

US 101/Dry Creek Road Interchange



Feasibility Study Report

Prepared for the City of Healdsburg



Presented by AECOM

AECOM

In Coordination with W-Trans



October 2020



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US 101/DRY CREEK ROAD INTERCHANGE FEASIBILITY STUDY REPORT

1. INTRODUCTION

General Information

Project Title: US 101/Dry Creek Road Interchange

Project Location: US 101/Dry Creek Road Interchange at Post Mile 36.3 on US 101, see Exhibit 1

Project Limits: Dry Creek Road between Kinley Drive and Grove Street

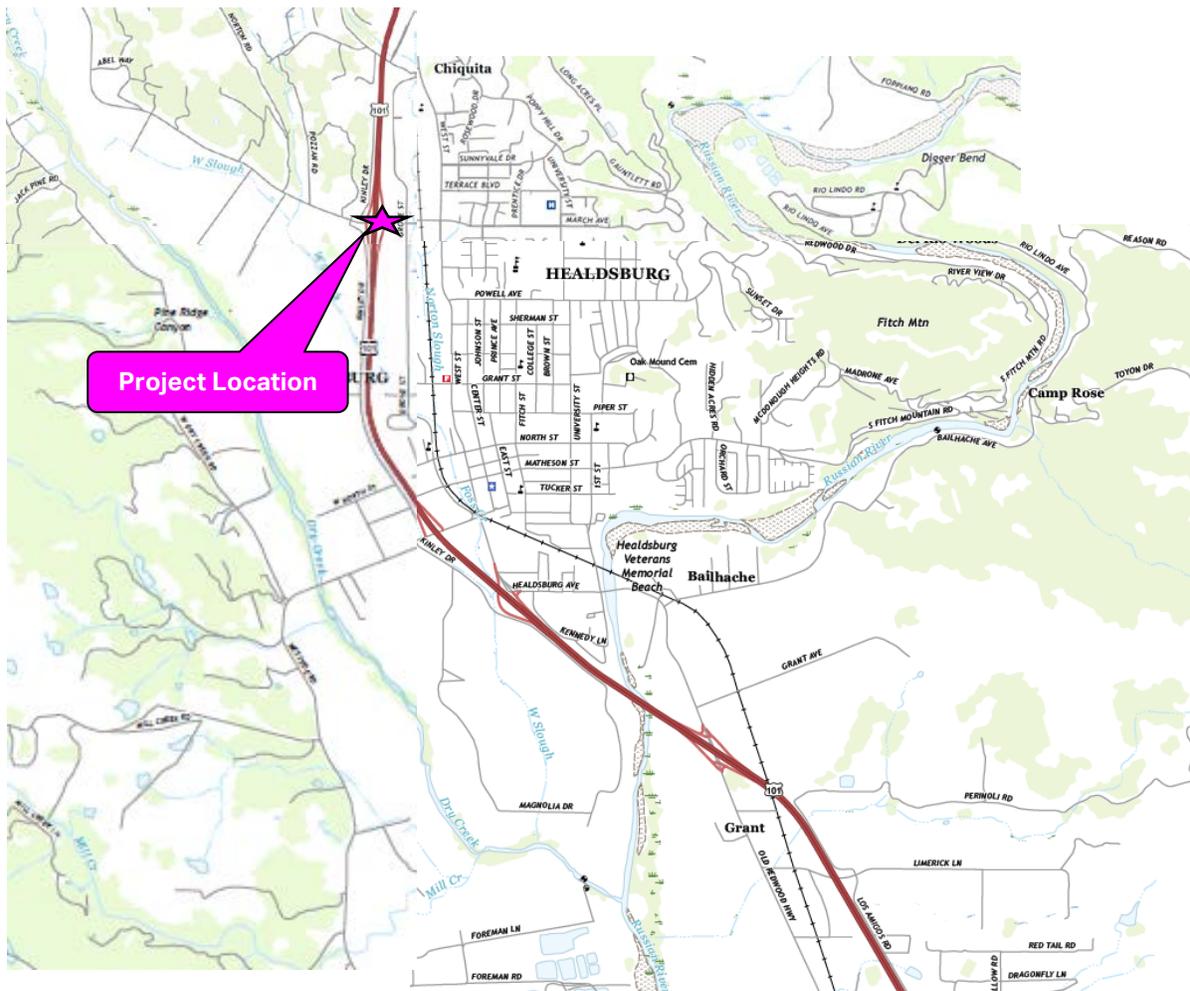


Exhibit 1. Project Location Map



2. BACKGROUND

Description of Existing Facilities

The existing US 101/Dry Creek Road interchange is a compact diamond type (Type L-1). It was constructed in early 1960s. Minor modifications have been made to the interchange over the years but no major construction work has been performed. The latest improvement was the installation of all-way stop control signage at the ramp intersections in 2019.

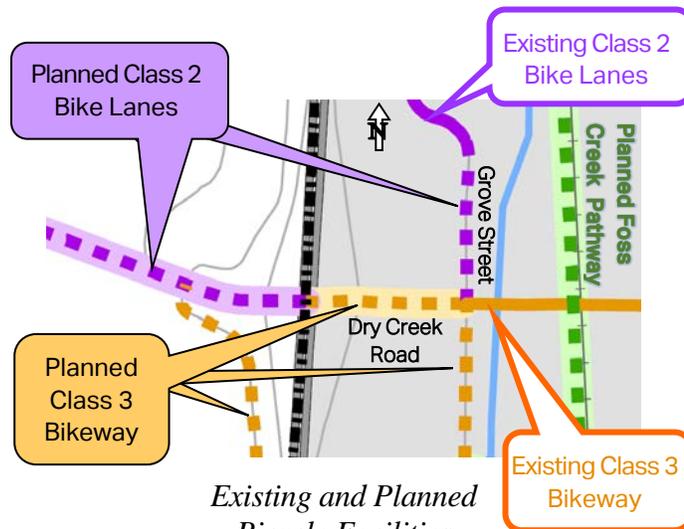
Dry Creek Road is classified as an arterial street within the project limits in the Healdsburg 2030 General Plan (adopted in December 2009 and amended in January 2010). It is one of three arterial streets in the City. The posted speed on Dry Creek Road is 30 mph within the project limits. This arterial begins on the west end at the City limit and ends at Healdsburg Avenue on the east end to become March Avenue.

There are no existing sidewalks on Dry Creek Road where it passes underneath US 101. Sidewalk deficiencies are documented in the Healdsburg Bicycle & Pedestrian Master Plan (2013). The intersection of Dry Creek Road and Grove Street is signalized with non-ADA compliant pedestrian facilities.

On Dry Creek Road, a Class 3 bikeway exists west of Grove Street. According to the Healdsburg Bicycle & Pedestrian Master Plan, there are planned Class 2 bike lanes and Class 3 bikeways within the project limits. The Foss Creek Pathway, located to the immediate west of the railroad track, is currently in the design phase. The planned bicycle facilities on Dry Creek Road within the project limits and Foss Creek Pathway are identified as part the regional bike route network in the Healdsburg Bicycle & Pedestrian Master Plan.



Sidewalk Deficiencies
(Healdsburg Bicycle & Pedestrian Master Plan)



Existing and Planned Bicycle Facilities
(Healdsburg Bicycle & Pedestrian Master Plan)



The existing intersections at the US 101/Dry Creek Road interchange include:

Existing All-Way Stop Controlled US 101 Southbound Ramp/Dry Creek Road Intersection

- One eastbound through-right lane
- One southbound through-left-right lane on the off-ramp
- One southbound receiving lane on the on-ramp
- One westbound through lane and one dedicated left-turn lane

Existing All-Way Stop Controlled US 101 Northbound Ramp/Dry Creek Road Intersection

- One eastbound through lane and one dedicated left-turn lane
- One northbound through-left-right lane on the off-ramp
- One northbound receiving lane on the on-ramp
- One westbound through-right lane

East of the interchange along Dry Creek Road, land uses include hotels, restaurants, service stations and a vehicle storage lot. Dry Creek Road on the west side of the interchange is within the jurisdiction of the County of Sonoma and provides access to the wineries and residences of Dry Creek Valley.

The existing intersection of Dry Creek Road and Grove Street is signalized. Between the interchange and Grove Street, there is a short segment of a two-way left-turn lane for accessing the driveway of the businesses on the south side of Dry Creek Road. This driveway serves a Best Western Hotel, Adel's (restaurant) and a Valero gas station. The existing lane configurations at the Dry Creek Road/Grove Street intersection include:

Existing Signal at Dry Creek Road/Grove Street Intersection

- One eastbound one through lane, through-right lane and one dedicated left-turn lane
- One southbound through-left-right lane
- One northbound through-left lane and one dedicated right-turn lane
- One westbound through lane, one dedicated left-turn lane and one dedicated right-turn lane

Existing utility overhead lines run on the north side of Dry Creek Road. There are existing gas, water, recycled water and sanitary lines that run along the roadway. Existing drainage facilities include ditches and headwalls within the interchange area along with an underground storm drainage system east of the interchange.

There is existing safety lighting at each ramp intersection. Street lighting with mast arms exists on the south side of Dry Creek Road between the interchange and Grove Street. There are decorative streetlights east of Grove Street on the south side of Dry Creek Road in front of the Trio Hotel. There is no street lighting on the north side of Dry Creek Road except for safety lighting at the intersections.

An existing culvert structure at Foss Creek is located approximately 150 feet east of the Dry Creek Road/Grove Street intersection. The North Coast Railroad Authority (NCRA) railroad, which



generally parallels US 101 within the City, is located approximately 450 feet east of the Dry Creek Road/Grove Street intersection. This segment of the NCRA track is part of the Russian River Division and it forms an at-grade crossing with Dry Creek Road. An existing overhead flashing-light signal with an automatic gate is installed for both directions of traffic. There is no raised median at the at-grade railroad crossing. There is currently no train traffic at this crossing. In September 2018, the Governor of California approved Senate Bill No. 1029 (SB-1029) to assess and provide the necessary information in order to determine the most appropriate way to dissolve the NCRA. Future rail service through Healdsburg is identified as part of the planned SMART Rail System North segment in the Sonoma-Marine Area Rail Transit District (SMART) Strategic Plan 2019. This segment of SMART's plan will extend passenger rail service from the Sonoma County Airport in northern Santa Rosa to the City of Cloverdale. Implementation of the SMART North segment rail service will be achieved in phases with planned stations in the Town of Windsor, the City of Healdsburg and the City of Cloverdale. SMART began construction of the Town of Windsor Extension in early 2020, and it is slated to be completed by late 2021. Additional SMART North projects, including extensions to Healdsburg and Cloverdale, will advance as funding is secured.

This project lies on the northern border of the Grove Street Neighborhood Plan that was adopted by the Healdsburg City Council in February 2000. The Plan was developed to create a planning policy that allows new developments to take place in a way that is consistent with the neighborhood's existing characteristics and unifies the neighborhood as projects are implemented. According to the Sonoma County Disadvantaged Communities online mapping by Sonoma County Transportation Authority (SCTA), the Grove Street Neighborhood is in a SCTA-Adopted Community of Concern and a Priority Area as defined by the Portrait of Sonoma County, which helps identify disadvantaged communities and disparities between Sonoma County neighborhoods. The project is located within a 2017 California Department of Transportation (Caltrans) Active Transportation Program (ATP) Disadvantaged Communities area. These areas are used to help prioritize program funding. See Exhibit 2.

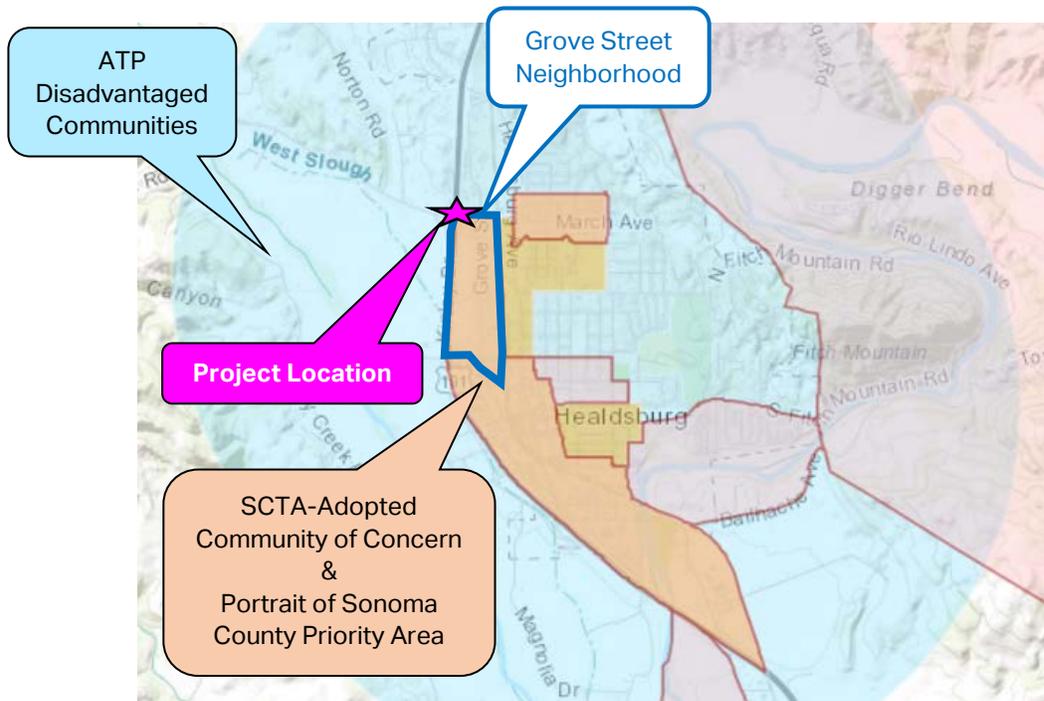


Exhibit 2. Sonoma County Disadvantaged Communities

(<https://scta.ca.gov/planning/comprehensive-transportation-plan/sonoma-disadvantaged-communities/>)

3. PROJECT NEED AND PURPOSE

Purpose

The purpose of the project is to address the traffic impacts to the general area of the US 101/Dry Creek Road interchange from the planned improvements at the north end of the City which include the North Village project (previously North East Area Plan, NEAP) and the Montage project (previously Saggio Hills). This project proposes to:

- Improve traffic operation of within the project limits on Dry Creek Road between US 101 and Grove Street
- Reduce traffic conflicts and backups at the US 101 ramp intersections with Dry Creek Road
- Improve bicycle and pedestrian access across US 101 within the project limits



Need

The existing US 101/Dry Creek Road interchange is unable to accommodate the existing and future traffic volumes, resulting in congestion on Dry Creek Road at the US 101 ramp intersections and east of this interchange. The operation deficiency was identified in the Healdsburg 2030 General Plan, and traffic signal installations at the ramp intersections were noted as planned improvements. This project was identified as a need by the Environmental Impact Reports (EIRs) for the North Entry Area Plan (including EIR Addendum for the North Village) and the Saggio Hills (Montage) projects. Construction of either interconnected signals or a roundabout couplet at this interchange was also documented as a planned project in the US 101 North Comprehensive Corridor Plan (Caltrans District 4, February 2018).

This project addresses the following within the project limits:

Improve Traffic Operation, Reduce Traffic Conflicts and Backups

According to the US 101 North Comprehensive Corridor Plan, the southbound off-ramp intersection operates at an unacceptable level of service (LOS) F during the morning and evening peak hours, and the southbound off-ramp traffic backs up onto the US 101 mainline shoulder regularly. The recent installation of stop signs for all approaches at the US 101/Dry Creek Road ramp intersections enhanced the general operation and safety of the interchange but congestion is still observed during the peak hours at the interchange. It is noted in the EIR for the North Entry Area Plan (NEAP) that traffic operation at the interchange will degrade to a LOS that is unacceptable by the City under the all-way stop control scenario when development under the NEAP is implemented. The Dry Creek Road/Grove Street intersection will also operate at an unacceptable LOS upon development under the NEAP.

Project improvements will improve traffic operation and reduce queuing at the US 101/Dry Creek Road interchange and the Dry Creek Road/Grove Street intersection, mitigating the impacts of the increased traffic from the North Village and Montage projects.

Improve Bicycle and Pedestrian Access

Sidewalk gaps within the project limits are identified by the Healdsburg Bicycle & Pedestrian Master Plan. There is a lack of continuous pedestrian facility on Dry Creek Road and Grove Street. Class III bicycle facilities are planned on Dry Creek Road between US 101 and Grove Street.

At the intersection of Dry Creek Road and Grove Street, it is observed in the field that pedestrian facilities, including curb ramps and push buttons, do not comply with the current requirements of the American Disability Act (ADA).

This project will construct sidewalks at the interchange where there are currently none. Sidewalk gaps will be in-filled and intersections will be constructed to be ADA-compliant. Signage for Class III bicycle facilities will be added where appropriate.



4. PROJECT PLANNING AND COORDINATION

The project is primarily located within the City of Healdsburg with encroachment into the jurisdictions of the County of Sonoma and Caltrans. The project is subject to conformance with state, regional, and local planning efforts. The following documents were reviewed for the development of this study:

- Environmental Impact Report, North Coast Railroad Authority Russian River Division Freight Rail Project (March 2011), NCRA
- Foss Creek Pathway Plan (October 2006), City of Healdsburg
- Grove Street Neighborhood Plan (February 2000), City of Healdsburg
- Healdsburg 2030 General Plan (July 2009 with amendments through January 2015), City of Healdsburg
- Healdsburg Bicycle & Pedestrian Master Plan (October 2008, update in 2013), City of Healdsburg
- Healdsburg Community-Based Transportation Plan (November 2009), SCTA
- Highway 101 Corridor – North of the Gate (October 2006), TAM/SCTA/MCOG
- Moving Forward 2040 Sonoma County’s Comprehensive Transportation Plan (September 2016), SCTA
- North Entry Area Plan (May 2019), City of Healdsburg
- North Village Project Initial Study/Addendum to NEAP EIR (February 2020), City of Healdsburg
- Saggio Hills Area Plan (January 2011), City of Healdsburg
- SCTA Countywide Bicycle and Pedestrian Master Plan (May 2008, updated in 2014), SCTA
- Sonoma County General Plan 2020 (September 2008 with amendments through August 2016), County of Sonoma
- Sonoma-Marin Area Rail Transit District Strategic Plan 2019 (September 2019), SMART
- Supplemental Initial Study/Proposed Mitigated Negative Declaration for the Foss Creek Pathway Segments 7 and 8 Project (April 2019), City of Healdsburg
- US 101 North Comprehensive Corridor Plan (February 2018), Caltrans

Transit service in the City is operated by the Sonoma County Transit. There is no transit service on Dry Creek Road between Kinley Drive and Grove Street. The nearest bus stop for Healdsburg Shuttle Route 67 is located approximately 170 feet south of Dry Creek Road on the east side of Grove Street. Another bus stop for InterCity Route 60 is located approximately 600 feet east of Grove Street on the north side of Dry Creek Road. There is no active rail service within or near the project limits.

Transit and rail accommodations were not explicitly evaluated in this study. It is recommended that Sonoma County Transit, NCRA and SMART are consulted during the environmental clearance phase of the project development to determine how planned transit and rail improvements may impact the project.



Adjacent Project

The Foss Creek Pathway Segments 7 and 8 project is currently under final design. A signalized midblock crossing is proposed on Dry Creek Road approximately 450 feet east of Grove Street, immediately west of the NCRA corridor. The midblock crossing signal will be activated for the passage of bicyclists and pedestrians, with a median island constructed within the limits of the existing two-way left-turn lane for refuge. The existing lane configurations on Dry Creek Road will remain as is at the crossing with one westbound and two eastbound travel lanes. Sidewalks will be constructed on both sides of Dry Creek Road from the midblock crossing, over the existing NCRA track, to connect with the existing sidewalks east of the track. According to the Supplemental Initial Study/Proposed Mitigated Negative Declaration for the Foss Creek Pathway Segments 7 and 8 project, the midblock crossing signal is not expected to worsen LOS or add additional delay at either Dry Creek Road/Grove Street or Dry Creek Road/Healdsburg Avenue intersections. Both intersection signals will need to be coordinated with the crossing signal.

There are no identified planned projects under development west of the interchange in the County of Sonoma at this time. However, according to the Dry Creek Valley Citizens Advisory Council approved minutes for January 16, 2020, a motion for Zo Wines LLC (Zo Winery) to increase their annual production from 600 cases to 5,000 cases was passed. Zo Winery is located within 3 miles to the northwest of the interchange on Dry Creek Road. Impacts to the US 101/Dry Creek Road interchange from the additional trips generated by Zo Winery should be considered as their use permit to increase production is advanced.

