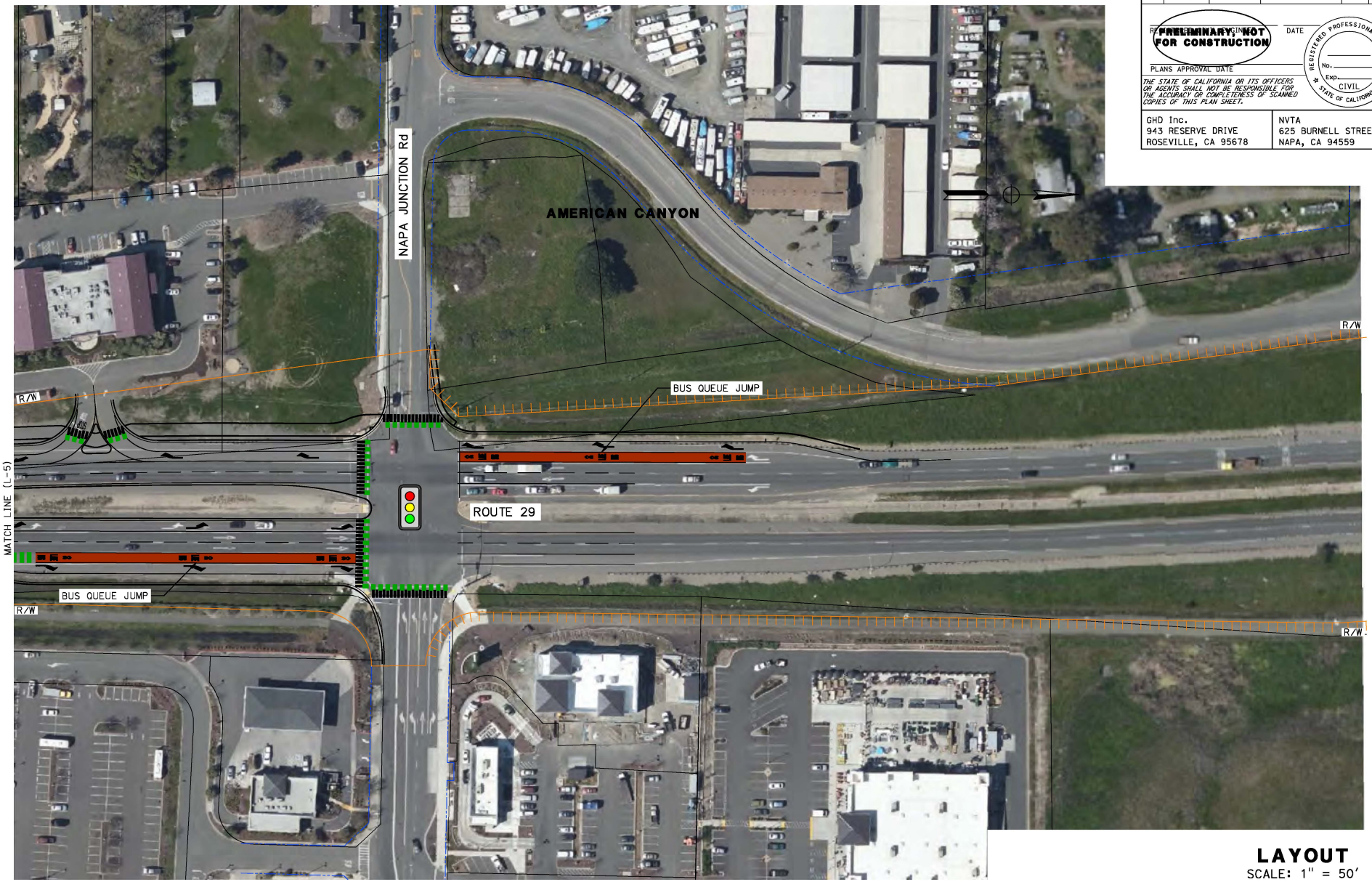

LAYOUT
SCALE: 1" = 50'

ALTERNATIVE 1

L-6

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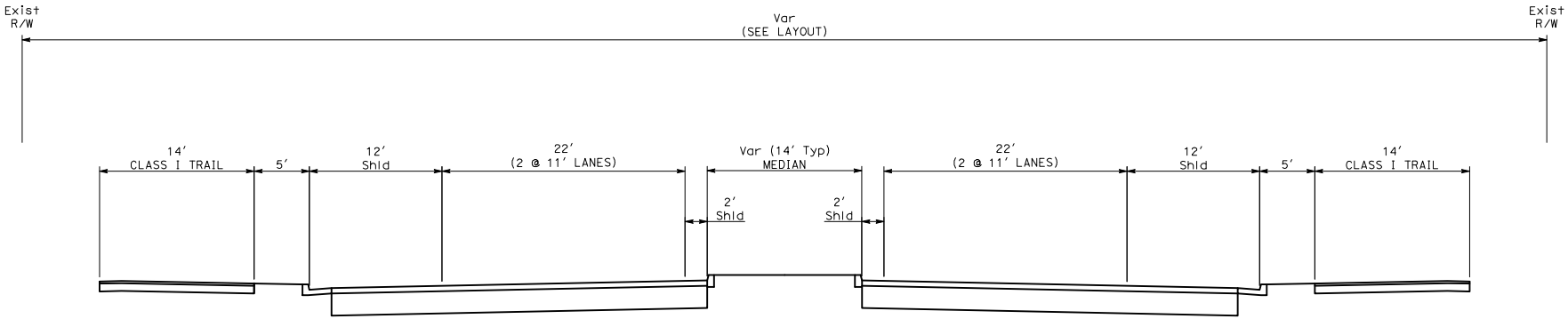

ROUTE 29

TYPICAL SECTIONS
NO SCALE

ALTERNATIVE 2

X-1

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ALTERNATIVE 2

L-1

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0000
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Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
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BORDER LAST REVISED 7/2/2010

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0317000163

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LAYOUT
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ALTERNATIVE 2

L-3

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
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CALCULATED-DESIGNED BY: MICHAEL PITCOCK
CHECKED BY: LINDSEY VAN PARYS

REVISED BY
DATE REVISED

LAST REVISION 00-00-00
DATE PLOTTED => 8-11-2022
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BORDER LAST REVISED 7/2/2010

USERNAME => mpitcock
DGN FILE => ALTERNATIVE2- 4 LANES.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0317000163

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

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LAYOUT
SCALE: 1" = 50'

ALTERNATIVE 2

L-4

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BORDER LAST REVISED 7/2/2010 | USERNAME => mpitcock | DGN FILE => ALTERNATIVE2- 4 LANES.DWG | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE 0317000163

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04	Nap	29	0.6/2.2	--	--

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LAYOUT
SCALE: 1" = 50'

ALTERNATIVE 2

L-5

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CALCULATED-DESIGNED BY	CHECKED BY
MICHAEL PITCOCK	LINDSEY VAN PARYS

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ALTERNATIVE 2

L-6

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RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0317000163

ATTACHMENT E

Preliminary Cost Estimates

PROJECT

PLANNING COST ESTIMATE ©

EA: 04-4Q010K PID: 419000297

EA: 04-4Q010K

PID: 419000297

District-County-Route: 04-NAP-29

PM: 0.69-2.05

Type of Estimate : Preliminary Project Cost Estimate

Program Code : TBD

Project Limits : American Canyon Rd to North Napa Junction Rd.

Project Description: Corridor Multimodal improvments

Scope : Multimodal Improvements- Class I Trail, Enhanced crossing marking, transit interesection improvements.

Alternative : Alternative # 1

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	$ 44,155,900	$ 53,147,808
TOTAL STRUCTURES COST	$ -	$ -
SUBTOTAL CONSTRUCTION COST	$ 44,155,900	$ 53,147,808
TOTAL RIGHT OF WAY COST	$ 4,884,416	$ 6,000,000
TOTAL CAPITAL OUTLAY COSTS	**$ 49,041,000**	**$ 59,148,000**
PA/ED SUPPORT	$ 3,964,000	$ 3,964,000
PS&E SUPPORT	$ 8,927,000	$ 9,302,000
RIGHT OF WAY SUPPORT	$ 479,000	$ 500,000
CONSTRUCTION SUPPORT	$ 2,453,000	$ 2,664,000
TOTAL SUPPORT COST	**$ 15,823,000**	**$ 16,430,000**
TOTAL PROJECT COST	**$ 64,900,000**	**$ 75,600,000**

Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	9	/	2022
Estimated Construction Start (Month/Year)	5	/	2025
Number of Working Days =	360		
Estimated Mid-Point of Construction (Month/Year)	11	/	2025
Estimated Construction End (Month/Year)	9	/	2026

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or Cost Estimate Certifier

Office Engineer / Cost Estimate Certifier	xx/xx/xxxx	(xxx) xxx-xxxx
	Date	**Phone**

Approved by Project Manager

Project Manager	xx/xx/xxxx	(xxx) xxx-xxxx
	Date	**Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	2,312,500
2	Pavement Structural Section	$	16,688,000
3	Drainage	$	1,870,000
4	Specialty Items	$	31,500
5	Environmental	$	2,685,900
6	Traffic Items	$	5,080,000
7	Detours	$	-
8	Minor Items	$	286,700
9	Roadway Mobilization	$	2,895,500
10	Supplemental Work	$	1,158,200
11	State Furnished	$	579,100
12	Time-Related Overhead	$	1,737,300
13	Roadway Contingency	$	8,831,200
	TOTAL ROADWAY ITEMS	**$**	**44,155,900**

Estimate Prepared By : Michael Pitcock, PE — 9/12/2022 (Date) — (916) 782-8688 (Phone)

Estimate Reviewed By : Lindsey Van Parys, PE — 9/13/2022 (Date) — (916) 782-8688 (Phone)

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	CY	62,500	x	37.00	=	$	2,312,500
190105A	Roadway Excavation (Aerially Deposited Lead)	LS		x		=	$	-
194001	Ditch Excavation	CY		x		=	$	-
19801X	Imported Borrow	CY/TON		x		=	$	-
192037	Structure Excavation (Retaining Wall)	CY		x		=	$	-
193013	Structure Backfill (Retaining Wall)	CY		x		=	$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$	-
16010X	Clearing & Grubbing	LS/ACRE		x		=	$	-
170101	Develop Water Supply	LS		x		=	$	-
19801X	Imported Borrow	CY/TON		x		=	$	-
210130	Duff	ACRE		x		=	$	-
XXXXXX	Some Item	Unit		x		=	$	-

TOTAL EARTHWORK SECTION ITEMS	$	2,312,500

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
401050	Jointed Plain Concrete Pavement	CY		x		=	$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404093	Seal Isolation Joint	LF		x		=	$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		=	$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		=	$	-
280010	Rapid Strength Concrete Base	CY		x		=	$	-
410095	Dowel Bar (Drill and Bond)	EA		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON	73,400	x	130.00	=	$	9,542,000
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON	12,500	x	150.00	=	$	1,875,000
395041	RHMA-O (Open Graded Fiction Course)	TON	6,300	x	150.00	=	$	945,000
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		=	$	-
260203	Class 2 Aggregate Base	TON/CY	18,500	x	80.00	=	$	1,480,000
198215	Subgrade Enhancement Geogrid	SQYD	78,500	x	5.00		$	392,500
290201	Asphalt Treated Permeable Base	CY		x		=	$	-
250401	Class 4 Aggregate Subbase	CY		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
397005	Tack Coat	TON	120	x	1,100.00	=	$	132,000
390100	Prime Coat	TON	110	x	1,400.00	=	$	154,000
377501	Slurry Seal	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
370001	Sand Cover (Seal)	TON		x		=	$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		=	$	-
730020	Minor Concrete (Curb)	CY	400	x	850.00	=	$	340,000
731504	Minor Concrete (Curb and Gutter)	CY	925	x	850.00	=	$	786,250
731516	Minor Concrete (Driveway)	CY	200	x	600.00	=	$	120,000
731521	Minor Concrete (Sidewalk)	CY	1,150	x	600.00	=	$	690,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		=	$	-
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
150860	Remove Base and Surfacing	CY	2,650	x	50.00	=	$	132,500
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
15312X	Remove Concrete	LF/CY/LS		x		=	$	-
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	14,100	x	7.00	=	$	98,700
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		=	$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		=	$	-
XXXXXX	Some Item	Unit		x		=	$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	$	16,688,000

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
15080X	Remove Culvert	EA/LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
155232	Sand Backfill	CY		x		=	$	-
15020X	Abandon Culvert	EA/LF		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
510501	Minor Concrete	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
5105XX	Minor Concrete (Type XX)	CY		x		=	$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF		x		=	$	-
6411XX	XX" Plastic Pipe	LF		x		=	$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF		x		=	$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF		x		=	$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF		x		=	$	-
69011X	XX" Corrugated Steel Pipe Downdrain (0.XXX" Thi	LF		x		=	$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF		x		=	$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF		x		=	$	-
7050XX	XX" Steel Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON		x		=	$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Treatment Best Management Practices	LS	1	x	500,000	=	$	500,000
XXXXXX	Additional Drainage	LS	1	x	1,370,000	=	$	1,370,000

TOTAL DRAINAGE ITEMS	$	1,870,000

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
080050	Progress Schedule (Critical Path Method)	LS		x		=	$	-
582001	Sound Wall (Masonry Block)	SQFT		x		=	$	-
510530	Minor Concrete (Wall)	CY		x		=	$	-
15325X	Remove Sound Wall	LF/LS		x		=	$	-
070030	Lead Compliance Plan	LS	1	x	5,000.00	=	$	5,000
141120	Treated Wood Waste	LB	6,000	x	0.75	=	$	4,500
153221	Remove Concrete Barrier	LF		x		=	$	-
150662	Remove Metal Beam Guard Railing	LF	300	x	10.00	=	$	3,000
150668	Remove Flared End Section	EA		x		=	$	-
8000XX	Chain Link Fence (Type XX)	LF		x		=	$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA		x		=	$	-
832005	Midwest Guardrail System	LF	300	x	60.00	=	$	18,000
839301	Single Thrie Beam Barrier	LF		x		=	$	-
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
8395XX	Terminal System (Type WB-31)	EA		x		=	$	-
839585	Alternative Flared Terminal System	EA		x		=	$	-
839584	Alternative In-line Terminal System	EA		x		=	$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF		x		=	$	-
839XXX	Crash Cushion (Insert Type)	EA		x		=	$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB		x		=	$	-
510060	Structural Concrete, Retaining Wall	CY		x		=	$	-
513553	Retaining Wall (Masonry Wall)	SQFT		x		=	$	-
511035	Architectural Treatment	SQFT		x		=	$	-
598001	Anti-Graffiti Coating	SQFT		x		=	$	-
203070	Rock Stain	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT		x		=	$	-
839543	Transition Railing (Type WB-31)	EA		x		=	$	-
597601	Prepare and Stain Concrete	SQFT		x		=	$	-
839561	Rail Tensioning Assembly	EA		x		=	$	-
83958X	End Anchor Assembly (Type X)	EA	1	x	1,000.00	=	$	1,000
XXXXXX	Some Item	Unit		x		=	$	-

TOTAL SPECIALTY ITEMS	$	31,500

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
	Biological Mitigation	LS		x		=	$	-
130670	Temporary Reinforced Silt Fence	LF	7,200	x	6.25	=	$	45,000
141000	Temporary Fence (Type ESA)	LF		x		=	$	-
						Subtotal Environmental Mitigation	$	*45,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
20XXXX	Highway Planting	LS	1	x	700,000.00	=	$	700,000
20XXXX	Irrigation System	LS	1	x	1,400,000.00	=	$	1,400,000
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment Work	LS		x		=	$	-
20XXXX	Follow-up Landscape Project	LS		x		=	$	-
150685	Remove Irrigation Facility	LS		x		=	$	-
20XXXX	Maintain Existing (Irrigation or Planted Areas)	LS		x		=	$	-
206400	Check and Test Existing Irrigation Facilities	LS		x		=	$	-
21011X	Imported Topsoil (X)	CY/TON		x		=	$	-
20XXXX	Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD		x		=	$	-
200122	Weed Germination	SQYD		x		=	$	-
208304	Water Meter	EA		x		=	$	-
2087XX	XX" Conduit (Use for Irrigation x-overs)	LF		x		=	$	-
20890X	Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF		x		=	$	-
						Subtotal Landscape and Irrigation	$	*2,100,000*

5C - EROSION CONTROL

Item code		Unit	Quantity		Unit Price ($)			Cost
210010	Move In/Move Out (Erosion Control)	EA	2	x	1,000.00	=	$	2,000
210350	Fiber Rolls	LF	30,000	x	3.50	=	$	105,000
210360	Compost Sock	LF		x		=	$	-
2102XX	Rolled Erosion Control Product (X)	SQFT		x		=	$	-
21025X	Bonded Fiber Matrix	SQFT/ACRE				=	$	-
210300	Hydromulch	SQFT		x		=	$	-
210420	Straw	SQFT		x		=	$	-
210430	Hydroseed	SQFT	150,000	x	0.13	=	$	19,500
210600	Compost	SQFT	150,000	x	0.25	=	$	37,500
210630	Incorporate Materials	SQFT	150,000	x	0.09	=	$	13,500
						Subtotal Erosion Control	$	*177,500*

5D - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
130300	Prepare SWPPP	LS	1	x	10,000.00	=	$	10,000
130200	Prepare WPCP	LS		x		=	$	-
130100	Job Site Management	LS	1	x	25,000.00	=	$	25,000
130330	Storm Water Annual Report	EA	2	x	10,000.00	=	$	20,000
130310	Rain Event Action Plan (REAP)	EA	40	x	500.00	=	$	20,000
130320	Storm Water Sampling and Analysis Day	EA	40	x	500.00	=	$	20,000
130520	Temporary Hydraulic Mulch	SQYD	13,000	x	5.00	=	$	65,000
130550	Temporary Hydroseed	SQYD	13,000	x	10.00	=	$	130,000
130505	Move-In/Move-Out (Temporary Erosion Control)	EA	5	x	5,000.00	=	$	25,000
130640	Temporary Fiber Roll	LF		x		=	$	-
130900	Temporary Concrete Washout	LS	1	x	3,000.00	=	$	3,000
130710	Temporary Construction Entrance	EA	2	x	5,000.00	=	$	10,000
130610	Temporary Check Dam	LF		x		=	$	-
130620	Temporary Drainage Inlet Protection	EA	70	x	220.00	=	$	15,400
130730	Street Sweeping	LS	1	x	20,000.00	=	$	20,000
						Subtotal NPDES	$	*363,400*
						TOTAL ENVIRONMENTAL	$	**2,685,900**

Supplemental Work for NPDES

066595	Water Pollution Control Maintenance Sharing*	LS		x		=	$	-
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item	LS		x		=	$	-
						Subtotal Supplemental Work for NDPS	$	-

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
860460	Lighting and Sign Illumination	LS		x		=	$	-
860201	Signal and Lighting	LS	1	x	3,250,000.00	=	$	3,250,000
860990	Closed Circuit Television System	LS		x		=	$	-
86110X	Ramp Metering System (Location X)	LS		x		=	$	-
871812	Interconnection Conduit and Cable	LS		x		=	$	-
5602XX	Furnish Sign Structure (Type X)	LB		x		=	$	-
5602XX	Install Sign Structure (Type X)	LB		x		=	$	-
498040	XX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
86080X	Inductive Loop Detectors	EA/LS		x		=	$	-
8609XX	Traffic Monitoring Station (Type X)	LS		x		=	$	-
15075X	Remove Sign Structure	EA/LS		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
860090	Maintain Existing Traffic Management System Elem	LS		x		=	$	-
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXX	Some Item	Unit		x		=	$	-

Subtotal Traffic Electrical $ *3,250,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
566011	Roadside Sign - One Post	EA		x		=	$	-
566012	Roadside Sign - Two Post	EA		x		=	$	-
5602XX	Furnish Sign	SQFT		x		=	$	-
568016	Install Sign Panel on Existing Frame	SQFT		x		=	$	-
150711	Remove Painted Traffic Stripe	LF		x		=	$	-
141101	Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF		x		=	$	-
150712	Remove Painted Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA		x		=	$	-
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
840502	Thermoplastic Traffic Stripe (Enhanced Wet Night V	LF		x		=	$	-
846012	Thermoplastic Crosswalk and Pavement Marking (E	SQFT		x		=	$	-
120090	Construction Area Signs	LS		x		=	$	-
84XXXX	Permanent Pavement Delineation & Signage	LS	1	x	500,000.00	=	$	500,000

Subtotal Traffic Signing and Striping $ *500,000*

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)			Cost
12865X	Portable Changeable Message Signs	LS	1	x	$ 30,000	=	$	30,000

Subtotal Traffic Management Plan $ *30,000*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
	Stage Construction	LS	1	x	1,300,000.00	=	$	1,300,000
120199	Traffic Plastic Drum	EA		x		=	$	-
12016X	Channelizer (Type X)	EA		x		=	$	-
120120	Type III Barricade	EA		x		=	$	-
129100	Temporary Crash Cushion Module	EA		x		=	$	-
120100	Traffic Control System	LS		x		=	$	-
129110	Temporary Crash Cushion	EA		x		=	$	-
129000	Temporary Railing (Type K)	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
XXXXXX	Some Item	Unit		x		=	$	-

Subtotal Stage Construction and Traffic Handling $ *1,300,000*

TOTAL TRAFFIC ITEMS $ **5,080,000**

SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	CY		x		=	$	-
19801X	Imported Borrow	CY/TON		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON		x		=	$	-
26020X	Class 2 Aggregate Base	TON/CY		x		=	$	-
250401	Class 4 Aggregate Subbase	CY		x		=	$	-
130620	Temporary Drainage Inlet Protection	EA		x		=	$	-
129000	Temporary Railing (Type K)	LF		x		=	$	-
128601	Temporary Signal System	LS		x		=	$	-
120149	Temporary Pavement Marking (Paint)	SQFT		x		=	$	-
80010X	Temporary Fence (Type X)	LF		x		=	$	-
XXXXXX	Some Item	LS		x		=	$	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS **$ -**

SUBTOTAL SECTIONS 1 through 7 $ 28,667,900

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items							
	ADA Items			1.0%	$	286,679	
8B - Bike Path Items							
	Bike Path Items			0.0%	$	-	
8C - Other Minor Items							
	Other Minor Items			0.0%	$	-	
	Total of Section 1-7	$	28,667,900	x 1.0%	= $	286,679	

TOTAL MINOR ITEMS **$ 286,700**

SECTIONS 9: ROADWAY MOBILIZATION

Item code								
999990	Total Section 1-8	$	28,954,600	x	10%	=	$	2,895,460

TOTAL ROADWAY MOBILIZATION **$ 2,895,500**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)			Cost
066670	Payment Adjustments For Price Index Fluctuations	LS		x		=	$	-
066094	Value Analysis	LS		x		=	$	-
066070	Maintain Traffic	LS		x		=	$	-
066919	Dispute Resolution Board	LS		x		=	$	-
066921	Dispute Resolution Advisor	LS		x		=	$	-
066015	Federal Trainee Program	LS		x		=	$	-
066610	Partnering	LS		x		=	$	-
066204	Remove Rock and Debris	LS		x		=	$	-
066222	Locate Existing Crossover	LS		x		=	$	-
XXXXXX	Some Item	Unit		x		=	$	-

*Cost of **NPDES** Supplemental Work specified in Section 5D* = $ -

Total Section 1-8	$	28,954,600	4%	=	$	1,158,184

TOTAL SUPPLEMENTAL WORK **$ 1,158,200**

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	Resident Engineers Office	LS		x		=	$0
066063	Traffic Management Plan - Public Information	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
8609XX	Traffic Monitoring Station (X)	LS		x		=	$0
066841	Traffic Controller Assembly	LS		x		=	$0
066840	Traffic Signal Controller Assembly	LS		x		=	$0
066062	COZEEP Contract	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066065	Tow Truck Service Patrol	LS		x		=	$0
066916	Annual Construction General Permit Fee	LS		x		=	$0
XXXXXX	Some Item	Unit		x		=	$0
	Total Section 1-8		$ 28,954,600		2%	= $	579,092

TOTAL STATE FURNISHED **$579,100**

SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization $28,954,600 (used to calculate TRO)

Total Construction Cost (excluding TRO and Contingency) $33,587,400 (used to check if project is greater than $5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **6%**

Item code		Unit	Quantity		Unit Price ($)		Cost
090100	Time-Related Overhead	WD	360	X	$4,826	=	$1,737,300

TOTAL TIME-RELATED OVERHEAD **$1,737,300**

SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12	$	35,324,700	x	**25%**	=	$8,831,175

TOTAL CONTINGENCY **$8,831,200**

EA: 04-4Q010K PID: 419000297

II. STRUCTURE ITEMS

	Bridge 1		Bridge 2		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Cost Per Square Foot	$0		$0		$0
COST OF EACH	**$0**		**$0**		**$0**

	Building 1		Bridge 2		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Cost Per Square Foot	$0		$0		$0
COST OF EACH	**$0**		**$0**		**$0**

TOTAL COST OF BRIDGES		**$0**
TOTAL COST OF BUILDINGS		**$0**
STRUCTURES MOBILIZATION	10%	**$0**

Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	**$0**
TOTAL COST OF STRUCTURES		**$0**

Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures — Date

EA: 04-4Q010K PID: 419000297

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	$	2,804,416
	A2)	SB-1210	$	0
B)		Acquisition of Offsite Mitigation	$	0
C)	C1)	Utility Relocation (Local Agency Share)	$	2,000,000
	C2)	Potholing (Design Phase)	$	80,000
D)		Railroad Acquisition	$	0
E)		Clearance / Demolition	$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	$	0
G)		Title and Escrow	$	0
H)		Environmental Review	$	0
I)		Condemnation Settlements 0%	$	0
J)		Design Appreciation Factor 0%	$	0
K)		Utility Relocation (Construction Cost)	$	0

L)	**TOTAL RIGHT OF WAY ESTIMATE**	**$4,884,416**
M)	**TOTAL R/W ESTIMATE: Escalated**	**$6,000,000**
N)	**RIGHT OF WAY SUPPORT**	**$500,000**

Support Cost Estimate Prepared By _____ Project Coordinator[1] Phone

Utility Estimate Prepared By _____ Utility Coordinator[2] Phone

R/W Acquisition Estimate Prepared By _____ Right of Way Estimator[3] Phone

Note: Items G & H applied to items A + B

[1] When estimate has Support Costs only [2] When estimate has Utility Relocation [3] When R/W Acquisition is required

PROJECT

PLANNING COST ESTIMATE ©

EA: 04-4Q010K PID: 419000297

EA: 04-4Q010K

PID: 419000297

District-County-Route: 04-NAP-29

PM: 0.69-2.05

Type of Estimate : Preliminary Project Cost Estimate

Program Code : TBD

Project Limits : American Canyon Rd to North Napa Junction Rd.

Project Description: Corridor Multimodal improvments & Intersection replacements

Scope : Multimodal Improvements-Class I Trail, Multilane Roundabout Construction. Construct Pedestrian Signals and Transit Signals

Alternative : Alternative # 2

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	$ 53,119,800	$ 63,937,117
TOTAL STRUCTURES COST	$ -	$ -
SUBTOTAL CONSTRUCTION COST	$ 53,119,800	$ 63,937,117
TOTAL RIGHT OF WAY COST	$ 8,916,667	$ 10,700,000
TOTAL CAPITAL OUTLAY COSTS	**$ 62,037,000**	**$ 74,638,000**
PA/ED SUPPORT	$ 5,003,000	$ 5,003,000
PS&E SUPPORT	$ 11,267,000	$ 11,741,000
RIGHT OF WAY SUPPORT	$ 479,000	$ 500,000
CONSTRUCTION SUPPORT	$ 3,102,000	$ 3,369,000
TOTAL SUPPORT COST	**$ 19,851,000**	**$ 20,613,000**
TOTAL PROJECT COST	**$ 81,900,000**	**$ 95,300,000**

Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	9	/	2022
Estimated Construction Start (Month/Year)	5	/	2025
Number of Working Days =	360		
Estimated Mid-Point of Construction (Month/Year)	11	/	2025
Estimated Construction End (Month/Year)	9	/	2026

Number of Plant Establishment Days

Estimated Project Schedule

PID Approval

PA/ED Approval

PS&E

RTL

Begin Construction

Reviewed by District O.E. or Cost Estimate Certifier

Office Engineer / Cost Estimate Certifier	xx/xx/xxxx	(xxx) xxx-xxxx
	Date	**Phone**

Approved by Project Manager

Project Manager	xx/xx/xxxx	(xxx) xxx-xxxx
	Date	**Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	2,527,100
2	Pavement Structural Section	$	18,050,100
3	Drainage	$	3,300,000
4	Specialty Items	$	339,500
5	Environmental	$	4,440,900
6	Traffic Items	$	5,830,000
7	Detours	$	-
8	Minor Items	$	344,900
9	Roadway Mobilization	$	3,483,300
10	Supplemental Work	$	1,393,300
11	State Furnished	$	696,700
12	Time-Related Overhead	$	2,090,000
13	Roadway Contingency	$	10,624,000
	TOTAL ROADWAY ITEMS	**$**	**53,119,800**

Estimate Prepared By : Michael Pitcock, PE — 9/12/2022 (Date) — (916) 782-8688 (Phone)

Estimate Reviewed By : Lindsey Van Parys, PE — 9/13/2022 (Date) — (916) 782-8688 (Phone)

By signing this estimate you are attesting that you have discussed your project with all functional units and have incorporated all their comments or have discussed with them why they will not be incorporated.

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	CY	68,300	x	37.00	=	$	2,527,100
190105A	Roadway Excavation (Aerially Deposited Lead)	LS		x		=	$	-
194001	Ditch Excavation	CY		x		=	$	-
19801X	Imported Borrow	CY/TON		x		=	$	-
192037	Structure Excavation (Retaining Wall)	CY		x		=	$	-
193013	Structure Backfill (Retaining Wall)	CY		x		=	$	-
193031	Pervious Backfill Material (Retaining Wall)	CY		x		=	$	-
16010X	Clearing & Grubbing	LS/ACRE		x		=	$	-
170101	Develop Water Supply	LS		x		=	$	-
19801X	Imported Borrow	CY/TON		x		=	$	-
210130	Duff	ACRE		x		=	$	-
XXXXXX	Some Item	Unit		x		=	$	-

TOTAL EARTHWORK SECTION ITEMS $ 2,527,100

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
401050	Jointed Plain Concrete Pavement	CY		x		=	$	-
400050	Continuously Reinforced Concrete Pavement	CY		x		=	$	-
404092	Seal Pavement Joint	LF		x		=	$	-
404093	Seal Isolation Joint	LF		x		=	$	-
413117	Seal Concrete Pavement Joint (Silicone)	LF		x		=	$	-
413118	Seal Pavement Joint (Asphalt Rubber)	LF		x		=	$	-
280010	Rapid Strength Concrete Base	CY		x		=	$	-
410095	Dowel Bar (Drill and Bond)	EA		x		=	$	-
390132	Hot Mix Asphalt (Type A)	TON	79,500	x	130.00	=	$	10,335,000
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON	12,400	x	150.00	=	$	1,860,000
395041	RHMA-O (Open Graded Fiction Course)	TON	6,200	x	150.00	=	$	930,000
393006	Geosynthetic Pavement Interlayer (Paving Grid)	SQYD		x		=	$	-
260203	Class 2 Aggregate Base	TON/CY	21,700	x	80.00	=	$	1,736,000
198215	Subgrade Enhancement Geogrid	SQYD	91,000	x	5.00		$	455,000
290201	Asphalt Treated Permeable Base	CY		x		=	$	-
250401	Class 4 Aggregate Subbase	CY		x		=	$	-
374002	Asphaltic Emulsion (Fog Seal Coat)	TON		x		=	$	-
397005	Tack Coat	TON	130	x	1,100.00	=	$	143,000
390100	Prime Coat	TON	110	x	1,400.00	=	$	154,000
377501	Slurry Seal	TON		x		=	$	-
3750XX	Screenings (Type XX)	TON		x		=	$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON		x		=	$	-
370001	Sand Cover (Seal)	TON		x		=	$	-
731530A	Hot Mix Asphalt (Textured Paving)	TONS		x		=	$	-
730020	Minor Concrete (Curb)	CY	720	x	750.00	=	$	540,000
731504	Minor Concrete (Curb and Gutter)	CY	1,300	x	750.00	=	$	975,000
731516	Minor Concrete (Driveway)	CY	210	x	600.00	=	$	126,000
731521	Minor Concrete (Sidewalk)	CY	1,110	x	600.00	=	$	666,000
39407X	Place Hot Mix Asphalt Dike (Type E)	LF		x		=	$	-
150771	Remove Asphalt Concrete Dike	LF		x		=	$	-
420201	Grind Existing Concrete Pavement	SQYD		x		=	$	-
398300	Remove Base and Surfacing	CY	1,700	x	50.00	=	$	85,000
390095	Replace Asphalt Concrete Surfacing	CY		x		=	$	-
15312X	Remove Concrete	LF/CY/LS		x		=	$	-
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD		x		=	$	-
153103	Cold Plane Asphalt Concrete Pavement	SQYD	5,630	x	8.00	=	$	45,040
39405X	Shoulder Rumble Strip (HMA, X-In Indentations)	STA		x		=	$	-
413113	Repair Spalled Joints, Polyester Grout	SQYD		x		=	$	-
420102	Groove Existing Concrete Pavement	SQYD		x		=	$	-
390136	Minor Hot Mix Asphalt	TON		x		=	$	-
394095	Roadside Paving (Miscellaneous Areas)	SQYD		x		=	$	-
XXXXXX	Some Item	Unit		x		=	$	-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS $ 18,050,100

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
15080X	Remove Culvert	EA/LF		x		=	$	-
150820	Modify Inlet	EA		x		=	$	-
155232	Sand Backfill	CY		x		=	$	-
15020X	Abandon Culvert	EA/LF		x		=	$	-
152430	Adjust Inlet	LF		x		=	$	-
155003	Cap Inlet	EA		x		=	$	-
510501	Minor Concrete	CY		x		=	$	-
510502	Minor Concrete (Minor Structure)	CY		x		=	$	-
5105XX	Minor Concrete (Type XX)	CY		x		=	$	-
620XXX	XX" Alternative Pipe Culvert (Type X)	LF		x		=	$	-
6411XX	XX" Plastic Pipe	LF		x		=	$	-
65XXXX	XX" Reinforced Concrete Pipe (Type X)	LF		x		=	$	-
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF		x		=	$	-
68XXXX	XX" Plastic Pipe (Edge Drain)	LF		x		=	$	-
69011X	XX" Corrugated Steel Pipe Downdrain (0.XXX" Thi	LF		x		=	$	-
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF		x		=	$	-
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF		x		=	$	-
7050XX	XX" Steel Flared End Section	EA		x		=	$	-
703233	Grated Line Drain	LF		x		=	$	-
72XXXX	Rock Slope Protection (Type and Method)	CY/TON		x		=	$	-
72901X	Rock Slope Protection Fabric (Class X)	SQYD		x		=	$	-
721420	Concrete (Ditch Lining)	CY		x		=	$	-
721430	Concrete (Channel Lining)	CY		x		=	$	-
750001	Miscellaneous Iron and Steel	LB		x		=	$	-
XXXXXX	Treatment Best Management Practices	LS	1	x	750,000	=	$	750,000
XXXXXX	Additional Drainage	LS	1	x	2,550,000	=	$	2,550,000

TOTAL DRAINAGE ITEMS	$	3,300,000

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
080050	Progress Schedule (Critical Path Method)	LS		x		=	$	-
582001	Sound Wall (Masonry Block)	SQFT		x		=	$	-
510530	Minor Concrete (Wall)	CY		x		=	$	-
15325X	Remove Sound Wall	LF/LS		x		=	$	-
070030	Lead Compliance Plan	LS	1	x	5,000.00	=	$	5,000
141120	Treated Wood Waste	LB	6,000	x	0.75	=	$	4,500
153221	Remove Concrete Barrier	LF		x		=	$	-
150662	Remove Metal Beam Guard Railing	LF	300	x	10.00	=	$	3,000
150668	Remove Flared End Section	EA		x		=	$	-
8000XX	Chain Link Fence (Type XX)	LF		x		=	$	-
80XXXX	XX" Chain Link Gate (Type CL-6)	EA		x		=	$	-
832005	Midwest Guardrail System	LF	300	x	60.00	=	$	18,000
839301	Single Thrie Beam Barrier	LF		x		=	$	-
839310	Double Thrie Beam Barrier	LF		x		=	$	-
839521	Cable Railing	LF		x		=	$	-
8395XX	Terminal System (Type WB-31)	EA		x		=	$	-
839585	Alternative Flared Terminal System	EA		x		=	$	-
839584	Alternative In-line Terminal System	EA		x		=	$	-
498052	60" CIDH Concrete Pile (Sign Foundation)	LF		x		=	$	-
839XXX	Crash Cushion (Insert Type)	EA		x		=	$	-
520103	Bar Reinforced Steel (Retaining Wall)	LB		x		=	$	-
510060	Structural Concrete, Retaining Wall	CY		x		=	$	-
513553	Retaining Wall (Masonry Wall)	SQFT		x		=	$	-
511035A	Architectural Treatment	LS	1	x	200,000.00	=	$	200,000
598001	Anti-Graffiti Coating	SQFT		x		=	$	-
203070	Rock Stain	SQFT		x		=	$	-
5136XX	Reinforced Concrete Crib Wall (Type X)	SQFT		x		=	$	-
839543	Transition Railing (Type WB-31)	EA		x		=	$	-
597601	Prepare and Stain Concrete	SQFT	18,000	x	6.00	=	$	108,000
839561	Rail Tensioning Assembly	EA		x		=	$	-
83958X	End Anchor Assembly (Type X)	EA	1	x	1,000.00	=	$	1,000
XXXXXX	Some Item	Unit		x		=	$	-

TOTAL SPECIALTY ITEMS	$	339,500

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
	Biological Mitigation	LS		x		=	$	-
130670	Temporary Reinforced Silt Fence	LF	7,200	x	6.25	=	$	45,000
141000	Temporary Fence (Type ESA)	LF		x		=	$	-
						Subtotal Environmental Mitigation	$	*45,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost
20XXXX	Highway Planting	LS	1	x	1,275,000.00	=	$	1,275,000
20XXXX	Irrigation System	LS	1	x	2,550,000.00	=	$	2,550,000
204099	Plant Establishment Work	LS		x		=	$	-
204101	Extend Plant Establishment Work	LS		x		=	$	-
20XXXX	Follow-up Landscape Project	LS		x		=	$	-
150685	Remove Irrigation Facility	LS		x		=	$	-
20XXXX	Maintain Existing (Irrigation or Planted Areas)	LS		x		=	$	-
206400	Check and Test Existing Irrigation Facilities	LS		x		=	$	-
21011X	Imported Topsoil (X)	CY/TON		x		=	$	-
20XXXX	Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQFT/SQYD		x		=	$	-
200122	Weed Germination	SQYD		x		=	$	-
208304	Water Meter	EA		x		=	$	-
2087XX	XX" Conduit (Use for Irrigation x-overs)	LF		x		=	$	-
20890X	Extend X" Conduit (Use for Extension of Irrigation x-overs)	LF		x		=	$	-
						Subtotal Landscape and Irrigation	$	*3,825,000*

5C - EROSION CONTROL

Item code		Unit	Quantity		Unit Price ($)			Cost
210010	Move In/Move Out (Erosion Control)	EA	2	x	1,000.00	=	$	2,000
210350	Fiber Rolls	LF	30,000	x	3.50	=	$	105,000
210360	Compost Sock	LF		x		=	$	-
2102XX	Rolled Erosion Control Product (X)	SQFT		x		=	$	-
21025X	Bonded Fiber Matrix	SQFT/ACRE				=	$	-
210300	Hydromulch	SQFT		x		=	$	-
210420	Straw	SQFT		x		=	$	-
210430	Hydroseed	SQFT	150,000	x	0.13	=	$	19,500
210600	Compost	SQFT	150,000	x	0.25	=	$	37,500
210630	Incorporate Materials	SQFT	150,000	x	0.09	=	$	13,500
						Subtotal Erosion Control	$	*177,500*

5D - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost
130300	Prepare SWPPP	LS	1	x	10,000.00	=	$	10,000
130200	Prepare WPCP	LS		x		=	$	-
130100	Job Site Management	LS	1	x	25,000.00	=	$	25,000
130330	Storm Water Annual Report	EA	2	x	10,000.00	=	$	20,000
130310	Rain Event Action Plan (REAP)	EA	40	x	500.00	=	$	20,000
130320	Storm Water Sampling and Analysis Day	EA	40	x	500.00	=	$	20,000
130520	Temporary Hydraulic Mulch	SQYD	15,000	x	5.00	=	$	75,000
130550	Temporary Hydroseed	SQYD	15,000	x	10.00	=	$	150,000
130505	Move-In/Move-Out (Temporary Erosion Control)	EA	5	x	5,000.00	=	$	25,000
130640	Temporary Fiber Roll	LF		x		=	$	-
130900	Temporary Concrete Washout	LS	1	x	3,000.00	=	$	3,000
130710	Temporary Construction Entrance	EA	2	x	5,000.00	=	$	10,000
130610	Temporary Check Dam	LF		x		=	$	-
130620	Temporary Drainage Inlet Protection	EA	70	x	220.00	=	$	15,400
130730	Street Sweeping	LS	1	x	20,000.00	=	$	20,000
						Subtotal NPDES	$	*393,400*
						TOTAL ENVIRONMENTAL	$	**4,440,900**

Supplemental Work for NPDES

066595	Water Pollution Control Maintenance Sharing*	LS		x		=	$	-
066596	Additional Water Pollution Control**	LS		x		=	$	-
066597	Storm Water Sampling and Analysis***	LS		x		=	$	-
XXXXXX	Some Item	LS		x		=	$	-
						Subtotal Supplemental Work for NDPS	$	-

*Applies to all SWPPPs and those WPCPs with sediment control or soil stabilization BMPs.

