City of Arcata

PROJECT STUDY REPORT (PSR)

South Arcata Multimodal and Safety Improvement Project (SAMSIP)

Project Limits: The limits of the project are within City of Arcata and Caltrans rights-of-way along the SR 255 (Samoa Boulevard) and US 101 interchange from F Street to Union Street.

1 Purpose and Need

1.1 Purpose

The purpose of the South Arcata Multimodal and Safety Improvement Project (SAMSIP) is to increase east-west connectivity between South Arcata (areas adjacent to Samoa Boulevard west of US 101) and the Sunnybrae and Bayside neighborhoods through safe, comfortable transportation facilities for all modes. The Project aims to address transportation inequities felt by residents, including disproportionately limiting access across US 101 for those taking active modes of transportation. The Project will improve connectivity to key destinations, specifically for those walking and bicycling across the US 101 and State Route 255 (SR 255) interchange.

1.2 Need

The US 101 – SR 255 / Samoa Boulevard interchange is a barrier to people walking and bicycling safely. US 101 is a significant regional route, providing connectivity to coastal communities include the City of Eureka, greater Humbolt County, and adjacent Del Norte and Mendocino counties. US 101 bisects the City of Arcata. There are other routes that provide pedestrian and bicycle connectivity across US 101, including 7th Street, 11th Street, and 14th Street. However, the southernmost connection, Samoa Boulevard, does not feature pedestrian or bicycle facilities, leaving people to walk or bike across the overpass in the vehicle lane or the 4-foot shoulder. The existing interchange configuration has far more vehicular capacity than required to meet current and forecasted travel demand. Potential conflicts at existing ramps with short weaving areas, high travel speeds approaching the mid-block crosswalk at F Street, speed differentials with through traffic and entering/exiting vehicles, and a lack of active transportation facilities all create a high stress environment for pedestrians, bicyclists, transit users, and motorists. During the most recent collision reporting period (2019-2023), there was one bicyclist-involved collision reported at the Samoa Boulevard and F Street intersection. Community members identified hazards and near miss collisions using the “Street Story” interactive map that was available during the community engagement process. Community members reported walking and bicycling across the interchange and identified several hazards, including lack of safe pedestrian and bicycle facilities, unsafe vehicle speeds, drivers not yielding to pedestrians and bicyclists, poor lighting conditions and

more. Community members reported three near miss collisions involving bicyclists, located on Samoa Boulevard across the interchange at the Union Street Roundabout[1]. A Bicycle Level of Traffic Stress (LTS) analysis resulted in an LTS 4 rating across the interchange based on existing conditions, which is a high stress environment.

2 Brief Project Description

2.1 Current Condition

The project study area is shown in Figure 1 and included in *Attachment A*. The SR 255 / US 101 interchange is located between South Arcata to the west and the Sunny Brae neighborhood to the east. Both US 101 and SR 255 are designated truck routes; US 101 serves interstate transportation and SR 255 provides truck access between Arcata, the Samoa peninsula, and the city of Eureka. The interchange is a full cloverleaf interchange with collector-distributer roads, and on/off ramps for all directions of travel serviced by free-flowing merge, diverge, and weaving lanes. The posted speed limit is 35 mph on Samoa Boulevard through the interchange, and there are mostly two lanes in each direction. The interchange is the eastern terminus of SR 255. The road continues as Samoa Boulevard to the east. West of the study area, Samoa Boulevard provides access to Downtown and South Arcata including several recreational opportunities in the Arcata Marsh. At the west end of the study area, the Samoa Boulevard and F Street intersection features a crosswalk with a refuge island and retro-reflective flashing beacons, located approximately 410 feet west of the US 101 southbound on- and off-ramps. West of F Street there are sidewalks along both sides of Samoa Boulevard. West of G Street, there are Class II bicycle facilities on both sides.

East of the interchange at Union Street and Samoa Boulevard, there is a single-lane roundabout that provides access to nearby Cal Poly Humboldt facilities, student housing, Union Street Charter School, the Arcata Sports Complex and Community Center, the Arcata little league fields, and the California Highway Patrol station. The Union Street roundabout has marked pedestrian crosswalks on all legs except for the west leg. Within the study area, bike lanes exist on Samoa Boulevard east of the Union Street roundabout. Paved off-street paths run along both sides of Samoa Boulevard east of Union Street, then continue on the north side of Samoa Boulevard to connect with a trail about 400 feet west of Union Street that leads to the Arcata Community Center.

The interchange and overcrossing are designed for motor vehicles only and there are no pedestrian or bicycle facilities to connect to existing multimodal facilities on either side.

[1] Feedback from the Street Story dashboard can be found at https://streetstory.berkeley.edu/reports.php?juris_type=custom&juris_name=000407.

Figure 1 SAMSIP Study Area

3 Project Alternatives

Initially, six alternatives were developed for consideration including new traffic controls for the ramp termini as either roundabouts or traffic signals. A seventh "no build" alternative was also considered. Of the seven alternatives, two alternatives were chosen for further evaluation based on community input, the project goals, and cost considerations with the overcrossing structure. Both alternatives are designed to enhance safety and connectivity for motorists, pedestrians, and bicyclists. All seven alternatives are within Caltrans and City of Arcata rights-of-way (ROW). For a table comparing all six alternatives analyzed, see Section 3.3: Alternatives Analysis. A traffic operations analysis was performed for existing conditions and 2050 design year conditions for the two alternatives evaluated, and the results are documented in *Attachment B*.

The design vehicle used for the roundabout concept was a Bus (Bus-45). Truck turns were run for Bus-45 and CA-Legal type vehicles. Additional modifications will need to be made for the southbound ramps to accommodate Cal-legal truck access from SR 255.

With both alternatives, there is a pedestrian and bicycle crossing opportunity at F Street and at G Street, and crossing opportunities at Union Street, to improve pedestrian and bicycle access to active transportation facilities on the opposite side of the street.

3.1 Roundabout Alternative

The roundabout alternative proposes roundabouts at both existing ramp termini, reconfiguring the ramps to be only on the south side of Samoa Boulevard and removing the ramps on the north side.

The alternative also eliminates one travel lane in each direction. Based on the traffic operations analysis, the roundabout alternative operates acceptably under both existing and design year conditions, with LOS A/B at both ramps during the peak hours. The queuing analysis presented acceptable results between the intersections and on the ramps.

This alternative also includes pedestrian and bicycle facilities between F Street and Union Street. A 12-foot bi-directional bikeway and 6-foot sidewalk are proposed on the north side of Samoa Boulevard. Due to existing bridge width limitations, the project proposes to merge the separate pedestrian and bicycle facilities into a 12-foot shared-use path across the bridge deck. The design for the shared-use path across the bridge deck proposes physical separation from vehicles via flexible delineator posts. The physical separation treatment for the pedestrian and bicycle treatment will need to be determined during the design phase based on the existing structure allowances. Alternatively, the flexible posts can be glued down instead of bolted if adding static weight to the structure is not viable.

At Union Street, the proposed separate sidewalk and two-way bikeway on the north side of Samoa Boulevard merge into a shared-use path around the intersection, connecting to the existing paths along Samoa Boulevard. Marked crosswalks with ADA ramps will be added to the west leg of the Union Street roundabout to provide access to paths on either side of the intersection. Bike ramps are proposed on the east leg of the Union Street roundabout to connect the proposed shared-use path to the existing bike lanes along Samoa Boulevard.

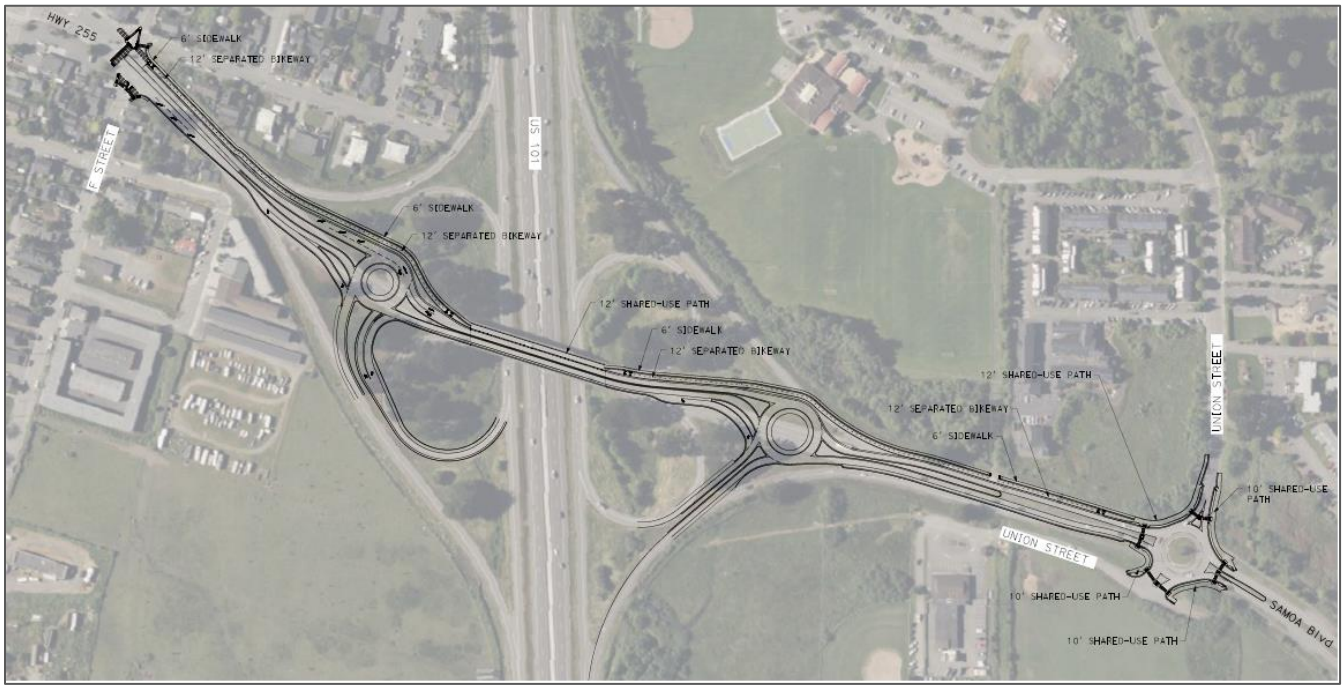
On the west side, pedestrians will be connected from the proposed sidewalk to existing sidewalk on either side of Samoa Boulevard via the existing crossings at F Street. The project proposes expanding the existing mid-block crosswalk across Samoa Boulevard at F Street to accommodate bicyclists. Bicyclists and pedestrians can also cross Samoa Boulevard at G Street at the existing traffic signal.

The City has completed 30% Conceptual Plans for the Roundabout Alternative; see *Attachment C*. The detailed cost estimate is included in *Attachment D*. Table 1 provides a preliminary cost estimate for the Roundabout Alternative.