5. PRELIMINARY ENVIRONMENTAL ASSESSMENT

A preliminary environmental assessment utilizing the Caltrans Preliminary Environmental Analysis Report (PEAR) template was performed for this project. Based on this preliminary assessment, an Initial Study or Focused Initial Study with proposed Negative Declaration (ND) or Mitigated ND is anticipated as the document for compliance with the California Environmental Quality Act (CEQA), and a Categorical Exclusion is the anticipated document for compliance with the National Environmental Policy Act (NEPA). A summary of the recommended reports and memorandums for the environmental clearance phase of the project are included in the assessment.

The preliminary environmental assessment document is included in Appendix A of this report.

6. DESIGN CRITERIA

Although the project is primarily within the City, design at the interchange must comply with the requirements of the Caltrans Highway Design Manual (HDM). US 101 in Healdsburg is classified as a STAA Terminal Access route, consequently, the design vehicle at the interchange is the STAA truck as defined in Section 404.4 of the HDM.



Outside Caltrans right-of-way, design should comply with local improvements standards. At the intersection of Dry Creek Road and Grove Street, the design intent is to minimize impacts to the existing private businesses while providing ADA-compliant facilities at each corner, including the construction of pedestrian curb ramps. As such, the curb return layout at each corner was generally maintained to the approximate radius of the existing face of curb. All of the existing curb returns are less than the standard 35-foot radius as required by the City for an arterial roadway.

There are no current design vehicle criteria in the City of Healdsburg Public Works Standard Specifications and Details. According to A Policy on Geometric Design of Highways and Streets (AASHTO Green Book) Section 2.8, Design Vehicles, the WB-40 is often considered an appropriate design vehicle for local roads and streets. The WB-40 vehicle is classified as an intermediate semitrailer. The preliminary design of the Dry Creek Road/Grove Street intersection of the build alternatives can accommodate the WB-40 vehicle for all turning movements as a minimum. However, with US 101 located to the west side of this intersection, consideration for larger trucks accessing Grove Street to and from the freeway are evaluated. The minimum design vehicle for each intersection corner for the preliminary design of the Dry Creek Road/Grove Street intersection is as follow:

- Northwest corner – California Legal
- Southwest corner – WB-50
- Northeast corner – WB-50
- Southeast corner – WB-40

No design changes are proposed for the horizontal and vertical alignments of the existing roadways and ramps at this time. It is anticipated that some grading will be necessary, particularly at the intersections for compliance with ADA and for the alternative with roundabouts at the ramp intersections.

Non-standard design elements within Caltrans right-of-way require approval of a design standard decision document from Caltrans, and deviations from the City's standards require written approval from the City Engineer.

For water quality, the preliminary design of bioswales was completed with the City Storm Water Low Impact Development Technical Design Manual and associated tools available on the City's website. See the PEAR in Appendix A for additional discussions on water quality and storm water runoff. Calculations of the preliminary bioswale design for both build alternatives are included in Appendix B of this report.

7. TRAFFIC ANALYSIS

An Operational Analysis for the US 101/Dry Creek Road Interchange Memorandum was prepared in support of this report for the two build alternatives presented in this report. Lane configuration recommendations were incorporated into each proposed build alternative. This traffic operations memorandum is included in Appendix C of this report.



Collision Data

Collision data within and near the project limits were provided by the City and summarized for a clear overview of the existing traffic conditions. Collision data provided included the period between January 2016 through April 2019. The information is summarized in Exhibit 3.

Based on the collision data, the majority of collisions in and around the project site occur at the Dry Creek Road/Grove Street intersection. Rear-end and same direction side swipe collisions are often direct results of traffic congestion with vehicles either slowing down unexpectedly, stopping suddenly or simply losing control during lane changes. Relieving congestion should enhance the safety of the project intersections as well as reduce delays.



Exhibit 3. Summary of Collision Data



8. DESCRIPTION OF PROPOSED ALTERNATIVES

There are three design alternatives that were considered for this project:

- No Build (see section for Description of Existing Facilities)
- Signals at US 101 Ramp Intersections
- Roundabouts at US 101 Ramp Intersections

Based on the traffic analysis that was already performed as part of the Saggio Hills EIR and NEAP EIR, it is clear that the No Build alternative is not a viable alternative.

The two build alternatives do not anticipate modifications to the existing undercrossing structure at the interchange or the US 101 mainline. General descriptions of each build alternative are as described:

Alternative 1 – Signals at US 101 Ramp Intersections

This alternative proposes to construct new interconnected signals at the intersections of Dry Creek Road and the US 101 ramps. The improvements include providing one through travel lane in each direction at the interchange with the following lane configurations at each intersection:

New Signal at US 101 Southbound Ramp/Dry Creek Road Intersection

- One eastbound through lane and one dedicated right-turn lane
- One southbound through-left-right lane on the off-ramp
- Two southbound receiving lanes on the on-ramp
- One westbound through lane and two dedicated left-turn lanes

New Signal at US 101 Northbound Ramp/Dry Creek Road Intersection

- One eastbound through lane and one dedicated left-turn lane
- One northbound through-left lane and one dedicated right lane on the off-ramp
- One northbound receiving lane on the on-ramp
- One westbound through lane and one through-right lane

Modifications proposed at the Dry Creek Road/Grove Street intersection are the same for both build alternatives. Proposed lane configurations are:

Modified Signal at Dry Creek Road/Grove Street Intersection

- One eastbound one through lane, one through-right lane and one dedicated left-turn lane
- One southbound through-left lane and one dedicated right-turn lane
- One northbound through-right lane and one dedicated left-turn lane
- One westbound through lane, one through-right lane and one dedicated left-turn lane

For this preliminary phase, sawcut line for roadway widening is located 1 foot inside the existing edge of pavement. Structural section for the project widening proposes the same section as the one used for the recent interchange project for installing stop signs. The structural section is



composed of 0.5 foot of hot mix asphalt (Type A) over 1.5 feet of aggregate base (Class II). Both will be refined in the next phase of the project development.

A 6-foot sidewalk is proposed on the south side of Dry Creek Road through the interchange area then conforming to the existing sidewalk just west of Grove Street. East of the interchange to Grove Street, a 6-foot shoulder is proposed on the south side and an 8-foot shoulder is proposed on north side. Shoulders would serve as Class III bikeways between the east of the interchange to Grove Street. Pedestrian curb ramps would be constructed to meet ADA requirements.

The existing overhead utility line on the north side of Dry Creek Road would require relocation within the project limits. Existing sanitary sewer manholes and water valves would be adjusted to grade. At the Dry Creek Road/Grove Street intersection, an existing fire hydrant would be relocated at the southwest corner and an existing underground utility vault would be relocated at the northwest corner.

A bioswale is proposed to the east of the existing US 101 northbound off-ramp within the existing Caltrans right-of-way for drainage and water quality. The existing lined ditch on the north side of Dry Creek Road at the undercrossing would be reconstructed. Existing headwalls and culverts within the interchange would be removed and underground drainage infrastructure would be implemented. Based on the preliminary information of this report, the proposed drainage on Dry Creek Road would not conflict with the footings of the existing undercrossing if standard Caltrans inlets are used.

Preliminary layouts of Alternative 1 are provided in Appendix D of this report.

Alternative 2 – Roundabouts at US 101 Ramp Intersections

This alternative proposes to construct a set of roundabout couplets at the intersections of Dry Creek Road and the US 101 ramps. The improvements include providing one through travel lane in each direction at the interchange with the following lane configurations at each roundabout:

New Roundabout at US 101 Southbound Ramp/Dry Creek Road Intersection

- One eastbound lane for the through and right-turn movements
- One southbound lane for all movements on the off-ramp
- One southbound receiving lane on the on-ramp
- One westbound lane for the through and left-turn movements

New Roundabout at US 101 Northbound Ramp/Dry Creek Road Intersection

- One eastbound lane for the through and left-turn movements
- One northbound lane for the through and left-turn movements and one right-turn slip lane on the off-ramp
- One northbound receiving lane with a slip lane from westbound right-turn lane on the on-ramp
- One westbound lane for the through movement and one right-turn slip lane



Modifications proposed at the Dry Creek Road/Grove Street intersection are the same for both build alternatives. Proposed lane configurations are:

Modified Signal at Dry Creek Road/Grove Street Intersection

- One eastbound one through lane, one through-right lane and one dedicated left-turn lane
- One southbound through-left lane and one dedicated right-turn lane
- One northbound through-right lane and one dedicated left-turn lane
- One westbound through lane, one through-right lane and one dedicated left-turn lane

For this preliminary phase, sawcut line for roadway widening is located 1 foot inside the existing edge of pavement. Structural section for the project widening proposes the same section as the one used for the recent interchange project for installing stop signs. The structural section is composed of 0.5 foot of hot mix asphalt (Type A) over 1.5 feet of aggregate base (Class II). Both will be refined in the next phase of the project development.

A 10-foot pathway is proposed on the south side of Dry Creek Road through the interchange area then conforming to the existing sidewalk just west of Grove Street. Shoulders of 8 feet are proposed through the interchange. East of the interchange to Grove Street, 6-foot shoulders on north side of Dry Creek Road. Shoulders would serve as Class III bikeways between the east of the interchange to Grove Street. Bicyclists could use the 10-foot pathway to navigate through the roundabouts at the interchange. The project should consider including a bike ramp east of the northbound off-ramp where the 10-foot pathway begins to narrow to allow bicyclists on the path to access the Class III bikeway on Dry Creek Road. Pedestrian curb ramps would be constructed to meet ADA requirements.

The existing overhead utility line on the north side of Dry Creek Road would require relocation within the project limits. Existing sanitary sewer manholes and water values would be adjusted to grade. At the Dry Creek Road/Grove Street intersection, an existing fire hydrant would be relocated at the southwest corner and an existing underground utility vault would be relocated at the northwest corner.

A bioswale is proposed to the east of the existing US 101 northbound off-ramp within the existing Caltrans right-of-way for drainage and water quality. The existing lined ditch on the north side of Dry Creek Road at the undercrossing would be reconstructed. Existing headwalls and culverts within the interchange would be removed and underground drainage infrastructure would be implemented. Based on the preliminary information of this report, the proposed drainage on Dry Creek Road would not conflict with the footings of the existing undercrossing if standard Caltrans inlets are used.

Preliminary layouts of Alternative 2 are provided in Appendix E of this report.



9. GEOTECHNICAL

Geotechnical investigation and analysis were not completed at this stage of the project development. It is recommended to be performed in the next phase of the project to provide preliminary findings, including subsurface soil conditions for detention and retention of bioswales. See the PEAR in Appendix A for additional discussions on geology, soils, seismic and topography.

10. RIGHT-OF-WAY

The majority of the proposed improvements for both alternatives are within the existing right-of-way. The limits of right-of-way acquisition are anticipated to be the same for both build alternatives at the Dry Creek Road/Grove Street intersection. Approximate areas of impact are summarized as follow:

Location	Right-of-Way Take	Temporary Construction Easement	Reason for Need
Northeast Corner	19 ft ²	10 ft ²	Reconstruct sidewalk, pedestrian curb ramp and signal
Southwest Corner	---	234 ft ²	
Southeast Corner	42 ft ²	72 ft ²	

Not included in this preliminary report are easements required by utility companies for relocation of their infrastructure.

11. PERMITTING

Permits from the following agencies may be necessary for the project and should be confirmed during the project approval and environmental clearance phase:

- California Regional Water Quality Control Board (401)
- Army Corps of Engineers (404)
- Caltrans (Encroachment)
- County of Sonoma (Encroachment)
- City of Healdsburg (Encroachment)



12. PRELIMINARY CONSTRUCTION COSTS

The preliminary construction costs were prepared using Caltrans’ 11-Page Preliminary Cost & R/W Conceptual Cost Estimates for the two build alternatives, and are summarized as follow:

Build Alternative	Year 2020	Escalated to Year 2025
Alternative 1 – Signals at US 101 Ramp Intersections	\$5.3 million	\$6.50 million
Alternative 2 – Roundabouts at US 101 Ramp Intersections	\$5.8 million	\$7.15 million

The estimates shown do not include support costs for the environmental clearance, final design, right-of-way support and construction support.

The 11-page preliminary construction cost estimate for each build alternative are included in Appendix F of the report.

13. PROJECT DEVELOPMENT TIMELINE

This Feasibility Study Report is a preliminary step in the overall project development process. The goal of the study is to determine feasible build alternatives that satisfy the project purpose and need, as well as identify next steps. If federal funding is anticipated, the typical project development process under the Caltrans Local Assistance Program should be followed. An example of funding that this project may be eligible for and would require oversight by the Caltrans Local Assistance is the Congestion Mitigation and Air Quality Improvement (CMAQ) Program.

If the project does not seek federal funding, the City should consult Caltrans on the most appropriate next step in the project development. Depending on the complexity of the preferred build alternative improvements within Caltrans right-of-way, the City may be able to construct this project under a Caltrans Encroachment Permit with the approval of a design engineering evaluation report (DEER).

If the traditional approval process is to be followed in accordance with the Caltrans Project Development Procedure Manual (PDPM), the City, with Caltrans’ concurrence, would prepare a project study report-project development support (PSR-PDS) project initiation document (PID) for the next phase. A PSR-PDS is prepared to achieve consensus on the purpose-and-need, scope and schedule of a project between the Caltrans and the involved regional and local agencies. The PID establishes the framework for the project approval & environmental document (PA&ED) phase of a project. Caltrans may propose another PID type as they deemed appropriate.

A cooperative agreement will be needed to be executed between the City and Caltrans prior to the start of the PID phase. A cooperative agreement is a contract that affirms the rights, duties, decisions and commitments made between Caltrans and the partner agencies. Separate future cooperative agreements for the PA&ED, Final Design, Right-of-Way and Construction phases of



the project will be required before those phases can begin. New or revised freeway agreement and freeway maintenance agreements will likely be needed.

The anticipated project development schedule is as follow:

Project Milestones	Estimated Schedule
Project Initiation Document (PID)	8 Months to 1 Year
Project Approval & Environmental Document (PA&ED)	1.5 Years to 2 Years
Environmental Technical Studies	
Environmental Document	
Project Report	
Final Design and Right-of-Way (R/W)	1.5 Years to 2 Years
Plans, Specifications and Estimate (PS&E)	
Utility Certification	
R/W Certification	

14. OTHER CONSIDERATIONS

Public Outreach

Selection of a preferred alternative requires public input to ensure project success. During the environmental clearance phase, it may become apparent which alternative is the obvious choice through public engagement. Without receiving input from the community and key stakeholders, it is a little early in the project development process to determine a preferred alternative.

To facilitate the City’s outreach planning efforts for this project, a Public Outreach Summary Memorandum is included in Appendix G of this report. Key stakeholders and outreach tasks are provided for the planning of the next project phase, with considerations included for virtual engagement.

Project Risks

Preliminary project risks have been identified and summarized in the Draft Project Risk Register included in Appendix H of this report. The risk items most likely to impact schedule are obtaining concurrence from right-of-way acquisitions, potential delays in utility relocations and the discovery of buried man-made objects during construction.



15. RECOMMENDATIONS

Based on the analysis performed, both build alternatives are feasible at this stage of the project development. While Alternative 2 is noted as the recommended option in the Operational Analysis for the US 101/Dry Creek Road Interchange Memorandum, an Intersection Control Evaluation (ICE) is typically required for concurrence by Caltrans for intersection control improvements within the State right-of-way.

This study concludes that it is feasible to advance both alternatives into the next project development phase for further evaluation.

APPENDIX A

Preliminary Environmental Assessment Document



PRELIMINARY ENVIRONMENTAL ANALYSIS REPORT

1. Project Information

District 4	County Sonoma	Route 101	PM 36.3	EA TBD
EFIS Project ID: TBD				
Project Title: US 101/Dry Creek Road Interchange Project				
Project Manager TBD			Phone #	
Project Engineer TBD			Phone #	
Environmental Office Chief/Manager			Phone #	
PEAR Preparer Teresa O'Grady			Phone # 510-768-9070	

2. Project Description

The City of Healdsburg (City), in cooperation with the California Department of Transportation (Caltrans), proposes to minimize traffic conflicts and backups where the United States Highway (US 101) ramps cross Dry Creek Road between Kinley Drive and Healdsburg Avenue, at Post Mile (PM) 36.3. The project area is in the City and unincorporated Sonoma County.

Purpose and Need

The purposes of the project are to:

- Improve traffic operations within the project limits on Dry Creek Road between Dry Creek Road between US 101 and Grove Street;
- Reduce traffic conflicts and backups at the US 101 ramp intersections with Dry Creek Road; and
- Improve bicycle and pedestrian access across US 101 within the project limits.

The project is needed to reduce traffic and backups in the project area. Dry Creek Road has one lane in each direction where it crosses under US 101 and lacks designated pedestrian and bicycle facilities. Although the City has completed a project to install all-way stop controls at the US 101 ramp intersections with Dry Creek Road, traffic is forecast to increase in the interchange area with new development in this part of the City, requiring additional improvements to accommodate existing and future traffic.

Description of work

Proposed project activities would be limited to improvements on Dry Creek Road to alleviate vehicle congestion and improve connectivity and safety for bicyclists and pedestrians. Project construction would include roadway and ramp widening, new sidewalks and bike lanes, utility

relocation, and interchange/signal modification. The project would also incorporate as many Complete Streets elements as possible. Improvements on US 101 include minor modification at the US 101 ramps. No work is proposed on the US 101 mainline

Alternatives

There are two preliminary alternatives under consideration (see Figures in Feasibility Study):

- **Alternative 1, Concept for Ramp Intersections with Signals**
 - Proposed Class III bike route along Dry Creek Road in each direction between US 101 and Grove Street
 - Proposed signals at the intersections of the on- and off-ramps at Dry Creek Road
 - Proposed signal modifications at the Dry Creek Road/Grove Street intersection
 - Proposed sidewalk on the south (eastbound) side of Dry Creek Road between US 101 and Grove Street
- **Alternative 2, Concept for Ramp Intersections with Roundabouts**
 - Proposed Class III bike route along Dry Creek Road in each direction between US 101 and Grove Street
 - Proposed roundabouts at the intersections of the on- and off-ramps at Dry Creek Road
 - Proposed signal modifications at the Dry Creek Road/Grove Street intersection
 - Proposed sidewalk on the south (eastbound) side of Dry Creek Road between US 101 and Grove Street

3. Anticipated Environmental Approval

Check the anticipated environmental determination or document for the proposed project in the table below.

CEQA		NEPA	
Environmental Determination			
Statutory Exemption	<input type="checkbox"/>		
Categorical Exemption	<input type="checkbox"/>	Categorical Exclusion	<input checked="" type="checkbox"/>
Environmental Document			
Initial Study or Focused Initial Study with proposed Negative Declaration (ND) or Mitigated ND	<input checked="" type="checkbox"/>	Routine Environmental Assessment with proposed Finding of No Significant Impact	<input type="checkbox"/>
		Complex Environmental Assessment with proposed Finding of No Significant Impact	<input type="checkbox"/>
Environmental Impact Report	<input type="checkbox"/>	Environmental Impact Statement	<input type="checkbox"/>
CEQA Lead Agency (if determined):		City of Healdsburg or Caltrans	
Estimated length of time (months) to obtain environmental approval:		18	
Estimated person hours to complete identified tasks:		TBD	

4. Special Environmental Considerations

The majority of the proposed project is located in an urbanized area and is not expected to require unusual, exceptional, or extended environmental processes. The proposed project would not result in 5 or more acres of permanent impacts to waters of the United States or require a National Environmental Policy Act (NEPA) Environmental Impact Statement; therefore, the alternatives would not require coordination under the NEPA and Clean Water Act Section 404 Integration Process. The proposed project is not expected to affect a Section 4(f) recreation facility, and the presence of Section 4(f) historic resources would be determined through the studies outlined in Section 8.6, below.

5. Anticipated Environmental Commitments

The following environmental commitments may result from environmental review and apply to all project alternatives.

- If previously undocumented cultural resources are encountered during construction, all destructive work in the vicinity of the find shall cease until a qualified archaeologist can assess the significance of the find and, if appropriate, provide recommendations for treatment;
- If human remains are found, the California Health and Safety Code requires that excavation be halted in the immediate area, and that the County coroner be notified to determine the nature of the remains. The coroner is required to examine all discoveries of human remains within 48 hours of receiving notice of a discovery on private or state lands (California Public Resources Code Section 7050.5[b]). If the coroner determines that the remains are those of a Native American, he or she must contact the Native American Heritage Commission (NAHC) by phone within 24 hours of making that determination (California Public Resources Code 7050.5[c]).
- Temporary and permanent storm water runoff or run-on should be limited by implementing best management practices to be designed during the PA&ED phase.
- Worker environmental awareness would be conducted before project construction.
- Vegetation removal in or near sensitive areas should be avoided or minimized. Cleared areas would be revegetated with native species post-construction.
- Avoid or prevent the introduction of invasive species during construction.