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
860460	Lighting and Sign Illumination	LS		x		=	$	-
860201	Signal and Lighting	LS	1	x	2,800,000.00	=	$	2,800,000
860990	Closed Circuit Television System	LS		x		=	$	-
86110X	Ramp Metering System (Location X)	LS		x		=	$	-
86070X	Interconnection Conduit and Cable	LF/LS		x		=	$	-
5602XX	Furnish Sign Structure (Type X)	LB		x		=	$	-
5602XX	Install Sign Structure (Type X)	LB		x		=	$	-
498040	XX" CIDHC Pile (Sign Foundation)	LF		x		=	$	-
86080X	Inductive Loop Detectors	EA/LS		x		=	$	-
8609XX	Traffic Monitoring Station (Type X)	LS		x		=	$	-
15075X	Remove Sign Structure	EA/LS		x		=	$	-
151581	Reconstruct Sign Structure	EA		x		=	$	-
152641	Modify Sign Structure	EA		x		=	$	-
860090	Maintain Existing Traffic Management System Elem	LS		x		=	$	-
872130	Modify Existing Electrcal System							
86XXXX	Fiber Optic Conduit System	LS		x		=	$	-
XXXXX	Some Item	Unit		x		=	$	-

Subtotal Traffic Electrical $ *2,800,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
566011	Roadside Sign - One Post	EA		x		=	$	-
566012	Roadside Sign - Two Post	EA		x		=	$	-
5602XX	Furnish Sign	SQFT		x		=	$	-
568016	Install Sign Panel on Existing Frame	SQFT		x		=	$	-
150711	Remove Painted Traffic Stripe	LF		x		=	$	-
141101	Remove Yellow Painted Traffic Stripe (Hazardous Waste)	LF		x		=	$	-
150712	Remove Painted Pavement Marking	SQFT		x		=	$	-
150742	Remove Roadside Sign	EA		x		=	$	-
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
840502	Thermoplastic Traffic Stripe (Enhanced Wet Night V	LF		x		=	$	-
846012	Thermoplastic Crosswalk and Pavement Marking (E	SQFT		x		=	$	-
120090	Construction Area Signs	LS		x		=	$	-
84XXXX	Permanent Pavement Delineation & Signage	LS	1	x	500,000.00	=	$	500,000

Subtotal Traffic Signing and Striping $ *500,000*

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)			Cost
12865X	Portable Changeable Message Signs	EA/LS	1	x	$ 30,000	=	$	30,000

Subtotal Traffic Management Plan $ *30,000*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
	Stage Construction	LS	1	x	2,500,000.00	=	$	2,500,000
120199	Traffic Plastic Drum	EA		x		=	$	-
12016X	Channelizer (Type X)	EA		x		=	$	-
120120	Type III Barricade	EA		x		=	$	-
129100	Temporary Crash Cushion Module	EA		x		=	$	-
120100	Traffic Control System	LS		x		=	$	-
129110	Temporary Crash Cushion	EA		x		=	$	-
129000	Temporary Railing (Type K)	LF		x		=	$	-
120149	Temporary Pavement Marking (Paint)	SQFT		x		=	$	-
82010X	Delineator (Class X)	EA		x		=	$	-
XXXXXX	Some Item	Unit		x		=	$	-

Subtotal Stage Construction and Traffic Handling $ *2,500,000*

TOTAL TRAFFIC ITEMS $ **5,830,000**

SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
190101	Roadway Excavation	CY		x		= $	-
19801X	Imported Borrow	CY/TON		x		= $	-
390132	Hot Mix Asphalt (Type A)	TON		x		= $	-
26020X	Class 2 Aggregate Base	TON/CY		x		= $	-
250401	Class 4 Aggregate Subbase	CY		x		= $	-
130620	Temporary Drainage Inlet Protection	EA		x		= $	-
129000	Temporary Railing (Type K)	LF		x		= $	-
128601	Temporary Signal System	LS		x		= $	-
120149	Temporary Pavement Marking (Paint)	SQFT		x		= $	-
80010X	Temporary Fence (Type X)	LF		x		= $	-
XXXXXX	Some Item	LS		x		= $	-

* Includes constructing, maintaining, and removal

TOTAL DETOURS **$ -**

SUBTOTAL SECTIONS 1 through 7 $ 34,487,600

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items							
	ADA Items				1.0%	$	344,876
8B - Bike Path Items							
	Bike Path Items				0.0%	$	-
8C - Other Minor Items							
	Other Minor Items				0.0%	$	-
	Total of Section 1-7	$	34,487,600	x	1.0%	= $	344,876

TOTAL MINOR ITEMS **$ 344,900**

SECTIONS 9: ROADWAY MOBILIZATION

Item code							
999990	Total Section 1-8	$	34,832,500	x	10%	= $	3,483,250

TOTAL ROADWAY MOBILIZATION **$ 3,483,300**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066670	Payment Adjustments For Price Index Fluctuations	LS		x		= $	-
066094	Value Analysis	LS		x		= $	-
066070	Maintain Traffic	LS		x		= $	-
066919	Dispute Resolution Board	LS		x		= $	-
066921	Dispute Resolution Advisor	LS		x		= $	-
066015	Federal Trainee Program	LS		x		= $	-
066610	Partnering	LS		x		= $	-
066204	Remove Rock and Debris	LS		x		= $	-
066222	Locate Existing Crossover	LS		x		= $	-
XXXXXX	Some Item	Unit		x		= $	-

*Cost of **NPDES** Supplemental Work specified in Section 5D* = $ -

	Total Section 1-8	$	34,832,500		4%	= $	1,393,300

TOTAL SUPPLEMENTAL WORK **$ 1,393,300**

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	Resident Engineers Office	LS		x		=	$0
066063	Traffic Management Plan - Public Information	LS		x		=	$0
066901	Water Expenses	LS		x		=	$0
8609XX	Traffic Monitoring Station (X)	LS		x		=	$0
066841	Traffic Controller Assembly	LS		x		=	$0
066840	Traffic Signal Controller Assembly	LS		x		=	$0
066062	COZEEP Contract	LS		x		=	$0
066838	Reflective Numbers and Edge Sealer	LS		x		=	$0
066065	Tow Truck Service Patrol	LS		x		=	$0
066916	Annual Construction General Permit Fee	LS		x		=	$0
XXXXXX	Some Item	Unit		x		=	$0
	Total Section 1-8		$ 34,832,500		2%	= $	696,650

TOTAL STATE FURNISHED **$696,700**

SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization $34,832,500 (used to calculate TRO)

Total Construction Cost (excluding TRO and Contingency) $40,405,800 (used to check if project is greater than $5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **6%**

Item code		Unit	Quantity		Unit Price ($)		Cost
090100	Time-Related Overhead	WD	360	X	$5,806	=	$2,090,000

TOTAL TIME-RELATED OVERHEAD **$2,090,000**

SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12	$	42,495,800	x	**25%**	=	$10,623,950

TOTAL CONTINGENCY **$10,624,000**

EA: 04-4Q010K PID: 419000297

II. STRUCTURE ITEMS

	Bridge 1		Bridge 2		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Bridge Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Cost Per Square Foot	$0		$0		$0
COST OF EACH	**$0**		**$0**		**$0**

	Building 1		Bridge 2		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Width (Feet) [out to out]	0 LF		0 LF		0 LF
Total Building Length (Feet)	0 LF		0 LF		0 LF
Total Area (Square Feet)	0 SQFT		0 SQFT		0 SQFT
Structure Depth (Feet)	0 LF		0 LF		0 LF
Footing Type (pile or spread)	xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx		xxxxxxxxxxxxxxxxxx
Cost Per Square Foot	$0		$0		$0
COST OF EACH	**$0**		**$0**		**$0**

TOTAL COST OF BRIDGES		**$0**
TOTAL COST OF BUILDINGS		**$0**
STRUCTURES MOBILIZATION	10%	**$0**

Recommended Contingency: (Pre-PSR 30%-50%, PSR 25%, Draft PR 20%, PR 15%, after PR approval 10%, Final PS&E 5%)

Total recommended percentages includes any quantified risk based contingency from the risk register.

STRUCTURES CONTINGENCY	10%	**$0**
TOTAL COST OF STRUCTURES		**$0**

Estimate Prepared By: _____ _____

XXXXXXXXXXXXXXXX ------ Division of Structures — Date

EA: 04-4Q010K PID: 419000297

III. RIGHT OF WAY

Fill in all of the available information from the Right of Way Data Sheet.

A)	A1)	Acquisition, including Excess Land Purchases, Damages & Goodwill, Fees	$	6,536,667
	A2)	SB-1210	$	0
B)		Acquisition of Offsite Mitigation	$	0
C)	C1)	Utility Relocation (Local Agency Share)	$	2,300,000
	C2)	Potholing (Design Phase)	$	80,000
D)		Railroad Acquisition	$	0
E)		Clearance / Demolition	$	0
F)		Relocation Assistance (RAP and/or Last Resort Housing Costs)	$	0
G)		Title and Escrow	$	0
H)		Environmental Review	$	0
I)		Condemnation Settlements 0%	$	0
J)		Design Appreciation Factor 0%	$	0
K)		Utility Relocation (Construction Cost)	$	0

L)	**TOTAL RIGHT OF WAY ESTIMATE**	**$8,916,667**
M)	**TOTAL R/W ESTIMATE: Escalated**	**$10,700,000**
N)	**RIGHT OF WAY SUPPORT**	**$500,000**

Support Cost Estimate Prepared By _____ Project Coordinator[1] Phone

Utility Estimate Prepared By _____ Utility Coordinator[2] Phone

R/W Acquisition Estimate Prepared By _____ Right of Way Estimator[3] Phone

Note: Items G & H applied to items A + B

[1] When estimate has Support Costs only [2] When estimate has Utility Relocation [3] When R/W Acquisition is required

ATTACHMENT F

K Phase Right of Way Conceptual Cost Estimate Request

K PHASE CONCEPTUAL COST ESTIMATE FORM - RIGHT OF WAY

A RIGHT OF WAY DATA SHEET WILL NEED TO BE COMPLETED FOR SUBSEQUENT PHASES*

To: **Caltrans District 4**
(*REQUESTING DIVISION*)

Michael O'Callaghan
(NAME OF REQUESTOR)

Date: **August 12, 2022**

Dist-Co-Rte-PM: **04-NAP-29-PM 0.69/PM 2.05**
Project ID/EA: **04190002971/04-4Q010**
Alternative #: **1**

From: **Brett A. Paulson, SRWA, RAC, NAC**
RIGHT OF WAY, Estimator
(CA DRE License No. 01405337)

John F. Almazán, Sr. Right of Way Agent
RIGHT OF WAY, QA/QC, Estimator
(CA DRE Real Estate Broker License No. 01104860)

The Conceptual Cost Estimate Request was received for the above-referenced project on 5/12/2022 with a requested completion date of 6/6/2022.

Scope of the Right of Way
Description of Required Right of Way: **The required right of way consists of partial acquisitions from the frontages of Highway Commercial properties. The acquisitions do not appear to impact the commercial businesses. There are also a few single family residential and multi-residential properties impacted. Temporary construction easements will also be needed to facilitate the construction. For estimation purposes, $28.31/sf was used for Commercial, $13.13/sf for Single Family Residential, and $23.82/sf for Multi-Residential properties. An itemized acquisition worksheet is available.**

Right of Way Required: ☒ Yes ☐ No
Number of Total Parcels: ☐ 1-10 ☐ 11-25 ☒ 26-50 ☐ 51-100 ☐ >100

Right of Way Requirements

Number of Fee Parcels **28**
Total Fee Area **44,337 sf**
Number of Permanent Easements **Unknown**
Total Permanent Easement Area **Unknown**
Number of Temporary Easements **50**
Total Temporary Easement Area **67,505 sf**
Length of Term Required for Temporary Easements **48 months**
Number of Excess Parcels/Other **Unknown**

K PHASE CONCEPTUAL COST ESTIMATE FORM - RIGHT OF WAY (Cont.)

USA Lands:	☐ Yes	☒ No	☐ Unknown	
BIA Lands:	☐ Yes	☒ No	☐ Unknown	
Displaced Persons/Businesses:	☐ Yes	☒ No	☐ Unknown	Number of Displacees **0**
Demolition/Clearance Required:	☐ Yes	☒ No	☐ Unknown	Number of Demos **0**
Railroad Involvement:	☐ Yes	☐ No	☒ Unknown	
C&M Agreement Needed:	☐ Yes	☐ No	☒ Unknown	
Utility Involvement:	☒ Yes	☐ No	☐ Unknown	Number of Utilities in Area 8
UT Relocations Anticipated:	☒ Yes	☐ No	☐ Unknown	
Potholing Needed:	☒ Yes	☐ No	☐ Unknown	
Project Public Meetings:	☒ Yes	☐ No	☐ Unknown	Number of Meetings 2-4
Permits To Enter ENV/ENG:	☒ Yes	☐ No	☐ Unknown	Number of Permits TBD
Environmental Mitigation:	☐ Yes	☒ No	☐ Unknown	Type_____
Outdoor Advertising Signs:	☐ Yes	☒ No	☐ Unknown	Number of Signs_____

Cost Estimates

Estimate reflects Right of Way only and does not include any capital costs for Right of Way Engineering/Land Surveys.

Capital Costs - Phase 9

- ☐ $0-$100,000
- ☐ $100,001-$250,000
- ☐ $250,001-$500,000
- ☐ $500,001-$1,000,000
- ☒ $1,000,001-$2,500,000
- ☐ $2,500,001-$5,000,000
- ☐ $5,000,001-$10,000,000
- ☐ $10,000,001-$25,000,000
- ☐ $25,000,001-$100,000,000
- ☐ >$100,000,000

Capital Costs – Phase 4

- ☐ $0-$100,000
- ☐ $100,001-$250,000
- ☐ $250,001-$500,000
- ☒ $500,001-$1,000,000
- ☐ $1,000,001-$2,500,000
- ☐ $2,500,001-$5,000,000
- ☐ $5,000,001-$10,000,000
- ☐ $10,000,001-$25,000,000
- ☐ $25,000,001-$100,000,000
- ☐ >$100,000,000

Phase 9 - Recommended R/W Capital Cost for Programming

$1.9 million, includes a 25% contingency and escalation to 2026

Phase 4 - Recommended R/W Capital Cost for Programming

$4.1 million, includes a 25% contingency and escalation to 2026

Estimate reflects Right of Way only and does not include any support costs for Right of Way Engineering/Land Surveys.

Phase 0 Support Costs (PA&ED) Tasks: 100.10, 160.10, 160.30, 165.10, 170.10, 170.15, 170.25, 175.10, 180.05, 180.10	**$50,000**

Phase 1 Support Costs (PS&E)
Tasks: 100.15, 185.05, 185.20, 185.25, 205.10, 205.15, 205.25, 235.05, 235.10, 255

- ☒ $0-$100,000
- ☐ $100,001-$250,000
- ☐ $250,001-$500,000
- ☐ $500,001-$1,000,000
- ☐ $1,000,001-$2,500,000
- ☐ $2,500,001-$5,000,000
- ☐ $5,000,001-$10,000,000
- ☐ $10,000,001-$25,000,000
- ☐ $25,000,001-$100,000,000
- ☐ >$100,000,000

Phase 2 Support Costs (RW)
Tasks: 100.25, 195.40, 195.45, 200.15, 200.20, 200.25, 200.30, 225.50, 225.60, 225.65, 225.70, 225.75, 225.80, 245.50, 245.60, 245.65, 245.70, 245.75, 245.80

- ☐ $0-$100,000
- ☐ $100,001-$250,000
- ☒ $250,001-$500,000
- ☐ $500,001-$1,000,000
- ☐ $1,000,001-$2,500,000
- ☐ $2,500,001-$5,000,000
- ☐ $5,000,001-$10,000,000
- ☐ $10,000,001-$25,000,000
- ☐ $25,000,001-$100,000,000
- ☐ >$100,000,000

Phase 3 Support Costs (CON)
Tasks: 270.25, 285

- ☒ $0-$100,000
- ☐ $100,001-$250,000
- ☐ $250,001-$500,000
- ☐ $500,001-$1,000,000
- ☐ $1,000,001-$2,500,000
- ☐ $2,500,001-$5,000,000
- ☐ $5,000,001-$10,000,000
- ☐ $10,000,001-$25,000,000
- ☐ $25,000,001-$100,000,000
- ☐ >$100,000,000

Schedule
Right of Way will require a minimum of **24** months to deliver a Right of Way Certification once final right of way requirements and mapping have been received, necessary environmental clearances have been obtained, and required freeway agreements have been approved. This schedule is based on a Right of Way Certification #1 with an anticipated cert date **to be determined once funding is identified**.

Areas of Concern
Potential areas of concern are noted below:

The majority of the impacted properties along the highway are commercial. There is risk of some claims for loss of business goodwill.

Assumptions and Limiting Conditions
This estimate is based on the following assumptions and limiting conditions and documented project risks:

The Scope of the Right of Way analysis includes applicable:

- Acquisition Costs (including any Excess Lands, Damages, Mitigation, etc.)
- Utility Relocation
- Railroad Involvement
- Relocation Assistance
- Clearance/Demolition
- Permits
- Title and Escrow Fees
- Construction Contract Work

Capital Costs are based on eminent domain estimating and appraisal methodologies and current market information. Support Costs are based on district workload estimating tools and historical data from previous similar projects.

Escalation and Contingency Rates were applied based on the proposed project schedule and previous district experience to account for changes in market conditions and other unanticipated project-related costs.

Check as applicable:

☒ A field review was not performed as part of this estimate.

☒ Mapping received did not provide sufficient detail to determine the limits of the right of way requirements and/or to determine damages to the remainder parcels impacted by the project.

☒ Additional right of way requirements may be anticipated but are not defined due to the preliminary nature of the early design requirements.

☐ We have determined that there are no right of way functional involvements in the proposed project at this time as currently designed.

☒ Utility lead time begins after PA&ED is met and we have received conflict maps.

☐ Right of Way certification is at risk. The current schedule does not provide Right of Way with sufficient lead time.

Contact
For further information regarding this estimate, please contact person below:

Title: ***Brett Paulson, SRWA/RAC/NAC***
Phone Number: ***(949) 632-5909***

Attachment(s)

1) Conceptual Cost Estimate Request (with mapping)
2) Acquisition Worksheet Alternative #1

K PHASE CONCEPTUAL COST ESTIMATE FORM - RIGHT OF WAY

A RIGHT OF WAY DATA SHEET WILL NEED TO BE COMPLETED FOR SUBSEQUENT PHASES*

To: **Caltrans District 4**
(*REQUESTING DIVISION*)

Michael O'Callaghan
(NAME OF REQUESTOR)

Date: **August 12, 2022**

Dist-Co-Rte-PM: **04-NAP-29-PM 0.69/PM 2.05**
Project ID/EA: **0419000297/04-4Q010**
Alternative #: **2**

From: **Brett A. Paulson, SRWA, RAC, NAC**
RIGHT OF WAY, Estimator
(CA DRE License No. 01405337)

John F. Almazán, Sr. Right of Way Agent
RIGHT OF WAY, QA/QC, Estimator
(CA DRE Real Estate Broker License No. 01104860)

The Conceptual Cost Estimate Request was received for the above-referenced project on 5/18/2022 with a requested completion date of 6/6/2022.

Scope of the Right of Way
Description of Required Right of Way: **The required right of way consists of partial acquisitions from the frontages of Highway Commercial properties. A full acquisition of APN 058-312-009, including relocation and demolition, will be required. A few of the acquisitions do appear to impact some of the commercial businesses. There are also a few single family residential and multi-residential properties impacted. Temporary construction easements will also be needed to facilitate the construction. For estimation purposes, $28.31/sf was used for Commercial, $13.13/sf for Single Family Residential, and $23.82/sf for Multi-Residential properties. An itemized acquisition worksheet is available.**

Right of Way Required: ☒ Yes ☐ No
Number of Total Parcels: ☐ 1-10 ☐ 11-25 ☐ 26-50 ☒ 51-100 ☐ >100

Right of Way Requirements

Number of Fee Parcels **38** Total Fee Area **126,310 sf**
Number of Permanent Easements **Unknown** Total Permanent Easement Area **Unknown**
Number of Temporary Easements **56** Total Temporary Easement Area **111,379 sf**
Length of Term Required for Temporary Easements **48 months**
Number of Excess Parcels/Other **Unknown**

K PHASE CONCEPTUAL COST ESTIMATE FORM - RIGHT OF WAY (Cont.)

USA Lands:	☐ Yes	☒ No	☐ Unknown	
BIA Lands:	☐ Yes	☒ No	☐ Unknown	
Displaced Persons/Businesses:	☒ Yes	☐ No	☐ Unknown	Number of Displacees **Unknown**
Demolition/Clearance Required:	☒ Yes	☐ No	☐ Unknown	Number of Demos **Unknown**
Railroad Involvement:	☐ Yes	☐ No	☒ Unknown	
C&M Agreement Needed:	☐ Yes	☐ No	☒ Unknown	
Utility Involvement:	☒ Yes	☐ No	☐ Unknown	Number of Utilities in Area 8
UT Relocations Anticipated:	☒ Yes	☐ No	☐ Unknown	
Potholing Needed:	☒ Yes	☐ No	☐ Unknown	
Project Public Meetings:	☒ Yes	☐ No	☐ Unknown	Number of Meetings 2
Permits To Enter ENV/ENG:	☒ Yes	☐ No	☐ Unknown	Number of Permits **Unknown**
Environmental Mitigation:	☐ Yes	☒ No	☐ Unknown	Type_____
Outdoor Advertising Signs:	☐ Yes	☒ No	☐ Unknown	Number of Signs_____

Cost Estimates

Estimate reflects Right of Way only and does not include any capital costs for Right of Way Engineering/Land Surveys.

Capital Costs - Phase 9

- ☐ $0-$100,000
- ☐ $100,001-$250,000
- ☐ $250,001-$500,000
- ☐ $500,001-$1,000,000
- ☐ $1,000,001-$2,500,000
- ☐ $2,500,001-$5,000,000
- ☒ $5,000,001-$10,000,000
- ☐ $10,000,001-$25,000,000
- ☐ $25,000,001-$100,000,000
- ☐ >$100,000,000

Capital Costs – Phase 4

- ☐ $0-$100,000
- ☐ $100,001-$250,000
- ☐ $250,001-$500,000
- ☐ $500,001-$1,000,000
- ☐ $1,000,001-$2,500,000
- ☒ $2,500,001-$5,000,000
- ☐ $5,000,001-$10,000,000
- ☐ $10,000,001-$25,000,000
- ☐ $25,000,001-$100,000,000
- ☐ >$100,000,000

Phase 9 - Recommended R/W Capital Cost for Programming

$5.72 million, including a 25% contingency and escalation to 2026.

Phase 4 - Recommended R/W Capital Cost for Programming

$4.98 million, including a 25% contingency and escalation to 2026.

Estimate reflects Right of Way only and does not include any support costs for Right of Way Engineering/Land Surveys.

Phase 0 Support Costs (PA&ED) Tasks: 100.10, 160.10, 160.30, 165.10, 170.10, 170.15, 170.25, 175.10, 180.05, 180.10	**$50,000**

Phase 1 Support Costs (PS&E) Tasks: 100.15, 185.05, 185.20, 185.25, 205.10, 205.15, 205.25, 235.05, 235.10, 255	☒ $0-$100,000	☐ $2,500,001-$5,000,000
	☐ $100,001-$250,000	☐ $5,000,001-$10,000,000
	☐ $250,001-$500,000	☐ $10,000,001-$25,000,000
	☐ $500,001-$1,000,000	☐ $25,000,001-$100,000,000
	☐ $1,000,001-$2,500,000	☐ >$100,000,000

Phase 2 Support Costs (RW) Tasks: 100.25, 195.40, 195.45, 200.15, 200.20, 200.25, 200.30, 225.50, 225.60, 225.65, 225.70, 225.75, 225.80, 245.50, 245.60, 245.65, 245.70, 245.75, 245.80	☐ $0-$100,000	☐ $2,500,001-$5,000,000
	☐ $100,001-$250,000	☐ $5,000,001-$10,000,000
	☒ $250,001-$500,000	☐ $10,000,001-$25,000,000
	☐ $500,001-$1,000,000	☐ $25,000,001-$100,000,000
	☐ $1,000,001-$2,500,000	☐ >$100,000,000

Phase 3 Support Costs (CON) Tasks: 270.25, 285	☒ $0-$100,000	☐ $2,500,001-$5,000,000
	☐ $100,001-$250,000	☐ $5,000,001-$10,000,000
	☐ $250,001-$500,000	☐ $10,000,001-$25,000,000
	☐ $500,001-$1,000,000	☐ $25,000,001-$100,000,000
	☐ $1,000,001-$2,500,000	☐ >$100,000,000

Schedule
Right of Way will require a minimum of **24** months to deliver a Right of Way Certification once final right of way requirements and mapping have been received, necessary environmental clearances have been obtained, and required freeway agreements have been approved. This schedule is based on a Right of Way Certification #1 with an anticipated cert date **to be determined once funding is identified**.

Areas of Concern
Potential areas of concern are noted below:

The majority of the impacted properties along the highway are commercial. There is risk of a number of claims for loss of business goodwill.

Assumptions and Limiting Conditions
This estimate is based on the following assumptions and limiting conditions and documented project risks:

The Scope of the Right of Way analysis includes applicable:

- Acquisition Costs (including any Excess Lands, Damages, Mitigation, etc.)
- Utility Relocation
- Railroad Involvement
- Relocation Assistance
- Clearance/Demolition
- Permits
- Title and Escrow Fees
- Construction Contract Work

Capital Costs are based on eminent domain estimating and appraisal methodologies and current market information. Support Costs are based on district workload estimating tools and historical data from previous similar projects.

Escalation and Contingency Rates were applied based on the proposed project schedule and previous district experience to account for changes in market conditions and other unanticipated project-related costs.

Check as applicable:

☒ A field review was not performed as part of this estimate.

☒ Mapping received did not provide sufficient detail to determine the limits of the right of way requirements and/or to determine damages to the remainder parcels impacted by the project.

☒ Additional right of way requirements may be anticipated but are not defined due to the preliminary nature of the early design requirements.

☐ We have determined that there are no right of way functional involvements in the proposed project at this time as currently designed.

☒ Utility lead time begins after PA&ED is met and we have received conflict maps.

☐ Right of Way certification is at risk. The current schedule does not provide Right of Way with sufficient lead time.

Contact
For further information regarding this estimate, please contact person below:

Title: ***Brett Paulson, SRWA/RAC/NAC***
Phone Number: ***(949) 632-5909***

Attachment(s)

1) Conceptual Cost Estimate Request (with mapping)
2) Acquisition Worksheet Alternative #2

ATTACHMENT G

Preliminary Environmental Analysis Report

PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT

1. Project Information

DIST-CO-RTE: 4-Napa-29	**PM/PM:** 0.0-2.5
EA: 4Q010	**EFIS Project ID:** 0419000297
Project Title: State Route 29 American Canyon Corridor Project	
Project Manager: Danielle Schmitz	**Phone:** (707) 259-5968
Project Engineer: Lindsey Van Parys, GHD, Inc.	**Phone:** (916) 245-4220
Environmental Office Chief/Manager: Lindsay Vivian	**Phone:** (510) 506-4310
PEAR Preparer: Charles Smith, AICP, LEED AP	**Phone:** (949) 585-5257

2. Project Description

Purpose and Need

Purpose

Provide a multimodal and complete streets corridor that:

- Improves mobility for all users;
- Improves safety for all users by incorporating Vision Zero concepts;
- Eliminates overhead utility poles;
- Improves corridor aesthetics;
- Reduces Vehicle Miles Traveled (VMT) by encouraging transportation mode shift which will help to reduce regional traffic on residential streets;
- Improves customer access to businesses adjacent to SR 29;
- Provides improved accessibility for all modes of transportation along SR 29 between American Canyon Road and Napa Junction Road.

Need

Regionally, State Route (SR) 29 provides a direct connection between counties along Interstate 80 and 580 and counties along US 101 in the North Bay. Locally, SR 29 is also the lifeblood of access into and out of Napa County.

Notwithstanding their disparate local context, vehicular volumes on SR 29 are comparable to other nearby state highways (SR 12 and SR 37). However, because the SR 29 Corridor (also known as "Broadway") functions as American Canyon's "Main Street," it experiences significant safety, aesthetic, and operational issues between American Canyon Road and Napa Junction during weekday and weekend peak hour conditions. The most pronounced issues in the corridor include:

- Lack of multimodal connectivity - particularly for bicycle and pedestrian access - along and across SR 29;
- Lack of low-stress routing options for bicyclists and pedestrians along SR 29;

- Lack of public transit lanes, facilities and pull outs for stops;
- Lack of aesthetic benefits of landscaping along the corridor to help define American Canyon's “Main Street;
- Unprotected overhead utility poles within the State right-of-way are within the clear recovery zone;
- Regional traffic congestion hinders customer access to American Canyon’s “Main Street” commercial businesses;
- Constraints at intersections cause extensive queuing, delays, and bottlenecks, resulting in unreliable travel times for both motorists and public transit and traffic diverting to residential streets;
- Compromised feasibility to provide enhanced transit service due to travel time unreliability;
- Increased safety risk and conflicts between motorists and active transportation users due to unseparated facilities and high speed differentials; and
- Increased response times for public safety vehicles.

Description of work

SR 29 is a major throughway through the City of American Canyon in Napa County. The Napa County Transportation Authority, in partnership with Caltrans District 4 and the City of American Canyon, is seeking to provide multiple multimodal improvements along SR 29, within American Canyon city limits, in order to address significant safety and operational issues.

Alternative selection will be made from those described below, to achieve the project’s desired multimodal and safety improvements.

Alternatives

In addition to the No Build Alternative, two build alternatives have been identified:

- **No Build Alternative:** The No Build Alternative assumes the existing land geometrics, traffic control, and pedestrian and bicycle facilities would remain the same. No intersection improvements, pedestrian and bicycle facilities, or corridor management systems would be improved or installed.
- **Build Alternative 1 – Comprehensive Multimodal Corridor Plan(CMCP) 4-Lane Alternative:** This alternative is largely consistent with the SR 29 CMCP and includes the construction of multimodal improvements adjacent to the shoulders of SR 29. Overall improvements are as follows:
    - Maintain SR 29 at 4 lanes, reducing lane widths to 11 feet
    - Construct island separated Class I facilities adjacent to SR 29 in both directions. Island width is 5 feet for both directions. A separation width of 3’ (not including 2’ Class I shoulder) could be utilized in right of way restrictive situations, still providing a HDM standard design.
    - Construct 18’ paved median (14’ island and two 2’ shoulders)

- Widen shoulders to 12' (including 2' gutter pan) to allow for part time bus on shoulder (queue jumps)
- Reconfigure and improve intersections along the corridor.

- **Alternative 2 - Roundabouts along SR 29:** Alternative 2 would construct roundabouts along SR 29 between Crawford Way and Napa Junction Road. Due to high turning and side street volumes, American Canyon Road would remain a traffic signal. Alterative 2 proposes a 4-lane corridor similar to Alternative 1, with the exception that there would be no bus on shoulder improvements (queue jumps) to accommodate free flow traffic. The corridor would be widened to 6 lanes approaching the intersections. Roundabouts are proposed to increase overall circulation while providing traffic calming and enhanced intersection safety for all users. A separated Class I bikeway would be constructed along both directions of the roadway with adjacent sidewalk spanning the length of the project.

During construction of the Alternatives 1 and-2, work would generally occur during the day (7:00 a.m. -7:00p.m.). No night work is anticipated. Staging of construction equipment would occur within Caltrans right-of-way, a Caltrans-owned parcel, and a City of American Canyon-owned parcel. Utility relocation is anticipated to be required under both alternatives in order to underground existing utility lines

It is anticipated that temporary construction easements and right-of-way acquisition would be needed in several areas under each of the build alternatives. Alternative 2 would likely require a greater amount of right-of-way acquisition than Alternative 1 in order to accommodate the roundabouts and additional roadway lanes.

Based on the PSR-PDS Report prepared by GHD for the City of American Canyon, Alternative 1 would increase efficiency of the roadway via the least intrusive construction phase. However, Alternative 2 may provide more long-term solutions to the congestion and excessive queuing issues currently plaguing the roadway. Alternative 2 would require additional take of right-of way and would be more expensive to implement.

3. Anticipated Environmental Approval

CEQA (choose one):

☐ Exemption

☐ Statutory ☐ Categorical ☐ Common Sense

☒ Initial Study or Focused Initial Study with proposed Negative Declaration (ND) or Mitigated ND

☐ Environmental Impact Report

NEPA (choose one):

☒ Categorical Exclusion

☐ Environmental Assessment with Finding of No Significant Impact

☐ Routine ☐ Complex

☐ Environmental Impact Statement

CEQA Lead Agency (if determined): Caltrans
Estimated length of time (months) to obtain environmental approval: 18 months
Estimated person hours to complete identified tasks: Not applicable, The project is not a reimbursable project, with the exception of the PID phase. Per direction from Caltrans PM, estimating Caltrans level of effort for subsequent project delivery phases is not necessary. Support Hours for oversight have been excluded because they are not needed.

4. Special Environmental Considerations

The proposed project is located in a fairly developed area and is not expected to require unusual, exceptional, or extended environmental processes. Vegetation in the project area is generally limited to ornamental landscape plantings and/or ruderal vegetation. Special-status species may be present. Some portions of the roadway would need to be widened; this could impact a drainage channel and may be subject to U.S. Army Corps of Engineers, Regional Water Quality Control Board, and California Department of Fish and Wildlife jurisdiction.

Pursuant to Senate Bill 743 and the current CEQA Guidelines, evaluation of the project's potential transportation impacts will require consideration of vehicle miles traveled (VMT), which refers to the amount and distance of automobile travel attributable to a project. Transportation projects that reduce or have no impact on VMT are presumed to cause a less than significant transportation impact. For roadway capacity projects, agencies have discretion to determine the appropriate measure of transportation impact consistent with CEQA and other applicable requirements. The purpose of the project is to provide multiple multimodal improvements along SR 29, within American Canyon city limits, in order to address significant safety and operational issues. The project does not add additional motor vehicle capacity and is not anticipated to require an induced vehicle travel analysis.

5. Anticipated Environmental Commitments

The anticipated NEPA environmental document for the proposed project is a Categorical Exclusion with supporting technical studies. This document level has been selected based on the minimal environmental constraints present in the project study area and the low potential for the project (including all the alternatives) to cause significant environmental impacts with incorporation of standard mitigation commitments. Caltrans would serve as the NEPA lead agency under its assumption of responsibility pursuant to 23 U.S. Code 327. The environmental technical reports and

Categorical Exclusion would take approximately 18 months to prepare and process, including time for substantive review by environmental division staff with Caltrans.

The anticipated CEQA document for the proposed project is an Initial Study/Mitigated Negative Declaration. NVTA would serve as the CEQA lead agency for the project, if delegated by Caltrans. The environmental document is anticipated to take approximately 14 months to prepare and process, including time for substantive review by the environmental division staff with Caltrans. Any changes in scope will require further project review and reassessment of the level of environmental documentation.

Please refer to Attachment A (PEAR Environmental Studies Checklist) for an overview of which environmental studies would be required during PA&ED, and Attachment B for an estimated schedule. A Mitigation and Compliance Cost Estimate and Cost Considerations are not required to be attached. The PSR-PDS will include (as a separate attachment from the PEAR) cost estimates for both alternatives.

6. Permits and Approvals

It is assumed that temporary construction easements (TCEs) will be needed on a majority of the parcels in order to conform the proposed improvements to the existing land uses. The extent of TCE's needed will be explored in further detail in the PA/ED Phase of the project but is conservatively assumed to require 20' from ROW.

Anticipated permits for the project would be further confirmed during the PA&ED phase. Some existing culverts would be extended but would not adversely affect capacity or ability to convey water through the project site. The project would also include improvements made within Caltrans and City right-of-way. The following permits or approvals may be required for the project:

- U.S. Army Corps of Engineers (Corps) – Section 404 Nationwide Permit (anticipated to be NWP 14, Linear Transportation Projects)
- State Historic Preservation Officer (SHPO) - Section 106 Consultation
- Regional Water Quality Control Board - 401 Water Quality Certification
- State Water Resources Control Board (SWRCB) – General Storm Water Construction Permit
- California Department of Fish and Wildlife (CDFW) - Streambed Alteration Agreement
- Caltrans encroachment permit - Improvements made within a Caltrans right-of-way

7. Level of Effort: Risks and Assumptions

The following considerations (see Chapter 5 of the Standard Environmental Reference; SER) can affect the level of effort and resources needed for the environmental analysis.

Assumptions	Risk Statement	Risk Probability	Risk Impact		
			Schedule	Cost	Scope
It is assumed no special-status species will be adversely impacted in the project area.	If it is found later that special status species are present within the project area and will be adversely impacted, then additional permits, avoidance measures, minimization measures, and/or mitigation will be necessary.	2	Moderate	High	Moderate
It is assumed no nesting birds will be observed in the project area.	If a nesting bird is observed within the project area, then the construction may be delayed in the buffer area until the chicks have fledged. This will add time and cost to the project.	2	Low	Low	Very Low
It is assumed permits to enter from property owners will be necessary.	If no permission is given by the property owners, then this could delay or prevent field surveys and delay environmental studies.	2	Moderate	Moderate	Moderate
It is assumed the scope of the project will not be increased.	If the scope of the project increases, then this may increase the length and time of the environmental studies or revalidation, increase the project cost, elevate the document level, and delay the project schedule.	1	Very High	Very High	Very High
It is assumed access to land for cultural studies will be obtained promptly.	Risk of delaying cultural surveys due to inability to obtain access to land (private PTEs and/or public land -ARPA, etc.) in an adequate timeframe would lead to delay in PA&ED studies.	1	Moderate	Low	Very Low
It is assumed no built environment resources requiring additional study or consultation will be identified.	Risk of identification of built environment resource(s) within the APE during cultural resource surveys that require additional documentation, evaluation, and/or consultation with consulting parties, would result in an additional 3-12 months and $50,000-$100,000.	2	High	High	Moderate
It is assumed the project will not adversely impact a historic built environment resource.	Risk of adversely impacting a historic built environment resource, will require the preparation of an MOA in consultation with consulting parties and establishment of mitigation measures (e.g., Data Recovery), which would result in an additional 12-24 months and $100,000-$200,000.	2	Very High	High	Moderate
It is assumed the project will not	Risk of adversely impacting a historic or pre-historic	2	High	Moderate	Moderate

Assumptions	Risk Statement	Risk Probability	Risk Impact		
			Schedule	Cost	Scope
adversely impact a historic or pre-historic archaeological resource.	archaeological site, will require the preparation of an MOA in consultation with consulting parties and establishment of mitigation measures (e.g. Data Recovery), which would result in an additional 12-24 months and $100,000-$200,000.				
It is assumed no buried cultural materials will be found at the work site.	If buried cultural materials are encountered during construction, it is Caltrans' policy that work stop in that area until a qualified archaeologist can evaluate the nature and significance of the find.	2	Very High	Very High	Moderate
It is assumed tree removal or trimming would occur outside of the nesting bird season (February 1st –September 31st).	If tree removal or trimming does occur during the nesting bird season and nesting birds were encountered work would be stopped and a biologist would be needed to implement a buffer and monitor the nesting birds until they fledge.	3	Moderate	Moderate	Moderate
It is assumed preparation of an Initial Study / Mitigated Negative Declaration will satisfy CEQA requirements.	If there are potential environmental impacts that cannot be mitigated below a level of significance, an Initial Study/Mitigated Negative Declaration will not be appropriate, and an Environmental Impact Report may be required to satisfy CEQA requirements.	2	High	High	High

Risk Probability Ranking	
Ranking	Probability of Risk Event
5	60-99%
4	40-59%
3	20-39%
2	10-19%
1	1-9%

Evaluating Impact of a Threat on Project Objectives						
Impact		Very Low	Low	Moderate	High	Very High
Objectives	Time	Insignificant Schedule Slippage	Delivery Plan Milestone Delay within quarter	Delivery Plan milestone delay of one quarter	Delivery Plan milestone delay of more than one quarter	Delivery Plan milestone delay outside of fiscal year
	Cost	Insignificant Cost Increase	<5% Cost Increase	5-10% Cost Increase	10-20% Cost Increase	>20% Cost Increase
	Scope	Scope decrease is barely noticeable	Changes in project limits or features with <5% Cost Increase	Changes in project limits of features with 5-10% Cost Increase	Sponsor does not agree that Scope meets the purpose and need	Scope does not meet purpose and need

8. PEAR Technical Summaries

The following paragraphs focus on topics that will need environmental review, consistent with the PEAR Environmental Studies Checklist (Attachment A).