Table 1 Preliminary project cost for Roundabout Alternative

Task	Cost
Project Approval & Environmental Document (2.5%) of Construction Costs)	$782,725
Plans, Specifications, and Estimates (15% of Construction Costs)	$4,696,350
Right of Way Capital	$200,000
Right of Way Support (1.0% of Construction Costs)	$313,090
Construction Support (10% of Construction Costs)	$3,130,900
Construction Capitol Cost	$23,929,500
Contingency (30% of Construction Costs)	$7,178,900
Subtotal	**$40,232,000**
Total Construction Cost (Rounded)	$31,109,000
Total Support Cost	$9,124,000
Total Project Cost (Rounded)	**$40,250,000**

Figure 2 – Roundabout Alternative



3.2 Traffic Signal Alternative

The Traffic Signal Alternative proposes traffic signals at both existing ramp termini. This alternative includes removing the southwest ramps and retaining access to the north side of Samoa Boulevard and removing the northeast ramps and retaining access to the south side of Samoa Boulevard. This results in the ramps being offset on either side of Samoa Boulevard. Similar to the Roundabout Alternative, the Signal Alternative removes one travel lane in each direction. Based on the traffic operations analysis, the Signal Alternative operates acceptably under both existing and design year conditions. For the 2050 design year, the signal at the US 101 Southbound Ramps operates at an LOS B during the AM peak hour and LOS C during PM peak hour. The signal at the US 101 Northbound Ramps operates at LOS A during the AM peak hour and LOS B during the PM peak hour. The queuing analysis showed that at the southbound ramps, queues at the southbound right turn may result in lane starvation for the southbound left in both AM and PM peak hours. queues exceed the available storage during the PM peak hour. The

This alternative also includes pedestrian and bicycle facilities between F Street and Union Street. Similar to the Roundabout Alternative, a 12-foot bi-directional bikeway and 6-foot sidewalk are proposed on the north side of Samoa Boulevard. Due to existing bridge width limitations, the project proposes to merge the separate pedestrian and bicycle facilities into a 12-foot shared-use path across the bridge deck. The shared-use path across the bridge deck proposes physical separation from vehicles via flexible delineator posts. This alternative proposes the same pedestrian and bicycle connections east and west of the project area as the Roundabout Alternative, at Union Street and F Street.

Table 2 provides a preliminary cost estimate for the Traffic Signal Alternative.

Table 2 Preliminary project cost for Signal Alternative

Task	Cost
Project Approval & Environmental Document (2.5% of Construction Costs)	$817,500
Plans, Specifications, and Estimates (15% of Construction Costs)	$4,905,000
Right of Way Capital	$200,000
Right of Way Support (1.0% of Construction Costs)	$327,000
Construction Support (10% of Construction Costs)	$3,270,000
Construction Capitol Cost	$25,000,000
Contingency (30% of Construction Capitol Costs)	$7,500,000
Subtotal	**$42,020,000**
Total Construction Cost (Rounded)	$32,700,000
Total Support Cost (Rounded)	$9,320,000
Total Project Cost (Rounded)	**$42,050,000**

Figure 3 – Signal Alternative

3.3 No Build Alternative

A "no build" alternative was considered but does not meet the purpose and need of the SAMSIP. The improvements identified by the traffic signal and roundabout alternatives are warranted as they aim to address the existing deficiencies outlined in the purpose and need.

3.4 Alternative Analysis

The traffic signal alternative ultimately did not meet the purpose and need of the project. A key need for the project is to reduce vehicles speeds to enhance safety for all users. Roundabouts reduce the speed differential between entering and circulating traffic, providing a traffic calming benefit, while traffic signals do not slow down vehicular speeds.

Additionally, with the US 101 Southbound Ramps configuration in the Traffic Signal Alternative, there are potential conflicts between motorists and non-motorized users at the signal. The traffic signal design alternative maintains the southbound ramp on the north side of Samoa Boulevard to allow for the turn lanes to be located outside of the overpass, eliminating the need to widen or replace the bridge at this time. This results in an interrupted pedestrian and bicycle facility where potential conflicts with vehicular traffic would occur at the proposed traffic signal. The Roundabout Alternative proposes uninterrupted pedestrian and bicycle facilities across the interchange.

Both signal and roundabout alternatives had acceptable traffic operations though the roundabout alternatives operated slightly better with less delay.

Table 3 provides a preliminary analysis of the six alternatives developed for the project. Other alternatives considered different ramp configurations and pedestrian and bicycle facilities. Five alternatives were eliminated; the recommended alternative is "Alternative 1: Roundabouts with Ped/Bike Facilities on the North Side".

Table 3 Preliminary Alternative Analysis

	Alternative 1 (Roundabout Alternative)	Alternative 2	Alternative 3	Alternative 4	Alternative 5 (Traffic Signal Alternative)	Alternative 6
Ramp Configuration	Southside Ramps	Southside Ramps	Southside Ramps	Southside Ramps	Offset Ramps	Offset Ramps
Traffic Control	Roundabout	Roundabout	Roundabout	Traffic Signal	Traffic Signal	Traffic Signal
Multimodal facility	Ped/Bike Facilities on North Side*	Shared-use path (North) + Sidewalk (South)	Bike lanes + Sidewalks (Both Sides)	Shared-use path (North Side)	Ped/Bike Facilities on North Side*	Bike Lanes + Sidewalks (Both Sides)
Traffic Calming Benefits	✓	✓	✓	✗	✗	✗
Ped and Bike Facilities Separated from Vehicle Traffic	✓	✓	✗	✓	✓	✗
Separate Pedestrian and Bicycle Facilities	✓*	✓	✓	✗	✓*	✓
Eliminates Intersection Conflicts Between Drivers, Bicyclists, and Pedestrians	✓	✗	✗	✓	✗	✗
Maintains Existing Bridge Width	✓	✓	✓	✗	✓	✗
Forecasted 2050 Design Year Traffic Operations (LOS and Queuing)	LOS A/B Acceptable Queues	LOS A/B Acceptable Queues	LOS A/B Acceptable Queues	LOS B-D Potential Queueing	LOS A-C Potential Queueing	LOS A-C Potential Queueing

* Based on community feedback this alternative proposes a separate bike path and sidewalk on the north side of Samoa Boulevard, except across the overpass where a shared-use path is proposed due to limited available bridge width.

4 Environmental Status

A reconnaissance-level assessment, including a desktop review and site visit, was completed for potential biological constraints.. Based on the preliminary assessment, a rare plant survey is not

recommended. A formal wetland delineation is needed to assess if potential permanent or temporary disturbances to wetlands are avoidable. The City of Arcata should scope for an Initial Study / Mitigated Negative Declaration (IS/MND), rather than a Categorical Exemption.

A cultural resource conditions and constraints analysis was also completed. The project is not anticipated to have significant impacts on cultural or historical resources.

5 Additional Considerations

5.1 System Planning

The project is consistent with the Circulation and Mobility Element of the City of Arcata General Plan, which calls for interchange improvements including roundabouts. The General Plan includes Class II bicycle lanes on Samoa Boulevard through the interchange, while the SAMSIP recommends a lower stress Class IV bikeway and sidewalk to physically separate users from vehicle traffic. The General Plan also includes policies that seek to expand low-stress pedestrian and bicycle facilities and connectivity within Arcata.

This project is consistent with the Caltrans District 1 “HUM 255 Electronic Corridor Management Plan” (eCMP), including locally maintaining SR 255/Samoa Boulevard as a 2-4 lane conventional highway. The project is also consistent with proposed interchange improvements identified in the Arcata General Plan Circulation and Mobility Element to accommodate planned urban growth in the City of Arcata.

5.2 Construction Considerations

A utility pole at the northeast corner of F Street will require relocation. Utility companies will be contacted early in the project to initiate pole relocation per their Arcata franchise agreement.

No prolonged closures are anticipated during construction. Construction flagging for one-way traffic may be needed and standard traffic control will be used. Traffic Control Plans will be provided as necessary.

5.3 Hazardous and Waste Material

There are no expected hazardous materials to be encountered for any aspect of the project. An Initial Site Assessment (ISA) will be completed in a future phase of the project to verify. If hazardous materials are present, proper procedures will be followed for waste removal and disposal.

5.4 Additional Agencies

The City will work with Caltrans and Humboldt County Association of Governments (HCAOG). Arcata will also coordinate with Humbolt Transit Authority, local emergency responders, law enforcement and school districts.

6 Potential funding sources

A portion of the funding for this project will be provided by local City funds. Other funding opportunities are potentially available through state and federal grants including the State

Transportation Improvement Program (STIP), Safe Streets and Roads for All (SS4A), the Caltrans Reconnecting Communities Program (RCP), Strengthening Mobility and Revolutionizing Transportation (SMART) grants, Better Utilizing Investments to Leverage Development (BUILD) discretionary grant program, and the Active Transportation Program (ATP).

7 Tentative Schedule

PID Approval	June 2026
Start of Environmental Study	April 2026
Final Environmental Study	January 2027
Begin Engineering Design	September 2026
Completion of Plans, Specifications, and Estimates	December 2027
Right-of-Way Certificate	March 2028
Ready to Advertise	July 2028
Start Construction (Contract Award)	September 2028
Project Completion	December 2029

8 Project Support

Survey, design and preparation of final plans, specifications and estimates will be performed by City Engineering staff or contracted. City forces or contracted consultant will perform environmental review, preliminary design and public meetings. Construction related testing will be performed by contracted consultant.

9 Report Preparation

This Project Report (PSR) has been prepared by the Arcata Engineering Department, and I hereby attest to its technical content.

Prepared By: _____
Rosanna Southern, EIT
GHD Inc.

Date: 9/16/2025

Reviewed By: _____
Netra Khatri, PE
City Engineer

Date: 9-17-25

10 List of Attachments

A. Study area map
B. Traffic Operations Memorandum
C. 30% Conceptual Plans for the Roundabout Alternative
D. 30% Preliminary Cost Estimate for the Roundabout Alternative

Attachment A.

Study Area Map

Paper Size ANSI A

0 110 220 330 440

Feet

Map Projection: Mercator Auxiliary Sphere
Horizontal Datum: WGS 1984
Grid: WGS 1984 Web Mercator Auxiliary Sphere

N

GHD

City of Arcata
South Arcata Multimodal Safety Improvement Plan

Project No.
Revision No. -
Date **07/29/2025**

Project Study Area

FIGURE 1

N:\US\Azure\EastUS\12625945\GIS\Maps\Deliverables\12625945_ExCon_2024_07_02\12625945_ExCon.aprx - 07_PSRStudyArea
Print date: 29 Jul 2025 - 12:38

Data source: World Hillshade: Sources: Esri, Airbus DS, USGS, NGA, NASA, CGIAR, N Robinson, NCEAS, NLS, OS, NMA, Geodatastyrelsen, Rijkswaterstaat, GSA, Geoland, FEMA, Intermap, and the GIS user community
World Imagery: Maxar. Created by: hmurphy

Attachment B.

Alternatives Traffic Operations Analysis

Technical Memorandum

July 30, 2025

To	Netra Khatri, City Engineer Jak Kirchubel (City of Arcata)		
Copy to	Oona Smith, HCAOG Catharine Crayne, Caltrans D1		
From	Rosanna Southern, EIT	**Project No.**	12625945
Project Name	Arcata US 101 SR 255 Multi-Modal Accessibility and Safety Improvements Project		
Subject	Alternatives Traffic Operations Analysis		

1. Introduction

GHD was retained by the City of Arcata to develop the South Arcata Multimodal Safety Improvements Plan (SAMSIP). The City of Arcata received funding for the SAMSIP through the Caltrans Sustainable Communities Planning Grant. The project includes the US 101 interchange with State Route (SR) 255, also known as Samoa Boulevard, between the roundabout east of the interchange (at Union Street), to F street west of the interchange. In Arcata, the US 101 and SR 255 interchange has created inequitable conditions that exacerbate disconnection between communities east and west of US 101.