6. Permits and Approvals

Permits may be required from both the California Department of Fish and Wildlife (CDFW) and United States Fish and Wildlife Service (USFWS) if project activities would result in impacts to a species listed as threatened or endangered. Permits will be required from some or all of the following agencies if work will occur within a waterway: United States Army Corps of Engineers, Regional Water Quality Control Board, and CDFW.

7. Level of Effort: Risks and Assumptions

The project will require agency permit approvals. Inability to obtain timely approval of the permits would add time to the project schedule.

8. PEAR Technical Summaries

The following descriptions of technical documentation needed for the project apply to both Alternatives 1 and 2 unless otherwise specified.

8.1 Land Use:

The project is on Dry Creek Road where it crosses under US 101, located on the western edge of Healdsburg in Sonoma County. The project area east of US 101 (northbound) is in Healdsburg while west of US 101 (southbound) is unincorporated Sonoma County. The project area east of US 101 in Healdsburg is designated and zoned for Mixed Use and Service Commercial (City of Healdsburg 2014, 2019), and the project area west of US 101 in unincorporated Sonoma County is designated for Land Intensive Agriculture and Rural Residential (Sonoma County 2016). Dry Creek Road between US 101 and Healdsburg Avenue is a major entryway to the city for visitors from Dry Creek Valley and US 101. Dry Creek Road between US 101 and Kinley Road is a major entryway to Dry Creek Valley. Land uses along the corridor in the Healdsburg include motels, restaurants, service stations, a truck storage lot and a liquor store. Pedestrian and bicycle facilities are limited in the area (City of Healdsburg 2015). Land uses in unincorporated Sonoma County include residential areas and several wineries in Dry Creek Valley (Sonoma County 2018).

There are no wildlife or waterfowl refuges or California Protected Areas in the project area; however, there are several community parks and recreation areas within 0.5 mile. The recreation areas in the project vicinity include the Carson Warner Memorial State Park and the Healdsburg Community Center, both zoned as Public/Quasi Public (PQP). There are no designated Wild and Scenic Rivers within the project area. Foss Creek is in the project area between Grove street and Healdsburg Drive; however, it has low visibility and no public access at this location. The project is consistent with the Transportation Element of the General Plan and the City's Bicycle and Pedestrian Master Plan by proposing pedestrian and bicycle pathways to Foss Creek.

Proposed project activities are limited to Dry Creek Road east of Kinley Road and west of Healdsburg Avenue. An encroachment permit from Caltrans is required for field work for data collection purposes. The project's potential impacts on land use will be discussed briefly in the environmental document; no additional documentation is necessary.

8.2 Growth:

The project area east of US 101 is located in Healdsburg. Healdsburg is a small tourist-oriented city located in northern Sonoma County containing approximately 4.46 square miles, with a population of 11,254 (US Census Bureau 2010). Historically, Healdsburg served as an agricultural service center and a milling and distribution center for north coast lumber. In 1960, US 101 was extended from Santa Rosa to bypass Healdsburg. The freeway changed local residents' purchasing and commute patterns. More recently, development of tourist-related businesses such as overnight accommodations, specialty retail, restaurants, and wine tasting have diversified the local economy and contributed to more growth in the area (City of Healdsburg 2010; SCTA 2009). In 1996, the City set an Urban Growth Boundary and a few years later a growth management ordinance was implemented. While a guiding principle for the City is to remain a residential and commercial center of a productive agricultural area, it also aims to balance resident and visitor needs and manage residential growth to ensure a measured pace of development. In 2000, Healdsburg citizens approved by referendum a growth management

program that limits the number of residential building permits each year (City of Healdsburg 2015).

West of US 101 (southbound), Dry Creek Road provides access to unincorporated areas of Sonoma County including Dry Creek Valley. The County has seen increases in tourism related to the wine industry, particularly in Dry Creek Valley, and anticipates an expansion of vineyard acreages. The unincorporated areas are home to approximately 30 percent of the County's total population. Net population change in the unincorporated areas includes both losses and gains over the years as a result of annexations of existing households near the edges of cities and new residential development (Sonoma County 2018). However, between 2006 and 2012, population in the unincorporated areas decreased by 2.7 percent. The County projects further population declines in unincorporated areas with additional absorption of development potential (Sonoma County 2018).

The project would add signals or roundabouts to intersection(s) on Dry Creek Road to reduce traffic backups on Dry Creek Road and the US 101 on- and off-ramps. While the project would provide an enhancement to the major transportation corridor for the City and improve connectivity for bicyclists, the nature of the project would not increase roadway capacity or remove what would be considered a major traffic bottleneck; and therefore, would not facilitate planned or unplanned growth. This will be discussed briefly in the environmental document; no additional documentation is necessary.

8.3 Farmlands/Timberlands:

The proposed project area does not include any important farmland mapped under the California Department of Conservation Division of Land Resource Protection Farmland Mapping and Monitoring Program; however, the surrounding area west of the project does include land designated for Prime Farmland. No lands in the project area are under Williamson Act contract. The project's potential impacts on farmlands will be discussed in the environmental document; no additional documentation is necessary.

8.4 Community Impacts:

The project area is on Dry Creek Road where the road crosses under US 101, connecting the City limits to the east to unincorporated Sonoma County to the west. While the area to the west of the project area is mostly agricultural and residential, the City of Healdsburg is a residential and commercial center for the area, with a low percentage of peoples living in poverty (U.S. Census Bureau 2017). The CalEnviroScreen 3.0¹ results for the project area are in the 35 to 50 percentiles, with the majority of the surrounding area in the 1 to 40 percentiles, which is not considered a disadvantaged community² (OHHHA 2018).

The project would add signals or roundabouts to intersections on Dry Creek Road to reduce traffic backups on Dry Creek Road and the US 101 on- and off-ramps. The project would

¹ The Office of Environmental Health Hazard Assessment (OEHHA), on behalf of the California Environmental Protection Agency (CalEPA), released Version 3.0 of the California Communities Environmental Health Screening Tool (CalEnviroScreen). An area with a high score is one that experiences a much higher pollution burden than areas with low scores. (OEHHA 2019).

² Communities at or above the 75th percentile of CES 3.0 scores (scores 75 or above) are considered disadvantaged communities (CEJA 2018).

minimize traffic conflicts and backups where the US 101 ramps cross Dry Creek Road and provide enhanced connectivity for the project area. The project would not change existing community boundaries or physically divide an established community. This will be discussed briefly in the environmental document; no additional documentation is necessary.

8.5 Visual/Aesthetics:

Healdsburg is situated in an inland valley defined principally by US 101, the Russian River, surrounding agricultural lands, and mountains to the east and west. Views of wooded ridges and hillsides, the Russian River, and adjacent agricultural valleys are the primary scenic resources in Healdsburg. The area has historically had a concentration of businesses related to the lumber, fruit packaging, and wine industries interspersed with commercial buildings, and maintains many of its original mixed-uses with scattered residential structures, light industrial buildings, and commercial buildings. Areas outside of Healdsburg in unincorporated Sonoma County retain a rural character with views of farmlands and hills to the east and west. The area includes several wineries and vineyards with rural residential dispersed throughout.

The project area does not contain any route designated as a California Scenic Highway, as defined by Caltrans; and is not within 200 feet of a Scenic Ridgeline, as defined by the City's General Plan. The entire length of US 101 in City limits is designated as a scenic road under the City's General Plan. The proposed project would be located on Dry Creek Road, which passes under US 101; therefore, project activities would not obstruct views from the highway.

For Alternative 1, Signals at US 101 Ramp Intersections, the Caltrans Questionnaire to Determine Visual Impact Assessment (VIA) Level produced a preliminary score of 14. This score indicates that negligible visual changes to the environment are proposed, and a brief Memorandum addressing visual issues can be prepared to provide a rationale why a technical study is not required for the project.

For Alternative 2, Roundabouts at US 101 Ramp Intersections, the Caltrans Questionnaire to Determine VIA Level produced a preliminary score of 15. This score indicates that noticeable visual changes to the environment are proposed, and an abbreviated VIA can be prepared to address visual issues. The assessment would briefly describe project features, impacts, and any avoidance and minimization measures.

Since both alternatives have a relatively similar score, an abbreviated VIA is recommended.

8.6 Cultural Resources:

The project area has been surveyed and analyzed for cultural resources by recent projects, including the North Area Plan and the Central Healdsburg Avenue Plan. In accordance with Healdsburg 2030 General Plan Policy Implementation Measures HCR-7 and HCR-8, a Northwest Information Center records search was conducted for the proposed project areas. The records search found that there is one resource within the study area: P-49-2834 (Northwestern Pacific Railroad). Other segments of the railroad outside of the project area have been evaluated for the National Register of Historic Places (NRHP) and California Register of Historical Resources and found not to be eligible. The railroad segment that crosses the study area has been modernized. This can be documented in a Historic Property Survey Report (HPSR), along with consultation with Native Americans and tribes that have requested notification per Assembly Bill

52 and CEQA requirements. Depending on the vertical and horizontal extent of the Area of Potential Effects (APE), an Archaeological Survey Report (ASR) and/or Historical Resources Evaluation Report (HRER) may be needed.

All bridges over creeks and the highway are listed as Category 5 and not eligible for the NRHP. There are no previously recorded prehistoric resources within the study area.

8.7 Hydrology and Floodplain:

The City of Healdsburg drains to two main surface waters, the Russian River and Foss Creek. The City's eastern boundary is defined by the Russian River, which extends 110 miles and drains approximately 1,500 square miles in Mendocino and Sonoma Counties into the Pacific Ocean. Most of the area within the city limits, including the project area, falls within the drainage area of Foss Creek. Foss Creek has its origins in the northeastern part of the City and empties into the Russian River. Foss Creek runs north-south through town, roughly paralleling the Northwestern Pacific Railroad tracks and leaves the city through double concrete boxes under US 101 near Exchange Avenue and Healdsburg Avenue. The floodway for project area includes flood hazard zones A and AE, which are subject to flooding by the 1%-annual-chance flood event (100-Year Floodplain).

The project area has been surveyed and analyzed for hydrology and floodplain resources by recent projects, including the North Area Plan and the Central Healdsburg Avenue Plan. A Location Hydraulic Study memorandum that incorporates the studies by reference will be prepared to address hydrology and floodplain for the proposed project. The memorandum will identify whether the project is anticipated to result in fill in the 100-year floodplain or floodway.

8.8 Water Quality and Storm Water Runoff:

The project area is within the Warm Springs Hydrologic Subarea of the Middle Russian River Hydrologic Area, which is included on the Section 303(d) list of impaired water bodies for sedimentation/siltation and temperature (SWRCB 2016).

Alternative 2, Roundabouts at US 101 Ramp Intersections, would require a greater amount of new pavement than Alternative 1, Signals at US 101 Ramp Intersections. Both project alternatives are anticipated to have less than one acre of disturbed soil area and would use existing pavement where possible. The project area has been surveyed and analyzed for water quality and storm water runoff by recent projects, including the Central Healdsburg Avenue Plan. A Water Quality Assessment memorandum based on recent reports in the project area will be prepared to evaluate the potential for water quality impacts to existing surface water and/or groundwater resources and the potential for hydromodification within the project limits. The Water Quality Assessment will also address post construction Low Impact Development (LID) Best Management Practices (BMPs) as related to the Alternative 2 design. Water quality treatment options will be considered and, as appropriate, included in the project. In addition, a Storm Water Data Report will be prepared to address storm water treatment commitments.

8.9 Geology, Soils, Seismic and Topography:

The City and surrounding unincorporated area is located in northern Sonoma County in the central portion of the Russian River watershed. The general area drains to the west and south via intermittent creeks and drainage channels, discharging into the Russian River. Elevations within

the City range from about 90 feet along the Russian River along the south side of the city, to more than 500 feet on the west side of Fitch Mountain. The western and central portions of the city, including the study area, are typically low-lying, gently sloping topography.

The region is within the central portion of the Coast Ranges geomorphic province of California, a region characterized by northwest-trending valleys and mountain ranges. Two principal rock units, referred to as the Great Valley Sequence and the Franciscan Assemblage, underlie the Healdsburg area (City of Healdsburg 2010). Rocks of the Great Valley Sequence underlie the majority of the upland areas. These rocks are of Cretaceous age (the period from about 130 to 65 million years ago) and consist mainly of claystone, siltstone, and sandstone. In the Healdsburg area, the Great Valley Sequence rocks typically consist of claystone with some interbedded siltstone and sandstone. These rocks are generally thin-bedded, are weak to moderately strong, and moderately to deeply weathered near the ground surface (City of Healdsburg 2010).

Seismicity in and adjacent to Healdsburg is directly related to activity on the San Andreas fault system. The Healdsburg fault passes through the eastern and northern areas of the City, and several active fault traces have been mapped in these areas. The Healdsburg fault is a right-lateral strike-slip fault and has been the source of earthquakes during historic time (USGS 2019; City of Healdsburg 2013). The northeast area of the project is within the Alquist-Priolo earthquake Jimtown Fault Zone, surrounding the surface traces of Maacama Fault, which is approximately 5.5 miles east of the proposed project. The southeast area of the project is within the Alquist-Priolo earthquake Healdsburg Fault Zone, surrounding the surface traces of Rogers Creek Fault, which is approximately 4.5 miles south of the proposed project (DOC 2019).

As part of the PA&ED phase of the project, a Preliminary Geotechnical Report will be prepared to summarize regional and local geology and seismology with respect to the project location. It will describe soil conditions, and geologic and seismic hazards, and identify preliminary recommendations or measures to consider during project design. The Preliminary Geotechnical Report will include a geologic hazard assessment in accordance with City of Healdsburg requirements.

8.10 Paleontology:

The project area has been surveyed and analyzed for paleontological sensitivity by recent projects, including the California Public Utilities Commission Fulton-Fitch Mountain Reconductoring Project. The Fulton-Fitch Mountain Reconductoring Project Initial Study identifies areas of high paleontological sensitivity in the US 101/Dry Creek Road interchange area (CPUC 2017). A Paleontological Evaluation Report and preliminary Paleontological Mitigation Plan would be prepared to document locations where monitoring or other measures should be implemented during construction.

8.11 Hazardous Waste/Materials:

The project is located on Dry Creek Road at the US Highway 101 interchange. A review of GeoTracker shows 11 hazardous material sites (5 open sites and 6 closed sites) within 0.25 mile of the project vicinity, between Kinley Drive and Healdsburg Avenue (Table 1). An Initial Site Assessment (ISA), which includes a public-records search and review and reviews of previous or ongoing remediation activities at nearby sites, will be prepared for this project.

8.12 Air Quality:

The City of Healdsburg and surrounding unincorporated area is located in northern Sonoma County, which falls within the North Coast Air Basin. The Northern Sonoma County Air Pollution Control District (NSCAPCD) is the local agency responsible for monitoring air quality conditions in northern Sonoma County, including the project area, and for carrying out enforcement activities to maintain air quality with applicable State and Federal standards.

In general, air quality in the Healdsburg is relatively good most of the year due to prevailing wind conditions and the lack of air pollution sources, and the air district is currently in attainment of all federal and state standards (CAPCOA 2015). Pursuant to the City's General Plan Policy NR-28, the project would implement best management practices, such as those promulgated by the Bay Area Air Quality Management District, during construction to minimize emissions. An Air Quality Report will be prepared to provide a quantitative analysis of construction-related emissions, mobile source air toxics, and operational and construction greenhouse gas emissions. Transportation conformity requirements no longer apply for the National Ambient Air Quality Standard for carbon monoxide; therefore, a carbon monoxide hot spot analysis is not needed and will not be included.

8.13 Noise and Vibration:

Much of Healdsburg consists of residential areas. The primary existing noise-sensitive land uses, other than residential, include parks, schools, and hospital uses. Sensitive receptors within 500 feet of the project area include several single-family residential homes, the Best Western/Dry Creek Inn, and recreation areas near Healdsburg Avenue and along Foss Creek. The main existing sources of noise affecting these noise sensitive land uses include traffic along US 101 and arterials such as Healdsburg Avenue (City of Healdsburg 2010). The surrounding unincorporated areas consist of dispersed rural residential areas and wineries/vineyards.

The proposed project is considered a Type I project under the Caltrans Traffic Noise Analysis Protocol because it would add lanes on Dry Creek Road and modify the US 101 ramps. A Noise Study Report would be prepared to address temporary and permanent changes with the project.

8.14 Wildfire

The City is not identified as a very high fire hazard severity zone in Cal Fire mapping (Cal Fire 2008); however, the northwest quadrant of the US 101/Dry Creek Road interchange located in unincorporated County is mapped as a moderate fire hazard severity zone in a State Responsibility Area (Cal Fire 2007). Wildfire risk related to the project will be addressed in the environmental document.

8.15 Energy and Climate Change:

Climate change, including sea level rise, will be addressed in the environmental document and will include quantitative analyses of construction and operational greenhouse gas emissions.

8.16 Biological Environment:

The project area is urban; however, agricultural land is within the project vicinity to the west. Other plant communities present in the vicinity include riverine, riparian, non-native (annual) grassland, and ruderal (City of Healdsburg 2013). Foss Creek is 0.20 mile east of US 101, and other drainage features exist along Dry Creek Road.

According to the USFWS IPaC database, special-status species including California red-legged frog (*Rana draytonii*; federal threatened), California tiger salamander (*Ambystoma californiense*; federal endangered and state threatened), and several federal endangered plants have potential habitat within 5 miles of the project (USFWS 2020). The project area is outside of designated critical habitat. The California Department of Fish and Wildlife's California Natural Diversity Database also identified western pond turtle (*Actinemys marmorata*; Species of Special concern) in the project vicinity (WRA 2019).

The majority of project work will be limited to the developed roadway, shoulders, and designated access and staging areas. Construction of the two alternatives could potentially impact habitat, including riparian habitat, for special-status species known to occur in the vicinity. To characterize the limited habitat and document the potential for special-status species to occupy the project area, a wildlife habitat assessment and tree inventory should be conducted. Preparation of a Natural Environment Study (NES) or NES-Minimal Impact (MI) will be required to determine the specific impacts of each alternative. Depending on the extent of project activities, either a Letter of Concurrence request (informal consultation) or a Biological Assessment (formal consultation) will be needed for Section 7 consultation with USFWS. Although no in-water work is proposed, Foss Creek is in the project area; therefore, consultation with the National Marine Fisheries Service may be necessary. An abbreviated Wetland Delineation Report will be prepared to document potentially jurisdictional waters in the project area.

8.17 Cumulative Impacts:

Cumulative impacts will be addressed in the environmental document.

8.18 Context Sensitive Solutions:

Caltrans applies Context Sensitive Solutions (CSS) to achieve transportation goals in harmony with community goals and natural environments. These solutions are reached through a collaborative interdisciplinary approach involving all stakeholders, and these efforts will be pursued during PA&ED.

9. Summary Statement for PID

A CEQA Initial Study with Proposed Negative Declaration (IS/ND; or Mitigated ND) would be appropriate for this project. The project could also be eligible for a NEPA Categorical Exclusion. This option can be evaluated when additional design information becomes available.

The project area has been surveyed and analyzed by other recent projects. As such, many of the environmental technical studies for this proposed project can incorporate the recent studies by reference, and provide additional information about the interchange area, as needed, along with potential impacts and avoidance, minimization, and mitigation measures that are specific to the proposed project.

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 Karin Beck, RPA, RPH	Date: 1/27/2020
Biologist Lynn McIntyre	Date: 1/27/2020
Community Impacts specialist Teresa O’Grady	Date: 1/27/2020
Noise and Vibration specialist Lynn McIntyre	Date: 1/27/2020
Air Quality specialist Lynn McIntyre	Date: 1/27/2020
Paleontology specialist/liaison Teresa O’Grady	Date: 1/27/2020
Water Quality specialist Teresa O’Grady	Date: 1/27/2020
Hydrology and Floodplain specialist Teresa O’Grady	Date: 1/27/2020
Hazardous Waste/Materials specialist Teresa O’Grady	Date: 1/27/2020
Visual/Aesthetics specialist Teresa O’Grady	Date: 1/27/2020
Energy and Climate Change specialist Lynn McIntyre	Date: 1/27/2020
Other:	Date:
PEAR Preparer (Name and Title) Teresa O’Grady, Environmental Planner	Date: 5/11/2020

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.