8.1 Land Use:

The proposed project site is located within an urbanized area of the City of American Canyon. The project site is located within Caltrans right-of-way and generally bordered by land uses designated and zoned as community commercial and commercial neighborhood. There are 20 parcels zoned community commercial, and two parcels zoned commercial neighborhood with a residential overlay. Existing land uses in the immediate vicinity of the project site include commercial uses such as car washes, gas stations, grocery stores, churches, nursery, a few open lots, and several single-family residences.

Temporary construction easements (TCE) and acquisition of right-of-way would be required from the adjacent parcels along the length of the project footprint under all three alternatives. Alternative 2 would likely require additional acquisition of right-of way compared to Alternative 1 in order to accommodate the roundabouts and additional roadway lanes proposed. It is assumed that a land use memo would be prepared during PA&ED.

The project site is not located within any publicly owned parks or recreational areas, however there are several public parks within a quarter mile of the project site. No right-of-way acquisition or temporary construction easements would be required within these recreational facilities. Therefore, it is not expected that the project would affect any Section 4(f) resources. It is anticipated that a no use memo would be prepared during PA&ED.

8.2 Growth:

Based on the historical and current population, housing, and employment trends, growth in the region and within the project area is inevitable. Although the project has been designed to accommodate anticipated levels of growth, implementation of the project itself would not construct residential housing developments or include development approvals that would induce growth beyond what is planned or being planned by local jurisdictions. Therefore, the project would not result in the conversion of adjacent land uses or improve access in ways that would foster local development beyond that which is already planned.

8.3 Farmlands/Timberlands:

The project is generally located within a commercial area/corridor. No farmlands or timberlands exist within the project area and therefore, none would be impacted as a result of the project.

8.4 Community Impacts:

The project study area is located in the City of American Canyon, in Napa County. According to the 2010 US Census, the City of American Canyon had a population of 19,454, consisting of 38.9% White, 7.9% African American, 0.7% Native American, 32.9% Asian, 0.9% Pacific Islander, 12.1% from other races, and 6.6% from two or more races. As of 2000, the median income for a household in the City was $52,105, and the median income for a family was $61,536. Out of the total population, 9.6% of those under the age of 18 and 10.6% of those 65 and older were living below the poverty line.

Although project construction would be temporary, it would take place over a period of months and could be disruptive to the local area. Lane closures, detours, and other construction over extended periods could temporarily impact local residents and businesses and result in temporary negative economic impacts as a result of lost business and/or increased commute times. However, in the long term, the Build Alternatives would provide necessary multimodal circulation infrastructure and enhanced safety within the Napa County transportation system. A Land Use and Community Impact Technical Memo would be prepared in support of the project during the PA&ED phase.

8.5 Visual/Aesthetics:

The Alternative 1 improvements would likely result in minor changes to the built environment, including new / improved shared use paths, and the potential widening of roadway surfaces at limited and specified locations. These improvements would likely result in minor impacts to a variety of existing paved and vegetated surface conditions. Project impacts to permanent irrigated landscapes would require retrofit or replacement

of existing landscaping and/or irrigation systems. Any impacts to vegetation currently acting as a visual screen would also require replacement.

Alternative 2 would result in a greater change to the existing built environment than Alternative 1, as Alternative 2 would include the construction and operation of new roundabouts and of two additional travel lanes on the roundabout approaches and through the intersections. Additional undeveloped areas would be converted to paved roadway when compared to Alternative 1. The intersection improvements under both alternatives would largely be consistent with the current visual character of the project site given it is generally characterized as a major throughway through American Canyon.

A Visual Impact Assessment (VIA) Questionnaire to identify potential visual impacts associated with the proposed project improvements was prepared by Lucas Piper, LLA., No. 5873. The Questionnaire resulted in a score of 14 points for Alternative 1, and 16 points for Alternative 2. The visual character of the site under each alternative would remain a heavily trafficked highway. Therefore, it is anticipated that the proposed improvements are expected to be largely consistent with the existing visual environment, however either a brief memorandum or a minor VIA addressing visual issues should be prepared.

8.6 Cultural Resources:

A review of the Northwestern Information Center (NWIC) was requested on June 29, 2020. The NWIC reviewed base maps that reference cultural resource records and reports, historic-period maps, and literature for Napa County. Through this review, it was determined that there have been 68 cultural resource studies that cover a portion of the proposed project area. Within the project area or immediately adjacent to it there are seven recorded archaeological resources, included two recorded Native American archaeological resources and five historic period archaeological resources. The State Office of Historic Preservation Built Environment Resources Directory (OHP BERD), which includes listings of the California Register of Historical Resources, California State Historical Landmarks, California State Points of Historical Interest, and the National Register of Historic Places, lists four recorded buildings or structures within or adjacent to the proposed project area. Therefore, there is potential for the project to encounter cultural and historical resources during construction of the proposed project.

Alternative 2 would result in a greater area of disturbance in comparison to Alternative 1. This would increase the possibility of encountering unknown cultural or historical resources present within the construction footprint and would result in potential increase in impacts to cultural resources. Alternative 1 would reduce potential impacts to cultural resources to the extent feasible.

It is anticipated that an Archaeological Survey Report (ASR), Historic Property Survey Report (HPSR), and potentially a Historic Resources Evaluation Report (HRER) would be prepared during the PA&ED phase. The Project would also comply with the Caltrans Section 106 Programmatic Agreement, as well as Section 106 Consultation. AB 52

Tribal consultation will also be required per state law. This additional research and consultation will be provided during the PA&ED phase.

8.7 Hydrology and Floodplain:

The project is not located in a Federal Emergency Management Agency (FEMA)-designated 100-year floodplain and would not adversely impact drainage or flood risk in the area. Some existing culverts would be extended but would not adversely affect capacity or ability to convey water through the project site.

8.8 Water Quality and Storm Water Runoff:

The project site is not located within or immediately adjacent to a body of water such as a river or creek. However, there are several riverine drainages located adjacent to SR 29. Since Alternative 1 may require the roadway be widened marginally to allow for the additional bus queues, lanes and multi-use paths, it has the potential to impact these drainages. Alternative 2 would widen the roadway significantly more than under the Alternative 1, which may result in increased impacts to adjacent drainages.

An aquatic resource delineation will need to be conducted to determine if these drainages are jurisdictional and their extent. If they are determined to be jurisdictional, regulatory agency permits may be required to ensure potential impacts to these jurisdictional features are minimized to the extent feasible and adequately mitigated for. An evaluation of potential water quality impacts would be prepared during PA&ED.

Citations:

NWI, National Wetlands Inventory. 2020. National Wetlands Inventory mapper. July. Accessed July 2020. https://www.fws.gov/wetlands/data/Mapper.html

8.9 Geology, Soils, Seismic and Topography:

Napa County is located within the California Coast Range geomorphic province, a geologically complex and seismically active region. The project site is located within the southern portion of the County. This area is generally flat, therefore the risk of landslides in the area is considered low. The West Napa, Concord-Green Valley, and Rogers Creek are the three faults closest to the City of American Canyon. Fault rupture and ground shaking are the most likely seismic hazards along the project corridor. Native soils in the project vicinity include Clear Lake clay, Haire clay loam, and Fagan clay loam. A geotechnical investigation would be prepared to address geotechnical constraints for the project during the PA&ED phase. The geotechnical report shall be submitted to Caltrans when completed.

8.10 Paleontology:

The project would include construction-related excavation; however, the project area is not known for having a high sensitivity for paleontological resources or resources on the

National Registry of Natural Landmarks. Paleontological resources are not anticipated at the project site and a clearance memo will be prepared during the PA&ED phase.

8.11 Hazardous Waste/Materials:

The project area is located within a fairly urban environment. According to the State Water Resources Control Board GeoTracker database, there are eight recorded hazardous material sites along and within the immediate vicinity of Alternative 1. All eight of these sites are designated "case closed" and no additional remedial action needs to be taken (GeoTracker 2020). Therefore, it is unlikely that hazardous material would be encountered during construction phase of Alternative 1. Alternative 2 would disturb a slightly greater area than Alternative 1, but no additional closed or open cases would overlap with the footprint of this alternative beyond what was assessed for Alternative 1. Therefore, impacts resulting from potential exposure to hazardous material sites would be similar under all alternatives.

Additionally, the project site, inclusive of the extent of the larger footprint of Alternative 2, is not located within a Federal Emergency Management 100-year flood zone (FEMA 2020), nor is it located within a high hazard fire zone (Napa County). Therefore, it is not anticipated that any of the alternatives would be affected by floods or fire hazards.

Citations:

Federal Emergency Management Agency (FEMA). 2020. Flood Insurance Rate Maps. July. Accessed July 2020.

Napa County. 2014. Wildland Fire Background Report.

Office of Planning and Research. 2018. Technical Advisory on Evaluating Transportation Impacts in CEQA. December

State Water Quality Control Board. 2020. GeoTracker. June. Accessed June 2020.

8.12 Air Quality:

The project area is designated as nonattainment of the federal ozone and fine particulate matter (PM2.5) standard, and nonattainment for the state ozone, and suspended particulate matter (PM2.5 and PM10) standards. The project area is designated as either attainment or unclassified for all other federal and state ambient air quality standards. Ozone is not emitted directly into the air, but is a regional pollutant formed by a photochemical reaction in the atmosphere. Ozone precursors, reactive organic gases (ROG), and nitrogen oxides (NOx) react in the atmosphere in the presence of sunlight to form ozone.

Project construction would result in regional air pollutant and precursor emissions from equipment exhaust and worker trips to the project site. The types of air pollutants generated by construction activities are typically NOx and particulate matter, such as

dust and exhaust. Construction activities could temporarily increase levels of PM2.5 and PM10 downwind of construction activity. These are temporary emissions that vary considerably from day-to-day and by the type of equipment and weather. In addition, carbon monoxide (CO) and reactive organic gases (ROG) are emitted during use of gas and diesel-powered construction-equipment. Construction of Alternative 1 is anticipated to occur over approximately 7 months. Alternative 2 would require a longer construction period, due to the additional intersection improvements proposed and the widening of the roadway.

As provided by the Bay Area Air Quality Management District's (BAAQMD's) 2017 CEQA Air Quality Guidelines (Guidelines), if the project meets the screening criteria for an impact category and is consistent with the methodology used to develop the screening criteria, then its air quality impact for that category may be considered less than significant. The BAAQMD's Guidelines provides screening criteria for determining whether a project could potentially result in significant construction-phase impacts from criteria pollutants and precursors. Construction of the project would result in a less than significant impact to air quality if the following screening criteria are met:

- The project is below the applicable screening level size shown in Table 1 [of the BAAQMD 2017 CEQA Air Quality Guidelines].
- All Basic Construction Mitigation Measures are included in the project design and implemented during construction.
- Construction-related activities would not include any of the following:
    - Demolition activities inconsistent with District Regulation 11, Rule 2: Asbestos Demolition, Renovation and Manufacturing;
    - Simultaneous occurrence of more than two construction phases;
    - Simultaneous construction of more than one land use type;
    - Extensive site preparation; or
    - Extensive material transport (e.g., greater than 10,000 cubic yards of soil import/export) requiring a considerable amount of haul truck activity.

The BAAQMD does not have a screening level specific for transportation infrastructure construction. For reference, the applicable construction criteria pollutant and precursor screening level for a city park is 600 acres of construction. The applicable construction screening level for general heavy industry land use or an industrial park is 11 acres. At an estimated construction footprint of 6 acres or less, the project would be less than the BAAQMD's construction criteria pollutant and precursor screening level.

Demolition activities would not require the removal of asbestos. The project would not involve the simultaneous occurrence of more than two construction phases and would not impact more than one land-use type (commercial). The project would not involve extensive site preparation or material transport. The project incorporates the basic construction measures recommended through design specifications. However, the volume of materials import and export is currently unknown. If the project's import/export volume remains under 10,000 cubic yards total, then the project's construction activity would not exceed the BAAQMD's screening guidance and would not generate a significant air quality impact. However, if the project's import/export

volume meets or exceeds 10,000 cubic yards total, additional analysis would be required to substantiate a significance determination.

The operational phase of the project is anticipated to improve traffic operations, reduce delay, and reduce existing and projected long-term traffic congestion. The project would not increase the operational emissions above existing operations, and would not result in a significant air quality impact if the following criteria are met:

- The project is not capacity-enhancing, and
- The project would improve, or reduce, operational emissions as a result of increased efficiency and decreased delay.

This project could include the use of federal funds, as such, it is assumed that the Federal Transportation Conformity Rule applies. An Air Quality Conformity analysis is required for both of the Build Alternatives.

Construction-related air quality impacts would be similar among Alternatives 1 and 2. Alternative 1 would upgrade signals at intersections and would widen the roadway at intersections and along the entire corridor, whereas Alternative 2 would involve the construction of roundabouts (which could incrementally increase the duration of construction) and would widen the corridor to 6 lanes approaching the roundabouts.

For operational air quality impacts, the removal of signalized intersections and additional travel lanes proposed under Alternative 2 would likely reduce travel times and the associated idling of vehicles. Congestion and traffic flow would also be anticipated to improve with Alternative 2. Operational air quality impacts would be generally similar in magnitude as compared to Alternative 1. Roundabout design and performance would need to be evaluated, and Interagency Consultation (IAC) may need to be conducted to determine if the project is not a Project of Air Quality Concern (POAQC). An Air Quality Conformity Analysis will be prepared during PAED phase or before PS&E phase.

8.13 Noise and Vibration:

Sensitive noise receptors near the project site primarily consist of nearby single-family homes. These homes are located in the High Residential (HR) zone, Suburban Residential (RS-6500), and Medium Residential (RM) zone. Per American Canyon City Code §8.12.070, residential single and double development may not experience sound levels of 60 dBA or greater between 7:00 a.m. and 10:00 p.m., or 50 dBA between 10:00 p.m. and 7:00 a.m. Additionally, multiple residential uses may not experience sound levels of 60 dBA or greater between 7:00 a.m. and 10:00 p.m., or 55 dBA between 10:00 p.m. and 7:00 a.m. Section 8.12.080 of the American Canyon Municipal Code restricts construction noise levels at residential uses to 75 dBA from 7:00 a.m. to 7:00 p.m. and 60 dBA from 7:00 p.m. to 7:00 a.m.

Both alternatives would use similar construction equipment, and construction activity would be comparable in duration. The two alternatives would have similar types of noise impacts at adjacent residences and sensitive receptors.

The project includes addition of a through traffic lane and is considered a Type I project per 23 CFR 772 and therefore requires a traffic noise study. This includes construction noise and construction vibration analyses. The noise analysis will evaluate noise levels during construction at residences in the immediate vicinity of the project site or if there would be proposed travel lanes closer to noise sensitive land uses (homes) than under existing conditions. The other surrounding land uses are commercial or industrial in nature and are not considered sensitive noise receptors.

8.14 Energy and Climate Change:

Construction activities for Alternative 1 would be limited in scope and duration, consisting of improvements to approximately 1.7 mile of roadway and lasting less than a year. In addition, the project does not include construction activities associated with higher greenhouse gas (GHG) emissions such as the use of significant amount of heavy construction equipment, substantial earth-moving activities, or import/export of a significant amount of material. Alternatives 1 and 2 would be similar with respect to the duration of construction and use of heavy equipment. However, quantification of construction emissions is required and should be prepared for the project file. The same emissions analysis can be used for both GHG and Air Quality.

The project is anticipated to improve traffic operations and safety, as well as provide some reduction in traffic delay and existing and projected long-term traffic congestion. Alternative 1 would not increase the operational GHG emissions above existing operations, and would not result in a significant GHG impact if the following criteria are met:

- The project is not capacity-enhancing, and
- The project would improve, or reduce, operational emissions as a result of increased efficiency and decreased delay.

However, as a congestion relief project, a quantitative analysis for operational and construction GHG emissions would be required. Quantification of operational GHG emissions was included as part of the ICE report prepared for the project and should be identified in a Climate Change Memorandum. Fuel consumption estimates for all alternatives would be calculated for each alternative. Measures to reduce GHG emissions will be necessary and should be accounted for in the cost estimate for all project alternatives.

The proposed project site is outside the coastal zone and not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected. The project location is just outside of the area identified as ‘moderate’ level of concern for wildfire exposure in the 2025, 2055, and 2085 RCP 8.5 climate change scenario. However, given the recent history of wildfires in Napa and

Sonoma Counties, it is acknowledged that wildfires are an ever-present risk throughout the general project vicinity.

Construction of both alternatives would generate GHG emissions; however, Alternative 2 result in slightly greater construction GHG impacts from inclusion of roundabouts and associated approach lanes. Operational GHG impacts may be reduced under Alternative 2 compared to Alternative 1, as the addition of travel lanes approaching the roundabouts would reduce the travel times of vehicles.

Half of California's GHG emissions are generated by the transportation sector, therefore, reducing Vehicle Miles Traveled (VMT) is considered an effective strategy in pursuing California's long-term climate goals. Projects that are capacity enhancing, such as the addition of through lanes on existing or new highways, would likely lead to a measurable and substantial increase in vehicle travel (OPR 2018). While Alternative 2 improves corridor and intersection operations, it is not anticipated to significantly enhance capacity, as the additional travel lanes would not be implemented along the entirety of the project, only at the approaches to each of the roundabouts. Alternative 1 would not provide any additional capacity and therefore is unlikely to result in an impact related to VMT.

Direct impacts from the environmental effects of climate change (i.e., sea-level rise, wildfire) would be the same for both alternatives.

8.15 Biological Environment:

A public records request was submitted to Caltrans for any recent biological reports prepared for projects within the vicinity of the proposed project site. Two biological reports, prepared in December 2018 and January 2019, respectively, were provided that partially overlap with the project area. The project area is generally developed; however, a previously identified drainage ditch is located within the proposed project footprint. Several special-status species with potential to occur were also identified, including California red-legged frog (CRLF) and western pond turtle. Informal USFWS consultation is assumed to be required. A seasonal work window will likely be required for CRLF avoidance. Alternative 1 may impact a drainage channel or other sensitive resources as some portions of the roadway would need to be widened. Alternative 2 would most likely have a greater impact to habitat and wildlife in the area with construction of the roundabouts and approach travel lanes in comparison to Alternative 1 and may also encroach into a drainage channel and adjacent riparian habitat. A wetland delineation and Natural Environment Study would need to be prepared during PA&ED.

Citations:

Caltrans. 2019. Natural Environment Study Culvert Replacement and Rehabilitation Project. January.

Caltrans. 2018. Natural Environment Study (Minimal Impacts) SR 29 ADA Compliance Upgrades. December.

8.16 Cumulative Impacts:

Cumulative impacts occur as a result of the combined action of multiple projects. Even when an individual project does not have significant impacts, in combination with other related projects, these cumulative effects may be considerable. The cumulative study area is largely built-out or planned for future development projects. Any project-related cumulative impacts resulting from the proposed project, combined with other projects in the vicinity, will be evaluated in the PA&ED phase.

8.17 Context Sensitive Solutions:

Caltrans uses Context Sensitive Solutions (CSS) as the approach to plan, design, construct, maintain, and operate its transportation system. CSS uses innovative and inclusive approaches that integrate and balance community, aesthetic, historic, and environmental values with transportation safety, maintenance, and performance goals and is reached through a collaborative, interdisciplinary approach involving all stakeholders. In order to ensure that CSS is fully integrated into the project development process, careful, imaginative, and early planning is required along with continuous community involvement. As proposed, the project is a Context Sensitive Solution. The Napa Valley Transportation Authority has conducted a previous public outreach process for the project as part of the SR29 Comprehensive Multi-Modal Corridor Plan (CMCP). The City of American Canyon also engaged with the community during preparation of its Gateway Corridor Plan. These efforts acknowledged the importance of developing a project design that meets the community's needs, including evaluation of the project pursuant to CEQA. During the subsequent NEPA environmental phases of the project, appropriate opportunities for public involvement will be provided including various community outreach meetings.

9. Summary Statement for PID

The anticipated NEPA environmental document for the proposed project is a Categorical Exclusion with supporting technical studies. This document level has been selected based on the minimal environmental constraints present in the project study area and the low potential for the project (including all the alternatives) to cause significant environmental impacts with incorporation of standard mitigation commitments. Caltrans would serve as the NEPA lead agency under its assumption of responsibility pursuant to 23 U.S. Code 327. The environmental technical reports and Categorical Exclusion would take approximately 18 months to prepare and process, including time for substantive review by environmental division staff with Caltrans. Any changes in scope will require further project review and reassessment of the level of environmental documentation.

It is anticipated that an Initial Study/Mitigated Negative Declaration (IS/MND) will need to be prepared. The IS/MND would include appropriate mitigation measures that would mitigate any impacts identified in the document. NVTA would serve as the CEQA lead agency for the project, if delegated by Caltrans. It is anticipated that the IS/MND would take approximately 14 months to prepare and process, including time for substantive

review by environmental division staff with Caltrans and Napa County. Any changes in scope will require further project review and reassessment of the level of environmental documentation.

Please refer to Attachment A (PEAR Environmental Studies Checklist) for an overview of which environmental studies would be required during PA&ED, and Attachment B for an estimated schedule. A Mitigation and Compliance Cost Estimate and Cost Considerations are not required to be attached. The PSR-PDS will include (as a separate attachment from the PEAR) cost estimates for both alternatives.

10. Disclaimer

This Preliminary Environmental Analysis Report (PEAR) provides information to support programming of the proposed project. It is not an environmental determination or document. Preliminary analysis, determinations, and estimates of mitigation costs are based on the project description provided in the PID. The estimates and conclusions in the PEAR are approximate and are based on cursory analyses of probable effects. A reevaluation of the PEAR will be needed for changes in project scope or alternatives, or in environmental laws, regulations, or guidelines.

11. List of Preparers

Cultural Resources specialist: Charles Smith	Date: 2/17/22
Biologist: Elizabeth Meisman	Date: 2/17/22
Community Impacts specialist: Charles Smith	Date: 2/17/22
Noise and Vibration specialist: Charles Smith	Date: 2/17/22
Air Quality specialist: Chryss Meier	Date: 2/17/22
Paleontology specialist/liaison: Charles Smith	Date: 2/17/22
Water Quality specialist: Charles Smith	Date: 2/17/22
Hydrology and Floodplain specialist: Charles Smith	Date: 2/17/22
Hazardous Waste/Materials specialist: Charles Smith	Date: 2/17/22
Visual/Aesthetics specialist: Lucas Piper	Date: 2/17/22
Energy and Climate Change specialist: Chryss Meier	Date: 2/17/22
Other: Charles Smith	Date: 2/17/22
PEAR Preparer (Name and Title): Charles Smith, Group Lead	Date: 2/17/22

12. Review and Approval

I confirm that environmental cost, scope, and schedule have been satisfactorily completed and that the PEAR meets all Caltrans requirements. Also, if the project is scoped as a routine EA, complex EA, or EIS, I verify that the HQ DEA Coordinator has concurred in the Class of Action.

Tom Roseveare — November 6, 2022

Environmental Branch Chief — Date

Amani Meligy — November 29,2022

Project Manager — Date

ATTACHMENTS:

Attachment A: PEAR Environmental Studies Checklist
Attachment B: Schedule (Gantt Chart)

Attachment A

PEAR Environmental Studies Checklist

Attachment A: PEAR Environmental Studies Checklist
State Route 29 American Canyon Corridor Project

Environmental Study	Not anticipated	Memo to file	Report required	Risk	Comments
Land Use	☐	☒	☐	L	Enter comments
Wild and Scenic River Consistency	☒	☐	☐	L	Enter comments
Coastal Management Plan	☒	☐	☐	L	Enter comments
Growth	☒	☐	☐	L	Enter comments
Farmlands/Timberlands	☒	☐	☐	L	Enter comments
Community Impacts	☐	☒	☐	L	Enter comments
Community Character and Cohesion	☒	☐	☐	L	Enter comments
Relocations	☒	☐	☐	L	Enter comments
Environmental Justice	☒	☐	☐	L	Enter comments
Utilities/Emergency Services	☒	☐	☐	L	Enter comments
Traffic/Transportation	☐	☒	☐	L	Enter comments
SB743/Induced Travel	☐	☐	☐	L	Enter comments
Visual/Aesthetics	☐	☒	☐	L	Enter comments
Cultural Resources:	☐	☐	☐	M	Enter comments
Archaeological Survey Report	☐	☐	☒	M	Enter comments
Historic Resources Evaluation Report	☐	☐	☒	M	Enter comments
Historic Property Survey Report	☐	☐	☒	M	Enter comments
Historic Resource Compliance Report	☒	☐	☐	L	Enter comments
Section 106 / PRC 5024 & 5024.5	☐	☒	☐	M	Enter comments
Native American Coordination	☐	☒	☐	M	Enter comments
Finding of Effect	☐	☐	☒	M	Enter comments
Data Recovery Plan	☒	☐	☐	L	Enter comments
Memorandum of Agreement	☒	☐	☐	L	Enter comments
Other: Enter other study	☒	☐	☐	L	Enter comments
Hydrology and Floodplain	☒	☐	☐	L	Enter comments
Water Quality and Stormwater Runoff	☐	☒	☐	L	Enter comments
Geology, Soils, Seismic and Topography	☒	☐	☐	L	Enter comments
Paleontology	☒	☐	☐	L	Enter comments
PER	☐	☐	☐	L	Enter comments
PMP	☐	☐	☐	L	Enter comments
Hazardous Waste/Materials:	☐	☐	☐	L	Enter comments
ISA (Additional)	☐	☒	☐	L	Enter comments
PSI	☒	☐	☐	L	Enter comments
Other: Enter other study	☒	☐	☐	L	Enter comments
Air Quality	☐	☐	☒	L	Enter comments

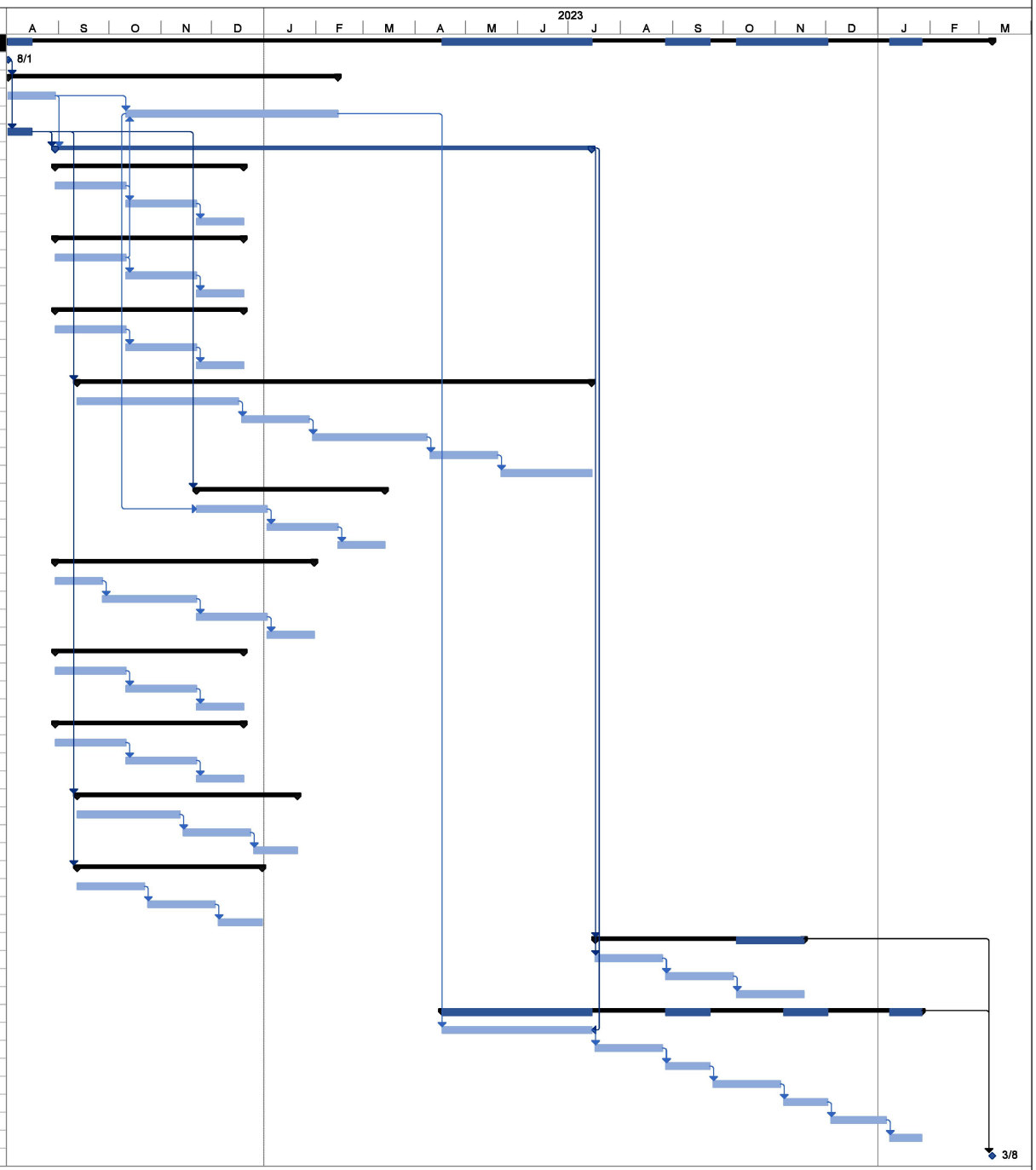
Environmental Study	Not anticipated	Memo to file	Report required	Risk	Comments
Noise and Vibration	☐	☒	☐	L	Enter comments
Energy	☒	☐	☐	L	Enter comments
Climate Change and Sea Level Rise	☒	☐	☐	L	Enter comments
Biological Environment	☐	☒	☐	M	Enter comments
Fish Passage	☒	☐	☐	L	Enter comments
Wildlife Connectivity	☒	☐	☐	L	Enter comments
Natural Environment Study	☐	☐	☒	L	Enter comments
Biological Assessment Section 7:	☒	☐	☐	L	Enter comments
Formal	☐	☐	☐	L	Enter comments
Informal	☐	☐	☐	L	Enter comments
No effect	☐	☐	☐	L	Enter comments
Section 10	☒	☐	☐	L	Enter comments
USFWS Consultation	☐	☒	☐	L	Enter comments
NMFS Consultation	☒	☐	☐	L	Enter comments
Species of Concern (CNPS, USFS, BLM, S, F)	☒	☐	☐	L	Enter comments
Wetlands & Other Waters/Delineation	☐	☒	☐	L	Enter comments
404(b)(1) Alternatives Analysis	☒	☐	☐	L	Enter comments
Invasive Species	☒	☐	☐	L	Enter comments
HMMP	☒	☐	☐	L	Enter comments
CDFW Consistency Determination	☒	☐	☐	L	Enter comments
2081	☒	☐	☐	L	Enter comments
Other: Enter other study	☒	☐	☐	L	Enter comments
Cumulative Impacts	☒	☐	☐	L	Enter comments
Context Sensitive Solutions	☒	☐	☐	L	Enter comments
Section 4(f) Evaluation	☐	☒	☐	L	No Use Memo
Permits:	☐	☐	☐	L	Enter comments
401 Certification Coordination	☐	☒	☐	M	Enter comments
404 Permit Coordination, IP, NWP, or LOP	☒	☐	☐	M	Enter comments
1602 Agreement Coordination	☐	☒	☐	M	Enter comments
Local Coastal Development Permit Coordination	☒	☐	☐	L	Enter comments
State Coastal Development Permit Coordination	☒	☐	☐	L	Enter comments
NPDES Coordination	☒	☐	☐	L	Enter comments
TRPA	☒	☐	☐	L	Enter comments
BCDC	☒	☐	☐	L	Enter comments

Attachment C

Schedule (Gantt Chart)

SR 29 American Canyon
Multimodal Improvement Project
PA&ED Phase

ID	Task Name	Start	Finish	Duration
1	**PA&ED Phase Schedule**	**Mon 8/1/22**	**Fri 3/8/24**	**420 days**
2	PA&ED Phase Kick-off	Mon 8/1/22	Mon 8/1/22	1 day
3	Preliminary Engineering and Investigations	Tue 8/2/22	Mon 2/13/23	140 days
4	Field Surveys	Tue 8/2/22	Mon 8/29/22	20 days
5	Preliminary Engineering Design	Tue 10/11/22	Mon 2/13/23	90 days
6	Review Environmental Study Request (ESR)	Tue 8/2/22	Mon 8/15/22	10 days
7	Prepare Studies/Reports	Tue 8/30/22	Fri 7/14/23	229 days
8	Land Use and Community Impacts Memorandum (Memo)	Tue 8/30/22	Mon 12/19/22	80 days
9	*Draft*	*Tue 8/30/22*	*Mon 10/10/22*	*30 days*
10	*Agency Review*	*Tue 10/11/22*	*Mon 11/21/22*	*30 days*
11	*Final*	*Tue 11/22/22*	*Mon 12/19/22*	*20 days*
12	Traffic Memo	Tue 8/30/22	Mon 12/19/22	80 days
13	*Draft*	*Tue 8/30/22*	*Mon 10/10/22*	*30 days*
14	*Agency Review*	*Tue 10/11/22*	*Mon 11/21/22*	*30 days*
15	*Final*	*Tue 11/22/22*	*Mon 12/19/22*	*20 days*
16	Visual Impacts Memo	Tue 8/30/22	Mon 12/19/22	80 days
17	*Draft*	*Tue 8/30/22*	*Mon 10/10/22*	*30 days*
18	*Agency Review*	*Tue 10/11/22*	*Mon 11/21/22*	*30 days*
19	*Final*	*Tue 11/22/22*	*Mon 12/19/22*	*20 days*
20	Cultural Reports (HPSR/HRER/ASR)	Mon 9/12/22	Fri 7/14/23	220 days
21	*Draft*	*Mon 9/12/22*	*Fri 12/16/22*	*70 days*
22	*Agency Review*	*Mon 12/19/22*	*Fri 1/27/23*	*30 days*
23	*Second Draft*	*Mon 1/30/23*	*Fri 4/7/23*	*50 days*
24	*Agency Review*	*Mon 4/10/23*	*Fri 5/19/23*	*30 days*
25	*Final*	*Mon 5/22/23*	*Fri 7/14/23*	*40 days*
26	Water Quality Memo	Tue 11/22/22	Mon 3/13/23	80 days
27	*Draft*	*Tue 11/22/22*	*Mon 1/2/23*	*30 days*
28	*Agency Review*	*Tue 1/3/23*	*Mon 2/13/23*	*30 days*
29	*Final*	*Tue 2/14/23*	*Mon 3/13/23*	*20 days*
30	Initial Site Investigation	Tue 8/30/22	Mon 1/30/23	110 days
31	*Field Investigation*	*Tue 8/30/22*	*Mon 9/26/22*	*20 days*
32	*Draft*	*Tue 9/27/22*	*Mon 11/21/22*	*40 days*
33	*Agency Review*	*Tue 11/22/22*	*Mon 1/2/23*	*30 days*
34	*Final*	*Tue 1/3/23*	*Mon 1/30/23*	*20 days*
35	Air Quality Report	Tue 8/30/22	Mon 12/19/22	80 days
36	*Draft*	*Tue 8/30/22*	*Mon 10/10/22*	*30 days*
37	*Agency Review*	*Tue 10/11/22*	*Mon 11/21/22*	*30 days*
38	*Final*	*Tue 11/22/22*	*Mon 12/19/22*	*20 days*
39	Noise & Vibration Memo	Tue 8/30/22	Mon 12/19/22	80 days
40	*Draft*	*Tue 8/30/22*	*Mon 10/10/22*	*30 days*
41	*Agency Review*	*Tue 10/11/22*	*Mon 11/21/22*	*30 days*
42	*Final*	*Tue 11/22/22*	*Mon 12/19/22*	*20 days*
43	Biological Environment Studies/Natural Environment Studies	Mon 9/12/22	Fri 1/20/23	95 days
44	*Draft*	*Mon 9/12/22*	*Fri 11/11/22*	*45 days*
45	*Agency Review*	*Mon 11/14/22*	*Fri 12/23/22*	*30 days*
46	*Final*	*Mon 12/26/22*	*Fri 1/20/23*	*20 days*
47	Section 4(f) Evaluation Memo	Mon 9/12/22	Fri 12/30/22	80 days
48	*Draft*	*Mon 9/12/22*	*Fri 10/21/22*	*30 days*
49	*Agency Review*	*Mon 10/24/22*	*Fri 12/2/22*	*30 days*
50	*Final*	*Mon 12/5/22*	*Fri 12/30/22*	*20 days*
51	Prepare NEPA Environmental Document	Mon 7/17/23	Fri 11/17/23	90 days
52	Draft Categorical Exclusion (CE)	Mon 7/17/23	Fri 8/25/23	30 days
53	*Agency Review*	*Mon 8/28/23*	*Fri 10/6/23*	*30 days*
54	Final CE	Mon 10/9/23	Fri 11/17/23	30 days
55	Prepare CEQA Environmental Document	Mon 4/17/23	Fri 1/26/24	205 days
56	Admin Draft IS/MND	Mon 4/17/23	Fri 7/14/23	65 days
57	*Agency Review*	*Mon 7/17/23*	*Fri 8/25/23*	*30 days*
58	Draft IS/MND	Mon 8/28/23	Fri 9/22/23	20 days
59	*Agency Review*	*Mon 9/25/23*	*Fri 11/3/23*	*30 days*
60	Final Draft IS/MND	Mon 11/6/23	Fri 12/1/23	20 days
61	*Public Circulation*	*Mon 12/4/23*	*Fri 1/5/24*	*25 days*
62	Final IS/MND	Mon 1/8/24	Fri 1/26/24	15 days
63	Adopt IS/MND	Mon 1/29/24	Fri 3/8/24	30 days



ATTACHMENT H

Life-Cycle Cost Analysis Memo

Technical Memorandum

September 07, 2021

To	State of California, Department of Transportation.	**Tel**	N/A
Copy to	Napa Valley Transportation Authority	**Email**	N/A
From	Lindsey Van Parys, PE Michael Pitcock, EIT	**Ref. No.**	0419000297 04-4Q010K
Subject	Route 29 in American Canyon Multimodal Improvements Project – Life-Cycle Cost Analyses		

1. Introduction

Since January 1, 2007, Life-Cycle Cost Analyses (LCCAs) are required for all project constructing pavement on the California State Highway System. Three LCCA was prepared for the Route 29 in American Canyon Multimodal Improvements Project utilizing Caltrans LCCA Software RealCost Version 2.5.4CA and Caltrans Lifecycle Cost Analysis Procedures Manual, dated August 1, 2013. This memorandum summarizes the results of the LCCAs performed.

2. Background and Assumptions

Utilizing traffic values from the project's Traffic Engineering Performance Assessment (TEPA), Truck Percentages from Caltrans' Traffic Census Truck Traffic (Route 29 Postmile 4.706 Behind), an approximate Traffic Index was calculated, netting a result of 13.0. The native soil R value was assumed to be 20, consistent with the Soscol Junction Interchange Project (EA 04-28120), located at postmile 5.5. Using these assumptions and the local Pavement Climate Region, Low Mountain, two Pavement Alternatives were developed.

Per the LCCA Procedures Manual, Figure 2-1, box 3b, a 40 Yr Flexible Pavement section and a 40 Yr Continuously Reinforced Concrete Pavement (CRCP) section were the selected pavement alternatives The sections were as follows:

Alternative 1: 40 Yr Flexible

0.10' Rubberized Hot Mix Asphalt – Open Graded (Non-Structural Wearing Course)

0.20' Rubberized Hot Mix Asphalt – Gap Graded

1.35' Hot Mix Asphalt (Type A)

0.50' Class 2 Aggregate Base

Subgrade Enhancement Geotextile

Alternative 2: 40 Yr CRCP

0.85' CRCP

0.25' Hot Mix Asphalt (Type A)

0.70' Class 2 Aggregate Subbase

3. LCCA Results

Utilizing Standard LCCA Traffic and Construction Inputs, the following tables summarize the results of the LCCAs.

