05-SLO-101–PM 21.1
Project ID 0515000038
EA 05-1G4800
PPNo 2830
20.xx.400.100 Local, 20.xx.075.600 STIP RIP
June 2020

Project Report

For Project Approval

In San Luis Obispo County at Route 101 Intersections at Avila Beach Dr.

Between 0.3 miles South of the Avila Beach Drive Interchange

And 0.2 miles North of the Avila Beach Drive Interchange

I have reviewed the right-of-way information contained in this report and the right-of-way data sheet attached hereto, and find the data to be complete, current and accurate:

Jamie Lupo, Central Region Division Chief, Right of Way

APPROVAL RECOMMENDED:

Paul Valadao, Project Manager

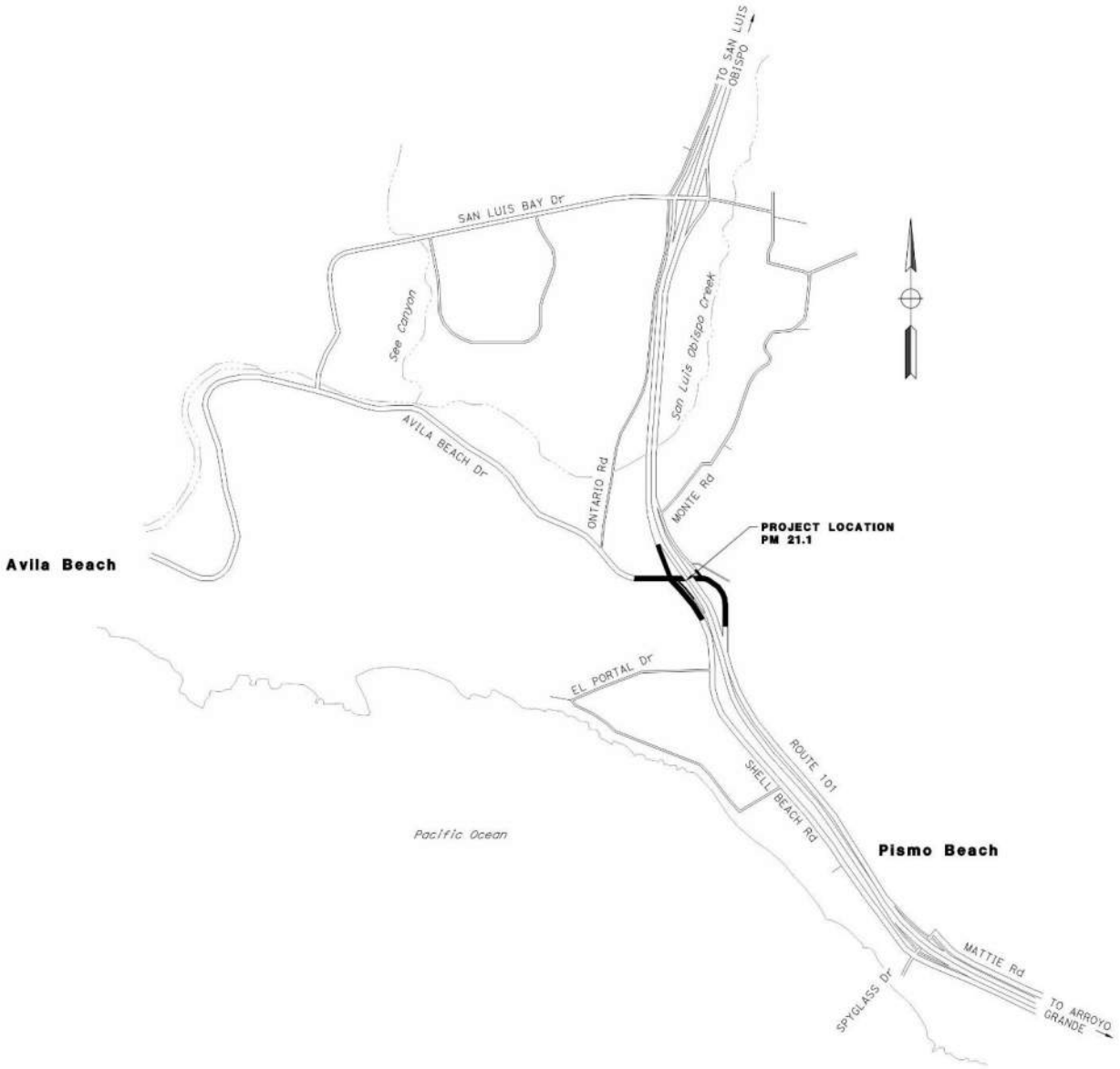
PROJECT APPROVED:

Timothy M. Gubbins, District 5 Director

06/30/2020

Date

Vicinity Map



This project report has been prepared under the direction of the following registered civil engineer. The civil engineer attests to the technical information contained herein and the engineering data upon which recommendations, conclusions, and decisions are based.

Sarah Huffman

SARAH M. HUFFMAN, P.E.

6/19/2020

DATE

Table of Contents

1. INTRODUCTION

The proposed project is located in San Luis Obispo County at Route 101 intersections at Avila Beach Drive. The County of San Luis Obispo (County) in cooperation with the San Luis Obispo Council of Governments (SLOCOG) and the California Department of Transportation (Caltrans) propose to address traffic operational deficiencies and improve multimodal access at the US 101/Avila Beach Drive interchange. A location map is included in Attachment A.

The proposed project would replace the two-way stop-controlled southbound (SB) ramp terminal intersection with a single-lane roundabout. The Build Alternative and the No-Build Alternative for the modification of the US 101/Avila Beach Drive interchange are presented in this report. The Build Alternative would also include roundabout warning signs towards the terminus of the northbound (NB) off-ramp as well as the eastbound roundabout approach and a park-and-ride lot at the southwest corner of Avila Beach Drive and Shell Beach Road.

Shell Beach Road and the southbound ramps will be realigned to intersect in the roundabout. The roundabout design includes median islands with pedestrian refuges at the crosswalks and shared-use paths offset from the roundabout using a landscaped buffer. A central island in the center of the roundabout features a truck apron for the off-tracking of the back tires of truck trailers. Beneath the US 101 freeway, the shared-use path will be separated from Avila Beach Drive behind the bridge support columns. The abutment fill will be retained with retaining walls. Between the southbound ramps and the US 101 mainline retaining walls will be required due to the realignment of the ramps.

Table 1-1
Project Summary

Project Limits	05-SLO-101 21.1	
Number of Alternatives	2 (Build and No Build)	
Build Alternative Cost Estimate	**Current Cost Estimate:**	**Escalated Cost Estimate:**
Capital Outlay Support	$2,202 K	$2,396 K
Capital Outlay Construction	$9,195 K	$10,475 K
Capital Outlay Right-of-Way	$332 K	$390 K
Funding Source	CMAQ, DEMO, STIP, SCCP (anticipated), Local	
Funding Year	FY 2022/2023	
Type of Facility	Freeway	
Number of Structures	0 bridges, 5 retaining walls	
Environmental Determination or Document	Mitigated Negative Declaration/ Categorical Exclusion	
Legal Description	In San Luis Obispo County at Route 101 Intersections at Avila Beach Drive	
Project Development Category	Category 3	

The park-and-ride lot will have access openings on Avila Beach Drive and Shell Beach Road and will provide multi-modal accessibility. This lot will accommodate a transit stop for the Avila-Pismo Beach Trolley and a San Luis Obispo Regional Transit Authority (SLORTA) bus.

2. RECOMMENDATION

It is recommended that this project be approved and proceed to the design phase.

The County of San Luis Obispo has been consulted with respect to the recommended plan and supports the plan as presented.

3. BACKGROUND

A. Project History

From 2013 through 2015, SLOCOG, the County, Caltrans District 5, the SLORTA, and other local agencies collaborated on a Master Plan assessment for needed improvements along US 101 in San Luis Obispo County. The County of San Luis Obispo has identified the intersection of Avila Beach Drive/US 101 southbound ramps/Shell Beach Road as operationally deficient and initiated a capital improvement project.

In 2012, the City of Pismo Beach held a community workshop, which identified a roundabout at the southbound ramp terminal intersection as the desired alternative along with a city gateway enhancement.

In January 2015, SLOCOG, Caltrans, and the County of San Luis Obispo initiated the Project Study Report-Project Development Study (PSR-PDS) effort corresponding to the County's capital improvement project and the recommendations listed in SLOCOG's 2014 *US 101 Corridor Mobility Master Plan*. The Avila Beach Drive/US 101 interchange is an important gateway to the communities of Avila Beach and Shell Beach and is recognized as in need of vehicular and bicyclist/ pedestrian operational and safety improvements. At the time of the PSR-PDS, SLOCOG and the County were considering a parking lot and a SLORTA bus stop at the southwest corner of Avila Beach Drive and Shell Beach Road that would serve recreational and commuter purposes.

An intersection control evaluation (ICE) Step 1 report was developed to inform the PSR-PDS. In the ICE Step 1 report, Caltrans evaluated different intersection control options and their combination for the following control types: 1) stop control; 2) signal control; and 3) yield control. The roundabout alternatives were found to provide superior AM/PM peak hour operations over either the stop controlled or the signal-controlled alternatives. The roundabout alternatives would preserve the existing US 101 overpass bridge, simplify the existing intersection configuration, reduce the number of decision points, and accommodate design vehicles (see Section 4.C. Traffic).

The PSR-PDS identified three alternatives:

- Alternative 1—Roundabouts on both the southbound and northbound ramp termini intersections.
- Alternative 2—Roundabout at the southbound ramp terminal intersection.
- Alternative 3—No-Build

The ICE Step 1 document concluded that operations and collision history do not support intersection control type change at the northbound ramp terminus. However, the PSR-PDS identified that without a roundabout at the northbound off-ramp terminal intersection, the westbound approach for the southbound ramp termini intersection would need to be designed as a high-speed approach to slow and transition vehicles approaching from the northbound off-ramp. The PSR-PDS was approved in May 2016, and the Project Approval and Environmental Document (PA&ED) phase of the interchange improvement project was kicked off in November 2017.

During the kick-off meeting for the PA&ED phase of the project, the Project Development Team (PDT), based on the Step 1 ICE conclusions, rejected Alternative 1 and identified Alternative 2 as the viable Build Alternative. The proposed project includes the conversion of the southbound ramp terminal intersection into a single-lane roundabout and a park-and-ride lot at the southwest corner of Avila Beach Drive and Shell Beach Road. Modifications at the northbound ramp terminal intersection are included to improve sight distance, consider bicycle access, and reduce vehicle speeds prior to the roundabout intersection.

As the Draft Project Report was being prepared, the County, as the California Environmental Quality Act (CEQA) lead, published the Draft Environmental Document and proceeded to prepare the Final Environmental Document. The PDT then consulted Caltrans Design and Environmental Planning. There was consensus that this project should bypass a Draft Project Report (DPR) and pursue a Project Report only, to achieve the PA&ED milestone. The purpose for negating the need for a DPR is primarily due to two reasons:

1. The County of San Luis Obispo is the CEQA lead and is the sole preparer of the CEQA environmental document, and
2. The project is pursuing one build alternative.

According to the Caltrans Project Development Procedures Manual (PDPM) Chapter 10, Section 5 (Draft Project Report) indicates: “When a Draft Environmental Document (DED) is required, approval of the DPR grants approval to release the DED to the public.” Since the County is the lead for CEQA, the County did not need to secure Caltrans' approval of the DPR prior to approving and releasing the DED to the public in January 2020. Caltrans retains its National Environmental Policy Act (NEPA) assignment

and is the sole preparer of the Categorical Exclusion (CE), but this environmental determination does not require public circulation or input. See Section 6.E. for additional information on the environmental process and the results of the public circulation.

B. Community Interaction

This project is sponsored by the County of San Luis Obispo and was recommended in SLOCOG's 2014 *US 101 Corridor Mobility Master Plan*. This plan included extensive public involvement, including seven local workshops, 30 community presentations, two web-based interactive tools, numerous stakeholder meetings and several SLOCOG board presentations. The study team included representatives from SLOCOG, Caltrans, County of San Luis Obispo and the cities of San Luis Obispo, Arroyo Grande, Atascadero, Grover Beach, Paso Robles, Pismo Beach, Regional Transit Authority and the County Air Pollution Control District (APCD).

A public meeting was held with Avila Valley Advisory Council (AVAC) in November 2018 to update stakeholders on the proposed project and intended improvements. Since this meeting and throughout the PA&ED process, the County has been in constant communication with local agencies, business owners, stakeholders, and the general public. This included a meeting with AVAC's land use committee in May 2019 regarding the project's Visual Impact Assessment and the general project layout. Another public workshop was held during the hour prior to the AVAC monthly meeting on January 13, 2020, with a formal presentation during the meeting. The workshop included representatives from Caltrans, SLOCOG, the County, and the consultant team. The developed alternative traffic impacts, environmental documents, schedule, and project funding, as well as roundabout educational materials, were presented. Comments received from the public outreach meeting and responses are included in the Mitigated Negative Declaration (MND) in Attachment J. The interchange project has broad local support. Additional presentations to the AVAC and other public workshops are anticipated in future phases.

C. Existing Facility

US 101 is the major north-south corridor in San Luis Obispo County and is functionally classified as freeway or expressway. The area around the interchange is mostly undeveloped State and County property. To the northwest of the interchange is the Avila Hot Springs campground. The campground property is located approximately 30-feet lower than the interchange area at the base of a 2:1 slope hillside. There is also a drainage ravine along the east side of the northbound off-ramp and Monte Road featuring steep fill slopes adjacent to these roadways.

US 101 in the project area is a divided freeway with two northbound 12-foot-wide lanes and two 12-foot-wide travel lanes, one 12-foot truck climbing lane, and paved shoulders in the southbound direction. The freeway is on a slight grade to the south and a horizontal curve to the east. These geometric features combined with peak hour traffic volumes between San Luis Obispo and southern San Luis Obispo County result in congestion during the commute hours. The southbound ramp configuration resembles a tight

diamond (Type L-1), and the northbound off-ramp is similar to a trumpet style (Type L-11). However, the northbound on-ramp is separated from Avila Beach Drive with a segment of Monte Road.

US 101 crosses over Avila Beach Drive on separate structures (Br. No. 49-0191L & R). Both bridges are three-span concrete structures with rectangular concrete columns set back approximately 6-feet from the face of curb. The abutment fill is loose dirt with a slope varying between 1.5:1 and 2:1.

The southbound off-ramp is a single lane ramp with a 12-foot lane and standard paved shoulders. The ramp is stop-controlled and flares at the intersection with Avila Beach Drive to provide a short right turn pocket, approximately 40-feet long. Like the mainline, the southbound off-ramp is on grade sloping to the ramp terminal from the gore. The western side of the existing off-ramp transitions from being at the top of a 2:1 slope above the campground to being at the base of a hillside near the gore. Both sides of the ramp have asphalt concrete dikes conveying runoff along the shoulders.

The southbound on-ramp intersection is offset approximately 140-feet to the east of the southbound off-ramp intersection. The ramp is wide at the intersection and then narrows down to one 12-foot wide lane, a 9-10-foot-wide right shoulder, and an approximately 6-foot wide left shoulder. Both sides of the ramp have asphalt concrete dikes. The on-ramp is on a grade of about 8% climbing to the south with a 3:1 slope between the mainline and the ramp. Shell Beach Road parallels the on-ramp approximately 45-feet to the west, and the terrain between the two roadways is relatively flat. There is a chain link fence delineating Caltrans access control and the boundary between County and State right-of-way.

The northbound off-ramp is a single-lane ramp with a 12-foot lane and standard paved shoulders. The ramp gently curves to the west to intersect with Avila Beach Drive and Monte Road. The superelevation rate of 12% results in a comfortable operating speed of almost 45 mph approaching this intersection. There is an asphalt concrete dike on the left edge of pavement, and the ramp is descending from the gore to the ramp terminal. There is a ravine located to the northeast of the ramp, and a metal beam guardrail along the right edge of shoulder shields errant vehicles from the vertical drop off to the ravine. The existing ground slopes gently from the mainline to the northbound off-ramp.

Avila Beach Drive is a County owned and maintained collector road with two lanes approximately 11.5-foot wide, paved shoulders 6-8 feet wide, and no sidewalks. It has a segment approach speed of 45 mph. West of the southbound off-ramp, Avila Beach Drive is on grade up to the interchange, and there is an asphalt concrete dike on the north side of the road. Through the interchange the road is crowned with about a 1% longitudinal grade to the east, and there is curb and gutter on both sides of the road under US 101. At the intersection with Monte Road and the northbound off-ramp, Avila Beach Drive is stop-controlled, and vehicles must make a left-turn to continue onto Monte Road. :

Shell Beach Road is also stop-controlled at its intersection with Avila Beach Drive and the southbound off-ramp terminal. Shell Beach Road is a County owned and maintained

collector road functioning as a frontage road to US 101 extending from Avila Beach Drive to Price Street in Pismo Beach. Shell Beach Road provides access to many residential properties and a few restaurants in Shell Beach. The Mattie Road interchange, a little over a mile to the south, also provides access to the Shell Beach community. Within the project limits, Shell Beach Road is a two-lane road with 11.8-foot wide lanes and 4.5-foot paved shoulders with asphalt concrete dike on both sides of the road and no sidewalks. The speed limit is 45 mph. Shell Beach Road is also on grade to the south and hugs the base of a large hillside to the west.

Within the project limits, Monte Road is within State right of way functioning as an extension to the northbound on-ramp and providing access to Gragg Canyon Road and Monte Road beyond the northbound on-ramp intersection. Monte Road is a two-lane road with 11.5-foot lanes and 4.5-foot paved shoulders with a design speed of 45 mph. There is a 4:1 slope between Monte Road and the US 101 mainline. The beginning of the northbound on-ramp is approximately a quarter of a mile north of Avila Beach Drive.

Complete Streets

Avila Beach Drive is one of two routes connecting the community of Avila Beach to US 101, with the second one being San Luis Bay Drive about a mile to the north. There are Class 2 bike lanes on Avila Beach Drive and Shell Beach Road. Monte Road is a bike route (Class 3) identified in the San Luis Obispo County Bike Map as a recreational route and will be an important connection once the Bob Jones Trail Class I bikeway is completed from San Luis Obispo to Avila Beach. The Bob Jones Trail alignment proposes to take an eastern alignment along US 101, then crossing US101 at San Luis Creek. During and immediately after heavy rains, the future Bob Jones Trail undercrossing may be unusable due to high water stage in San Luis Creek, making the Monte Road connection an alternate route for bicyclists. There are no existing pedestrian facilities in the interchange area; however, there is a popular hiking trail a quarter of a mile to the south on Shell Beach Road.

4. PURPOSE AND NEED

Purpose

The purpose of the proposed project is to improve the operations and multimodal access of the US 101/Avila Beach Drive interchange southbound and northbound intersections.

Need

The five-legged intersection of the southbound ramps, Avila Beach Drive, and Shell Beach Road experiences operational issues during the weekend peak travel times and the summer tourist seasons. The intersection is currently operating at Level of Service (LOS) “D” during the weekend peak period.

Traffic patterns at the US 101 northbound off-ramp, Avila Beach Drive and Monte Road intersection are challenging, especially for bicyclists. Vehicles on the northbound off-ramp, which are not required to yield, approach the intersection at high speeds. The

northbound off-ramp terminal intersection at Avila Beach Drive generally has a higher "total" crash rate compared to the state-wide average for similar facilities. The corner sight distance is limited for the minor movement turning left (the only movement possible) onto Monte Road from eastbound Avila Beach Drive.

A. Problem, Deficiencies, Justification

Avila Beach Drive is one of two routes connecting the community and tourist destination of Avila Beach to US 101, with the second one being San Luis Bay Drive about a mile to the north. Avila Beach Drive and the US 101/Avila Beach Drive interchange are heavily used for weekend travel between the beach community and surrounding cities, particularly during the summer months. The general increase in traffic, coupled with the anticipated future traffic from planned projects in the area, is forecast to degrade the southbound ramp terminal intersection from level of service D to F in the years from 2018 to 2032. In addition, during peak periods, the intersection experiences increased congestion due to drivers on US 101 attempting to bypass mainline congestion by exiting the freeway to use local roads as an alternative throughway.

Shell Beach Road, a frontage road for US 101 south of Avila Beach Drive, intersects Avila Beach Drive directly opposite from the southbound off-ramp, and the southbound on-ramp is slightly offset to the east. These unique roadway features result in a lack of efficiency at the interchange and affects the traffic operations. The corner sight distance (CSD) at the terminus of the southbound off-ramp is limited for vehicles at the stop bar limit line that maneuver straight through the intersection onto southbound Shell Beach Road, and for those that turn left onto eastbound Avila Beach Drive. The CSD for the drivers looking west at the eastbound traffic on Avila Beach Drive is limited due to the existing metal beam guardrail (MBGR) and a utility pole along the northwest corner of the southbound ramp intersection. The northbound off-ramp vehicles do not have to stop and continue at a high rate of speed as they pass under US 101, which causes the southbound off-ramp to experience queueing.

The US 101/Avila Beach Drive interchange is a nexus for road bikers. Cyclists can often be seen travelling between Avila Beach Drive and Monte Road for weekend rides or between Shell Beach Road and Avila Beach Drive commuting to work. Traffic patterns at the US 101 northbound off-ramp, Avila Beach Drive and Monte Road intersection are challenging since both ramp terminal intersections are two-way stop controlled with cross traffic travelling through the intersections at approximately 45 mph. Based on intersection turning movement counts collected on January 25th and 27th, 2018, there were 14 cyclists at the northbound off-ramp terminal intersection during the peak weekend hour. The majority of these cyclists were making the move from eastbound Avila Beach Drive onto northbound Monte Road.

The proposed project improves operations of the southbound ramp termini intersection from LOS D to LOS B in the forecast year and addresses bicycle corner sight distance at the northbound off-ramp terminal intersection. The separated shared-use path on the north side of Avila Beach Drive behind the bridge columns gives cyclists the opportunity to avoid the left-turn across the northbound off-ramp altogether.

B. Regional and System Planning

This project has been planned and designed through a coordinated effort by the County , the SLOCOG, and Caltrans, as well as with input from local residents.

Identify Systems

US 101 is a Federal Aid Primary Route and designated as Freeway and Expressway as part of the Freeway Expressway System. The U.S. Department of Defense, in cooperation with the U.S. Department of Transportation, has identified US 101 as part of the National Highway System as a Strategic Highway Corridor Network route. US 101 is part of Caltrans' Interregional Road System and designated as a High Emphasis Route and is part of the Surface Transportation Assistance Act (STAA) National Network (Truck Terminal Access).

Avila Beach Drive is the primary east-west route between Avila Beach and US 101.

State Planning

The Caltrans District 5, 2014 Transportation Concept Report (TCR) for US 101 projects that US 101 will exceed capacity for the year 2035. The 2035 corridor concept for US 101 is a freeway with capacity of four to six lanes. Beyond 2035, the ultimate corridor concept for US 101 is a freeway with capacity up to six lanes. The proposed project is compatible with the ultimate corridor concept outlined in the 2014 TCR.

The 2015 Interregional Transportation Strategic Plan identifies US 101 in the project area as a Strategic Interregional Corridor connecting the Central Coast to San Jose and the San Francisco Bay area. The project is at an interchange along this corridor and proposes to improve intersection operations and reduce collisions with the implementation of a single-lane roundabout.

This project will meet the goals of the California Transportation Plan 2040 by adding transit facilities, implementing a safer intersection design, expanding and improving the bike and pedestrian facilities, and reducing greenhouse gas emissions.

The 2015 District System Management Plan identifies five Strategic Goals for District 5: Safety and Health; Stewardship and Efficiency; Sustainability, Livability, and Economy; System Performance; and Organizational Excellence. The last goal is an internal goal for the Caltrans organization. The proposed project meets the other four goals by providing a safer intersection design for all users, supporting active modes of transportation and access to transit, and working collaboratively with local agencies to deliver a strategic project. Intersection improvement for US 101 southbound ramps at Avila Beach Drive and Shell Beach Road is included in the District 5 System Management Plan 2015 (DSMP) Project List as DSMP 2015 ID#2141.

Regional Planning

SLOCOG's *2019 Regional Transportation Plan* (RTP) shows that the US 101 mainline through this area is congested. The *US 101 Corridor Mobility Master Plan* identifies safety and operational improvements to the US 101/Avila Beach Drive interchange. The RTP also includes these improvements at the interchange due to operational issues with the five-legged southbound ramp termini intersection and the high speeds on the northbound off-ramp. The US 101/Avila Beach Drive interchange operational improvement project and park-and-ride lot is listed in the 2019 RTP as a constrained project with a cost estimate of $7.2 million.

A park-and-ride lot is proposed at the US 101/Avila Beach Drive interchange in accordance with the RTP and SLOCOG's *2017 Park & Ride Lot Study (PRLS)*. This park-and-ride lot was shown to have 20-24 spaces in the *2017 Park & Ride Lot Study*. As discussed in the PRLS, the location of a park-and-ride lot is the most important characteristic for success; the proposed location of this lot is close to freeway ramp terminals and has good visibility. The park-and-ride lot will be accessible from the freeway via Avila Beach Drive and Shell Beach Road and accessible to all modes of transportation. Another important feature of a park-and-ride lot, as identified in the PRLS, is security. Aside from the visible location of the lot, overhead lighting will be included in the design. The style of lighting will complement the safety lighting to be used around the roundabout. This project is compatible with the needs identified in the regional plans.

Local Planning

The community of Avila Beach is a popular destination for San Luis Obispo County residents as well as tourists from out of town. In addition to beach and pier access, Avila Beach has other amenities such as hot springs, spas, a golf course, hotels, and restaurants. The golf course also hosts several special events throughout the year resulting in exacerbated weekend peak trips through the US 101/Avila Beach Drive and US 101/San Luis Bay Drive interchanges. Additional residential and hospitality developments are in the planning process for the beach area.

The County was a key participant in the regional planning process. The County has plans for improvements to the park-and-ride lot at the nearby Bob Jones Trail trailhead at Ontario Road. Improvements would include an addition of 30 spaces and the installation of a "smart crosswalk" across Ontario Road at the Bob Jones trailhead, including in-pavement flashing lights and a rapid flashing beacon on a post. These upgrades combined with the Bob Jones Trail extension north to the City of San Luis Obispo shown in the 2015/16 San Luis Obispo County Bikeways Plan will likely increase pedestrian and cyclist travel in the vicinity of Ontario Road, including the US 101/Avila Beach Drive interchange.