Environmental Branch Chief

Date: _____

Project Manager

Date: _____

ATTACHMENTS:

Attachment A: PEAR Environmental Studies Checklist

Attachment A: PEAR Environmental Studies Checklist

Environmental Studies for PA&ED Checklist					
	Not anticipated	Memo to file	Report required	Risk* L M H	Comments
Land Use	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	Address in ED
Wild and Scenic River Consistency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Coastal Management Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Growth	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	Address in ED
Farmlands/Timberlands	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	Address in ED
Community Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	Address in ED
Community Character and Cohesion	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Relocations	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Environmental Justice	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Utilities/Emergency Services	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Visual/Aesthetics	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	Abbreviated VIA
Cultural Resources:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Archaeological Survey Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Historic Resources Evaluation Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Historic Property Survey Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Historic Resource Compliance Report	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Section 106 / PRC 5024 & 5024.5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Native American Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Finding of Effect	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Data Recovery Plan	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Memorandum of Agreement	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Hydrology and Floodplain	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Water Quality and Stormwater Runoff	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Geology, Soils, Seismic and Topography	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	Preliminary Geotechnical Report
Paleontology	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
PER	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
PMP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Hazardous Waste/Materials:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
ISA (Additional)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
PSI	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	
Air Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Noise and Vibration	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L	
Energy	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	Address in ED
Climate Change and Sea Level Rise	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L	Address in ED

Environmental Studies for PA&ED Checklist

	Not anticipated	Memo to file	Report required	Risk*			Comments
				L	M	H	
Biological Environment	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Fish Passage	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Wildlife Connectivity	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Natural Environment Study	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L			
Biological Assessment Section 7:	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L			
Formal	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Informal	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L			To be confirmed
No effect	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Section 10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
USFWS Consultation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L			
NMFS Consultation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L			
Species of Concern (CNPS, USFS, BLM, S, F)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Wetlands & Other Waters/Delineation	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L			
404(b)(1) Alternatives Analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Invasive Species	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
HMMP	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
CDFW Consistency Determination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
2081	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Other:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Cumulative Impacts	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			Address in ED
Context Sensitive Solutions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			Address in ED
Section 4(f) Evaluation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			Address in ED
Permits:							
401 Certification Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L			
404 Permit Coordination, IP, NWP, or LOP	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L			
1602 Agreement Coordination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
Local Coastal Development Permit Coordination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
State Coastal Development Permit Coordination	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
NPDES Coordination	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	L			
TRPA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			
BCDC	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	L			

APPENDIX B

Calculations of Preliminary Bioswale Design

LID BMP Summary Page & Site Global Values

Welcome to the City of Santa Rosa Storm Water BMP Calculator. This calculator and it's worksheets are required to be submitted with all projects containing LID features.

NOTE: In order for this calculator to function properly, macros must be enabled.

Go to www.srcity.org/stormwaterlid for the latest version of this calculator.

Rev. 8.11.0 11212019

Project Information: (Required Information)

Project Name: **US 101 / DRY CREEK RD (Alternative 1 - Signals)**

Address/Location: **CITY OF HEALDSBURG, CA**

Designer: **FW / CJ**

Date: **2/17/2020**

Click on Button to begin Calculations:

BMP Data Input

Cell Color Key:

Yellow Cells

- Data Input. Require information. User input or pick from drop down list.

Blue Cells

- Calculated results by worksheet.

Green Cells

- Drop Down Value, Values/results from other worksheets.

Function Buttons

Select a BMP ID (Green Heading below) and then choose function:

Retrieve BMP Saved Data

Retrieves the saved selected BMP data and loads into Input BMP Data worksheet(s). **Will overwrite existing unsaved data in worksheets!**

Delete Selected BMP

Will Delete the selected BMP and it's saved data. **Data Can Not be recovered!**

Print Selected BMP

Print All BMPs

Prints this page (Summary) and the **saved data** of the selected BMP ID or ALL BMPs listed. "Print Selected BMP" and "Print All BMPs" will not overwrite existing data in the worksheets.

Print Selected Worksheets

Prints the selected worksheet with the current data. Use the "Retrieve BMP Saved Data" to load data into worksheets.

Site Information:

Mean Seasonal Precipitation (MSP) of Project Site: **40.00** (inches)

K=MSP/30 K= **1.33**

Impervious area - Pre Project: **110,731** ft²

New or replaced impervious area - Post Project: **140,318** ft²

Based upon the pre and post development impervious area or special condition*, the design requirement is:

100% Capture & Treatment

*** Treatment Only Special Condition**

Check this box only if it has been determined by the North Coast Regional Water Quality Control Board that infiltration will not be required on this project. Documentation of NCRWQCB approval MUST be provided.

Summary of BMPs Design: (saved data)

BMP ID:	Tributary Area		Requirements		Design Results						
	Tributary Area (ft ²)	Runoff Reduction Measures (Y/N)	Type of Requirement Met:	Type of BMP Design	Percent Achieved	Hydromodification Control		Flow Base Treatment		Delta Volume Capture	
						Required V _{Hydromod} (ft ³)	Achieved (ft ³)	Required Q Treatment (cfs)	Achieved Q Treatment (cfs)	Required Vdelta (ft ³)	Achieved Vdelta (ft ³)
Signals-BMP1	64230	No	100% Horizontal Flow Treatment	Priority 1: P1-06 Swale with Bioretention	100.00			0.2752	0.2758		

STORM WATER CALCULATOR

BMP Input Worksheet

Enter BMP ID and BMP's Information:		Instructions: Enter in the Individual BMP's Tributary parameters in the yellow cells. To view the calculation worksheet, Click on the Display button for that section. All calculations are performed in the individual worksheets. To update the results on this worksheet, use the "Calculate Results" or "Calculate All" buttons.	
To start a New BMP calculation, Press the Clear/Reset All Inputs button.	BMP ID (MUST BE unique): <input style="width: 100%;" type="text" value="Healdsburg-Signals"/>	CAUTION - MUST USE the Calculate button(s) to update results!	
BMP's Physical Tributary Area:	<input style="width: 50%;" type="text" value="64,230"/> ft ² <input style="width: 50%;" type="text" value="1.475"/> Acres		
BMP Design Criteria:		Action Buttons:	
Type of BMP Design (select from pull down):		Clear/Reset All Inputs	Clear or load default values into cells of individual section or entire page.
Priority 1: P1-06 Swale with Bioretention		Calculate	Will load values into worksheet, calculate and displays results.
BMP Notes:		Display Calculation Worksheet	Will load the values, calculate and display the corresponding worksheet with results.
		Save BMP Data and Results	Calculates all sections before saving the BMP's design data, and then copies the results to the Summary worksheet by BMP ID. Will not save BMP if error(s) are present in the Runoff Reduction Measures or selected treatment method.
Clear/Reset All Inputs	Calculate All Sections	Save BMP Data and Results	

Runoff Reduction Measures		Note: The maximum Runoff Reduction Measures allowed is 50% of the physical tributary area.	
Interceptor Trees			
Number of new Evergreen Trees that qualify as interceptor trees: <input style="width: 50%;" type="text" value="0"/>		Interceptor Tree trunk must be no greater than 25 feet from impervious surface.	
Number of new Deciduous Trees that qualify as interceptor trees: <input style="width: 50%;" type="text" value="0"/>			
Enter square footage of qualifying existing tree canopy : <input style="width: 50%;" type="text" value="0"/> ft ²			
Disconnected Roof Drains			
Select disconnection condition: <input style="width: 100%;" type="text" value="Select disconnection condition"/>			
Method 1			
Amount of rooftop area that drain to disconnected downspouts: <input style="width: 50%;" type="text" value="0"/> ft ²		INSTRUCTIONS: Method 1: Total Rooftop square foot area (ft ²) that is drained by the downspouts flowing to the single Tributary Area as designated. Can be from separate buildings. OR Method 2: Total Rooftop percentage (%) area relating to the total physical Tributary Area as designated.	
OR Method 2			
Percent of rooftop area to be disconnected from downspouts: <input style="width: 50%;" type="text" value="0"/> % Select Density: <input style="width: 50%;" type="text" value="1"/> Units per Acre			
Paved Area Disconnection			
Paved Area Type (select from drop down list): <input style="width: 100%;" type="text" value="Select paved area type"/>			
Enter area of alternatively designed paved area: <input style="width: 50%;" type="text" value="0.0"/> ft ²			
Buffer Strips & Bovine Terraces			
Area draining to a Buffer Strip or Bovine Terrace: <input style="width: 50%;" type="text" value="0.0"/> ft ²		Total Runoff Reduction Measures: <input style="width: 50%;" type="text" value="0"/> ft ²	
Reset Reduction Measures Inputs		Display "Runoff Reduction Measures" calculation worksheet	
		Calculate Results	
		Resulting reduced Tributary Area used for BMP sizing: <input style="width: 50%;" type="text" value="64,230"/> ft ²	

Hydromodification Control Requirement: 100% Volume Capture; V_{Hydromod}		If User Composite CN is used, Supporting calculations are required to be submitted.	
Post development hydrologic soil type within tributary area: <input style="width: 100%;" type="text" value="D: 0 - 0.05 in/hr infiltration (transmission) rate"/>		V_{Hydromod} = <input style="width: 50%;" type="text" value="5,975.32"/> ft³	
Post development ground cover description: <input style="width: 100%;" type="text" value="Streets and roads - Paved; curbs and gutters (excluding right-of-way)"/>			
User Composite post development CN: <input style="width: 50%;" type="text" value="98"/>			
Entering a calculated composite CN will override selections made from the pull down menus above.			
Reset Hydromod Inputs		Display "Hydromod" calculation worksheet	
		Calculate Results	

BMP Sizing Tool: Hydromodification Control Requirement			
BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.		BMP Volume Below Ground	
Imported BMP Soil Porosity: <input style="width: 50%;" type="text" value="0.24"/>		Ponded Water Above Ground	
Depth: <input style="width: 50%;" type="text" value="2.00"/> ft		Depth: <input style="width: 50%;" type="text" value="0.00"/> ft	
Width: <input style="width: 50%;" type="text" value="5.00"/> ft		Width: <input style="width: 50%;" type="text" value="0.00"/> ft	
Length: <input style="width: 50%;" type="text" value="2,490.00"/> ft		Length: <input style="width: 50%;" type="text" value="0.00"/> ft	
-- OR -- Entering an Area information will override Width & Length information!			
Area BMP: <input style="width: 50%;" type="text" value="0.00"/> ft ²		Ponded Area: <input style="width: 50%;" type="text" value="0.00"/> ft ²	
Total Volume achieved in BMP: <input style="width: 50%;" type="text" value="5,976.00"/> ft³			
Reset Hydromod Sizing Inputs		Display "Hydromod Sizing" calculation worksheet	
		Calculate Results	
		Percent of Requirement Achieved: <input style="width: 50%;" type="text" value="100.01"/> % Results must be at least 100%	
		Select Hydromodification BMP Design when Saving? <input type="radio"/> Yes	

100% Treatment		If User Composite C_{POST} and/or I_{Historical} are used, supporting calculations are required to be submitted.	
Post development surface: <input style="width: 100%;" type="text" value="Asphalt"/>		Q_{TREATMENT} = <input style="width: 50%;" type="text" value="0.2752"/> cfs	
User Composite post development C _{POST} : <input style="width: 50%;" type="text" value="0.70"/>			
-- OR -- Entering a calculated C_{POST} will override selection made from the pull down menu.			
Treatment Factor (Tf): <input style="width: 50%;" type="text" value="1.0"/> Calculated		Default Value	
Design Storm: <input style="width: 50%;" type="text" value="0.20"/> in./hr.			
-- OR -- Entering I_{Historical} will override I_{Design Storm} and set Tf to 2x			
Historical: <input style="width: 50%;" type="text" value=""/> in./hr.			
Reset Treatment Inputs		Display "100% Treatment" calculation worksheet	
		Calculate Results	

BMP Sizing Tool: 100% Treatment
Horizontal Flows - Swales

Swale Side Slope (H / V):	<input type="text" value="2.00"/> ft./ft. (2:1 Max Slope)	Calculated Swale Flow Depth =	<input type="text" value="0.0368"/> ft
Swale Bed Width:	<input type="text" value="5.00"/> ft. (2-7 foot width)	V _{sw} =	<input type="text" value="1.4770"/> ft/s
Longitudinal Swale Slope, %:	<input type="text" value="1.0%"/> (8% Maximum Slope)	Q Calculated Design Flow =	<input type="text" value="0.2758"/> cfs
Manning Roughness Coefficient for Sheet Flow:	<input type="text" value="Smooth surfaces; Concrete, Asphalt, Gravel, or Bare Soil"/>		
Manning's n:	<input type="text" value="0.011"/>		
Grass Height:	<input type="text" value="3.0"/> Inches		
Swale Input Flow Characteristics:	<input type="text" value="90% or more of flow enters upstream end"/>	Percent of Treatment Requirement Achieved:	<input type="text" value="100.0"/> %
Minimum required contact time:	<input type="text" value="5"/> Minutes		<i>Results must be at least 100%</i>
Design Swale Length:	<input type="text" value="444.0"/> ft		

Yes

BMP Sizing Tool: 100% Treatment
Vertical Flow - Planter Boxes

Infiltration rate of the specified BMP soil, k:	<input type="text" value="0.00"/> in./hr.	Q Calculated Design Flow =	<input type="text" value="0.0000"/> cfs
Depth of drainage pipe:	<input type="text" value="1.50"/> ft (1.5 ft. minimum)	Percent of Requirement Achieved:	<input type="text" value="0.0"/> %
BMP Length:	<input type="text" value="0.0"/> ft		<i>Results must be at least 100%</i>
BMP Width:	<input type="text" value="0.0"/> ft		

Yes

Delta Volume Capture; V_{delta}

If User Composite CN is used, Supporting calculations are required to be submitted.

Hydrologic soil type within tributary area:	<input type="text" value="C: 0.05 - 0.15 in/hr infiltration (transmission) rate"/>		
Predevelopment ground cover description:	<input type="text" value="Streets and roads - Paved; open ditches (excluding right-of-way)"/>		
Post development ground cover description:	<input type="text" value="Streets and roads - Paved; curbs and gutters (excluding right-of-way)"/>		
CN _{PRE} =	<input type="text" value="92"/>	<input type="button" value="User Cells must be blank to use CN<sub>PRE</sub> OR CN<sub>POST</sub> from drop down lists."/>	
CN _{POST} =	<input type="text" value="98"/>		
User Composite Predevelopment CN:	<input type="text" value=""/>	V _{DELTA} =	<input type="text" value="2,450.375"/> ft ³
User Composite Post development CN:	<input type="text" value=""/>		

-- OR -- Entering a calculated composite CN_{PRE} Or CN_{POST} will override selections made from the pull down menus above.

BMP Sizing Tool: Delta Volume Capture Requirement

BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.	Imported BMP Soil Porosity:	<input type="text" value="0.24"/>	Ponded Water Area Above Ground	
	Depth:	<input type="text" value="2.0"/> ft	Depth:	<input type="text" value="0.00"/> ft
	Width:	<input type="text" value="5.0"/> ft	Width:	<input type="text" value="0.0"/> ft
	Length:	<input type="text" value="1,021.0"/> ft	Length:	<input type="text" value="0.0"/> ft

The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation.

-- OR -- Entering Area number will override Width & Length information!

Area BMP:	<input type="text" value="0"/> ft ²	Area:	<input type="text" value="0"/> ft ²
Total Volume for calculation:		<input type="text" value="10,210.00"/> ft ³	

Percent of Requirement Achieved: %
Results must be at least 100%

Yes

LID BMP Summary Page & Site Global Values

Welcome to the City of Santa Rosa Storm Water BMP Calculator. This calculator and it's worksheets are required to be submitted with all projects containing LID features.

NOTE: In order for this calculator to function properly, macros must be enabled.

Go to www.srcity.org/stormwaterlid for the latest version of this calculator.

Rev. 8.11.0 11212019

Project Information: (Required Information)

Project Name: **US 101 / DRY CREEK RD (Alternative 2 - Roundabouts)**

Address/Location: **CITY OF HEALDSBURG, CA**

Designer: **FW / CJ**

Date: **2/17/2020**

Click on Button to begin Calculations:

BMP Data Input

Cell Color Key:

Yellow Cells

- Data Input. Require information. User input or pick from drop down list.

Blue Cells

- Calculated results by worksheet.

Green Cells

- Drop Down Value, Values/results from other worksheets.

Function Buttons

Select a BMP ID (Green Heading below) and then choose function:

Retrieve BMP Saved Data

Retrieves the saved selected BMP data and loads into Input BMP Data worksheet(s). **Will overwrite existing unsaved data in worksheets!**

Delete Selected BMP

Will Delete the selected BMP and it's saved data. **Data Can Not be recovered!**

Print Selected BMP

Print All BMPs

Prints this page (Summary) and the **saved data** of the selected BMP ID or ALL BMPs listed. "Print Selected BMP" and "Print All BMPs" will not overwrite existing data in the worksheets.

Print Selected Worksheets

Prints the selected worksheet with the current data. Use the "Retrieve BMP Saved Data" to load data into worksheets.

Site Information:

Mean Seasonal Precipitation (MSP) of Project Site: **40.00** (inches)

K=MSP/30 K= **1.33**

Impervious area - Pre Project: **122,054** ft²

New or replaced impervious area - Post Project: **172,007** ft²

Based upon the pre and post development impervious area or special condition*, the design requirement is:

100% Capture & Treatment

*** Treatment Only Special Condition**

Check this box only if it has been determined by the North Coast Regional Water Quality Control Board that infiltration will not be required on this project. Documentation of NCRWQCB approval MUST be provided.

Summary of BMPs Design: (saved data)

BMP ID:	Tributary Area		Requirements		Design Results						
	Tributary Area (ft ²)	Runoff Reduction Measures (Y/N)	Type of Requirement Met:	Type of BMP Design	Percent Achieved	Hydromodification Control		Flow Base Treatment		Delta Volume Capture	
						Required V _{Hydromod} (ft ³)	Achieved (ft ³)	Required Q Treatment (cfs)	Achieved Q Treatment (cfs)	Required Vdelta (ft ³)	Achieved Vdelta (ft ³)
ldsburg-BMP1	66370	No	100% Horizontal Flow Treatment	Priority 1: P1-06 Swale with Bioretention	100.00			0.2844	0.2909		

STORM WATER CALCULATOR

Swale Side Slope (H / V): <input type="text" value="2.00"/> ft./ft. (2:1 Max Slope) Swale Bed Width: <input type="text" value="5.00"/> ft. (2-7 foot width) Longitudinal Swale Slope, %: <input type="text" value="1.0%"/> (8% Maximum Slope) Manning Roughness Coefficient for Sheet Flow: <input type="text" value="Smooth surfaces: Concrete, Asphalt, Gravel, or Bare Soil"/> Manning's n: <input type="text" value="0.011"/> Grass Height: <input type="text" value="3.0"/> Inches Swale Input Flow Characteristics: <input type="text" value="90% or more of flow enters upstream end"/> Minimum required contact time: <input type="text" value="5"/> Minutes Design Swale Length: <input type="text" value="453.0"/> ft	Q Calculated Design Flow = <input type="text" value="0.2909"/> cfs Percent of Treatment Requirement Achieved: <input type="text" value="100.0"/> % <i>Results must be at least 100%</i>
<input type="button" value="Reset Treatment Sizing Inputs"/> <input type="button" value="Display 'Horizontal Flow Sizing' calculation worksheet"/> <input type="button" value="Calculate Results"/>	<input type="button" value="Select 100% Flow Base Treatment Horizontal BMP Design Requirements when Saving?"/> <input checked="" type="radio"/> Yes

BMP Sizing Tool: 100% Treatment Vertical Flow - Planter Boxes

Infiltration rate of the specified BMP soil, k: <input type="text" value="0.00"/> in./hr. Depth of drainage pipe: <input type="text" value="1.50"/> ft (1.5 ft. minimum) BMP Length: <input type="text" value="0.0"/> ft BMP Width: <input type="text" value="0.0"/> ft	Q Calculated Design Flow = <input type="text" value="0.0000"/> cfs Percent of Requirement Achieved: <input type="text" value="0.0"/> % <i>Results must be at least 100%</i>
<input type="button" value="Reset Vertical Sizing Inputs"/> <input type="button" value="Display 'Vertical Flow Sizing' calculation worksheet"/> <input type="button" value="Calculate Results"/>	<input type="button" value="Select 100% Flow Base Treatment Vertical BMP Design Requirements when Saving?"/> <input checked="" type="radio"/> Yes

Delta Volume Capture; V_{delta}

If User Composite CN is used, Supporting calculations are required to be submitted.