Table 1 Project Build Alternative 1

Total Cost	Alternative 1: 40 Yr Flexible		Alternative 2: 40 Yr CRCP	
	Agency Cost ($1000)	User Cost ($1000)	Agency Cost ($1000)	User Cost ($1000)
Undiscounted Sum	$19,812	$2,798	$13,760	$3,575
Present Value	**$13,956**	**$2,798**	**$13,725**	**$3,575**
EUAC	$631	$127	$621	$162

Table 2 Project Build Alternative 2

Total Cost	Alternative 1: 40 Yr Flexible		Alternative 2: 40 Yr CRCP	
	Agency Cost ($1000)	User Cost ($1000)	Agency Cost ($1000)	User Cost ($1000)
Undiscounted Sum	$23,072	$3,498	$16,060	$4,275
Present Value	**$16,313**	**$3,498**	**$16,025**	**$4,275**
EUAC	$738	$158	$725	$193

Table 3 Project Build Alternative 3 (Rejected Alternative)

Total Cost	Alternative 1: 40 Yr Flexible		Alternative 2: 40 Yr CRCP	
	Agency Cost ($1000)	User Cost ($1000)	Agency Cost ($1000)	User Cost ($1000)
Undiscounted Sum	$23,052	$2,798	$15,560	$3,575
Present Value	**$16,009**	**$2,798**	**$15,525**	**$3,575**
EUAC	$724	$127	$702	$162

4. Conclusions

The direct output of the LCCA Results show the 40 Yr CRCP section being the most cost-effective alternative over the life span of the pavement. The difference in cost is moderate, varying from 1.7% to 3.1%. However, consistently, the user cost of the CRCP significantly exceeds the user cost of the HMA, ranging from 22% to 28% higher costs. While the LCCA Procedures Manual states that CRCP alternative should be the preferred alternative, differences in unit prices and the lack of stage construction analysis may negate all savings shown in this analyses. Additionally, pavement costs associated to the flexible pavement were relatively conservative, eliminating overlay areas on the mainline north of American Canyon Road. Future information, obtained in future stages, may indicate that widening and overlay strategies may be appropriate, further reducing the flexible pavement costs. Due to these factors, it is recommended that 40 Yr flexible pavement be considered as the preferred alternative proceeding into the next stage of construction.

Attachments:

A. Alternative 1 RealCost Output

B. Alternative 2 RealCost Output

C. Alternative 3 RealCost Output

ALTERNATIVE 1

RealCost Input Data

1. Economic Variables	
Value of Time for Passenger Cars ($/hour)	$13.00
Value of Time for Single Unit Trucks ($/hour)	$29.60
Value of Time for Combination Trucks ($/hour)	$29.60

2. Analysis Options	
Include User Costs in Analysis	Yes
Include User Cost Remaining Service Life Value	Yes
Use Differential User Costs	Yes
User Cost Computation Method	Calculated
Include Agency Cost Remaining Service Life Value	Yes
Traffic Direction	Both
Analysis Period (Years)	55
Beginning of Analysis Period	2025
Discount Rate (%)	4.0
Number of Alternatives	2

3. Project Details and Quantity Calculations	
State Route	29
Project Type	New/Reconstruction/Widen
Project Name	American Canyon Corridor Improvements Project
Maintenance Service Level	1
Local Region	
County	NAPA 0.7/2.1
Climate Region	Low Mountain
Analyzed By	BNI
Mileposts	
Begin	
End	
Length of Project (miles)	1.40
Comments	Limits are conservative

4. Traffic Data	
AADT Construction Year (total for both directions)	38,800
Cars as Percentage of AADT (%)	93.0
Single Unit Trucks as Percentage of AADT (%)	3.0
Combination Trucks as Percentage of AADT (%)	4.0
Annual Growth Rate of Traffic (%)	0.8
Speed Limit Under Normal Operating Conditions (mph)	55
No of Lanes in Each Direction During Normal Conditions	2
Free Flow Capacity (vphpl)	2019
Queue Dissipation Capacity (vphpl)	1700
Maximum AADT (total for both directions)	53,773
Maximum Queue Length (miles)	2
5. Maintenance and Rehabilitation Sequence	
Alternative 1	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST RHMA W/RHMA-O (40YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	21.84
Activity 1 Activity Service Life (Year)	40
Activity 2 Name	CAPM RHMA W/ RHMA-O

Activity 2 Year of Action	2065
Activity 2 Annual Maintenance Cost ($1000)	3.92
Activity 2 Activity Service Life (Year)	8
Activity 3 Name	REHAB RHMA W/ RHMA-O (20YR)
Activity 3 Year of Action	2073
Activity 3 Annual Maintenance Cost ($1000)	22.96
Activity 3 Activity Service Life (Year)	24
Activity 4 Name	CAPM HMA
Activity 4 Year of Action	2097
Activity 4 Annual Maintenance Cost ($1000)	8.8
Activity 4 Activity Service Life (Year)	5
Activity 5 Name	REHAB HMA (20YR)
Activity 5 Year of Action	2102
Activity 5 Annual Maintenance Cost ($1000)	23.2
Activity 5 Activity Service Life (Year)	5
Activity 6 Name	
Activity 6 Year of Action	2107
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0
Alternative 2	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST CRCP (40YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	1.12
Activity 1 Activity Service Life (Year)	55.0
Activity 2 Name	CAPM (CPR C)
Activity 2 Year of Action	2080
Activity 2 Annual Maintenance Cost ($1000)	24
Activity 2 Activity Service Life (Year)	5.0
Activity 3 Name	CAPM (CPR B)
Activity 3 Year of Action	2085
Activity 3 Annual Maintenance Cost ($1000)	12
Activity 3 Activity Service Life (Year)	10
Activity 4 Name	
Activity 4 Year of Action	2095
Activity 4 Annual Maintenance Cost ($1000)	0
Activity 4 Activity Service Life (Year)	0
Activity 5 Name	
Activity 5 Year of Action	2095
Activity 5 Annual Maintenance Cost ($1000)	1
Activity 5 Activity Service Life (Year)	0
Activity 6 Name	
Activity 6 Year of Action	2095
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0
Alternative 3	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST HMA W/RHMA (20YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	0
Activity 1 Activity Service Life (Year)	23
Activity 2 Name	CAPM HMA W/ RHMA
Activity 2 Year of Action	2048
Activity 2 Annual Maintenance Cost ($1000)	0
Activity 2 Activity Service Life (Year)	10
Activity 3 Name	REHAB HMA W/ RHMA (20YR)

Activity 3 Year of Action	2058
Activity 3 Annual Maintenance Cost ($1000)	0
Activity 3 Activity Service Life (Year)	23
Activity 4 Name	CAPM (PR A)
Activity 4 Year of Action	2081
Activity 4 Annual Maintenance Cost ($1000)	5
Activity 4 Activity Service Life (Year)	10
Activity 5 Name	
Activity 5 Year of Action	2091
Activity 5 Annual Maintenance Cost ($1000)	0
Activity 5 Activity Service Life (Year)	0
Activity 6 Name	
Activity 6 Year of Action	2091
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0
Alternative 4	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST CRCP (20YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	0
Activity 1 Activity Service Life (Year)	30
Activity 2 Name	CAPM (PR C)
Activity 2 Year of Action	2055
Activity 2 Annual Maintenance Cost ($1000)	0
Activity 2 Activity Service Life (Year)	5
Activity 3 Name	CAPM (PR B)
Activity 3 Year of Action	2060
Activity 3 Annual Maintenance Cost ($1000)	0
Activity 3 Activity Service Life (Year)	10
Activity 4 Name	CAPM (PR A)
Activity 4 Year of Action	2070
Activity 4 Annual Maintenance Cost ($1000)	0
Activity 4 Activity Service Life (Year)	10
Activity 5 Name	20
Activity 5 Year of Action	2080
Activity 5 Annual Maintenance Cost ($1000)	0
Activity 5 Activity Service Life (Year)	0
Activity 6 Name	
Activity 6 Year of Action	2080
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0

Alternative 1	40 Year HMA
Number of Activities	3

Activity 1	NEW/RECONST RHMA W/RHMA-O (40YR)
Agency Construction Cost ($1000)	$12,000.00
User Work Zone Costs ($1000)	
Work Zone Duration (days)	360
No of Lanes Open in Each Direction During Work Zone	1
Activity Service Life (years)	40.0
Activity Structural Life (years)	
Maintenance Frequency (years)	1
Agency Maintenance Cost ($1000)	21.84
Work Zone Length (miles)	1.50
Work Zone Speed Limit (mph)	45
Work Zone Capacity (vphpl)	1510

Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Activity 2	CAPM RHMA W/ RHMA-O	
Agency Construction Cost ($1000)	$4,062.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	10	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	8.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	3.92	
Work Zone Length (miles)	1.50	
Work Zone Speed Limit (mph)	45	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

Activity 3	REHAB RHMA W/ RHMA-O (20YR)	
Agency Construction Cost ($1000)	$9,371.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	80	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	24.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	22.96	
Work Zone Length (miles)	1.50	
Work Zone Speed Limit (mph)	45	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

Alternative 2	40 Yr CRCP
Number of Activities	1

Activity 1	NEW/RECONST CRCP (40YR)	
Agency Construction Cost ($1000)	$13,700.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	460	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	55.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	1.12	
Work Zone Length (miles)	1.50	
Work Zone Speed Limit (mph)	45	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Deterministic Results

Total Cost	Alternative 1: 40 Year HMA		Alternative 2: 40 Yr CRCP	
	Agency Cost ($1000)	User Cost ($1000)	Agency Cost ($1000)	User Cost ($1000)
Undiscounted Sum	$19,812	$2,798	$13,760	$3,575
Present Value	$13,956	$2,798	$13,725	$3,575
EUAC	$631	$127	$621	$162

ALTERNATIVE 2

RealCost Input Data

1. Economic Variables	
Value of Time for Passenger Cars ($/hour)	$13.00
Value of Time for Single Unit Trucks ($/hour)	$29.60
Value of Time for Combination Trucks ($/hour)	$29.60

2. Analysis Options	
Include User Costs in Analysis	Yes
Include User Cost Remaining Service Life Value	Yes
Use Differential User Costs	Yes
User Cost Computation Method	Calculated
Include Agency Cost Remaining Service Life Value	Yes
Traffic Direction	Both
Analysis Period (Years)	55
Beginning of Analysis Period	2025
Discount Rate (%)	4.0
Number of Alternatives	2

3. Project Details and Quantity Calculations	
State Route	29
Project Type	New/Reconstruction/Widen
Project Name	American Canyon Corridor Improvements Project
Maintenance Service Level	1
Local Region	
County	NAPA 0.7/2.1
Climate Region	Low Mountain
Analyzed By	MCP
Mileposts	
Begin	
End	
Length of Project (miles)	1.40
Comments	Limits are conservative

4. Traffic Data	
AADT Construction Year (total for both directions)	38,800
Cars as Percentage of AADT (%)	93.0
Single Unit Trucks as Percentage of AADT (%)	3.0
Combination Trucks as Percentage of AADT (%)	4.0
Annual Growth Rate of Traffic (%)	0.8
Speed Limit Under Normal Operating Conditions (mph)	55
No of Lanes in Each Direction During Normal Conditions	2
Free Flow Capacity (vphpl)	2019
Queue Dissipation Capacity (vphpl)	1700
Maximum AADT (total for both directions)	53,773
Maximum Queue Length (miles)	2
5. Maintenance and Rehabilitation Sequence	
Alternative 1	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST RHMA W/RHMA-O (40YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	21.84
Activity 1 Activity Service Life (Year)	40
Activity 2 Name	CAPM RHMA W/ RHMA-O

Activity 2 Year of Action	2065
Activity 2 Annual Maintenance Cost ($1000)	3.92
Activity 2 Activity Service Life (Year)	8
Activity 3 Name	REHAB RHMA W/ RHMA-O (20YR)
Activity 3 Year of Action	2073
Activity 3 Annual Maintenance Cost ($1000)	22.96
Activity 3 Activity Service Life (Year)	24
Activity 4 Name	CAPM HMA
Activity 4 Year of Action	2097
Activity 4 Annual Maintenance Cost ($1000)	8.8
Activity 4 Activity Service Life (Year)	5
Activity 5 Name	REHAB HMA (20YR)
Activity 5 Year of Action	2102
Activity 5 Annual Maintenance Cost ($1000)	23.2
Activity 5 Activity Service Life (Year)	5
Activity 6 Name	
Activity 6 Year of Action	2107
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0
Alternative 2	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST CRCP (40YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	1.12
Activity 1 Activity Service Life (Year)	55.0
Activity 2 Name	CAPM (CPR C)
Activity 2 Year of Action	2080
Activity 2 Annual Maintenance Cost ($1000)	24
Activity 2 Activity Service Life (Year)	5.0
Activity 3 Name	CAPM (CPR B)
Activity 3 Year of Action	2085
Activity 3 Annual Maintenance Cost ($1000)	12
Activity 3 Activity Service Life (Year)	10
Activity 4 Name	
Activity 4 Year of Action	2095
Activity 4 Annual Maintenance Cost ($1000)	0
Activity 4 Activity Service Life (Year)	0
Activity 5 Name	
Activity 5 Year of Action	2095
Activity 5 Annual Maintenance Cost ($1000)	1
Activity 5 Activity Service Life (Year)	0
Activity 6 Name	
Activity 6 Year of Action	2095
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0
Alternative 3	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST HMA W/RHMA (20YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	0
Activity 1 Activity Service Life (Year)	23
Activity 2 Name	CAPM HMA W/ RHMA
Activity 2 Year of Action	2048
Activity 2 Annual Maintenance Cost ($1000)	0
Activity 2 Activity Service Life (Year)	10
Activity 3 Name	REHAB HMA W/ RHMA (20YR)

Activity 3 Year of Action	2058
Activity 3 Annual Maintenance Cost ($1000)	0
Activity 3 Activity Service Life (Year)	23
Activity 4 Name	CAPM (PR A)
Activity 4 Year of Action	2081
Activity 4 Annual Maintenance Cost ($1000)	5
Activity 4 Activity Service Life (Year)	10
Activity 5 Name	
Activity 5 Year of Action	2091
Activity 5 Annual Maintenance Cost ($1000)	0
Activity 5 Activity Service Life (Year)	0
Activity 6 Name	
Activity 6 Year of Action	2091
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0
Alternative 4	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST CRCP (20YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	0
Activity 1 Activity Service Life (Year)	30
Activity 2 Name	CAPM (PR C)
Activity 2 Year of Action	2055
Activity 2 Annual Maintenance Cost ($1000)	0
Activity 2 Activity Service Life (Year)	5
Activity 3 Name	CAPM (PR B)
Activity 3 Year of Action	2060
Activity 3 Annual Maintenance Cost ($1000)	0
Activity 3 Activity Service Life (Year)	10
Activity 4 Name	CAPM (PR A)
Activity 4 Year of Action	2070
Activity 4 Annual Maintenance Cost ($1000)	0
Activity 4 Activity Service Life (Year)	10
Activity 5 Name	20
Activity 5 Year of Action	2080
Activity 5 Annual Maintenance Cost ($1000)	0
Activity 5 Activity Service Life (Year)	0
Activity 6 Name	
Activity 6 Year of Action	2080
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0

Alternative 1	40 Year HMA
Number of Activities	3

Activity 1	NEW/RECONST RHMA W/RHMA-O (40YR)
Agency Construction Cost ($1000)	$14,100.00
User Work Zone Costs ($1000)	
Work Zone Duration (days)	450
No of Lanes Open in Each Direction During Work Zone	1
Activity Service Life (years)	40.0
Activity Structural Life (years)	
Maintenance Frequency (years)	1
Agency Maintenance Cost ($1000)	21.84
Work Zone Length (miles)	1.50
Work Zone Speed Limit (mph)	45
Work Zone Capacity (vphpl)	1510

Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Activity 2	CAPM RHMA W/ RHMA-O	
Agency Construction Cost ($1000)	$4,729.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	10	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	8.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	3.92	
Work Zone Length (miles)	1.50	
Work Zone Speed Limit (mph)	45	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

Activity 3	REHAB RHMA W/ RHMA-O (20YR)	
Agency Construction Cost ($1000)	$11,059.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	80	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	24.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	22.96	
Work Zone Length (miles)	1.50	
Work Zone Speed Limit (mph)	45	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

Alternative 2	40 Yr CRCP
Number of Activities	1

Activity 1	NEW/RECONST CRCP (40YR)	
Agency Construction Cost ($1000)	$16,000.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	550	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	55.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	1.12	
Work Zone Length (miles)	1.50	
Work Zone Speed Limit (mph)	45	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Deterministic Results

Total Cost	Alternative 1: 40 Year HMA		Alternative 2: 40 Yr CRCP	
	Agency Cost ($1000)	User Cost ($1000)	Agency Cost ($1000)	User Cost ($1000)
Undiscounted Sum	$23,072	$3,498	$16,060	$4,275
Present Value	$16,313	$3,498	$16,025	$4,275
EUAC	$738	$158	$725	$193

ALTERNATIVE 3

RealCost Input Data

1. Economic Variables	
Value of Time for Passenger Cars ($/hour)	$13.00
Value of Time for Single Unit Trucks ($/hour)	$29.60
Value of Time for Combination Trucks ($/hour)	$29.60

2. Analysis Options	
Include User Costs in Analysis	Yes
Include User Cost Remaining Service Life Value	Yes
Use Differential User Costs	Yes
User Cost Computation Method	Calculated
Include Agency Cost Remaining Service Life Value	Yes
Traffic Direction	Both
Analysis Period (Years)	55
Beginning of Analysis Period	2025
Discount Rate (%)	4.0
Number of Alternatives	2

3. Project Details and Quantity Calculations	
State Route	29
Project Type	New/Reconstruction/Widen
Project Name	American Canyon Corridor Improvements Project
Maintenance Service Level	1
Local Region	
County	NAPA 0.7/2.1
Climate Region	Low Mountain
Analyzed By	MCP
Mileposts	
Begin	
End	
Length of Project (miles)	1.40
Comments	Limits are conservative

4. Traffic Data	
AADT Construction Year (total for both directions)	38,800
Cars as Percentage of AADT (%)	93.0
Single Unit Trucks as Percentage of AADT (%)	3.0
Combination Trucks as Percentage of AADT (%)	4.0
Annual Growth Rate of Traffic (%)	0.8
Speed Limit Under Normal Operating Conditions (mph)	55
No of Lanes in Each Direction During Normal Conditions	2
Free Flow Capacity (vphpl)	2019
Queue Dissipation Capacity (vphpl)	1700
Maximum AADT (total for both directions)	53,773
Maximum Queue Length (miles)	2
5. Maintenance and Rehabilitation Sequence	
Alternative 1	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST RHMA W/RHMA-O (40YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	21.84
Activity 1 Activity Service Life (Year)	40
Activity 2 Name	CAPM RHMA W/ RHMA-O

Activity 2 Year of Action	2065
Activity 2 Annual Maintenance Cost ($1000)	3.92
Activity 2 Activity Service Life (Year)	8
Activity 3 Name	REHAB RHMA W/ RHMA-O (20YR)
Activity 3 Year of Action	2073
Activity 3 Annual Maintenance Cost ($1000)	22.96
Activity 3 Activity Service Life (Year)	24
Activity 4 Name	CAPM HMA
Activity 4 Year of Action	2097
Activity 4 Annual Maintenance Cost ($1000)	8.8
Activity 4 Activity Service Life (Year)	5
Activity 5 Name	REHAB HMA (20YR)
Activity 5 Year of Action	2102
Activity 5 Annual Maintenance Cost ($1000)	23.2
Activity 5 Activity Service Life (Year)	5
Activity 6 Name	
Activity 6 Year of Action	2107
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0
Alternative 2	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST CRCP (40YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	1.12
Activity 1 Activity Service Life (Year)	55.0
Activity 2 Name	CAPM (CPR C)
Activity 2 Year of Action	2080
Activity 2 Annual Maintenance Cost ($1000)	24
Activity 2 Activity Service Life (Year)	5.0
Activity 3 Name	CAPM (CPR B)
Activity 3 Year of Action	2085
Activity 3 Annual Maintenance Cost ($1000)	12
Activity 3 Activity Service Life (Year)	10
Activity 4 Name	
Activity 4 Year of Action	2095
Activity 4 Annual Maintenance Cost ($1000)	0
Activity 4 Activity Service Life (Year)	0
Activity 5 Name	
Activity 5 Year of Action	2095
Activity 5 Annual Maintenance Cost ($1000)	1
Activity 5 Activity Service Life (Year)	0
Activity 6 Name	
Activity 6 Year of Action	2095
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0
Alternative 3	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST HMA W/RHMA (20YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	0
Activity 1 Activity Service Life (Year)	23
Activity 2 Name	CAPM HMA W/ RHMA
Activity 2 Year of Action	2048
Activity 2 Annual Maintenance Cost ($1000)	0
Activity 2 Activity Service Life (Year)	10
Activity 3 Name	REHAB HMA W/ RHMA (20YR)

Activity 3 Year of Action	2058
Activity 3 Annual Maintenance Cost ($1000)	0
Activity 3 Activity Service Life (Year)	23
Activity 4 Name	CAPM (PR A)
Activity 4 Year of Action	2081
Activity 4 Annual Maintenance Cost ($1000)	5
Activity 4 Activity Service Life (Year)	10
Activity 5 Name	
Activity 5 Year of Action	2091
Activity 5 Annual Maintenance Cost ($1000)	0
Activity 5 Activity Service Life (Year)	0
Activity 6 Name	
Activity 6 Year of Action	2091
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0
Alternative 4	
Final Pavement Surface	
Design Life	
Activity 1 Name	NEW/RECONST CRCP (20YR)
Activity 1 Year of Action	2025
Activity 1 Annual Maintenance Cost ($1000)	0
Activity 1 Activity Service Life (Year)	30
Activity 2 Name	CAPM (PR C)
Activity 2 Year of Action	2055
Activity 2 Annual Maintenance Cost ($1000)	0
Activity 2 Activity Service Life (Year)	5
Activity 3 Name	CAPM (PR B)
Activity 3 Year of Action	2060
Activity 3 Annual Maintenance Cost ($1000)	0
Activity 3 Activity Service Life (Year)	10
Activity 4 Name	CAPM (PR A)
Activity 4 Year of Action	2070
Activity 4 Annual Maintenance Cost ($1000)	0
Activity 4 Activity Service Life (Year)	10
Activity 5 Name	20
Activity 5 Year of Action	2080
Activity 5 Annual Maintenance Cost ($1000)	0
Activity 5 Activity Service Life (Year)	0
Activity 6 Name	
Activity 6 Year of Action	2080
Activity 6 Annual Maintenance Cost ($1000)	0
Activity 6 Activity Service Life (Year)	0

Alternative 1	40 Year HMA
Number of Activities	3

Activity 1	NEW/RECONST RHMA W/RHMA-O (40YR)
Agency Construction Cost ($1000)	$13,700.00
User Work Zone Costs ($1000)	
Work Zone Duration (days)	360
No of Lanes Open in Each Direction During Work Zone	1
Activity Service Life (years)	40.0
Activity Structural Life (years)	
Maintenance Frequency (years)	1
Agency Maintenance Cost ($1000)	21.84
Work Zone Length (miles)	1.50
Work Zone Speed Limit (mph)	45
Work Zone Capacity (vphpl)	1510

Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Activity 2	CAPM RHMA W/ RHMA-O	
Agency Construction Cost ($1000)	$4,591.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	10	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	8.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	3.92	
Work Zone Length (miles)	1.50	
Work Zone Speed Limit (mph)	45	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

Activity 3	REHAB RHMA W/ RHMA-O (20YR)	
Agency Construction Cost ($1000)	$12,836.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	80	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	24.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	22.96	
Work Zone Length (miles)	1.50	
Work Zone Speed Limit (mph)	45	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure		
Second period of lane closure		
Third period of lane closure		

Alternative 2	40 Yr CRCP
Number of Activities	1

Activity 1	NEW/RECONST CRCP (40YR)	
Agency Construction Cost ($1000)	$15,500.00	
User Work Zone Costs ($1000)		
Work Zone Duration (days)	460	
No of Lanes Open in Each Direction During Work Zone	1	
Activity Service Life (years)	55.0	
Activity Structural Life (years)		
Maintenance Frequency (years)	1	
Agency Maintenance Cost ($1000)	1.12	
Work Zone Length (miles)	1.50	
Work Zone Speed Limit (mph)	45	
Work Zone Capacity (vphpl)	1510	
Traffic Hourly Distribution	Weekday Single-Peak	
Time of Day of Lane Closures (use whole numbers based on a 24-hour clock)		
Inbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		
Outbound	Start	End
First period of lane closure	0	24
Second period of lane closure		
Third period of lane closure		

Deterministic Results

Total Cost	Alternative 1: 40 Year HMA		Alternative 2: 40 Yr CRCP	
	Agency Cost ($1000)	User Cost ($1000)	Agency Cost ($1000)	User Cost ($1000)
Undiscounted Sum	$23,052	$2,798	$15,560	$3,575
Present Value	$16,009	$2,798	$15,525	$3,575
EUAC	$724	$127	$702	$162

ATTACHMENT I

Risk Register

RISK REGISTER LEVEL	3	PROJECT NAME	SR29 In American Canyon Multimodal Improvements Project	DIST-EA	04-4Q010 (0419000297)	Project Manager	Amani Meligy	RISK MANAGER	Lindsey Van Parys	TOTAL COST (Capital +Support)	$77,274,800.00
PROJECT PHASE	PID	PDT MEMBERS		RISK ASSESSMENT INFORMATION						TOTAL DAYS (Construction + Initial review (30 days)+ Closeout (60 days))	450

Risk Identification						Probability		Cost Impact ($)				Time Impact (days)				Phase	Capital / Support	Individual Risk	Risk Response				
Status	ID #	Category	Title	Risk Statement	Current Status/ Assumptions	Prob Low	Prob High	Cost Low	Cost Most likely	Cost High	Cost Probable	Low	Most likely	High	Time Probable	ENG/ CON	C/S	Rationale	Strategy	Response Actions	Risk Owner	Updated
Active	1	ROW	Delayed Property Access	If the permits to enter into private properties are required for conducting the technical studies for the project are delayed or no permission is given by the property owners, the required field surveys could be delayed or prevented, resulting in a delay to the project schedule.	It is assumed that access to properties will be obtained in a timely manner.	11	30	$0	$500,000	$1,000,000	$102,500	30	60	90	42	ENG	S	This risk is used to quantify costs attributed to a delay in schedule due to property owners denying access to private parcels. Based on environmental team input	Mitigate	Begin discussions with property owners early and identify reasons for delay or denial and work with engineering and environmental leads to mitigate or address the property owner issues	Right of way Agent	11/4/2022
Active	2	Environmental	Historic Properties (Archaeological Site) Adversely Impacted	If historic or pre-historic archaeological resources are adversely impacted, a Memorandum of Agreement (MOA), consultation, and mitigation measures will be required, resulting in additional support costs and schedule delays.	It is assumed the project will not adversely impact a historic or pre-historic archaeological resource based upon preliminary evaluation.	1	20	$0	$2,500,000	$5,000,000	$262,500	0	90	180	19	ENG	S	This risk is based on input from environmental team.	Mitigate	Identify potential locations for pre-historic or historical recourses as a first order of work. Once identified, work with the Design PE to avoid the resource if possible or develop mitigations to be performed during soil excavation.	Environmental Lead	11/4/2022
Active	3	Environmental	Special-Status Species Affected	If it is found during the project development process that special-status species are present within the project area and will be adversely impacted, then additional permits, avoidance measures, minimization measures, and/or mitigation will be necessary.	It is assumed no special-status species will be adversely impacted in the project area.	1	10	$0	$2,500,000	$5,000,000	$137,500	30	60	90	33	ENG	S	This risk is based on input from environmental team.	Mitigate	Avoid impacts to special-status species if possible, and if not, proceed with the necessary documentation and permits as efficiently as possible.	Environmental Lead	3/24/2022
Active	4	Environmental	Scope Change	If the scope of the project increases or significantly changes due to technical studies or public/stakeholder engagement, then this may increase the length and time of the environmental studies or revalidation, increase the project cost, elevate the document level, and delay the project schedule.	It is assumed the scope of the project will not be increased.	1	10	$5,000,000	$5,610,000	$6,220,000	$308,550	30	60	90	33	ENG	C	This risk is based on input from environmental team.	Accept	Continue to have discussions and regular meetings with NVTA and City staff, stakeholders, and the public to inform them of the project status and progression to reduce the likelihood of scope creep/increase.	Project Manager	3/24/2022
Active	5	Design	Approval of Design Exceptions	As a result of existing constraints (physical, R/W, public input), there may be a need for design exceptions that may not be approvable. This could lead to delays in the project schedule and increased project development and capital costs.	It is assumed that any design exceptions will be approvable.	5	20	$5,000,000	$5,610,000	$6,220,000	$701,250	30	60	90	38	ENG	S	This risk is based on input from the design and project management teams.	Accept	Design project to meet Caltrans standards to the maximum extent practicable. Schedule focus meeting with District Design Liaison to coordinate nonstandard features and process a Design Standard Decision Document. If the DDL indicated a design exception will not be granted, drop the alternative from further consideration.	Design PE	11/4/2022
Active	6	Environmental	Export of Contaminated Soil	Should contaminated soil be encountered that are higher than anticipated (exceeding regulated quantities of lead or other pollutants) additional studies may be required, resulting in an impact to cost and schedule.	Based upon desktop surveys and knowledge of the project area, it is assumed that contaminated soil (if found) will be below the minimum thresholds and additional studies will not be required.	5	30	$0	$187,500	$375,000	$32,813	0	45	90	16	ENG	S	This risk is based on input from environmental team.	Accept	Perform the standard soil contamination investigations at each phase of the project and implement mitigation measures as appropriate	Environmental Lead	3/24/2022
Active	7	Organizational	Maintenance Agreement with Outside Agency	If all parties do not concur with the maintenance responsibilities and/or cost implications included in the new freeway maintenance agreement, there may be a delay project schedule and/or the proposed design.	Assumed a maintenance will be needed for various project components.	11	30	$0	$50,000	$100,000	$10,250	30	60	90	42	ENG	S	This risk is based on input from the client and project management teams.	Accept	Once the preferred alignment is selected, the agencies will enter into discussions around maintenance responsibilities as soon as possible.	Project Manager	11/4/2022
Active	8	Utilities	Utility Verification	If unknown or additional unidentified utilities are encountered during the utility verification process, there may be a delay in the project development schedules, design and/or relocation costs	As-built/atlas maps have been received by utility purveyors. Positive location verification pursuant to Caltrans Standard Requirements will be performed.	31	50	$5,000,000	$5,610,000	$6,220,000	$2,272,050	90	135	180	126	ENG	S	This risk is based on input from the design and project management teams.	Accept	Known utilities will be incorporated in the project plans and specifications during PS&E. If any unidentified utilities are encountered during utility verification the design PE to work with ROW and the utility purveyors to identify the utility and/or resolve the conflict. Allocate additional time during project development to account for additional utility coordination time.	Design PE	11/4/2022
Active	9	Utilities	Utility Verification	If relocation negotiation takes longer than expected with the utility purveyors there may be a delay in project schedule or increase in capital costs to relocate or protect in place.	Relocations will be required. Coordination with utilities will be conducted on a regular and frequent basis.	31	50	$5,000,000	$5,610,000	$6,220,000	$2,272,050	90	135	180	126	CON	S	This risk is based on input from the design and project management teams.	Accept	Coordinate with utilities on a regular and frequent basis. Establish early any utilities that would be complicated to relocate and modify design if possible to avoid relocation.	Design PE	11/4/2022
Active	10	Right of Way	R/W Capital	As a result of the project requiring significant right of way, including some relocations, difficult negotiations may occur, which could delay the schedule and increase R/W capital needed to obtain the R/W.	The current PSR-PDS ROW CCE accounts for right of way at the current market rate, and does not account for any unforeseen market swings or inflation.	31	50	$0	$5,000,000	$10,000,000	$2,025,000	30	105	180	91	ENG	C	Based on RAP requirements and volatile real estate market conditions.	Accept	Begin negotiations with property owners and tenants as early as possible to assess the owners willingness to sell the property and/or any relocation assistance efforts will be needed. Begin relocation efforts as early as possible	Right of way Agent	11/4/2022
Active	11	Right of Way	Condemnation Required	If right of way negotiations are not successful, condemnation may be required, leading to a delay in project schedule and increased support costs.	Project schedule has appropriate time for R/W negotiations. It is assumed R/W negotiations will be successful an agreement with the purchasing agency and will not require any condemnation.	31	50	$0	$2,750,000	$10,000,000	$1,417,500	90	225	360	199	ENG	S	Based on input from right of way team	Avoid	Begin negotiations with property owners and tenants as early as possible to assess the owners willingness to sell the property and/or any relocation assistance efforts will be needed. Begin relocation efforts as early as possible	Right of way Agent	11/4/2022
Active	12	Construction	Discovery of Hazardous Material	Unanticipated hazardous materials encountered during construction may require mitigation, removal, and disposal resulting in additional costs to the project.	Hazardous materials may require onsite storage areas to dispose of which can be costly.	31	50	$5,000,001	$5,610,001	$6,220,000	$2,272,050	30	60	90	54	CON	S	Based on input from Environmental and Design Teams	Accept	The Construction RE to work with the PDT and Contractor to identify level of contamination encountered and immediately coordinate the corresponding removal/disposal as required by State and Federal laws.	Construction RE	3/24/2022

RISK REGISTER LEVEL	3	PROJECT NAME	SR29 In American Canyon Multimodal Improvements Project	DIST-EA	04-4Q010 (0419000297)	Project Manager	Amani Meligy	RISK MANAGER	Lindsey Van Parys	TOTAL COST (Capital +Support)	$77,274,800.00
PROJECT PHASE	PID	PDT MEMBERS		RISK ASSESSMENT INFORMATION						TOTAL DAYS (Construction + Initial review (30 days)+ Closeout (60 days))	450

Risk Identification						Probability		Cost Impact ($)				Time Impact (days)				Phase	Capital / Support	Individual Risk	Risk Response				
Status	ID #	Category	Title	Risk Statement	Current Status/ Assumptions	Prob Low	Prob High	Cost Low	Cost Most likely	Cost High	Cost Probable	Low	Most likely	High	Time Probable	ENG/ CON	C/S	Rationale	Strategy	Response Actions	Risk Owner	Updated
Active	13	Environmental	Buried Cultural Materials	If buried historical objects are encountered during construction, then work must be stopped in the area until a qualified archaeologist can evaluate the nature and significance of the find, resulting in an impact to cost and the construction schedule.	It is assumed that no buried historical objects will be encountered during construction.	11	30	$0	$2,500,000	$5,000,000	$512,500	0	90	180	37	CON	S	Based on input from environmental team.	Mitigate	The Construction RE will work with the Cultural Resources lead to determine the most efficient and culturally sensitive strategy as soon as possible to.	Environmental Lead	3/24/2022
Active	14	Environmental	Tree Removal or Trimming within Bird Nesting Season	If nesting birds are encountered & construction work is halted to mitigate for the presence of nesting birds, this may cause a delay in the construction schedule.	It is assumed tree removal or trimming would occur outside of the nesting bird season (February 1st –September 31st).	31	50	$0	$2,500,000	$5,000,000	$1,012,500	30	60	90	54	CON	C	Based on input from environmental team.	Mitigate	Manage construction schedule/timeline to minimize potential nesting bird impacts and specify regulations in the contract documents. If tree removal or trimming occurs during the nesting bird season, a nesting bird survey would be required to be performed by a qualified biologist before bird nesting season.	Construction RE	3/24/2022
Active	15	Project Management	Higher Bids	As a result of a fluctuating economy, bids may come in high, which would lead to a funding shortfall.	Assumption is the bids would be close to Engineer's estimate.	1	10	$5,000,001	$5,610,001	$6,220,000	$308,550	0	1	1	0	ENG	S	This risk is based on input from the design and project management teams.	Accept	Design team to monitor the trends and update project estimate as necessary up until the RTL.	Project Manager	3/24/2022
Active	16	Construction	Unidentified/ unknown Utilities Located during construction	Additional utility conflicts could occur during construction which may cause a delay in schedule and increase in costs.	Potholing required by contractor prior to excavation.	11	30	$0	$2,500,000	$5,000,000	$512,500	30	60	90	42	CON	C	This risk is based on input from the design and project management teams.	Accept	Known utilities will be incorporated in the project plans and specifications during PS&E. Construction activities may affect existing utilities. If any unidentified utilities are encountered during construction, RE to work with ROW and design to resolve the conflict	Construction RE	11/4/2022
Active	17	Construction	Weather Delays	As a result of unpredictable weather, additional rain delays beyond what is anticipated in the construction contract may occur, which would lead to construction schedule delays and cost overruns.	Standard weather days are included in the construction contract documents	11	30	$0	$2,500,000	$5,000,000	$512,500	0	15	30	6	CON	C	This risk is based on input from the design and project management teams.	Accept	During construction NVTA and Construction RE to coordinate with the contractor on schedule efficiencies where possible if a delay occurs due to weather days.	Construction RE	11/4/2022
Active	18	Construction	Project Funding	As a result of funding not yet being secured, funding may fall short, which would lead to a delay in project construction	NVTA (project sponsor) has and will continue to apply for grants to fund this project.	31	50	$0	$2,500,000	$5,000,000	$1,012,500	0	15	30	12	CON	C	Based on cost increases and assumptions on schedule delay to obtain additional funding.	Accept	NVTA to continue to apply for project grants to secure funding.	Project Manager	7/21/2022
Active	19	Project Scope	Pubic Engagement	Over the duration of the project, community priorities, public sentiment or policies may change, which may lead to design adjustments which could increase the capital or support costs as well as may delay the project schedule	Public Outreach has taken place in this stage and initial indications are the public supports the project and the proposed alternatives meet current local and state policies.	11	30	$0	$2,500,000	$5,000,000	$512,500	0	180	360	74	ENG	S	Based on input from Project management and design teams for costs needed for revised designs.	Accept	NVTA and Caltrans to continue public outreach through all project phases.	Project Manager	11/4/2022
Active	20	Traffic	Construction	As a result of the project being in a preliminary phase, construction staging may limit traffic in construction, which require changes to the TMP and potentially additional delays to the public. This may also cause a delay in schedule to address the changes in TMP.	Construction Staging not yet determined. It will be determined in PA&ED or PS&E. Target maximum delay is 10 minutes.	11	30	$0	$2,500,000	$5,000,000	$512,500	0	15	30	6	CON	C	Based on input from traffic engineering team.	Accept	The TMP should be updated throughout project development, especially when Construction Staging Plans are finalized during project development.	Design PE	7/23/2022
Active	21	Design	Vehicle Miles Traveled	As a result of VMT Analysis not yet being run, an increase of VMT may be determined by analysis, which would lead to a project scope change.	The limited lane additions at the roundabouts are assumed to have no significant impact to VMT. Additionally, the multimodal plans are assumed to lead to a decrease in VMT.	1	10	$0	$2,500,000	$5,000,000	$137,500	0	15	30	2	CON	S	Based on input from traffic planning team.	Accept	As soon as the Vehicle Miles Analysis is completed to address any indication of increased induced VMT, the PDT should work together to determine mitigation measures or to prepare a Statement of Overriding Considerations for approval.	Design PE	7/23/2022

ATTACHMENT J

Complete Streets Decision Document

Complete Streets Decision Document (CSDD)

1) Is the project located entirely on a facility where bicyclists and pedestrians are legally prohibited and the project does not involve a shared use path, pedestrian/bicycle structure or work impacting a local road crossing or interchange? (For example, a project including freeway mainline and ramp work, not including the ramp connection with the minor road, where the project freeway segment legally prohibits bicyclists and pedestrians.)

__X__ NO - Proceed to Question 2
_____ YES - Stop here. The project is exempt from further complete streets evaluation. Sign and attach to the Project Initiation Document (PID).

2) Is the primary project purpose to address assets that are outside of the roadbed where pedestrian and bicycle travel is not affected, and proposed project will not affect future pedestrian and bicycle facilities? Examples may include culvert outfalls, storm water treatment facilities, bridge substructure or scour mitigation, planting or vegetation removal, retaining walls, etc.

__X__ NO - Continue to Question 3
_____ YES - Stop here. The project is exempt from further complete streets evaluation. Sign and attach to PID.

3) Has a Transportation Planning Scoping Information Sheet (TPSIS) been completed for this project?

__X__ NO – Proceed to Question 4
_____ YES – Skip to Question 5 (Note: TPSIS is attached to the PID)

4) Which of the following planning documents were consulted to determine bicycle, pedestrian or transit needs? Select all that apply and proceed to Question 5.
   - _____a. District Active Transportation Plan
   - __X__b. Other Caltrans or local/regional agency bike/ped/transit/safe routes to school plans
   - _____c. ADA Transition Plan/Grievances (consult with the District ADA Coordinator)
   - __X__d. Corridor planning documents
   - _____e. Other (list here) _____

5) Based on the reviews completed in Question 4 or identified in the TPSIS, after a review of the roadway geometrics, or identified by the PDT, are there any bicycle, pedestrian, or transit needs, deficiencies or opportunities for improvement identified for the project location?