In 2018, the County re-evaluated the Level of Service (LOS) policy and capacity analysis metric for Avila Beach Drive. In the draft Avila Beach Drive Capacity Metric & LOS Policy Evaluation, dated June 13, 2018, traffic volumes for the corridor were evaluated

for seasonality and peak events. One of the recommendations from the evaluation was to require Transportation Demand Management (TDM) "for special events to help mitigate congestion and potential safety hazards caused by road blockages during these periods. TDM measures could include participation in publicly or privately organized shuttle systems in designated parking areas that remove passenger cars from the transportation system and replace them with bus or trolley options." The proposed park-and-ride lot would provide a location to implement this TDM measure.

The 2015/16 San Luis Obispo County Bikeways Plan identifies Avila Beach Drive and Shell Beach Road as Class 2 bike routes. The 2009 Avila Circulation Study shows Avila Beach Drive as an arterial and the primary evacuation route for the Avila Beach community.

Transit Operator Planning

Avila Beach is a popular public beach in the region, and as the popularity grows, the availability of parking in the community decreases. SLORTA provides two routes in the project's vicinity. There is a trolley service for the Pismo Beach and Avila Beach communities that runs on weekends. The proposed park-and-ride lot will feature a bus loading area that may be used by the trolley and alleviate some of the parking issues at the beachfront. There is also a regional transit service to and from southern San Luis Obispo County through this area. The proposed park-and-ride lot at the US 101/Avila Beach Drive interchange will be a potential stop along the route.

C. Traffic

Based on the ICE Step 1 in support of the May 2016 PSR-PDS approved by Caltrans, the recommended control strategy at the southbound ramp terminal intersection was a yield (roundabout) controlled intersection. The 2016 Caltrans study also considered enhancements to the northbound off-ramp and ramp terminal intersection at Avila Beach Drive and concluded two-way stop control was appropriate for the northbound ramp terminal intersection.

The ICE Step 2 was completed on March 2019 by Kittleson & Associates, and Caltrans District 5 reviewed and concurred with the results. The ICE Step 2 and the concurrence memorandum are included in Attachment B. The final recommendation confirms the Step 1 analysis completed for the PSR(PDS). Reconstructing the southbound ramp terminal intersection to a yield (roundabout) controlled intersection addresses the operational and safety performance needs when compared to other improvements and the no-build condition. The report also confirms that the northbound off ramp intersection does not need any operational improvements. The ICE Step 2 report recommends moving forward with Alternative 2 as the Build Alternative and rejects Alternative 1 from the PSR (PDS).

Current and Forecasted Traffic

The traffic data collection plan along with the tools and methods used in the intersection operations analysis were documented in the Traffic Operations Methodology Memorandum, *Kittelson & Associates*, March 2018. The 2018 AM, PM, and weekend

peak hour volumes for the US 101/Avila Beach Drive interchange, included in the ICE Step 2 Report (Attachment B), were collected by Central Coast Transportation Consulting (CCTC). These volumes were supplemented by traffic counts collected by Caltrans in 2018, as well as historic seasonal peak traffic counts. For the southbound ramp termini intersection, peak hour factors of 0.88, 0.95, and 0.95 were determined for weekday AM, PM, and weekend peak hours, respectively. The northbound off-ramp terminal intersection had peak hour factors of 0.86,0.89, and 0.95 for weekday AM, PM, and weekend peak hours, respectively.

CCTC developed and proposed cumulative traffic volumes to establish forecast conditions. CCTC reviewed the land uses and modeled outputs from Avila Area (County) and San Luis Obispo Council of Governments (SLOCOG) travel demand models and compare them with the Avila Circulation Study traffic projections. CCTC modified volumes as appropriate for use in forecast conditions evaluations based on the anticipated opening year of 2022 and a 20-year planning horizon of 2042. Table 4-1 shows the current and future traffic volumes data.

Table 4-1
Traffic Volume Data Summary

Segment	US 101 SB Off	US 101 SB On	US 101 NB Off	Avila Beach Dr	Shell Beach Rd	Monte Rd
Annual ADT (veh)						
Base Year: 2018	1200	3400	2900	9200	3100	1700
Projected: 2042	3100	4000	4800	13700	4900	2400
AM Peak Hour (veh)						
Base Year: 2018	50	90	230	410	170	90
Projected: 2042	190	120	320	670	340	140
PM Peak Hour (veh)						
Base Year: 2018	110	530	170	900	310	110
Projected: 2042	270	610	340	1330	480	190
Weekend Peak Hour (veh)						
Base Year: 2018	130	300	430	1060	400	230
Projected: 2042	400	330	710	1720	600	260

The design designation for US 101 in the project area is the following:

ADT (2018)= 72 000 D= 55%
ADT (2042)= 104 000 T= 9%
DHV= 10 400 V= 65 mph
ESAL= 17 742 000 TI_{20}= 12.5
CLIMATE REGION= Central Coast

The design designation for Avila Beach Drive in the project area is the following:

ADT (2018)= 9 200 D= 55%
ADT (2042)= 13 700 T= 5%
DHV= 1 370 V= 45mph
ESAL= 1 254 000 TI_{20}= 9.0
CLIMATE REGION= Central Coast

The design designation for Shell Beach Road in the project area is the following:

ADT (2018)= 3 100	D= 55%
ADT (2042)= 4 900	T= 3%
DHV= 490	V= 45 mph
ESAL= 263 000	TI_{20}= 7.5
CLIMATE REGION= Central Coast	

The notation above is explained as follows:

ADT: average daily traffic, vehicles

DHV: The two-way design hourly volume, vehicles

D: The percentage of the DHV in the direction of heavier flow.

ESAL: The equivalent single axle loads forecasted for pavement engineering.

T: The truck traffic volume expressed as a percent of the DHV

TI_{20}: Traffic Index used for pavement engineering. The number in the subscript is the pavement design life used for pavement design.

V: Design speed in miles per hour.

Collision Rates

The collision rates for a three-year period from January 1, 2014 through December 31, 2016 at US 101 northbound off-ramp and the southbound ramps Avila Beach Drive are shown in Table 4-2. The northbound on-ramp is not included in this analysis, since it is outside the project area. The rates were obtained from Caltrans Traffic Accident Surveillance and Analysis System (TASAS) crash reports. The data in TASAS comes from the California Statewide Integrated Traffic Records System (SWITRS). Table 4-2 summarizes the crashes by crash frequency and severity, along with the actual and state-wide average crash (or accident) rates. Caltrans provided these state-wide averages for similar facility types, i.e. ramp types and the area type (i.e. urban/rural).

Table 4-2 shows a total of 7 crashes were reported on the northbound and southbound on- and off-ramp terminal intersections at Avila Beach Drive over the three-year period. No crashes resulted in fatalities, and 4 crashes resulted in injury. There were several broadside collisions at the southbound ramp termini intersection. The other common collision types on the southbound off-ramp and Shell Beach Drive were rear-ends. The crash modification factor (CMF) for converting a stop-controlled intersection to a roundabout is 0.28+/-0.11, based on data from the Federal Highway Administration (FHWA) CMF Clearinghouse. Therefore, the Build Alternative is expected to decrease the number of crashes (all types and severities) by 61% to 83% for the southbound ramp terminal intersection.

Table 4-2
Summary of Crash Data and Rates (1/1/2014 – 12/31/2016)

Facility	Crash Severity				Total Crash Rates (Crashes/MV*)		ADT Main X-St	Total MV*
	Total	Fatal	Injury	Multi-Vehicle	Actual	Average		
US 101 Ramp Terminal Intersections and Avila Beach Drive								
Southbound on-ramp	0	0	0	0	0	0.60	3.4 4.6	8.82
Southbound off-ramp	2	0	2	2	**0.14**	0.92	1.2 11.7	14.08
Northbound off-ramp	4	0	2	4	**0.73**	0.50	3.5 1.5	5.50

*MV – Million Vehicles
Cells highlighted in grey represent crash rates that are greater than the state-wide average for similar facility types.

As summarized in Table 4-2, the northbound ramp terminal intersection at Avila Beach Drive generally has a higher "total" crash rate compared to the state-wide average for similar facilities. The Avila Beach Drive/Monte Road/northbound off-ramp intersection showed a number of broadside collisions with the through northbound off-ramp movement.

5. ALTERNATIVES

A. Viable Alternatives

No-Build Alternative

The No-Build Alternative would not address the project purpose and need but offers a basis for comparison with the Build Alternative. It assumes no major construction on the US 101/Avila Beach Drive interchange other than continued route and intersection maintenance. This alternative does not meet the purpose and need; therefore, it was not selected.

Build Alternative

The Build Alternative would replace the two-way stop-controlled southbound ramp terminal intersection with a single-lane roundabout and a park-and-ride lot located southwest of the interchange. The improvements do not include any modifications to the mainline of US 101 or the grade separation structures over Avila Beach Drive.

This alternative provides acceptable levels of service for the 20-year design life of the project, as documented in the traffic section of this report.

The conceptual roundabout design was jointly developed by Kittelson and Associates and Wallace Group in a process that include a peer review conducted by Wallace Group. The design presented in this report represents refinements of the original design concept

evaluated in the ICE Step 2 Report. The roundabout design conforms to the guiding principles contained in the National Cooperative Highway Research Program (NCHRP) Report 672, Roundabouts: An Informational Guide (2nd Edition) and the Caltrans Design Information Bulletin (DIB) 80-01. This alternative accommodates the standard STAA design vehicle for all movements in the roundabout, movements to the northbound on-ramp, and movements from the northbound off-ramp.

This alternative includes Class 1 bike lanes on Avila Beach Drive and Shell Beach Road with bike ramps which connect to shared-use paths. Shared-use paths are available to pedestrians and those cyclists who'd prefer to not ride with vehicular traffic through the roundabout. These paths connect to crosswalks on the south, west, and north leg of the roundabout and extend east to Monte Road on the north side of Avila Beach Drive behind the bridge columns. A path was not included on the south side in order to avoid conflicts with the southbound on-ramp and northbound off-ramp. For cyclists riding through the roundabout in the roadway, the corner sight distance is improved for the left-turn movement from eastbound Avila Beach Drive to northbound Monte Road by regrading the fill slope and using speed reduction features on the northbound off-ramp.

This alternative is the only viable build alternative. The design team has reviewed the comments received from the circulation of the DED and the public review process. Retaining wall aesthetics, lighting locations, and landscaping specifics will be refined in the final design phase; however, changes to the project design were not required at this stage.

Proposed Engineering Features

A new 140’ inscribed circle diameter (ICD) would be constructed at the southbound ramp termini intersection (see Attachments C and D). The roundabout would have five legs, including the entrance and exit ramps for southbound US 101, Avila Beach Drive, and Shell Beach Road.

At the southbound ramp intersection with Avila Beach Drive/Shell Beach Road, the roundabout influence area will extend to the ends of the splitter islands and/or to the limits of the conforms from the radii approaching/leaving the roundabout. Within this influence area, the NCHRP Report 672 is the governing design guide. Avila Beach Drive and Shell Beach Road have segment approach speeds of 45 mph which transition to around 20 mph at the roundabout intersection as vehicles enter the roundabout influence area. The southbound off-ramp design speed transitions from 65 mph at the gore to 25 mph at the ramp terminus. Currently, the northbound off-ramp design speed transitions from 65 mph at the gore to 45 mph at the Avila Beach Drive/Monte Road intersection. This project includes speed reduction treatments towards the terminus of the northbound off-ramp to transition drivers into the low-speed environment of the roundabout.

The roundabout location resulted from considering and adapting to site constraints and developing a context-appropriate configuration within hillside, fill slope, park-and-ride, and US 101 bridge location constraints. The east leg of the roundabout was optimized under US 101 to avoid the existing bridge columns while attaining westbound roundabout

entry alignments that provide entry deflection and an offset left alignment that maximized the value of the central island terminal vista. The east leg of the roundabout matches the cross section and alignment of the northbound ramp terminal intersection. Shoulders are not carried through roundabouts, and shoulders will drop between the northbound ramp terminal intersection and the roundabout. The placement of the roundabout avoids the fill slope in the northwest quadrant, accommodates the park-and-ride lot, and serves the design vehicle destined from northbound Shell Beach Road to the southbound US 101 on-ramp.

All approaches of the roundabout were designed for an STAA-STD-56 design vehicle from the Caltrans Highway Design Manual (HDM), 6th Edition (Updated July 2016), since the roundabout will be providing access to US 101 which is part of the National Network. The roundabout can accommodate the STAA Standard Truck for all through and turning movements without requiring external truck aprons. All approaches of the roundabout will also serve a California Legal 65' Truck from the Caltrans HDM for all through and turning movements. All approaches of the roundabout will allow a 45-Foot Bus & Motorhome design vehicle from the Caltrans HDM to circulate all through and turning movements without tracking over the truck apron.

The roundabout is designed to limit entry speeds to 25 mph, in conformance with the NCHRP Report 672. Providing appropriate deflection on entry for the inscribed circle diameter (ICD) location introduced varying degrees of advance roadway curvature that also create speed management features. The circulatory roadway is approximately 21-feet wide with a slope away from the central island varying up to 3%. The central island includes a 12-foot wide truck apron designed to accommodate the off-tracking of back tires of trailers of large trucks. The truck apron will be separated from the circulatory roadway using a fully mountable and traversable curb. Behind the truck apron will be an eight-foot strip of hardscape to control weeds and provide required lines of sight. The center of the central island will be mounded and landscaped to increase the visibility and aesthetic appeal of the roundabout. A ten-foot wide shared-use path would be constructed around the southwest, northwest, and northeast intersection quadrants with a buffer between the path and the circulatory roadway.

Avila Beach Drive is currently a two-lane collector with bike lanes. The proposed design would maintain the two lanes and bike lanes; however, the alignment would be modified to provide appropriate deflection on entry through the use of raised median islands. The existing pavement will be grinded and overlaid where feasible and constructed with a new structural section, as necessary. The raised median islands will feature hardscape treatment. The proposed vertical design would follow the current profile. There is a proposed shared-use path on the north side of Avila Beach Drive under the freeway that would be situated between the existing bridge columns and the abutment through the use of a retaining wall.

Shell Beach Road is also currently a two-lane collector with bike lanes. The proposed design would maintain the two lanes and bike lanes; however, Shell Beach Road would be realigned to the west to accommodate the design vehicles and to provide appropriate deflection on entry through the use of raised median islands. The existing pavement will

be grinded and overlaid where feasible and constructed with a new structural section, if necessary. The raised median islands will feature hardscape treatment. The proposed vertical design would generally match existing grades; however, the realignment of the road will result in some earthwork.

The US 101 southbound off-ramp is currently a one-lane ramp that flares to two lanes at the limit line. The proposed design would realign the ramp to the east to provide appropriate superelevation design approaching the roundabout influence area and deflection on entry. A southbound right-turn bypass lane would be constructed with a raised hardscaped channelizing island between the two lanes. Realigning the ramp to the east will shift the ramp into the fill slope of mainline US 101, and the resulting slopes will be about 2:1 with a retaining wall near the underpass.

Similarly, the US 101 southbound on-ramp is currently a single-lane ramp that would be realigned to the east to accommodate the design vehicles. Realigning the ramp to the east will shift the ramp into the fill slope of mainline US 101, requiring retaining walls.

The existing public right-of-way is sufficient for the proposed improvements, and no impacts to private properties are anticipated. A transfer of ownership between the County and the State is required to update the access control around the southbound ramp termini intersection. Access fencing would be modified between Shell Beach Road and the southbound on-ramp. Additional discussion of right-of-way and access control is included in a following section.

Retaining walls are proposed at several locations to accommodate the realignment of the southbound ramps and the construction of a shared-use path on the north side of the bridge columns and within the park and ride lot. Retaining walls would range in height up to 23-feet above grade in cut sections of the roadway. Table 5-1 summarizes the wall locations, heights, and descriptions of use, including two alternatives for the wall between the southbound on-ramp and mainline US 101. The Advance Planning Study for the retaining walls is included in Attachment E.

Due to the proximity of the proposed roundabout at the southbound ramp terminal intersection, improving corner sight distance at the Avila Beach Drive/Monte Road/northbound off-ramp terminal intersection is proposed. The embankment fill between eastbound Avila Beach Drive and the northbound off-ramp currently restricts corner sight distance for the eastbound left-turn movement to vehicles on the northbound off-ramp that are approaching at approximately 45 mph. This project will include regrading the embankment to provide the required corner sight distance. This will also improve the stopping sight distance from the northbound off-ramp to potential queuing at the westbound roundabout approach. In addition, the proposed project seeks to reduce the speeds on the northbound off-ramp prior to the roundabout intersection with speed feedback signs, pavement markings, a curbed cross section, and potential transverse rumble strips. The speed reduction on the northbound off-ramp would reduce the required sight distance length and will also improve multi-modal safety.

Table 5-1
Retaining Wall Locations

Wall Number	Location/Station	Length (feet)	Max. Exposed Wall Height (feet)	Slope to Wall	Cut/ Fill	Retaining Wall Notes
N1	"AV1-8" 78+16.32 to "F-21" 300+75.98	211	15'	4:1	Cut	In front of Abutment 4 of Avila Road Undercrossing (Br. No, 49-0191L/R) Sub-horizontal ground anchor
W1-Alt 1	"R-22a-1" 150+00.00 to "AV1-5" 49+20.37	240	23'	4:1	Cut	Between the SB on-ramp and mainline US 101 Single wall, soil nail
W1-Alt 2	A: "R-22a-1" 150+00.00 to "AV1-5" 49+20.37	240	10'	4:1	Cut	Between the SB on-ramp and mainline US 101 Two-tiered, soil nail
	B: "R-22a-1" 151+46.73 to "R-22a-1" 152+42.22	107	14'			
W2	"AV1-8" 77+17.77 to 78+16.32	66	16'	2:1	Cut	Between the SB off-ramp and mainline US 101 Soil nail
W3	Park-and-ride lot	103	4	2:1	Cut	South side of overflow parking lot

As a part of this project, drought tolerant landscaping would be installed to the extent feasible in unpaved areas. See Highway Planting section below for more information.

Hydraulics

The proposed drainage design would include the use and extension of existing facilities where possible and construction of new facilities where necessary. Storm water runoff from the interchange and surrounding area is ultimately collected in an existing Caltrans 66-inch Corrugated Metal Pipe (CMP) culvert on the north side of Avila Beach Drive. There are Caltrans interchange drainage systems that outlet at the County right-of-way in the southwest quadrant where the proposed County park-and-ride lot is to be located. From those outlets the flows continue to the northwest in an overland swale and mix with other overland flows to then enter the inlet for the culvert crossing Avila Beach Drive. Flows collected in that existing inlet are conveyed north across Avila Beach Drive and into the 66-inch CMP upstream of the 66-inch CMP outlet. Off-site runoff and runoff from and around the northbound off-ramp are collected in the ravine to the northeast of the interchange prior to entering the 66-inch CMP. In the northbound ramp area, one drainage system will require minor modifications to a left shoulder inlet and the connection to a gore area inlet.

Traffic Analysis

Levels of service for the two-way stop-controlled intersections of the US 101/Avila Beach Drive ramp termini were calculated using the methodologies outlined in the Highway Capacity Manual 6th Edition (HCM 6). Table 5-2 summarizes the 2018 AM, PM, and weekend peak hour traffic operations. As shown in Table 5-2, the US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive intersection operates at LOS D during existing weekend peak traffic conditions. This does not meet Caltrans' performance

thresholds of a LOS C or better. This intersection operates acceptably during the weekday existing AM and PM peak hours.

The other two intersections, i.e. US 101 NB off-ramp/Monte Road/Avila Beach Drive and US 101 SB on-ramp/Avila Beach Drive operate at no worse than LOS C for existing peak hour traffic conditions.

Traffic forecasts, analysis periods, and methodology for the traffic analysis were developed cooperatively by the County and Caltrans through the March 2018 traffic memorandum. Opening Day is assumed to be Year 2022 with a 20-year horizon period of Year 2042. Traffic forecasts were developed by CCTC based on the existing traffic counts, land uses, and model outputs from the Avila Area (County) and SLOCOG travel demand models. The 20-year design volumes for the AM, PM, and weekend peak hour conditions are provided in the ICE Step 2 Report (Attachment B). Operational analysis for the roundabout was completed using Highway Capacity Software (HCS7) that integrates the Highway Capacity Manual, 6th Edition (HCM6) methodologies. Table 5-3 summarizes the 2042 AM, PM, and weekend peak hour traffic operations for the No-Build Alternative.

Table 5-2
Existing (2018) AM, PM, and Weekend Peak Hour Traffic Operations

Intersection Information		Approach	Peak Hour	V/C Ratio	95% Queue Length (veh)	Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive	WBLT	AM	0.01	0.0	7.6	A
			PM	0.02	0.2	9.2	A
			Wkd	0.03	0.1	8.5	A
		NBLR[1]	AM	0.09	0.3	8.3	A
			PM	0.18	0.6	14.5	B
			Wkd	**0.64**	**4.2**	**31.7**	**D**
		SBLTR	AM	0.07	0.2	9.8	A
			PM	0.33	1.4	20.8	C
			Wkd	0.22	0.9	13.1	B
Overall Intersection[2] Delay, s/veh | LOS			AM	9.8		A	
			PM	20.8		C	
			Wkd	**31.7**		**D**	
#2	US 101 NB Exit Ramp/Monte Road/Avila Beach Drive	NBLT[1]	AM	0.15	0.5	11.6	B
			PM	0.13	0.5	10.9	B
			Wkd	0.45	2.3	17.9	C
		SBR	AM	0.00	0.0	9.7	A
			PM	0.01	0.0	9.2	A
			Wkd	0.01	0.0	11.0	B
Overall Intersection[2] Delay, s/veh | LOS			AM	11.6		B	
			PM	10.9		B	
			Wkd	17.9		C	
#3	US 101 SB Entrance Ramp/Avila Beach Drive	WBLT[1]	AM	0.00	0.0	7.6	A
			PM	0.01	0.0	8.8	A
			Wkd	0.01	0.0	8.5	A
Overall Intersection[2] Delay, s/veh | LOS			AM	7.6		A	
			PM	8.8		A	
			Wkd	8.5		A	

[1]Critical Movement
[2]For two-way, stop-controlled intersections, the "critical movement delay and LOS" for that intersection is the overall intersection delay and LOS.
V/C: volume to capacity ratio
s/veh: seconds per vehicle
WBLT: westbound shared left-turn/through lane
NBLR: northbound shared left-turn/right-turn lane
SBLTR: southbound shared left-turn/through/right-turn lane
NBLT: northbound shared left-turn/through
SBR: southbound right-turn lane
Wkd: Weekend
Cells with grey color and bold represents lane groups/intersection operating below the Caltrans' LOS threshold.

As shown in Table 5-3, the US 101 SB off-ramp/Shell Beach Road/Avila Beach Drive intersection is forecast to operate at LOS C and LOS F in the 2042 no-build AM and PM peak hours, respectively. This intersection is forecast to operate at LOS F in the 2042 no-

build weekend peak hour. The other two intersections that access US 101 operate at LOS B or better during the weekday AM and PM peak hours.

Table 5-3
2042 Peak Hour Traffic Operations—No Build Alternative

Intersection Information		Approach	Peak Hour	V/C Ratio	95% Queue Length (veh)	Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive	WBLT	AM	0.02	0.1	7.7	A
			PM	0.04	0.1	9.9	A
			Wkd	0.04	0.1	8.7	A
		NBLR[1]	AM	0.42	2.0	18.4	C
			PM	**>1**	**14.4**	**>100**	**F**
			Wkd	**>1**	**47.0**	**>100**	**F**
		SBLTR	AM	0.25	1.0	10.6	B
			PM	**1.00**	**10.3**	**92.4**	**F**
			Wkd	**>1**	**15.8**	**>100**	**F**
Overall Intersection[2] Delay, s/veh | LOS			AM	18.4		C	
			PM	**>100**		**F**	
			Wkd	**>100**		**F**	
#2	US 101 NB Exit Ramp/Monte Road/Avila Beach Drive	NBLT[1]	AM	0.25	1.0	13.6	B
			PM	0.33	1.4	14.7	B
			Wkd	**0.74**	**5.7**	**40.7**	**E**
		SBR	AM	0.02	0.1	10.4	B
			PM	0.02	0.1	10.4	B
			Wkd	0.03	0.1	13.9	B
Overall Intersection[2] Delay, s/veh | LOS			AM	13.6		B	
			PM	14.7		B	
			Wkd	**40.7**		**E**	
#3	US 101 SB Entrance Ramp/Avila Beach Drive	WBLT[1]	AM	0.03	0.1	7.8	A
			PM	0.05	0.2	9.5	A
			Wkd	0.03	0.1	8.7	A
Overall Intersection[2] Delay, s/veh | LOS			AM	7.8		A	
			PM	9.5		A	
			Wkd	8.7		A	

[1]Critical Movement
[2]For two-way, stop-controlled intersections, the "critical movement delay and LOS" for that intersection is the overall intersection delay and LOS.
Cells with grey color and bold represents lane groups/intersection operating below the Caltrans' LOS threshold.

The US 101 SB on-ramp/Avila Beach Drive intersection operates with queues of one vehicle or less and meets Caltrans' performance thresholds of the side-street stop-controlled intersection in the future weekend peak hour traffic conditions.

The US 101 NB off-ramp/Monte Road/Avila Beach Drive intersection does not meet Caltrans' performance thresholds in the 2042 weekend peak hour. The left turn onto

Monte Road to access US 101 Northbound is the critical approach for the intersection operating at LOS E. This approach has a v/c ratio of 0.74 and a queue length of 6 vehicles (about 150 feet). This queue would not impact operations at the US 101 southbound ramp terminals as there is about 350 feet of storage under the US 101 bridge. Since the worst approach is more than 25% below its capacity and the queues are contained to six vehicles or less, no change in the existing control is recommended.

Table 5-4 summarizes the 2042 AM, PM, and weekend peak hour traffic operations for the Build Alternative. Because there is no change to the control strategy for the northbound ramp terminal intersection (two-way, stop control), the forecast operations for the 2042 No-Build Alternative shown in Table 5-3 apply.

Table 5-4
2042 Peak Hour Traffic Operations—Build Alternative

Intersection Information		Approach	Peak Hour	V/C Ratio		95% Queue Length (veh)		Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive	EB	AM	0.20		0.7		5.0	A
			PM	0.83		10.2		21.8	C
			Wkd	0.49		2.8		8.7	A
		WB	AM	0.31		1.3		5.9	A
			PM	0.29		1.2		5.7	A
			Wkd	0.72		6.5		15.4	C
		NB	AM	0.18		0.6		4.9	A
			PM	0.26		1.0		9.3	A
			Wkd	0.46		2.4		10.4	B
		SB	AM	0.13	0.13	0.4	0.5	5.6	A
			PM	0.18	0.15	0.6	0.5	5.8	A
			Wkd	0.18	0.66	0.6	4.7	20.3	C
Overall Intersection[2] Delay, s/veh | LOS			AM	5.4				A	
			PM	14.6				B	
			Wkd	13.7				B	

As shown in Table5-4, the US 101 SB off-ramp/Shell Beach Road/Avila Beach Drive roundabout is forecast to operate at LOS A in the 2042 AM peak hour and LOS B in the PM and weekend peak hours. Therefore, the Build Alternative (previous Alternative 2) provides acceptable traffic operations for the US 101/Avila Beach Drive interchange and meets Caltrans' performance thresholds for the 20-year traffic forecast design requirements, and Alternative 1 is not required.