Hydrologic soil type within tributary area: <input type="text" value="C: 0.05 - 0.15 in/hr infiltration (transmission) rate"/> Predevelopment ground cover description: <input type="text" value="Streets and roads - Paved; open ditches (excluding right-of-way)"/> Post development ground cover description: <input type="text" value="Streets and roads - Paved; curbs and gutters (excluding right-of-way)"/> CN _{PRE} = <input type="text" value="92"/> CN _{POST} = <input type="text" value="98"/> User Composite Predevelopment CN: <input type="text"/> User Composite Post development CN: <input type="text"/> -- OR -- Entering a calculated composite CN _{PRE} Or CN _{POST} will override selections made from the pull down menus above.	V _{DELTA} = <input type="text" value="2,532.016"/> ft ³ User Cells must be blank to use CN _{PRE} OR CN _{POST} from drop down lists.
<input type="button" value="Reset VDelta Inputs"/> <input type="button" value="Display 'Delta Volume Capture' calculation"/> <input type="button" value="Calculate Results"/>	

BMP Sizing Tool: Delta Volume Capture Requirement

BMP Depth: - Measured from ground surface WITHOUT perforated pipe. - Measured from bottom of perforated pipe if installed.	Imported BMP Soil Porosity: <input type="text" value="0.24"/> Depth: <input type="text" value="2.0"/> ft Width: <input type="text" value="5.0"/> ft Length: <input type="text" value="1,160.0"/> ft	Poned Water Area Above Ground Depth: <input type="text" value="0.00"/> ft Width: <input type="text" value="0.0"/> ft Length: <input type="text" value="0.0"/> ft	The above and below ground Depth, Width, and Length or Areas will be summed together for the Percent of Requirement Achieved calculation. Percent of Requirement Achieved: <input type="text" value="109.95"/> % <i>Results must be at least 100%</i>
-- OR -- Entering Area number will override Width & Length information! Area BMP: <input type="text" value="0"/> ft ² Area: <input type="text" value="0"/> ft ²			
Total Volume for calculation: <input type="text" value="11,600.00"/> ft ³			
<input type="button" value="Reset VDelta BMP Sizing Inputs"/>	<input type="button" value="Display 'VDelta BMP Sizing' calculation worksheet"/>	<input type="button" value="Calculate Results"/>	<input type="button" value="Select Delta Volume Capture BMP Design Requirements when Saving?"/> <input checked="" type="radio"/> Yes

<input type="button" value="Clear/Reset All Inputs"/>	<input type="button" value="Calculate All"/>	<input type="button" value="Save BMP Data and Results"/>
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APPENDIX C

Operational Analysis for the US 101/Dry Creek Road Interchange Memorandum



Memorandum

Date: April 30, 2020

Project: HEA071

To: Sherina Lam
AECOM

From: Dalene J. Whitlock
dwhitlock@w-trans.com
Allison Jaromin
ajaromin@w-trans.com

Subject: Operational Analysis for the US 101/Dry Creek Road Interchange

The purpose of this memorandum is to provide analysis results indicating whether the planned improvements associated with signalizing or installing roundabouts at the US 101/Dry Creek Road interchange would operate acceptably or not. For this analysis, future volumes were used from the *North Entry Area Plan Environmental Impact Report* (NEAP EIR); it is noted that these volumes were later reviewed to ensure that they were adequate to include the North Village Project, which is currently going through the City's development review process. The 2040 model maintained by the Sonoma County Transportation Authority (SCTA) was reviewed for consistency; however, the model was under a major update and results were not available for use in this analysis. It is anticipated that the model would reflect development of the North Entry Area as the Plan was nearing adoption at the end of 2019. The interchange improvements are identified in the City's General Plan, and their need was verified in the EIR for the Saggio Hills project (now Montage) as well as the recently completed EIR for the North Entry Area Plan (now North Village).

The study area includes the intersections along Dry Creek Road at the US 101 Interchange and extending east to the SMART tracks (but not including the future crossing for the Foss Creek Trail), resulting in the three study intersections at the US 101 South Ramps, US 101 North Ramps, and Grove Street. The study intersections were analyzed using methodologies published in the *Highway Capacity Manual* (HCM), Transportation Research Board, 2010. Analyses were performed both to ensure that operation would meet the City's LOS D policy and that queuing could be accommodated within all turn lanes as designed.

Existing Configuration

For comparative purposes, operation of the three study intersections under current and future volumes with their existing configurations, including the recent conversion to all-way stop controls at Dry Creek Road/US 101 South Ramps, are provided. The data provided in Table 1 represents the results of the "Existing Conditions" and "Future plus Project" conditions scenarios as presented in the NEAP EIR. As can be seen from these results, both of the currently unsignalized ramp intersections are expected to experience unacceptable operation under anticipated future volumes if left unimproved.

Table 1– Peak Hour Intersection Levels of Service – Existing Geometrics and Controls

Study Intersection	AM Peak				PM Peak			
	Existing		Future		Existing		Future	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
1. Dry Creek Rd/US 101 S Ramps	16.5	C	21.1	C	23.0	C	81.1	F
2. Dry Creek Rd/US 101 N Ramps	14.0	B	35.7	E	6.4	A	22.9	C
<i>Northbound Off-ramp</i>	33.4	D	78.0	F	21.4	C	119.5	F
3. Dry Creek Rd/Grove St	24.5	C	24.3	C	39.0	D	46.5	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation

Signalized Option

Operational Analysis

Under the Future 2040 volumes indicated above and assuming signalization of Dry Creek Road/US 101 Ramps as indicated on plans provided by AECOM on January 11, 2020, together with coordination of these two new signals with the existing one at Dry Creek Road/Grove Street, the new signalized intersections would be expected to operate acceptably as shown in Table 2 with the exception of Dry Creek Road/Grove Street.

While the intersection of Dry Creek Road/Grove Street was analyzed with the planned future lane configuration that includes the northbound right-turn lane changed to a through/right-turn lane, allowing the left lane to be for left turns only, unacceptable operation was still projected. To achieve acceptable operation, the configuration of Grove Street/Dry Creek Road intersection would need to have the westbound right-turn lane changed to a through/right-turn lane and the eastbound and westbound left-turn lanes converted to protected/permitted left-turn operation.

Table 2– Future Peak Hour Intersection Levels of Service - Signalized, Operational Adequacy Only

Study Intersection	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Dry Creek Rd/US 101 S Ramps	24.8	C	43.4	D
<i>w/ Grove St Recommended Reconfiguration</i>	24.0	C	40.0	D
2. Dry Creek Rd/US 101 N Ramps	41.4	D	34.3	C
<i>w/ Grove St Recommended Reconfiguration</i>	41.6	D	34.2	C
3. Dry Creek Rd/Grove St	103.3	F	135.2	F
<i>Recommendation: EB/WB Prot/Perm, WB Thru/Right</i>	25.6	C	54.2	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; Prot/Perm = Protected/Permitted Left-turn Phasing; **Bold** text = deficient operation

Queueing

Under each scenario, the projected maximum queues in critical left-turn pockets at the study intersections were determined using the 95th percentile queues from Vistro. These results are summarized in Table 3.

Table 3 – Maximum Projected Left-Turn Queues – Signalized Option

Study Intersection Approach	Available Storage	Maximum Queues					
		AM Peak Hour			PM Peak Hour		
		Original Layout	With Ops Recs	With Queue Recs	Original Layout	With Ops Recs	With Queue Recs
1. Dry Creek Rd/US 101 S Ramps Westbound	340	346	340	202	797	738	310
2. Dry Creek Rd/US 101 N Ramps Eastbound	230	11	10	10	16	17	19
3. Dry Creek Rd/Grove St Northbound	N/A	197	123	123	335	172	226
Eastbound	330	236	129	129	401	333	282

Notes: All distances are measured in feet; "With Ops Recs" indicates results with implementation of the improvements identified to achieve acceptable operation; "With Queue Recs" indicates results with implementation of the improvements identified to address queuing impacts; **Bold** text = queue length exceeds available storage

Left-turn storage is expected to exceed existing or planned storage capacity in two locations, even with the improvements identified as being needed to achieve acceptable operation: on the westbound Dry Creek Road approach to the intersection with US 101 South Ramps, and on the eastbound Dry Creek Road approach to Grove Street. It is assumed that the northbound Grove Street approach to Dry Creek Road will be designed to provide adequate stacking.

At the intersection of Dry Creek Road and US 101 South Ramps, the westbound left-turn queues are expected to exceed storage capacity under future volumes during both the morning and evening peak hours. During the a.m. peak hour, the queue would extend 50 feet past the Dry Creek Road/US 101 North Ramps, and nearly to the intersection of Dry Creek Road/Grove Street during the p.m. peak hour.

Due to excessive queue lengths on the westbound approach to US 101 SB Ramps/Dry Creek Road a second left-turn lane is recommended. Table 4 shows the resulting change in operation with the additional westbound left-turn lane at this intersection.

Table 4– Future Peak Hour Intersection Levels of Service – Signalized, Recommended Geometrics

Study Intersection	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Dry Creek Rd/US 101 S Ramps	24.8	C	43.4	D
<i>Queueing Recommendation: Dual WB Left-Turn & Grove St Reconfiguration</i>	21.5	B	25.6	C
2. Dry Creek Rd/US 101 N Ramps	41.4	D	34.3	C
<i>w/ Grove St Reconfiguration & Queueing Recommendation</i>	41.6	D	35.3	D
3. Dry Creek Rd/Grove St	103.3	F	135.2	F
<i>w/ Grove St Reconfiguration & Queueing Recommendation</i>	25.6	C	44.4	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation

Finding – While the new signals at US 101 SB Ramps/Dry Creek Road and US 101 NB Ramps/Dry Creek Road and the existing signal at Grove Street/Dry Creek Road would be expected to operate acceptably in terms of delay with the recommended improvements noted above, queuing would exceed available stacking at both the SB Ramp and Grove Street intersections.

Recommendations – To provide adequate queueing space, the intersection of US 101 SB Ramps/Dry Creek Road would need an additional westbound left-turn lane and a second receiving lane on the on-ramp. The previously noted recommendation to reconfigure Grove Street/Dry Creek Road to include conversion of the westbound right-turn lane to a through/right-turn lane and the left-turn phasing on Dry Creek Road to protected/permitted is also needed to accommodate the anticipated queuing.

Queueing and operational results with the proposed changes in geometrics are shown in Table 3 and Table 4 respectively. Plate 1 represents the recommended intersection configurations.

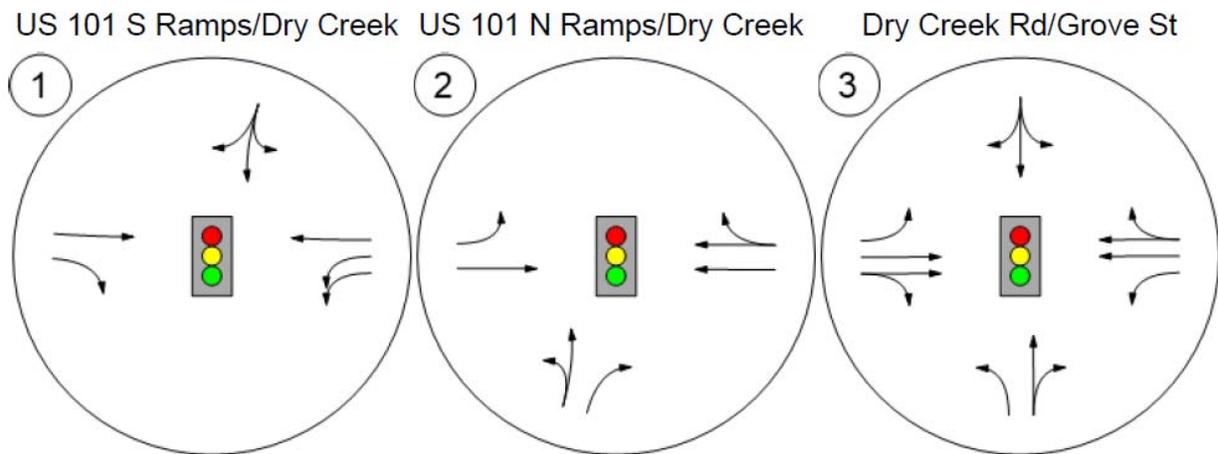


Plate 1 Signalized Option Recommended Layout

Roundabouts

Operational Analysis

While evaluation of the proposed roundabout geometrics shown on the plans provided by AECOM on January 11, 2020, indicated that acceptable operation could be achieved under Future volumes, the analysis also showed that the preliminary layout would be expected to result in excessive queuing. An iterative process was therefore used to arrive at a layout that would work operationally and also result in queuing that could be accommodated within available stacking space.

To minimize their footprints, the two roundabouts were first analyzed with and without the right-turn slip lanes as shown in the plans provided by AECOM and with the addition of a right-turn lane for the US 101 North off-ramp. The right-turn lane eastbound at the US 101 South Ramps was determined to be unnecessary, and thus was removed from the analysis. The right-turn slip lane for the westbound approach at the US 101 North Ramps was confirmed as being necessary; further, a right-turn slip lane for the northbound off-ramp would be necessary to prevent excessive queues during the morning peak hour. Table 5 shows the results of the operational analysis for the roundabout layout, along with a comparison of the configuration proposed for Dry Creek Road/Grove Street and the operational analysis for a reconfigured intersection as discussed under the “signalized” option above.

Table 5 – Future Peak Hour Intersection Levels of Service – Roundabout

Study Intersection	AM Peak		PM Peak	
	Delay	LOS	Delay	LOS
1. Dry Creek Rd/US 101 S Ramps	11.5	B	27.5	C
2. Dry Creek Rd/US 101 N Ramps	4.8	A	8.7	A
3. Dry Creek Rd/Grove St	58.2	E	60.8	E
<i>With recommended reconfiguration</i>	44.1	D	53.9	D

Notes: Delay is measured in average seconds per vehicle; LOS = Level of Service; **Bold** text = deficient operation

To achieve acceptable operation at the northbound off-ramp, a free right-turn lane would be needed from the northbound off-ramp to eastbound Dry Creek Road in addition to the proposed westbound free right-turn lane. With this additional lane, the US 101 North Ramps intersection would operate acceptably. Similar to the full signalization option, the configuration at Dry Creek Road/Grove Street would need to be changed on the westbound and southbound approaches to achieve acceptable operation.

Queueing

Under each of the various layouts tested to achieve acceptable operation and eliminate queuing issues, the projected maximum queues in critical left-turn pockets at the remaining signalized intersection of Dry Creek Road/Grove Street as well as on the approaches to the roundabouts where stacking is constrained were determined based on the 95th percentile queues from Vistro or SIDRA. These results are summarized in Table 6.

Table 6 – Maximum Projected Left-Turn Queues – Roundabout Option

Study Intersection Approach	Available Storage	Maximum Queues			
		AM Peak Hour		PM Peak Hour	
		Round-about	With Ops Rec	Round-about	With Ops Rec
1. Dry Creek Rd/US 101S Ramps	1,000+	361	n/a	361	n/a
		92	n/a	0	n/a
2. Dry Creek Rd/US 101 N Ramps	1200	0	n/a	0	n/a
		128	n/a	287	n/a
3. Dry Creek Rd/Grove St	n/a	93	82	158	159
		264	264	263	274

Notes: * = approximate values; all distances are measured in feet; "With Ops Rec" refers to conditions that include implementation of the recommendations made to achieve acceptable operation

While queueing in the eastbound left-turn lane on Dry Creek Road at Grove Street would exceed storage with the geometrics proposed, with the change to protected/permitted left-turn phasing on Dry Creek Road as suggested to address the operational issue, the increased capacity would reduce queuing to a level that could be accommodated in the available space including the two-way left turn lane.

Finding – With the improvements identified as being needed to achieve acceptable operation (additional lanes at Dry Creek Road/Grove Street together with the slip lane on the northbound off-ramp), queuing could be accommodated within the available stacking space for all critical movements. The eastbound right-turn slip lane at the US 101 South Ramps included on the original concept plans is unnecessary to meet either operational or queuing demands, so can be eliminated.

Recommendations – To address the queuing issue, a right-turn slip lane should be included at the northbound off-ramp in addition to the proposed westbound free right-turn lane; however, the eastbound slip lane included on the concept plans for the southbound on-ramp can be eliminated. Additionally, the improvements identified as being needed at Dry Creek Road/Grove Street with the signalized option would also be needed with the roundabouts. Plate 2 represents the recommended intersection configurations.

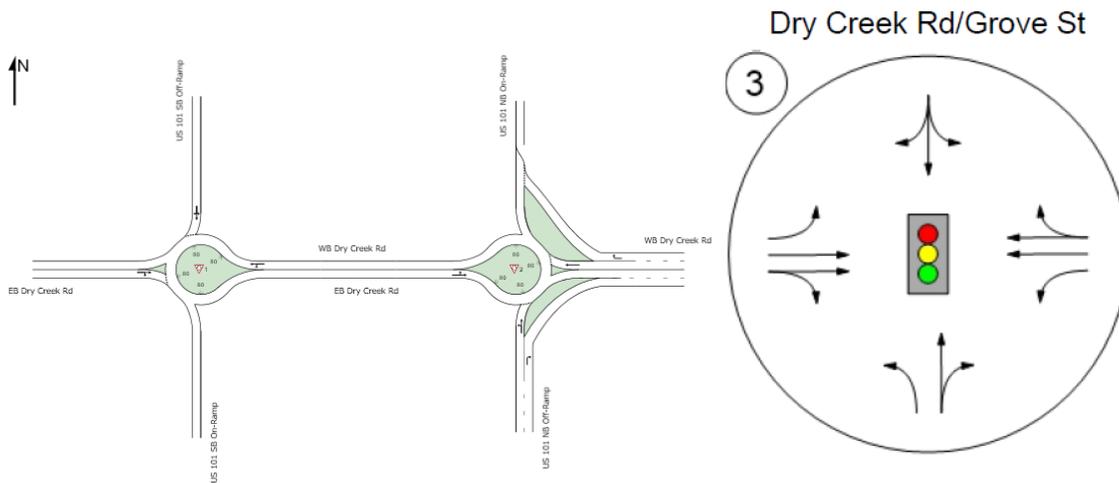


Plate 2 Roundabouts Recommended Layout

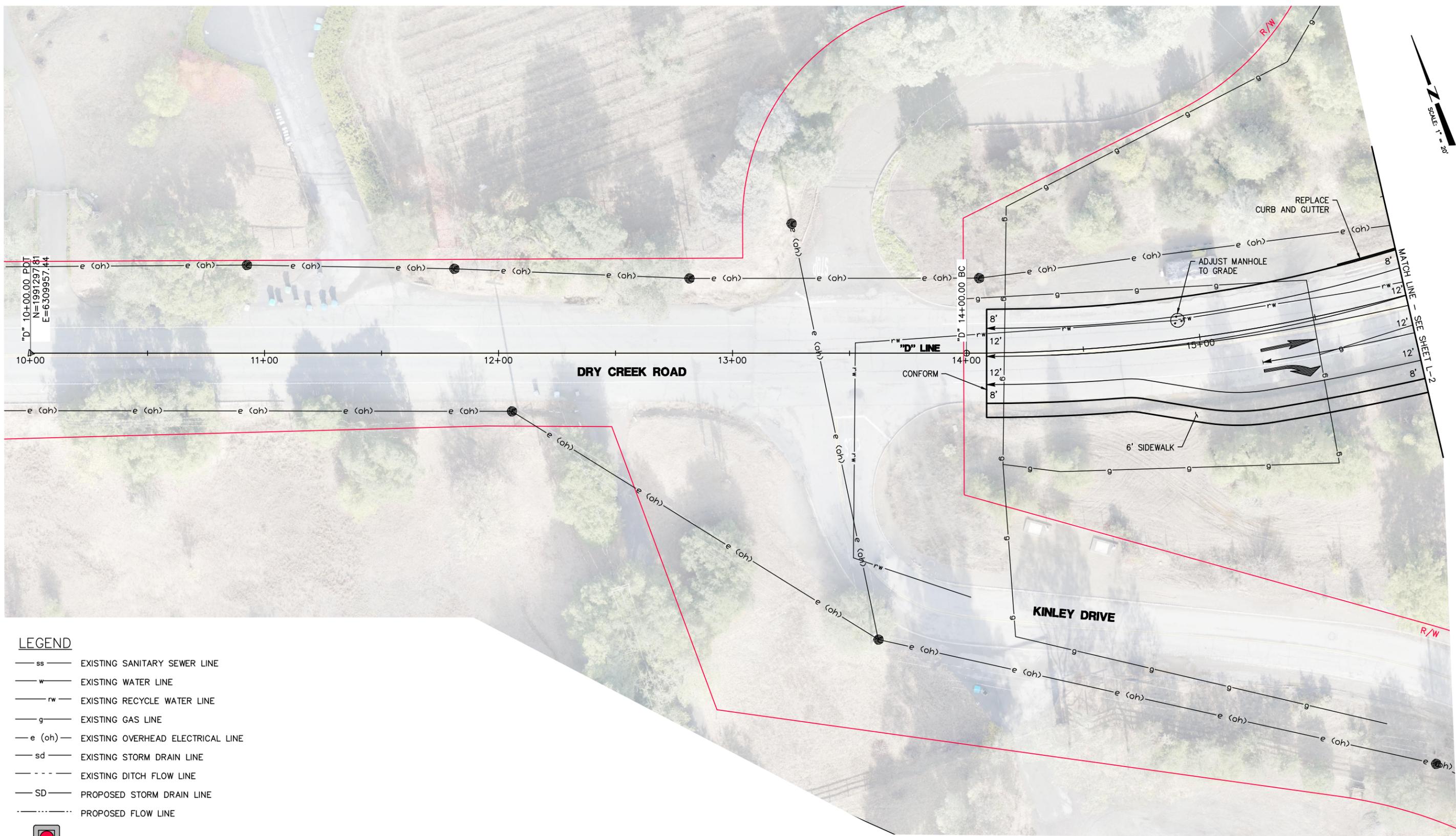
Conclusions and Recommendations

- To achieve acceptable operation with traffic signals at the two Dry Creek Road/US 101 interchange intersections under future traffic volumes it would be necessary to include dual left-turn lanes westbound at the southbound on-ramp together with a second receiving lane and the intersection at Grove Street would need protected/permitted phasing for the left turns on Dry Creek Road as well as reassignment of the lanes on the northbound and westbound approaches.
- Under the roundabout option the three study intersections would be expected to operate acceptably under projected future volumes with the proposed layout, but some queues would exceed available stacking length. To address the queuing issue, a right-turn slip lane would be needed at the northbound off-ramp, but not at the southbound on-ramp, as proposed. Additionally, the improvements identified as being needed at Dry Creek Road/Grove Street with the signalized option would also be needed with the roundabouts.
- Because it would result in a smaller footprint and provides superior operation, the roundabout option appears to be superior and is therefore recommended.