_____ NO – Provide brief description of findings: _____
Stop here. The project meets the requirements for consideration of Complete Streets elements. Sign and attach to the PID.
__X__ YES – Describe them here and proceed to Question 6: Construct 14 ft Class I Bikeways (Shared-use Paths) adjacent to the right shoulders of Route 29. Construct new curb ramps and crossings.
Construct Transit Queue Jumps (Alternative 1) at signals
Widen Shoulders to Permit Part-time Bus on Shoulder operations
Construct Pedestrian refuges (Alternative 2 only)

6) Based on the needs identified in Question 5, what would be the preferred complete streets elements to address those needs (e.g. road diet, separated bikeway, reconstructed sidewalk, etc.)? Resources include the Complete Streets Elements Toolbox, the Contextual Guidance for Bikeway Facility Selection, the Bikeway Facility Selection Guidance Memorandum, etc. List them in the table below and

provide a rough estimated cost to construct preferred project complete streets elements (including right-of-way and support costs) and proceed to Question 7.

FACILITY TYPE	UNIT	QUANTITY	ESTIMATED TOTAL COST
Class I Bikeway (Shared Use Path) [PM 0.7- 2.1]	*LF*	*15,000*	*$1,600,000*
Transit Queue Jumps	*EA*	*5*	*$850,000*
Crosswalks (New and upgraded)	*LF*	*1,800*	*$100,000*
Enhanced Crossings	EA	30	(See Above)
Sidewalks (Replaced)	LF	217	$20,000
Sidewalks (New)	LF	68	$6,000
Conflict Zone Green Paint	EA	39	$75,000
Shoulder Managed Transit Lanes	LNMI	3	*$1,005,000*

7) Was there any known public and stakeholder opposition to any preferred complete streets elements identified for the project? Provide response and proceed to Question 8.

__X__ NO
_____ YES – Describe the opposition position here: _____

8) Does the programmable project alternative/project scope include all the complete streets elements identified in Question 6?

_____ NO - Proceed to Question 9
__X__ YES - Stop here. The project has met the requirements for consideration of complete streets elements. Sign and attach to PID.

9) Does the project include any of the complete streets elements that are identified in Question 6? Or are there any proposed incremental improvements related to the complete streets elements in Question 6? Provide response and proceed to Question 10.

_____ NO – The programmable project alternative does not include any complete streets elements, and therefore does not address identified needs for complete streets elements.
_____ YES – List them here:

FACILITY TYPE	UNIT	QUANTITY	ESTIMATED TOTAL COST

10) Does the project funding have constraints that would preclude the ability to incorporate additional complete streets elements into the project (For example, cannot combine funding with other sources.)? Provide response and proceed to Question 11.

_____ NO
_____ YES – Describe the constraints here: _____

11) Provide a rationale and justification for not including all the recommended complete streets elements into the project: (Consider the engineering justification, right-of-way constraints, environmental impacts, etc.). _____

Prepared by:

Lindsey Van Parys, PID Preparer in responsible charge
GHD Inc for Napa Valley Transportation Authority

Concurred by:

11/30/2022

Sergio Ruiz
District Complete Streets Coordinator

Date

Celia McCuaig

12/28/2022

Name
Deputy District Director, Planning

Date

1/23/2023

Name
Deputy District Director, Design or
Division Chief, Design/Project Development

Date

Dina El-Tawansy

02/03/2023

Name
District Director

Date

Distribution: Attach completed original CSDD to PID and email to HQ Division of Design at CSDD@dot.ca.gov

Revalidation of CSDD at PA&ED

Does the project scope defined in the project approval document include the complete streets elements identified in Question 6 or 9 of this CSDD and the PID?

_____ NO – Prepare a Superseding CSDD (answer Questions 1 through 11) replacing the original CSDD, obtain all certified and concurrence signatures below, and attach the superseding CSDD to the project approval document. Email superseding CSDD to HQ Division of Design at CSDD@dot.ca.gov.
_____ YES – Certify there are no changes to the scope of complete streets elements with only the project engineer certification signature below on the original approved CSDD and attach the CSDD to the project approval document. Email revalidated CSDD to HQ Division of Design at CSDD@dot.ca.gov.

Certified by:

_____ _____
Name, Project Engineer Date
Branch/Company

Concurred by: *(Include concurrence signatures only if a Superseding CSDD is prepared.)*

_____ _____
Name Date
District Complete Streets Coordinator

_____ _____
Name Date
Deputy District Director, Planning

_____ _____
Name Date
Deputy District Director, Design or
Division Chief, Design/Project Development

_____ _____
Name Date
District Director

Revalidation of CSDD at PS&E

Does the project scope designed in the plans, specifications and estimate include the complete streets elements identified in Question 6 or 9 of the CSDD (or Superseding CSDD, if applicable) certified at the PA&ED revalidation and the project approval document?

_____ NO – Prepare a Superseding CSDD (answer Questions 1 through 11) replacing the CSDD that was approved at PA&ED revalidation, obtain all certified and concurrence signatures below, and attach to the Supplemental PR. If a Supplemental PR is not required, place in the project history file. Email superseding CSDD to HQ Division of Design at CSDD@dot.ca.gov.
_____ YES – Certify there are no changes to scope of complete streets elements in the project, and that temporary bike and pedestrian facilities during construction have been considered. Include only the project engineer certification signature below on the CSDD that was approved at PA&ED revalidation and place the CSDD in the project history file. Email revalidated CSDD to HQ Division of Design at CSDD@dot.ca.gov.

Certified by:

_____ _____
Name, Project Engineer Date
Branch/Company

Concurred by: *(Include concurrence signatures only if a Superseding CSDD is prepared.)*

_____ _____
Name Date
District Complete Streets Coordinator

_____ _____
Name Date
Deputy District Director, Planning

_____ _____
Name Date
Deputy District Director, Design or
Division Chief, Design/Project Development

_____ _____
Name Date
District Director

ATTACHMENT K

Stormwater Data Report

Dist-County-Route: Dist 4 – NAP – SR29
Post Mile Limits: 0.69 – 2.05
Type of Work: Proposed Roadway Improvement Along SR 29
Project ID (EA): 04-4Q010
Program Identification: _____
Phase: ☒ PID ☐ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): San Francisco (Region 2)
Total Disturbed Soil Area: Alt 1: 27.5 ac, Alt 2: 35.5 ac
PCTA: Alt 1: 15.9 ac, Alt 2: 17.1 ac
Alternative Compliance (acres): 0
ATA 2 (50% Rule)? Yes ☐ No ☒
Estimated Const. Start Date: 5/1/2025
Estimated Const. Completion Date: 9/31/2026
Risk Level: RL 1 ☐ RL 2 ☒ RL 3 ☐ WPCP ☐ Other: _____
Is MWELO applicable? Yes ☐ No ☒
Is the Project within a TMDL watershed? Yes ☒ No ☐
TMDL Compliance Units (acres): N/A
Notification of ADL reuse (if yes, provide date): Yes ☐ Date: _____ No ☒

This Report has been prepared under the direction of the following Licensed Person. The Licensed Person attests to the technical information contained herein and the date upon which recommendations, conclusions, and decisions are based. Professional Engineer or Landscape Architect stamp required at PS&E only.

Erik Fanselau — *9/19/2022*
Erik Fanselau, PE, Registered Project Engineer — Date

I have reviewed the stormwater quality design issues and find this report to be complete, current and accurate:

Amani Meligy — 11/29/2022
Amani Meligy, Project Manager — *Date*

Arminder Jhajj — 11/17/2022
Arminder Jhajj, Designated Maintenance Representative — *Date*

11/18/22
Joaquin Pedrin, Designated Landscape Architect Representative — *Date*

Mojgan Osooli — 11/22/2022
Mojgan Osooli, District/Regional Design SW Coordinator or Designee — *Date*

[Stamp Required at PS&E only]

STORMWATER DATA INFORMATION

1. Project Description

The Napa Valley Transportation Authority (NVTA), in cooperation with the California Department of Transportation (Caltrans) and the City of American Canyon (City), proposes roadway improvements along State Route 29 (SR 29) approximately from 0.1 mile south of American Canyon Rd and SR 29 intersection to 0.1 mile North of Napa Junction Road and SR 29 intersection within much of the City limits to address various operational and safety needs along the SR 29 corridor. These improvements are needed to improve and increase multimodal transportation opportunities within the City. Collectively, these improvements are referred to herein as the American Canyon SR 29 Corridor Improvement Project (Project). The Project is located along SR 29 in American Canyon, California between Post Miles (PM) 0.69 and 2.05. See Attachment 1 for the Project Location map.

NVTA has begun evaluating various alternatives that: 1) maximize efficiency and safety; 2) achieve acceptable operating conditions relative to projected future demand; 3) improve air quality, economic development, and social equity; 4) are context sensitive in accord with SR 29's rural and scenic character; and 5) minimize potential impacts to the natural environment. These alternatives are:

- Alternative 1: Multimodal improvements along the SR 29 corridor from American Canyon Road to Napa Junction Road. Improvements include Class I shared use paths on both sides of SR 29, reconstruction of the roadway to provide consistent median width, 11-foot lanes, 10-foot shoulders on SR 29 allowing for part time bus on shoulder, and landscaped planting areas to separate the Class I paths from the roadway. The project will also include signal upgrades. The existing 4-lane roadway configuration would be maintained.

  Minor right of way acquisitions are anticipated for the project. For southbound traffic, additional ROW will be required near Eucalyptus Drive and between Donaldson Way and American Canyon Road. For northbound traffic, additional ROW will be required from Crawford Way to Eucalyptus Drive.

- Alternative 2: Roundabouts along SR 29 at all major intersections except American Canyon Road. Due to high turning and side street volumes, the intersection with American Canyon Road will remain a traffic signal. Alternative 2 proposes to maintain the 4-lane corridor with the same multimodal improvements as Alternative 1. At the roundabout intersections, the corridor will be widened to six lanes approaching the intersections, allowing necessary circulation. Locations with close intersection spacing will maintain six lanes along the corridor. Roundabouts are proposed to increase overall circulation whilst providing traffic calming and enhanced intersection safety for all users. Alternative 2 will require similar right of way needs along the corridor as Alternative 1 but will require additional acquisitions at the intersections due to the larger size roundabout intersections. Additionally, this may require the complete acquisition of various properties along the corridor.

- No-build: the no build alternative eliminates all proposed improvements and leaves Route 29 in its current condition, maintaining all deficiencies and limited multimodal infrastructure.

Disturbed Soil Area and New Impervious Surface

The disturbed soil area (DSA) was calculated by using designed grading limits, where defined and assumed five-foot grading limits, where profiles were not set. A five-foot buffer was added outside these assumed grading limits to account for construction activities. New Impervious Surface (NIS) is the sum of the Net New Impervious surface (NNI) [post-project impervious area – pre-project impervious area} and Replaced Impervious Surface (RIS). Treatment BMPs will be required if the NIS is over an acre. This analysis takes into account the Section C.3 Provisions that state that trails less than 10 feet in width and more than 50 feet away from a body of water are exempt from treatment. Also, for new trail construction the area can be discounted.

Table 1 - Alternative 1 Disturbed Soil Area

State Right-of-Way		City Right-of-Way	
Square Feet	Acres	Square Feet	Acres
1,071,576	24.6	125,937	2.9

Table 2 - Alternative 2 Disturbed Soil Area

State Right-of-Way		City Right-of-Way	
Square Feet	Acres	Square Feet	Acres
1,319,868	30.3	225,446	5.2

Survey data, project models, and aerial photography were utilized to calculate the NIS for the project. The NIS was calculated by summing the NNI and the RIS. Impervious areas created by the Class 1 Bike trail have been discounted from the calculation, as allowed by Table 4-1 in section 4.3 of the Caltrans Stormwater Quality Handbook.

The following tables provides a breakdown of the impervious surface areas by right-of-way.

Table 3 - Alternative 1 Impervious Area Summary

Areas	State Right-of-Way		City Right-of-Way	
	Square Feet	Acres	Square Feet	Acres
NNI Surface Area	35,283	0.81	0	0
RIS Area	646,430	14.84	6,579	0.2
NIS Area	**681,713**	**15.65**	**6,579**	**0.2**

Table 4 - Alternative 2 Impervious Area Summary

Areas	State Right-of-Way		City Right-of-Way	
	Square Feet	Acres	Square Feet	Acres
NNI Surface Area	10,454	0.24	8712	0.2
RIS Area	714,384	16.40	11,149	0.3
NIS Area	**724,838**	**16.64**	**19,861**	**0.5**

NNI and NIS account only for the change in permeable surfaces and don't consider areas that remain permeable after the construction and are impacted by grading or other permeable improvements. Because of this, areas used in the calculations don't correspond to the disturbed area in this project.

2. Site Data and Stormwater Quality Design Issues

Hydrologic Unit, Receiving Waterbodies, and CWA 303(d) List

The project is located within the San Francisco Bay RWQCB, designated Region Number 2, which sets policy on implementing state and federal water quality law. The Hydrologic Unit is San Pablo and the Hydrologic Area is Napa River. Located within Hydraulic Sub-Area 206.50, the receiving water body near the project limits is the Napa River which discharges to San Pablo Bay, which is part of the San Francisco Bay. The San Francisco Bay ultimately terminates into the Pacific Ocean. The San Francisco Bay is included in the 2014-2016 303(d) list.

Beneficial Users

Existing Beneficial users for this Region 2 waterway (San Pablo Bay) are considered to be commercial and sport fishing (COMM), estuarine habitat (EST), migration of aquatic resources (MIGR), endangered species (RARE), wildlife habitat (WILD), contact/non-contact water recreation (REC-1/REC-2), navigation (NAV), shellfish harvesting (SHELL), spawning (SPWN), and industrial service supply (IND).

Climatic Data

The project is in a semi-arid region characterized by moderate summers and mild wet winters. The rainy season falls between October and April with an annual average precipitation of 18 inches, based on information provided by Caltrans.

Geotechnical Information and Land Use

The Project area is located in Napa County, within the San Francisco Bay Area. At this time, a project specific geotechnical investigation has not been performed. However, based on information provided by the USDA and Caltrans, soils consist mostly of clay soils with 0 to 2% slopes and can be classified in hydrologic soil group D. The soil has a K-factor of 0.24, per Caltrans Water Quality Planning Tool, indicating the soils have moderate detachment susceptibility and can create moderate runoff. The project area is comprised of existing roadway and bordered by commercial and undeveloped land.

Hazardous Waste

No hazardous waste has been identified yet as part of the initial project investigation.

404 Permit and 401 Certification

It has not been determined if a 404 Permit or Section 401 certification from the San Francisco Regional Water Quality Control Board will be required This will be determined in a subsequent submittal.

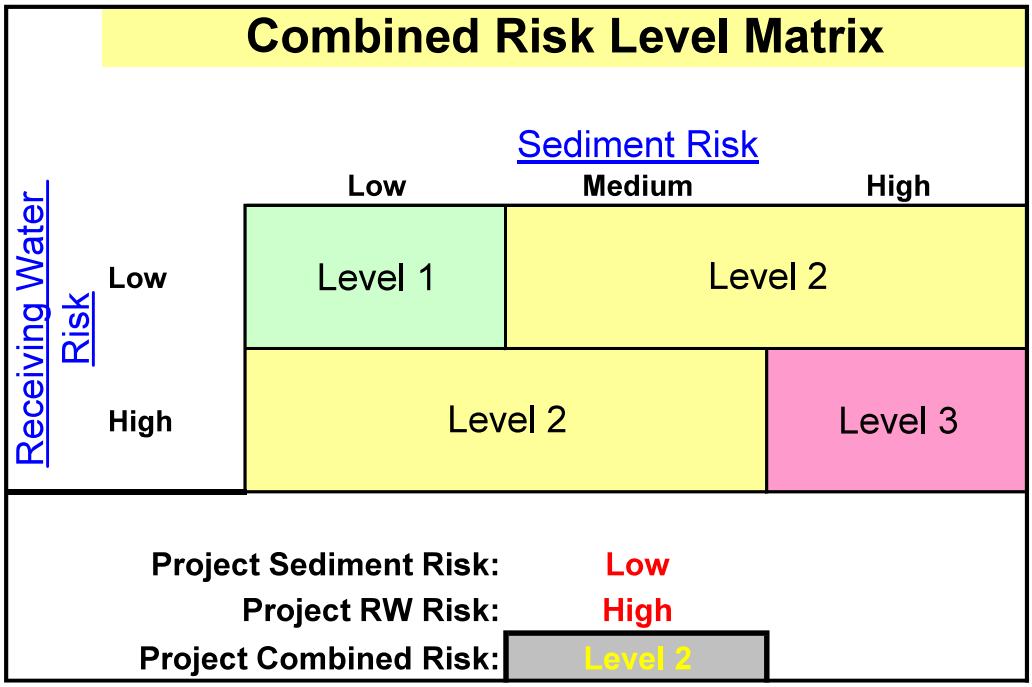
3. Construction Site BMPs to be used on Project

This project disturbs greater than 1 acre of soil and thus requires a Stormwater Pollution Prevention Plan (SWPPP). The SWPPP will be developed by the Contractor and submitted to Caltrans for approval prior to the start of construction.

Project Risk Factor

Project Risk Level: **Level 2**

The project risk level was determined by weighing the sediment risk factor with the receiving water risk factor. See below for the Risk Level Matrix.



Due to the risk level Rain Event Action Plans will be required and effluent limits for pH and turbidity are required to be compliant.

Construction Site BMP Strategies

The projects disturbed soils will be protected with various BMPs, listed within the SWPPP.

Temporary fiber rolls, silt fences, and street sweeping will be used to mitigate sediment contamination during construction, while hydromulch will be used for soil stability. Check dams, drainage inlet protection, and construction entrances will be utilized to prevent sediments from transferring off site. Staging areas, or other stockpile areas, will utilize appropriate BMPs, such as those listed above, to protect neighboring inlets and ditches during construction.

Waste contamination will be prevented by utilizing appropriate BMPs around stockpiles and utilizing concrete washouts. Storm water monitoring and rain event action plans will be required along with regular water sampling to avoid excessive pollutants and unnecessary impacts to the water body. A Stormwater Pollution Prevention Plan (SWPPP) is required and will be prepared and submitted by the Contractor.

4. Maintenance BMPs

The water quality design has not been evaluated at this point in the project, but permanent water quality treatment will be required as part of the design. It is probable that bioswales will be incorporated into the design to address this requirement.

5. Other Water Quality Requirements and Agreements

The majority of this project will be constructed within Caltrans ROW and additional ROW acquisition will be required to support the project construction. American Canyon operates under the Municipal Regional National Pollutant Discharge Elimination System Stormwater Permit issued by the San Francisco Regional Water Quality Control Board.

6. Permanent BMPs

Rapid Stability Assessment

No RSA is required as the project area is not part of a Threshold Drainage Area.

Design Pollution Prevention (DPP) BMP Strategy

Downstream Effects

There are no direct discharges to a stream so there are no downstream effects.

Slope/Surface Protection

Slope/Surface Protection Systems will be in place. Other permanent erosion control strategies may include compost, hydroseed, hydromulch, and fiber rolls.

Concentrated Flow Conveyance Systems

The existing roadway drainage system includes existing inlets, manholes, and pipes. The proposed drainage modifications will continue to discharge to this system.

Preservation of Existing Vegetation and Soils

Clearing of existing vegetation within the project limits will be necessary. Any environmentally sensitive areas will be marked with high visibility fence prior to construction beginning. Existing vegetation will be unaltered in locations where possible.

Treatment BMP Strategy

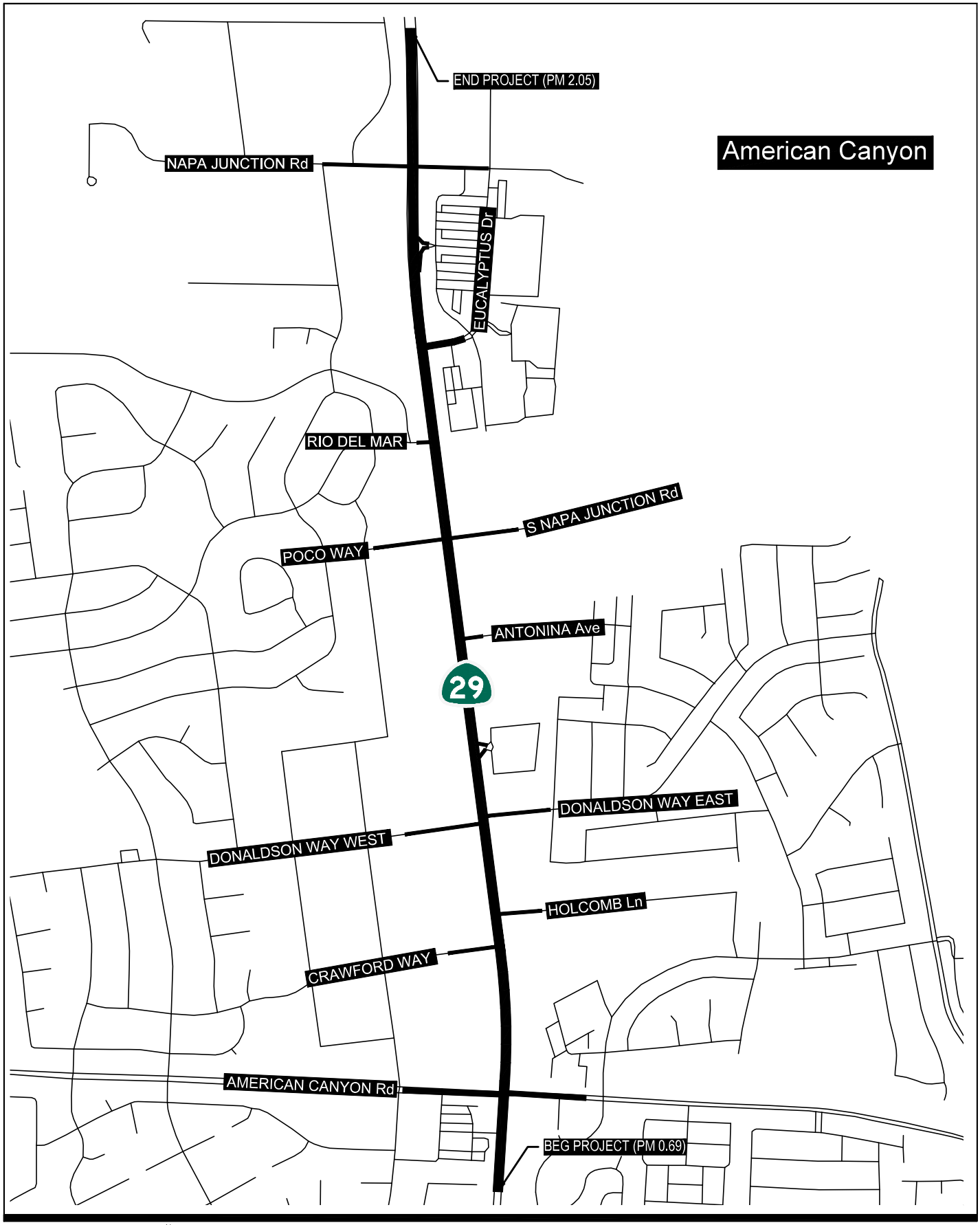
Treatment solutions have not been determined at this stage of the project. However, it is likely that permanent water quality treatment design will consist of vegetated swales that treat the roadway runoff before it drains to the adjacent receiving system. This project is located outside the delineated Significant Trash Generating Area (STGA) for District 4. However, to the maximum extent practicable, trash capture features will be incorporated into the design.

Required Attachments

1. Vicinity Map/ Location Map
2. Evaluation Documentation Form (EDF)
3. Risk Level Determination Documentation
4. SWDR Attachment for SMARTS Input (To be completed in PS&E)
5. Stormwater Data Report Summary Spreadsheet Output (To be completed in PS&E)

Supplemental Attachments

6. Temporary Water Pollution Control Plan (To be completed in PS&E)
7. DSA Exhibit
8. Change in Pervious and Impervious Surfaces Exhibit
9. Grading Plans (To be completed in PA/ED)
10. Drainage Plans (To be completed in PS&E)
11. Erosion Control Plans (To be completed in PS&E)
12. (not used)
13. Typical Cross-Sections



N

0 1000 2000

1 inch = 1000 ft.

GHD

NVTA
ROUTE 29 IN AMERICAN CANYON
COMPLETE STREETS IMPROVEMENTS PROJECT

PROJECT LOCATION MAP

Project No. 0419000297
Date 9/7/2021

Attachment 1

Filename: N:\US\Roseville\Projects\561\11187559\00-SR 29 Am Can PID Project\Design- CAD\Project Location Map.dwg
Plot Date: 10 December 2021 3:00 PM

DATE: __9/19/2022_____

Project ID (EA): ___04-4Q010_____

No.	Criteria	Yes ✓	No ✓	Supplemental Information for Evaluation
1.	Begin Project evaluation regarding requirement for implementation of Treatment BMPs	✓		See Figure 4-1, Project Evaluation Process for Consideration of Treatment BMPs. Continue to 2.
2.	Is the scope of the Project to install Treatment BMPs (e.g., Alternative Compliance or TMDL Compliance Units)?		✓	**If Yes**, go to 8. If **No**, continue to 3.
3.	Is there a direct or indirect discharge to surface waters?	✓		**If Yes**, continue to 4. If **No**, go to 9.
4.	As defined in the WQAR or ED, does the project: a. discharge to Areas of Special Biological Significance (ASBS), or b. discharge to a TMDL watershed where Caltrans is named stakeholder, or c. have other pollution control requirements for surface waters within the project limits?		✓	**If Yes to any**, contact the District/Regional Design Stormwater Coordinator or District/Regional NPDES Coordinator to discuss the Department's obligations, go to 8 or 5. MO *(Dist./Reg. Coordinator initials)* If **No** to all, continue to 5.
		✓		
			✓	
5.	Are any existing Treatment BMPs partially or completely removed? (ATA Condition 1, Section 4.4.1)		✓	**If Yes**, go to 8 **AND** continue to 6. If **No**, continue to 6.
6.	Is this a Routine Maintenance Project?		✓	**If Yes**, go to 9. If **No**, continue to 7.
7.	Does the project result in an increase of one acre or more of new impervious surface (NIS)?	✓		**If Yes**, go to 8. If **No**, go to 9.
8.	Project is required to implement Treatment BMPs.	Complete Checklist T-1, Part 1.		
9.	Project is not required to implement Treatment BMPs. MO *(Dist./Reg. Design SW Coord. Initials)* _EDF_____ *(Project Engineer Initials)* *_9/19/22_____ (Date)*	Document for Project Files by completing this form and attaching it to the SWDR.		

Attachment 3
Risk Level Determination Document

	A	B	C	D
1	American Canyon			
2	**Sediment Risk Factor Worksheet**		**Entry**	
3	**A) R Factor**			CON
4	Analyses of data indicated that when factors other than rainfall are held constant, soil loss is directly proportional to a rainfall factor composed of total storm kinetic energy (E) times the maximum 30-min intensity (I30) (Wischmeier and Smith, 1958). The numerical value of R is the average annual sum of EI30 for storm events during a rainfall record of at least 22 years. "Isoerodent" maps were developed based on R values calculated for more than 1000 locations in the Western U.S. Refer to the link below to determine the R factor for the project site.			
5	http://cfpub.epa.gov/npdes/stormwater/LEW/lewCalculator.cfm			
6			**R Factor Value** 40.00	
7	**B) K Factor (weighted average, by area, for all site soils)**			
8	The soil-erodibility factor K represents: (1) susceptibility of soil or surface material to erosion, (2) transportability of the sediment, and (3) the amount and rate of runoff given a particular rainfall input, as measured under a standard condition. Fine-textured soils that are high in clay have low K values (about 0.05 to 0.15) because the particles are resistant to detachment. Coarse-textured soils, such as sandy soils, also have low K values (about 0.05 to 0.2) because of high infiltration resulting in low runoff even though these particles are easily detached. Medium-textured soils, such as a silt loam, have moderate K values (about 0.25 to 0.45) because they are moderately susceptible to particle detachment and they produce runoff at moderate rates. Soils having a high silt content are especially susceptible to erosion and have high K values, which can exceed 0.45 and can be as large as 0.65. Silt-size particles are easily detached and tend to crust, producing high rates and large volumes of runoff. Use Site-specific data must be submitted.			
9	Site-specific K factor guidance			
10			**K Factor Value** 0.24	
11	**C) LS Factor (weighted average, by area, for all slopes)**			
12	The effect of topography on erosion is accounted for by the LS factor, which combines the effects of a hillslope-length factor, L, and a hillslope-gradient factor, S. Generally speaking, as hillslope length and/or hillslope gradient increase, soil loss increases. As hillslope length increases, total soil loss and soil loss per unit area increase due to the progressive accumulation of runoff in the downslope direction. As the hillslope gradient increases, the velocity and erosivity of runoff increases. Use the LS table located in separate tab of this spreadsheet to determine LS factors. Estimate the weighted LS for the site prior to construction.			
13	LS Table			
14			**LS Factor Value** 0.53	
15				
16	**Watershed Erosion Estimate (=RxKxLS) in tons/acre**	5.088		
17	**Site Sediment Risk Factor**	**Low**		
18	Low Sediment Risk: < 15 tons/acre			
19	Medium Sediment Risk: >=15 and <75 tons/acre			
20	High Sediment Risk: >= 75 tons/acre			
21				
22				
23	Additional Information Needed in NOI in SMARTS	SF	AC	
24	Total Site Size (ac or sf):	1,197,900	27.50	
25	Total Project Site Size (ac or sf):	1,197,900	27.50	
26	Total area to be disturbed (ac):	1,197,900	27.50	
27	% Of Total Area (%)		100.00%	
28	Imperviousness Before Construction (%):	655,142	54.69%	
29	Imperviousness After Construction (%):	690,425	79.93%	
30	Delta in Impervious (SF) - Pos=Increase; Neg=Decrease		25.24%	
31	Type of Construction: Residential; Commercial: Industrial; Reconstruction; Transporation; Utility: Type; Other	Road/Trail		
32	Name & Telephone Number of Local Reviewing Agency:	American Canyon		
33	Engineering			
34	Receiving Water Information: If indirectly or directly specify name of receiving water. Else - agency storm drain system	Directly: storm drain system Indirectly: creek		
35				

Caltrans Water Quality Planning Tool

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- [ ] Arid and Semi-Arid Regions
- [ ] Caltrans Districts
- [ ] Caltrans Facilities
- [ ] Caltrans T 1 Monitorir Sites
- [ ] Calwater Watershec
- [ ] Coastal Zone
- [ ] Counties
- ( ) Geologic Map (Legend)
- [ ] High Risk Receiving Watershec
- [ ] Monthly Precipitatic
- [ ] MS4 Areas

Information
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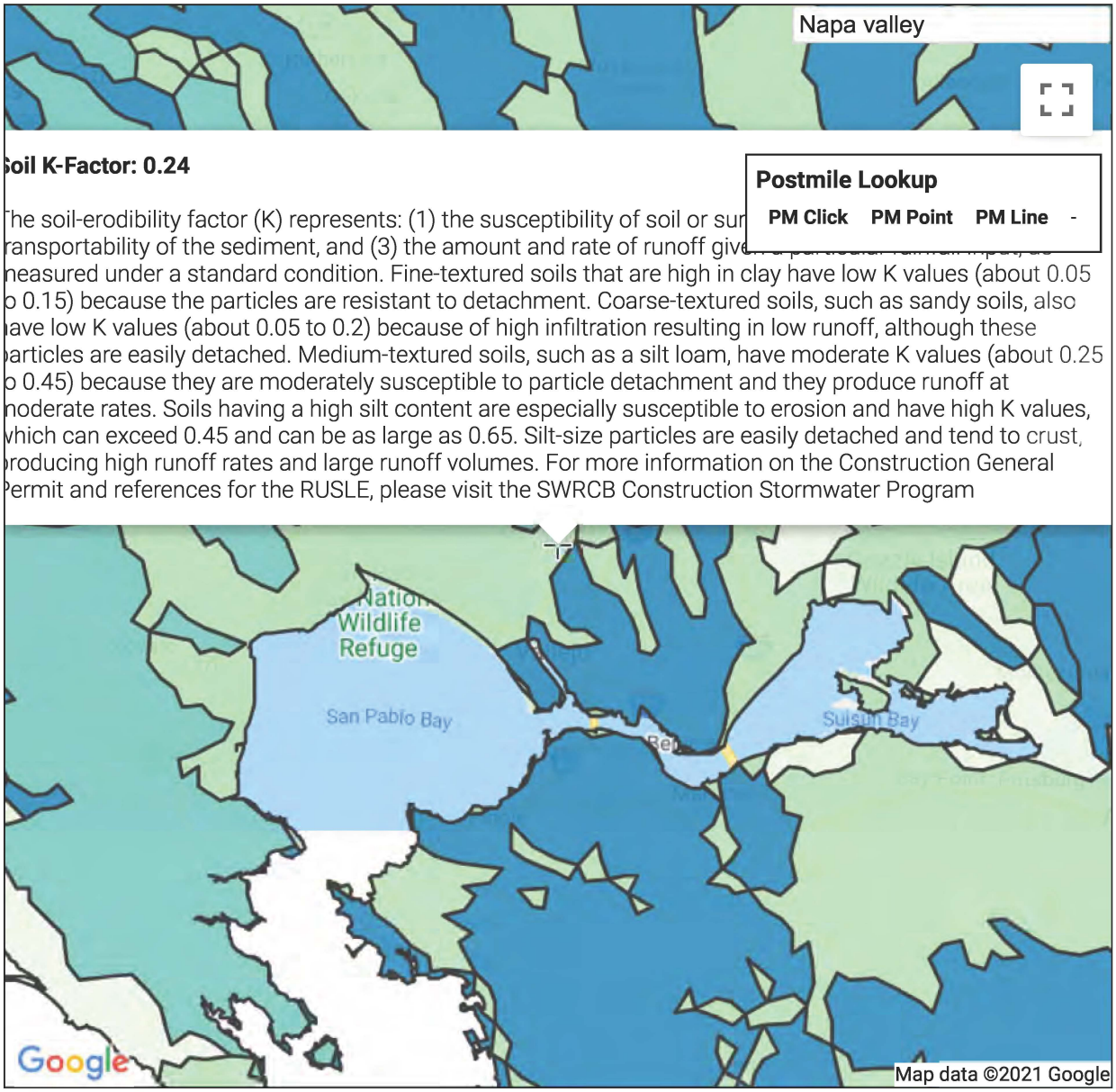
Help



Watershed Information

CALWATER WATERSHED

Hydrologic Unit	SAN PABLO	Hydrologic Area	Napa River	Hydrologic Sub-Area #	206.50
Hydrologic Sub-Area Name	undefined	Planning Watershed	2206500405	HSA Area (acres)	266735
Latitude, Longitude	38.1673, -122.2532				

WATERSHED BOUNDARY DATASET

Watershed	Tulucay Creek-Frontal San Pablo Bay Estuaries	**Subwatershed**	American Canyon Creek-Frontal San Pablo Bay Estuaries	**Hydrologic Unit Code**	180500020401
Average Annual Precipitation (inches)	17.86				

TMDLs & 303(d) Listed Water Bodies (2014 - 2016 List)

Key: Water body on 303(d) list Water body with a TMDL

Name	Pollutant	Size	Status
Carquinez Strait	Chlordane	5657.31 Acres	TMDL required
Carquinez Strait	DDT (Dichlorodiphenyltrichloroethane)	5657.31 Acres	TMDL required
Carquinez Strait	Dieldrin	5657.31 Acres	TMDL required
Carquinez Strait	Dioxin compounds (including 2,3,7,8-TCDD)	5657.31 Acres	TMDL required
Carquinez Strait	Furan Compounds	5657.31 Acres	TMDL required
Carquinez Strait	Invasive Species	5657.31 Acres	TMDL required
Carquinez Strait	Mercury	5657.31 Acres	Being addressed with USEPA approved TMDL
Carquinez Strait	PCBs (Polychlorinated biphenyls)	5657.31 Acres	Being addressed with USEPA approved TMDL
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Henne, Lake	Mercury	17.24 Acres	TMDL required
Lake Chabot (Solano Co)	Mercury	47.96 Acres	TMDL required
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Water Quality Objectives

The following waterbodies are in or near HSA 206.50. Click on the waterbody to get information on water quality objectives and beneficial uses

Waterbody Name	Beneficial Uses	Sediment-Sensitive Waterbody
Briones Reservoir	COLD, MUN, REC1, REC2, SPWN, WARM, WILD	False
Calabazas Creek	AGR, COLD, GWR, NAV, REC1, REC2, WARM, WILD	False
Calabazas Creek	AGR, COLD, GWR, NAV, REC1, REC2, WARM, WILD	False
Carquinez Strait	COMM, EST, IND, MIGR, NAV, RARE, REC1, REC2, SPWN, WILD	False
Dry Creek	AGR, COLD, MIGR, MUN, REC1, REC2, SPWN, WARM, WILD	True
Green Valley Creek	COLD, FRSH, REC1, REC2, SPWN, WARM, WILD	False
Green Valley Creek	COLD, FRSH, REC1, REC2, SPWN, WARM, WILD	False
Hennessay Lake	COLD, MUN, REC1, REC2, SPWN, WARM, WILD	False
Herman Lake	COLD, IND, MUN, REC1, REC2, SPWN, WARM, WILD	False
Kimball Reservoir	MUN, REC1, REC2, WARM, WILD	False
Lafayette Lake	COLD, MUN, REC2, SPWN, WARM, WILD	False
lake Chabot (Solano)	AGR, MUN, REC1, REC2, SPWN, WARM, WILD	False
Lake Curry	MUN, REC1, REC2, SPWN, WARM, WILD	False
Lake Frey	COLD, MUN, REC2, SPWN, WARM, WILD	False
Lake Madigan	AGR, COLD, MUN, REC2, SPWN, WARM, WILD	False
Lake Marie	AGR, COLD, REC1, REC2, SPWN, WARM, WILD	False
Mallard Reservoir	AGR, IND, MUN, PROC, REC1, REC2, SPWN, WARM, WILD	False
Miller Cr	COLD, MIGR, RARE, REC1, REC2, SPWN, WARM, WILD	True
Milliken Reservoir	COLD, MUN, REC1, REC2, SPWN, WARM, WILD	False
Montezuma Slough	NAV, RARE, REC1, REC2, SPWN, WARM, WILD	False
Napa R	AGR, COLD, MIGR, MUN, NAV, RARE, REC1, REC2, SPWN, WARM, WILD	True
Pacheco Pond	COMM, REC1, WARM	False
Pinhole Creek	COLD, MIGR, REC1, REC2, SPWN, WARM, WILD	True
Rector Reservoir	COLD, MUN, REC1, SPWN, WARM, WILD	False
San Pablo Bay	COMM, EST, IND, MIGR, NAV, RARE, REC1, REC2, SHELL, SPWN, WILD	False
San Pablo Bay	COMM, EST, IND, MIGR, NAV, RARE, REC1, REC2, SHELL, SPWN, WILD	False
San Pablo Cr	MIGR, REC2, SPWN, WARM, WILD	False
Sonoma Cr	COLD, MIGR, RARE, REC1, REC2, SPWN, WARM, WILD	True
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Stafford Lake	COLD, MUN, REC1, REC2, SPWN, WARM, WILD	False
Suisun Cr	COLD, FRSH, MIGR, REC1, REC2, SPWN, WARM, WILD	True
Suisun Cr	COLD, FRSH, MIGR, REC1, REC2, SPWN, WARM, WILD	True
York Creek	COLD, MIGR, REC2, SHELL, SPWN, WILD	True

Caltrans Facilities

MAINTENANCE STATIONS

Name	Address
Mount Saint Helena	Hwy 29 PM 43.6
Calistoga	1413 Tubbs Lane
Napa	3161 Jefferson Street

FREEWAYS AND HIGHWAYS

Route	Length (miles)
12	3.1
29	51.4
37	11.9

Vallejo	1700 Sear Point Road	80	7.7
Carquinez/Benicia/Antioch Bridges	Carquinez Toll Plaza	121	13.9
		128	17
		221	2.7
		780	1.5

PARK & RIDE LOTS

Name	District	County	Route	Post Mile
LEMON	4	SOL	80	2.2
MAGAZINE	4	SOL	80	1.738
IMOLA	4	NAP	29	10.305
BENICIA	4	SOL	80	2.445

REST AREAS

Name	District	County	Route	Post Mile
HUNTER HILL	4	SOL	80	6.700

Additional Information

Help for the Water Quality Planning Tool

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R Factor erosivity calculations