Non-Standard Design Features

A Design Standard Decision Document was reviewed and approved on January 30, 2020. There is one nonstandard design feature that required Caltrans Headquarters approval and two nonstandard design features with District delegated approval:

- HDM Index 504.8—**Access Control**
- HDM Index 304.1—Side Slope Standards
- HDM Index 504.8—Access Control

There is a design feature that required Caltrans Headquarters approval for nonstandard access rights opposite the US 101 southbound off-ramp terminal on Avila Beach Drive. Section 504.8 of the HDM states: **For new construction or major reconstruction, access rights shall be acquired on the opposite side of the local road from ramp terminals to preclude driveways or local roads within the ramp intersection.** This nonstandard feature is being proposed to avoid excessive cost and environmental impacts, as a result of providing the standard solution. Shell Beach Road intersects Avila Beach Drive at the southbound ramp terminal intersection. The proposed project would not eliminate the existing non-standard access rights opposite of the southbound off-ramp. To provide standard access rights to meet the boldface standard, it would require realigning Shell Beach Road to intersect Avila Beach Drive approximately 500 feet to the west. This realignment would be through a 140' high undeveloped coastal hillside which would be environmentally infeasible and cost prohibitive.

A nonstandard design feature that required District approval is proposed for the fill slopes on the existing southbound off-ramp that are steeper than 4:1. Section 304.1 of the HDM states: for new construction, widening, or where slopes are otherwise being modified, embankment (fill) slopes should be 4:1 or flatter. This nonstandard feature is being proposed to remain to avoid excessive cost, right-of-way and environmental impacts, as a result of providing the standard solution. The existing southbound off-ramp is at the top of an embankment with existing slopes steeper than 3:1. The project proposes to realign the southbound off-ramp to the east to meet roundabout speed control requirements, which would also increase the separation to the embankment slope. The project is proposing to leave the embankment slope in place to limit the environmental impact, right-of-way acquisition, and construction and relocation expenses associated with regrading the hillside with flatter slopes.

A nonstandard design feature that required District approval is proposed for the nonstandard access control of approximately 50-feet on Shell Beach Road at the US 101 southbound ramp terminal intersection. Section 504.8 of the HDM states: For new constructions, access control should extend 100 feet beyond the end of the curb return or ramp radius in urban areas and 300 feet in rural areas, or as far as necessary to ensure that entry onto the facility does not impair operational characteristics. Section 408.10 (14) states that *the access control standards in Index 504.3(3) and 504.8 apply to roundabouts at interchange ramp intersections. The dimensions shown in Index 504.8 are to be measured from the inscribed circle diameter. Driveways should not be placed within 100 feet from the inscribed circle diameter*. This nonstandard feature is being proposed to avoid excessive cost and environmental impacts, as a result of providing the standard solution. The proposed park-and-ride driveway on Shell Beach Road would be located approximately 50-feet from the inscribed circle diameter. This location would avoid significant impacts to the adjacent hillside and avoid costly retaining walls.

Interim Features

There are no interim improvements proposed in the project area.

High-Occupancy Vehicle (Bus and Carpool) Lanes

There are no bus and carpool lanes proposed in this project.

Ramp Metering

The US 101/Avila Beach Drive interchange is not included in the Caltrans 2017 Ramp Metering Development Plan dated February 2018. For this reason, ramp meters on the southbound on-ramp are not proposed as part of this project. However, the proposed improvements would not preclude the possible future installation of ramp metering at the on-ramps.

California Highway Patrol Enforcement Areas

There are no California Highway Patrol (CHP) enforcement areas proposed in this project.

Park-and-Ride Facilities

This alternative includes a park-and-ride lot located southwest of the interchange between Avila Beach Drive and Shell Beach Road. The park-and-ride layout seeks to maximize parking capacity, minimize conflict points, and optimize circulation for vehicles and transit buses. It has a right-in/right-out driveway on Avila Beach Drive and a driveway on Shell Beach Road that accommodates left and right-turn movements. The parking lot is set back from the roundabout's shared-use path and minimizes impacts to the southern swale along the base of the hillside. The separate parking area located west of the driveway on Avila Beach Drive is a combination of parallel and right-angle parking including up to approximately 14 overflow parking spaces and would remain unpaved to reduce impacts to water quality. This overflow parking area would also be depressed to detain peak runoff flows, and this would require a small retaining wall along the southern edge of the parking area.

The paved angled parking area includes 26 spaces, including three accessible parking spaces. Circulation within the angled parking area is one-way, clockwise flow with a transit pullout in the center landscaped area. The accessible parking stalls are located adjacent to the transit stop making it unnecessary to cross the drive aisle. The transit pullout is situated in a way to facilitate one-way bus flow entering from Shell Beach Road and exiting onto Avila Beach Drive. The roundabout will provide the opportunity for the bus to access any leg of the intersection. Additional features, such as benches, trash cans, or shelters may be provided at the discretion of SLORTA.

Utility and Other Owner Involvement

As shown on the utility plan included in Attachment F, several utility facilities are in the project area, including the following:

- Underground and overhead electric (PG&E)
- Gas (Southern California Gas Company)
- Oil (Phillips 66)
- Storm Drain (Caltrans and County)
- Telephone (AT&T)
- Water (County)
- Overhead Fiber (Charter)

AT&T maintains underground fiber/telephone lines along Avila Beach Drive and Monte Road. There is a vault at the northeast corner of the Monte Road/northbound off-ramp intersection that would be protected in place. Another vault located at the northwest corner of the southbound ramp termini intersection is within the proposed shared-use path alignment. This facility would need to be adjusted to grade or relocated if necessary.

Pacific Gas and Electric (PG&E) owns and maintains overhead electric lines and utility poles in the vicinity of the proposed project. Charter Communications have overhead lines on PG&E's facilities. There are no proposed modifications to the overhead lines or utility poles due to project improvements.

Phillips 66 has an oil pipeline that traverses the proposed park-and-ride lot and Avila Beach Drive improvement areas and crosses Monte Road east of the interchange. It is anticipated that this line would be in conflict with some improvements and is to be reconstructed.

Southern California Gas Company (So Cal Gas) maintains a gas distribution line through proposed park-and-ride and along Shell Beach Road. This line conflicts with the excavation for the overflow parking lot and would require a vertical relocation.

The County of San Luis Obispo maintains a water line through the proposed park-and-ride and along Shell Beach Road. A portion of this line conflicts with the excavation for the overflow basin and would require a vertical relocation. There are existing water valves and a vault located at the west edge of Shell Beach Road and the north edge of Avila Beach Drive between the existing ramp terminus and the US 101 structures. These facilities will need to be relocated behind the proposed back of walk near the park-and-ride lot.

See Right of Way Data Sheet in Attachment F for more information. Utility investigation will continue through the final design phase.

Railroad Involvement

There are no rail facilities within the vicinity of the proposed project.

Highway Planting

As shown in Attachment G, it is intended that portions of the proposed project would utilize hardscape and low maintenance landscaping to create visual cues and screening, provide areas for stormwater quality treatment, minimize maintenance costs and irrigation water use, and provide a visually pleasing design. Areas that are intended to have landscaping are the central island and areas within the park-and-ride lot. These areas would consist of drought tolerant landscape plants that can adapt to the climate of the area and would not need long-term supplemental irrigation. Many of the areas envisioned to receive landscaping are also water treatment areas. Areas to be hydroseeded will not need to be irrigated and can be mowed annually.

The landscape in the area of the roundabout would serve as a visual cue to help traffic maneuver the roundabout and reduce potential visual impact. This landscape will include shrubs and groundcovers. The landscaping in the area of the walls would serve to soften the presence of large man-made features. Landscaping in the park-and-ride lot would also be used to reduce potential visual impact.

A separate contract for highway planting work on this project is not required, because Part 3, Chapter 29, Section 2, Article 1 of the Project Development Procedures Manual (PDPM) states, "Highway planting with an estimated cost of less than $300,000, in conjunction with or resulting from a roadway construction project, may remain with the parent roadway construction project and must include one year of plant establishment. Exceptions to this policy must receive concurrence from both district maintenance and the district landscape architect (LA) and be approved by the Headquarters Landscape Architecture Program." The estimated cost for planting and irrigation, as shown in the attached cost estimate, is less than $300,000; therefore, a separate planting contract is not required.

Erosion Control

Cut and fill slopes on the project would be 2:1 or flatter. All disturbed areas would be stabilized with fiber rolls, compost, and native plant seeding. Existing slopes are generally 2:1 or flatter and are vegetated. Where concentrated surface flow is expected, hydraulic conveyance systems would be constructed, and the outlets of these systems would be treated to provide energy dissipation and to reduce erosion potential. Concentrated flow conveyance systems include ditches, berms, dikes, and swales. Erosion control issues are addressed in more detail in the Storm Water Data Report (Attachment H).

Noise Barriers

Noise barriers (sound walls) are not proposed for this project.

Non-Motorized and Pedestrian Features

A stated purpose of the project is to improve multi-modal access; therefore, the proposed project would include features for cyclists and pedestrians. Bike lanes will be retained on Avila Beach Drive and Shell Beach Road. The roundabout features a shared-use path around the perimeter to provide a separate place for cyclists and pedestrians to traverse the interchange. Prior to the roundabout on Avila Beach Drive and Shell Beach Road, the bike lanes terminate into bike ramps to access the shared-use path. Cyclists would have the option to take the lane and navigate the roundabout as a vehicle or to use the shared-use path as a pedestrian. In a roundabout, cyclists can take the lane more easily because vehicle speeds are reduced and are closer to the speed of a bicycle. The shared-use path would cross Shell Beach Road, the southbound off-ramp, and the west leg of Avila Beach Drive at high-visibly crosswalks. Pedestrian activated signals and beacons are not proposed at this time, since only one lane of traffic is crossed at a time.

The bike path of travel from eastbound Avila Beach Drive to northbound Monte Road would be improved by raising the southside of the intersection to reduce the uphill grade. Speed reduction treatments are proposed to reduce vehicular speeds from the northbound off-ramp and the sight lines for the bike and vehicle would be increased by grading the slope back at the northbound off-ramp gore.

Needed Roadway Rehabilitation and Upgrading

The project does not propose any work on the mainline of US 101 and will grind and overlay or reconstruct the various legs of the intersection within the project limits. Pavement on Avila Beach Drive was recently surfaced with a chip seal.

Needed Structure Rehabilitation and Upgrading

No existing structure rehabilitation or upgrading is anticipated for this project.

Cost Estimates

The preliminary cost (current year costs) for this alternative is $11.8 million which includes $8.0 million in roadway items, $332 thousand in right-of-way costs, and $2.2 million in project support costs. The Project Report Cost Estimate is included as Attachment I.

Right-of-Way Data

The project is contained within public right of way limits and does not require acquisition of privately-owned right of way. A portion of existing County right-of-way, which was relinquished to the County by the State on May 8, 1967, is to return to State jurisdiction by statute. See Right of Way Data Sheet in Attachment F for more information.

Effect of Projects-Funded-by-Others on State Highway

This project is a joint venture with state and federal funding; therefore, this section does not apply.

B. Rejected Alternatives

The ICE Step 1 report analyzed the six intersection control alternatives listed below:

- Alternative E: existing/baseline two-way stop-control (TWSC) at northbound and southbound ramp termini intersections (no build)
- Alternative E1: all-way stop-control (AWSC) at southbound ramp termini intersection and TWSC at northbound off-ramp terminal intersection
- Alternative S1: signal control at southbound ramp termini intersection and TWSC at northbound off-ramp terminal intersection
- Alternative R1: roundabout control at southbound ramp termini intersection and TWSC at northbound off-ramp terminal intersection
- Alternative R2: roundabout control at northbound and southbound ramp termini intersections with southbound on-ramp outside the roundabout
- Alternative R3: roundabout control at northbound and southbound ramp termini intersections with southbound on-ramp inside the roundabout

The report concluded that roundabout alternatives R1 or R3 were the only viable alternatives to serve the forecast traffic, and they have better expected safety performance than the traffic signal and strop control alternatives. Operations and collision history did not support intersection control type change at the northbound ramp terminus.

During the kick-off meeting for the PA&ED phase of the project, the Project Development Team (PDT) reviewed the conclusions of the Step 1 ICE document and identified Alternative R1 as the viable Build Alternative.

6. CONSIDERATIONS REQUIRING DISCUSSION

A. Hazardous Waste

Rincon Consultants, Inc. prepared the Draft Initial Site Assessment (ISA), dated April 2019. There were two suspect environmental concerns identified in the report: hazardous liquid pipeline and natural gas pipeline within and adjacent to the project site and aerially deposited lead (ADL) detected in onsite soil.

The ISA concluded that no unauthorized releases from the hazardous pipelines were known or reported to have occurred. The presence of these pipelines is considered a Potential Recognized Environmental Condition; however, based on the intended site use

as a roadway, the health risk associated to roadway passengers with the onsite pipelines is considered insignificant.

The ISA included a preliminary site investigation (PSI) prepared by Padre Associates, Inc. to evaluate the project site soil for potential aerially deposited lead (ADL)-Contaminated Soil. ADL was detected at the project site. However, based on the statistical analysis using the 95th percent upper confidence limit (UCL) for lead and for soluble lead, the detected concentrations of lead are low enough that the soil can be reused onsite as "clean" soil. Therefore, the soil may be reused onsite with no restrictions and no further assessment is needed.

During construction, unknown hazardous materials could be encountered, or materials could be accidentally spilled. Best Management Practices would minimize or avoid these risks.

B. Value Analysis

A value analysis study is not required and was not conducted.

C. Resource Conservation

The project proposes improving the interchange within and adjacent to the current alignment as much as possible, utilizing and preserving existing materials, and making the most efficient use of existing facilities.

Horizontal and vertical alignments are proposed to maximize the use of existing pavement and embankment material. Existing roadway items such as signs, light standards, guardrails, and other associated hardware are to be used or stockpiled for future use whenever possible. Asphalt concrete pavement and concrete removed from existing roadways may be reused as either base material or embankment material on this project.

D. Right-of-Way Issues

Right-of-Way

The project is contained within public right of way limits and does not require acquisition of privately-owned right of way. A portion of existing County right-of-way, which was relinquished to the County by the State on May 8, 1967, is to return to State jurisdiction by statute (see Streets and Highways Code 83). State jurisdiction currently includes the southbound on-ramp and off-ramp but does not encompass Shell Beach Road or the full intersection. The project proposes to revise the State access control to extend 100-feet from the roundabout circulatory roadway westerly along Avila Beach Drive and 50-feet southerly along Shell Beach Road. The State access control boundary will also include the shared use path at the southwest quadrant of the roundabout. Additionally, the proposed realignment of Shell Beach Road would result in a portion of the roadway extending into State right-of-way. This project proposes to revise the State access control

line at this location to relinquish the Shell Beach Road area to the County. See the layout and right-of-way exhibit in Attachment C for additional information.

Utilities

Within the County right-of-way, a portion of the County water line conflicts with the excavation for the overflow basin and would require a vertical relocation. Similarly, the Southern California Gas line conflicts with the excavation for the overflow parking lot and would require a vertical relocation. Utility relocations within State right-of-way would be limited to streetlights and water valves. There is also a state-owned traffic count pole located at the northeast corner of the southbound off-ramp terminal intersection that would need to be relocated. There is an existing joint utility agreement within the project limits for the Philips 66 oil pipeline. It is assumed that no replacement utility easements or revisions to existing utility easement will be required. See Right of Way Data Sheet in Attachment E for more information.

Relocation Impact Studies

A Relocation Impact Document is not required for this project since the project will not displace any person or business.

Airspace Lease Areas

There are no navigable airspaces being affected by this project.

E. Environmental Compliance

This project is subject to environmental review under the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA). The MND has been prepared by the County in accordance with Caltrans' environmental procedures, as well as State and federal environmental regulations. The attached MND is the appropriate document for the proposal. The project is Categorically Excluded under NEPA. Attachment J contains the MND and the NEPA CE.

Wetlands and Flood Plains

There are no natural drainage features or wetlands within the project area. Riparian habitat associated with Gragg Canyon is adjacent to, but not part of, the project area. Regulatory permits for wetlands and/or waterways will not be necessary for this project.

The project is not located in a 100-year floodplain.

Visual Impact Assessment

As documented in the report dated May 31, 2019, Rincon Consultants documented a Visual Impact Assessment (VIA) in a technical report to assess the visual impacts of the proposed project.

The existing visual context is characterized by hillsides covered in moderately dense vegetation surrounding the interchange, with more sparse vegetation and typical interchange signage and lighting in the immediate vicinity of the interchange. Campground facilities are present and partially visible northwest of the project area. This project will change the vegetated, natural appearance in the immediate vicinity of the interchange with the implementation of additional developed transportation infrastructure. The primary overall visual effects of the project would be a decrease in the natural characteristics and increased nighttime lighting in the area. The inherent visual change associated with an increase in visual scale and additional hardscape and lighting would be unavoidable and noticeable. Viewer sensitivity and response to change is expected to be moderate to moderate-high. In combination with the moderate to moderate-high sensitivity and response to change of the various viewer groups, the overall visual impact is characterized as moderate to moderate-high.

Retaining wall aesthetic treatments, landscaping requirements, tree protection and replacement, and a signage and lighting plan will be incorporated into the project as mitigation to reduce the overall visual impact. Retaining walls will be designed to reduce visual impact, incorporating context sensitive solutions to mitigate or minimize their visual impact. Planting of native and indigenous vegetation and landscaping consistent with the character of the adjacent community landscape as appropriate will improve buffers between roadway and communities. The project shall take measures to consolidate signs, avoid redundancy in signage, locate traffic control cabinets out of sight, eliminate redundancy of lighting standards and use context sensitive street lighting designs. International Dark-Sky Association -compliant lighting shall be used to minimize light pollution into the sky while maximizing light cast onto the ground.

Other Environmental Impacts

Table 6-1 contains a summary of the environmental impacts of the project.

Table 6-1
Summary of Environmental Impacts

Environmental Impact	Result
Aesthetics	Retaining wall aesthetic treatments, landscaping requirements, tree protection and replacement, and a signage and lighting plan will be incorporated into the project as mitigation to reduce the overall visual impact.
Agriculture and Forest Resources	No impact

Biological Resources	No wetlands or waterways will be impacted. No special-status species were detected or expected to occur onsite. Nesting birds may occur throughout the project area especially within vegetation that will be removed.
Cultural Resources	No historical resources will be impacted. No significant archaeological resources will be impacted. Paleontological Resources Monitoring and Mitigation Plan to be implemented though no paleontological resources found.
Geology and Soils	Potential sedimentation and erosion issues will be addressed through implementation of the Storm Water Pollution Prevention Plan. The project will improve the structural integrity of the slopes around the interchange with installation of retaining walls and improved onsite drainage. The project is designed to withstand anticipated seismic and geologic stresses.
Greenhouse Gas Emissions	Construction will generate temporary increase in greenhouse gases, but this project's emissions fall under the threshold*, so no mitigation is required and will have a less than significant impact.
Hazards and Hazardous Materials	Although aerially deposited lead was detected onsite, it has been properly characterized and addressed. Therefore, the project site soil is defined as clean soil and may be reused onsite with no restrictions.
Hydrology and Water Quality	No impact, but a Stormwater Pollution Prevention Plan will be implemented
Land Use and Planning	Project is consistent with applicable adopted plans and policies. No impact to existing and future land use, but avoidance, minimization, and mitigation measures associated with some resources will be implemented. A Coastal Development Permit through the County Planning Department will be required.
Noise	Increased noise levels during construction, but no impact.
Transportation/ Traffic	Transportation Management Plan to be implemented. Overall, the project is seen as a benefit to transportation and traffic by increasing efficiency at the interchange and providing congestion relief for motorists and non-motorists.

Utilities and Service Systems	A subsurface infiltrator system for stormwater quality and a detention basin for peak flow management will be constructed.

*This information was stated in a letter the County received from the APCD titled "APCD Comments Regarding the Avila Beach Drive at US 101 Interchange Project" from February 2019. The letter mentions that the APCD evaluated the construction phase emissions and found that the construction phase would likely be less than the APCD's significance threshold values identified in Table 2-1 of the CEQA Air Quality Handbook (April 2012).

F. Air Quality Conformity

The proposed project is located in the South-Central Coast Air Basin in San Luis Obispo County which is in attainment and/or unclassified for all Federal Standards. This project is considered as an intersection channelization and is exempted from the regional conformity requirements, according to the attached MND. The information was cited according to 40CFR Section 93.127 Table 3.

The construction of a roundabout would provide environmental benefits, as it would reduce vehicle delay and the number of stops when compared to the current intersection control. Vehicles continue moving, rather than coming to a complete stop. This may reduce noise and air quality impacts and fuel consumption significantly by reducing the number of acceleration/deceleration cycles and the time spent idling.

G. Title VI Considerations

The project has been developed in accordance with Title VI of the Civil Rights Act of 1964. Title VI prohibits discrimination by recipient of Federal assistance on the basis of race, color, and national origin, including the denial of meaningful access for limited English proficient Persons. Modifications to the US 101/Avila Beach Drive interchange would include the construction of a shared-use path on the north side of Avila Beach Drive underneath US 101 in conformance with American Disabilities Act (ADA) requirements. Pedestrian traffic through the roundabout would be facilitated by crosswalks with median refuges. Implementation of the proposed project would not result in any long-term adverse effects upon the minority, low-income, or surrounding communities.

H. Noise Abatement Decision Report

No adverse impacts from construction are anticipated. As discussed in the Environmental Document, the only sensitive receptor site is the Avila Hot Springs; however, the noise impacts were determined to be less than significant. Construction activities which may generate noise would be temporary. The project will be constructed in accordance with Caltrans Standard Specification Section 14-8.02.

I. Life-Cycle Cost Analysis

As documented in the approved ICE Step 2 document, a service life assessment was performed as part of the benefit cost (B/C) analysis. This analysis considered multiple costs and benefits for various intersection types through forecast year 2042. It was determined that the proposed project was significantly superior in terms of life cycle cost as compared to other evaluated intersection controls. For example, the roundabout yields a 4.37 B/C ratio when compared to the existing stop-controlled intersection

J. Reversible Lanes

This project does not qualify as a capacity increasing or a major street or highway realignment project, and reversible lanes have not been considered. It is also difficult and costly to convert bi-directional facilities, and reversible lanes do not meet the project's purpose and need.

7. OTHER CONSIDERATIONS AS APPROPRIATE

A. Public Hearing Process

The DED was circulated by the County to the public and interested parties from January 6, 2020 through February 5, 2020. During the public circulation period, a public workshop/presentation was held on January 13, 2020. Comments from the public review process have been addressed in the attached MND. The general tenor of the comments was positive and detailed with focus on aesthetics, lighting, bike access, and traffic operations.

B. Route Matters

Existing freeway agreement does not need to be modified for this project. County will relinquish a portion of right-of-way to the State to accommodate access control revisions.

C. Permits

The project is within the Coastal Zone and is subject to the County's Local Coastal Plan (LCP). In order to comply with the LCP, the project will require a Coastal Development Permit from the County Planning and Building Department prior to construction.

D. Cooperative Agreements

An executable Cooperative Agreement between Caltrans and the County addressing the final design and permitting activities is attached to this document in Attachment K. It is recommended that a Cooperative Agreement be negotiated for the design phase of project development where the County would be the implementing agency for the final design and permitting activities, and Caltrans would be responsible for providing oversight and Independent Quality Assurance of the project. The construction phase of the project would be addressed in a subsequent Cooperative Agreement once full construction funding is formalized.

E. Other Agreements

Maintenance Agreement

Existing Maintenance Agreement will be revised and updated to address the maintenance of the proposed improvements. A project specific Maintenance Agreement may also be required for any portion of the proposed improvements that will exist in the State's right of way.

F. Report on Feasibility of Providing Access to Navigable Rivers

The proposed project does not affect a navigable river or waterway.

G. Public Boat Ramps

The proposed project does not affect any public boat ramps.

H. Transportation Management Plan

Traffic impacts due to the construction of the roundabout would be reduced by closing the northbound off ramp, southbound on and off ramp at Avila Beach Drive and detouring traffic to the San Luis Bay Drive and the Shell Beach Drive interchanges. Short-term lane and road closures may also be required on Avila Beach Drive, Shell Beach Road, and Monte Road to construct intersection improvements. Closures would be limited to off-peak periods to the maximum extent practicable. Charts for ramp closures will be provided in the Plans, Specifications, and Estimate (PS&E) phase. See the Transportation Management Plan Data Sheet in Attachment L for more information. Detours will be provided at all times during construction for bicycle and pedestrian travel along the local roadways through the construction zone.

I. Stage Construction

Construction of the southbound ramp termini intersection would be completed during several stages of work to maintain access to through traffic. Construction activities would be shielded from traffic with temporary railing (Type K) as necessary. Although, the ultimate construction staging plan will be determined by the contractor, the following is a potential plan for constructing the improvements in four major stages to minimize potential detours and maintain existing traffic patterns through the interchange:

Stage 1: Outside the existing traveled ways, temporary paving would be constructed for the future rerouting of the southbound off-ramp, Shell Beach Road, and the west leg of Avila Beach Drive. Partial construction of the permanent southbound ramp alignments, the walls in the interchange area, and the shared-use path under US 101 on the north side of Avila Beach Drive would also be completed. Existing traffic patterns would be maintained.

Stage 2: The southbound off-ramp and Shell Beach Road traffic would be shifted east onto the temporary paving constructed in Stage 1. Avila Beach Drive traffic would be shifted south. Portions of the western half of the intersection would be constructed.

Stage 3: Traffic would be moved to the new alignments of the southbound on and off-ramps and Shell Beach Road. The gore area between the southbound on-ramp and Shell Beach Road and the northeast and southeast portions of the roundabout would be constructed. Short-term partial closures of Avila Beach Drive, Monte Road, and the northbound off-ramp would be required.

Stage 4: Construction of the remaining portions of the roundabout and the islands would be completed as well as the construction of the park-and-ride lot. Traffic would be rerouted within paved areas during this stage.

J. Accommodation of Oversize Loads

Clearances at the existing structures and east of the southbound ramp terminal roundabout will be unaffected by the project. The roundabout will be designed to accommodate the STAA-STD-56 design vehicle from the Caltrans Highway Design Manual for all movements since the roundabout will be providing access to US 101—part of the National Network. Entry widths have been widened when necessary to provide space for truck trailer off-tracking within the lane, while in the circulatory roadway a truck apron around the central island is provided for the off-tracking of the trailer's back tires. The truck apron would be slightly raised to deter other vehicles from using it, but it will be easily mountable to not disturb the trailer loads. Other oversized loads may be accommodated using removable signage.