Please feel free to contact us if there are any questions regarding this information.

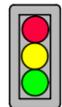
APPENDIX D

Preliminary Layouts of Alternative 1



LEGEND

- ss — EXISTING SANITARY SEWER LINE
- w — EXISTING WATER LINE
- rw — EXISTING RECYCLE WATER LINE
- g — EXISTING GAS LINE
- e (oh) — EXISTING OVERHEAD ELECTRICAL LINE
- sd — EXISTING STORM DRAIN LINE
- - - - EXISTING DITCH FLOW LINE
- SD — PROPOSED STORM DRAIN LINE
- — — — PROPOSED FLOW LINE



PROPOSED SIGNAL

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 PLOT DATE: 5/13/2020 4:45 PM BY: JMBREZ, CINDY



CITY OF HEALDSBURG
 PUBLIC WORKS DEPARTMENT
 401 GROVE STREET
 HEALDSBURG, CA 95448

ORIGINAL SCALE IN INCHES
 FOR REDUCED PLANS
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AECOM
 2020 L STREET, SUITE 400
 SACRAMENTO, CA 95811
 (916) 414-5800

REGISTERED ENGINEER

 DATE



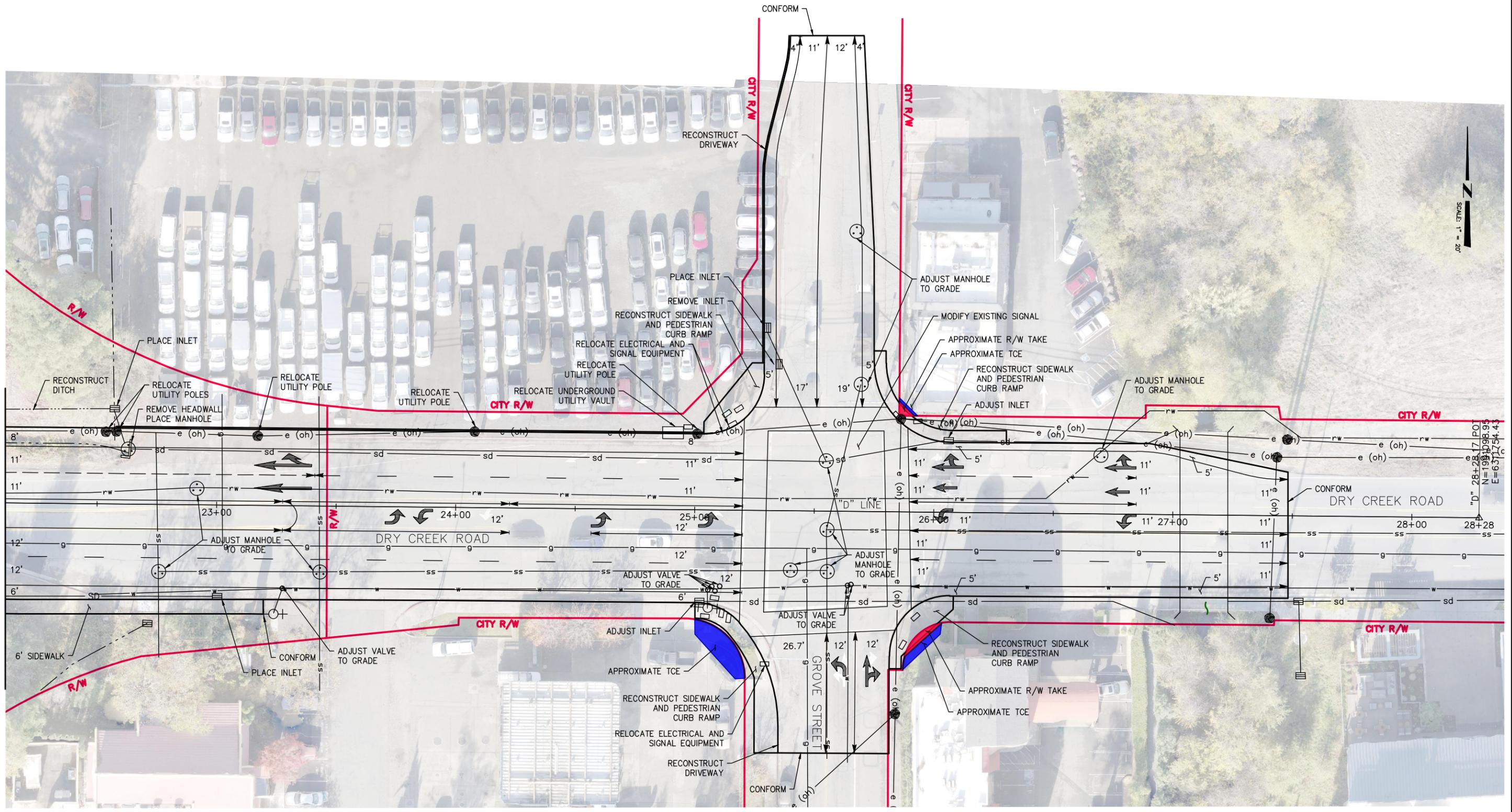
REVISIONS					
No.	BY	DATE	DESCRIPTION	APPROVED	DATE

ACCEPTED BY THE CITY CAPITAL PROJECTS ENGINEER

 DATE

US 101 / DRY CREEK ROAD INTERCHANGE							
SIGNALS AT RAMP INTERSECTIONS							
PRELIMINARY LAYOUT							
DESIGNED BY	DRAWN BY	CHECKED BY	PROJECT No.	DATE	SHEET	OF	
X	X	X	X	X	X	X	X

L-1

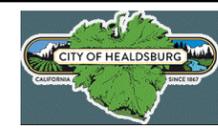


SCALE: 1" = 20'

MATCH LINE - SEE SHEET L-2

L-3

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 PLOT DATE: 5/19/2020 3:15 AM
 BY: LAM, SHERINA



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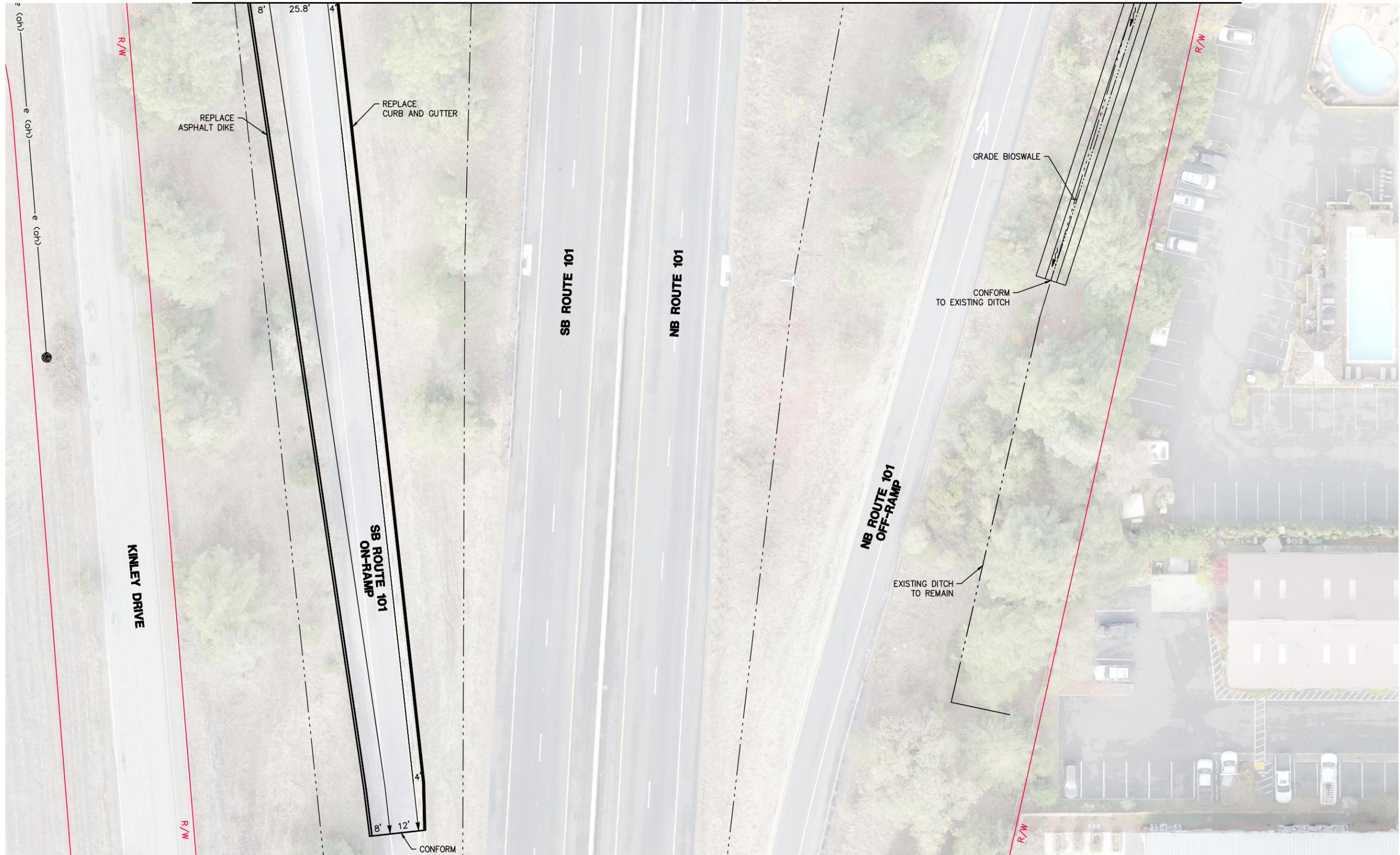
REGISTERED ENGINEER
 DATE

REVISIONS		APPROVED		DATE	
No.	DESCRIPTION	BY	DATE		

ACCEPTED BY THE CITY CAPITAL PROJECTS ENGINEER

MERCEDITAS ESPERANZA DATE

US 101 / DRY CREEK ROAD INTERCHANGE						
SIGNALS AT RAMP INTERSECTIONS						
PRELIMINARY LAYOUT						
DESIGNED BY	DRAWN BY	CHECKED BY	PROJECT No.	DATE	SHEET	OF
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SCALE: 1" = 20'

L-4

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 PLOT DATE: 5/13/2020 4:45 PM
 BY: JMBENEZ, CINDY



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MERCEDITAS ESPERANZA			DATE		

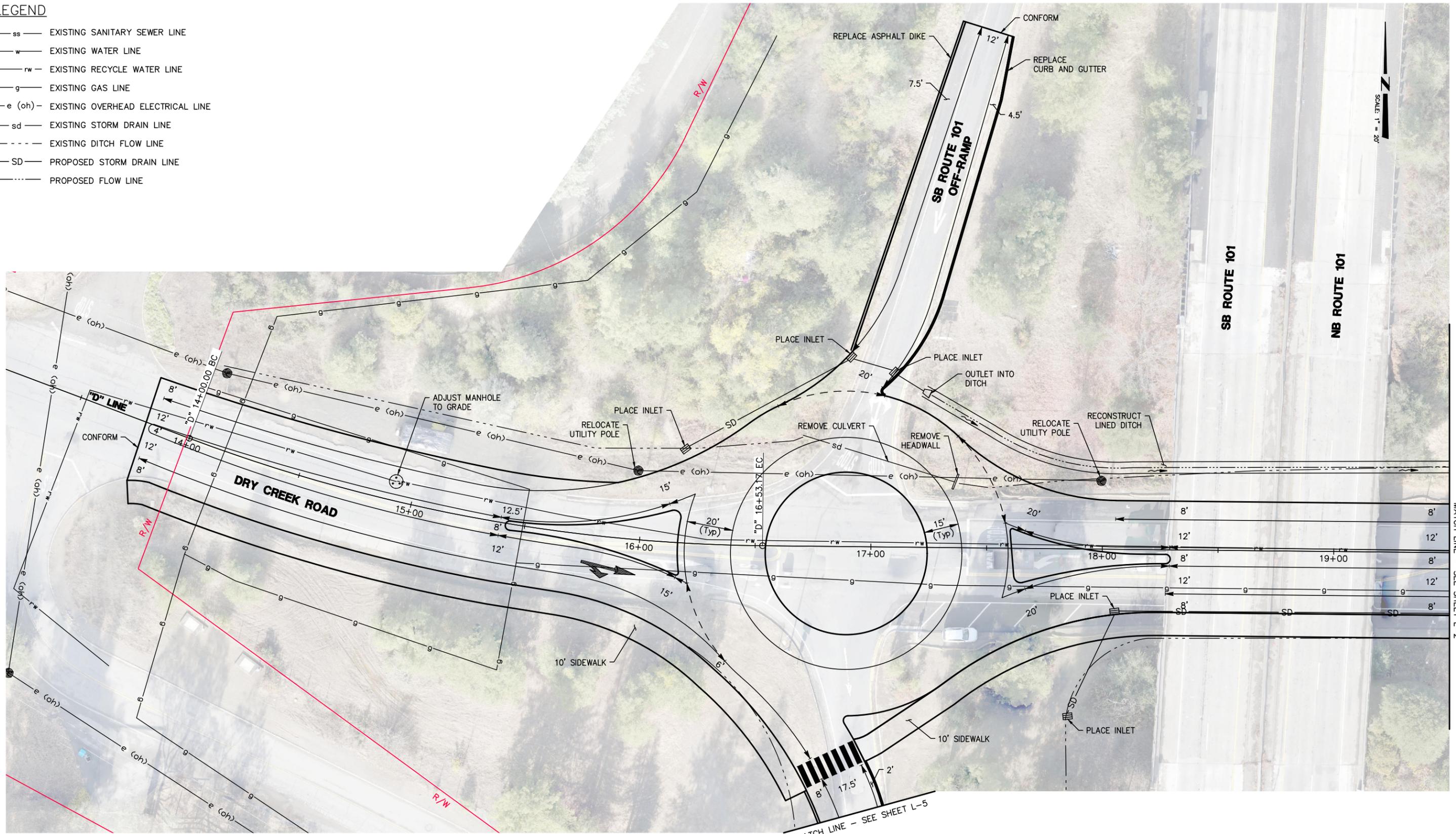
US 101 / DRY CREEK ROAD INTERCHANGE						
SIGNALS AT RAMP INTERSECTIONS						
PRELIMINARY LAYOUT						
DESIGNED BY	DRAWN BY	CHECKED BY	PROJECT No.	DATE	SHEET	OF
X	X	X	X	X	X	X

APPENDIX E

Preliminary Layouts of Alternative 2

LEGEND

- ss — EXISTING SANITARY SEWER LINE
- w — EXISTING WATER LINE
- rw — EXISTING RECYCLE WATER LINE
- g — EXISTING GAS LINE
- e (oh) — EXISTING OVERHEAD ELECTRICAL LINE
- sd — EXISTING STORM DRAIN LINE
- - - - EXISTING DITCH FLOW LINE
- SD — PROPOSED STORM DRAIN LINE
- — — — PROPOSED FLOW LINE



SCALE: 1" = 20'

MATCH LINE - SEE SHEET L-2

MATCH LINE - SEE SHEET L-5

L-1

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 BY: JIMENEZ, CINDY



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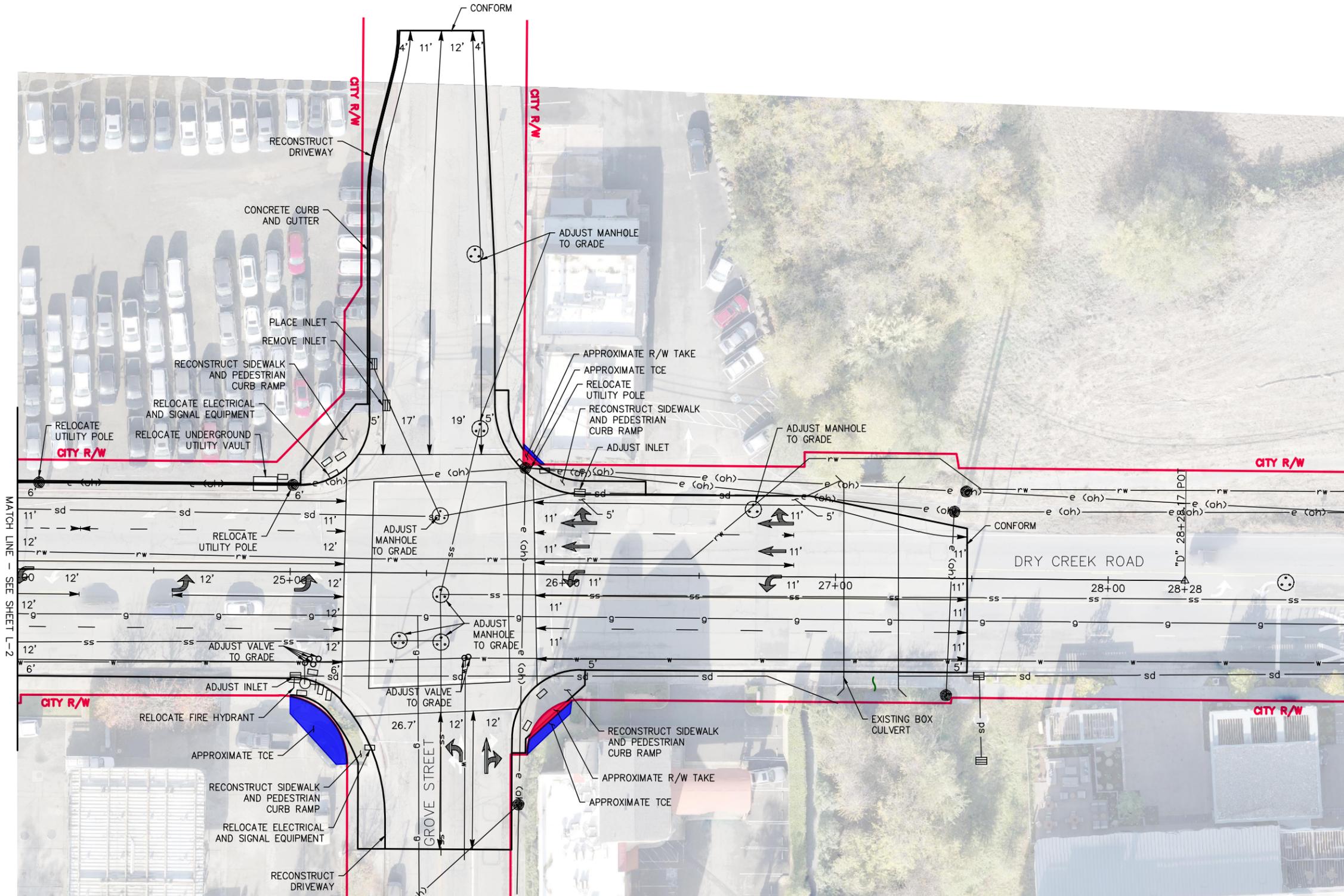


REVISIONS		APPROVED		DATE	
No.	DESCRIPTION	BY	DATE		

ACCEPTED BY THE CITY CAPITAL PROJECTS ENGINEER

MERCEDITAS ESPERANZA _____ DATE _____

US 101 / DRY CREEK ROAD INTERCHANGE						
ROUNDABOUTS AT RAMP INTERSECTIONS						
PRELIMINARY LAYOUT						
DESIGNED BY	DRAWN BY	CHECKED BY	PROJECT No.	DATE	SHEET	OF
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L-3