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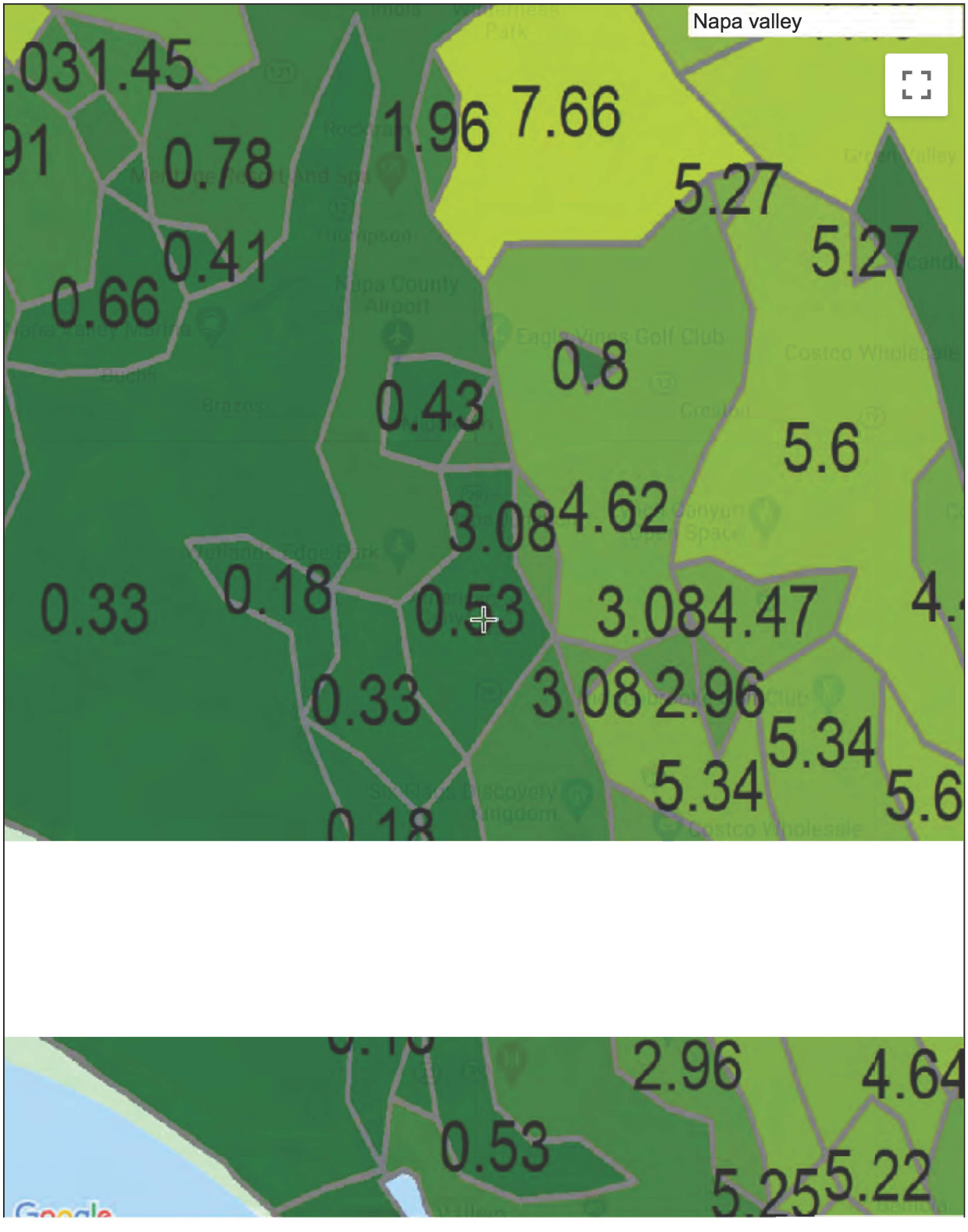

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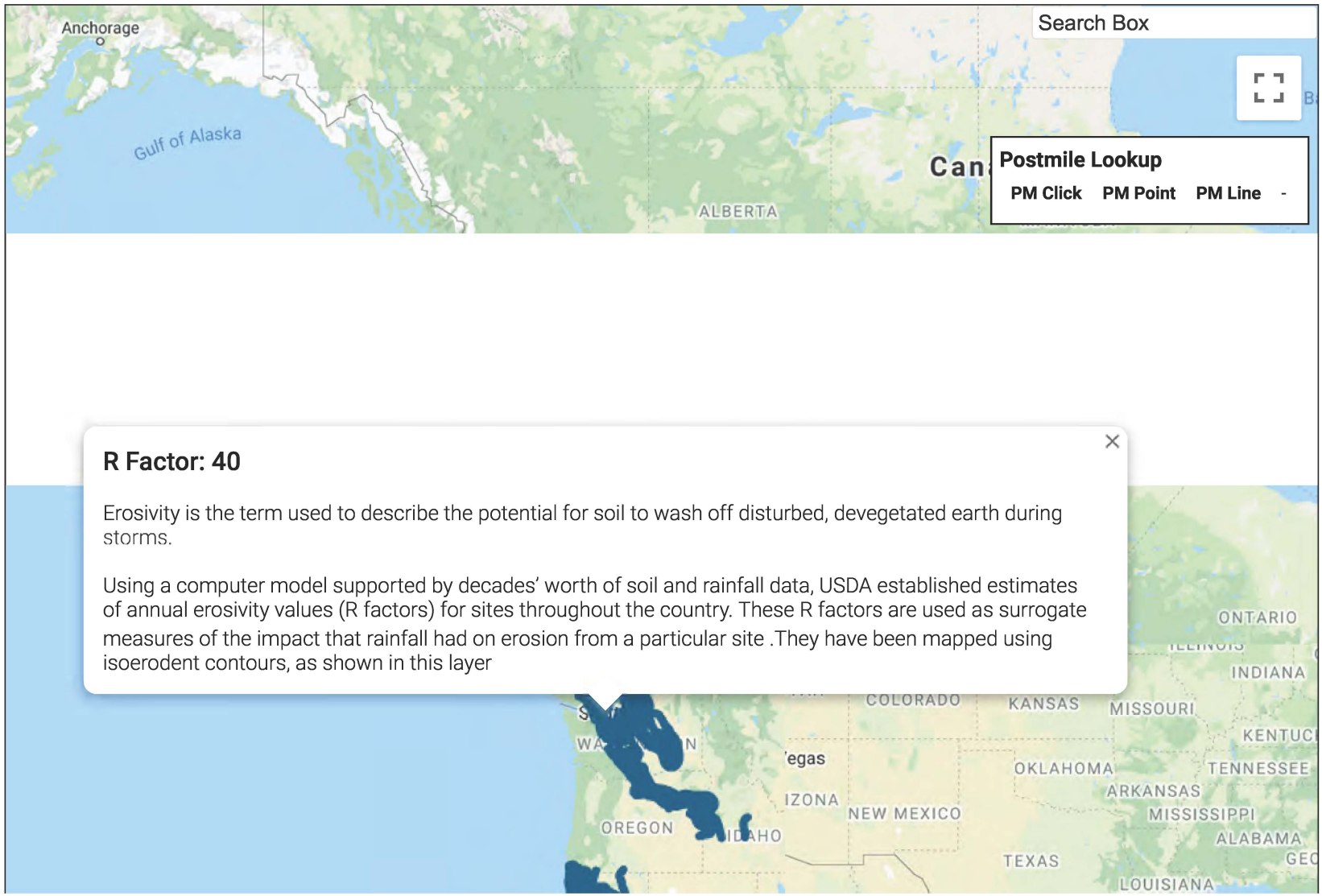

Determination

☐ Erosivity Index

Information
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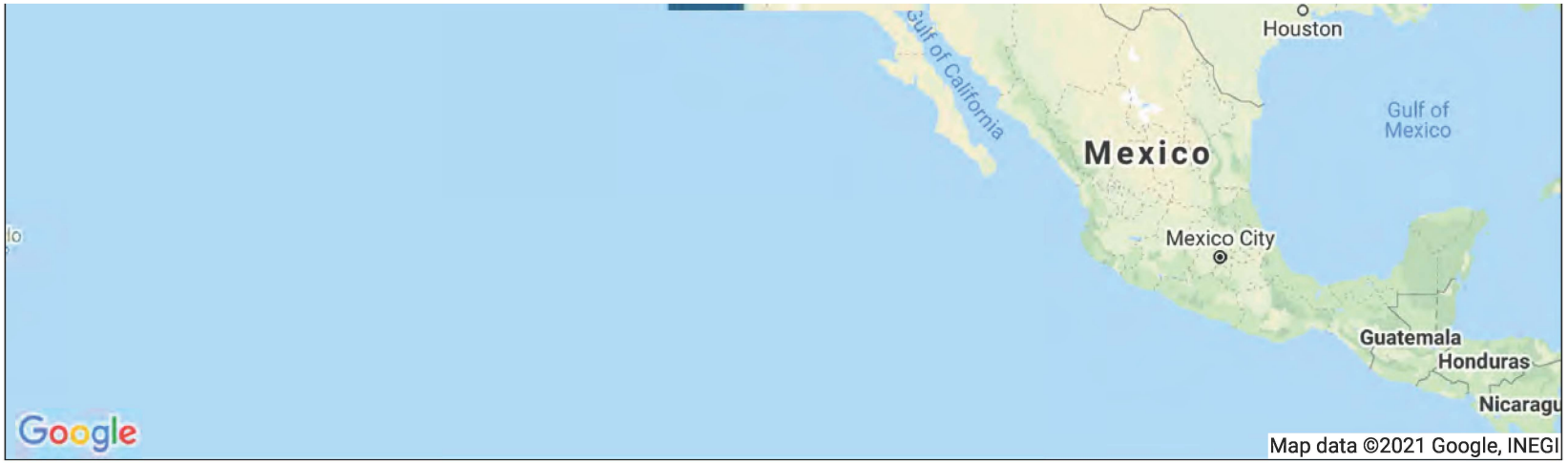
Help



Watershed Information

CALWATER WATERSHED

Hydrologic Unit		Hydrologic Area	Hydrologic Sub-Area #
Hydrologic Sub-Area Name		Planning Watershed 0	HSA Area (acres)
Latitude, Longitude	41.1807, -119.2388		

WATERSHED BOUNDARY DATASET

Watershed	High Rock Lake	Subwatershed	Willow Creek	Hydrologic Unit Code	160402030209
Average Annual Precipitation (inches)	0				

TMDLs & 303(d) Listed Water Bodies (2014 - 2016 List)

Key: Water body on 303(d) list Water body with a TMDL

Name	Pollutant	Size	Status
No listings found.			

Water Quality Objectives

The following waterbodies are in or near HSA . Click on the waterbody to get information on water quality objectives and beneficial uses

Waterbody Name	Beneficial Uses	Sediment-Sensitive Waterbody

Caltrans Facilities

MAINTENANCE STATIONS

Name Address

FREEWAYS AND HIGHWAYS

Route Length (miles)

PARK & RIDE LOTS

Name District County Route Post Mile

REST AREAS

Name District County Route Post Mile

Additional Information

Help for the Water Quality Planning Tool

TMDL information from the SWRCB

Construction General Permit information from the SWRCB

Groundwater Depth information from the California Department of Water Resouces

R Factor erosivity calculations

ATTACHMENT 7

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

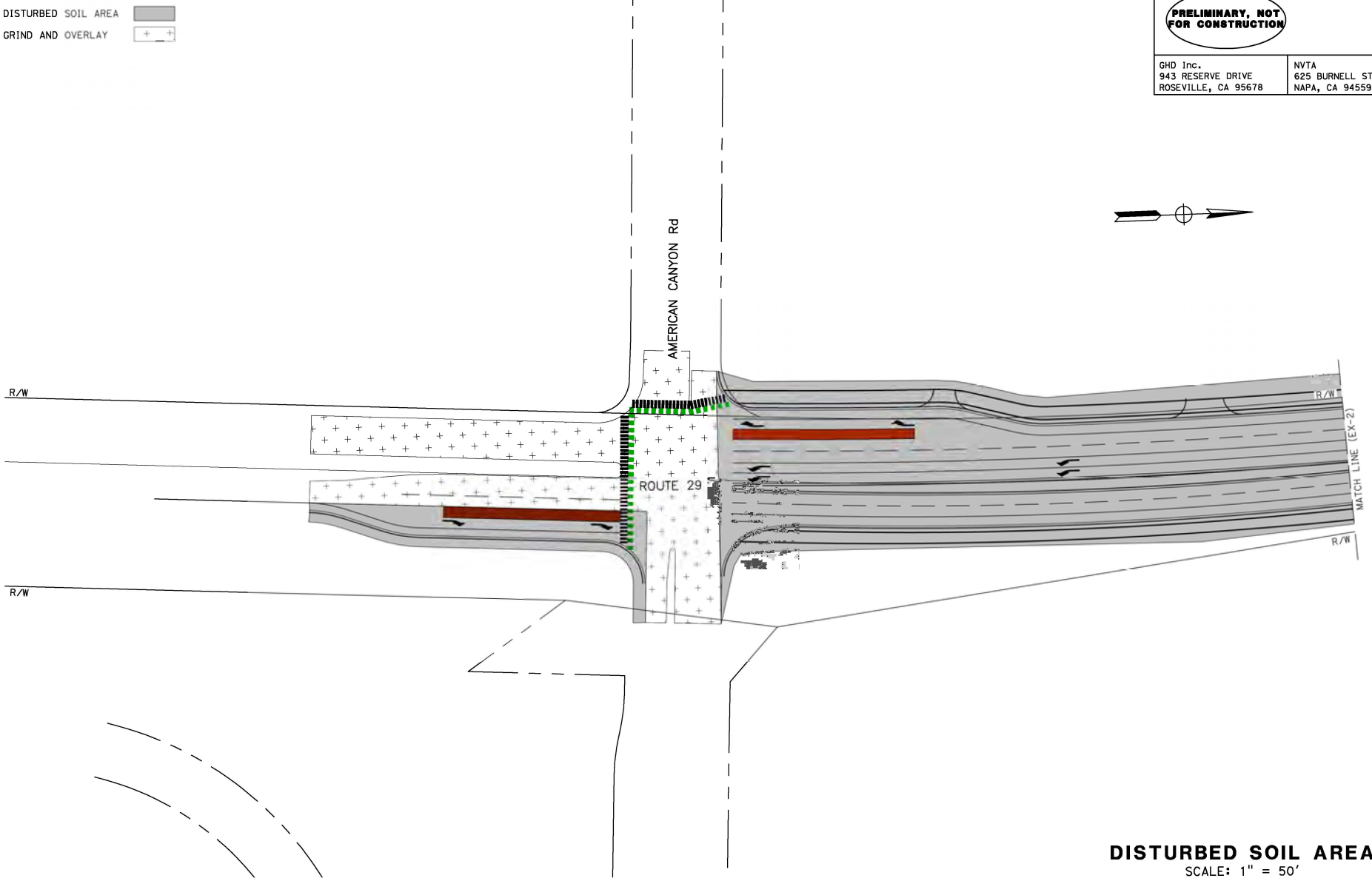
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 1

EX-1

CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
DELANEY BABCOCK	LINDSEY VAN PARYS		

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

RONALD G. BOYLE
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 2-2-2022
TIME PLOTTED => 16:34

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - DSA ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

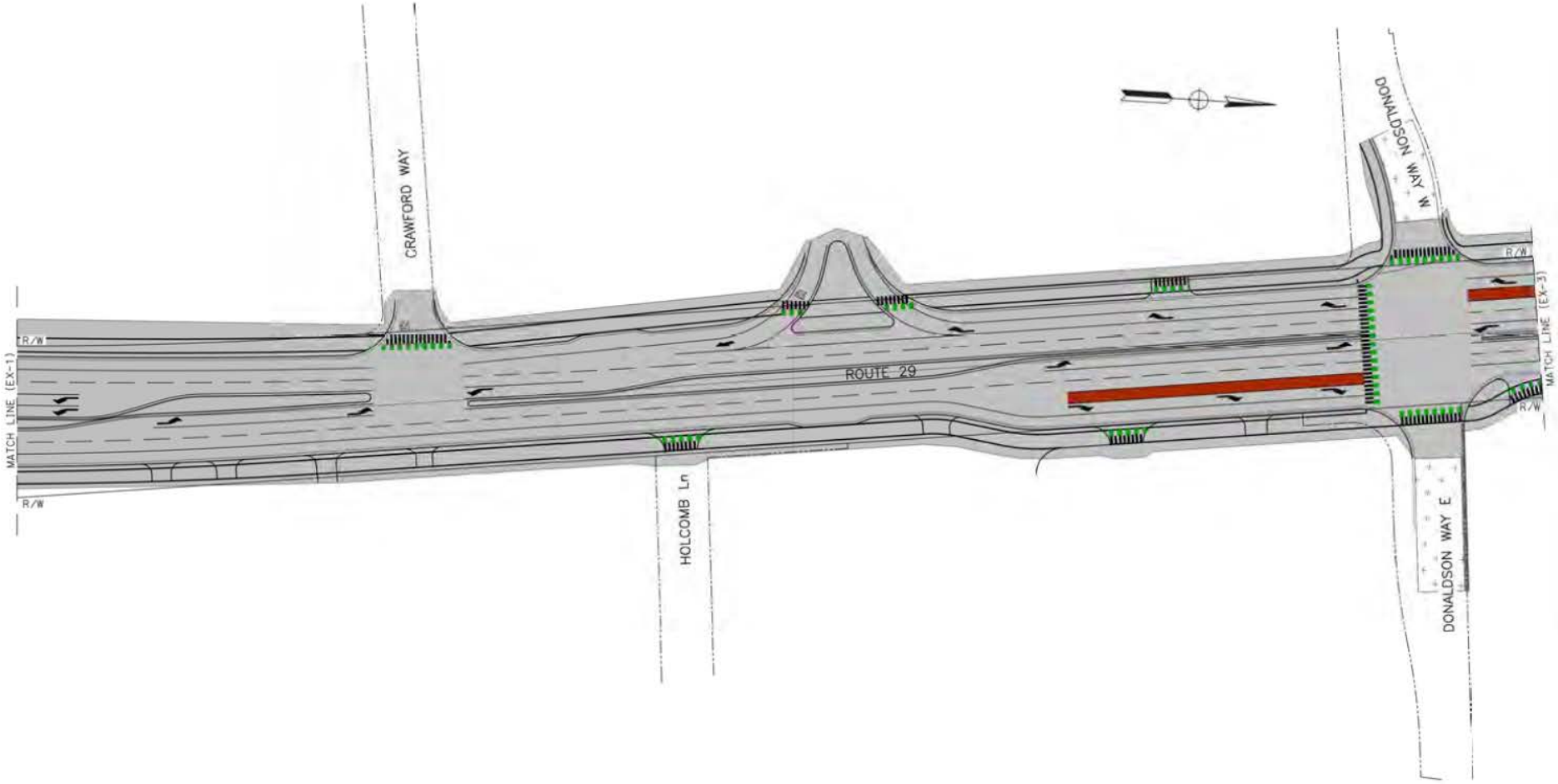
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA
SCALE: 1" = 50'

ALTERNATIVE 1

EX-2

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

RONALD G. BOYLE — ASSISTANT FUNCTIONAL SUPERVISOR

LINDSEY VAN PARYS — CHECKED BY

DELANEY BABCOCK — CALCULATED-DESIGNED BY

REVISED BY | DATE REVISED

BORDER LAST REVISED 7/2/2010

USERNAME => mpltcock
DGN FILE => 11187559EX004 - DSA ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

LAST REVISION | DATE PLOTTED => 2-2-2022 | 00-00-00 | TIME PLOTTED => 16:35

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

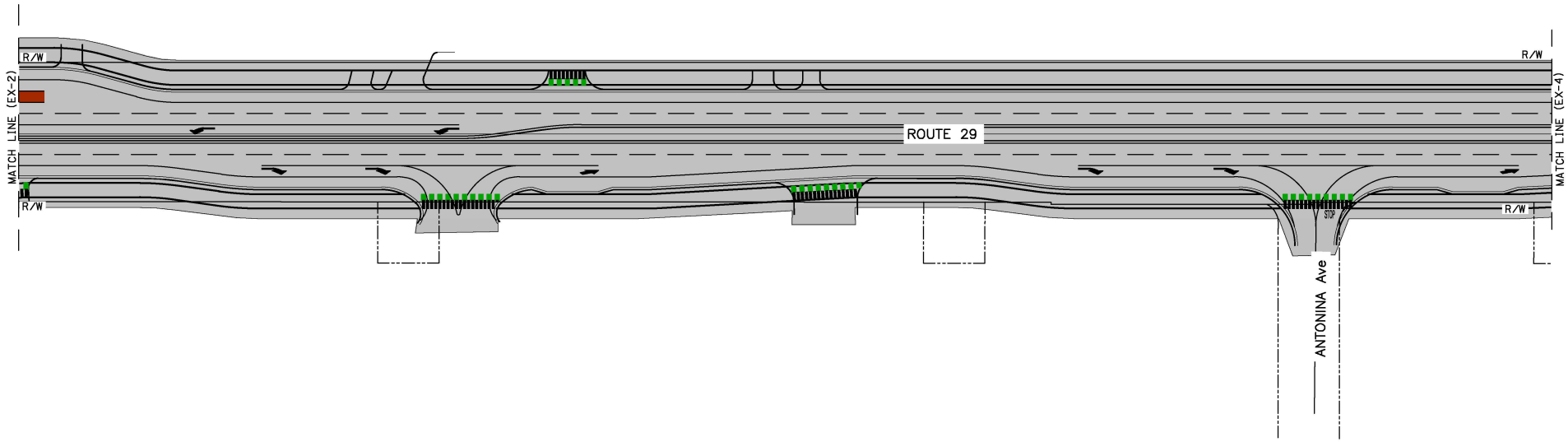
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 1

EX-3

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY: DELANEY BABCOCK
CHECKED BY: LINDSEY VAN PARYS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RONALD G. BOYLE
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 2-2-2022
TIME PLOTTED => 16:35

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - DSA ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

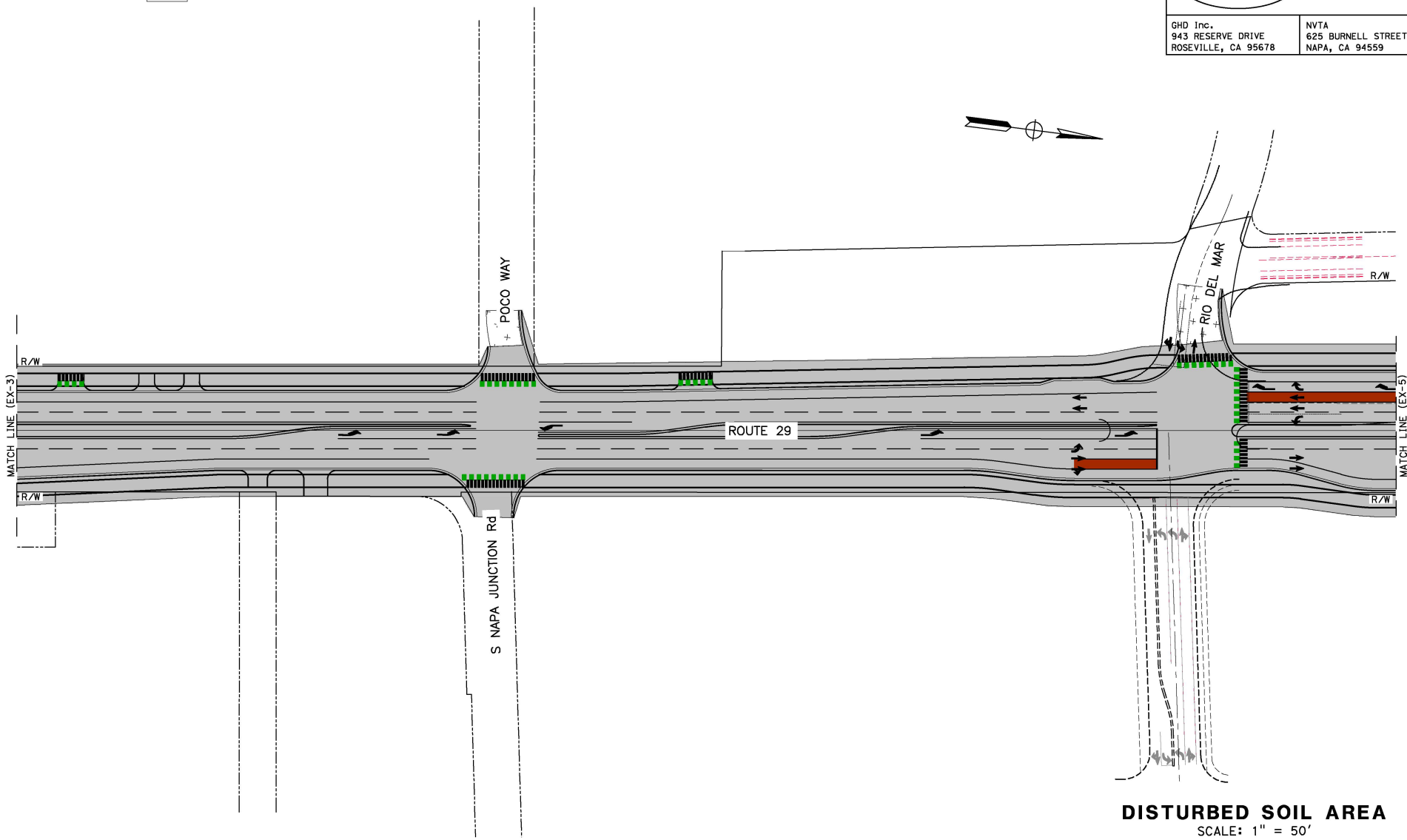
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 1

EX-4

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

RONALD G. BOYLE
PROJECT ASSISTANT FUNCTIONAL SUPERVISOR

DELANEY BABCOCK
LINDSEY VAN PARYS
CALCULATED-DESIGNED BY
CHECKED BY

REVISED BY
DATE REVISED

LAST REVISION 00-00-00
DATE PLOTTED => 2-2-2022
TIME PLOTTED => 16:35

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - DSA ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

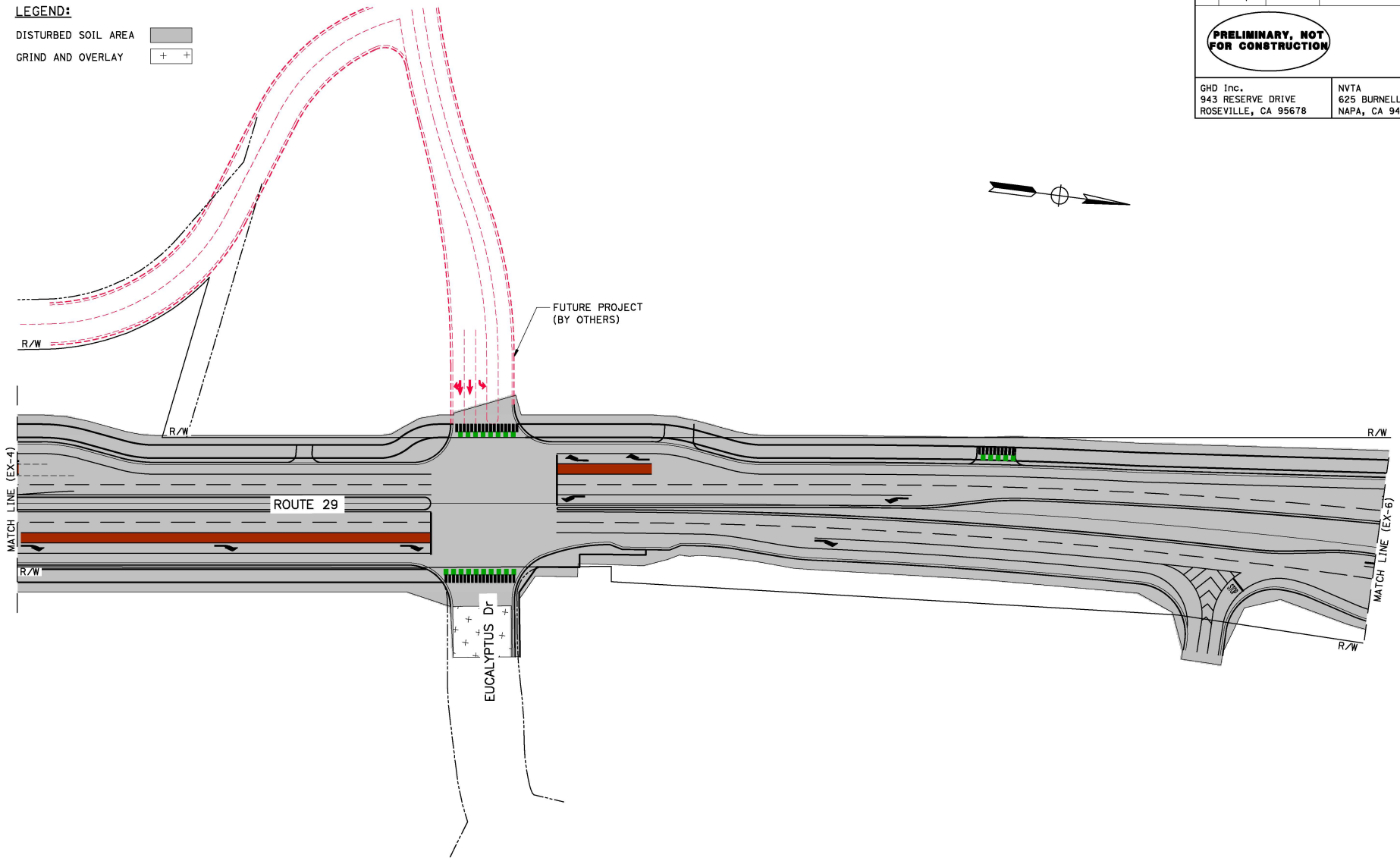
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 1

EX-5

REVISED BY | DATE REVISED

DELANEY BABCOCK | LINDSEY VAN PARYS

CALCULATED-DESIGNED BY | CHECKED BY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

RONALD G. BOYLE

ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - DSA ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

LAST REVISION 00-00-00

DATE PLOTTED => 2-2-2022
TIME PLOTTED => 16:35

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

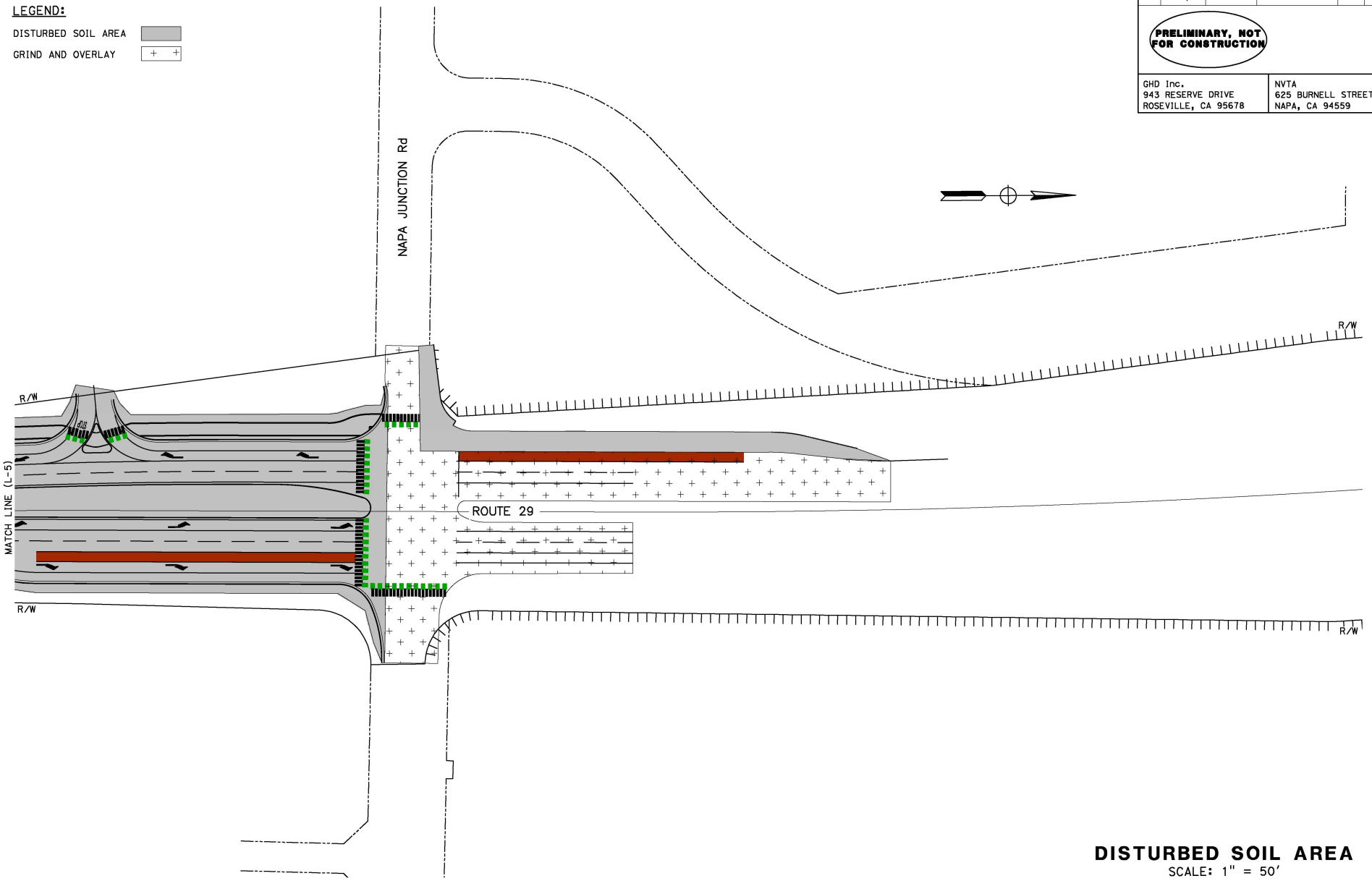
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 1

EX-6

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

RONALD G. BOYLE
ASSISTANT FUNCTIONAL SUPERVISOR

CALCULATED-DESIGNED BY

CHECKED BY

DELANEY BABCOCK

LINDSEY VAN PARYS

REVISED BY

DATE REVISED

LAST REVISION 00-00-00

DATE PLOTTED => 2-2-2022
TIME PLOTTED => 16:35

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - DSA ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

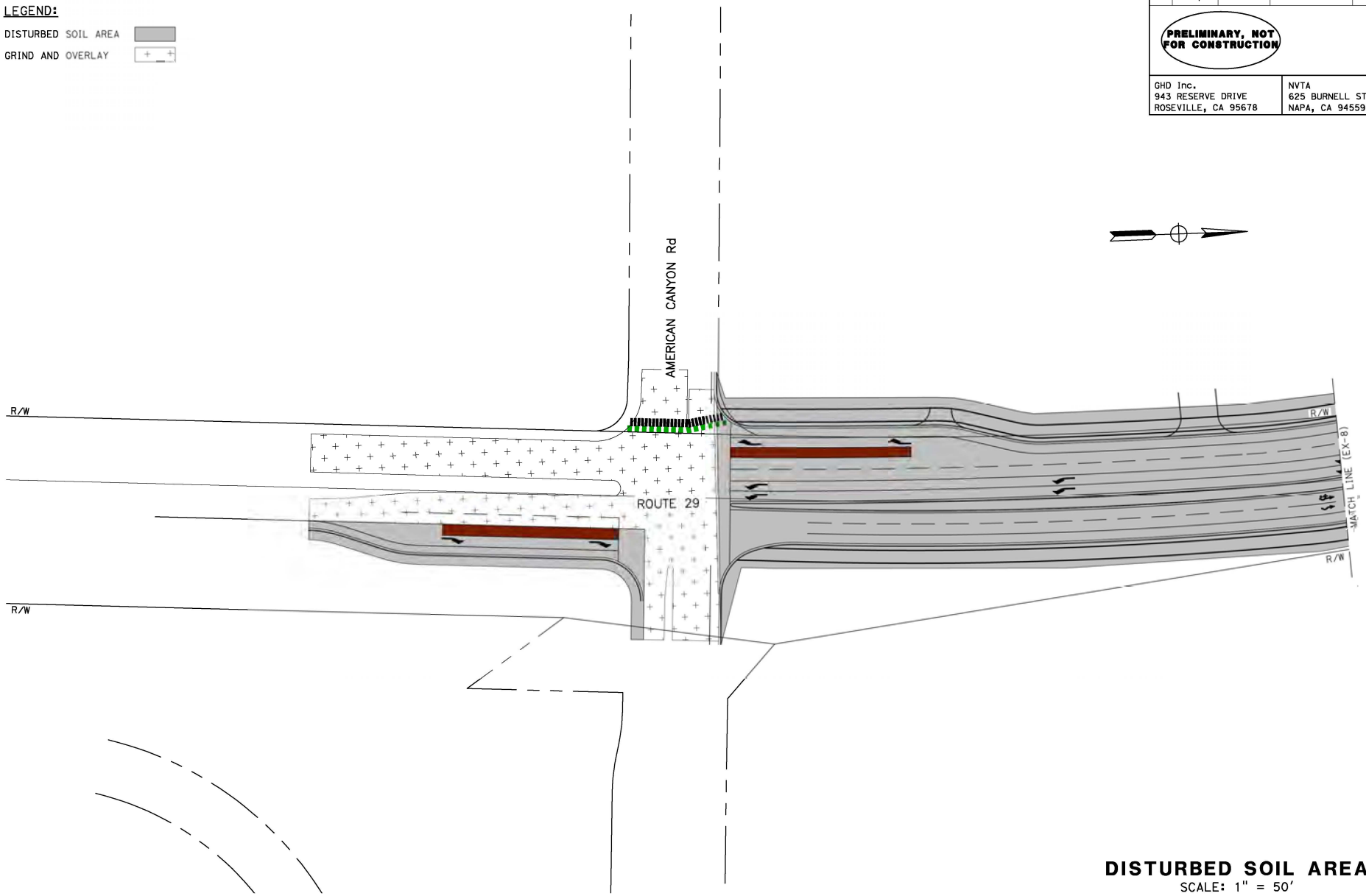
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 2

EX-7

REVISED BY | DATE REVISED

LINDSEY VAN PARYS

CALCULATED-DESIGNED BY | CHECKED BY

RONALD G. BOYLE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00 | DATE PLOTTED => 2-2-2022 | TIME PLOTTED => 16:34

BORDER LAST REVISED 7/2/2010 | USERNAME => mpittcock | DGN FILE => 11187559EX004 – DSA ALT 2.DWG | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

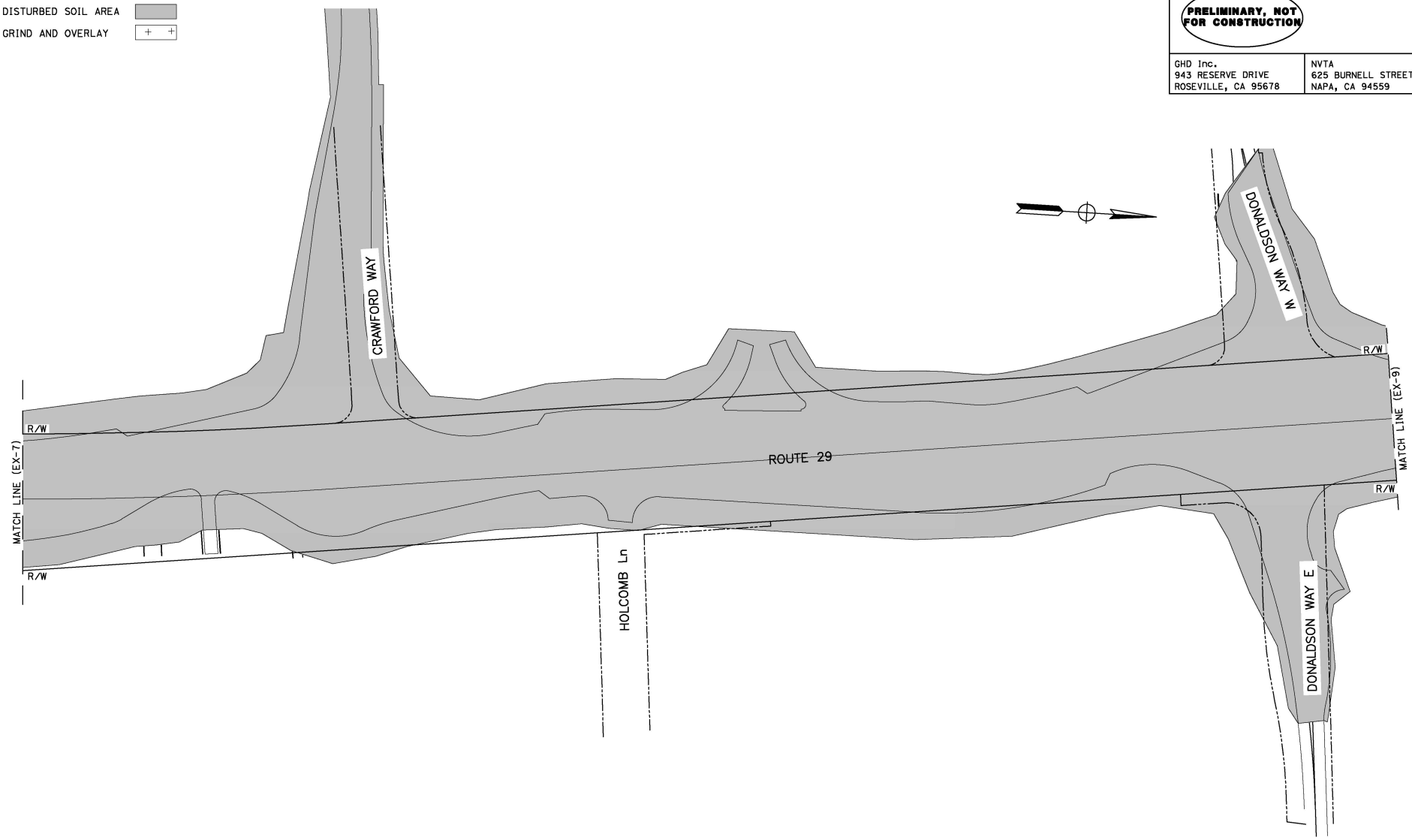
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 2