K. Graffiti Control

The proposed project is not in a graffiti-prone area. However, graffiti resistant treatments will be considered for the retaining walls.

L. Asset Management

Transportation asset management is defined by United States Code (23 U.S. Code § 101) as "a strategic and systematic process of operating, maintaining, and improving physical assets, with a focus on both engineering and economic analysis based upon quality information, to identify a structured sequence of maintenance, preservation, repair, rehabilitation, and replacement actions that will achieve and sustain a desired state of good repair over the lifecycle of the assets at minimum practicable cost."

This project will improve the interchange by providing acceptable traffic operations for more than 20 years without impacts to the existing undercrossing structure or mainline US 101. Existing pavement will be preserved or rehabilitated where possible. As discussed in section 6.I., this project was significantly superior in terms of life cycle cost as compared to other evaluated intersection controls.

M. Complete Streets

The Complete Streets Act (AB 1358, 2008) directs local transportation agencies across California to plan facilities that meet the needs of all users, including bicyclists, pedestrians, and transit riders. As discussed in previous sections, this project will provide for the needs of all users with bike lanes, shared-use paths, and a park-and-ride lot which includes transit facilities.

N. Climate Change Considerations

According to Caltrans' Office of Smart Mobility and Climate Change, Caltrans' climate change efforts are to create and maintain sustainable practices to reduce greenhouse gas emissions from transportation operations and projects, and to implement adaptation measures to increase the resilience of the State Highway System to climate impacts and address vulnerabilities.

This project includes converting a stop-controlled intersection to a roundabout. The construction of a roundabout would reduce vehicle delay, the number of stops, the number of acceleration/deceleration cycles, and the time spent idling. Although this project is in a coastal area, the project site is not subject to sea level rise. The project is generally surrounded by open space and vegetated drainage facilities.

O. Broadband and Advanced Technologies

This project is not a Caltrans-led highway construction project and is therefore not required to incorporate wired broadband facilities.

8. FUNDING, PROGRAMMING AND ESTIMATE

A. Funding

SLOCOG's *2019 Regional Transportation Plan* (RTP) lists an operational improvement project and park-and-ride lot at the US 101/Avila Beach Drive interchange as a financially constrained project. A combination of local and Federal funds, including Congestion Mitigation and Air Quality (CMAQ) Improvement Program funds and Automated Driving System (ADS) Demonstration Grants, have been used for the PA&ED phase of this project. The PS&E phase will be funded through a combination of Federal, State, and Local funds through the State Transportation Improvement Program (STIP), CMAQ, Regional State Highway Account (RSHA), and Road Improvement Fee (RIF). Construction funding is anticipated to be a combination of CMAQ and Senate Bill (SB) 1 funds through the Solutions for Congested Corridors Program (SCCP).

It has been determined that this project is eligible for Federal-aid funding.

B. Programming

This project is included as a financially constrained project in SLOCOG's 2019 RTP with an estimated construction cost of $7.2 million. As summarized in the following section,

this is less than the current estimated construction costs. Table 8-1 summarizes the estimated costs to complete this project.

Table 8-1
Funding Estimate

Fund Source	Fiscal Year Estimate							
See notes below	Prior[1]	20/21[1]	21/22	22/23[1,2]	23/24	24/25	Future	Total
Component	In thousands of dollars ($1,000)							
PA&ED Support	690							690
PS&E Support		882						882
Right-of-Way Support		13						13
Construction Support				810				810
Right-of-Way				390				390
Construction				10,475				10,475
Total	690	895		11,675				13,260

[1]20.xx.400.100 Local
[2]20.xx.075.600 STIP RIP
Notes: Support and construction costs are escalated at 5.0% per year to the 22/23 year. The support cost ratio is 28.2%.

C. Estimate

The project cost estimate is included as Attachment I, and the total project cost that includes capital and support costs is estimated as shown in Table 8-2.

Table 8-2
Cost Summary

	Current Year Cost (2019)	**Escalated Cost (2022)**
Capital Outlay Costs:		
Roadway Items	$7,951 K	$9,058 K
Structures Items	$1,244 K	$1,418 K
Subtotal Construction Cost	$9,195 K	$10,475 K
Utility Relocation	$332 K	$390 K
Total Capital Outlay Cost (Rounded)	**$9,528 K**	**$10,866 K**
Support Costs:		
PA/ED Support	$690 K	$690 K
PS&E Support	$800 K	$882 K
Right-of-Way Support	$12 K	$13 K
Construction Support	$700 K	$810 K
Total Support Cost (Rounded)	**$2,202 K**	**$2,396 K**
Total Project Cost (Rounded)	**$11,750 K**	**$13,300 K**

9. DELIVERY SCHEDULE

Table 9-1
Project Milestone Schedule

Project Milestones		Milestone Date (Month/Day/Year)	Milestone Designation (Target/Actual)
BEGIN ENVIRONMENTAL	M020	10/2017	Actual
CIRCULATE DED EXTERNALLY	M120	1/2020	Actual
PA & ED	M200	6/2020	Target
PROJECT PS&E	M380	12/2021	Target
RIGHT OF WAY CERTIFICATION	M410	12/2021	Target
READY TO LIST	M460	3/2022	Target
AWARD	M495	7/2022	Target
FINAL PROJECT CLOSEOUT	M900	6/2024	Target

10. RISKS

The project Risk Register, included as Attachment M, lists 15 risks that have been identified for the project. They span the environmental, design, and construction phases and are of varying impacts. Risk control strategies include mitigation, acceptance, and avoidance. In general, risks would impact the project schedule and cost if they were realized. Below are the current active identified risks that have at least a moderate rating of probability of occurring.

Two “moderate” risks are related to environmental, with acceptance and avoidance strategies that include using a conservative Area of Potential Effects (APE) boundary for environmental studies and avoiding impacts to oak trees where possible.

Two “moderate” risks are related to right-of-way with acceptance strategies that include coordination with utility companies to determine relocation schedules and liabilities and associated costs.

One "moderate" risk is related to construction funding with acceptance strategies. This project is listed as constrained in SLOCOG’s 2019 RTP and relies heavily on construction funding from SB 1’s Congested Corridors Program. This is a statewide competitive program and, as such, the project’s construction funding could be at risk if no other federal or state fund source is available. However, this project is one of the top three priority projects for the County with strong support from SLOCOG, Caltrans District 5, and the County. These agencies will continue to advocate for SB 1 Funding for this project. This project is a component of the Congested Corridors Relief Project for southbound Route 101.

11. EXTERNAL AGENCY COORDINATION

California Coastal Commission
California Public Resources Code Division 20 (California Coastal Act)
Coastal Development Permit (through County Department of Planning and Building)

SLORTA

SLOCOG

12. PROJECT REVIEWS

Kick off field review (November 8, 2017)
List participants of the kick off field review:

- Ben Jensen, Wallace Group, Design
- Brian Ray, Kittelson & Associates, Traffic
- Claudia Espino, Caltrans, Design
- Craig Campbell, Wallace Group, Hydraulics
- Eric Fredrickson, Mark Thomas, Structures
- Jeff Brubaker, SLOCOG, Traffic
- Joe Fernandez, Central Coast Transportation Consulting, Traffic
- Jorge Aguilar, Wallace Group, Project Manager
- Joshua Roberts, County, Transportation
- Katie Drexhage, County, Environmental
- Kristen Inkrott, Caltrans, Hydraulics
- Matt Willis, County, Environmental
- Michael Thomas, Caltrans, Environmental
- Paul Valadao, Caltrans, Project Manager
- Pete Riegelhuth, Caltrans, Environmental/Hydraulics
- Sam Toh, Caltrans, Traffic
- Steve Talbert, Caltrans, Safety

District Traffic Engineer: *Roger Barnes*
Project Manager: *Paul Valadao*
District Safety Review *Anthony DeAnda*
Constructability Review: *Project Development Team* (February 12, 2019)

13. PROJECT PERSONNEL

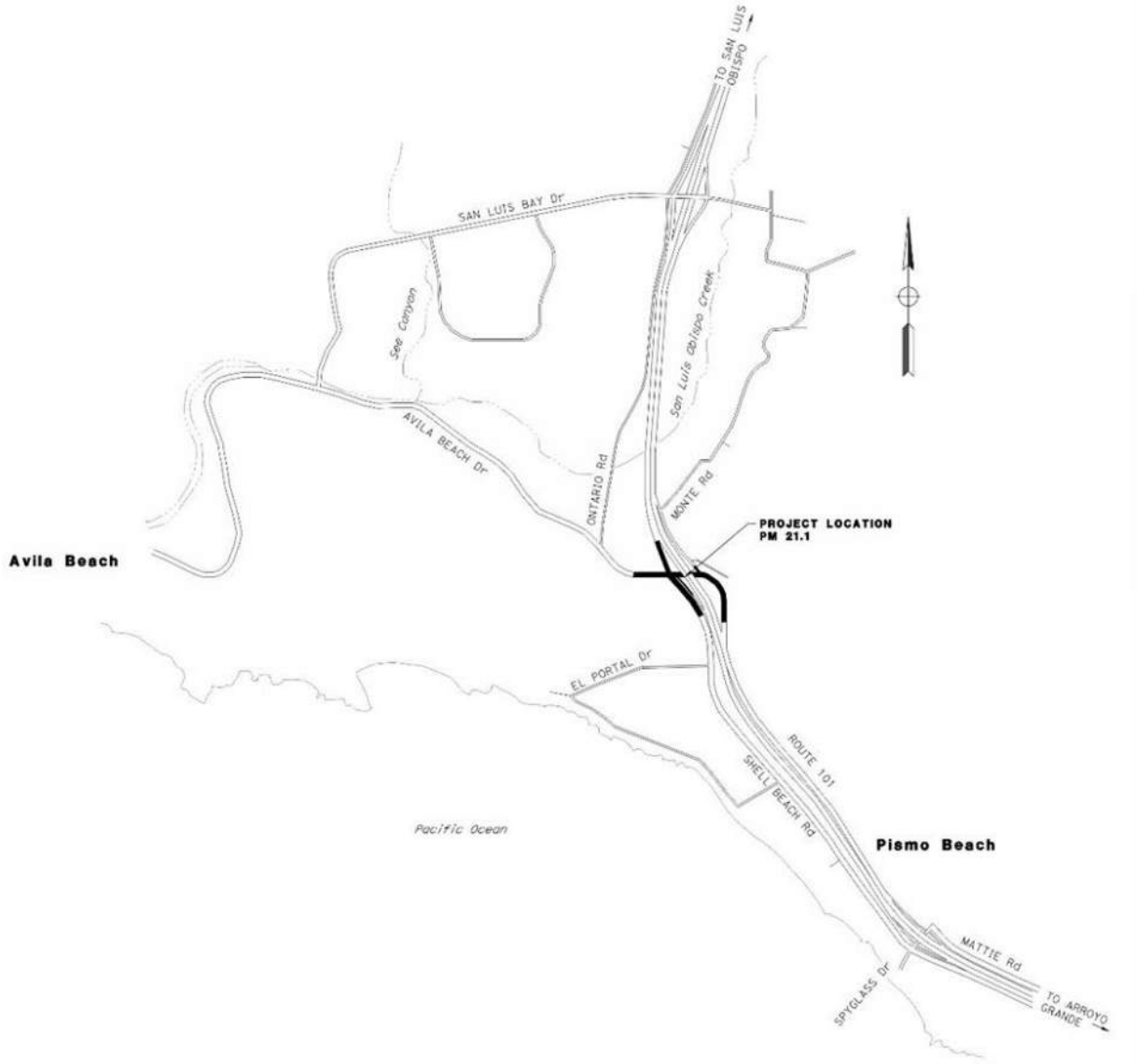
Name	Role	Phone
Genaro Diaz	County of San Luis Obispo Project Manager	805-781-5279
Matt Willis	County of San Luis Obispo Environmental	805-781-1952
Paul Valadao	Caltrans Project Manager	805-549-3016
Claudia Espino	Caltrans Design	805-549-3079
Roger Barnes	Caltrans Traffic Operations	805-549-3473
Pete Riegelhuth	Caltrans Stormwater	805-549-3375

Jorge Aguilar	Consultant Project Manager	805-544-4011
Sarah Huffman	Consultant Project Engineer	805-544-4011
Craig Campbell	Consultant Stormwater Engineer	805-544-4011
Fred Wismer	Consultant Traffic Operations	503-535-7440
Eric Fredrickson	Consultant Structures Design	916-403-5727

14. ATTACHMENTS

A. Location Map
B. ICE Step 2 Report & Caltrans Concurrence Memorandum
C. Layout
D. Typical Cross Sections
E. Advance Planning Study, Retaining Walls
F. Right of Way Data Sheet and Utility Plan
G. Highway Planting Exhibits
H. Storm Water Data Report-Signed Cover Sheet
I. Project Report Cost Estimate
J. IS/MND and NEPA CE
K. Cooperative Agreement
L. Transportation Management Plan Data Sheet
M. Risk Register
N. Distribution List

Attachment A
Location Map



Attachment B
ICE Step 2 Report & Caltrans Concurrence Memorandum

KITTELSON & ASSOCIATES
155 GRAND AVENUE, SUITE 900
OAKLAND, CA 94612
P 510.839.1742 F 510.839.0871

MEMORANDUM

Date: March 28, 2019

Project #: 20758

To: Jorge Aguilar, PE, Wallace Group

From: Brian L. Ray, Anusha Musunuru; & Fred Wismer, PE

Project: US 101/Avila Beach Drive Interchange

Subject: FINAL Intersection Control Evaluation (ICE) Step 2

OVERVIEW

The memorandum describes Intersection Control Evaluation (ICE) Step 2 activities for the southbound interchange ramp terminal intersection at US 101/Avila Beach Drive.

Based on the Intersection Control Evaluations (ICE) Step 1 in support of the May 2016 Project Study Report-Project Development Support (PSR-PDS) approved by Caltrans, the recommended control strategy at the southbound ramp terminal intersection was a yield (roundabout) controlled intersection. The 2016 Caltrans study also considered enhancements to the northbound off-ramp and ramp terminal intersection at Avila Beach Drive and concluded two-way stop control was appropriate for the northbound ramp terminal intersection.

Kittelson & Associates, Inc., (Kittelson) evaluated roundabout and stop-control strategies at the southbound ramp terminal intersection and has organized the findings in the following sections:

- Summary – Overview of screening and ICE Step 2 screening results.
- ICE Step 2– Design and Traffic Analysis: Technical Studies.
- Next Steps – ICE Step 2 Concepts in Design.

Based on our technical analysis, Kittelson validates the 2016 ICE Step 1 findings and concludes the roundabout is the optimal intersection form to serve non-motorized and motorized users. The intersection will readily serve a.m. and p.m. existing and forecast traffic while reducing crash frequency and severity compared to a two-way stop condition of the no-build alternative. The roundabout at the southbound ramp terminal and associated treatments at the northbound ramp terminal will eliminate the free flow condition for through movements passing under US 101 and reduce travel speeds within the interchange. The roundabout will create a gateway effect while supporting an environment conducive to a park-and-ride facility and increased pedestrian and bicyclist activity.

SUMMARY-- OVERVIEW OF SCREENING AND ICE STEP 2 SCREENING RESULTS

Kittelson evaluated a no-build condition and a roundabout build alternative scenario for 2042 (20-year) weekday morning peak, weekday afternoon peak, and weekend peak conditions. Two-way stop control would remain at the northbound ramp terminal intersection. A roundabout at the southbound ramp terminal intersection meets traffic operations objectives, includes non-motorized facilities through the roundabout and interchange, and provides access to a proposed park-and-ride facility. The no-build alternative does not serve 2042 forecast traffic volumes, nor does it include defined pedestrian and bicycle facilities.

The roundabout form is forecast to reduce all crash types over the no-build, two-way stop condition. It would reduce travel speeds along Avila Beach Drive compared to the no-build alternative and eliminates the most severe crash types of head on and angle crashes. The roundabout would serve as a gateway and terminal vista for the Avila Beach and Pismo Beach communities. This would support driver deceleration over the current stop-controlled form (and no-build alternative). The no-build alternative provides no safety benefit for interchange users.

ICE Step 2 Key findings include:

- The single lane roundabout alternative is adequate to meet 2042 a.m. and p.m. forecast traffic. The no-build alternative (two-way stop control) will not accommodate 2042 forecast traffic.
- A service life analysis indicates the single lane roundabout alternative could operate until 2048 under the weekday and weekend peak hour volumes before exceeding the Caltrans' performance criteria of LOS C.
- Converting the stop-controlled intersection to a roundabout is expected to decrease the number of crashes (all types and severities) by 61% to 83%. In 2042, the roundabout is forecast to reduce the number of crashes to below reported 2018 values.
- The roundabout will integrate features that serve pedestrians and bicyclists through the interchange area and provide access to the proposed park-and-ride facility. The roundabout results in reduced speeds compared to the no-build alternative. Low speeds increase yield rates at crosswalks and reduce crash severity, especially for vulnerable users.
- The roundabout will have an Inscribed Circle Diameter (ICD) of 140' and will accommodate an STAA design vehicle for each movement. Kittelson recommends using steel reinforced curbing and sidewalk in the roundabout influence area for increased durability from potential over tracking.
- The roundabout will have entry speeds of less than 25 miles per hour and have adequate intersection stopping sight distance and corner sight distance.
- The roundabout configuration from this ICE Step 2 evaluation will form the basis of the roundabout's final design where refinements are likely to occur as the final design is developed.
- The life-cycle benefit/cost analysis of the stop-controlled intersection compared to the roundabout is 4.37.

ICE STEP 2– DESIGN AND TRAFFIC ANALYSIS: TECHNICAL STUDIES RESULTS

Caltrans Traffic Operations Policy Directive (TOPD) 13-02 (August 30, 2013) summarizes the ICE policy and framework. ICE Step 1 is intended to conduct sufficient technical analysis to screen and advance promising intersection control strategies. ICE Step 2 includes engineering analyses of the control strategies advanced from ICE Step 1.

For ICE Step 2, Kittelson analyzed existing and forecast traffic volumes (2042) for a single lane roundabout. Kittelson considered roundabout configurations that fit within the constrained site conditions and completed performance checks (Design Vehicle, Fastest Path, and Sight Distance). The roundabout specifically integrates pedestrian and bicycle facilities and will serve the surrounding area via the interchange.

The TOPD notes ICE Step 2 results in preliminary plan alternatives that include critical design features and traffic elements to advise decision makers of "potential risks, performance deficiencies, mitigation strategies and improvement concepts needed beyond the service life recommendations." Specifically, the TOPD states:

> *"…The result of Step Two activities is an engineering estimate and comparison of the system performance impacts, benefits, and costs expected over the design or service life of each control strategy and No Build or Control scenario. Traffic analysis will produce performance impacts and benefits estimates related to intersection control delay…collision frequency and severity…"*

To assess the strategies, Kittelson considered the following performance categories:

- Traffic Operations
- Safety Performance
    - Roundabout performance checks
    - Crash comparison
- Footprint:
    - Practical and Context Sensitive
- Design/Service Life
    - Service life
    - Life cycle analysis
- Supporting/not precluding future projects

The ICE Step 2 Design and Traffic Analysis results show the No-build alternative does not meet traffic operations performance requirements in the forecast year (2042). Further, the proposed roundabout meets forecast traffic operations performance requirements through 2048 with the construction of the right-turn yield lane as shown in Exhibit 12 and detailed in the Traffic Report. As the ICE Step 2 designs are advanced into final design, engineering cost estimates will be prepared and assessed.

Traffic Operations

***Appendix A* contains the *Final Traffic Report* and traffic operations and safety evaluation results. Only select exhibits from the *Final Traffic Report* are included in this Step 2 ICE Memorandum.**

Kittelson applied the two-way stop controlled and roundabout methodologies of the Highway Capacity Manual, 6th Edition (HCM6) as implemented by Highway Capacity Software (HCS7). Based on Caltrans controlling the US Highway 101 mainline and ramps and San Luis Obispo County controls Avila Beach Drive, Kittelson applied the following mobility targets for the operations analysis:

- Proposed roundabout alternative: LOS C
- Existing side-street-stop controlled intersection (critical movement): LOS C

The future year 2042 traffic volumes for the weekday a.m. and p.m. peak hour and weekend peak hour conditions are provided in Exhibits 1 through 3.

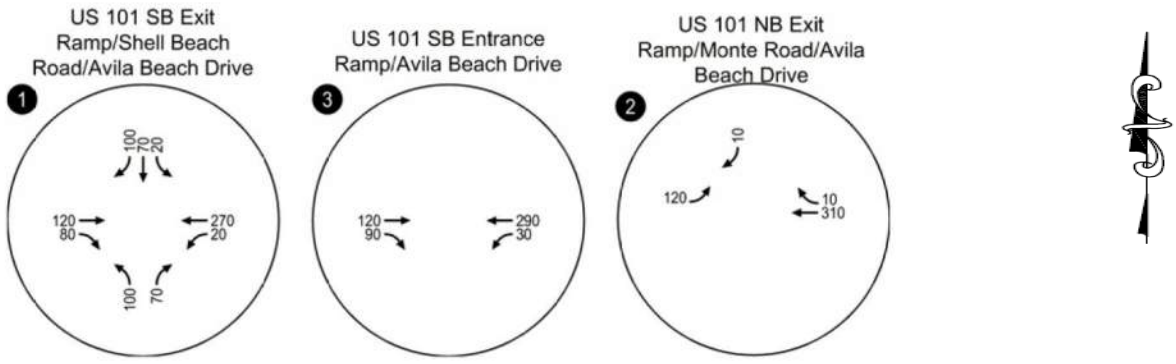


Exhibit 1: Future (2042) Traffic Volumes, Weekday A.M. Peak Hour

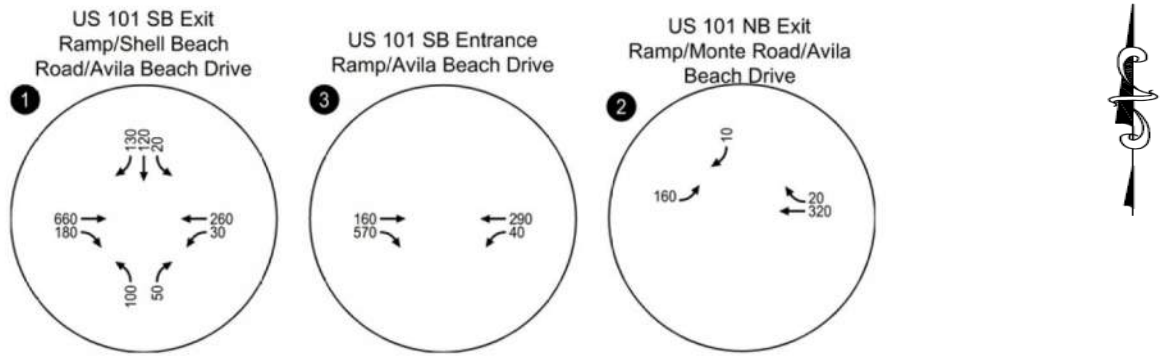


Exhibit 2: Future (2042) Traffic Volumes, Weekday P.M. Peak Hour

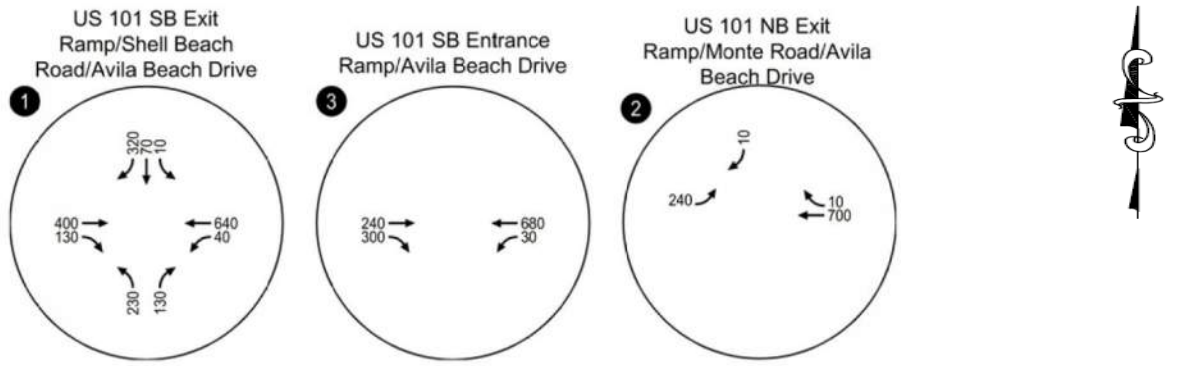


Exhibit 3: Future (2042) Traffic Volumes, Weekend Peak Hour

Kittelson evaluated design year 2042 forecast traffic volumes for the roundabout build alternative. Exhibit 4 shows the lane configurations of the roundabout build alternative and the two-way stop control for the northbound ramp terminal intersection.

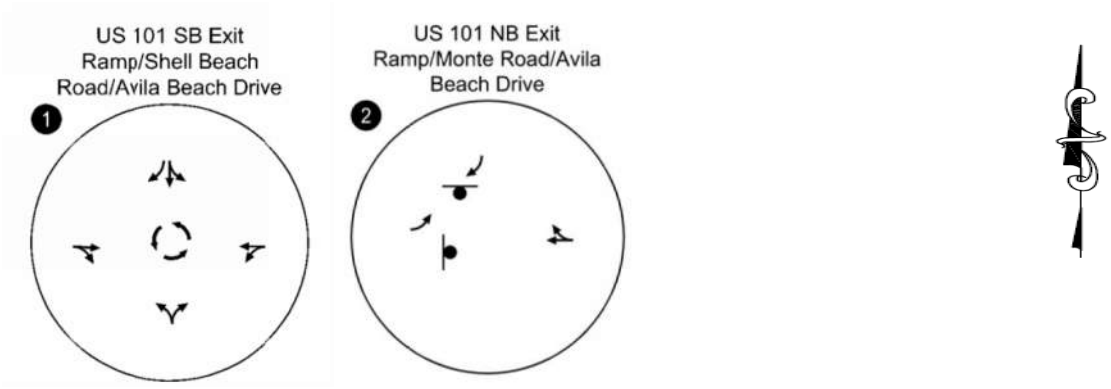


Exhibit 4: Intersection Lane Configurations for the Future (2042) Build Conditions

Kittelson evaluated forecast conditions using the forecast volumes for the 20-year (2042) forecast for the roundabout build alternative. The proposed design includes a southbound right-turn yield lane at the request and general consensus of the project's management team. Exhibit 5 summarizes the weekday a.m., and p.m. future 2042 condition operations.