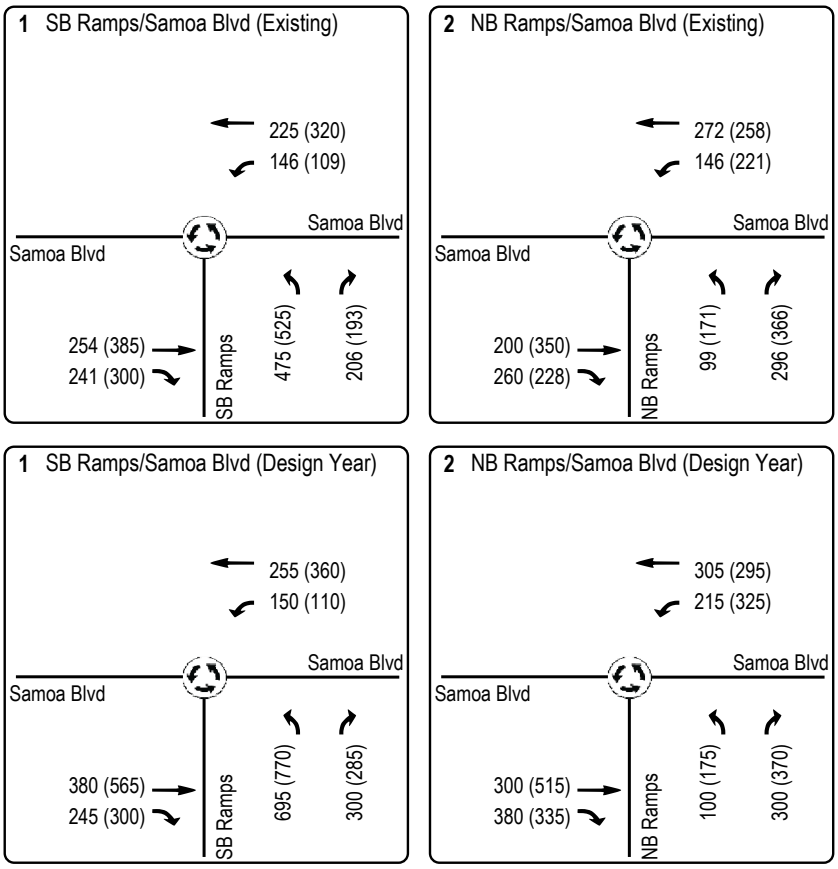
The purpose of this memorandum is to present the traffic operations results for two interchange alternatives for Existing and 2050 Design Year conditions.

1.1 Purpose

The purpose of the SAMSIP is to increase east-west connectivity in southern Arcata through safe, comfortable transportation facilities, specifically addressing barriers to non-motorized transportation. The Plan aims to address transportation inequities and improve access to key destination for all residents, specifically for those walking and bicycling.

2. Existing and Forecasted Turning Movement Volumes

Figure 2.1 presents Existing and projected 2050 Design Year intersection volumes with the roundabout intersection configuration for the AM and PM peak hours. Existing conditions ramp volumes for the interchange are based on weekday volume data provided by Caltrans from August 23, 2022 through August 29, 2022. 2050 Design Year forecasts were projected using growth rates determined from the Humboldt County Regional Travel Demand Model. The traffic forecast methodology is documented in a separate memorandum dated March 14, 2025, which was approved by Caltrans D1 staff for the purposes of the SAMSIP.



Legend

XX (YY) AM (PM) Peak Hour Volumes

Turn Lane

Stop Sign

Traffic Signal

Roundabout

GHD

City of Arcata
South Arcata Multimodal Safety Improvement Plan (SAMSIP)
Existing and Design Year Conditions Peak Hour Traffic Volumes, Lane Geometries & Traffic Control

Project No. **12625945**
Report No. **001**
Date **5/2/25**

FIGURE 2.1

3. Traffic Analysis Policies and Methodology

3.1 Level of Service Methodologies

Traffic operations are quantified through the determination of "Level of Service" (LOS). LOS is a qualitative measure of traffic operating conditions, whereby a letter grade "A" through "F" is assigned to an intersection, representing progressively worsening traffic operations as determined by vehicle delay or congestion. LOS “A” represents free-flow operating conditions and LOS “F” represents over-capacity conditions. These LOS letters correspond to numerical ranges of delay that are included in Table 3.1. Delay was calculated for the study intersection control types using the methods documented in the Transportation Research Board Publication Highway Capacity Manual, Sixth Edition (HCM 6).

3.1.1 Intersection Operations

Synchro 11 (Trafficware) was used to implement HCM 6 analysis methodologies to evaluate AM and PM peak hour conditions. Synchro 11 has the capability to produce results based on HCM 2000, HCM 2010, HCM 6, and Synchro methodologies, and considers intersection signal timing and queuing constraints when calculating delay, the corresponding delay, and queue lengths. Intersection Level of Service (LOS) was determined for the signalized intersections using the methods documented in HCM 6. For signalized intersections, a LOS determination is based on the calculated averaged delay for all approaches and movements. SimTraffic was used to determine 95th percentile queue results for the signalized alternative. SIDRA Intersection 9.0 and the Sidra Standard Roundabout Capacity Model were used to determine LOS and 95th percentile queue results for the roundabout alternative. The vehicular-based LOS criteria for different types of intersection controls are presented in Table 3.1. All Synchro and SimTraffic reports are included in Attachment 1, and all Sidra results are included in Attachment 2.

Agency Level of Service Guidelines and Policies

Caltrans

Caltrans' Guide for the Preparation of Traffic Impact Studies contains the following policy pertaining to the LOS standards within Caltrans jurisdiction:

> *Caltrans has transitioned away from LOS thresholds in favor of considering Vehicle Miles Traveled (VMT). Caltrans' Transportation Analysis Framework (TAF) and Transportation Analysis Under CEQA (TAC) state that intersection improvement projects are "not likely to lead to a measurable and substantial increase in VMT and which therefore generally should not require an induced travel analysis per OPR’s Technical Advisory."*

City of Arcata

The Arcata General Plan 2045 contains the following policy pertaining to the LOS standards within the City’s jurisdiction:

> ***Operational analysis and intersection level of service (LOS) summary.*** *Deprioritize level of service as a management consideration for City streets, and shift focus to methods of analysis that better measure a project’s transportation-related environmental impacts such as Vehicle Miles Traveled.*

As this project will be looking at implementing intersection traffic controls at the interchange, it will not create an increase in VMT. As the City and Caltrans do not have a defined LOS threshold for intersection operations, a reference of LOS D was used since the interchange is in an urbanized area.

Table 3.1: Level of Service (LOS) Criteria for Intersections

Level of Service	Type of Flow	Delay	Maneuverability	Stopped Delay per Vehicle (seconds per vehicle)	
				Signalized	Un-signalized
A	Stable Flow	Very slight delay. Progression is very favorable, with most vehicles arriving during the green phase not stopping at all.	Turning movements are easily made, and nearly all drivers find freedom of operation.	≤10.0	≤10.0
B	Stable Flow	Good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	Vehicle platoons are formed. Many drivers begin to feel somewhat restricted within groups of vehicles.	>10.0 and ≤20.0	>10.0 and ≤15.0
C	Stable Flow	Higher delays resulting from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear at this level. The number of vehicles stopping is significant, although many still pass through the intersection without stopping.	Back-ups may develop behind turning vehicles. Most drivers feel somewhat restricted	>20.0 and ≤35.0	>15.0 and ≤25.0
D	Approaching Unstable Flow	The influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume-to-capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	Maneuverability is severely limited during short periods due to temporary back-ups.	>35.0 and ≤55.0	>25.0 and ≤35.0
E	Unstable Flow	Generally considered to be the limit of acceptable delay. Indicative of poor progression, long cycle lengths, and high volume-to-capacity ratios. Individual cycle failures are frequent occurrences.	There are typically long queues of vehicles waiting upstream of the intersection.	>55.0 and ≤80.0	>35.0 and ≤50.0
F	Forced Flow	Generally considered to be unacceptable to most drivers. Often occurs with over saturation. May also occur at high volume-to-capacity ratios. There are many individual cycle failures. Poor progression and long cycle lengths may also be major contributing factors.	Jammed conditions. Back-ups from other locations restrict or prevent movement. Volumes may vary widely, depending principally on the downstream back-up conditions.	>80.0	>50.0

4. Alternatives

Two interchange alternatives were analyzed to determine feasible intersection controls and geometries that meet the existing and projected future demand of the interchange: Roundabouts vs Traffic Signals.

Alternative 1 consists of two roundabouts at the ramp termini, with one through lane in each direction on the overcrossing, and a multi-use path on the north side of the interchange. The US 101 Ramps were located on the south side of Samoa Boulevard for the Roundabout Alternative to determine the feasibility of creating a multi-use path north of Samoa Boulevard that is completely separated from vehicular traffic, and can fit within the available bridge width for the US 101 overcrossing.

The roundabouts are spaced approximately 1,000 feet apart with turn pockets that provide access to the US 101 ramps. The roundabout alternative also reduces the number of lanes west of the interchange to provide space for the multi-use path into the city (or separate pedestrian and bicycle facilities if desired). Figure 4.1 presents a concept layout for this alternative in Sidra software.

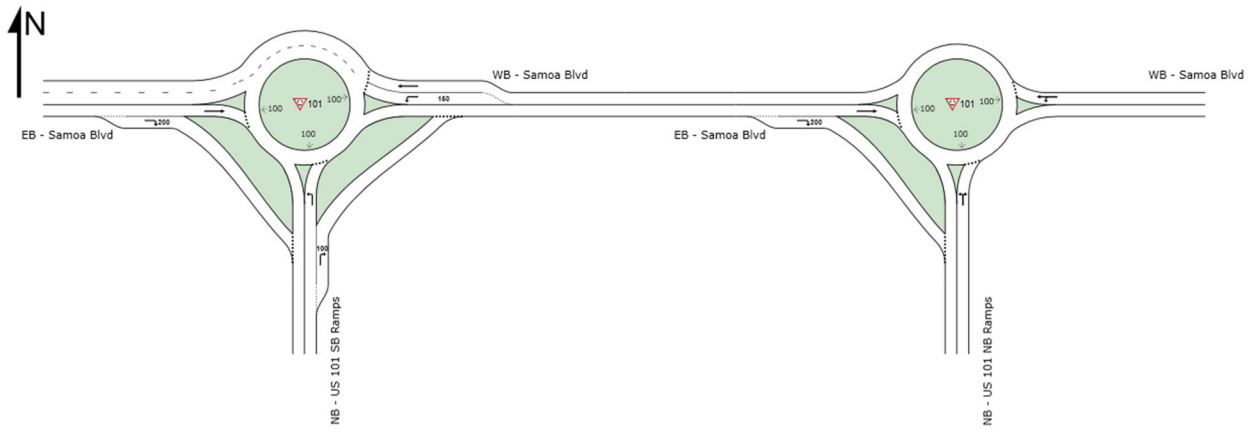


Figure 4.1: Alternative 1 – Roundabouts in Sidra

Alternative 2 consists of two signalized intersections at the ramp termini that also provides one lane in each direction on the overcrossing to preserve the structure's width and provide space for a multi-use path on the north side. The US 101 Ramps are "offset" where the southbound ramps are on the north side, and the northbound ramps are on the south side of the interchange. This configuration was chosen to allow the existing overcrossing to be retained with a proposed multi-use path proposed across the interchange on the north side.