EX-8

CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
DELANEY BABCOCK	LINDSEY VAN PARYS		

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RONALD G. BOYLE
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 2-2-2022
TIME PLOTTED => 16:34

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - DSA ALT 2.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

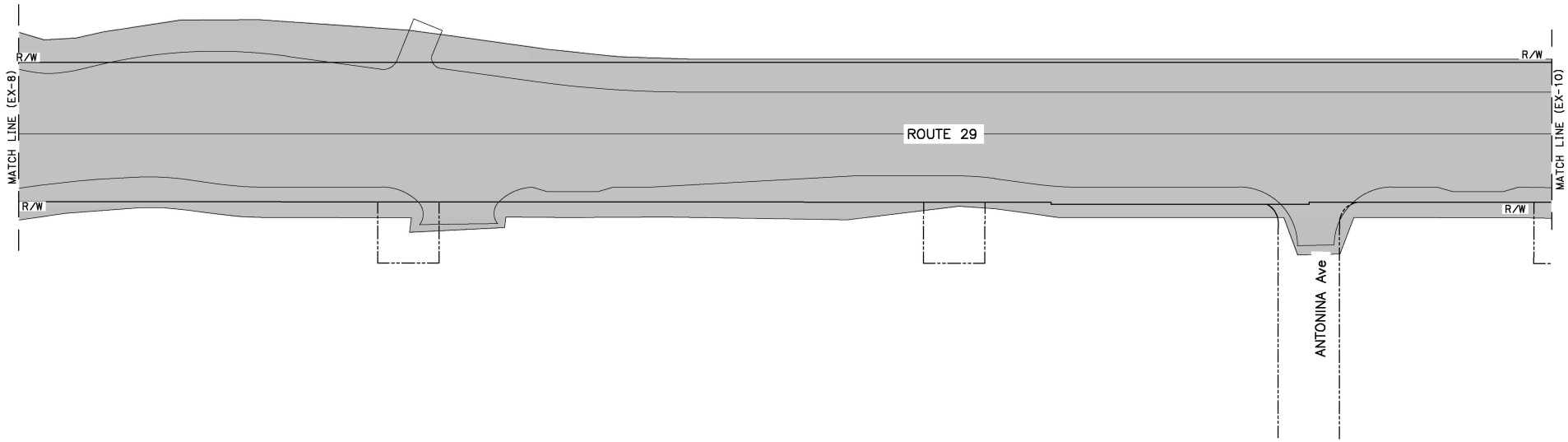
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 2

EX-9

REVISED BY | DATE REVISED

DELANEY BABCOCK | LINDSEY VAN PARYS

CALCULATED-DESIGNED BY | CHECKED BY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

RONALD G. BOYLE

ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00 | DATE PLOTTED => 2-2-2022 | TIME PLOTTED => 16:34

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - DSA ALT 2.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

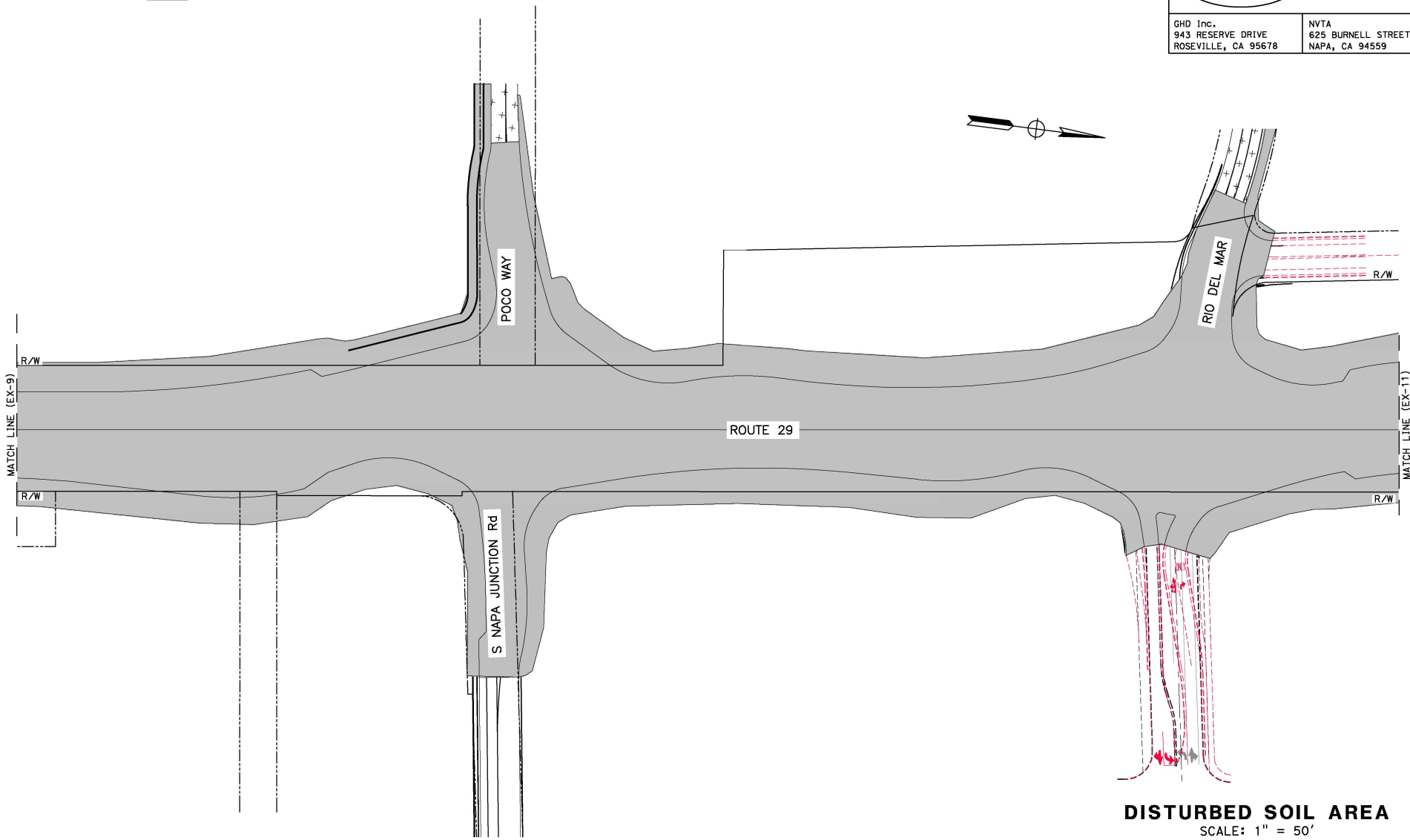
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA
SCALE: 1" = 50'

ALTERNATIVE 2

EX-10

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RONALD G. BOYLE — ASSISTANT FUNCTIONAL SUPERVISOR
DELANEY BABCOCK — CALCULATED-DESIGNED BY
LINDSEY VAN PARYS — CHECKED BY
REVISED BY — DATE REVISED

LAST REVISION 00-00-00
DATE PLOTTED => 2-2-2022
TIME PLOTTED => 16:34

BORDER LAST REVISED 7/2/2010
USERNAME => mpittcock
DGN FILE => 11187559EX004 – DSA ALT 2.DWG
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0000
PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

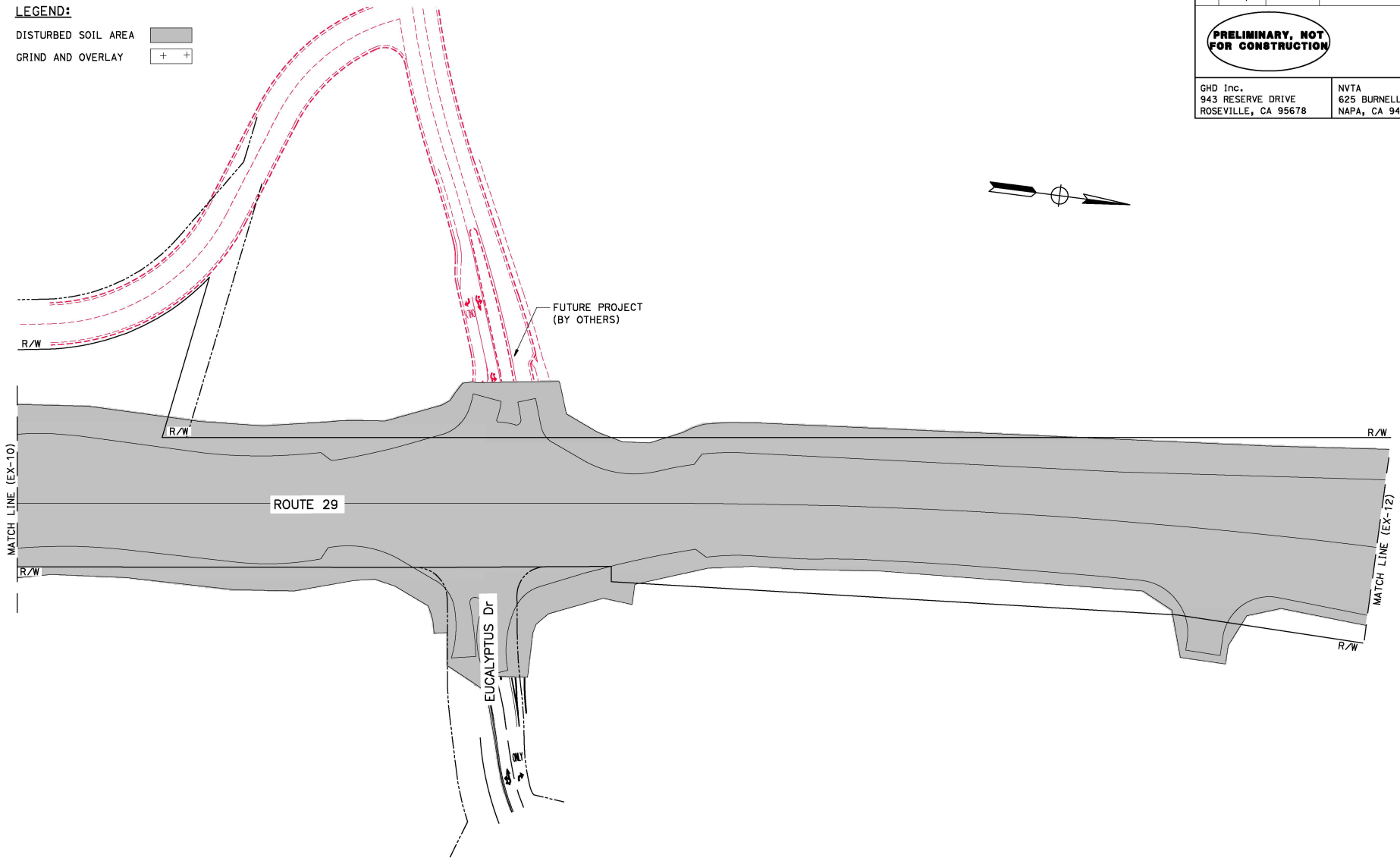
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 2

EX-11

REVISED BY | DATE REVISED

DELANEY BABCOCK | LINDSEY VAN PARYS

CALCULATED-DESIGNED BY | CHECKED BY

RONALD G. BOYLE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00 | DATE PLOTTED => 2-2-2022 | TIME PLOTTED => 16:34

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - DSA ALT 2.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

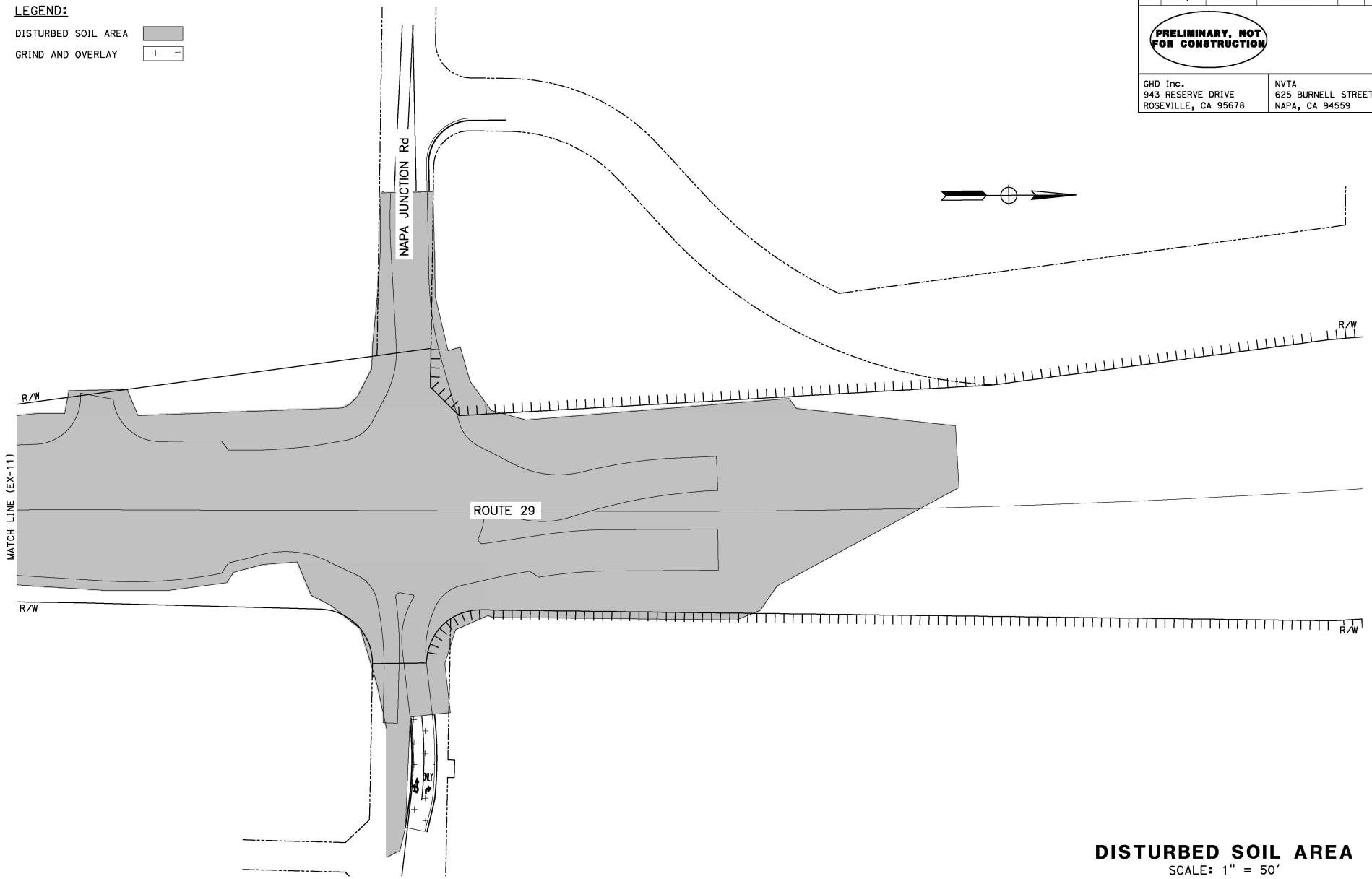
GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

LEGEND:

DISTURBED SOIL AREA

GRIND AND OVERLAY



DISTURBED SOIL AREA

SCALE: 1" = 50'

ALTERNATIVE 2

EX-12

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY	CHECKED BY
DELANEY BABCOCK	LINDSEY VAN PARYS

RONALD G. BOYLE
REGISTERED CIVIL ENGINEER
ASSISTANT FUNCTIONAL SUPERVISOR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 2-2-2022
TIME PLOTTED => 16:34

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - DSA ALT 2.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

ATTACHMENT 8

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc. 943 RESERVE DRIVE ROSEVILLE, CA 95678	NVTA 625 BURNELL STREET NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 1

EX-13

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

RONALD G. BOYLE — PROJECT FUNCTIONAL SUPERVISOR

DELANEY BABCOCK — CALCULATED-DESIGNED BY

LINDSEY VAN PARYS — CHECKED BY

REVISED BY | DATE REVISED

LAST REVISION 00-00-00 | DATE PLOTTED => 2-4-2022 | TIME PLOTTED => 07:30

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - IAS ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES
SCALE: 1" = 50'

ALTERNATIVE 1

EX-14

REVISED BY	DATE REVISED	DELANEY BABCOCK	LINDSEY VAN PARYS	CALCULATED-DESIGNED BY	CHECKED BY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RONALD G. BOYLE
ASSISTANT FUNCTIONAL SUPERVISOR

LAST REVISION 00-00-00
DATE PLOTTED => 2-4-2022
TIME PLOTTED => 07:30

BORDER LAST REVISED 7/2/2010
USERNAME => mpittcock
DGN FILE => 11187559EX004 - IAS ALT 1.DWG
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3
UNIT 0000
PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 1

EX-15

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY	CHECKED BY
DELANEY BABCOCK	LINDSEY VAN PARYS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ASSISTANT FUNCTIONAL SUPERVISOR
RONALD G. BOYLE

Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 2-4-2022
TIME PLOTTED => 07:31

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - IAS ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 1

EX-16

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY	CHECKED BY
DELANEY BABCOCK	LINDSEY VAN PARYS

RONALD G. BOYLE
ASSISTANT FUNCTIONAL SUPERVISOR

LAST REVISION 00-00-00
DATE PLOTTED => 2-4-2022
TIME PLOTTED => 07:31

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - IAS ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 1

EX-17

REVISED BY	DATE REVISED
DELANEY BABCOCK	LINDSEY VAN PARYS

CALCULATED-DESIGNED BY | CHECKED BY

RONALD G. BOYLE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 2-4-2022
TIME PLOTTED => 07:43

BORDER LAST REVISED 7/2/2010

USERNAME => mpitcock
DGN FILE => 11187559EX004 - IAS ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

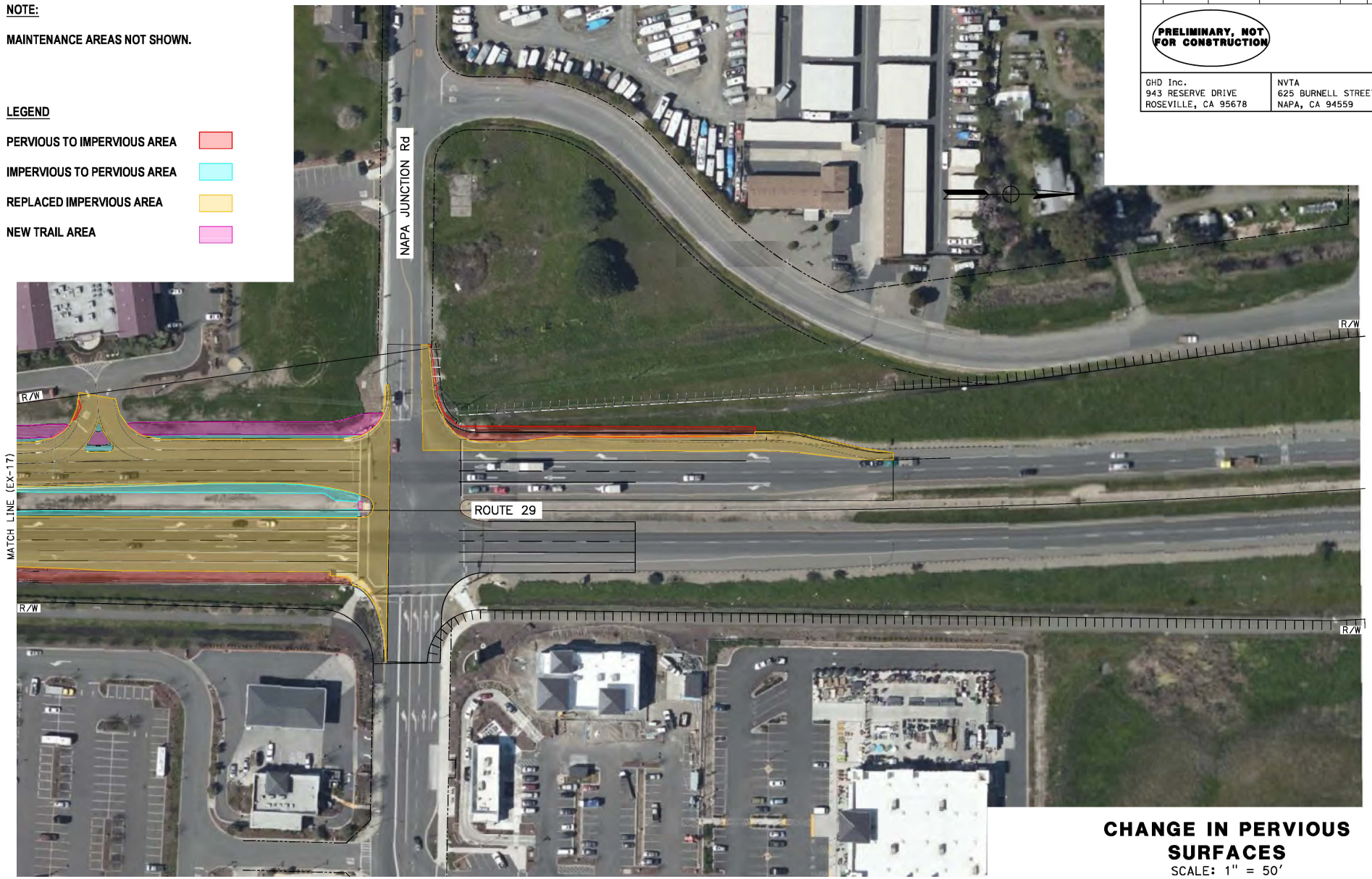
NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA



CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 1

EX-18

REVISED BY	DATE REVISED
DELANEY BABCOCK	LINDSEY VAN PARYS
CALCULATED-DESIGNED BY	CHECKED BY
RONALD G. BOYLE	

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 2-4-2022
TIME PLOTTED => 07:43

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - IAS ALT 1.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 2

EX-19

REVISED BY	DATE REVISED

DELANEY BABCOCK
LINDSEY VAN PARYS

CALCULATED-DESIGNED BY
CHECKED BY

RONALD G. BOYLE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION
DATE PLOTTED => 2-3-2022
TIME PLOTTED => 15:45
00-00-00

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - IAS ALT 2.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 2

EX-20

REVISED BY	DATE REVISED
DELANEY BABCOCK	LINDSEY VAN PARYS
CALCULATED-DESIGNED BY	CHECKED BY
RONALD G. BOYLE	

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 2-3-2022
TIME PLOTTED => 15:46

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - IAS ALT 2.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 2

EX-21

REVISED BY	DATE REVISED
DELANEY BABCOCK	LINDSEY VAN PARYS

CALCULATED-DESIGNED BY	CHECKED BY
RONALD G. BOYLE	

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION 00-00-00
DATE PLOTTED => 2-3-2022
TIME PLOTTED => 15:46

BORDER LAST REVISED 7/2/2010

USERNAME => mpittcock
DGN FILE => 11187559EX004 - IAS ALT 2.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 2

EX-22

REVISED BY	DATE REVISED
DELANEY BABCOCK	LINDSEY VAN PARYS

CALCULATED-DESIGNED BY | CHECKED BY

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RONALD G. BOYLE
ASSISTANT FUNCTIONAL SUPERVISOR

Caltrans

LAST REVISION | DATE PLOTTED => 2-3-2022
00-00-00 | TIME PLOTTED => 15:47

BORDER LAST REVISED 7/2/2010 | USERNAME => mpittcock | DGN FILE => 11187559EX004 - IAS ALT 2.DWG | RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3 | UNIT 0000 | PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc. 943 RESERVE DRIVE ROSEVILLE, CA 95678	NVTA 625 BURNELL STREET NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA

CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 2

EX-23

REVISED BY	DATE REVISED

CALCULATED-DESIGNED BY	CHECKED BY
DELANEY BABCOCK	LINDSEY VAN PARYS

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
RONALD G. BOYLE
ASSISTANT FUNCTIONAL SUPERVISOR

LAST REVISION 00-00-00
DATE PLOTTED => 2-3-2022
TIME PLOTTED => 15:47

BORDER LAST REVISED 7/2/2010

USERNAME => mpitcock
DGN FILE => 11187559EX004 - IAS ALT 2.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

PRELIMINARY, NOT FOR CONSTRUCTION

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

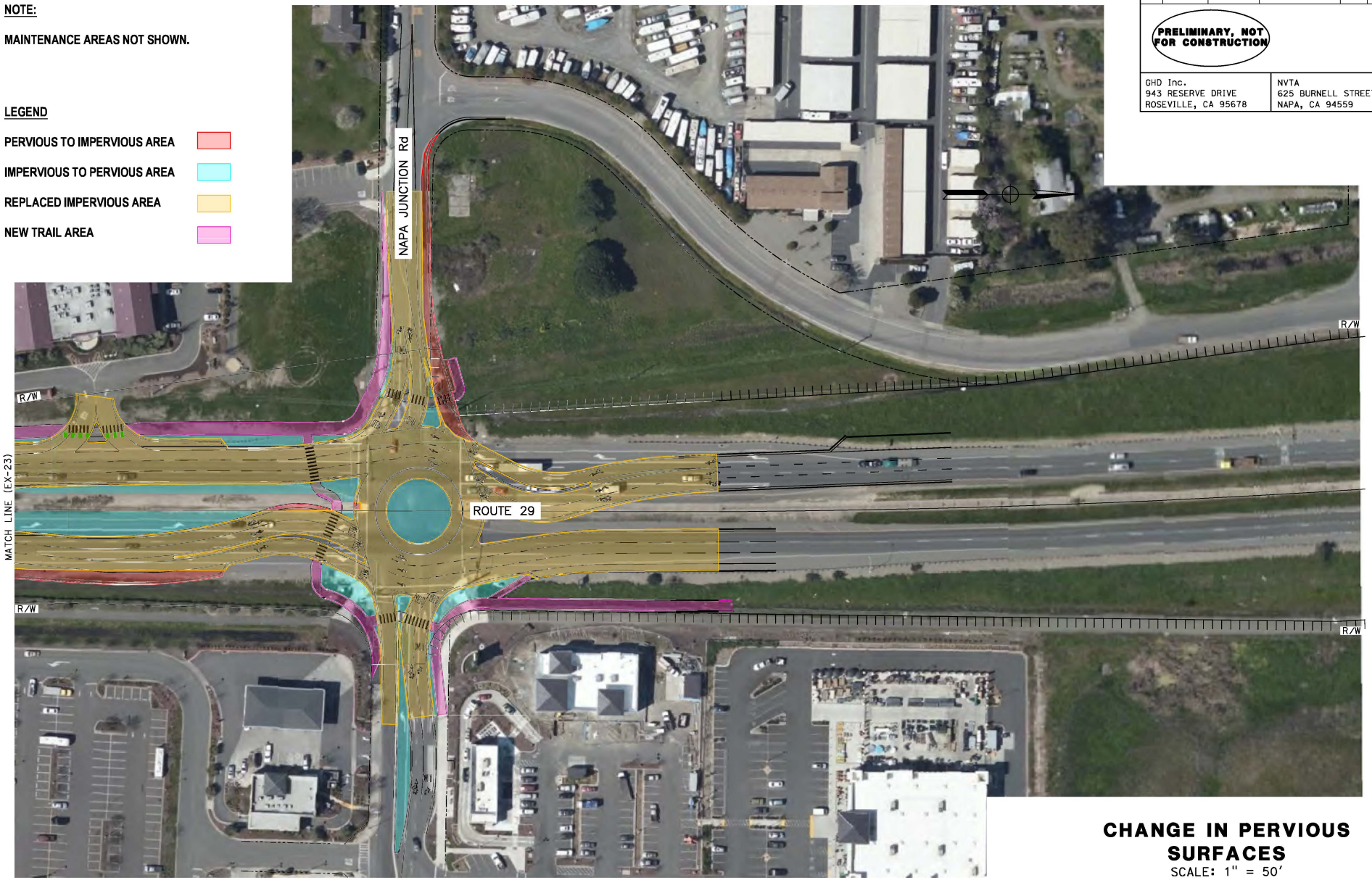
NVTA
625 BURNELL STREET
NAPA, CA 94559

NOTE:

MAINTENANCE AREAS NOT SHOWN.

LEGEND

- PERVIOUS TO IMPERVIOUS AREA
- IMPERVIOUS TO PERVIOUS AREA
- REPLACED IMPERVIOUS AREA
- NEW TRAIL AREA



CHANGE IN PERVIOUS SURFACES

SCALE: 1" = 50'

ALTERNATIVE 2

EX-24

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

REVISED BY	DATE REVISED

DESIGNED BY	CHECKED BY
DELANEY BABCOCK	LINDSEY VAN PARYS

RONALD G. BOYLE
ASSISTANT FUNCTIONAL SUPERVISOR

LAST REVISION 00-00-00
DATE PLOTTED => 2-3-2022
TIME PLOTTED => 15:47

BORDER LAST REVISED 7/2/2010

USERNAME => mpitcock
DGN FILE => 11187559EX004 - IAS ALT 2.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0419000297

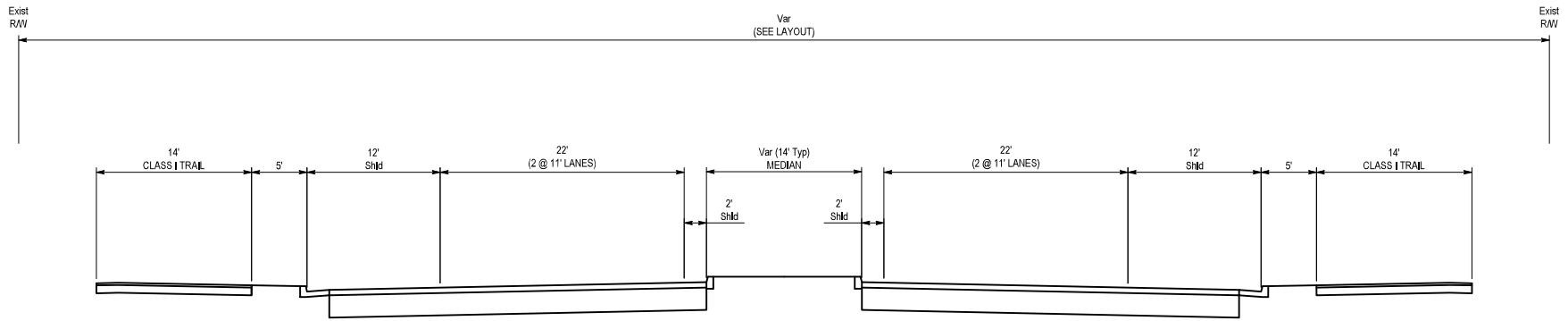
ATTACHMENT 13

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY - NOT FOR CONSTRUCTION
DATE
PLANS APPROVAL DATE
No. Exp. CIVIL
STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

GHD Inc. 943 RESERVE DRIVE ROSEVILLE, CA 95678	NVTA 625 BURNELL STREET NAPA, CA 94559



ROUTE 29

TYPICAL SECTIONS
NO SCALE

ALTERNATIVE 1

X-1

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	CONSULTANT FUNCTIONAL SUPERVISOR	RONALD G.BOYLE	CALCULATED-DESIGNED BY	MICHAEL PITCOCK	REVISED BY
			CHECKED BY	LINDSEY VAN PARYS	DATE REVISED

BORDER LAST REVISED 7/2/2010

USERNAME => mpitcock
DGN FILE => ALTERNATIVE1 – 4 LANES.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0317000163

DATE PLOTTED => 12-22-2021
TIME PLOTTED => 10:30

LAST REVISION 00-00-00

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
04	Nap	29	0.6/2.2	--	--

REGISTERED ENGINEER - CIVIL — DATE

PRELIMINARY - NOT FOR CONSTRUCTION

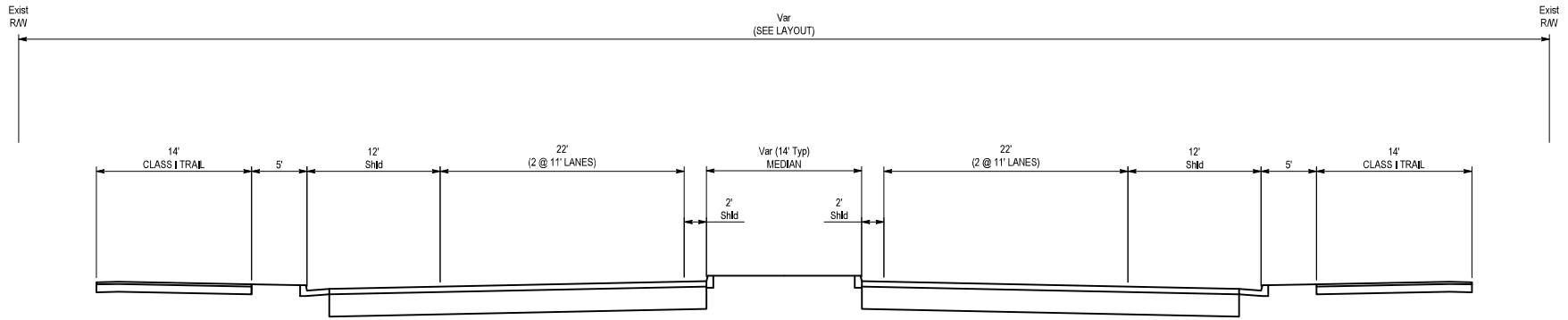
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — No. — Exp. — CIVIL — STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

GHD Inc.
943 RESERVE DRIVE
ROSEVILLE, CA 95678

NVTA
625 BURNELL STREET
NAPA, CA 94559



ROUTE 29

TYPICAL SECTIONS
NO SCALE

ALTERNATIVE 2

X-2

CALCULATED-DESIGNED BY	CHECKED BY	REVISED BY	DATE REVISED
MICHAEL PITCOCK	LINDSEY VAN PARYS		

CONSULTANT FUNCTIONAL SUPERVISOR: RONALD G.BOYLE

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

BORDER LAST REVISED 7/2/2010

USERNAME => mpitcock
DGN FILE => ALTERNATIVE2– 4 LANES.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0317000163

DIST-EA/REVISION 04-40-A00

DATE PLOTTED => 12-22-2021
TIME PLOTTED => 10:31

ATTACHMENT L

Vehicle Miles Traveled Decision Document

Vehicle-Miles Traveled Decision Document (VMTDD)

Applicability: This form is required for PIDs prepared by Caltrans or partners, with the following project exceptions: active transportation, transit, and most SHOPP projects.[1] Fill out the form and send it to Sustainability as a Word file. Add additional information as needed under each question. After review and agreement, e-signatures are required under Approval Recommended.

District/County/Route/PM: 04/NAP/29/0.69-2.05
Project Name: Route 29 in American Canyon Improvements Project
EA/EFIS Number: 04-4Q010

1) Are all project alternatives screened as not likely to induce travel per Section 5.1.1 of Transportation Analysis Under CEQA?

☐ NO - Proceed to Question 2.
☒ YES – Cite screening criterion(ia):

- Alternative 2 Only: Installation of roundabouts or traffic circles
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Roadway shoulder enhancements to provide "breakdown space," dedicated space for use only by transit vehicles, to provide bicycle access, or to otherwise improve safety, but which will not be used as automobile vehicle travel lanes
- Installation, removal, or reconfiguration of traffic control devices, including Transit Signal Priority (TSP) features
- Timing of signals to optimize vehicle, bicycle, or pedestrian flow
- Addition of new or enhanced bike or pedestrian facilities on existing streets/highways or within existing public rights-of -way
- Addition of Class I bike paths, trails, multi-use paths, or other off-road facilities that serve non-motorized travel

Stop here. The project is exempt from further VMT evaluation. Obtain district-level signatures and attach to the Project Initiation Document (PID). No headquarters concurrence is needed.

2) Do any of the project alternatives add lane-miles (mainline or aux lanes greater than 1 mile) to the State Highway System?

☐ NO - Continue to Question 3.
☐ YES – Provide estimate of new lane-miles for all alternatives and proceed to Question 4.

Alternative Number	Alternative Name	Lane-miles Added
1		

[1] This form is required for SHOPP projects that add lane-miles, including auxiliary lanes, and/or expand interchanges.

2		
3		
4		
5		
6		

3) Do any of the proposed alternatives add other capacity to the State Highway System (e.g., a new or widened interchange)?

☐ NO – Proceed to Question 4.
☐ YES – Describe and proceed to Question 4.

Alternative Number	Alternative Name	Capacity Added
1		
2		
3		
4		
5		
6		

4) Has induced VMT been estimated, as prescribed in Transportation Analysis Framework (TAF), Transportation Analysis Under CEQA (TAC), or other methods, for the project alternatives?

☐ NO – Proceed to Question 5.
☐ YES – Provide estimates and the methods from which they were obtained, and proceed to Question 5.

Alternative Number	Alternative Name	VMT Estimate	Estimation Method
1			
2			
3			
4			
5			
6			

5) Have VMT-reducing project elements or mitigation measures have been identified?

☐ NO – Proceed to Question 6
☐ YES – Describe and proceed to Question 6:_____

6) What is the budget for VMT mitigation? Provide the dollar figure and rationale.

7) Provide estimated completion dates and points of contacts for the following technical studies to be produced in PA&ED and submitted to HQ.

Document	Contact name	Contact e-mail	Scheduled date
VMT assessment methodology*			
Draft VMT assessment*			
Final VMT assessment*			
Mitigation plan			
Draft environmental document			
Final environmental document			

* Submission not required for projects exclusively employing the NCST California Induced Travel Calculator, nor for projects located in counties outside of MPO boundaries.

To Be Completed by HQ

Recommendation(s) to Project Development Teams (PDTs), Districts, and/or Partners

Project screened as unlikely to induce VMT ☒ YES ☐ NO

The project consists of a No Build alternative; Alternative 1, which includes a series of multimodal and intersection and improvements; and Alternative 2, a series of roundabouts at key intersections with multimodal elements. Alternative 3, a 6-lane highway expansion, was rejected. Alternatives will feature part-time bus-on-shoulder facilities and bus only signal phases to incorporate queue jump movements utilizing the shoulder as well as pedestrian throughput enhancements.

After reviewing the draft PSR and discussions with District staff, Sustainability agrees that the project is unlikely to induce substantial and measurable increases in VMT for the following reasons:

- Alternative 1 retains the existing 4-lane configuration of the highway, with intersection changes oriented around facilitating bicycle and pedestrian safety and throughput, and bus travel during commute times. The bus-on-shoulder component will be signed and enforced to limit the potential for general purpose travel. As a result, this alternative comports with project types listed in 5.1.1 of the TAC.
- Alternative 2 includes several roundabouts at intersections. To facilitate operations at the roundabouts, the project would add approach lanes in the southbound and northbound directions. From South Napa Junction to Napa Junction Road, these approach lanes would continue through the intersections for a little over ½ a mile to reduce queuing.

  In general, roundabouts are designed to improve safety at intersections by slowing speeds via their geometric design. The intention is to allow traffic to continue to move through intersections while permitting other movements, such as turning, safely. Moreover, as page 24 of the draft PSR indicates, "the additional travel lanes would not be implemented along the entirety of the project, only at the approaches to each of the roundabouts." As a result, Sustainability concurs that this alternative comports with Section 5.1.1 of the TAC.

The above assessment is based on the current project description and subject to change if the scope is altered to include potential VMT inducing alternatives. Please contact Sustainability with any questions.