Exhibit 5: Future (2042) Roundabout Alternative Weekday A.M., and P.M. Peak Hour Traffic Operations

Future Build Conditions (2042)									
Intersection Information		Approach	Peak Hour	V/C Ratio		95% Queue Length (veh)		Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive (Roundabout)	EB	AM	0.20		0.7		5.0	A
			PM	0.83		10.2		21.8	C
		WB	AM	0.31		1.3		5.9	A
			PM	0.29		1.2		5.7	A
		NB	AM	0.18		0.6		4.9	A
			PM	0.26		1.0		9.3	A
		SB	AM	0.13	0.13	0.4	0.5	5.6	A
			PM	0.18	0.15	0.6	0.5	5.8	A
Overall Intersection Delay, s/veh | LOS			AM	5.4				A	
			PM	14.6				B	

As shown in Exhibit 5, the overall intersection delay is forecast to be 5.4 and 14.6 seconds/vehicle in the future weekday a.m. and p.m. peak periods, respectively. The overall LOS for the roundabout build alternative for future weekday a.m., and p.m. traffic conditions is LOS A and B respectively.

Exhibit 6: Future (2042) Weekend Peak Hour Traffic Operations

Future Build Conditions (2042)									
Intersection Information		Approach	Peak Hour	V/C Ratio		95% Queue Length (veh)		Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive (Roundabout)	EB	Weekend MD	0.49		2.8		8.7	A
		WB		0.72		6.5		15.4	C
		NB		0.46		2.4		10.4	B
		SB		0.18	0.66	0.6	4.7	20.3	C
Overall Intersection Delay, s/veh | LOS				13.7				B	

As shown in Exhibit 6, the overall intersection delay is forecast to be 13.7 seconds/vehicle in 2042. The overall LOS for the roundabout alternative for the 2042 weekend peak hour traffic conditions is LOS B.

Safety performance

Kittelson analyzed crash report data from Caltrans Traffic Accident Surveillance and Analysis System (TASAS) and California Statewide Integrated Traffic Records System (SWITRS) for a three-year period from January 1, 2014 through December 31, 2016 at US 101 northbound ramp and southbound ramps. Exhibit 7 summarizes the crashes by crash frequency and severity, along with the actual and state-wide average crash (or accident) rates. Caltrans provided these state-wide averages for similar facility types, i.e. ramp types and the area type (i.e. urban/rural).

Exhibit 7: Summary of Ramp Terminal Intersections' Crash Data and Rates (1/1/2014 – 12/31/2016)

	Crash Severity				Total Crash Rates (Crashes/MV*)			
Facility	Total	Fatal	Injury	Multi-Vehicle	Actual	Average	ADT Main X-St	Total MV*
US 101 Ramp Terminal Intersections and Avila Beach Drive								
Southbound on Ramp	0	0	0	0	0	0.60	3.4 4.6	8.82
Southbound off Ramp	2	0	2	2	**0.14**	0.92	1.2 11.7	14.08
Northbound on Ramp	1	0	0	0	**0.60**	0.33	1.3 0.2	1.66
Northbound off Ramp	4	0	2	4	**0.73**	0.50	3.5 1.5	5.50

*MV – Million Vehicles

Cells highlighted in grey represent crash rates that are greater than the state-wide average for similar facility types.

Exhibit 7 shows a total of 7 crashes were reported on the northbound and southbound on and off ramp terminal intersections at Avila Beach Drive, over the three-year period. No crashes resulted in fatalities, and 4 crashes resulted in injury. As summarized in Exhibit 7, the northbound ramp terminal intersection at Avila Beach Drive generally have more "total" crash rates compared to the state-wide average for similar facilities. The crash rate may be reduced by improving sight distance at the US 101 Northbound Ramp Terminal intersection and reducing off-ramp speeds through the use of optical speed bars, speed feedback signs, and advanced warning signs.

Kittelson used a Safety Performance Functions (SPFs) from Part C of the *Highway Safety Manual, First Edition* to calculate predicted crash frequency for a minor road stop-controlled intersection. The SPF predicts the crash frequency for the southbound ramp terminal intersection in the study for current and forecast conditions. Since no calibration factors are available, the predicted crash numbers are relative and for comparison purposes only.

Kittelson applied a crash modification factor (CMF) for converting a stop-controlled intersection to a single lane roundabout (CMF = 0.28; standard error = 0.11) from Federal Highway Administration (FHWA) CMF Clearinghouse. Kittelson multiplied the SPF results by the roundabout CMF to obtain the predicted crash frequency for a roundabout. Exhibit 8 summarizes the predicted crash frequency ranges of southbound ramp terminal intersection before and after converting to roundabout for all crash severities associated with single and multiple vehicle crashes for current and forecast conditions.

Exhibit 8: Predicted Crash Frequency Comparison for Existing (2018) and Forecast (2042) Conditions

Crash Type	Predicted Crash Frequency			
	Stop Controlled Intersection	Roundabout	Stop Controlled Intersection	Roundabout
	Year 2018		Year 2042	
Multiple Vehicle	1.97 crashes/year	0.33 to 0.77 crashes/year	3.18 crashes/year	0.54 to 1.24 crashes/year
Single Vehicle	0.27 crashes/year	0.05 to 0.10 crashes/year	0.33 crashes/year	0.06 to 0.13 crashes/year

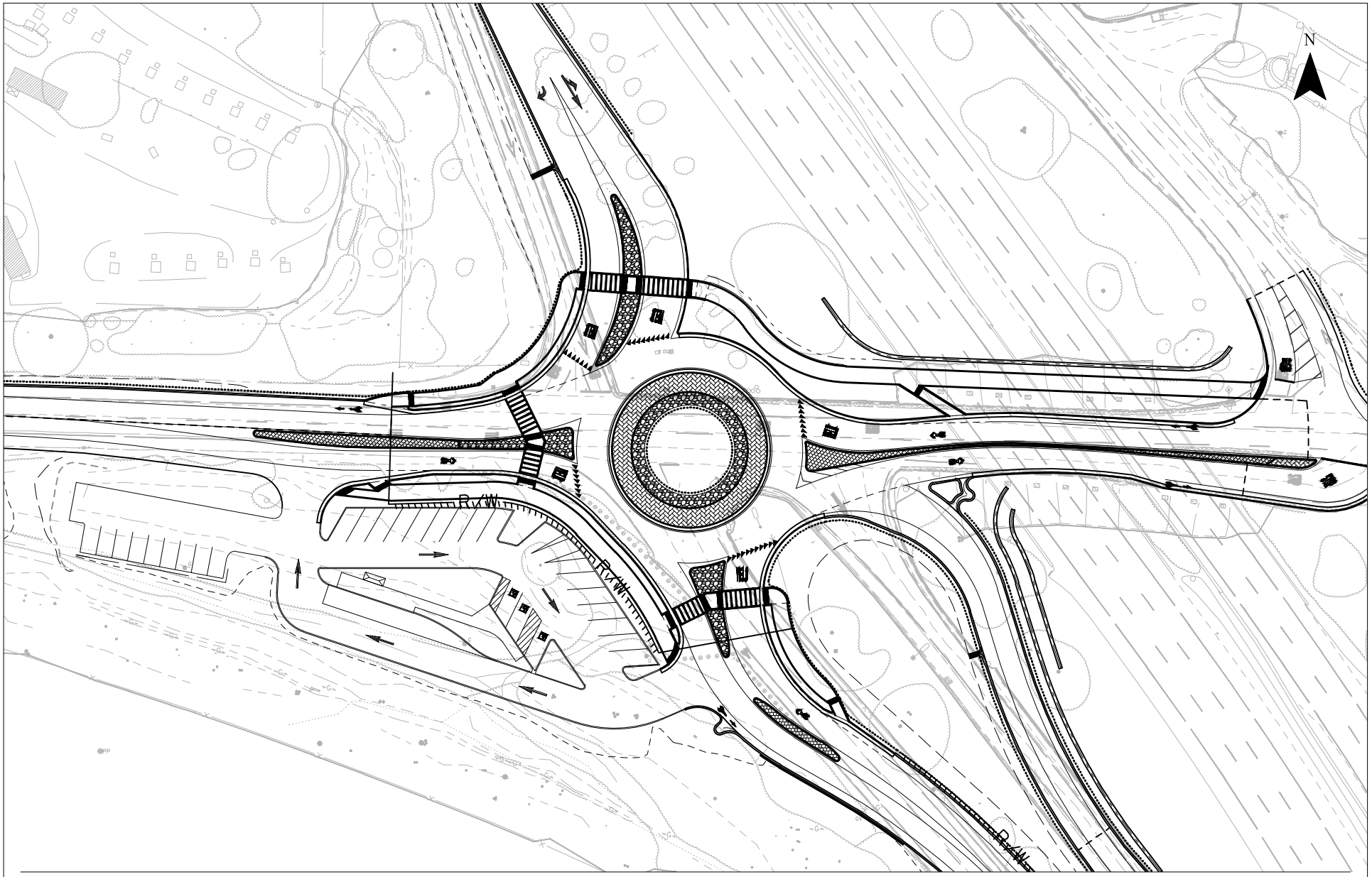
Exhibit 8 shows converting the stop-controlled intersection to a roundabout is expected to decrease the number of crashes (all types and severities) by 61% to 83%. In the forecast year, the roundabout is forecast to reduce the number of crashes to below 2018 values.

Footprint

Based on the Intersection Control Evaluations (ICE) Step 1 in support of the May 2016 Project Study Report-Project Development Support (PSR-PDS) approved by Caltrans, the recommended control strategy at the southbound ramp terminal intersection was a yield (roundabout) controlled intersection. The 2016 Caltrans study also considered enhancements to the northbound off ramp and ramp terminal intersection at Avila Beach Drive and concluded two-way stop control was appropriate for the northbound ramp terminal intersection. Therefore, this memorandum addresses the southbound ramp terminal only.

This section addresses the roundabout horizontal design elements and constraints related to the under crossing and US 101 bridges. These design constraints set the foundation for the roundabout's size and location, which was established via a series of iterations to develop a practical and context sensitive configuration. Exhibit 9 shows the proposed single lane roundabout with the proposed southbound right-turn yield lane. Invariably, actual field conditions will lead to minor design modifications and enhancements of the roundabout.

From the work completed for this ICE Step 2 effort, there do not appear to be obvious non-conforming features of the roundabout.



Source: Wallace Group

Proposed Single Lane Roundabout
Avila Beach

Exhibit
9

KITTELSON & ASSOCIATES

Underpass Constraints

- Kittelson optimized the east leg of the roundabout passing under US 101 to avoid the existing bridge columns while attaining westbound roundabout entry alignments that provide entry deflection and an offset left alignment that maximized the value of the central island terminal vista.

- The east leg of the roundabout matches the cross section and alignment of the northbound ramp terminal intersection. Shoulders are not carried through roundabouts and shoulders will drop between the northbound ramp terminal intersection and the roundabout.

- The design team may need to optimize the configuration under the US 101 bridges as field constraints and other design needs become apparent in final design.

Roundabout Location

The roundabout location resulted from considering and adapting to site constraints and developing a context-appropriate configuration within hillside, fill slope, park-and-ride, and US 101 bridge location constraints. The roundabout will include specific features to accommodate pedestrian and bicyclist movements within the interchange area and support planned extensions of the 'Bob Jones Trail.' The future extensions are anticipated to increase bicycle and pedestrian activity to the area through the study area interchange.

The horizontal design of the roundabout followed guidance in NCHRP Report 672 *Roundabouts: An Informational Guide, 2nd Edition (Roundabout Guide).* Kittelson considered four primary roundabout locations:

- On existing roadway centerlines. This location was dismissed because of the extensive fill required in the north west quadrant of the intersection.

- South of Avila Beach Drive on the alignment of the southbound ramp terminal along Shell Beach Road. This location was dismissed because of impacts to the proposed park-and-ride lot and the extensive cut required to bring Shell Beach Road into the roundabout.

- East of Shell Beach Road on the alignment of Avila Beach Drive. This location was dismissed because of the location of the US 101 bridge piers and the inability to serve design vehicles northbound on Shell Beach Road turning right to access southbound US 101.

- Kittelson and the project team then settled on an optimized location that moved the roundabout south and east of the existing southbound exit ramp at Avila Beach Drive. It avoids the fill slope in the northwest quadrant, reduces the impact to the park-and-ride lot, and serves the design vehicle destined from northbound Shell Beach Road to the southbound US 101 on ramp.

Inscribed Circle Diameter (ICD) Considerations:

- Kittelson generated a single-lane roundabout configuration based on validating the configuration that meets Caltrans performance requirements for each leg through the for 20-year forecast of 2042.

- The site is constrained along the west leg due to a significant grade drop to the north of Avila Beach Drive and along the south leg due to the proposed park-and-ride lot location in the SW Quadrant of the roundabout. Kittelson considered design features and approaches that would minimize prioritized site impacts.

- Kittelson ultimately used a 140' ICD based on the vertical and horizontal constraints of the intersection, as well as the required needs for design vehicles, pedestrians, bicyclists, and speed management principles. The ICD of the single-lane roundabout configuration is consistent with principles outlined in the *Roundabout Guide*.

Design Vehicle:

Performance Checks (Fastest Paths, Intersection Sight Distance, and Truck Paths) are provided in *Appendix B*.

Kittelson conducted roundabout performance checks for non-motorized and motorized design users. The roundabout will accommodate the STAA vehicles without external truck aprons.

- Kittelson designed all approaches of the roundabout for an STAA-STD-56 design vehicle from the *Caltrans Highway Design Manual, 6th Edition (Updated July 2016)*, since the roundabout will be providing access to US 101 which is part of the National Network. The roundabout can accommodate the STAA Standard Truck for all through and turning movements without requiring external truck aprons. However, the 140' ICD and roadway approaches result in relatively tight paths for the STAA. Kittelson recommends adding steel reinforcement to concrete curbs and sidewalks in the roundabout influence area for maximum durability.

- Kittelson also confirmed all approaches of the roundabout will readily serve a California Legal 65' Truck from the *Caltrans Highway Design Manual, 6th Edition (Updated July 2016)* for all through and turning movements.

- Kittelson designed all approaches of the roundabout to allow a 45-Foot Bus & Motorhome design vehicle from the *Caltrans Highway Design Manual, 6th Edition (Updated July 2016)* to circulate all through and turning movements without tracking over the truck apron.

Speed Performance Checks:

- The roundabout is designed to limit entry speeds to 25 mph.
- While not intentionally included to support speed reduction, providing appropriate deflection on entry for the ICD location introduced varying degrees of advance roadway curvature that create speed management features.
- Kittelson computed fastest paths based on vehicle acceleration for locations where horizontal exit curvature (R3) yielded speeds exceeding 30 mph.
- Kittelson completed theoretical fastest path calculations per guidance in the *Roundabout Guide*.

Sight Distance

The roundabout will have adequate intersection stopping sight distance and corner sight distance.

- Kittelson performed Intersection sight distance (ISD) and stopping sight distance (SSD) calculations for each roundabout approach using the methods documented in *Roundabout Guide*.
- The accompanying exhibits in *Appendix B* illustrate the ISD and SSD, as well as the areas that clear sight lines should be maintained through low-growth landscaping and intersection grading during later design stages.

Design/Service Life

The single lane roundabout alternative will meet Caltrans and County performance requirements for 2042 a.m. and p.m. weekday and weekend peak hour forecast traffic volumes. Kittelson also performed a service life assessment by applying a growth to 2042 forecast volumes and found the intersection could operate until 2048 before exceeding the Caltrans performance criteria of LOS C.

Kittelson completed a life-cycle (collision) benefit/cost analysis using an Excel spreadsheet tool provided by Caltrans staff as part of their June 4, 2018 comments on the DRAFT ICE document. Based on the planning level cost opinions completed with the PSR-PDS, a roundabout yields a 4.37 benefit/cost ratio when compared to the existing stop-controlled intersection.

Conclusion

The traffic operations and safety evaluation indicate a single lane roundabout alternative meets Caltrans and County performance requirements with significant operational benefits over the two-way stop controlled existing and no-build 2042 conditions. The roundabout form is expected to significantly reduce the number of crashes at the southbound ramp terminal intersection. The configuration adapts to the constrained site locations and provides a context sensitive approach to addressing existing operational conditions while better serving non-motorized and motorized users.

NEXT STEPS – ICE STEP 2 CONCEPTS IN DESIGN.

This ICE Step 2 analysis concludes the roundabout should be advanced to final design. Design configurations and supporting performance checks support this conclusion. The roundabout CAD files used for this ICE Step 2 evaluations will form the basis of the final design for the interchange. Invariably, actual field conditions will lead to minor design modifications and enhancements of the roundabout. From the work completed for this ICE Step 2 effort, there do not appear to be obvious non-conforming features.

Next steps should include consultations with Caltrans and County staff to review the configurations and performance evaluation results. As the ICE Step 2 concept is advanced through final design, the design team should inform Caltrans and the County of design modifications and possible mitigations to non-standard features. A collaborative work approach will lead to a successfully implemented project.

APPENDICES

Appendix A – Traffic Report

Appendix B – Performance Checks

Appendix C – Collision Cost Analysis and Benefit / Cost Worksheet

Appendix A Traffic Report

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MEMORANDUM

Date: March 28, 2019

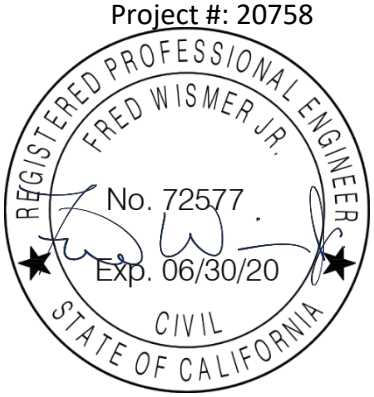
Project #: 20758

To: Jorge Aguilar, PE, Wallace Group

From: Brian L. Ray; Aaron Elias, PE; Anusha Musunuru; & Fred Wismer, PE

Project: US 101/Avila Beach Drive Interchange

Subject: Traffic Report



OVERVIEW

This memorandum summarizes activities associated with data collection, existing condition evaluations, and network analyses comparing operational and safety impacts associated with traffic control alternatives for the U.S. 101 (US 101) interchange at Avila Beach Drive near the Avila Beach community in San Luis Obispo County. A roundabout at the southbound US 101 ramp terminal intersection was advanced as the preferred intersection control strategy in an Intersection Control Evaluation (Step 1) completed by Caltrans. Reconstructing the southbound ramp terminal intersection to a yield (roundabout) controlled intersection addresses the operational and safety performance needs when compared to the no-build condition.

Kittelson & Associates, Inc. (Kittelson) has re-evaluated the intersection using updated existing and forecast traffic operations. Kittelson compared expected safety performance of stop and roundabout control while considering access to regional trails and the proposed park and ride facility. Kittelson concurs with earlier findings in support of a roundabout at the southbound ramp terminal intersection and retaining two-way stop control for the northbound ramp terminal intersection. The traffic operational and safety evaluation results supporting a roundabout configuration as an operational improvement for the southbound ramp terminal are presented in this memorandum. Next steps include refining roundabout concept design and completing performance checks. The results from this traffic report and the concept design will support a subsequent Intersection Control Evaluation (ICE) Step 2 document.

KEY FINDINGS

The following are the key findings from the operations and safety analysis:

1. Caltrans strives to maintain a target level of service (LOS) at the transition between LOS C and LOS D on State Operated facilities (Guide for Preparation of Traffic Studies, Caltrans, December 2002). Under the 2018 existing conditions for the weekend peak hour, the US 101 southbound ramp terminal intersection at Avila Beach Drive operates at LOS D for the northbound approach. With the increased demand by 2042, this intersection was found to operate at LOS F in both the weekday p.m. peak hour and the weekend peak hour.

2. Converting the Avila Beach Drive and US 101 southbound off-ramp into a roundabout would improve the overall operations of the intersection to LOS C or better for all peak hours meeting the Caltrans performance threshold. This would also result in reduced queues for the southbound off-ramp and Shell Beach Road.

3. Under the 2042 future weekday traffic conditions, the US 101 northbound ramp terminal intersection at Avila Beach Drive operates below the Caltrans performance threshold (LOS C) for the weekend peak hour. However, the worst approach is more than 30% below its capacity and the queues are contained to five vehicles or less. With significant additional capacity and a short queue length, no change in intersection control is recommended by 2042.

4. The northbound on ramp and off ramp at US 101/Avila Beach Drive interchange have higher crash rates than the state-wide average for similar facility types, according to the crash data and state-wide averages provided by Caltrans.

5. The crash data show the US 101 northbound ramp terminal intersections at Avila Beach Drive generally have more “total” crash rates compared to the state-wide average for similar facilities.

6. The safety analysis results show converting the stop-controlled intersection at the US 101 southbound ramp terminal intersection at Avila Beach Drive to a roundabout is expected to decrease the number of crashes (of all types and severities) by 61-83%.

BACKGROUND

Based on the Intersection Control Evaluations (ICE) Step 1 in support of the May 2016 Project Study Report-Project Development Support (PSR-PDS) approved by Caltrans, the recommended control strategy at the southbound ramp terminal intersection was a roundabout controlled intersection. The project will also integrate transit park and ride facilities immediately west of the southbound ramp terminal intersection from Avila Beach Drive and Shell Beach Road. The 2016 Caltrans study also considered enhancements to the northbound off ramp and ramp terminal intersection at Avila Beach

Drive and concluded a two-way stop control was appropriate for the northbound ramp terminal intersection.

STUDY AREA

The traffic study area included the US 101/Avila Beach Drive interchange and adjacent roadways in the operational influence area of the ramp terminal intersections. This includes Shell Beach Road, Monte Road, and Avila Beach Drive from Ontario Rd to Monte Rd.

As the project is addressing only the ramp terminal intersection and will not affect the freeway ramps or mainline, there was no freeway traffic analysis included in this study. Kittelson evaluated intersection operations at three US 101 study intersections. The three analysis intersections include:

1. US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive
2. US 101 NB Exit Ramp/Monte Road/Avila Beach Drive
3. US 101 SB Entrance Ramp/Avila Beach Drive

The proposed interchange ramp terminal configurations will include pedestrian and bicycle features to accommodate pedestrian and bicyclist movements within the interchange area. The current 'Bob Jones Trail' connects the Coast to the Ontario Road trailhead. The trail will be extended 4.5 miles in the future to the City of San Luis Obispo Octagon Barn trailhead. The future extensions are anticipated to draw bicycle and pedestrian activity to the area through the study area interchange and will be accommodated by the proposed interchange modifications.

The US 101 southbound ramp terminal intersection had minimal pedestrian activity for all observed time periods. Bicycle activity ranged from 3 to 32 bicycles for the weekday and weekend peak hours. The US 101 northbound ramp terminal intersection had no pedestrian activity for all observed time periods, and bicycle activity ranged from 2 to 14 bicycles for the weekday and weekend peak hours. The proposed interchange ramp terminal intersections will serve existing and future pedestrians and bicyclists.

INTERSECTION OPERATIONAL ANALYSIS

Kittelson applied the two-way stop controlled and roundabout methodologies of the Highway Capacity Manual, 6th Edition (HCM6) as implemented by Highway Capacity Software (HCS7). The analyses reflect the peak 15-minute flow rate during the a.m., p.m., and weekend peak hours. Using the peak 15-minute flow rate means the analysis is based on a reasonable worst-case scenario. Kittelson used HCS7 to analyze intersection operations in the existing and future conditions, because the roundabout scenarios in HCS7 are a direct application to the HCM6 methods.

PERFORMANCE THRESHOLDS

Caltrans controls the US Highway 101 mainline and ramps and relies on Level of Service (LOS) to identify impacts. Caltrans strives to maintain operations at the LOS C/D threshold on state-operated facilities, where LOS C is acceptable, but LOS D is not. If an existing State Highway facility is operating at LOS D, E, or F the existing service level should be maintained.

The County's Traffic Impact Study policies provide guidelines for identifying transportation impacts. The study intersections are located in a rural area outside of the Avila Beach Urban Reserve Line, so LOS C is acceptable, but LOS D is not.

Kittelson considers additional performance metrics to complement delay and LOS when evaluating intersections; these include volume to capacity (v/c) ratios for individual movements along with 95th percentile queue lengths.

Volume to capacity ratios in the range of 0.85 to 0.95 generally represent a reasonable threshold for satisfactory operations. Individual lanes with v/c ratios greater than about 0.95 should be evaluated to determine the sensitivity of the lane to varying traffic conditions and/or driver behavior. Queue lengths provide additional information that can help in project decision making. For example, an intersection may have an overall relatively low level of delay while individual approaches may have queue lengths that conflict with driveways, adjacent intersections, or back up on high speed approaches such as freeway exit ramps.

The following mobility targets apply for the operations analysis:

- Existing side-street-stop controlled intersection (critical movement): LOS C
- Proposed roundabout alternatives (overall intersection): LOS C

EXISTING TRAFFIC OPERATIONS

The traffic data collection plan along with the tools and methods used in the intersection operations analysis were documented in the Traffic Operations Methodology Memo (Kittelson, 03/07/2018). Performance measures considered in this analysis include LOS, volume-to-capacity (v/c) ratio, delay, and 95th-percentile vehicle queue lengths. Existing traffic volumes were provided to Kittelson from Central Coast Transportation Consulting (CCTC) based on counts collected on Thursday (01/25/2018) from 7-9 a.m. and 4-6 p.m. and Saturday (01/27/2018) from 11 a.m. to 1 p.m. Exhibit 1 shows intersection lane configurations under existing conditions. Appendix A provides existing and future traffic volumes for the three study intersections.

Exhibit 2 through Exhibit 4 summarize the existing weekday a.m., p.m., and weekend peak hour volumes respectively. Exhibit 5 summarizes the existing weekday a.m., and p.m. peak hour operations. Kittelson used Peak Hour Factor (PHF= 0.88, 0.95, and 0.95) for weekday a.m., p.m., and weekend peak hours respectively, for US 101 southbound direction and Peak Hour Factor (PHF = 0.86,

0.89, and 0.95) for weekday a.m., p.m., and weekend peak hours respectively, for northbound ramp terminal intersections based on the information provided by CCTC. Kittelson also analyzed weekend conditions to account for potential differences between the weekday peak hours and more recreational travel patterns on the weekend. Exhibit 6 summarizes the weekend peak hour existing conditions operations.