The intersections were spaced approximately 1,000 ft apart with turn pockets that provided access onto the US 101 ramps. The number of lanes west of the interchange were reduced to provide space for the multi-use path to continue west from the overcrossing into the city. Figure 4.2 presents a concept layout for this alternative in Synchro software.

Figure 4.2: Alternative 2 – Signals in Synchro

5. Existing Conditions – Alternatives Traffic Operations

The Existing conditions analysis utilized existing traffic volumes, proposed interchange geometry and intersection controls to determine anticipated traffic operations with current travel patterns. The roundabout and signalized intersection alternatives were analyzed to determine feasible options that will adequately serve existing volumes.

5.1 Roundabouts

Table 5.1 presents the delay (s/veh) and LOS results for the roundabout alternative in Existing conditions. Both roundabouts operate acceptably.

Table 5.1: Existing Conditions LOS Operations – Roundabout

#	Intersection	Control Type[1]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	Samoa Blvd & US 101 SB Ramps	RNDBT	D	5.4	A	6.4	A
2	Samoa Blvd & US 101 NB Ramps	RNDBT	D	5.8	A	8.6	A

Notes:
1. LOS = Delay based on average of all approaches for Signalized intersections
2. **Bold** = Unacceptable Conditions

Table 5.2 presents the roundabout alternative 95th percentile queue results for Existing conditions. The 95th percentile queues do not exceed the available storage provided at the intersections in Existing conditions.

Table 5.2: Existing Conditions 95th Percentile Queue Results – Roundabout

Int. #	Intersection/Approach	Control Type	Existing Roundabout Alternative 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***Samoa Blvd & US 101 SB Ramps***				
	Eastbound Thru	RNDBT	25	55	700
	Eastbound Right		30	40	200
	Westbound Left		30	25	150
	Westbound Thru		40	70	1000
	Northbound Left		75	95	
	Northbound Right		25	30	100
2	***Samoa Blvd & US 101 NB Ramps***				
	Eastbound Thru	RNDBT	20	50	1000
	Eastbound Right		30	30	200
	Westbound Left/Thru		70	95	1000
	Northbound Left/Right		65	180	275

Note: **Bold** text indicates queues that exceed available storage

5.2 Signalized Intersections

Table 5.3 presents the delay (s/veh) and LOS results for the signalized alternative in Existing conditions. Both intersections operate acceptably.

Table 5.3: Existing Conditions LOS Operations – Signals

#	Intersection	Control Type[1]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	Samoa Blvd & US 101 SB Ramps	Signal	D	11.5	B	16.9	B
2	Samoa Blvd & US 101 NB Ramps	Signal	D	8.8	A	14.5	B

Notes:
1. LOS = Delay based on average of all approaches for Signalized intersections
2. **Bold** = Unacceptable Conditions

Table 5.4 presents the signalized alternative 95th percentile queue results for Existing conditions. The 95th percentile queues do not exceed the available storage provided at the intersections in Existing conditions.

Table 5.4: Existing Conditions 95th Percentile Queue Results – Traffic Signals

Int. #	Intersection/Approach	Control Type	Existing Signal Alternative 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***Samoa Blvd & US 101 SB Ramps***				
	Eastbound Left	Signal	140	185	250
	Eastbound Thru		85	125	730
	Westbound Thru		140	195	1000
	Westbound Right		80	75	200
	Southbound Left		150	155	300
	Southbound Right		130	180	900
2	***Samoa Blvd & US 101 NB Ramps***				
	Eastbound Thru	Signal	115	205	1000
	Eastbound Right		85	140	200
	Westbound Left		90	165	250
	Westbound Thru		90	105	920
	Northbound Left		90	125	300
	Northbound Right		115	165	900

Note: **Bold Red** text indicates queues that exceed available storage. **Bold** text indicates queues resulting in turn lane starvation.

6. 2050 Design Year Conditions – Alternatives Traffic Operations

The 2050 Design Year conditions analysis utilized forecasted 2050 traffic volumes, proposed interchange geometry, and intersection controls to determine future year traffic operations.

6.1 Roundabouts

Table 6.1 presents the delay (s/veh) and LOS results for the roundabout alternative in 2050 Design Year conditions. Both roundabouts are projected to operate acceptably.

Table 6.1: 2050 Design Year Conditions LOS Operations – Roundabout

#	Intersection	Control Type[1]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	Samoa Blvd & US 101 SB Ramps	RNDBT	D	7.4	A	11.3	B
2	Samoa Blvd & US 101 NB Ramps	RNDBT	D	6.0	A	10.2	B

Notes:
1. LOS = Delay based on average of all approaches for Roundabouts
2. **Bold** = Unacceptable Conditions

Table 6.2 presents the roundabout alternative 95th percentile queue results for 2050 Design Year conditions. All 95th percentile queues are projected to be within the available storage in Design Year conditions. Queuing is not anticipated to exceed capacity on the bridge between intersections. Additionally, queuing is not expected to

exceed capacity on the US 101 off ramps. Therefore, it is unlikely queuing will spill back into freeway traffic in 2050 Design Year conditions.

Table 6.2: 2050 Design Year Conditions 95th Percentile Queue Results – Roundabout

Int. #	Intersection/Approach	Control Type	2050 Roundabout Alternative 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***Samoa Blvd & US 101 SB Ramps***				
	Eastbound Thru	RNDBT	50	85	700
	Eastbound Right		30	40	200
	Westbound Left		45	45	150
	Westbound Thru		70	170	1000
	Northbound Left		175	395	
	Northbound Right		45	55	100
2	***Samoa Blvd & US 101 NB Ramps***				
	Eastbound Thru	RNDBT	35	90	1000
	Eastbound Right		50	50	200
	Westbound Left/Thru		85	130	
	Northbound Left/Right		70	260	

Note: **Bold** text indicates queues that exceed available storage

6.2 Signalized Intersections

Table 6.3 presents the delay (s/veh) and LOS results for the signalized alternative in 2050 Design Year conditions. Both intersections are projected to operate acceptably.

Table 6.3: 2050 Design Year Conditions LOS Operations – Signals

#	Intersection	Control Type[1]	Target LOS	AM Peak Hour		PM Peak Hour	
				Delay	LOS	Delay	LOS
1	Samoa Blvd & US 101 SB Ramps	Signal	15.1	B	21.2	C	15.1
2	Samoa Blvd & US 101 NB Ramps	Signal	10.0	A	17.1	B	10.0

Notes:
1. LOS = Delay based on average of all approaches for Signalized intersections
2. **Bold** = Unacceptable Conditions

Table 6.4 presents the signalized alternative 95th percentile queue results for 2050 Design Year conditions. All 95th percentile queues are projected to be within the available storage in Design Year conditions. However, in the PM peak at the Samoa Boulevard & US 101 southbound ramps, the westbound through queue exceeds the westbound right turn pocket storage, and the southbound right queue exceed southbound left turn pocket storage, resulting in potential lane starvation. The same is true for the Samoa Boulevard and US 101 northbound ramps at the PM peak for the eastbound through lane, which exceeds the eastbound right turn pocket storage.

Table 6.4: 2050 Design Year Conditions 95th Percentile Queue Results – Traffic Signals

Int. #	Intersection/Approach	Control Type	2050 Signal Alternative 95th Percentile Queue (ft)		Available Storage
			AM Peak Hour	PM Peak Hour	
1	***Samoa Blvd & US 101 SB Ramps***				
	Eastbound Left	Signal	165	225	250
	Eastbound Thru		120	185	730
	Westbound Thru		180	**270**	1000
	Westbound Right		115	140	200
	Southbound Left		260	285	300
	Southbound Right		235	**375**	900
2	***Samoa Blvd & US 101 NB Ramps***				
	Eastbound Thru	Signal	165	**270**	1000
	Eastbound Right		135	175	200
	Westbound Left		160	245	250
	Westbound Thru		100	95	920
	Northbound Left		100	165	300
	Northbound Right		130	185	900

Note: **Bold Red** text indicates queues that exceed available storage. **Bold** text indicates queues resulting in turn lane starvation.

7. Conclusion

The following conclusions are made based on the results of the alternative analysis for Existing and Design Year conditions.

- Both interchange alternatives operate acceptably in Existing conditions. 95th percentile queues do not exceed storage, and queues do not spill back onto the freeway.
- The roundabout alternative is projected to operate with acceptable LOS in 2050 Design Year conditions. Queues along the overcrossing are not projected to exceed the available space between intersections, and queues are not projected to exceed the storage for any movements.
- The signal alternative is projected to operate with acceptable LOS in 2050 Design Year conditions. Queues along the overcrossing are not projected to exceed the available storage between intersections. However, at the intersection of Samoa Boulevard and US 101 southbound ramps during PM peak hour, there are potential for lane starvation for the westbound right and southbound left turn pockets. Lane starvation may also occur at the intersection of Samoa Boulevard and US 101 northbound ramps for the eastbound right turn pocket. Queues are not anticipated to spill back onto the freeway.

Attachment C.