Approved by:

Melanie Brent

Melanie Brent
Deputy District Director, Environmental

11/09/2022
Date

Celia McCuaig

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

12/28/2022
Date

Dina El-Tawansy

Dina El-Tawansy
District Director

02/03/2023
Date

Tony Dang
Deputy Director, Sustainability

11/04/2022
Date

VMTDD - NAPA 29 Multimodal improvement project (4Q010K)

Final Audit Report 2022-11-05

Created:	2022-11-04
By:	Alexander Doerr (s146872@dot.ca.gov)
Status:	Signed
Transaction ID:	CBJCHBCAABAANK2qYIJI6C-9wHvtZgb7A-39vtL9rYOR

"VMTDD - NAPA 29 Multimodal improvement project (4Q010K)" History

Document created by Alexander Doerr (s146872@dot.ca.gov)
2022-11-04 - 10:13:27 PM GMT

Document emailed to Tony Dang (tony.dang@dot.ca.gov) for signature
2022-11-04 - 10:14:14 PM GMT

Email viewed by Tony Dang (tony.dang@dot.ca.gov)
2022-11-04 - 11:55:58 PM GMT

Document e-signed by Tony Dang (tony.dang@dot.ca.gov)
Signature Date: 2022-11-05 - 0:05:36 AM GMT - Time Source: server

Agreement completed.
2022-11-05 - 0:05:36 AM GMT

ATTACHMENT M

TMP Data Sheet

TRANSPORTATION MANAGEMENT PLAN DATA SHEET

For Consultant TMP Projects

PROJECT MANAGER Rui (Ricky) Gao (Phone #)
PROJECT ENGINEER James Chuang (Phone #)
DIST-EA/PROJ ID: 04-4Q010 PROGRAM CATEGORY
PROJECT COMMON NAME Route 29 in American Canyon Multimodal Improvements Project
CO-RTE-PM: 04-29-0.69/2.05
LEGAL DESCRIPTION: In American Canyon, from American Canyon Drive to Napa Junction Road
DETAILED WORK DESCRIPTION: Intersection Construction, Curb, Gutter and Sidewalk Construction
CONSTRUCTION COST ESTIMATE:
PROJECT PHASE: PIR ☒ PR ☐ PS&E ☐ _____%

Traffic Impact Descriptions

A) Does the proposed project include long term closures (> 24 hours)
Yes__X__ No___
[If "No", Continue to Item D (Preliminary TMP Elements and Costs.). If "Yes", Check Applicable Facilities.]

- ☐ Freeway Lanes
- ☐ Freeway Shoulder
- ☐ Freeway Connectors
- ☐ Freeway Off-ramps
- ☐ Freeway On-ramps
- ☒ Local Streets
- ☐ Full Freeway Closures

B) Are there any construction strategies that can restore existing number of lanes? (Check Applicable Strategies)

- ☐ Temporary Roadway Widening Structure Involvement? Yes____ No____ (If yes, notify Project Manager)
- ☒ Lane Restriping (Temporary Narrow Lane Widths) Yes_X_ No____
- ☒ Roadway Realignment (Detour Around Work Area)
- ☒ Median and/or Right Shoulder Utilization
- ☐ Use of an HOV lane as a Temporary Mixed Flow Lane
- ☐ Staging Alternatives (Explain Below)

Notes:

C) Calculated Delays (To be performed if construction strategies in Item B do not mitigate congestion resulting from Item A)

1. Estimated Maximum Individual Vehicle Delay TBD[1] Minutes
2. Existing or Acceptable Individual Vehicle Delay TBD[1] Minutes

[1]Delay Calculations to be provided in PA/ED Phase

3. Estimated Individual Vehicle Delay Requiring Mitigation [(1) - (2)] _____ Minutes
4. Estimated Delay Cost (Most Applicable)
   - ☐ Extended Weekend Closure $_____
   - ☐ Weekly (7 days) $_____
5. Estimated Duration of Project Related Delays _____
6. Cost of Construction Related Delays [(4 x 5)] $_____

D) Preliminary TMP Elements and Cost

1. Public Information
   - ☒ a. Brochures and Mailers $ 5,000
   - ☒ b. Press Release $ 2,000
   - ☐ c. Paid Advertising $
   - ☐ d. Public Information Center/Kiosk $
   - ☒ e. Public Meeting/Speakers Bureau $ 3,000
   - ☒ f. Telephone Hotline $ 1,500
   - ☒ g. Internet $ 1,500
   - ☒ h. Notification to impacted groups $ 2,500

   (Bicycle users, Pedestrians with disability, others.)
   - ☐ i. Others _____ $

   SUB TOTAL **$** 15,500

2. Motorists Information strategies
   - ☐ a. Changeable Message Signs (Fixed) $
   - ☒ b. Changeable Message Signs (Portable) $ 30,000
   - ☒ c. Ground Mounted Signs $ 15,000
   - ☐ d. Highway Advisory Radio $
   - ☒ e. Caltrans Highway Information Network (CHIN) $ 1,000
   - ☒ f. Revised Transit Schedules/Maps $ 2,500
   - ☐ g. Others _____ $

   SUB TOTAL **$** 48,500

3. Incident Management
   - ☒ a. Construction or Maintenance Zone Enhanced Enforcement Program (COZEEP or MAZEEP) $ 50,000
   - ☐ b. Freeway Service Patrol $
   - ☐ c. Traffic Management Team $
   - ☐ d. New CCTVs and Detectors $
   - ☐ e. Others _____ $

SUB TOTAL **$** 50,000

4. Construction Strategies (In Addition to Elements Identified on Item B)
   - ☒ a. Off Peak/Night/Weekend Work (Lane Closure Charts) $
   - ☐ b. Reversible Lanes $
   - ☐ c. Total Facility Closure $
   - ☐ d. Extended Weekend Closure $
   - ☐ e. Truck Traffic Restrictions $
   - ☒ f. Reduced Speed Zone $ Included in CAS
   - ☐ g. Connector and Ramp Closures $
   - ☐ h. Incentive and Disincentive $
   - ☐ i. Moveable Barrier $
   - ☐ j. Others: Maintain Traffic $ 31,000

SUB TOTAL **$**

5. Demand Management
   - ☐ a. HOV Lanes/Ramps (New or Convert) $
   - ☐ b. Park and Ride Lots $
   - ☐ c. Rideshare Incentives $
   - ☐ d. Variable Work Hours $
   - ☐ e. Telecommute $
   - ☐ f. Ramp Metering (New Installation) $
   - ☐ g. Ramp Metering (Maintain Existing) $
   - ☐ h. Others _____ $

SUB TOTAL **$**

6. Alternate Route Strategies
   - ☐ a. Add Capacity to Freeway Connector $
   - ☐ b. Street Improvement (widening, traffic signal, etc) $
   - ☐ c. Traffic Control Officers $
   - ☐ d. Parking Restrictions
   - ☐ e. Others _____ $

SUB TOTAL **$**

7. Other Strategies
   - ☐ a. Application of New Technology $
   - ☐ b. Others _____ $

SUB TOTAL **$**

8. The Project includes the following: (Check applicable type of facility closures)
   - ☒ a. Highway or Freeway Lanes
   - ☒ b. Highway or Freeway Shoulders
   - ☐ c. Full Freeway Closure
   - ☐ d. Freeway On/Off-Ramps
   - ☐ e. Freeway Connectors
   - ☒ f. Local Streets
   - ☐ g. Prolonged Ramp Closures

9. Major operations requiring traffic control and working days for each

Operation	# of Working Days	# of Traffic Control Days
☒ a. Clearing and Grubbing	15	10
☒ b. Existing Feature Removal	40	30
☒ c. Excavation of Embankments Construction	50	40
☒ d. Structural Section Construction	75	60
☐ e. Drainage Feature Construction	30	20
☒ f. Structures Construction	90	75
☒ g. MGS/Barrier Construction	20	20
☒ h. Striping	25	25
☒ i. Electrical Component Construction	90	60
☐ j. Other		
Total days	435	

TOTAL ESTIMATED COST OF TMP ELEMENTS = **$** 145,000

Notes : Extensive TMP may be required for the significant impacts.

PREPARED BY (Consultant) Lindsey Van Parys, PE DATE 6/14/2022

APPROVAL RECOMMENDED BY
(Caltrans Oversight Engineer) Johnny Villasica DATE 7/13/2022

APPROVED BY (TMP Office) Evelyn Gestuvo DATE 7/14/2022

ATTACHMENT N

Quality Management Plan

American Canyon SR 29 Corridor Improvement Project

04-NAP-29-0.69/2.05
04-4Q010K

Quality Management Plan

For Preparation of Project Initiation Documents for Locally Implemented Projects on the State Highway system

Napa Valley Transportation Authority

APPROVAL SHEET

This Quality Management Plan (QMP) has been developed to direct the Quality Assurance/Quality Control (QA/QC) program that will be implemented for the development, review, and approval of Project Initial Documents (PIDs) for the American Canyon SR 29 Corridor Improvement Project.

Concurred by: Amani Meligy Date: 11-29-2022
Amani Meligy
Caltrans Project Manager

Approved by: Date: 11-8-2022
Danielle Schmitz
NVTA Project Manager

Approved by: Date: 11-8-2022
Lindsey Van Parys, PE
Project Manager

Approved by: Date: 11-8-2022
Stephanie Ledbetter, PE
Quality Assurance/Quality Control Manager

REVIEW AND REVISION RECORD LOG

Date: 12/01/2021

To: Napa Valley Transportation Authority

From: Stephanie Ledbetter, PE, Quality Assurance/Quality Control Manager

Subject: Quality Management Plan

Contents

Exhibits

1. Introduction

The purpose of the Quality Management Plan (QMP) is to facilitate an effective and efficient process for the development, review, and approval of Project Initiation Documents (PIDs) for State Highway System (SHS) projects sponsored by Napa Valley Transportation Authority (NVTA). NVTA, the project sponsor, must develop and follow a QMP that meets the standards of professional practice and satisfies requirements of the project scope, cost, and schedule. The Project Managers from Caltrans and NVTA shall ensure that all Project Development Team (PDT) members utilize the QMP elements as described in this document during the production and review of the PIDs. Quality Assurance and Quality Control (QA/QC) will be performed before deliverables are presented to Caltrans for review. Each team member must understand the project objectives, apply sound engineering principles and is expected to produce quality, accurate, and complete documents within the project schedule and budget. Project documents will be prepared in accordance with current Caltrans and City of American Canyon regulations, policies, procedures, manuals, and standards including compliance with Federal Highway Administration (FHWA) requirements as applicable.

2. Quality Control Reviews

1. Quality Control (QC) reviews shall be conducted for all deliverables. A Project schedule shall be developed with the consensus of the PDT that identifies anticipated reports, submittal dates and review periods. **Exhibit A** contains a sample general list of deliverables and assigned QC reviewers.
2. Prior to submission to Caltrans, each deliverable will be subject to review by senior GHD staff and NVTA's project manager.
3. Project documents will be reviewed for conformance with project design criteria, legibility, and completeness and compliance with regulatory and code requirements.
4. All QC comments will be evaluated by the lead author for the document, discussed with the QC reviewer as needed and, if appropriate, incorporate into the deliverable. The NVTA and Caltrans Project Manager will review and approve the resolution of each comment.
5. The Project Quality Control Coversheet, as shown in **Exhibit B**, shall be used to document all quality control reviews.

3. Checking of Calculations

Final report calculations associated with the conceptual alternatives, cost estimates, and traffic technical reports shall be checked for reasonableness by GHD. All calculations shall be reviewed by NVTA.

4. Checking of Drawings

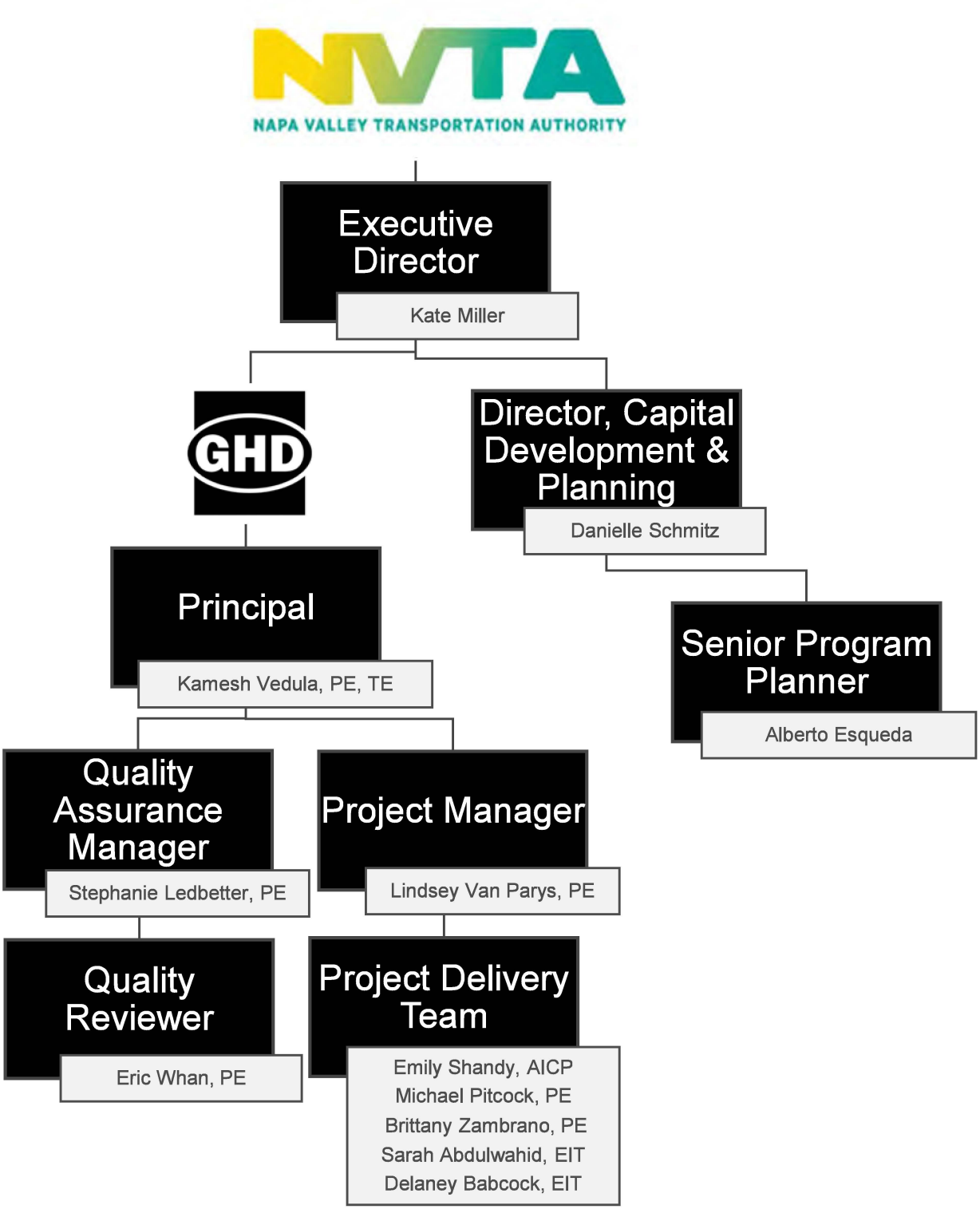
Conceptual geometric plans, figures, mapping and preliminary bridge and/or structure plans (if applicable) shall be checked in accordance with established standards (e.g. Highway Design Manual and City of American Canyon standards) by GHD.

5. Quality Assurance

The project managers from Caltrans and NVTA, along with GHD, will be responsible for the development of deliverables and assure that the stated quality control procedures are being followed. A Quality Assurance Log that includes dates when documents were received, reviewed, and names of the QC reviewers shall be maintained for each report or work product.

6. Reporting Structure

The high-level organization chart that describes the reporting structure and assigned staff that are involved in the QA/QC is included on the following page.



7. QA/QC Duties and Responsibilities

Quality control begins with assigning the most appropriate person to each task. Each member of the team should be responsible for controlling the quality of the product, beginning with the project staff through to the project managers. The qualifications of the team members overseeing and doing the work should be identified. All team members should be in regular communication with each other and their respective managers in regards to project status, schedule, and any issues that might arise during the development of the PID.

The duties and responsibilities of each of the project members in coordinating and guiding the project efforts are described below:

a. Principals-in-Charge (PICs)

PICs are responsible for allocation of resources and monitoring of the project to ensure adherence to the project objectives, schedule, budget, approvals and for ensuring that the QC plan is in place and implemented. The PIC provides periodic audits of technical work and performance of respective staff.

b. Caltrans Project Manager

The PM is responsible for coordinating and managing independent quality assurance (IQA) as described in the cooperative agreement.

c. NVTA Project Manager

The PM:

- Is responsible for completion of the project scope and tasks, and adherence to project schedule and budget, including the QC program.
- Allocates resources for the work, establishes and implements the QMP, schedules the various activities, and adjusts plans as the work progresses.
- Identifies potential problem areas and resolves them in a timely manner.
- Is responsible for technical review and approval of project documents before issuance to Caltrans.
- Certifies that each submittal has been prepared and checked in accordance with Caltrans standards, policies, and procedures, which sound engineering practices have been used to produce a quality product and maintains frequent contact and communication with the Caltrans PM to assure satisfactory progress and performance.

d. GHD Project Manager

The PM:

- Reviews and monitors the implementation of the QC program and ensures consistency with Caltrans standards, policies, and procedures.
- Identifies the QC actions required to be taken, the resources to be applied, and the interaction of these activities with the other elements of work.

- Identifies the involved personnel and their duties, allocates time and resources to the quality control function, and reviews the allocated resources as the work progresses.
- Is responsible for the technical work produced by GHD's staff.
- Works closely with the Caltrans and NVTA PM's.
- Ensures early identification and resolution of any product deficiencies.
- Performs periodic reviews of QC documentation.
- Identifies and corrects nonconforming conditions.

e. Technical Staff

The technical staff:

- Are responsible to GHD's PM for the quality of the work produced within their respective disciplines.
- Monitors work to assure adherence to the contract scope of services and to the established review procedures to ensure consistency with Caltrans and City of American Canyon standards, policies, and procedures.
- Advises the GHD PM regarding the progress of work and of any circumstances that may require particular attention.
- Reviews work prior to providing to GHD's QC reviewer.
- Resolves QC review comments.
- Ensures comments are incorporated into final documents.
- Reviews completed work before it is transmitted to NVTA and Caltrans.

8. Document Control

GHD shall maintain and make available electronic records and hard copies of drafts and final reports for inspection.

9. Control of Subconsultants

GHD shall ensure that all sub-consultants have the same responsibilities as GHD. There are no sub-consultants involved for this phase.

Exhibit A – Example List of Deliverables and Assigned QC Reviewers

Deliverable	Consultant Reviewer	NVTA Reviewer
Project Schedule	Eric Whan, PE	Danielle Schmitz
QA/QC Plan	Eric Whan, PE	Danielle Schmitz
Project Purpose and Need Statement	Eric Whan, PE	Danielle Schmitz
Alternatives Evaluation & Screening	Eric Whan, PE	Danielle Schmitz
Traffic Analysis and Reports & ICE	Kamesh Vedula, PE, TE	Danielle Schmitz
PEAR	Charles Smith, AICP	Danielle Schmitz
SWDR	Erik Fanselau, PE	Danielle Schmitz
Complete Streets Design Documentation	Eric Whan, PE	Danielle Schmitz
Risk Register	Eric Whan, PE	Danielle Schmitz
Cost Estimates	Eric Whan, PE	Danielle Schmitz
Traffic Management Plan	Eric Whan, PE	Danielle Schmitz
Draft and Final PSR-PDS	Eric Whan, PE	Danielle Schmitz

EXHIBIT B - EXAMPLE QUALITY CONTROL REVIEW FORM
Quality Control Review Sign-Off Form

Client:	City of Oxnard	**Date to Reviewer:**	October 2, 2015
Project Name:	Rice Ave Grade Sep PSR-PDS	**Review Deadline:**	October 10, 2015
Client & Job Number:	Jason Samonte (15003)	**Actual Review Date:**	October 8, 2015
Project Manager:	Carlos Cadena	**Deliverable Due Date:**	October 16, 2015
Reviewer:	Hank Nguyen	**Actual Hours:**	120
Production Coordinator:	Michael Hynes	**Project Type:**	PSR-PDS
Item Reviewed:	Alternative Plans and PSR/PDS	**Task/Activity:**	Review PSR-PDS document and plans
Project Task or Phase:	PID		
Deliverable %:	Draft PSR-PDS		Internal Review

Type of Review	Comment Sheet Attached/Emailed	Completed by Reviewer	
		Initial	Date
Reports:			
Environmental	Comments on product, E-mailed	Rich Galvin	October 8, 2015
Master Plans	Comments on product, Emailed	Hank Nguyen	October 8, 2015
Reports and Documents	Comments on product, Emailed	Hank Nguyen	October 8, 2015
Technical Memorandum	Comments on product, Emailed	Marc Cooley	October 8, 2015
Other:			
Design:			
Architectural	N/A		
Calculations	N/A		
Civil	N/A		
Cost Estimates	Comments on product, Emailed	Hank Nguyen	October 9, 2015
Electrical	N/A		
Spec and/or Front-Ends	N/A		
Instrumentation & Control	N/A		
Mechanical	N/A		
Plan & Profile (Pipeline)	N/A		
Process	N/A		
Structural	Comments on product, Emailed	Vinh Trinh	October 2, 2015
Stormwater	Comments on product, Emailed	Michael Hynes	October 8, 2015
Other:			
Miscellaneous:			
Submittal/Previous QC Backcheck	Comments on product, Attached	Michael Hynes	October 9, 2015
Drafting Backcheck	Attached	Michael Hynes	October 11, 2015
Project Guide	Attached	Michael Hynes	October 12, 2015
O&M Manuals			
Survey Datums & Sea Level Rise			
Other:			

Notes:
Please return "signed" QC Review Sign-off Form and markups to your assigned Production Coordinator.

Signatures:

Carlos Cadena, Project Manager — Date - Response to Comments: 10/30/15

Michael Hynes, QC Reviewer — Date - Resolution Accepted: 10/30/15

Instructions:
1) Project Manager fills out QC Review form & transmits to assigned QC Reviewer with document(s); 2) After review, QC Reviewer returns reviewed document/completed QC Review form to PM with comments: 3) Project Manager is responsible for reviewing comments, making appropriate changes/notations, & informing QC Reviewer of changes made; 4) QC Reviewer completes form upon resolution.

QA-QC Program Coord. Dan Weddell, QA/QC Manager — Date: 12/2/2015

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→ The Power of Commitment

ATTACHMENT O

Design Scoping Index

Design Scoping Index

Attach the project location map to index to show the location of all design improvements.

Today's Date:	9-12-2022
Status (Initial, Update):	Initial

General Information:

District:	County:	Route:	Post Mile	Project Number
04	Nap	29	0.69/2.05	0419000297

Project Manager	Amani Meligy	Phone #	
Task Manager		Phone #	
Project Engineer	James Chuang	Phone #	
Design Functional Manager		Phone #	

General Project Description:	Construction of multimodal improvemetns inlcuding class I trails, bus queue jumps and reconfiguring intersection control. Two Alternatives are being considered. Alternative 1 is a singal corridor. Alternative 2 is roundabout corridor.

Project Need:	Regionally, State Route (SR) 29 provides a direct connection between counties along Interstate 80 (I-80) and I-580 and counties along US 101 in the North Bay. Locally, SR 29 is also the lifeblood of access into and out of Napa County. Notwithstanding their disparate local context, vehicular volumes on SR 29 are comparable to other nearby state highways (SR 12 and SR 37). However, because the SR 29 Corridor functions as American Canyon's "Main Street", it experiences significant safety, aesthetic, and operational deficiencies between American Canyon Road and Napa Junction Road during weekday and weekend AM and PM peak hour conditions. The most pronounced issues in the corridor include: • Lack of multimodal connectivity - particularly for bicycle and pedestrian access - along and across SR 29; • Lack of low-stress routing options for bicyclists and pedestrians along SR 29; • Lack of public transit lanes, facilities and pull outs for stops • Lack of aesthetic benefits of landscaping along the corridor to help define American Canyon's "Main Street"; • Unprotected overhead utility poles in the State Right of Way are within the clear recovery zone • Regional traffic congestion hinders customer access to American Canyon's "Main Street" Commercial businesses; • Constraints at intersections cause extensive queuing and delays, and bottlenecks resulting in unreliable travel times for both motorists and public transit and traffic diverting to residential streets; • Compromised feasibility to provide enhanced transit service due to travel time unreliability; • Increased safety risk and conflicts between motorists and active transportation users due to unseparated facilities and high speed differentials; and • Increased response times for public safety vehicles.
Project Purpose:	Provide a multimodal and complete streets corridor that: • Improves mobility for all users • Improves safety for all users by incorporating Vision Zero concepts, which include strategies to eliminate all traffic fatalities and severe injuries through a systematic approach that believes traffic deaths are preventable • Eliminates overhead utility poles • Improves corridor aesthetics • Reduces Vehicle Miles Traveled (VMT) by encouraging transportation mode shift, which will help to reduce regional traffic on residential streets • Improves customer access to businesses adjacent to SR 29 • Provides improved accessibility for all modes of transportation along SR 29 between American Canyon Road and Napa Junction Road

Item	Considerations	Yes/No/Specify	Comments (summarize pertinent information. assumptions and reference location of detailed information):
	Rural or Urban?	Urban	

1. Project Setting (refer to Planning Scoping Checklist)	Current Land Uses: (e.g., industrial, light industry, commercial, agricultural residential etc).	Right of way, Light Industry, Commercial, Residential	
	Adjacent Land Uses:	Light Industry, Commercial, Residential	
	Existing Landscaping:	No	
	Designated or Eligible Scenic Highway	No	

The following pages are to be used for each alternative provided that the scope is significantly different. If a route has been adopted as a freeway, a decision must be made as to whether or not the project will address improvements to the existing traversable highway or move to construction of a freeway facility.

Alternative 1:

Item	Considerations		Yes/No/ Specify	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Design Concept and Route Matters	1.	Design Concept?		
		Freeway/Expressway/ Conventional Highway	Conventional Hwy	
		Mixed highway and transit	Yes	
		Mixed highway and rail	No	
		Urban	Yes	
		Other		
	2.	Existing Route Adoption Date		
	3.	New Route Adoption Proposed?	No	
	4.	Existing Freeway Agreement Date	N/A	
	5.	New Freeway Agreement Proposed?	N/A	
	6.	Public Road Connection Proposed?	Yes	
Design Criteria	1.	Design speed for highway facilities within the project limit	55	
		mi/hr?		
	2.	Design Period: (10 yr/15 yr/20 yr)	20 yr	
		Construction Year	TBD	Anticipated 2026
		Design Year		
	3.	Design Capacity - Level of Service to be maintained over the design period:	E	
		Mainline	E	
		Ramp	N/A	
		Local Street	E	
		Weaving Sections	E	
	4.	Design Vehicle Selection		
		STAA	Yes	Through Movement Only
		California	Yes	Left and Right turns onto and off of Route 29.
		Bus	Yes	45' Bus

Forecasted Average Daily Traffic volumes	~38800
Percent truck volume	~7%%

Proposed Roadbed and Structure Widths

	Roadbed Width			Structure Width		
State Highway	Existing	Proposed	Standard	Existing	Proposed	Standard
Lane widths/#	12'/4	11'/4,4,6	12'			
Left Shoulder	4'	2'	2'			
Right Shoulder	Var. 0'-8'	12'	8'			
Median Width	40'	14'	12'			
Bicycle lane	0'	0'				
Sidewalk	0'	14'	6'			
Planting strip	0'	3'				
Local Streets						
Lane widths/#	11'	11'	11'			
Left Shoulder	0'	0'	0'			
Right Shoulder	0'	Maintain Exist	0'			
Median Width	0'	0'(Typ)	0'			
Bicycle lane	0'	0'(Typ)	0'			
Sidewalk	5'	5'	5'			
Planting strip	0'	0'				

Item	Considerations		Yes/No/ Specify	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Roadway Design Scoping	1. Mainline Operations	Main lane highway widening?	Yes	Roadway Widened for portions of Alternative 2. Left Edges moved inwards to shrink median.
		Existing pavement to be rehabilitated with Asphalt Concrete/Rubberized AC/PCC?	Yes	Grind and Overlay to eliminate construction stripe ghosting.
		Widen existing facility from __ lanes to __lanes.	No	
		Local street structures to span ___ lanes.		
		Curb extensions	No	
		Shoulder improvements	Yes	Widen shoulder to allow for Part Time Bus on Shoulder (BOS)
		Bicycle lanes	No	
		Pedestrian refuge islands	Yes	Alternative 2 only
		Sidewalks	Yes	Class I bike/ped Shared Use Path
		Right of Way acquisition required for ___ lanes.	Yes	Required at intersections for Transit Queue Jumps (Roundabouts for Alternative 2) and consistently for Class I Trail
		Upgrade existing facility to: Expressway/Freeway/ Controlled Access Highway/ Traversable Highway Standards?	No	
		Improve Vertical Clearance	N/A	

		Adequate Falsework Clearance	N/A	
		Traffic calming features	Yes	Reduced Lane widths for Traffic Calming.

Item	Considerations		Yes/No/ Specify	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Roadway Design Scoping	2. Ramp/Street Intersection Improvements	New Signals?	Yes	5 New Signal replacements.
		Modify Existing Signals?	Yes	Modify American Canyon Rd. Signal
		Right Turn Lanes	Yes	Build new Right turn lanes where existing lanes exist.
		Widening for Localized Through lanes?	No	
		Merging Lanes?	Yes	Sub Standard Merge Lengths maintained
		Deceleration/ Acceleration lanes?	Yes	Existing Configurations Maintained
		Left Turn Lanes?	Yes	Existing Left Turn Lane lengths maintained
		>300 VPH Left Turn (Requires Double Left Turn Lane)	Unknown	Existing Lane Configurations Maintained
		Interchange Spacing?	N/A	
		Ramps Intersect Local Street < 4% grade?	N/A	
		Intersection Spacing?	N/A	Existing Spacing Maintained. HDM Ramp Intersection Spacing Standard not applicable.
		Exit Ramps >1,500 VPH (Requires two lane exit)	N/A	
		Single lane ramps exceeding 1000' widened to Two lanes	N/A	
		Curb Ramps?	Yes	Reconstruct Curb Ramps where affected. Bring to ADA Compliance.
		Pedestrian Facilities?	Yes	Class I Trail
		Other?	Yes	Transit Queue Jumps
Operational Improvements	Truck Climbing Lane	Sustained Grade exceeding 2% and Total Rise Exceeds 50'?	N/A	
		Other?		
	Auxiliary Lanes	2000' between Successive On-Ramps?	N/A	
		Two lane Exit Ramps have 1300' Auxiliary Lane?	N/A	
		Weaving < 2000' between off-ramp and on-ramp?	N/A	
		Other?		

Item	Considerations	Yes/No/ Specify	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Right of Way Access Control	Existing access control extends at least 50 ft beyond end of curb return, radius or taper?	TBD	
	New construction access control extends at least 100' (urban areas) or 300' (rural areas) beyond end of curb returns, radius or taper?	TBD	
	Other?	No	Access point consolidation proposed.
Highway Planting and Irrigation	Clearing and Grubbing?	Yes	
	Relocate Existing Irrigation Facilities? Highway Planting and Irrigation (including median and roadside)	No	
Roadside Management	Vegetation control treatments (road edge, guardrails, signs, drainage facilities, miscellaneous pavement narrow areas, etc.)	Yes	Minor Conc Veg Control to be added if maintenance requests
	Modernization and clustering of facilities and hardware (removing and replacing other items), gore area pavement	N/A	
	Rehabilitate gore area pavement and pavement beyond gore areas (remove and replace miscellaneous pavement and curbs	N/A	
	Contour grading, slope rounding, stepped slopes and topsoil reapplication	Unknown	To be determined in design phase
	Side slopes/embankment slope	Yes	Slopes anticipated
Safety	Off-Freeway Access (gate, access road, and stairways)	N/A	
	Maintenance Vehicle Pull-Out	No	
	Adequate safety working conditions	Yes	Shoulder width = 12'
	Relocate roadside facilities/features (cabinets, poles, pull boxes and vaults) away from traffic	Yes	
Hydraulics/ Stormwater (Refer to the Stormwater data sheet)	Erosion Control?	Yes	
	Drainage?	Yes	Extent of Drainage will be identified in future phases
	Slope Design?	TBD	
Structures (Refer to Structures Scoping Checklist or APS)	New Bridge? Providing public access for recreational purposes must be fully considered for new bridges over navigable rivers.	No	
	Bridge Rehabilitation?	No	
	Retaining Wall	No	
	Bicycle or Pedestrian Overcrossing/Undercrossing	No	
	Other		
	On STRAIN list for:		

Other	Class I Bikeway (bicycle path)	Yes	14' Class I Trails on both sides of road.

Alternative 2:

Item	Considerations		Yes/No/ Specify	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Design Concept and Route Matters	1.	Design Concept?	Yes	
		Freeway/Expressway/ Conventional Highway	Conventional Hwy	
		Mixed highway and transit	Yes	
		Mixed highway and rail	No	
		Urban	Yes	
		Other		
	2.	Existing Route Adoption Date		
	3.	New Route Adoption Proposed?	No	
	4.	Existing Freeway Agreement Date	N/A	
	5.	New Freeway Agreement Proposed?	N/A	
	6.	Public Road Connection Proposed?	Yes	
Design Criteria	1.	Design speed for highway facilities within the project limit	55	
		mi/hr?		
	2.	Design Period: (10 yr/15 yr/20 yr)	20 yr	
		Construction Year	TBD	Anticipated 2026
		Design Year		
	3.	Design Capacity - Level of Service to be maintained over the design period:	E	
		Mainline	E	
		Ramp	N/A	
		Local Street	E	
		Weaving Sections	E	
	4.	Design Vehicle Selection		
		STAA	Yes	Through Movement Only
		California	Yes	Left and Right turns onto and off of Route 29.
		Bus	Yes	45' Bus

Forecasted Average Daily Traffic volumes	~38800
Percent truck volume	~7%%

Proposed Roadbed and Structure Widths

	Roadbed Width			Structure Width		
State Highway	Existing	Proposed	Standard	Existing	Proposed	Standard
Lane widths/#	12'/4	11'/4	12'			
Left Shoulder	4'	2'	2'			
Right Shoulder	Var. 0'-8'	12'	8'			
Median Width	40'	14'				
Bicycle lane	0'	0'				
Sidewalk	0'	14'	6'			
Planting strip	0'	3'				
Local Streets						
Lane widths/#	11'	11'	11'			
Left Shoulder	0'	0'	0'			
Right Shoulder	0'	Maintain Exist	0'			
Median Width	0'	0'(Typ)	0'			
Bicycle lane	0'	0'(Typ)	0'			
Sidewalk	5'	5'	5'			
Planting strip	0'	0'				

Item	Considerations		Yes/No/ Specify	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Roadway Design Scoping	1. Mainline Operations	Main lane highway widening?	Yes	Roadway Widened for portions of Alternative 2. Left Edges moved inwards to shrink median.
		Existing pavement to be rehabilitated with Asphalt Concrete/Rubberized AC/PCC?	Yes	Grind and Overlay to eliminate construction stripe ghosting.
		Widen existing facility from __ lanes to __lanes.	4 to 6	Alternative 2 at Roundabouts
		Local street structures to span ___ lanes.		
		Curb extensions	No	
		Shoulder improvements	Yes	Widen shoulder to allow for Part Time Bus on Shoulder (BOS)
		Bicycle lanes	No	
		Pedestrian refuge islands	Yes	
		Sidewalks	Yes	Class I bike/ped Shared Use Path
		Right of Way acquisition required for ___ lanes.	Yes	Required at intersections for Roundabouts and consistently for Class I Trail
		Upgrade existing facility to: Expressway/Freeway/ Controlled Access Highway/ Traversable Highway Standards?	No	
		Improve Vertical Clearance	N/A	

		Adequate Falsework Clearance	N/A	
		Traffic calming features	Yes	Reduced Lane widths and Roundabouts for speed reduction.

Item	Considerations		Yes/No/ Specify	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Roadway Design Scoping	2. Ramp/Street Intersection Improvements	New Signals?	No	Conversion to Roundabouts
		Modify Existing Signals?	Yes	Modify American Canyon Rd. Signal
		Right Turn Lanes	Yes	Build new Right turn lanes where existing lanes exist.
		Widening for Localized Through lanes?	No	
		Merging Lanes?	Yes	Sub Standard Merge Lengths maintained
		Deceleration/ Acceleration lanes?	Yes	Existing Configurations Maintained
		Left Turn Lanes?	Yes	Existing Left Turn Lane lengths maintained
		>300 VPH Left Turn (Requires Double Left Turn Lane)	Unknown	Existing Lane Configurations Maintained
		Interchange Spacing?	N/A	
		Ramps Intersect Local Street < 4% grade?	N/A	
		Intersection Spacing?	N/A	Existing Spacing Maintained. HDM Ramp Intersection Spacing Standard not applicable.
		Exit Ramps >1,500 VPH (Requires two lane exit)	N/A	
		Single lane ramps exceeding 1000' widened to Two lanes	N/A	
		Curb Ramps?	Yes	Reconstruct Curb Ramps where affected. Bring to ADA Compliance.
		Pedestrian Facilities?	Yes	Class I Trail
		Other?	Yes	Transit Queue Jumps
Operational Improvements	Truck Climbing Lane	Sustained Grade exceeding 2% and Total Rise Exceeds 50'?	N/A	
		Other?		
	Auxiliary Lanes	2000' between Successive On-Ramps?	N/A	
		Two lane Exit Ramps have 1300' Auxiliary Lane?	N/A	

		Weaving < 2000' between off-ramp and on-ramp?	N/A	
		Other?		

Item	Considerations	Yes/No/ Specify	Comments (summarize pertinent information, assumptions and reference location of detailed information):
Right of Way Access Control	Existing access control extends at least 50 ft beyond end of curb return, radius or taper?	TBD	
	New construction access control extends at least 100' (urban areas) or 300' (rural areas) beyond end of curb returns, radius or taper?	TBD	
	Other?	No	Access point consolidation proposed.
Highway Planting and Irrigation	Clearing and Grubbing?	Yes	
	Relocate Existing Irrigation Facilities? Highway Planting and Irrigation (including median and roadside)	No	
Roadside Management	Vegetation control treatments (road edge, guardrails, signs, drainage facilities, miscellaneous pavement narrow areas, etc.)	Yes	Minor Conc Veg Control to be added if maintenance requests
	Modernization and clustering of facilities and hardware (removing and replacing other items), gore area pavement	N/A	
	Rehabilitate gore area pavement and pavement beyond gore areas (remove and replace miscellaneous pavement and curbs	N/A	
	Contour grading, slope rounding, stepped slopes and topsoil reapplication	Unknown	To be determined in design phase
	Side slopes/embankment slope	Yes	Slopes anticipated
Safety	Off-Freeway Access (gate, access road, and stairways)	N/A	
	Maintenance Vehicle Pull-Out	No	
	Adequate safety working conditions	Yes	Shoulder width = 12'
	Relocate roadside facilities/features (cabinets, poles, pull boxes and vaults) away from traffic	Yes	
Hydraulics/ Stormwater (Refer to the Stormwater data sheet)	Erosion Control?	Yes	
	Drainage?	Yes	Extent of Drainage will be identified in future phases
	Slope Design?	TBD	
Structures (Refer to Structures Scoping Checklist or APS)	New Bridge? Providing public access for recreational purposes must be fully considered for new bridges over navigable rivers.	No	
	Bridge Rehabilitation?	No	
	Retaining Wall	No	
	Bicycle or Pedestrian Overcrossing/Undercrossing	No	
	Other		
	On STRAIN list for:		

Other	Class I Bikeway (bicycle path)	Yes	14' Class I Trails on both sides of road.

Caltrans Comment and Response Form

Document Type : Executive review PSR-PDS including attachments for NAP 29 Multimodal Due Date:
Co: ALA Rte: 29 PM: 0.69/2.05 Unit: GHD, consultant EA: 4Q010 Proj ID: 0419000297 Phase: K, Sub/Object: 150
MSA:_____Proj Mgr: Amani Meligy Oversight Project Engineer: James Chuang Oversight Senior: Mimy Hew

Reviewer's Name and Branch/Unit	Comments/Questions Please reference document section (e.g., paragraph, page #, etc.)	Circulator's Response to Comments/Questions
Mimy Hew - Senior Advance Planning	Update PSR-PDS attachments with latest signed versions	will comply
	1. As stated in my earlier comments, the QMP is to be "concurred" by Caltrans PM, not "approved" by Mimy Hew. The name was fixed but not the word, "approved."	will comply
Amani Meligy - Project Manager	no comments	noted
Celia McCuaig - Office Chief Advance Planning	Please see the revised Risk Register. It was faster for me to just edit it directly. So long as the Risk section of the PSR-PDS is also updated accordingly, it's good to go. I believe the language was general enough on the last draft that this should be okay.	wlll replace risk register with the version edited by you
Betcy Joseph - District Division Chief, Design North	no comments	noted
Celia McCuaig - Acting Deputy Director Planning	no comments	noted
Helena Culik-Caro - Deputy Director Design	no comments	noted

Caltrans Comment and Response Form

Document Type : Executive review PSR-PDS including attachments for NAP 29 Multimodal Due Date:
Co: ALA Rte: 29 PM: 0.69/2.05 Unit: GHD, consultant EA: 4Q010 Proj ID: 0419000297 Phase: K, Sub/Object: 150
MSA:___________Proj Mgr: Amani Meligy Oversight Project Engineer: James Chuang Oversight Senior: Mimy Hew

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