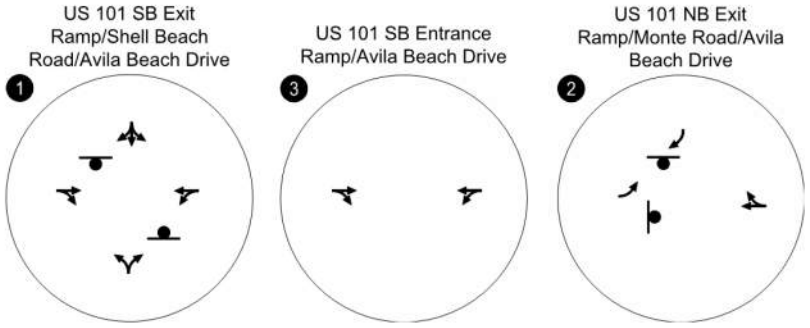


Exhibit 1: Intersection Lane Configurations in the Existing (2018) Conditions

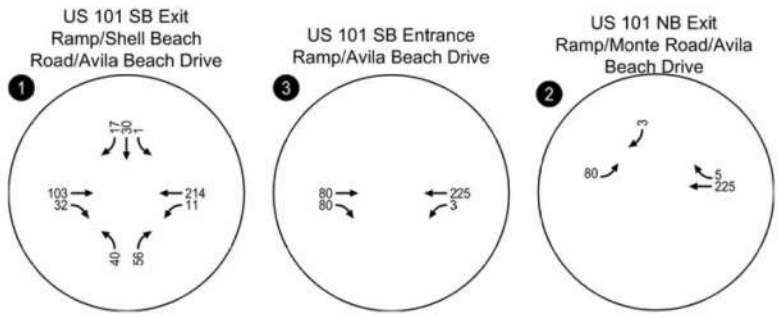


Exhibit 2: Existing (2018) Traffic Volumes, Weekday A.M. Peak Hour

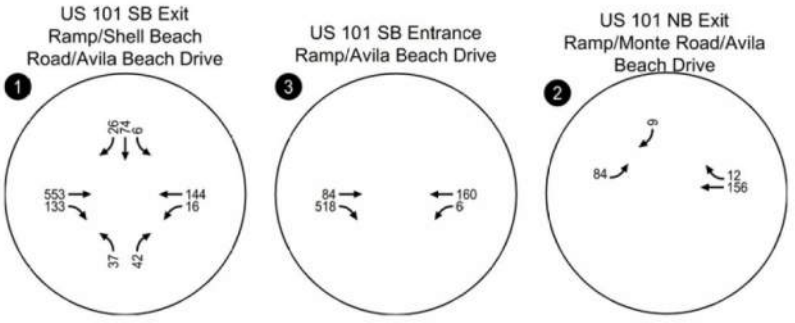


Exhibit 3: Existing (2018) Traffic Volumes, Weekday P.M. Peak Hour

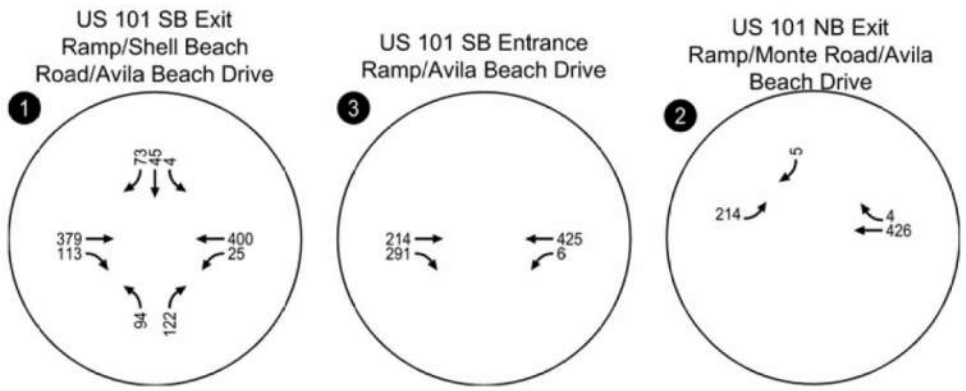


Exhibit 4: Existing (2018) Traffic Volumes, Weekend Peak Hour

Exhibit 5: Existing (2018) Weekday A.M., and P.M. Peak Hour Traffic Operations

Existing Conditions (2018)							
Intersection Information		Approach	Peak Hour	V/C Ratio	95% Queue Length (veh)	Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive	WBLT	AM	0.01	0.0	7.6	A
			PM	0.02	0.1	9.2	A
		NBLR	AM	0.09	0.3	8.3	A
			PM	0.18	0.6	14.5	B
		SBLTR[1]	AM	0.07	0.2	9.8	A
			PM	0.33	1.4	20.8	C
Overall Intersection[2] Delay, s/veh | LOS			AM	9.8		A	
			PM	20.8		C	
#2	US 101 NB Exit Ramp/Monte Road/Avila Beach Drive	NBLT[1]	AM	0.15	0.5	11.6	B
			PM	0.13	0.5	10.9	B
		SBR	AM	0.00	0.0	9.7	A
			PM	0.01	0.0	9.2	A
Overall Intersection[2] Delay, s/veh | LOS			AM	11.6		B	
			PM	10.9		B	
#3	US 101 SB Entrance Ramp/Avila Beach Drive	WBLT[1]	AM	0.00	0.0	7.6	A
			PM	0.01	0.0	8.8	A
Overall Intersection[2] Delay, s/veh | LOS			AM	7.6		A	
			PM	8.8		A	

[1]Critical Movement
[2]For two-way, stop-controlled intersections, the "critical movement delay and LOS" for that intersection is the overall intersection delay and LOS.

As shown in Exhibit 5, the US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive intersection operates at LOS A and LOS C during the weekday existing a.m. and p.m. peak hours respectively; this

meets the Caltrans' performance thresholds of the side-street stop-controlled intersection in the existing conditions. The other two intersections, i.e. US 101 NB Exit Ramp/Monte Road/Avila Beach Drive and US 101 SB Entrance Ramp/Avila Beach Drive operate at no worse than LOS B on existing weekday a.m., and p.m. conditions, and with limited queues under existing weekday a.m., and p.m. traffic conditions.

Exhibit 6: Existing (2018) Weekend Peak Hour Traffic Operations

Existing Conditions (2018)							
Intersection Information		Approach	Peak Hour	V/C Ratio	95% Queue Length (veh)	Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive	WBLT	Weekend MD	0.03	0.1	8.5	A
		NBLR[1]		**0.64**	**4.2**	**31.7**	**D**
		SBLTR		0.22	0.9	13.1	B
Overall Intersection[2] Delay, s/veh | LOS				**31.7**		**D**	
#2	US 101 NB Exit Ramp/Monte Road/Avila Beach Drive	NBLT[1]		0.45	2.3	17.9	C
		SBR		0.01	0.0	11.0	B
Overall Intersection[2] Delay, s/veh | LOS				17.9		C	
#3	US 101 SB Entrance Ramp/Avila Beach Drive	WBLT[1]		0.01	0.0	8.5	A
Overall Intersection[2] Delay, s/veh | LOS				8.5		A	

[1]Critical Movement
[2]For two-way, stop-controlled intersections, the "critical movement delay and LOS" for that intersection is the overall intersection delay and LOS.
Cells with grey color and bold represents lane groups/intersection operating below the Caltrans' LOS threshold

As shown in Exhibit 6, the US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive intersection operates at LOS D during existing weekend peak traffic conditions, which does not meet Caltrans' performance thresholds. The northbound approach for the intersection is the "critical movement/approach", operating at LOS D and v/c ratio of 0.64 during the weekend peak hour. The queue lengths in the northbound direction during weekend peak is 4 vehicles, which correspond to a queue length of about 100 feet (assuming 25 feet per vehicle). There are no driveways within the queue length and the relatively straight roadway provides at least 300 feet of stopping sight distance for the 40 miles per hour posted speed limit. The posted speed is 40 mph and drivers are accustomed to a stop condition. So, qualitatively, while the LOS result is D with an approach delay of 30 seconds/vehicle, and a queue length of 100 feet, there are no other especially concerning conditions on the northbound approach. This means the intersection generally operates acceptably overall but with localized peaking on the northbound approach.

The other two intersections, i.e. US 101 NB Exit Ramp/Monte Road/Avila Beach Drive and US 101 SB Entrance Ramp/Avila Beach Drive operate at no worse than LOS C on existing weekend peak hour traffic conditions, and with limited queues under existing weekend peak hour conditions.

20 YEAR DESIGN TRAFFIC OPERATIONS

The proposed operational improvement to address the deficiency of the northbound approach to the intersection of US 101 Southbound Off-Ramps and Shell Beach Road/Avila Beach Drive is to construct a roundabout. Exhibit 7 shows the proposed lane configuration as a single lane roundabout.

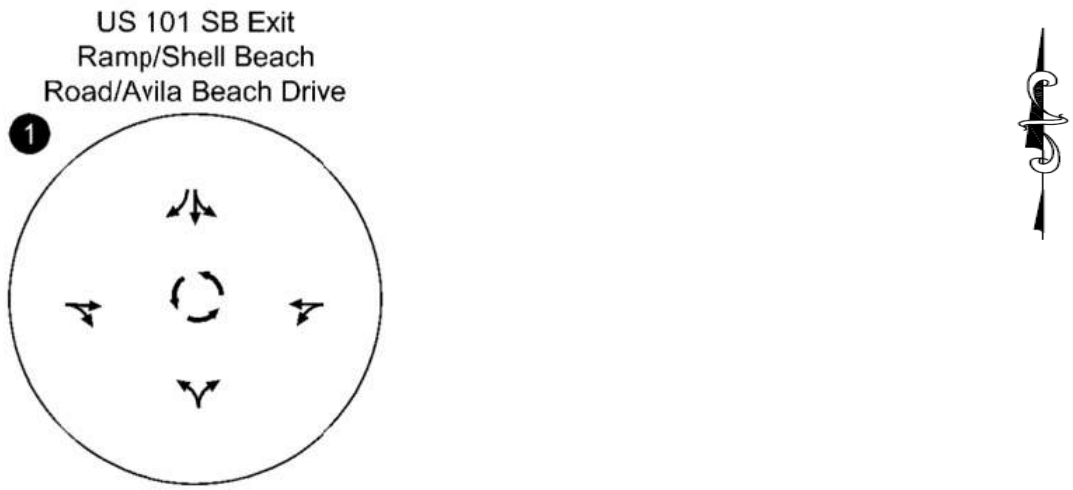


Exhibit 7: Intersection Lane Configurations for the Proposed Roundabout

The proposed roundabout at the southbound ramp terminal was evaluated for a 20-year design period by analyzing operations in 2042. 2042 traffic volumes were generated by CCTC based on the existing traffic counts, land uses, and model outputs from the Avila Area (County) and San Luis Obispo Council of Governments (SLOCOG) travel demand models. In addition to performing an operational analysis on the southbound ramp terminal, the other two intersections accessing US 101 were analyzed to determine if other operational improvements may be needed in 2042. These other two access points include:

- US 101 Southbound On-Ramp and Avila Beach Drive
- US 101 Northbound Off-Ramp and Monte Road/Avila Beach Drive.

The future year 2042 traffic volumes for these three intersections on the weekday a.m., p.m., and weekend peak hour conditions are provided in Exhibit 8 through Exhibit 10, respectively. Kittelson applied peak hour factors consistent with those applied to existing traffic conditions to 2042 forecasts at each of the three intersections.

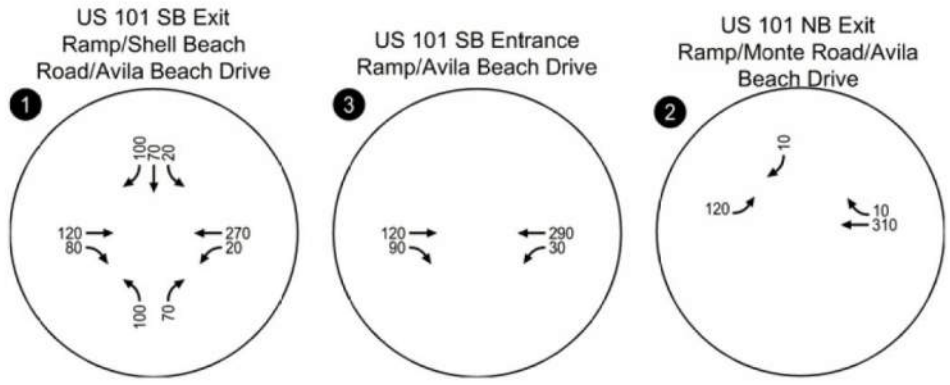


Exhibit 8: Future (2042) Traffic Volumes, Weekday A.M. Peak Hour

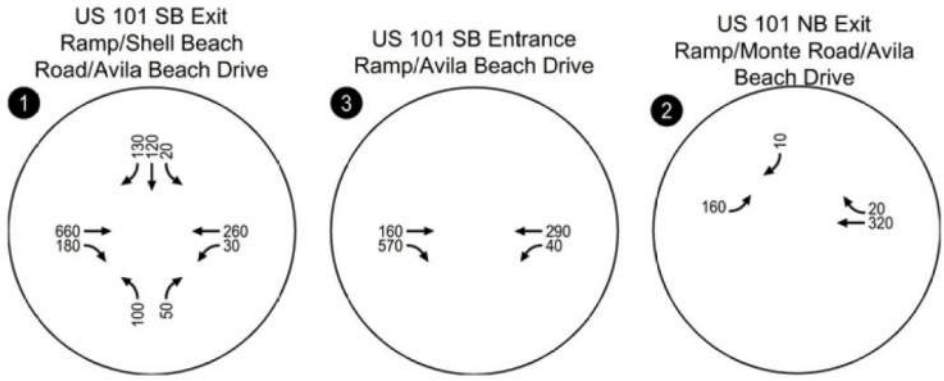


Exhibit 9: Future (2042) Traffic Volumes, Weekday P.M. Peak Hour

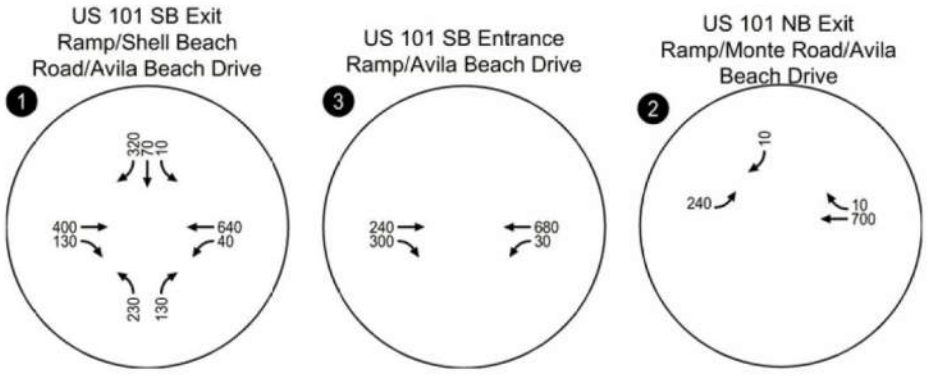


Exhibit 10: Future (2042) Traffic Volumes, Weekend Peak Hour

Kittelson conducted operational analysis of these three study intersections for 2042 conditions both with and without the roundabout operational improvement. A summary of the findings is included in this section.

No-Build Alternative

The year 2042 no-build traffic analysis identifies how the three study intersections are forecasted to operate without operational improvements. Exhibit 11 summarizes 2042 no-build operations by lane group for each of the three intersections for weekday a.m., and p.m. peak hour. Exhibit 12 summarizes the same information for the weekend peak hour.

Exhibit 11: Future (2042) No-Build Weekday A.M., and P.M. Peak Hour Traffic Operations

Future No Build Conditions (2042)							
Intersection Information		Approach	Peak Hour	V/C Ratio	95% Queue Length (veh)	Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive	WBLT	AM	0.02	0.1	7.7	A
			PM	0.04	0.1	9.9	A
		NBLR[1]	AM	0.42	2.0	18.4	C
			PM	**>1**	**14.4**	**>100**	**F**
		SBLTR	AM	0.25	1.0	10.6	B
			PM	**1.00**	**10.3**	**92.4**	**F**
Overall Intersection[2] Delay, s/veh | LOS			AM	18.4		C	
			PM	**>100**		**F**	
#2	US 101 NB Exit Ramp/Monte Road/Avila Beach Drive	NBLT[1]	AM	0.25	1.0	13.6	B
			PM	0.33	1.4	14.7	B
		SBR	AM	0.02	0.1	10.4	B
			PM	0.02	0.1	10.4	B
Overall Intersection[2] Delay, s/veh | LOS			AM	13.6		B	
			PM	14.7		B	
#3	US 101 SB Entrance Ramp/Avila Beach Drive	WBLT[1]	AM	0.03	0.1	7.8	A
			PM	0.05	0.2	9.5	A
Overall Intersection[2] Delay, s/veh | LOS			AM	7.8		A	
			PM	9.5		A	

[1]Critical Movement
[2]For two-way, stop-controlled intersections, the "critical movement delay and LOS" for that intersection is the overall intersection delay and LOS.
Cells with grey color and bold represents lane groups/intersection operating below the Caltrans' LOS threshold

Exhibit 12: Future (2042) No-Build Weekend Peak Hour Traffic Operations

Future No Build Conditions (2042)							
Intersection Information		Approach	Peak Hour	V/C Ratio	95% Queue Length (veh)	Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive	WBLT	Sat MD	0.04	0.1	8.7	A
		NBLR[1]		**>1**	**47.0**	**>100**	**F**
		SBLTR		**>1**	**15.8**	**>100**	**F**
Overall Intersection[2] Delay, s/veh | LOS				**>100**		**F**	
#2	US 101 NB Exit Ramp/Monte Road/Avila Beach Drive	NBLT[1]		**0.74**	**5.7**	**40.7**	**E**
		SBR		0.03	0.1	13.9	B
Overall Intersection[2] Delay, s/veh | LOS				**40.7**		**E**	
#3	US 101 SB Entrance Ramp/Avila Beach Drive	WBLT[1]		0.03	0.1	8.7	A
Overall Intersection[2] Delay, s/veh | LOS				8.7		A	

[1]Critical Movement
[2]For two-way, stop-controlled intersections, the "critical movement delay and LOS" for that intersection is the overall intersection delay and LOS.
Cells with grey color and bold represents lane groups/intersection operating below the Caltrans' LOS threshold

As shown in Exhibit 11, the US 101 SB Exit Ramp/Shell Beach Road/ Avila Beach Drive intersection will operate at LOS C and LOS F in the 2042 no-build a.m. and p.m. peak hours, respectively. During the p.m. peak hour, both the northbound and southbound approaches operate at LOS F. The queue length in the northbound direction during the p.m. peak hour is 12 vehicles (about 300 feet) while the southbound approach has a queue length of 10 vehicles (about 250 feet) during the p.m. peak hour. The other two intersections that access US 101 operate at LOS B or better during the weekday a.m. and p.m. peak hours.

The weekend peak hour operations (Exhibit 12) show the US 101 SB Exit Ramp/Shell Beach Road/ Avila Beach Drive intersection will operate at LOS F in the future no-build weekend peak hour not meeting Caltrans' performance thresholds for side-street stop-controlled intersections. The northbound approach for the intersection is the critical approach, operating at LOS F with a v/c ratio greater than 1.0. The queue lengths in the northbound direction during the weekend peak hour is 47 vehicles (about 1,175 feet). The southbound approach for this intersection also operates at LOS F with a v/c ratio greater than 1.0 during the future no-build weekend peak traffic conditions. The queue length in the southbound direction is 16 vehicles (about 400 feet) during the weekend peak hour future traffic conditions. Approach delays greater than 100 seconds/vehicle, combined with long queue lengths (1,175 feet) will create unacceptable traffic conditions on the northbound and southbound approaches in the future no-build weekend peak hour conditions.

The US 101 NB Exit Ramp/Monte Road/Avila Beach Drive does not meet Caltrans' performance thresholds in the 2042 weekend peak hour. The left turn onto Monte Road to access US 101 Northbound is the critical approach for the intersection operating at LOS E. This approach has a v/c

ratio of 0.74 and a queue length of 6 vehicles (about 150 feet). This queue would not impact operations at the US 101 Southbound ramp terminals as there is about 350 feet of storage under the US 101 overpass. Since the worst approach is more than 25% below its capacity and the queues are contained to six vehicles or less, no change in the existing control is recommended.

The US 101 SB Entrance Ramp/Avila Beach Drive operates with queues of one vehicle or less and meets Caltrans' performance thresholds of the side-street stop-controlled intersection in the future weekend peak hour traffic conditions.

Build Alternative

Kittelson analyzed how implementing a single lane roundabout with a right-turn yield, as an operational improvement at the US 101 Southbound Off-Ramp and Avila Beach Drive/Shell Beach Road would improve operations over the existing intersection control. The findings of this analysis are shown in Exhibit 13 and Exhibit 14 weekday and weekend peak hours. Because there is no change to the control strategy for the northbound ramp terminal intersection (two-way, stop control), the forecast operations for the 2042 "no-build" from Exhibit 11 and Exhibit 12 apply.

Exhibit 13: Future (2042) Weekday A.M., and P.M. Peak Hour Traffic Operations

Future Build Conditions (2042)									
Intersection Information		Approach	Peak Hour	V/C Ratio		95% Queue Length (veh)		Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive (Roundabout)	EB	AM	0.20		0.7		5.0	A
			PM	0.83		10.2		21.8	C
		WB	AM	0.31		1.3		5.9	A
			PM	0.29		1.2		5.7	A
		NB	AM	0.18		0.6		4.9	A
			PM	0.26		1.0		9.3	A
		SB	AM	0.13	0.13	0.4	0.5	5.6	A
			PM	0.18	0.15	0.6	0.5	5.8	A
Overall Intersection Delay, s/veh | LOS			AM	5.4				A	
			PM	14.6				B	

Exhibit 14: Future (2042) Weekend Peak Hour Traffic Operations

Future Build Conditions (2042)									
Intersection Information		Approach	Peak Hour	V/C Ratio		95% Queue Length (veh)		Control Delay (s/veh)	Level of Service
#1	US 101 SB Exit Ramp/Shell Beach Road/Avila Beach Drive (Roundabout)	EB	Weekend MD	0.49		2.8		8.7	A
		WB		0.72		6.5		15.4	C
		NB		0.46		2.4		10.4	B
		SB		0.18	0.66	0.6	4.7	20.3	C
Overall Intersection Delay, s/veh | LOS				13.7				B	

As shown in Exhibit 13, the overall intersection delay is forecast to be 5.4 and 14.6 seconds/vehicle in the future weekday a.m. and p.m. peak hours, respectively. Since these delays represent LOS B or better, the roundabout build alternative will meet Caltrans' performance thresholds in the future weekday a.m. and p.m. peak hours. The longest queue is in the eastbound direction during the future p.m. peak hour conditions at 11 vehicles which corresponds to a queue length of about 275 feet. There will be one driveway for the park and ride lot on the eastbound leg over this distance and the roadway curvature allows greater visibility than the stopping sight distance, hence, the queue length will not result in safety or operational challenges.

Exhibit 14 shows the operations of the roundabout for the weekend peak hour in 2042. The overall intersection delay for the roundabout is forecast to be 13.7 seconds/vehicle corresponding to LOS B meeting Caltrans' performance threshold. The southbound approach shows the highest delay per vehicle at about 21 seconds per vehicle (LOS C). The queue length at 125 feet (5 vehicles) is significantly less than the available storage (1,000 feet) on the southbound off-ramp. Additionally, there is adequate stopping sight distance for vehicles existing US 101 to see and stop for the 95th percentile queue length. The single lane roundabout with a right-turn yield, will meet the Caltrans performance threshold by operating at LOS B overall under 2042 conditions which is better than the no-build conditions meeting Caltrans' performance threshold.

In summary, Kittelson determined that the roundabout build alternative at the southbound ramp terminal intersection will meet Caltrans' performance requirements during the weekday a.m., weekday p.m., and weekend peak hours for 2042 conditions.

Service Life Evaluation

The single lane roundabout serves 2042 future traffic for the a.m., p.m., and weekend peak hour conditions. Kittelson evaluated the service life for the a.m. and p.m. peak hour conditions by applying a growth rate of 2.32% for the a.m. peak traffic conditions, and 1.80% for the p.m. peak traffic conditions to 2042 forecast volumes. These rates for a.m. and p.m. reflect the change from 2017 volumes and the 2042 volumes for each time period. Kittelson found the southbound ramp terminal intersection with the roundabout could operate until 2048 before the overall intersection LOS exceeds Caltrans' performance criteria of intersection LOS C.

Appendix B provides existing and future traffic operations output sheets from HCS7 for the three study intersections. This also provides the output sheets for the traffic operations from the service life evaluation analysis.

SAFETY ANALYSIS

Kittelson obtained crash reports for a three-year period from January 1, 2014 through December 31, 2016 at US 101 northbound and southbound ramps and the area near Avila Beach Drive from the Caltrans Traffic Accident Surveillance and Analysis System (TASAS) in August 2018. The data in TASAS

comes from the California Statewide Integrated Traffic Records System (SWITRS). Exhibit 15 summarizes the crashes by crash frequency and severity, along with the actual and state-wide average crash (or accident) rates. Caltrans provided these state-wide averages for similar facility types, i.e. ramp types and the area type (i.e. urban/rural).

Exhibit 15: Summary of Ramp Terminal Intersections' Crash Data and Rates (1/1/2014 – 12/31/2016)

	Crash Severity				Total Crash Rates (Crashes/MV*)		ADT Main X-St	Total MV*
Facility	Total	Fatal	Injury	Multi-Vehicle	Actual	Average		
US 101 Ramp Terminal Intersections and Avila Beach Drive								
Southbound on Ramp	0	0	0	0	0	0.60	3.4 4.6	8.82
Southbound off Ramp	2	0	2	2	**0.14**	0.92	1.2 11.7	14.08
Northbound on Ramp	1	0	0	0	**0.60**	0.33	1.3 0.2	1.66
Northbound off Ramp	4	0	2	4	**0.73**	0.50	3.5 1.5	5.50

*MV – Million Vehicles

Cells highlighted in grey represent crash rates that are greater than the state-wide average for similar facility types.

Exhibit 15 shows a total of 7 crashes were reported on the northbound and southbound on and off ramp terminal intersections at Avila Beach Drive, over the three-year period. No crashes resulted in fatalities, and 4 crashes resulted in injury. As summarized in Exhibit 15, the northbound ramp terminal intersections at Avila Beach Drive generally have more "total" crash rates compared to the state-wide average for similar facilities. The crash rate may be reduced by improving sight distance at the US 101 Northbound Ramp Terminal intersection and reducing off-ramp speeds through the use of optical speed bars, speed feedback signs, and advanced warning signs.

Safety performance functions (SPFs) predict the average number of intersection crashes per year as a function of exposure. For intersections, exposure is represented by the annual average daily traffic (AADT) associated with the intersection on the major and minor road approaches. Kittelson used the SPF for predicted crash frequency calculation for a minor road stop-controlled intersection from Part C of the Highway Safety Manual, First Edition. The SPF predicts the crash frequency for the southbound ramp terminal intersection in the study for current and forecast conditions. Since no calibration factors are available, the predicted crash numbers are relative and for comparison purposes only.