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 BY: LAM, SHEENA



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 PUBLIC WORKS DEPARTMENT
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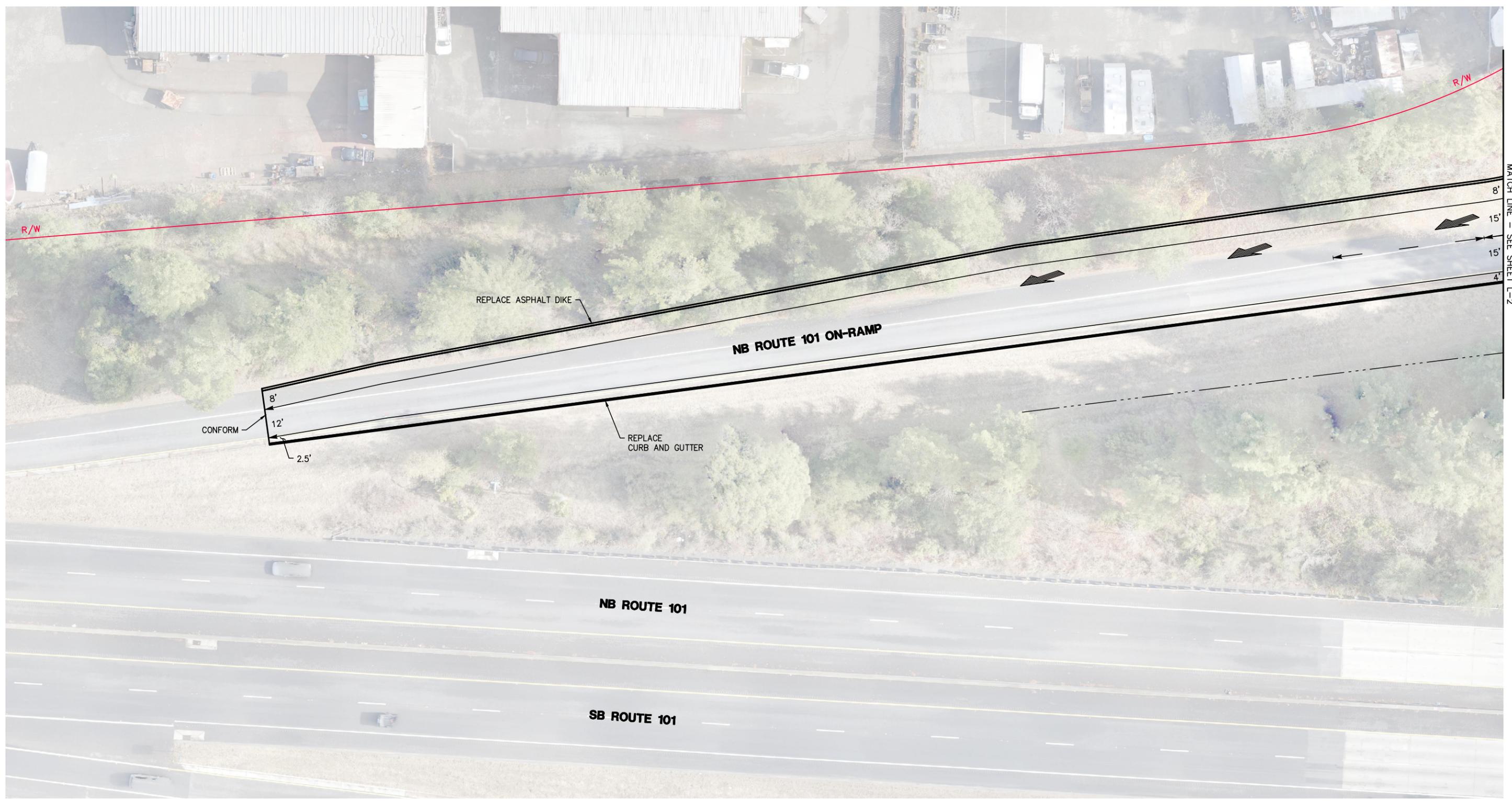


REVISIONS		APPROVED		DATE	
No.	BY	DATE	DESCRIPTION	DATE	

ACCEPTED BY THE CITY CAPITAL PROJECTS ENGINEER

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US 101 / DRY CREEK ROAD INTERCHANGE						
ROUNDABOUTS AT RAMP INTERSECTIONS						
PRELIMINARY LAYOUT						
DESIGNED BY	DRAWN BY	CHECKED BY	PROJECT No.	DATE	SHEET	OF
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MATCH LINE - SEE SHEET L-2

L-4

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 PLOT DATE: 5/13/2020 4:43 PM BY: JMBREZ, CINDY



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AECOM
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 SACRAMENTO, CA 95811
 (916) 414-5800

REGISTERED ENGINEER

 DATE



REVISIONS		APPROVED	DATE
No.	DESCRIPTION		

ACCEPTED BY THE CITY CAPITAL PROJECTS ENGINEER

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US 101 / DRY CREEK ROAD INTERCHANGE ROUNDABOUTS AT RAMP INTERSECTIONS						
PRELIMINARY LAYOUT						
DESIGNED BY	DRAWN BY	CHECKED BY	PROJECT No.	DATE	SHEET	OF
X	X	X	X	X	X	X

APPENDIX F

Preliminary Construction Cost Estimates

I. ROADWAY ITEMS SUMMARY

	Section	Cost
1	Earthwork	\$ 240,000
2	Pavement Structural Section	\$ 933,600
3	Drainage	\$ 363,500
4	Specialty Items	\$ 17,000
5	Environmental	\$ 223,600
6	Traffic Items	\$ 1,219,800
7	Detours	\$ -
8	Minor Items	\$ 179,900
9	Roadway Mobilization	\$ 317,800
10	Supplemental Work	\$ 215,000
11	State Furnished	\$ 94,300
12	Time-Related Overhead	\$ -
13	Roadway Contingency	\$ 1,141,400

TOTAL ROADWAY ITEMS	\$ 4,945,900
----------------------------	---------------------

Estimate Prepared By :

Name and Title	Date	Phone
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Estimate Reviewed By :

Name and Title	Date	Phone
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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	CY	2,200	50.00	110,000
152320	LS	1	5,000.00	5,000
194001	CY	2,500	40.00	100,000
19801X	CY/TON			-
192037	CY			-
193013	CY			-
193031	CY			-
16010X	LS	1	25,000.00	25,000
170101	LS			-
210130	ACRE			-

TOTAL EARTHWORK SECTION ITEMS	\$	240,000
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SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code	Unit	Quantity	Unit Price (\$)	Cost
401050	CY			-
400050	CY			-
404092	LF			-
404093	LF			-
413117	LF			-
413118	LF			-
280010	CY			-
410095	EA			-
390132	TON	3,000	170.00	510,000
390137	TON			-
39300X	SQYD			-
260203	CY	1,700	100.00	170,000
290201	CY			-
250401	CY			-
374002	TON			-
397005	TON			-
377501	TON			-
3750XX	TON			-
374492	TON			-
370001	TON			-
731530	CY			-
510501	CY	100	1,000.00	100,000
731504	CY	65	1,000.00	65,000
39407X	LF			-
150771	LF	500	10.00	5,000
420201	SQYD			-
	SQFT			-
390095	CY			-
731840	LF	2,500	20.00	50,000
731780	SQYD	80	20.00	1,600
394090	SQYD			-
398200	SQYD	4,000	8.00	32,000
39405X	STA			-
413113	SQYD			-
420102	SQYD			-
390136	TON			-
394095	SQYD			-

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS	\$	933,600
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SECTION 3: DRAINAGE

Item code	Unit	Quantity	Unit Price (\$)	Cost
710136 Remove Pipe	LF	170	x 100.00 = \$	17,000
710150 Remove Inlet	EA	4	x 1,000.00 = \$	4,000
150820 Modify Inlet	EA		x = \$	-
155232 Sand Backfill	CY		x = \$	-
15020X Abandon Culvert	EA/LF		x = \$	-
710196 Adjust Inlet	EA	3	x 2,000.00 = \$	6,000
710212 Adjust Manhole to Grade	EA	10	x 1,500.00 = \$	15,000
155003 Cap Inlet	EA		x = \$	-
510094 Structural Concrete, Drainage Inlet	CY	39	x 3,500.00 = \$	136,500
510502 Minor Concrete (Minor Structure)	CY		x = \$	-
5105XX Minor Concrete (Type XX)	CY		x = \$	-
610108 18" Alternative Pipe Culvert	LF	830	x 200.00 = \$	166,000
18" Alternative Flared End Section	EA	3	x 1,000.00 = \$	3,000
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" Thick)	LF		x = \$	-
70321X XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF		x = \$	-
70XXXX XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF		x = \$	-
703233 Grated Line Drain	LF		x = \$	-
Rock Slope Protection (Type and Method)	CY		x = \$	-
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	4,000	x 2.00 = \$	8,000
710152 Remove Headwall	EA	3	x 1,500.00 = \$	4,500
710236 Modify Headwall	EA		x = \$	-
710214 Adjust Valve Box Frame and Cover To Grade	EA	7	x 500.00 = \$	3,500
			x = \$	-
TOTAL DRAINAGE ITEMS				\$ 363,500

SECTION 4: SPECIALTY ITEMS

Item code	Unit	Quantity	Unit Price (\$)	Cost
080050 Progress Schedule (Critical Path Method)	LS	1	x 5,000.00 = \$	5,000
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		x = \$	-
153221 Remove Concrete Barrier	LF		x = \$	-
150662 Remove Metal Beam Guard Railing	LF		x = \$	-
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 = \$	-
832001 Metal Beam Guard Railing	LF		x = \$	-
839301 Single Thrie Beam Barrier	LF		x = \$	-
839310 Double Thrie Beam Barrier	LF		x = \$	-
839521 Cable Railing	LF		x = \$	-
8395XX Terminal System (Type CAT)	EA		x = \$	-
839585 Alternative Flared Terminal System	EA		x = \$	-
839584 Alternative In-line Terminal System	EA		x = \$	-
4906XX CIDH Concrete Piling (Insert Diameter)	LF		x = \$	-
839XXX Crash Cushion (Insert Type)	EA		x = \$	-
83XXXX Concrete Barrier (Insert Type)	LF		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 = \$	-
83954X Transition Railing (Type X)	EA		x = \$	-
597601 Prepare and Stain Concrete	SQFT		x = \$	-
839561 Rail Tensioning Assembly	EA		x = \$	-
Relocate Fire Hydrant	EA	1	x 7,000.00 = \$	7,000
Relocate Water Meter	EA		x 2,000.00 = \$	-
Remove and Replace Non-Traffic Pull Box	EA		x 500.00 = \$	-
Survey Monument	EA		x 400.00 = \$	-
TOTAL SPECIALTY ITEMS				\$ 17,000

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
	LS	x	= \$	-
Biological Mitigation	LF	x	= \$	-
130680 Temporary Silt Fence	LF	x	= \$	-
141000 Temporary Fence (Type ESA)				
<i>Subtotal Environmental Mitigation</i>				\$ -

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX Highway Planting	LS	x	0.00 = \$	-
20XXXX Irrigation System	LS	x	30,000.00 = \$	-
20XXXX Existing Tree Removal	EA	x	2,200.00 = \$	-
20XXXX LID Bioretention Swales Construction (w/o plants)	SF	4430.00 x	30.00 = \$	132,900
20XXXX Tree Planting (24" box trees installed)	EA	x	1,100.00 = \$	-
20XXXX LID Landscaping (1gal. plants installed per 9 SF)	EA	x	50.00 = \$	-
20XXXX Plant Establishment Work	YR	x	50,000.00 = \$	-
20XXXX Extend Plant Establishment Work	LS	x	0.00 = \$	-
20XXXX Follow-up Landscape Project	LS	x	0.00 = \$	-
20XXXX Remove Irrigation Facility	LS	x	0.00 = \$	-
20XXXX Maintain Existing (Irrigation or Planted Areas)	LS	x	12,000.00 = \$	-
20XXXX Check and Test Existing Irrigation Facilities	LS	x	0.00 = \$	-
20XXXX Imported Topsoil (X)	CY	x	40.00 = \$	-
20XXXX Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQYD	x	20.00 = \$	-
20XXXX Weed Germination and Till	SQYD	x	0.50 = \$	-
20XXXX Water Meter	EA	x	25,000.00 = \$	-
20XXXX XX" Conduit (Use for Irrigation x-overs)	LF	x	0.00 = \$	-
20XXXX Extend X" Conduit	LF	x	0.00 = \$	-
<i>Subtotal Landscape and Irrigation</i>				\$ 132,900

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010 Move In/Move Out (Erosion Control)	EA	x	= \$	-
210350 Fiber Rolls	LF	x	3 = \$	-
210360 Compost Sock	LF	x	= \$	-
2102XX Rolled Erosion Control Product (X)	SQFT	x	= \$	-
21025X Bonded Fiber Matrix	SQFT/ACRE	x	= \$	-
210300 Hydromulch	SQFT	x	= \$	-
210420 Straw	SQFT	x	= \$	-
210430 Hydroseed	SQFT	x	0.5 = \$	-
210600 Compost	SQFT	x	= \$	-
210630 Incorporate Materials	SQFT	x	= \$	-
<i>Subtotal Erosion Control</i>				\$ -

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300 Prepare SWPPP	LS	1 x	15,000.00 = \$	15,000
130200 Prepare WPCP	LS	x	= \$	-
130100 Job Site Management	LS	1 x	25,000.00 = \$	25,000
130330 Storm Water Annual Report	EA	1 x	2,000.00 = \$	2,000
130310 Rain Event Action Plan (REAP)	EA	24 x	500.00 = \$	12,000
130320 Storm Water Sampling and Analysis Day	EA	15 x	500.00 = \$	7,500
130520 Temporary Hydraulic Mulch	SQYD	x	= \$	-
130550 Temporary Hydroseed	SQYD	x	= \$	-
130505 Move-In/Move-Out (Temporary Erosion Control)	EA	x	= \$	-
130640 Temporary Fiber Roll	LF	x	= \$	-
130900 Temporary Concrete Washout	LS	1.00 x	10,000.00 = \$	10,000
130710 Temporary Construction Entrance	EA	2.00 x	3,500.00 = \$	7,000
130610 Temporary Check Dam	LF	800.00 x	8.00 = \$	6,400
130620 Temporary Drainage Inlet Protection	EA	23.00 x	250.00 = \$	5,750
130730 Street Sweeping	LS	x	= \$	-
<i>Subtotal NPDES</i>				\$ 90,650

TOTAL ENVIRONMENTAL	\$ 223,600
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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	= \$	-
<i>Subtotal Supplemental Work for NDPS</i>				\$ -

*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	= \$	-
Signal and Lighting	LS	1	x 1,000,000.00 = \$	1,000,000
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 Elements During Construction	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
Subtotal Traffic Electrical				\$ 1,000,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
Project Funding Identification Signs	LS	x	3,000.00 = \$	-
Install New Traffic Sign and Post	EA	20	x 300.00 = \$	6,000
566012 Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
Remove Thermoplastic Traffic Stripe	LF	3,400	x 1.50 = \$	5,100
Remove Yellow Thermoplastic Traffic Stripe (Hazardous Waste)	LF	2,600	x 4.00 = \$	10,400
Remove Painted Pavement Marking	SQFT	1,300	x 1.50 = \$	1,950
Remove Roadside Sign	EA	6	x 100.00 = \$	600
Reset Roadside Sign	EA	x	300.00 = \$	-
Relocate Post and Traffic Signs	EA	26	x 375.00 = \$	9,750
82010X Delineator (Class X)	EA	x	= \$	-
Thermoplastic Pavement Stripe	LF	9,500	x 2.00 = \$	19,000
Thermoplastic Pavement Markings	SQFT	2,400	x 5.00 = \$	12,000
Construction Area Signs	LS	1	x 5,000.00 = \$	5,000
84XXXX Permanent Pavement Delineation	LS	x	= \$	-
Subtotal Traffic Signing and Striping				\$ 69,800

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	1	x \$ 50,000 = \$	50,000
Subtotal Traffic Management Plan				\$ 50,000

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
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	= \$	-
Temporary Traffic Control	LS	1	x 100,000.00 = \$	100,000
129110 Temporary Crash Cushion	EA	x	= \$	-
Traffic Control System for Lane Closure (10-1.17)	LS	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				\$ 100,000

TOTAL TRAFFIC ITEMS	\$ 1,219,800
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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	\$ -
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SUBTOTAL SECTIONS 1 through 7	\$ 2,997,500
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SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items

ADA Items	1.0%	\$ 29,975
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8B - Bike Path Items

Bike Path Items	0.0%	\$ -
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8C - Other Minor Items

Other Minor Items	5.0%	\$ 149,875
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Total of Section 1-7	\$ 2,997,500	x 6.0%	= \$ 179,850
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TOTAL MINOR ITEMS	\$ 179,900
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SECTIONS 9: ROADWAY MOBILIZATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
999990	Total Section 1-8	\$ 3,177,400	x 10%	= \$ 317,740

TOTAL ROADWAY MOBILIZATION	\$ 317,800
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670	Payment Adjustments For Price Index Fluctuations	LS	1 x 15,900.00	= \$ 15,900
066094	Value Analysis	LS	x	= \$ -
066070	Maintain Traffic	LS	1 x 72,000.00	= \$ 72,000
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	\$ 3,177,400	4%	= \$ 127,096
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TOTAL SUPPLEMENTAL WORK	\$ 215,000
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SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price (\$)	=	Cost
066105	Resident Engineers Office	LS	1	x	25,666.67	=	\$25,667
066063	Traffic Management Plan - Public Information	LS	1	x	5,000.00	=	\$5,000
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			\$ 3,177,400		2%	=	\$ 63,548
TOTAL STATE FURNISHED							\$94,300

SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$3,177,400 (used to calculate TRO)
 Total Construction Cost (excluding TRO and Contingency) \$3,804,500 (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	120	X	\$0	=	\$0
TOTAL TIME-RELATED OVERHEAD							\$0

SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12			\$ 3,804,500	x	30%	=	\$1,141,350
TOTAL CONTINGENCY							\$1,141,400

II. STRUCTURE ITEMS

	Bridge 1		Bridge 2		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
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)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	Building 1				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
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)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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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
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

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	\$	75,000
	A2)	SB-1210	\$	0
B)		Acquisition of Offsite Mitigation	\$	0
C)	C1)	Utility Relocation (State Share)	\$	250,000
	C2)	Potholing (Design Phase)	\$	0
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
		<u>0%</u>		
J)		Design Appreciation Factor	\$	0
		<u>0%</u>		
K)		Utility Relocation (Construction Cost)	\$	0

L)

TOTAL RIGHT OF WAY ESTIMATE	\$325,000
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M)

TOTAL R/W ESTIMATE: Escalated

N)

RIGHT OF WAY SUPPORT	\$0
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Support Cost Estimate Prepared By _____
Project Coordinator¹
Phone

Utility Estimate Prepared By _____
Utility Coordinator²
Phone

R/W Acquisition Estimate Prepared By _____
Right of Way Estimator³
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

SECTION 1: EARTHWORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
190101	Roadway Excavation	CY	3,800 x 50.00 = \$	190,000
152320	Lead Compliance Plan	LS	1 x 5,000.00 = \$	5,000
194001	Ditch Excavation	CY	370 x 40.00 = \$	14,800
	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 = \$	-
	Clearing & Grubbing	LS	1 x 100,000.00 = \$	100,000
170101	Develop Water Supply	LS	x = \$	-
210130	Duff	ACRE	x = \$	-
XXXXXX	Some Item	Unit	x = \$	-

TOTAL EARTHWORK SECTION ITEMS	\$	309,800
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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	4,000 x 170.00 = \$	680,000
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON	x = \$	-
39300X	Geosynthetic Pavement Interlayer (Type X)	SQYD	x = \$	-
260203	Class 2 Aggregate Base	CY	3,000 x 100.00 = \$	300,000
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	x = \$	-
377501	Slurry Seal	TON	x = \$	-
3750XX	Screenings (Type XX)	TON	x = \$	-
374492	Asphaltic Emulsion (Polymer Modified)	TON	x = \$	-
370001	Sand Cover (Seal)	TON	x = \$	-
731530	Minor Concrete (Textured Paving)	CY	x = \$	-
510501	Minor Concrete	CY	400 x 1,000.00 = \$	400,000
731504	Minor Concrete (Curb and Gutter)	CY	180 x 1,000.00 = \$	180,000
39407X	Place Hot Mix Asphalt Dike (Type X)	LF	x = \$	-
150771	Remove Asphalt Concrete Dike	LF	1,500 x 10.00 = \$	15,000
420201	Grind Existing Concrete Pavement	SQYD	x = \$	-
	Remove Base and Surfacing	SQFT	x = \$	-
390095	Replace Asphalt Concrete Surfacing	CY	x = \$	-
731840	Remove Concrete (Curb and Gutter)	LF	2,500 x 20.00 = \$	50,000
731780	Remove Concrete Sidewalk (SQYD)	SQYD	2,000 x 20.00 = \$	40,000
394090	Place Hot Mix Asphalt (Miscellaneous Area)	SQYD	x = \$	-
398200	Cold Plane Asphalt Concrete Pavement	SQYD	4,400 x 8.00 = \$	35,200
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	\$	1,700,200
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SECTION 3: DRAINAGE