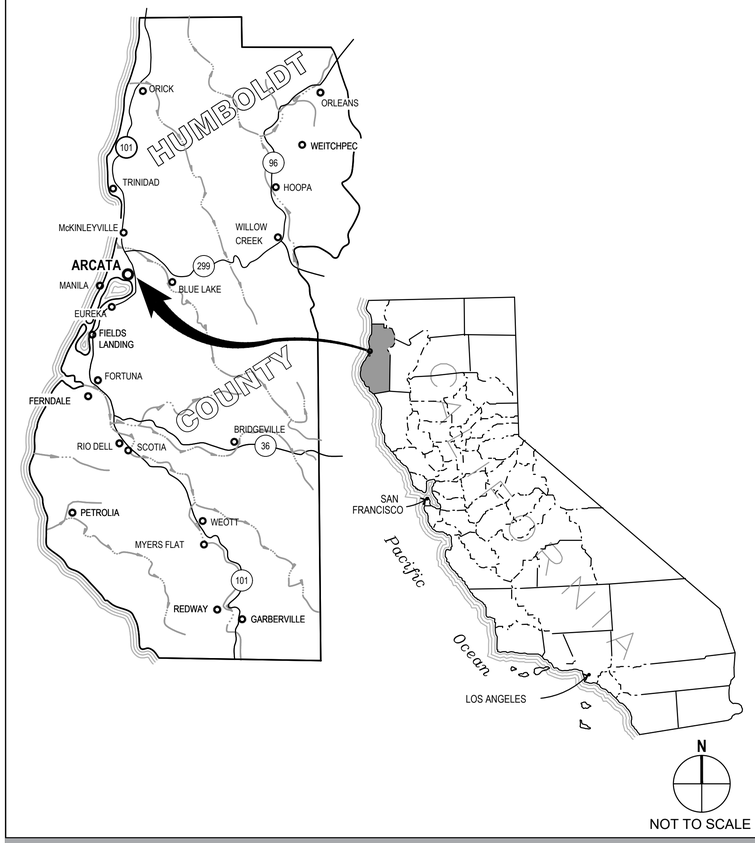
30% Conceptual Plans for the Roundabout Alternative

US 101 SR 255 MULTI-MODAL IMPROVEMENTS PROJECT

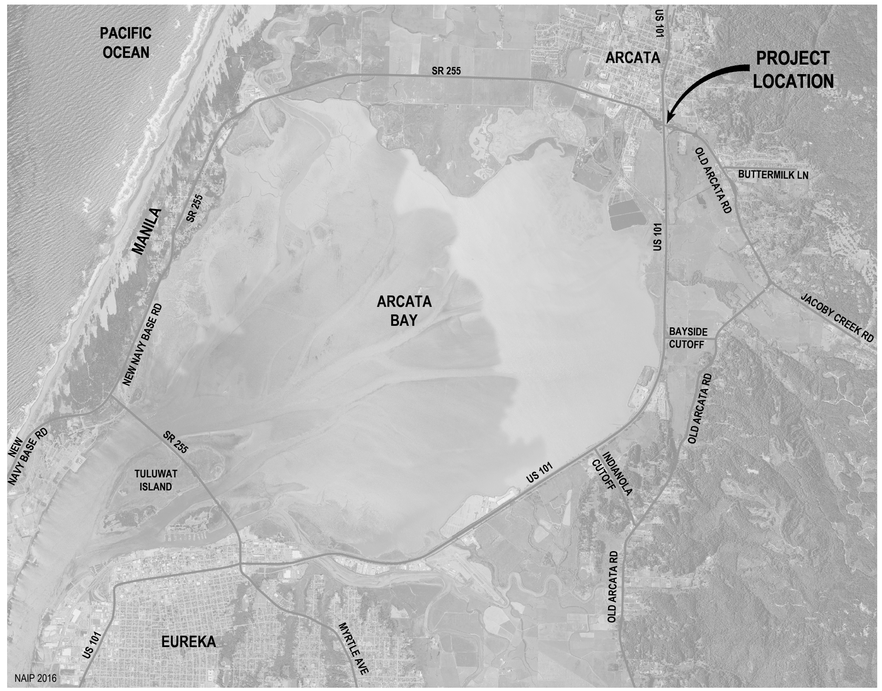
June 2025

PROJECT NUMBER: 12625945

AREA MAP



LOCATION MAP



APPROVALS

RECOMMENDED

MEGHAN SIGLER
RCE 88235
CIVIL ENGINEER
GHD INC.

DATE

APPROVED

NETRA KHATRI
RCE 75428
CITY ENGINEER
CITY OF ARCATA

DATE

CITY COUNCIL MEMBERS

SARAH SCHAEFER, MAYOR
MEREDITH MATTHEWS, VICE-MAYOR
STACY ATKINS-SALAZAR, COUNCILMEMBER
ALEXANDRA STILLMAN, COUNCILMEMBER
KIMBERLEY WHITE, COUNCILMEMBER

CITY MANAGER

KAREN DIEMER

SHEET INDEX

30% CONCEPTS

No.	Issue	Checked	Approved	Date
Author	S. TIEFENBACH	Drafting Check	O. GOODE	Project Manager	T. TREGENZA
Designer	S. TIEFENBACH	Design Check	O. GOODE	Project Director	J. WOLF

Bar is one inch on original size sheet
0 1"

REGISTERED PROFESSIONAL ENGINEER MEGHAN E. SIGLER No. 88235 CIVIL STATE OF CALIFORNIA

GHD Inc.
2200 21st Street
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Client: CITY OF ARCATA
Project: US 101 SR 255 MULTI-MODAL IMPROVEMENTS PROJECT
Title: TITLE SHEET
Size: ANSI D
Status Code:
Project No.: 12625945
Date: 2025-07-22
Scale: AS NOTED
Sheet No.: G-1
Sheet: 1 of X

Plot Date: 28 July 2025 - 9:59 AM
Plotted By: Cait O'Sullivan
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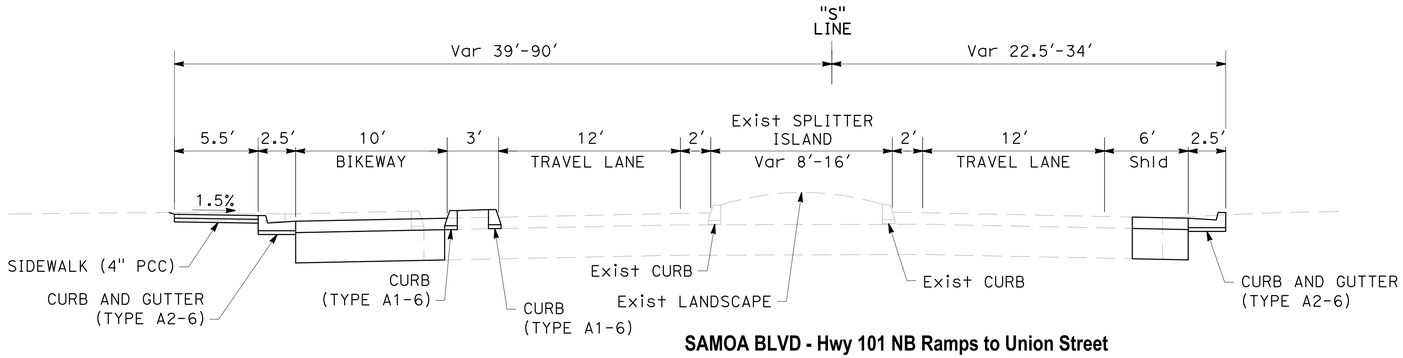

SAMOA BLVD - Hwy 101 NB Ramps to Union Street

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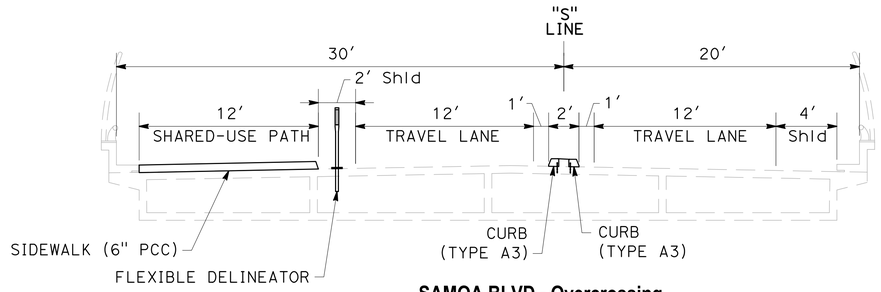

SAMOA BLVD - Overcrossing

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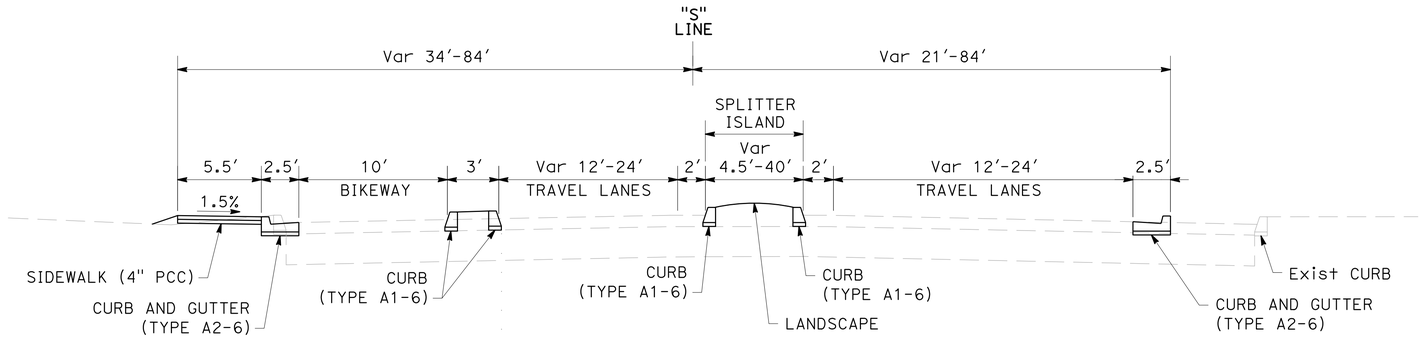

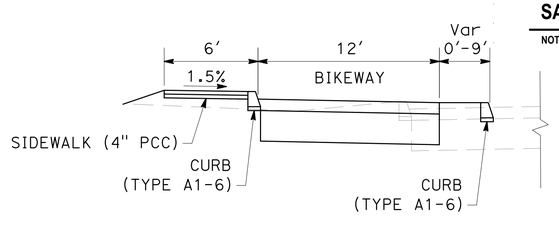

SAMOA BLVD - F Street to Hwy 101 SB Ramps

NOT TO SCALE

30% CONCEPTS

No.	Issue	Checked	Approved	Date
Author	C. O'SULLIVAN	Drafting Check	O. GOODE	Project Manager	T. TREGENZA
Designer	O. GOODE	Design Check	M. SIGLER	Project Director	J. WOLF

Bar is one inch on original size sheet
0 1"