Kittelson obtained the crash modification factor (CMF) for converting a stop-controlled intersection to a single-lane roundabout (CMF = 0.28) from Federal Highway Administration (FHWA) CMF Clearinghouse, which is a web-based repository of CMFs used in the field of traffic safety. Upon calculating the predicted crash frequency for stop-controlled intersection for current and forecast conditions, Kittelson multiplied the results by the roundabout CMF to obtain the predicted crash

frequency for a roundabout. Kittelson took the standard error of the CMF (standard error = 0.11) into account and reported the ranges for the predicted crash frequency of the roundabout for the existing and future years. Exhibit 16 summarizes the predicted crash frequency of southbound ramp terminal intersection before and after converting to roundabout for all crash severities associated with single and multiple vehicle crashes for current and forecast conditions.

Exhibit 16: Predicted Crash Frequency Comparison for Existing (2018) and Forecast (2042) Conditions

	Predicted Crash Frequency			
	Stop Controlled Intersection	Roundabout	Stop Controlled Intersection	Roundabout
Crash Type	Year 2018		Year 2042	
Multiple Vehicle	1.97 crashes/year	0.33 to 0.77 crashes/year	3.18 crashes/year	0.54 to 1.24 crashes/year
Single Vehicle	0.27 crashes/year	0.05 to 0.10 crashes/year	0.33 crashes/year	0.06 to 0.13 crashes/year

Exhibit 16 shows converting the stop-controlled intersection to a roundabout is expected to decrease the number of crashes (all types and severities) by 61% to 83%. In the forecast year, the roundabout is forecast to reduce the number of crashes to below 2018 values. Since there is no change in the intersection form at the US 101 northbound exit ramp/Monte Road/Avila Beach Drive intersection, Kittelson did not evaluate the difference for the safety performance at this intersection.

Appendix C provides the crash prediction worksheets for the existing and future year.

CONCLUSION

The intersection of Avila Beach Drive and US 101 southbound off-ramp was found to have intersection operations below the Caltrans LOS C standard for existing conditions during the weekend peak hour. With the projected traffic growth by 2042, this intersection would also operate below the Caltrans' LOS C standard for the weekday p.m. peak hour. A single lane roundabout at this intersection would improve the operations meeting the Caltrans LOS C standard for all peak hours. The roundabout form is expected to significantly reduce the number of crashes at this southbound ramp terminal intersection.

Kittelson also evaluated intersection operations at the intersection of Avila Beach Drive and US 101 northbound off-ramp. This overall intersection LOS meets Caltrans' LOS C standard the weekend peak hour under 2042 conditions. Since the worst approach is more than 30% below its capacity and the queues are contained to five vehicles or less, no change in the existing control is recommended. This is consistent with ICE Step 1 recommendations.

Given the operational and safety benefits for the roundabout build alternative, Kittelson recommends a single lane roundabout with a right-turn yield, be advanced at the southbound ramp terminal intersection. Additionally, the crash rate may be reduced by improving sight distance at the US 101

Northbound Ramp Terminal intersection and reducing off-ramp speeds through the use of optical speed bars, speed feedback signs, and advanced warning signs.

Appendices

Appendix A: Traffic Counts at the Study Intersections

Appendix B: Existing and Future Traffic Operations Output Sheets

Appendix C: Crash Prediction Worksheets

Appendix A: Traffic Counts at the Study Intersections

Time Period	INTID	NBL	NBT	NBR	SBL	SBT	SBR	EBL	EBT	EBR	WBL	WBT	WBR
						2018							
EX AM	1	40		56	1	30	17	0	103	32	11	214	0
	2	0		0	0	0	3	80	0	0	0	225	5
	3	0		0	0	0	0	0	80	80	3	225	0
EX PM	1	37		42	6	74	26	0	553	133	16	144	0
	2	0		0	0	0	9	84	0	0	0	156	12
	3	0		0	0	0	0	0	84	518	6	160	0
EX SAT MD	1	94		122	4	45	73	0	379	113	25	400	0
	2	0		0	0	0	5	214	0	0	0	426	4
	3	0		0	0	0	0	0	214	291	6	425	0
						2022							
2022 AM	1	50		60	10	40	30		110	40	20	220	
	2						10	100				240	10
	3								100	80	10	240	
2022 PM	1	50		50	10	80	40		570	140	20	160	
	2						10	100				180	20
	3								100	530	10	180	
2022 SAT MD	1	120		130	10	50	110		380	120	30	440	
	2						10	220				470	10
	3								220	300	10	470	
						2032							
2032 AM	1	75		65	15	55	65		115	60	20	245	
2032 PM	1	75		50	15	100	85		615	160	25	210	
2032 SAT MD	1	175		130	10	60	215		390	125	35	540	
						2042							
2042 AM	1	100		70	20	70	100		120	80	20	270	
	2						10	120				310	10
	3								120	90	30	290	
2042 PM	1	100		50	20	120	130		660	180	30	260	
	2						10	160				320	20
	3								160	570	40	290	
2042 SAT MD	1	230		130	10	70	320		400	130	40	640	
	2						10	240				700	10
	3								240	300	30	680	

Appendix B: Existing and Future Traffic Operations Output Sheets

HCS7 Two-Way Stop-Control Report

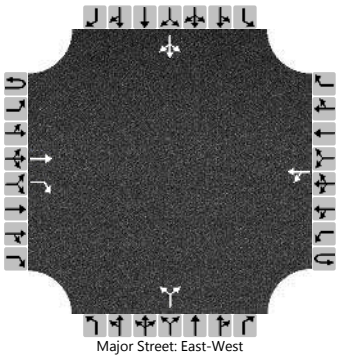
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2018
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (Existing Conditions)

Site Information

Intersection	Shell Beach Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	SB Exit Ramp/Shell Beach
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	0		0	1	0		0	1	0
Configuration			T	R		LT					LR				LTR	
Volume (veh/h)			103	32		11	214			40		56		1	30	17
Percent Heavy Vehicles (%)						3				3		3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized			No													
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1	6.5	6.2
Critical Headway (sec)						4.13				7.13		6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5	4.0	3.3
Follow-Up Headway (sec)						2.23				3.53		3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						13					109				55	
Capacity, c (veh/h)						1419					1210				798	
v/c Ratio						0.01					0.09				0.07	
95% Queue Length, Q_{95} (veh)						0.0					0.3				0.2	
Control Delay (s/veh)						7.6					8.3				9.8	
Level of Service (LOS)						A					A				A	
Approach Delay (s/veh)						0.4				8.3				9.8		
Approach LOS										A				A		

HCS7 Two-Way Stop-Control Report

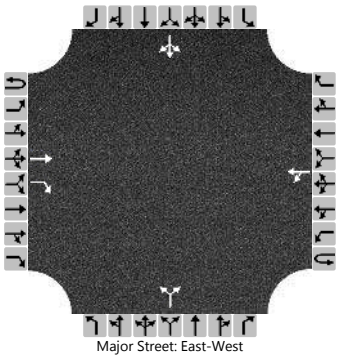
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2018
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (Existing Conditions)

Site Information

Intersection	Shell Beach Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	SB Exit Ramp/Shell Beach
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	0		0	1	0		0	1	0
Configuration			T	R		LT					LR				LTR	
Volume (veh/h)			553	133		16	144			37		42		6	74	26
Percent Heavy Vehicles (%)						3				3		3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized			No													
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1	6.5	6.2
Critical Headway (sec)						4.13				7.13		6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5	4.0	3.3
Follow-Up Headway (sec)						2.23				3.53		3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						17					83				112	
Capacity, c (veh/h)						874					462				338	
v/c Ratio						0.02					0.18				0.33	
95% Queue Length, Q_{95} (veh)						0.1					0.6				1.4	
Control Delay (s/veh)						9.2					14.5				20.8	
Level of Service (LOS)						A					B				C	
Approach Delay (s/veh)						1.1				14.5				20.8		
Approach LOS										B				C		

HCS7 Two-Way Stop-Control Report

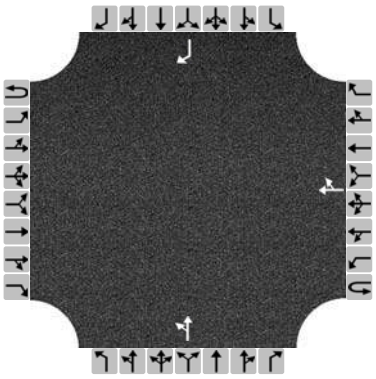
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2018
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (Existing Conditions)

Site Information

Intersection	NB Ramp/Monte Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US101 NB Ramp/Monte Rd
Peak Hour Factor	0.86
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	0	0	0	0	1	0		0	1	0		0	0	1
Configuration								TR		LT						R
Volume, V (veh/h)							225	5		0	80					3
Percent Heavy Vehicles (%)										3	3					3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)										7.1	6.5					6.2
Critical Headway (sec)										6.43	6.53					6.23
Base Follow-Up Headway (sec)										3.5	4.0					3.3
Follow-Up Headway (sec)										3.53	4.03					3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										93						3
Capacity, c (veh/h)										637						771
v/c Ratio										0.15						0.00
95% Queue Length, Q_{95} (veh)										0.5						0.0
Control Delay (s/veh)										11.6						9.7
Level of Service, LOS										B						A
Approach Delay (s/veh)										11.6				9.7		
Approach LOS										B				A		

HCS7 Two-Way Stop-Control Report

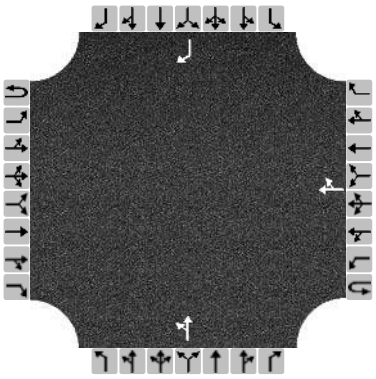
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2018
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (Existing Conditions)

Site Information

Intersection	NB Ramp/Monte Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US101 NB Ramp/Monte Rd
Peak Hour Factor	0.89
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	0	0	0	0	1	0		0	1	0		0	0	1
Configuration								TR		LT						R
Volume, V (veh/h)							156	12		0	84					9
Percent Heavy Vehicles (%)										3	3					3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										94						10
Capacity, c (veh/h)										704						857
v/c Ratio										0.13						0.01
95% Queue Length, Q_{95} (veh)										0.5						0.0
Control Delay (s/veh)										10.9						9.2
Level of Service, LOS										B						A
Approach Delay (s/veh)										10.9				9.2		
Approach LOS										B				A		

HCS7 Two-Way Stop-Control Report

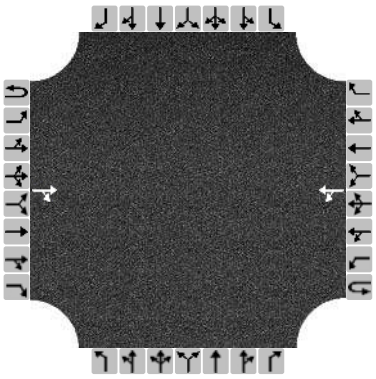
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2018
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (Existing Conditions)

Site Information

Intersection	US101 SB/Avila Beach Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US 101 SB Entrance Ramp
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT										
Volume, V (veh/h)			80	80		3	225									
Percent Heavy Vehicles (%)						3										
Proportion Time Blocked																
Percent Grade (%)																
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						3										
Capacity, c (veh/h)						1386										
v/c Ratio						0.00										
95% Queue Length, Q_{95} (veh)						0.0										
Control Delay (s/veh)						7.6										
Level of Service, LOS						A										
Approach Delay (s/veh)					0.1											
Approach LOS																

HCS7 Two-Way Stop-Control Report

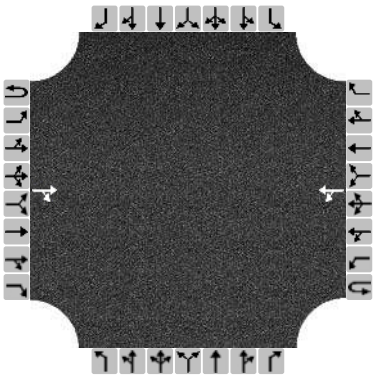
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2018
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (Existing Conditions)

Site Information

Intersection	US101 SB/Avila Beach Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US 101 SB Entrance Ramp
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT										
Volume, V (veh/h)			84	518		6	160									
Percent Heavy Vehicles (%)						3										
Proportion Time Blocked																
Percent Grade (%)																
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						6										
Capacity, c (veh/h)						943										
v/c Ratio						0.01										
95% Queue Length, Q_{95} (veh)						0.0										
Control Delay (s/veh)						8.8										
Level of Service, LOS						A										
Approach Delay (s/veh)					0.4											
Approach LOS																

HCS7 Two-Way Stop-Control Report

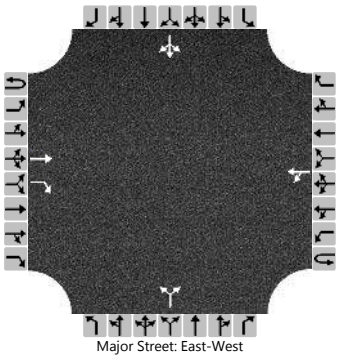
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2018
Time Analyzed	Sat Mid Day
Intersection Orientation	East-West
Project Description	Avila Beach Drive (Existing Conditions)

Site Information

Intersection	Shell Beach Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	SB Exit Ramp/Shell Beach
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	0		0	1	0		0	1	0
Configuration			T	R		LT					LR				LTR	
Volume (veh/h)			379	113		25	400			94		122		4	45	73
Percent Heavy Vehicles (%)						3				3		3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized			No													
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1	6.5	6.2
Critical Headway (sec)						4.13				7.13		6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5	4.0	3.3
Follow-Up Headway (sec)						2.23				3.53		3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						26					227				128	
Capacity, c (veh/h)						1042					354				572	
v/c Ratio						0.03					0.64				0.22	
95% Queue Length, Q_{95} (veh)						0.1					4.2				0.9	
Control Delay (s/veh)						8.5					31.7				13.1	
Level of Service (LOS)						A					D				B	
Approach Delay (s/veh)						0.8				31.7				13.1		
Approach LOS										D				B		

HCS7 Two-Way Stop-Control Report

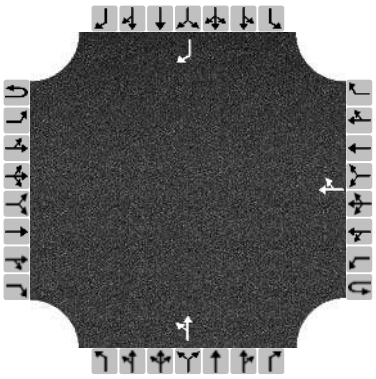
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2018
Time Analyzed	Sat Mid Day
Intersection Orientation	East-West
Project Description	Avila Beach Drive (Existing Conditions)

Site Information

Intersection	NB Ramp/Monte Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US101 NB Ramp/Monte Rd
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	0	0	0	0	1	0		0	1	0		0	0	1
Configuration								TR		LT						R
Volume, V (veh/h)							426	4		0	214					5
Percent Heavy Vehicles (%)										3	3					3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										225						5
Capacity, c (veh/h)										501						606
v/c Ratio										0.45						0.01
95% Queue Length, Q_{95} (veh)										2.3						0.0
Control Delay (s/veh)										17.9						11.0
Level of Service, LOS										C						B
Approach Delay (s/veh)										17.9				11.0		
Approach LOS										C				B		

HCS7 Two-Way Stop-Control Report

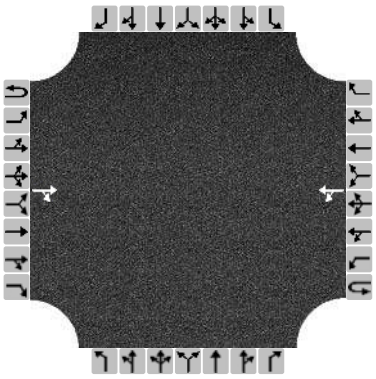
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2018
Time Analyzed	Sat Mid Day
Intersection Orientation	East-West
Project Description	Avila Beach Drive (Existing Conditions)

Site Information

Intersection	US101 SB/Avila Beach Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US 101 SB Entrance Ramp
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT										
Volume, V (veh/h)			214	291		6	425									
Percent Heavy Vehicles (%)						3										
Proportion Time Blocked																
Percent Grade (%)																
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						6										
Capacity, c (veh/h)						1029										
v/c Ratio						0.01										
95% Queue Length, Q_{95} (veh)						0.0										
Control Delay (s/veh)						8.5										
Level of Service, LOS						A										
Approach Delay (s/veh)					0.2											
Approach LOS																

HCS7 Two-Way Stop-Control Report

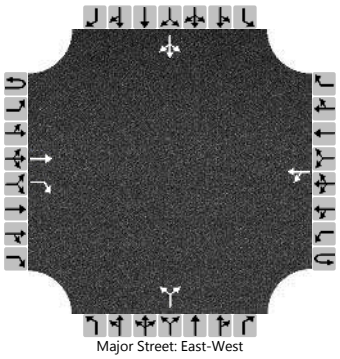
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2042
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (No Build Conditions)

Site Information

Intersection	Shell Beach Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	SB Exit Ramp/Shell Beach
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	0		0	1	0		0	1	0
Configuration			T	R		LT					LR				LTR	
Volume (veh/h)			120	80		20	270			100		70		20	70	100
Percent Heavy Vehicles (%)						3				3		3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized			No													
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1	6.5	6.2
Critical Headway (sec)						4.13				7.13		6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5	4.0	3.3
Follow-Up Headway (sec)						2.23				3.53		3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						23					193				216	
Capacity, c (veh/h)						1333					460				862	
v/c Ratio						0.02					0.42				0.25	
95% Queue Length, Q_{95} (veh)						0.1					2.0				1.0	
Control Delay (s/veh)						7.7					18.4				10.6	
Level of Service (LOS)						A					C				B	
Approach Delay (s/veh)						0.7				18.4				10.6		
Approach LOS										C				B		

HCS7 Two-Way Stop-Control Report

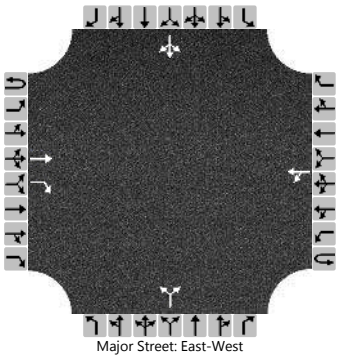
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2042
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (No Build Conditions)

Site Information

Intersection	Shell Beach Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	SB Exit Ramp/Shell Beach
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	0		0	1	0		0	1	0
Configuration			T	R		LT					LR				LTR	
Volume (veh/h)			660	180		30	260			100		50		20	120	130
Percent Heavy Vehicles (%)						3				3		3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized			No													
Median Type | Storage						Undivided										

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1	6.5	6.2
Critical Headway (sec)						4.13				7.13		6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5	4.0	3.3
Follow-Up Headway (sec)						2.23				3.53		3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						32					158				284	
Capacity, c (veh/h)						760					76				285	
v/c Ratio						0.04					2.09				1.00	
95% Queue Length, Q_{95} (veh)						0.1					14.4				10.3	
Control Delay (s/veh)						9.9					620.1				92.4	
Level of Service (LOS)						A					F				F	
Approach Delay (s/veh)						1.5				620.1				92.4		
Approach LOS										F				F		

HCS7 Two-Way Stop-Control Report

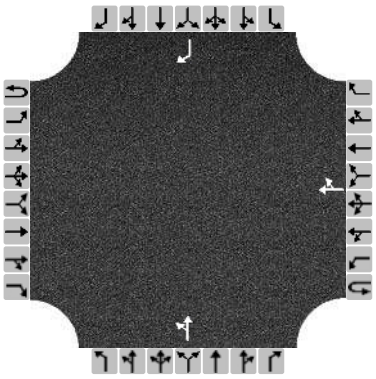
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2042
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (No Build Conditions)

Site Information

Intersection	NB Ramp/Monte Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US101 NB Ramp/Monte Rd
Peak Hour Factor	0.86
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	0	0	0	0	1	0		0	1	0		0	0	1
Configuration								TR		LT						R
Volume, V (veh/h)							310	10		0	120					10
Percent Heavy Vehicles (%)										3	3					3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage		Undivided														

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										140						12
Capacity, c (veh/h)										556						677
v/c Ratio										0.25						0.02
95% Queue Length, Q_{95} (veh)										1.0						0.1
Control Delay (s/veh)										13.6						10.4
Level of Service, LOS										B						B
Approach Delay (s/veh)										13.6				10.4		
Approach LOS										B				B		

HCS7 Two-Way Stop-Control Report

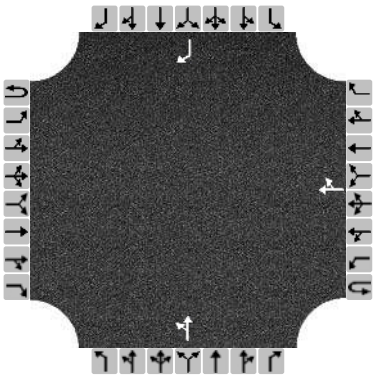
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2042
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (No Build Conditions)

Site Information

Intersection	NB Ramp/Monte Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US101 NB Ramp/Monte Rd
Peak Hour Factor	0.89
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	0	0	0	0	1	0		0	1	0		0	0	1
Configuration								TR		LT						R
Volume, V (veh/h)							320	20		0	160					10
Percent Heavy Vehicles (%)										3	3					3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										180						11
Capacity, c (veh/h)										549						672
v/c Ratio										0.33						0.02
95% Queue Length, Q_{95} (veh)										1.4						0.1
Control Delay (s/veh)										14.7						10.4
Level of Service, LOS										B						B
Approach Delay (s/veh)										14.7				10.4		
Approach LOS										B				B		

HCS7 Two-Way Stop-Control Report

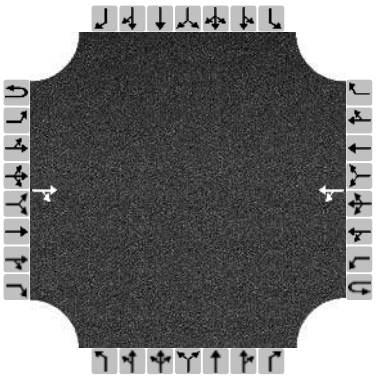
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2042
Time Analyzed	AM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (No Build Conditions)

Site Information

Intersection	US101 SB/Avila Beach Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US 101 SB Entrance Ramp
Peak Hour Factor	0.88
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT										
Volume, V (veh/h)			120	90		30	290									
Percent Heavy Vehicles (%)						3										
Proportion Time Blocked																
Percent Grade (%)																
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						34										
Capacity, c (veh/h)						1320										
v/c Ratio						0.03										
95% Queue Length, Q_{95} (veh)						0.1										
Control Delay (s/veh)						7.8										
Level of Service, LOS						A										
Approach Delay (s/veh)					1.0											
Approach LOS																

HCS7 Two-Way Stop-Control Report

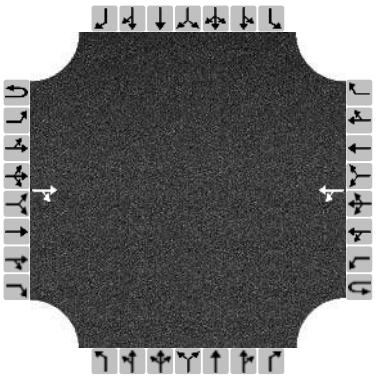
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2042
Time Analyzed	PM Peak
Intersection Orientation	East-West
Project Description	Avila Beach Drive (No Build Conditions)

Site Information

Intersection	US101 SB/Avila Beach Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US 101 SB Entrance Ramp
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT										
Volume, V (veh/h)			160	570		40	290									
Percent Heavy Vehicles (%)						3										
Proportion Time Blocked																
Percent Grade (%)																
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						42										
Capacity, c (veh/h)						841										
v/c Ratio						0.05										
95% Queue Length, Q_{95} (veh)						0.2										
Control Delay (s/veh)						9.5										
Level of Service, LOS						A										
Approach Delay (s/veh)					1.7											
Approach LOS																

HCS7 Two-Way Stop-Control Report

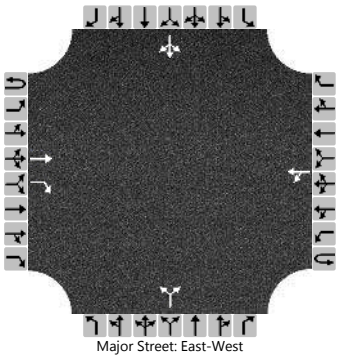
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2042
Time Analyzed	Sat Mid Day
Intersection Orientation	East-West
Project Description	Avila Beach Drive (No Build Conditions)

Site Information

Intersection	Shell Beach Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	SB Exit Ramp/Shell Beach
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes


Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	1	0	0	1	0		0	1	0		0	1	0
Configuration			T	R		LT					LR				LTR	
Volume (veh/h)			400	130		40	640			230		130		10	70	320
Percent Heavy Vehicles (%)						3				3		3		3	3	3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized			No													
Median Type | Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)						4.1				7.1		6.2		7.1	6.5	6.2
Critical Headway (sec)						4.13				7.13		6.23		7.13	6.53	6.23
Base Follow-Up Headway (sec)						2.2				3.5		3.3		3.5	4.0	3.3
Follow-Up Headway (sec)						2.23				3.53		3.33		3.53	4.03	3.33

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						42					379				421	
Capacity, c (veh/h)						1007					27				375	
v/c Ratio						0.04					13.88				1.12	
95% Queue Length, Q_{95} (veh)						0.1					47.0				15.8	
Control Delay (s/veh)						8.7					6070.8				117.3	
Level of Service (LOS)						A					F				F	
Approach Delay (s/veh)					1.1				6070.8				117.3			
Approach LOS									F				F			

HCS7 Two-Way Stop-Control Report

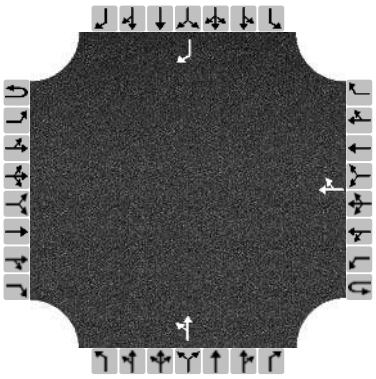
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2042
Time Analyzed	Sat Mid Day
Intersection Orientation	East-West
Project Description	Avila Beach Drive (No Build Conditions)