Item code	Unit	Quantity		Unit Price (\$)		Cost
710136 Remove Pipe	LF	200	x	100.00	= \$	20,000
710150 Remove Inlet	EA	4	x	1,000.00	= \$	4,000
150820 Modify Inlet	EA		x		= \$	-
155232 Sand Backfill	CY		x		= \$	-
15020X Abandon Culvert	EA/LF		x		= \$	-
710196 Adjust Inlet	EA	2	x	2,000.00	= \$	4,000
710212 Adjust Manhole to Grade	EA	10	x	1,500.00	= \$	15,000
155003 Cap Inlet	EA		x		= \$	-
510094 Structural Concrete, Drainage Inlet	CY	55	x	3,500.00	= \$	192,500
510502 Minor Concrete (Minor Structure)	CY		x		= \$	-
5105XX Minor Concrete (Type XX)	CY		x		= \$	-
610108 18" Alternative Pipe Culvert	LF	930	x	200.00	= \$	186,000
18" Alternative Flared End Section		3	x	1,000.00	= \$	3,000
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" Thick)	LF		x		= \$	-
70321X XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF		x		= \$	-
70XXXX XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF		x		= \$	-
703233 Grated Line Drain	LF		x		= \$	-
Rock Slope Protection (Type and Method)	CY		x		= \$	-
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	5,600	x	2.00	= \$	11,200
710152 Remove Headwall	EA	5	x	1,500.00	= \$	7,500
710236 Modify Headwall	EA		x		= \$	-
710214 Adjust Valve Box Frame and Cover To Grade	EA	7	x	500.00	= \$	3,500
XXXXXX Additional Drainage	LS		x		= \$	-

TOTAL DRAINAGE ITEMS	\$	446,700
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SECTION 4: SPECIALTY ITEMS

Item code	Unit	Quantity		Unit Price (\$)		Cost
080050 Progress Schedule (Critical Path Method)	LS	1	x	7,000.00	= \$	7,000
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		x		= \$	-
153221 Remove Concrete Barrier	LF		x		= \$	-
150662 Remove Metal Beam Guard Railing	LF		x		= \$	-
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		= \$	-
832001 Metal Beam Guard Railing	LF		x		= \$	-
839301 Single Thrie Beam Barrier	LF		x		= \$	-
839310 Double Thrie Beam Barrier	LF		x		= \$	-
839521 Cable Railing	LF		x		= \$	-
8395XX Terminal System (Type CAT)	EA		x		= \$	-
839585 Alternative Flared Terminal System	EA		x		= \$	-
839584 Alternative In-line Terminal System	EA		x		= \$	-
4906XX CIDH Concrete Piling (Insert Diameter)	LF		x		= \$	-
839XXX Crash Cushion (Insert Type)	EA		x		= \$	-
83XXXX Concrete Barrier (Insert Type)	LF		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		= \$	-
83954X Transition Railing (Type X)	EA		x		= \$	-
597601 Prepare and Stain Concrete	SQFT		x		= \$	-
839561 Rail Tensioning Assembly	EA		x		= \$	-
Relocate Utility Pole	EA		x		= \$	-
Relocate Fire Hydrant	EA	1	x	7,000.00	= \$	7,000
Relocate Water Meter	EA		x	2,000.00	= \$	-
Remove and Replace Non-Traffic Pull Box	EA		x	500.00	= \$	-
Survey Monument	EA		x	400.00	= \$	-

TOTAL SPECIALTY ITEMS	\$	19,000
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SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
	LS	x	= \$	-
130670	Temporary Reinforced Silt Fence	LF	= \$	-
141000	Temporary Fence (Type ESA)	LF	= \$	-
<i>Subtotal Environmental Mitigation</i>				\$ -

5B - LANDSCAPE AND IRRIGATION

Item code	Unit	Quantity	Unit Price (\$)	Cost
20XXXX	Highway Planting	LS	x 0.00 = \$	-
20XXXX	Irrigation System	LS	x 30,000.00 = \$	-
20XXXX	Existing Tree Removal	EA	x 2,200.00 = \$	-
20XXXX	LID Bioretention Swales Construction (w/o plants)	SF	5,950 x 30.00 = \$	178,500
20XXXX	Tree Planting (24" box trees installed)	EA	x 1,100.00 = \$	-
20XXXX	LID Landscaping (1gal. plants installed per 9 SF)	EA	x 50.00 = \$	-
20XXXX	Plant Establishment Work	YR	x 50,000.00 = \$	-
20XXXX	Extend Plant Establishment Work	LS	x 0.00 = \$	-
20XXXX	Follow-up Landscape Project	LS	x 0.00 = \$	-
20XXXX	Remove Irrigation Facility	LS	x 0.00 = \$	-
20XXXX	Maintain Existing (Irrigation or Planted Areas)	LS	x 12,000.00 = \$	-
20XXXX	Check and Test Existing Irrigation Facilities	LS	x 0.00 = \$	-
20XXXX	Imported Topsoil (X)	CY	x 40.00 = \$	-
20XXXX	Rock Blanket, Rock Mulch, DG, Gravel Mulch	SQYD	x 20.00 = \$	-
20XXXX	Weed Germination and Till	SQYD	x 0.50 = \$	-
20XXXX	Water Meter	EA	x 25,000.00 = \$	-
20XXXX	XX" Conduit (Use for Irrigation x-overs)	LF	x 0.00 = \$	-
20XXXX	Extend X" Conduit	LF	x 0.00 = \$	-
<i>Subtotal Landscape and Irrigation</i>				\$ 178,500

5C - EROSION CONTROL

Item code	Unit	Quantity	Unit Price (\$)	Cost
210010	Move In/Move Out (Erosion Control)	EA	x = \$	-
210350	Fiber Rolls	LF	x = \$	-
210360	Compost Sock	LF	x = \$	-
2102XX	Rolled Erosion Control Product (X)	SQFT	x = \$	-
21025X	Bonded Fiber Matrix	SQFT/ACRE	x = \$	-
210300	Hydromulch	SQFT	x = \$	-
210420	Straw	SQFT	x = \$	-
210430	Hydroseed	SQFT	x = \$	-
210600	Compost	SQFT	x = \$	-
210630	Incorporate Materials	SQFT	x = \$	-
<i>Subtotal Erosion Control</i>				\$ -

5D - NPDES

Item code	Unit	Quantity	Unit Price (\$)	Cost
130300	Prepare SWPPP	LS	1 x 15,000.00 = \$	15,000
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 2,000.00 = \$	4,000
130310	Rain Event Action Plan (REAP)	EA	30 x 500.00 = \$	15,000
130320	Storm Water Sampling and Analysis Day	EA	20 x 500.00 = \$	10,000
130520	Temporary Hydraulic Mulch	SQYD	x = \$	-
130550	Temporary Hydroseed	SQYD	x = \$	-
130505	Move-In/Move-Out (Temporary Erosion Control)	EA	x = \$	-
130640	Temporary Fiber Roll	LF	x = \$	-
130900	Temporary Concrete Washout	LS	1 x 10,000.00 = \$	10,000
130710	Temporary Construction Entrance	EA	2 x 3,500.00 = \$	7,000
130610	Temporary Check Dam	LF	820 x 8.00 = \$	6,560
130620	Temporary Drainage Inlet Protection	EA	25 x 250.00 = \$	6,250
130730	Street Sweeping	LS	x = \$	-
<i>Subtotal NPDES</i>				\$ 98,810

TOTAL ENVIRONMENTAL	\$ 277,400
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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 = \$	-
<i>Subtotal Supplemental Work for NDPS</i>				\$ -

*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	= \$	-
Signal and Lighting	LS	1	x 200,000.00 = \$	200,000
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 Elements During Construction	LS	x	= \$	-
86XXXX Fiber Optic Conduit System	LS	x	= \$	-
XXXXX Some Item	Unit	x	= \$	-
Subtotal Traffic Electrical				\$ 200,000

6B - Traffic Signing and Striping

Item code	Unit	Quantity	Unit Price (\$)	Cost
Project Funding Identification Signs	LS	x	3,000.00 = \$	-
Install New Traffic Sign and Post	EA	20	x 300.00 = \$	6,000
Roadside Sign - Two Post	EA	x	= \$	-
5602XX Furnish Sign	SQFT	x	= \$	-
568016 Install Sign Panel on Existing Frame	SQFT	x	= \$	-
Remove Thermoplastic Traffic Stripe	LF	4,300	x 1.50 = \$	6,450
Remove Yellow Thermoplastic Traffic Stripe (Hazardous Waste)	LF	3,500	x 4.00 = \$	14,000
Remove Painted Pavement Marking	SQFT	1,500	x 1.50 = \$	2,250
Remove Roadside Sign	EA	6	x 100.00 = \$	600
Reset Roadside Sign	EA	x	300.00 = \$	-
Relocate Post and Traffic Signs	EA	25	x 375.00 = \$	9,375
82010X Delineator (Class X)	EA	x	= \$	-
Thermoplastic Pavement Stripe	LF	12,000	x 2.00 = \$	24,000
Thermoplastic Pavement Markings	SQFT	1,800	x 5.00 = \$	9,000
Construction Area Signs	LS	1	x 5,000.00 = \$	5,000
84XXXX Permanent Pavement Delineation	LS	x	= \$	-
Subtotal Traffic Signing and Striping				\$ 76,675

6C - Traffic Management Plan

Item code	Unit	Quantity	Unit Price (\$)	Cost
12865X Portable Changeable Message Signs	EA/LS	1	x \$ 50,000 = \$	50,000
Subtotal Traffic Management Plan				\$ 50,000

6C - Stage Construction and Traffic Handling

Item code	Unit	Quantity	Unit Price (\$)	Cost
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	= \$	-
Temporary Traffic Control	LS	1	x 182,000.00 = \$	182,000
129110 Temporary Crash Cushion	EA	x	= \$	-
Traffic Control System for Lane Closure (10-1.17)	LS	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				\$ 182,000

TOTAL TRAFFIC ITEMS	\$ 508,700
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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	\$	-
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SUBTOTAL SECTIONS 1 through 7	\$	3,261,800
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SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items

ADA Items	1.0%	\$	32,618
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8B - Bike Path Items

Bike Path Items	0.0%	\$	-
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8C - Other Minor Items

Other Minor Items	5.0%	\$	163,090
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Total of Section 1-7	\$	3,261,800	x	6.0%	= \$	195,708
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TOTAL MINOR ITEMS	\$	195,800
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SECTIONS 9: ROADWAY MOBILIZATION

Item code	Unit	Quantity	Unit Price (\$)	Cost			
999990	Total Section 1-8	\$	3,457,600	x	10%	= \$	345,760

TOTAL ROADWAY MOBILIZATION	\$	345,800
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SECTION 10: SUPPLEMENTAL WORK

Item code	Unit	Quantity	Unit Price (\$)	Cost
066670	Payment Adjustments For Price Index Fluctuations	LS	1	x 21,100.00 = \$ 21,100
066094	Value Analysis	LS	x	= \$ -
066070	Maintain Traffic	LS	1	x 72,000.00 = \$ 72,000
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	\$	3,457,600	4%	= \$	138,304
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TOTAL SUPPLEMENTAL WORK	\$	231,500
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SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price (\$)	=	Cost
066105	Resident Engineers Office	LS	1	x	88,977.78	=	\$88,978
066063	Traffic Management Plan - Public Information	LS	1	x	5,000.00	=	\$5,000
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			\$ 3,457,600		2%	=	\$ 69,152
TOTAL STATE FURNISHED							\$163,200

SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization \$3,457,600 (used to calculate TRO)
 Total Construction Cost (excluding TRO and Contingency) \$4,198,100 (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	200	X	\$0	=	\$0
TOTAL TIME-RELATED OVERHEAD							\$0

SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12			\$ 4,198,100	x	30%	=	\$1,259,430
TOTAL CONTINGENCY							\$1,259,500

II. STRUCTURE ITEMS

	Bridge 1		Bridge 2		
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Bridge Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
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)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

	Building 1				
DATE OF ESTIMATE	00/00/00		00/00/00		00/00/00
Building Name	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Bridge Number	57-XXX		57-XXX		57-XXX
Structure Type	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
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)	XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX		XXXXXXXXXXXXXXXXXXXX
Cost Per Square Foot	\$0		\$0		\$0
COST OF EACH	\$0		\$0		\$0

TOTAL COST OF BRIDGES	\$0
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TOTAL COST OF BUILDINGS	\$0
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STRUCTURES MOBILIZATION	10%	\$0
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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
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TOTAL COST OF STRUCTURES	\$0
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Estimate Prepared By: _____
 XXXXXXXXXXXXXXXXXXXX ----- Division of Structures

 Date

APPENDIX G

P Public Outreach Summary Memorandum

Public Outreach Summary Memorandum

Public participation is essential to the California Environmental Quality Act (CEQA) process; and therefore, as the lead agency under CEQA, the City of Healdsburg will make diligent efforts to engage and inform the public that may be impacted by the U.S. 101/Dry Creek Road Interchange Project (project).

The goals of the proposed outreach activities are to keep the community informed about project development, gain effective feedback/input from affected stakeholders, address and document concerns raised during this process, and support the City in advancing the project.

This memo provides a framework for developing a detailed public outreach strategy and timeline to be implemented during future project phases.

Potential stakeholder locations

The project is located at the U.S. 101 ramps that cross Dry Creek Road between Kinley Drive and Healdsburg Avenue. The majority of the proposed improvements are within the existing right-of-way, with some right-of-way acquisitions anticipated at the Dry Creek Road/Grove Street intersection. Early public outreach will be especially important where property acquisitions and easements are anticipated.

Anticipated stakeholders

Key stakeholders include local and regional agencies and nearby development projects impacted or involved in the project or project area:

- City of Healdsburg
- County of Sonoma
- Sonoma County Transportation Authority
- Sonoma County Transit
- Healdsburg Fire Department
- Healdsburg Police Department
- Comstock Homes (North Village Project)
- Montage Healdsburg

Due to the right-of-way acquisitions at the Dry Creek Road/Grove Street intersection and proximity of potential project disturbance, important stakeholders likely to have long-term impacts include:

- GMC Silveira Commercial Truck Lot
- Plank Coffee
- Valero Fueling Station
- Travelodge

Due to the proximity of potential project disturbance, other important stakeholders likely interested in the project or to have temporary construction impacts include:

- Approximately 15 private residents along U.S. 101
- Best Western Dry Creek Inn
- Adel's Healdsburg Restaurant
- Zimmerman Fuel
- Alysian Wines
- Alley 6 Craft Distillery
- NAPA Auto Parts
- Hotel Trio
- Big John's Olive Hill Market
- Garrett Hardware & Plumbing Company
- Tip Top Liquor Warehouse
- Healdsburg Gas Mart

Community Outreach Key Tasks

Identify stakeholders who may require targeted outreach

Confirm and build a contact database of the list of project contacts and individual stakeholders who may require targeted outreach in addition to public mechanism.

Identify outreach timing

- Project Study Report phase
 - Consider public alternatives evaluation meeting
 - Determine needs for/timing of targeted stakeholder outreach
- At or before beginning of Project Approval and Environmental Document phase
 - Consider public scoping meeting
 - Determine City processes for council, etc. input
 - Determine needs for/timing of targeted stakeholder outreach
- Draft Environmental Document (DED) circulation
 - Schedule public meeting midway through the DED public review period
 - Determine City processes for council, etc. input and meetings
 - Determine needs for/timing of targeted stakeholder outreach
- Environmental Document Approval

Identify appropriate outreach mechanisms and tools

- Develop appropriate outreach materials
 - Project Fact Sheet
 - Mailings to individual property owners
 - Newspaper advertisement
 - Website messaging
 - Messaging for Media Campaign
 - Messaging for Social media Campaign
- Scoping Meetings
- Public Workshops and Meetings
- Establish media contacts

In addition, the City should identify virtual engagement and meeting possibilities to allow for meaningful and public participation appropriate for the project during, and potentially after, the current COVID-19 pandemic, including developing interactive microsites, virtual meetings, and/or tele townhall platforms.

APPENDIX H

Draft Project Risk Register

LEVEL 2 - RISK REGISTER				Project Name: US 101/Dry Creek Road Interchange			DIST- EA	04-TBD	Project Manager	TBD						
Risk Identification							Risk Assessment						Risk Response			
Status	ID #	Type	Category	Title	Risk Statement	Current status/assumptions	Probability	Cost Impact	Cost Score	Time Impact	Time Score	Rationale	Strategy	Response Actions	Risk Owner	Updated
Active	1	Threat	Design	Field Survey and Studies	Delay to schedule due to weather or threat of wildfire threat.	Wildfire threat is a potential issue in Sonoma County.	3-Moderate	2 -Low	6	2 -Low	6	Delays may occur due to rain and wildfire.	Accept	Look for opportunities to accelerate schedule with other tasks if schedule is impacted by weather or wildfire.	Design Team	5/15/2020
Active	2	Threat	Design	Survey File	Inaccuracies or incomplete information in the survey file could lead to rework of the design.	Preliminary design phase with only ROW boundary surveyed.	1-Very Low	2 -Low	2	4 -Moderate	4	Appropriate survey requirements for PA&ED and final design will be scoped.	Avoid	Verify that survey information is accurate, complete and consistent with design datum.	Design Team	5/15/2020
Active	3	Threat	Environmental	Challenge to environmental document or opposition to project.	Potential lawsuits and project opposition may challenge the environmental report, delaying project approval and the start of construction or threatening loss of funding.	Project has been identified in several approved documents, including City General Plan and area project EIRs.	2-Low	2 -Low	4	2 -Low	4	The public is well aware of need to improve traffic operation and reduce delays at this location.	Avoid	Address concerns of stakeholders and public during environmental process. Early engagement of key stakeholders and public to solicit input.	City and Design Team	5/15/2020
Active	4	Threat	Design	Supplemental ED	A design change that is outside of the parameters contemplated in the Environmental Document triggers a supplemental ED which causes a delay due to the public comment period.	Project needs and available alternatives have are clear.	1-Very Low	1 -Very Low	1	1 -Very Low	1	At this point, need for a design change that would trigger a supplemental ED is very low.	Avoid	Both build alternatives are being recommended for further evaluation, leading to a broader scope during the environmental phase and less likely to trigger the need to supplement ED.	City and Design Team	5/15/2020
Active	5	Threat	Construction	Utility Relocation	Delay to utility relocations may delay start of construction.	Existing utilities have been mapped based on existing as-builts and field observations. The utility to most likely delay project is PG&E.	3-Moderate	4 -Moderate	12	4 -Moderate	12	Design and relocation of overhead utility is dependent on PG&E's schedule and staff availability.	Mitigate	Early engagement with PG&E and other utility owners to discuss schedule and required relocations will facilitate coordination during project development.	City and Design Team	5/15/2020
Active	6	Threat	Construction	Hazardous Materials	Hazardous materials encountered during construction will require an on-site storage area and potential additional costs to dispose.	An Initial Site Assessment (ISA) is recommended in the PEAR to the Feasibility Report.	2-Low	2 -Low	4	2 -Low	4	Additional studies will be performed during environmental clearance and design phases of the project.	Avoid	Prepare ISA as recommended and additional studies as identified during the design phase.	City and Design Team	5/15/2020
Active	7	Threat	ROW	Delay of R/W Acquisition	Impacts to existing parcels and businesses may lengthen negotiation process to acquire ROW and delay start of construction.	Preliminary design phase has identified some ROW impacts for ADA improvements at Dry Cree Road/Grove Street intersection.	2-Low	4 -Moderate	8	4 -Moderate	8	Improvements at the corners of the intersection will enhance pedestrian access and increase foot traffic for businesses. However, businesses may be concerned about impacts during construction.	Mitigate	Early discussions with businesses in the project area to inform them of impacts during construction and how they will be handled.	City and Design Team	5/15/2020
Active	8	Threat	Construction	Buried Objects	Unanticipated buried man-made objects uncovered during construction require removal and disposal resulting in additional costs.	Initial review of as-builts provide preliminary information of potential buried objects.	3-Moderate	4 -Moderate	12	4 -Moderate	12	Buried man-made objects including abandoned pipes and inlets may be present and undetectable during design.	Accept	Include a Supplemental Work item to cover this risk.	City and Design Team	5/15/2020
Active	9	Threat	Environmental	Nesting birds	Nesting birds, protected from harassment under the Migratory Bird Treaty Act, may delay construction during the nesting season.	Preliminary design phase with understanding that mitigations for nesting birds will be proposed during environmental clearance and permitting.	2-Low	2 -Low	4	2 -Low	4	Provisions will be included in the final bid document to address nesting and migratory birds as required.	Mitigate	Schedule contract work to avoid the nesting season or remove nesting habitat before starting work.	City and Design Team	5/15/2020