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Client **CITY OF ARCATA**

Project **US 101 SR 255 MULTI-MODAL IMPROVEMENTS PROJECT**

Title **TYPICAL SECTIONS**

Size **ANSI D**

Status Code

Project No.	Date	Scale	Sheet No.	Sheet
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Plot Date: 28 July 2025 - 9:57 AM
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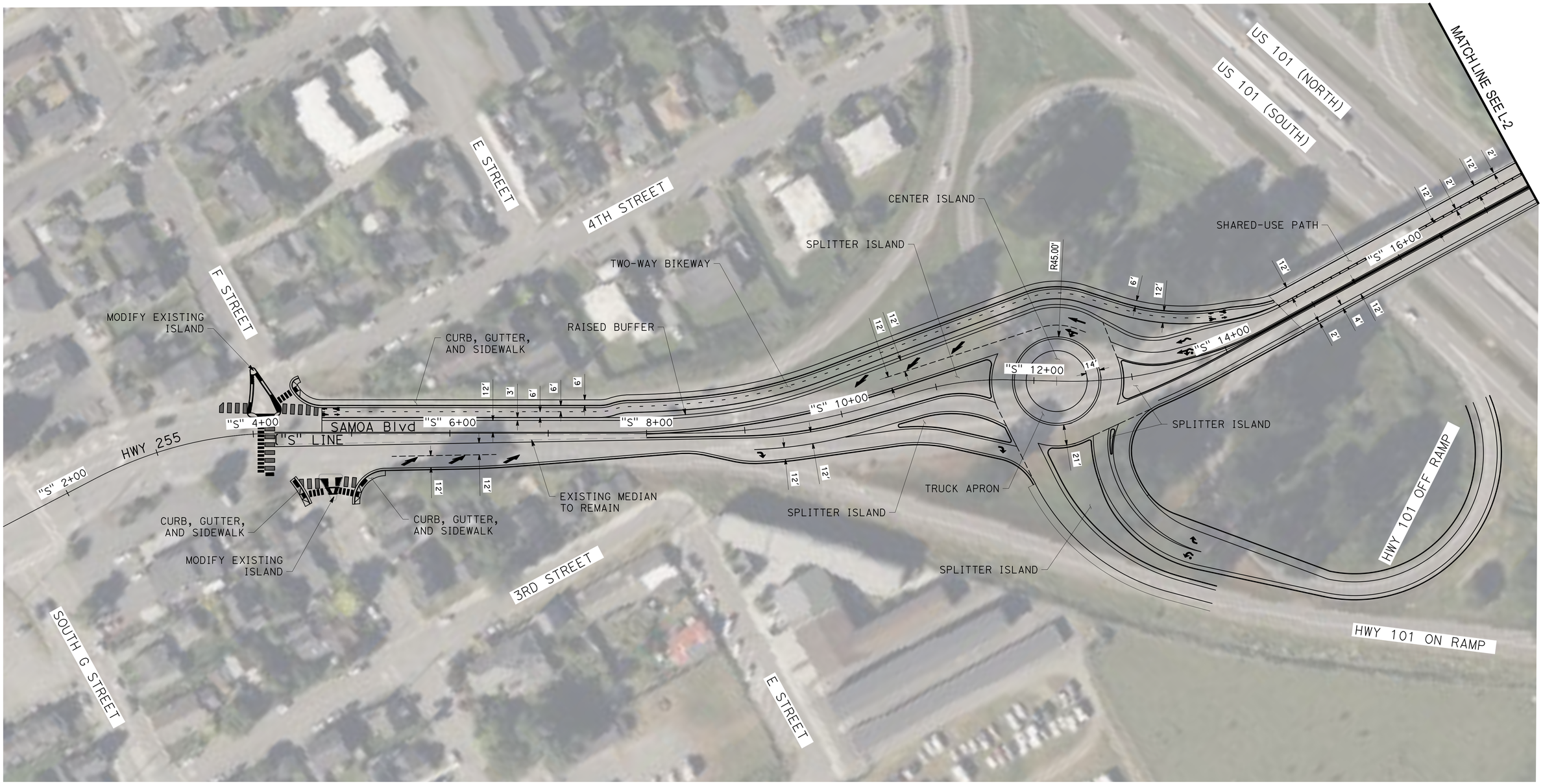

PLAN VIEW: STA 4+00 TO 17+50

SCALE: AS SHOWN

0 50' 100'

30% CONCEPTS

No.	Issue	Checked	Approved	Date
Author	C. O'SULLIVAN	Drafting Check	O. GOODE	Project Manager	T. TREGENZA
Designer	C. O'SULLIVAN	Design Check	O. GOODE	Project Director	J. WOLF

Bar is one inch on original size sheet
0 1"

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Client: CITY OF ARCATA

Project: US 101 SR 255 MULTI-MODAL IMPROVEMENTS PROJECT

Project No.: 12625945 | Date: 2025-07-22 | Scale: AS NOTED

Title: LAYOUT

Size: ANSI D

Status Code

Sheet No.: L-1 | Sheet: 3 of X

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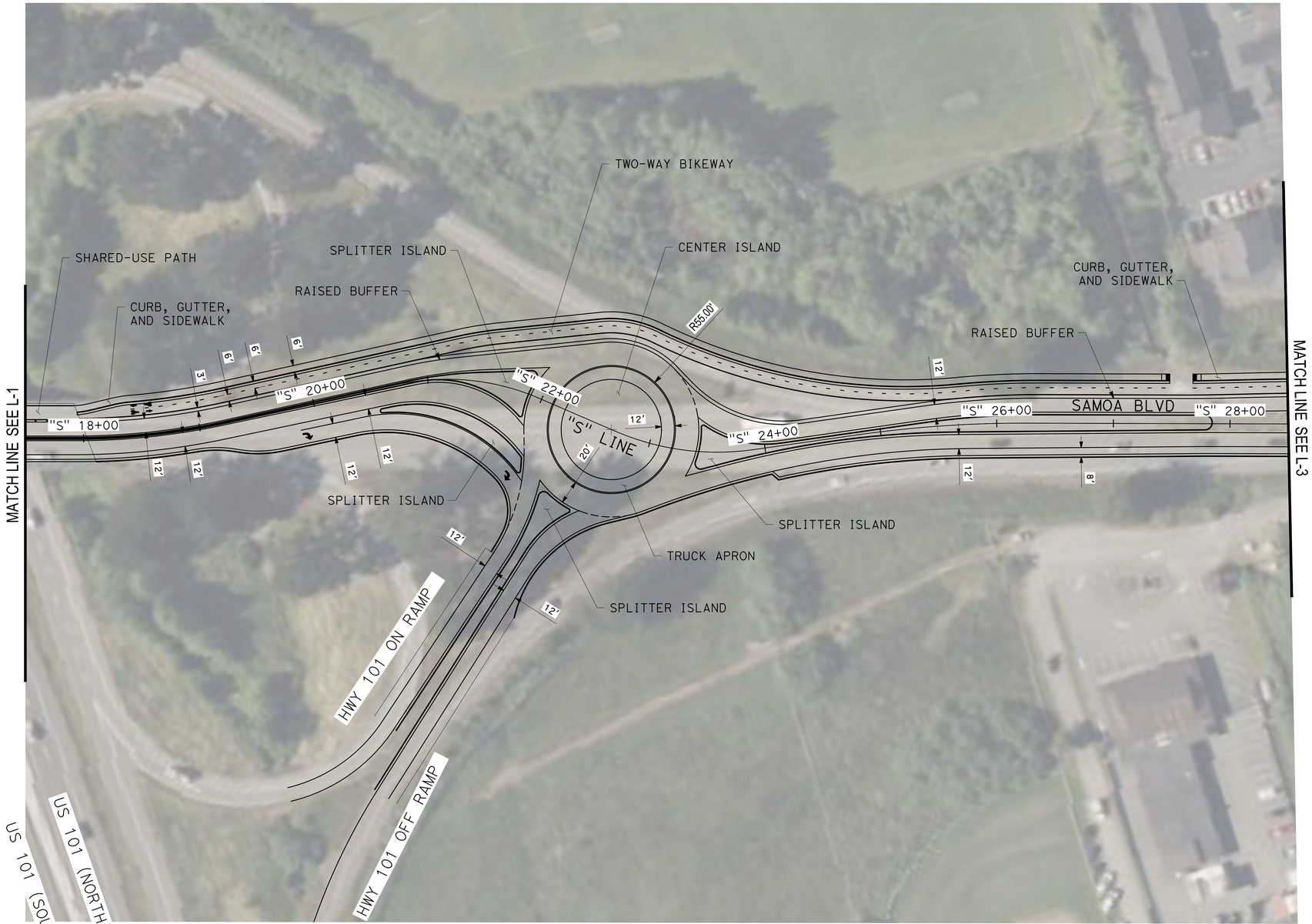

PLAN VIEW: STA 17+50 TO 28+50

SCALE: AS SHOWN

0 50' 100'

N

30% CONCEPTS

No.	Issue	Checked	Approved	Date
Author	C. O'SULLIVAN	Drafting Check	O. GOODE	Project Manager	T. TREGENZA
Designer	C. O'SULLIVAN	Design Check	O. GOODE	Project Director	J. WOLF

Bar is one inch on original size sheet

0 1"

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Client **CITY OF ARCATA**

Project **US 101 SR 255 MULTI-MODAL IMPROVEMENTS PROJECT**

Title **LAYOUT**

Size **ANSI D**

Status Code

Project No. **12625945**

Date **2025-07-22**

Scale **AS NOTED**

Sheet No. **L-2**

Sheet **4 of X**

Plot Date: 28 July 2025 - 9:38 AM
Plotted By: Cait O'Sullivan
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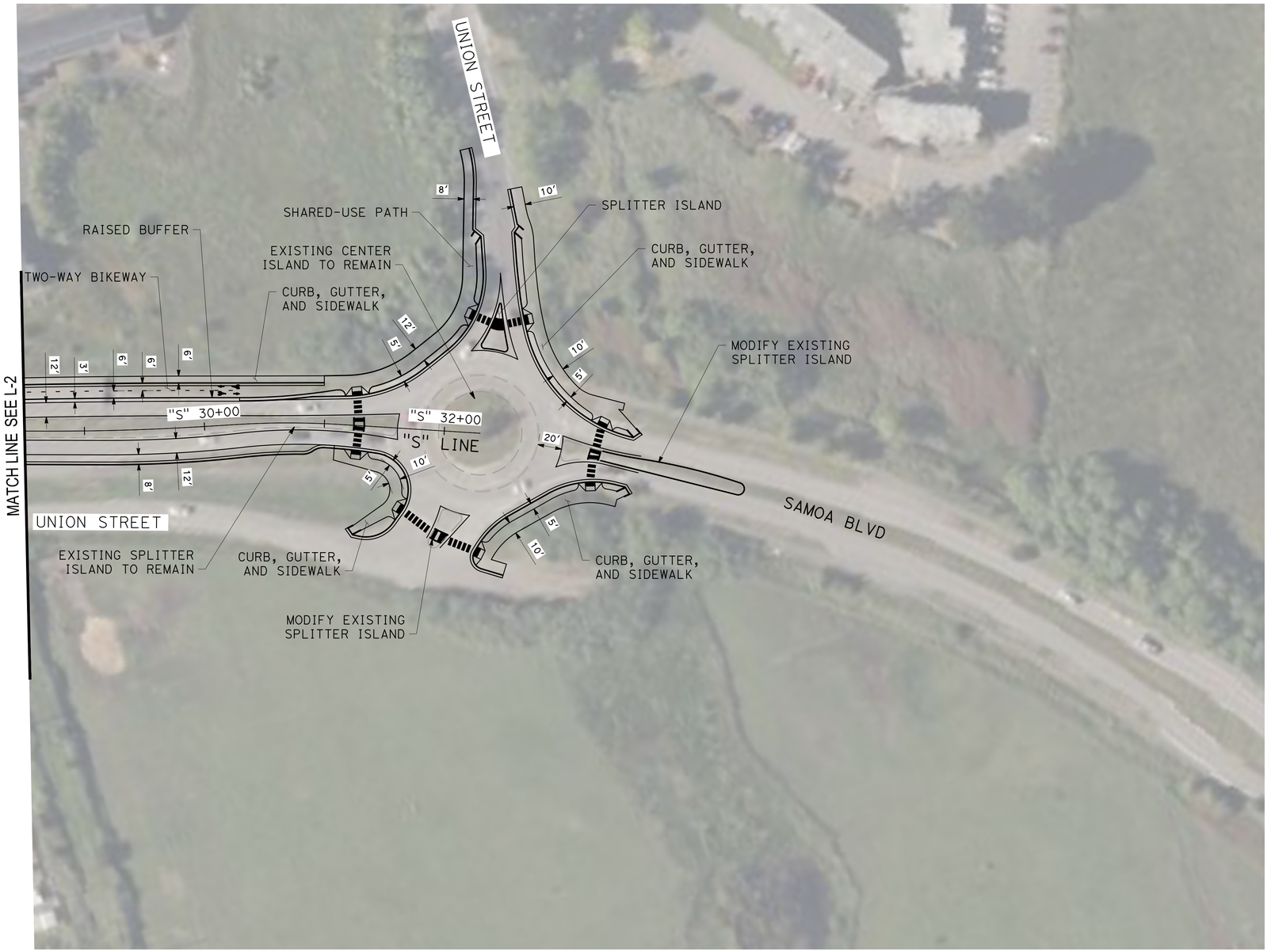

PLAN VIEW: STA 28+50 TO END

SCALE: AS SHOWN

0 50' 100'

N

30% CONCEPTS

No.	Issue		Checked	Approved	Date
Author	C. O'SULLIVAN	Drafting Check	O. GOODE	Project Manager	T. TREGENZA
Designer	C. O'SULLIVAN	Design Check	O. GOODE	Project Director	J. WOLF

Bar is one inch on original size sheet

0 1"

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Client: CITY OF ARCATA

Project: US 101 SR 255 MULTI-MODAL IMPROVEMENTS PROJECT

Title: LAYOUT

Size: ANSI D

Status Code

Project No.	Date	Scale	Sheet No.	Sheet
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Plot Date: 28 July 2025 - 9:38 AM
Plotted By: Cait O'Sullivan
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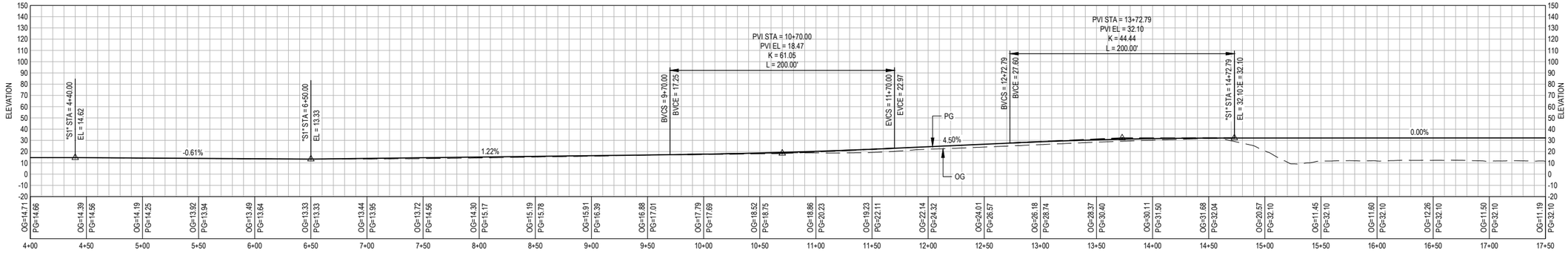

PROFILE VIEW: STA 4+00 TO STA 17+50

SCALE: AS SHOWN

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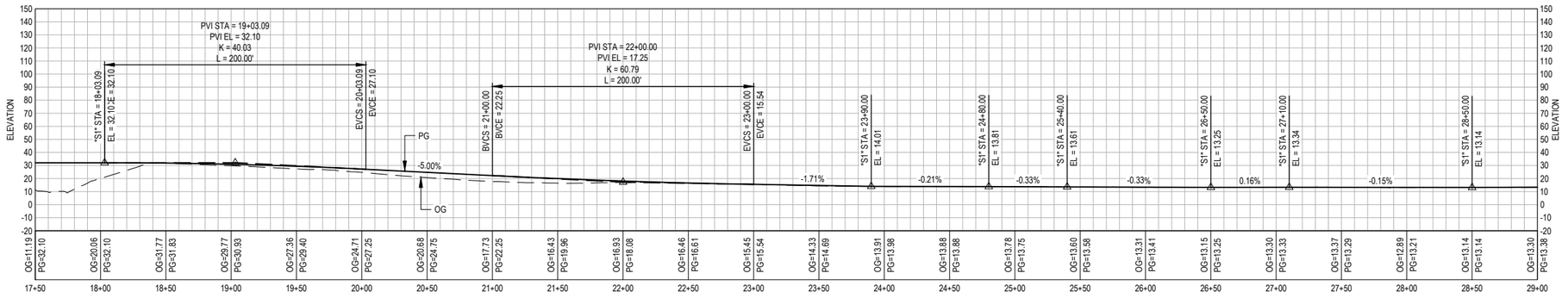
0 50' 100' VERTICAL



PROFILE VIEW: STA 17+50 TO STA 29+00

SCALE: AS SHOWN

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0 50' 100' VERTICAL

30% CONCEPTS

No.	Issue	Checked	Approved	Date
Author	**O. GOODE**	Drafting Check	**M. SIGLER**	Project Manager **T. TREGENZA**
Designer	**O. GOODE**	Design Check	**M. SIGLER**	Project Director **J. WOLF**

Bar is one inch on original size sheet

0 1"

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Client **CITY OF ARCATA**

Project **US 101 SR 255 MULTI-MODAL IMPROVEMENTS PROJECT**

Title **PROFILE**

Size **ANSI D**

Status Code

Project No. **12625945**

Date **2025-07-22**

Scale **AS NOTED**

Sheet No. **PD-1**

Sheet **6 of X**

Plot Date: 28 July 2025 - 10:01 AM
Plotted By: Cait O'Sullivan
Filename: C:\ADSK\ACCDocs\GHD Services Pty Ltd\12625945-Arcata US 101 SR 255 Impr\Project Files\01 WIP\Civil\C3D\Sheets\12625945fa001.dwg

Attachment D.

30% Preliminary Cost Estimate for the Roundabout Alternative

PROJECT

PLANNING COST ESTIMATE ©

EA: ***EA: PID:***

PID:

District-County-Route: 01-HUMBOLDT-1

PM: 8.6 / 85.7

Type of Estimate : Project Initiation Document

Program Code :

Project Limits : On Route 101 in Arcata

Project Description: Multi-modal Accessibility and Safety Improvements Project

Scope : Construct curb, gutter, sidwalk, bike lanes, shared-use paths, roundabouts

Alternative : #1

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	$ 31,108,400	$ 35,850,084
TOTAL STRUCTURES COST	$ -	$ -
SUBTOTAL CONSTRUCTION COST	$ 31,108,400	$ 35,850,084
TOTAL RIGHT OF WAY COST	$ 200,000	$ 206,400
TOTAL CAPITAL OUTLAY COSTS	$ 31,309,000	$ 36,057,000
PA/ED SUPPORT	$ 782,725	$ 807,772
PS&E SUPPORT	$ 4,696,350	$ 5,001,725
RIGHT OF WAY SUPPORT	$ 313,090	$ 333,448
CONSTRUCTION SUPPORT	$ 3,130,900	$ 3,441,187
TOTAL SUPPORT COST	$ 8,924,000	$ 9,585,000
TOTAL PROJECT COST	$ 40,250,000	$ 45,650,000

Programmed Amount

	Month	/ Year
Date of Estimate (Month/Year)	July	/ 2025
Estimated Construction Start (Month/Year)	Sept	/ 2028
Number of Working Days (Assumes Delayed Start Clause for Signal Equip Acquisition) =	180	
Estimated Mid-Point of Construction (Month/Year)	April	/ 2029
Estimated Construction End (Month/Year)	December	/ 2029
Number of Plant Establishment Days	360	

Estimated Project Schedule

PID Approval	1/1/2026
PA/ED Approval	1/1/2027
PS&E	9/1/2026
RTL	7/1/2028
Begin Construction	9/1/2028

Reviewed by District O.E. or Cost Estimate Certifier

Office Engineer / Cost Estimate Certifier **Date** **Phone**

Approved by Project Manager

Project Manager **Date** **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	**Earthwork**	$	6,775,000
2	**Pavement Structural Section**	$	3,436,500
3	**Drainage**	$	758,200
4	**Specialty Items**	$	55,000
5	**Environmental**	$	1,159,500
6	**Traffic Items**	$	4,125,500
7	**Detours**	$	50,000
8	**Minor Items**	$	1,636,000
9	**Roadway Mobilization**	$	1,799,600
10	**Supplemental Work**	$	130,000
11	**State Furnished**	$	2,204,600
12	**Time-Related Overhead**	$	1,799,600
13	**Roadway Contingency**	$	7,178,900
	TOTAL ROADWAY ITEMS	**$**	**31,108,400**

Estimate Prepared By :

Name and Title | Date | Phone

Estimate Reviewed By : Meghan Sigler, GHD, PM (530) 242-1700

Name and Title | Date | Phone

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

SECTION 1: EARTHWORK

Item code		Unit	Quantity		Unit Price ($)			Cost
190101	Roadway Excavation	CY	7,000	x	300.00	=	$	2,100,000
190101	Roadway Excavation (Ramp Removal)	CY	9,500	x	300.00	=	$	2,850,000
152320	Lead Compliance Plan	LS	1	x	5,000.00	=	$	5,000
19801X	Imported Borrow	CY	7,000	x	250.00	=	$	1,750,000
160102	Clearing & Grubbing	LS	1	x	50,000.00	=	$	50,000
100100	Develop Water Supply	LS	1	x	20,000.00	=	$	20,000

TOTAL EARTHWORK SECTION ITEMS $ 6,775,000

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
190185	Shoulder Backing	TON	200	x	80.00	=	$	16,000
378000	Micro-Surfacing	TON	1,000	x	250.00	=	$	250,000
390132	Hot Mix Asphalt (Type A)	TON	4,500	x	165.00	=	$	742,500
260203	Class 2 Aggregate Base	CY	6,000	x	120.00	=	$	720,000
730010	Minor Concrete (Curb)	LF	1,200	x	40.00	=	$	48,000
730070	Detectable Warning Surface	SQFT	1,000	x	50.00	=	$	50,000
731504A	Minor Concrete (Curb and Gutter)	LF	6,000	x	60.00	=	$	360,000
731623	Minor Concrete (Curb Ramp)	SQFT	2,000	x	25.00	=	$	50,000
731521A	Minor Concrete (Sidewalk)	CY	800	x	1,500.00	=	$	1,200,000

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS $ 3,436,500

Alternative 1

EA: PID:

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost	
510090	Structural Concrete, Box Culvert	CY		x		=	$	-	
15080X	Remove Culvert	EA/LF		x		=	$	-	
150820	Modify Inlet	EA		x		=	$	-	
155232	Sand Backfill	CY		x		=	$	-	
15020X	Abandon Culvert	EA/LF		x		=	$	-	
152430	Adjust Inlet	LF		x		=	$	-	
155003	Cap Inlet	EA		x		=	$	-	
510501	Minor Concrete	CY		x		=	$	-	
510502	Minor Concrete (Minor Structure)	CY	50	x	2,000.00	=	$	100,000	Assumed 5CY per inlet. Assumed 10 inlets.
5105XX	Minor Concrete (Type XX)	CY		x		=	$	-	
620XXX	XX" Alternative Pipe Culvert (Type X)	LF		x		=	$	-	
6411XX	XX" Plastic Pipe	LF		x		=	$	-	
65XXXX	18" Reinforced Concrete Pipe	LF	1,000	x	500.00	=	$	500,000	
6650XX	XX" Corrugated Steel Pipe (0.XXX" Thick)	LF		x		=	$	-	
68XXXX	XX" Plastic Pipe (Edge Drain)	LF		x		=	$	-	
69011X	XX" Corrugated Steel Pipe Downdrain (0.XXX" Thi	LF		x		=	$	-	
70321X	XX" Corrugated Steel Pipe Inlet (0.XXX" Thick)	LF		x		=	$	-	
70XXXX	XX" Corrugated Steel Pipe Riser (0.XXX" Thick)	LF		x		=	$	-	
7050XX	18" Steel Flared End Section	EA	4	x	500.00	=	$	2,000	
703233	Grated Line Drain	LF		x		=	$	-	
72XXXX	Rock Slope Protection	CY	120	x	500.00	=	$	60,000	
72901X	Rock Slope Protection Fabric	SQYD	120	x	10.00	=	$	1,200	
721420	Concrete (Ditch Lining)	CY		x		=	$	-	
721430	Concrete (Channel Lining)	CY		x		=	$	-	
750001	Miscellaneous Iron and Steel	LB	10,000	x	2	=	$	20,000	
XXXXXX	Additional Drainage	LS	1	x	75,000.00	=	$	75,000	

TOTAL DRAINAGE ITEMS $ 758,200

SECTION 4: SPECIALTY ITEMS

Item code		Unit	Quantity		Unit Price ($)			Cost
080050	Progress Schedule (Critical Path Method)	LS	1	x	15,000.00	=	$	15,000
800321	Chain Link Fence (Type CL-4)	LF	300	x	100.00	=	$	30,000
070030	Lead Compliance Plan	LS	1	x	10,000.00	=	$	10,000

TOTAL SPECIALTY ITEMS $ 55,000

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost		
	Biological Mitigation	LS	1	x	100,000.00	=	$	100,000		
								Subtotal Environmental Mitigation	*$*	*100,000*

5D - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost		
130300	Prepare SWPPP	LS	1	x	10,000.00	=	$	10,000		
130100	Job Site Management	LS	1	x	250,000.00	=	$	250,000		
130330	Storm Water Annual Report	EA	2	x	2,000.00	=	$	4,000		
130310	Rain Event Action Plan (REAP)	EA	1	x	500.00	=	$	500		
130320	Storm Water Sampling and Analysis Day	EA	20	x	500.00	=	$	10,000		
130520	Temporary Hydraulic Mulch	SQYD	302,000	x	1.50	=	$	453,000		
130550	Temporary Hydroseed	SQYD	302,000	x	0.50	=	$	151,000		
130505	Move-In/Move-Out (Temporary Erosion Control)	EA	1	x	2,500.00	=	$	2,500		
130640	Temporary Fiber Roll	LF	11,000	x	5.00	=	$	55,000		
130900	Temporary Concrete Washout	LS	1	x	3,000.00	=	$	3,000		
130710	Temporary Construction Entrance	EA	1	x	8,000.00	=	$	8,000		
130610	Temporary Check Dam	LS	2	x	5,000.00	=	$	10,000		
130620	Temporary Drainage Inlet Protection	EA	10	x	250.00	=	$	2,500		
130730	Street Sweeping	LS	1	x	100,000.00	=	$	100,000		
								Subtotal NPDES	*$*	*1,059,500*
								TOTAL ENVIRONMENTAL	**$**	**1,159,500**

Supplemental Work for NPDES

066596	Additional Water Pollution Control**	LS	1	x	40,000.00	=	$	40,000		
066597	Storm Water Sampling and Analysis***	LS	1	x	10,000.00	=	$	10,000		
								Subtotal Supplemental Work for NDPS	*$*	*50,000*

*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.

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost		
20XXXX	Highway Planting	LS	1	x	200,000.00	=	$	200,000		
20XXXX	Irrigation System	LS	1	x	300,000.00	=	$	300,000		
204099	Plant Establishment Work	LS	1	x	50,000.00	=	$	50,000		
204101	Extend Plant Establishment Work	LS	1	x	15,000.00	=	$	15,000		
208304	Water Meter	EA	2	x	3,000.00	=	$	6,000		
								Subtotal Landscape and Irrigation	*$*	*571,000*

5C - EROSION CONTROL

Item code		Unit	Quantity		Unit Price ($)			Cost		
210010	Move In/Move Out (Erosion Control)	EA	2	x	3500.00	=	$	7,000		
210350	Fiber Rolls	LF	15000	x	5.00	=	$	75,000		
210300	Hydromulch	SQFT	302000	x	0.5	=	$	151,000		
210420	Straw	ACRE	7	x	20000	=	$	140,000		
210430	Hydroseed	SQFT	302000	x	0.5	=	$	151,000		
								Subtotal Erosion Control	*$*	*524,000*

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
870700	Flashing Beacon System	LS	1	x	200,000.00	=	$	200,000
870200	Lighting System	LS	1	x	3,000,000.00	=	$	3,000,000
870600	Traffic Monitoring Station System	LS	1	x	40,000.00	=	$	40,000

Subtotal Traffic Electrical $ *3,240,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
120204A	Portable Radar Speed Feedback System Day (LS)	LS	1	x	40,000.00	=	$	40,000
129161A	Automated Flagger Assistance Device (LS)	LS	1	x	50,000.00	=	$	50,000
820760	Furnish Single Sheet Aluminum Sign (0.080" unframed)	SF	2,000	x	30.00	=	$	60,000
820840	Roadside Sign - One Post	EA	180	x	400.00	=	$	72,000
820850	Roadside Sign - Two Post	EA	20	x	500.00	=	$	10,000
846030	Remove Thermoplastic Traffic Stripe	LF	34,000	x	1.00	=	$	34,000
846035	Remove Thermoplastic Pavement Marking	SQFT	2,000	x	6.00	=	$	12,000
840591	6" Thermoplastic Traffic Stripe (Recessed)	LF		x	2.00	=	$	-
840563	8" Thermoplastic Traffic Stripe (Recessed)	LF		x	5.00	=	$	-
840515	Thermoplastic Pavement Marking	SQFT		x	13.50	=	$	-
150742	Remove Roadside Sign	EA	100	x	100.00	=	$	10,000
152320	Reset Roadside Sign	EA		x		=	$	-
152390	Relocate Roadside Sign	EA		x		=	$	-
82010X	Delineator	EA	34	x	70.00	=	$	2,380
840502	Thermoplastic Traffic Stripe (Enhanced Wet Night Visibility)	LF	20,000	x	1.50	=	$	30,000
846012	Thermoplastic Crosswalk and Pavement Marking (Enhance	SQFT	2,200	x	8.00	=	$	17,600
872146	Removing Flashing Beacon Systems	LS	1	x	25,000.00	=	$	25,000
	Relocate Speed Radar Sign	EA		x	5,000.00	=	$	-
120090	Construction Area Signs	LS	1	x	50,000.00	=	$	50,000

Subtotal Traffic Signing and Striping $ *412,980*

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)			Cost
128652	Portable Changeable Message Signs	LS	1	x	$ 80,000	=	$	80,000

Subtotal Traffic Management Plan $ *80,000*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120199	Traffic Plastic Drum	EA	1	x	100,000.00	=	$	100,000
120165	Channelizer (Surface Mounted)	EA	300	x	75.00	=	$	22,500
120120	Type III Barricade	EA	10	x	500.00	=	$	5,000
129100	Temporary Crash Cushion Module	EA	5	x	300.00	=	$	1,500
120100	Traffic Control System	LS	1	x	200,000.00	=	$	200,000
129110	Temporary Crash Cushion	EA	5	x	5,000.00	=	$	25,000
120159	Temporary Traffic Stripe (Paint)	LF	9,000	x	3.50	=	$	31,500
120149	Temporary Pavement Marking (Paint)	SQFT	2,000	x	3.50	=	$	7,000
120320	Temporary Barrier System	LF		x	90.00	=	$	-
129110	Temporary Crash Cushion	EA		x	4,000.00	=	$	-

Subtotal Stage Construction and Traffic Handling $ *392,500*

TOTAL TRAFFIC ITEMS **$ 4,125,500**

SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
	Detour Signing	LS	1	x	50,000	= $	50,000

* Includes constructing, maintaining, and removal

TOTAL DETOURS $ 50,000

SUBTOTAL SECTIONS 1 through 7 $ 16,359,700

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items							
	ADA Items				2.0%	$	327,194
8B - Bike Path Items							
	Bike Path Items				7.0%	$	1,145,179
8C - Other Minor Items							
	Other Minor Items				1.0%	$	163,597
	Total of Section 1-7	$	16,359,700	x	10.0%	= $	1,635,970

TOTAL MINOR ITEMS $ 1,636,000

SECTIONS 9: ROADWAY MOBILIZATION

Item code							
999990	Total Section 1-8	$	17,995,700	x	10%	= $	1,799,570

TOTAL ROADWAY MOBILIZATION $ 1,799,600

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066670	Payment Adjustments For Price Index Fluctuations	LS	1	x	20,000.00	= $	20,000
066070	Maintain Traffic	LS	1	x	60,000.00	= $	60,000
	*Cost of **NPDES** Supplemental Work specified in Section 5D*					= $	50,000

TOTAL SUPPLEMENTAL WORK $ 130,000

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	Resident Engineers Office	LS	1	x	60,000.00	=	$60,000
066063	Traffic Management Plan - Public Information	LS	1	x	50,000.00	=	$50,000
066062	COZEEP Contract	LS	1	x	180,000.00	=	$180,000
066916	Annual Construction General Permit Fee	LS	1	x	5,000.00	=	$5,000
066901	Water Expenses	LS	1	x	10,000.00	=	$10,000
870600	Traffic Monitoring System	LS	1	x	100,000.00	=	$100,000

Total Section 1-8	$ 17,995,700	10%	= $	1,799,570	
			TOTAL STATE FURNISHED		**$2,204,600**

SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization $17,995,700 (used to calculate TRO)

Total Construction Cost (excluding TRO and Contingency) $22,129,900 (used to check if project is greater than $5 million excluding contingency)

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

Item code		Unit	Quantity		Unit Price ($)		Cost
090100	Time-Related Overhead	WD	180	X	$9,998	=	$1,799,600

		TOTAL TIME-RELATED OVERHEAD		**$1,799,600**

SECTION 13: ROADWAY CONTINGENCY

Total Section 1-12	$	23,929,500	x	**30%**	=	$7,178,850
				TOTAL CONTINGENCY		**$7,178,900**

II. STRUCTURE ITEMS

Bridge 1

DATE OF ESTIMATE					
Bridge Name					
Bridge Number					
Structure Type					
Width (Feet) [out to out]					
Total Bridge Length (Feet)					
Total Area (Square Feet)					
Structure Depth (Feet)					
Footing Type (pile or spread)					
Cost Per Square Foot					
COST OF EACH	**$0**		**$0**		**$0**

Building 1

DATE OF ESTIMATE					
Building Name					
Bridge Number					
Structure Type					
Width (Feet) [out to out]					
Total Building Length (Feet)					
Total Area (Square Feet)					
Structure Depth (Feet)					
Footing Type (pile or spread)					
Cost Per Square Foot					
COST OF EACH	**$0**		**$0**		**$0**

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

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

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

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

Estimate Prepared By: N/A

------ Division of Structures

Date