Site Information

Intersection	NB Ramp/Monte Rd/Avila Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US101 NB Ramp/Monte Rd
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	0	0	0	0	1	0		0	1	0		0	0	1
Configuration								TR		LT						R
Volume, V (veh/h)							700	10		0	240					10
Percent Heavy Vehicles (%)										3	3					3
Proportion Time Blocked																
Percent Grade (%)										0				0		
Right Turn Channelized		No				No				No				No		
Median Type/Storage			Undivided													

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)										253						11
Capacity, c (veh/h)										340						414
v/c Ratio										0.74						0.03
95% Queue Length, Q_{95} (veh)										5.7						0.1
Control Delay (s/veh)										40.7						13.9
Level of Service, LOS										E						B
Approach Delay (s/veh)										40.7				13.9		
Approach LOS										E				B		

HCS7 Two-Way Stop-Control Report

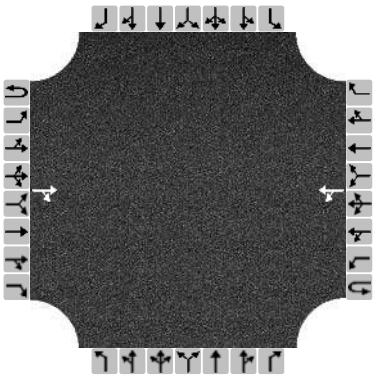
General Information

Analyst	Anusha Musunuru
Agency/Co.	
Date Performed	4/20/2018
Analysis Year	2042
Time Analyzed	Sat Mid Day
Intersection Orientation	East-West
Project Description	Avila Beach Drive (No Build Conditions)

Site Information

Intersection	US101 SB/Avila Beach Dr
Jurisdiction	San Luis Obispo, CA
East/West Street	Avila Beach Dr
North/South Street	US 101 SB Entrance Ramp
Peak Hour Factor	0.95
Analysis Time Period (hrs)	0.25

Lanes



Major Street: East-West

Vehicle Volumes and Adjustments

Approach	Eastbound				Westbound				Northbound				Southbound			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Priority	1U	1	2	3	4U	4	5	6		7	8	9		10	11	12
Number of Lanes	0	0	1	0	0	0	1	0		0	0	0		0	0	0
Configuration				TR		LT										
Volume, V (veh/h)			240	300		30	680									
Percent Heavy Vehicles (%)						3										
Proportion Time Blocked																
Percent Grade (%)																
Right Turn Channelized	No				No				No				No			
Median Type/Storage	Undivided															

Critical and Follow-up Headways

Base Critical Headway (sec)																
Critical Headway (sec)																
Base Follow-Up Headway (sec)																
Follow-Up Headway (sec)																

Delay, Queue Length, and Level of Service

Flow Rate, v (veh/h)						32										
Capacity, c (veh/h)						998										
v/c Ratio						0.03										
95% Queue Length, Q_{95} (veh)						0.1										
Control Delay (s/veh)						8.7										
Level of Service, LOS						A										
Approach Delay (s/veh)					0.8											
Approach LOS																

HCS7 Roundabouts Report

General Information

Analyst	Anusha Musunuru
Agency or Co.	
Date Performed	2/5/2019
Analysis Year	2042
Time Analyzed	AM Peak
Project Description	Avila Beach Drive (Build Conditions): Scenario1

Site Information

Intersection	Shell Beach Rd/Avila Beach Dr
E/W Street Name	Avila Beach Dr
N/S Street Name	Shell Beach Road/US 101 SB Exit Ramp
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.88
Jurisdiction	San Luis Obispo, CA

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			TR				LT				LR				LT	
Volume (V), veh/h	0		120	80	30	20	270		0	100		70	0	20	70	100
Percent Heavy Vehicles, %	3		3	3	3	3	3		3	3		3	3	3	3	3
Flow Rate (v_{PCE}), pc/h	0		140	94	35	23	316		0	117		82	0	23	82	117
Right-Turn Bypass	None				None				None				Yielding			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	4.9763
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	2.6087

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		234.00			374.00			199.00			105.00	117.00
Entry Volume veh/h		227.18			363.11			193.20			101.94	113.59
Circulating Flow (v_c), pc/h	163			117			198			491		
Exiting Flow (v_{ex}), pc/h	280			433			0			199		
Capacity (c_{pce}), pc/h		1168.62			1224.76			1127.64			836.33	887.30
Capacity (c), veh/h		1134.58			1189.09			1094.79			811.97	861.46
v/c Ratio (x)		0.20			0.31			0.18			0.13	0.13

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		5.0			5.9			4.9			5.7	5.5
Lane LOS		A			A			A			A	A
95% Queue, veh		0.7			1.3			0.6			0.4	0.5
Approach Delay, s/veh	5.0			5.9			4.9			5.6		
Approach LOS	A			A			A			A		
Intersection Delay, s/veh | LOS	5.4						A					

HCS7 Roundabouts Report

General Information

Analyst	Anusha Musunuru
Agency or Co.	
Date Performed	2/5/2019
Analysis Year	2042
Time Analyzed	PM Peak
Project Description	Avila Beach Drive (Build Conditions): Scenario1

Site Information

Intersection	Shell Beach Rd/Avila Beach Dr
E/W Street Name	Avila Beach Dr
N/S Street Name	Shell Beach Road/US 101 SB Exit Ramp
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.95
Jurisdiction	San Luis Obispo, CA

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			TR				LT				LR				LT	
Volume (V), veh/h	0		660	180	40	30	260		0	100		50	0	20	120	130
Percent Heavy Vehicles, %	3		3	3	3	3	3		3	3		3	3	3	3	3
Flow Rate (v_{PCE}), pc/h	0		716	195	43	33	282		0	108		54	0	22	130	141
Right-Turn Bypass	None				None				None				Yielding			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	4.9763
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	2.6087

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		911.00			358.00			162.00			152.00	141.00
Entry Volume veh/h		884.47			347.57			157.28			147.57	136.89
Circulating Flow (v_c), pc/h	228			108			781			466		
Exiting Flow (v_{ex}), pc/h	835			390			0			358		
Capacity (c_{pce}), pc/h		1093.65			1236.05			622.18			857.93	927.08
Capacity (c), veh/h		1061.80			1200.05			604.06			832.94	900.08
v/c Ratio (x)		0.83			0.29			0.26			0.18	0.15

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		21.8			5.7			9.3			6.1	5.5
Lane LOS		C			A			A			A	A
95% Queue, veh		10.2			1.2			1.0			0.6	0.5
Approach Delay, s/veh	21.8			5.7			9.3			5.8		
Approach LOS	C			A			A			A		
Intersection Delay, s/veh | LOS	14.6						B					

HCS7 Roundabouts Report

General Information

Analyst	Anusha Musunuru
Agency or Co.	
Date Performed	2/5/2019
Analysis Year	2042
Time Analyzed	Sat Mid Day
Project Description	Avila Beach Drive (Build Conditions): Scenario1

Site Information

Intersection	Shell Beach Rd/Avila Beach Dr
E/W Street Name	Avila Beach Dr
N/S Street Name	Shell Beach Road/US 101 SB Exit Ramp
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.95
Jurisdiction	San Luis Obispo, CA

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			TR				LT				LR				LT	
Volume (V), veh/h	0		400	130	30	40	640		0	230		130	0	10	70	320
Percent Heavy Vehicles, %	3		3	3	3	3	3		3	3		3	3	3	3	3
Flow Rate (v_{PCE}), pc/h	0		434	141	33	43	694		0	249		141	0	11	76	347
Right-Turn Bypass	None				None				None				Yielding			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	4.9763
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	2.6087

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		575.00			770.00			390.00			87.00	347.00
Entry Volume veh/h		558.25			747.57			378.64			84.47	336.89
Circulating Flow (v_c), pc/h	163			249			478			1019		
Exiting Flow (v_{ex}), pc/h	619			943			0			260		
Capacity (c_{pce}), pc/h		1168.62			1070.48			847.49			488.08	527.42
Capacity (c), veh/h		1134.58			1039.30			822.81			473.86	512.05
v/c Ratio (x)		0.49			0.72			0.46			0.18	0.66

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		8.7			15.4			10.4			10.1	22.8
Lane LOS		A			C			B			B	C
95% Queue, veh		2.8			6.5			2.4			0.6	4.7
Approach Delay, s/veh	8.7			15.4			10.4			20.3		
Approach LOS	A			C			B			C		
Intersection Delay, s/veh | LOS	13.7						B					

HCS7 Roundabouts Report

General Information

Analyst	Anusha Musunuru
Agency or Co.	
Date Performed	4/20/2018
Analysis Year	2048
Time Analyzed	PM Peak
Project Description	Avila Beach Drive (Build Conditions): Scenario1

Site Information

Intersection	Shell Beach Rd/Avila Beach Dr
E/W Street Name	Avila Beach Dr
N/S Street Name	Shell Beach Road/US 101 SB Exit Ramp
Analysis Time Period (hrs)	0.25
Peak Hour Factor	0.95
Jurisdiction	San Luis Obispo, CA

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			TR				LT				LR				LT	
Volume (V), veh/h	0		735	200	45	33	289		0	111		56	0	22	134	145
Percent Heavy Vehicles, %	3		3	3	3	3	3		3	3		3	3	3	3	3
Flow Rate (v_{PCE}), pc/h	0		797	217	49	36	313		0	120		61	0	24	145	157
Right-Turn Bypass	None				None				None				Yielding			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	4.9763
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	2.6087

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		1014.00			398.00			181.00			169.00	157.00
Entry Volume veh/h		984.47			386.41			175.73			164.08	152.43
Circulating Flow (v_c), pc/h	254			120			870			518		
Exiting Flow (v_{ex}), pc/h	931			433			0			398		
Capacity (c_{pce}), pc/h		1065.03			1221.02			568.19			813.61	887.30
Capacity (c), veh/h		1034.01			1185.45			551.64			789.92	861.46
v/c Ratio (x)		0.95			0.33			0.32			0.21	0.18

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		37.6			6.1			11.1			6.8	6.0
Lane LOS		E			A			B			A	A
95% Queue, veh		16.4			1.4			1.4			0.8	0.6
Approach Delay, s/veh	37.6			6.1			11.1			6.4		
Approach LOS	E			A			B			A		
Intersection Delay, s/veh | LOS	23.3						C					

HCS7 Roundabouts Report

General Information		Site Information	
Analyst	Anusha Musunuru	Intersection	Shell Beach Rd/Avila Beach Dr
Agency or Co.		E/W Street Name	Avila Beach Dr
Date Performed	4/20/2018	N/S Street Name	Shell Beach Road/US 101 SB Exit Ramp
Analysis Year	2049	Analysis Time Period (hrs)	0.25
Time Analyzed	PM Peak	Peak Hour Factor	0.95
Project Description	Avila Beach Drive (Build Conditions): Scenario1	Jurisdiction	San Luis Obispo, CA

Volume Adjustments and Site Characteristics

Approach	EB				WB				NB				SB			
Movement	U	L	T	R	U	L	T	R	U	L	T	R	U	L	T	R
Number of Lanes (N)	0	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0
Lane Assignment			TR				LT				LR				LT	
Volume (V), veh/h	0		748	204	45	34	295		0	113		57	0	23	136	147
Percent Heavy Vehicles, %	3		3	3	3	3	3		3	3		3	3	3	3	3
Flow Rate (v_{PCE}), pc/h	0		811	221	49	37	320		0	123		62	0	25	147	159
Right-Turn Bypass	None				None				None				Yielding			
Conflicting Lanes	1				1				1				1			
Pedestrians Crossing, p/h	0				0				0				0			

Critical and Follow-Up Headway Adjustment

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Critical Headway (s)		4.9763			4.9763			4.9763			4.9763	4.9763
Follow-Up Headway (s)		2.6087			2.6087			2.6087			2.6087	2.6087

Flow Computations, Capacity and v/c Ratios

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Entry Flow (v_e), pc/h		1032.00			406.00			185.00			172.00	159.00
Entry Volume veh/h		1001.94			394.17			179.61			166.99	154.37
Circulating Flow (v_c), pc/h	258			123			885			529		
Exiting Flow (v_{ex}), pc/h	947			443			0			405		
Capacity (c_{pce}), pc/h		1060.70			1217.29			559.56			804.53	878.30
Capacity (c), veh/h		1029.80			1181.83			543.26			781.10	852.71
v/c Ratio (x)		0.97			0.33			0.33			0.21	0.18

Delay and Level of Service

Approach	EB			WB			NB			SB		
Lane	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass	Left	Right	Bypass
Lane Control Delay (d), s/veh		41.9			6.2			11.5			6.9	6.1
Lane LOS		E			A			B			A	A
95% Queue, veh		17.7			1.5			1.4			0.8	0.7
Approach Delay, s/veh	41.9			6.2			11.5			6.5		
Approach LOS	E			A			B			A		
Intersection Delay, s/veh | LOS	25.6						D					

Appendix C: Crash Prediction Worksheets

2018 Predicted Crash Frequency			
Multi Vehicle Crashes		*Single Vehicle Crashes*	
Stop-Controlled Intersection		*Stop-Controlled Intersection*	
AADT* Major Approach	9200	AADT* Major Approach	9200
AADT* Minor Approach	4300	AADT* Minor Approach	4300
Safety Performance Function (SPF)		Safety Performance Function (SPF)	
a (Coefficient in SPF)	-8.9	a (Coefficient in SPF)	-5.33
b (Coefficient in SPF)	0.82	b (Coefficient in SPF)	0.33
c (Coefficient in SPF)	0.25	c (Coefficient in SPF)	0.12
Total Crashes (Stop-Controlled)	1.97	Total Crashes (Stop-Controlled)	0.27
Roundabout (Yield) Controlled Intersection		*Roundabout (Yield) Controlled Intersection*	
Crash Modification Factor (CMF)		Crash Modification Factor (CMF)	
Mean	0.28	Mean	0.28
Standard Error	0.11	Standard Error	0.11
Total Crashes (Roundabout) Range	0.33 0.77	Total Crashes (Roundabout) Range	0.05 0.10
*AADT - Average Annual Daily Traffic			

2042 Predicted Crash Frequency			
Multi Vehicle Crashes		*Single Vehicle Crashes*	
Stop-Controlled Intersection		*Stop-Controlled Intersection*	
AADT* Major Approach	13700	AADT* Major Approach	13700
AADT* Minor Approach	8000	AADT* Minor Approach	8000
Safety Performance Function (SPF)		Safety Performance Function (SPF)	
a (Coefficient in SPF)	-8.9	a (Coefficient in SPF)	-5.33
b (Coefficient in SPF)	0.82	b (Coefficient in SPF)	0.33
c (Coefficient in SPF)	0.25	c (Coefficient in SPF)	0.12
Total Crashes (Stop-Controlled)	3.18	Total Crashes (Stop-Controlled)	0.33
Roundabout (Yield) Controlled Intersection		*Roundabout (Yield) Controlled Intersection*	
Crash Modification Factor (CMF)		Crash Modification Factor (CMF)	
Mean	0.28	Mean	0.28
Standard Error	0.11	Standard Error	0.11
Total Crashes (Roundabout) Range	0.54 1.24	Total Crashes (Roundabout) Range	0.06 0.13

*AADT - Average Annual Daily Traffic

Appendix B Performance Checks

Appendix B: Performance Checks

Fastest Paths

Stopping Sight Distances

Design Vehicle Considerations: STAA Standard

Design Vehicle Considerations: CA Legal

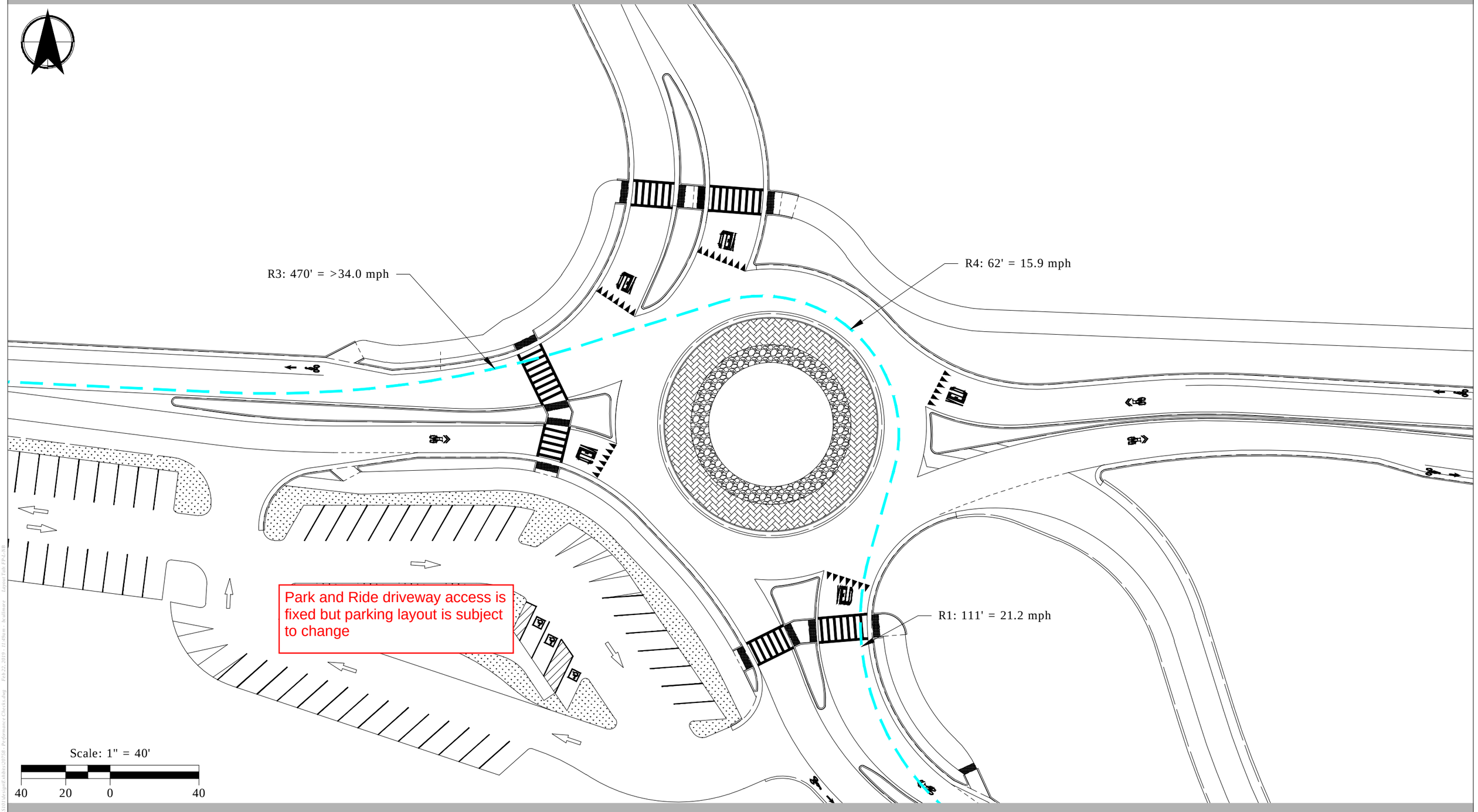
Design Vehicle Considerations: 45' Bus & Motorhome

Fastest Paths

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Performance Checks - Fastest Path Left Turn - NB

Preliminary Design Subject to Change
Date: February 18, 2019



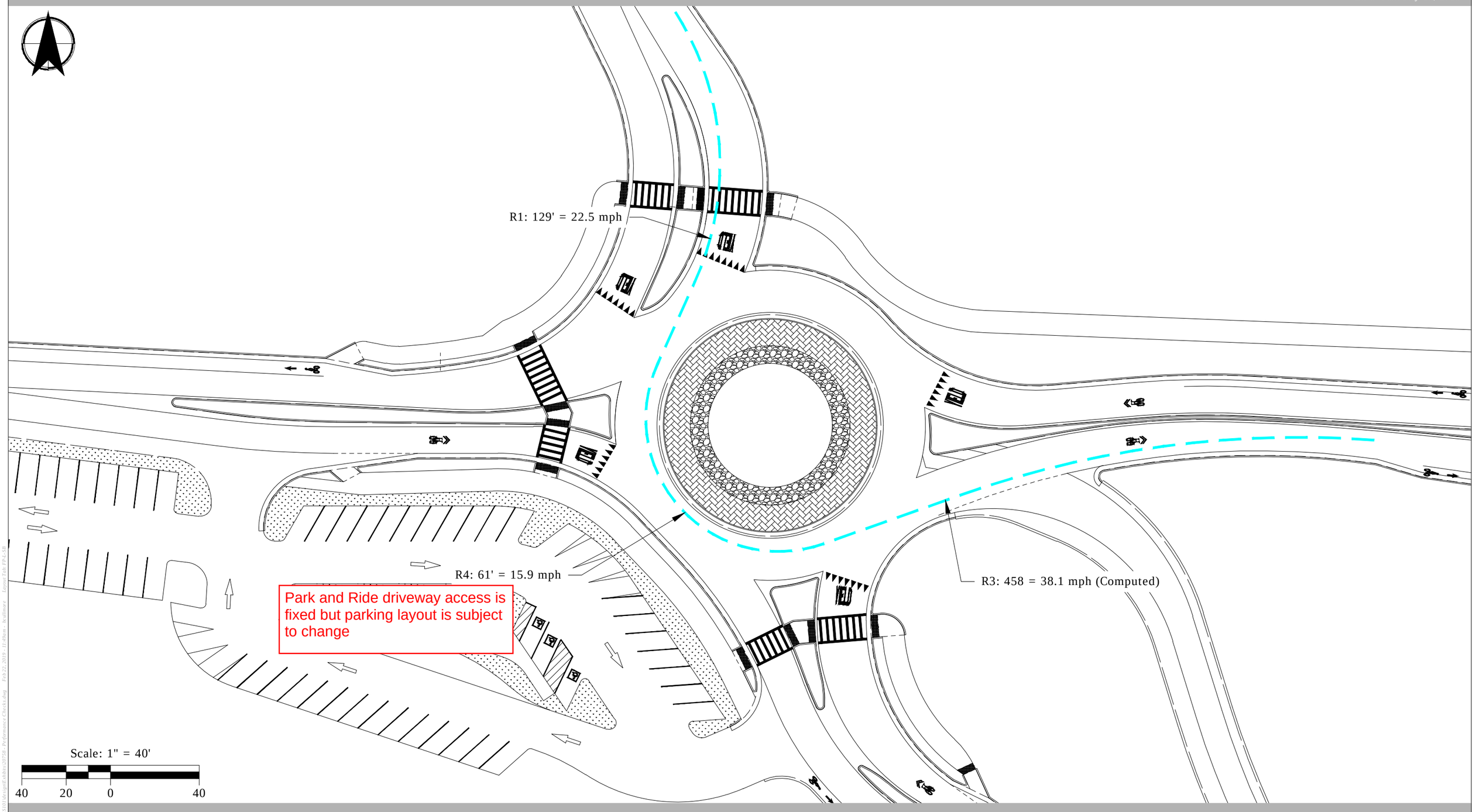
KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - Fastest Path Left Turn - SB

Preliminary Design Subject to Change
Date: February 18, 2019



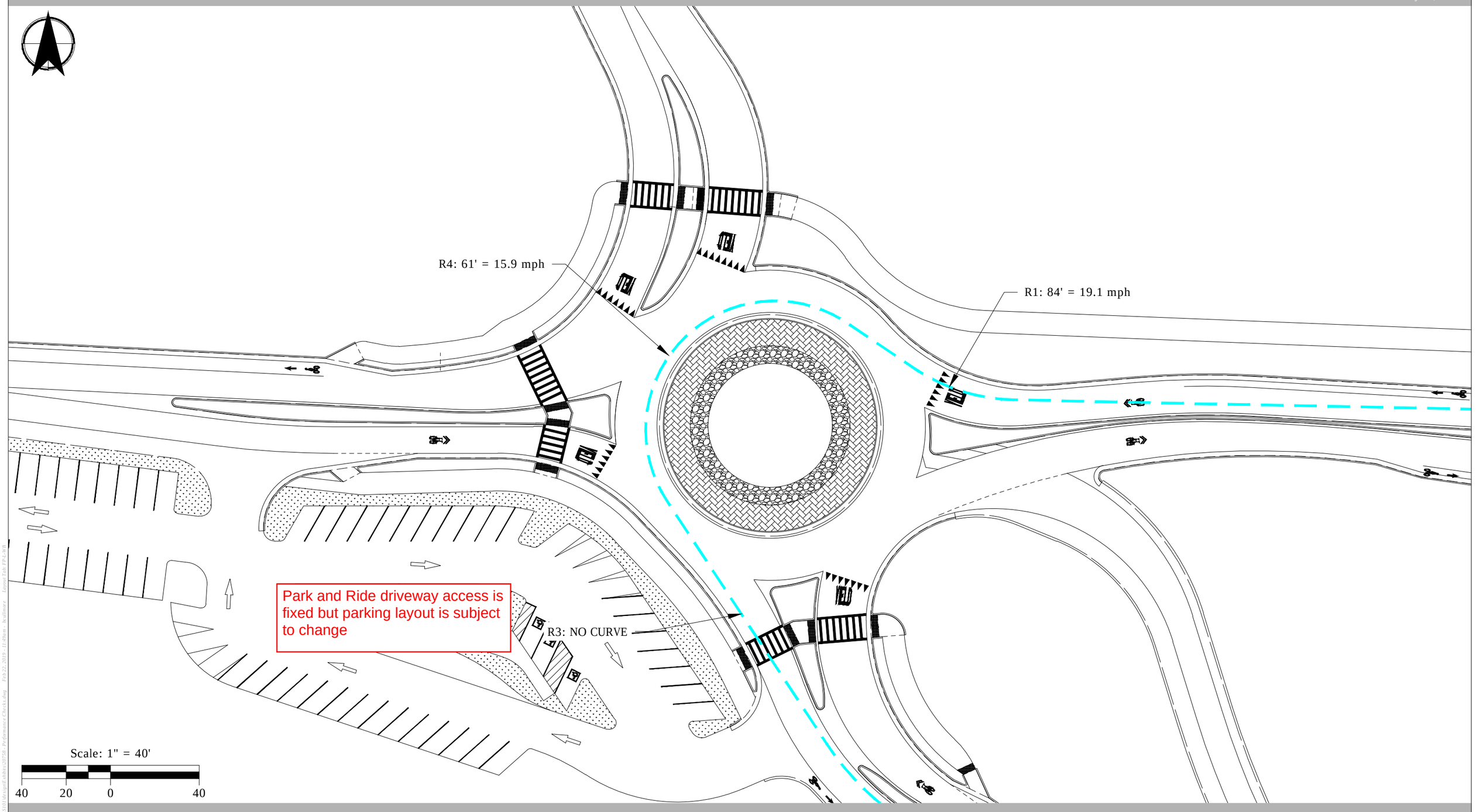
KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - Fastest Path Left Turn - WB

Preliminary Design Subject to Change
Date: February 18, 2019



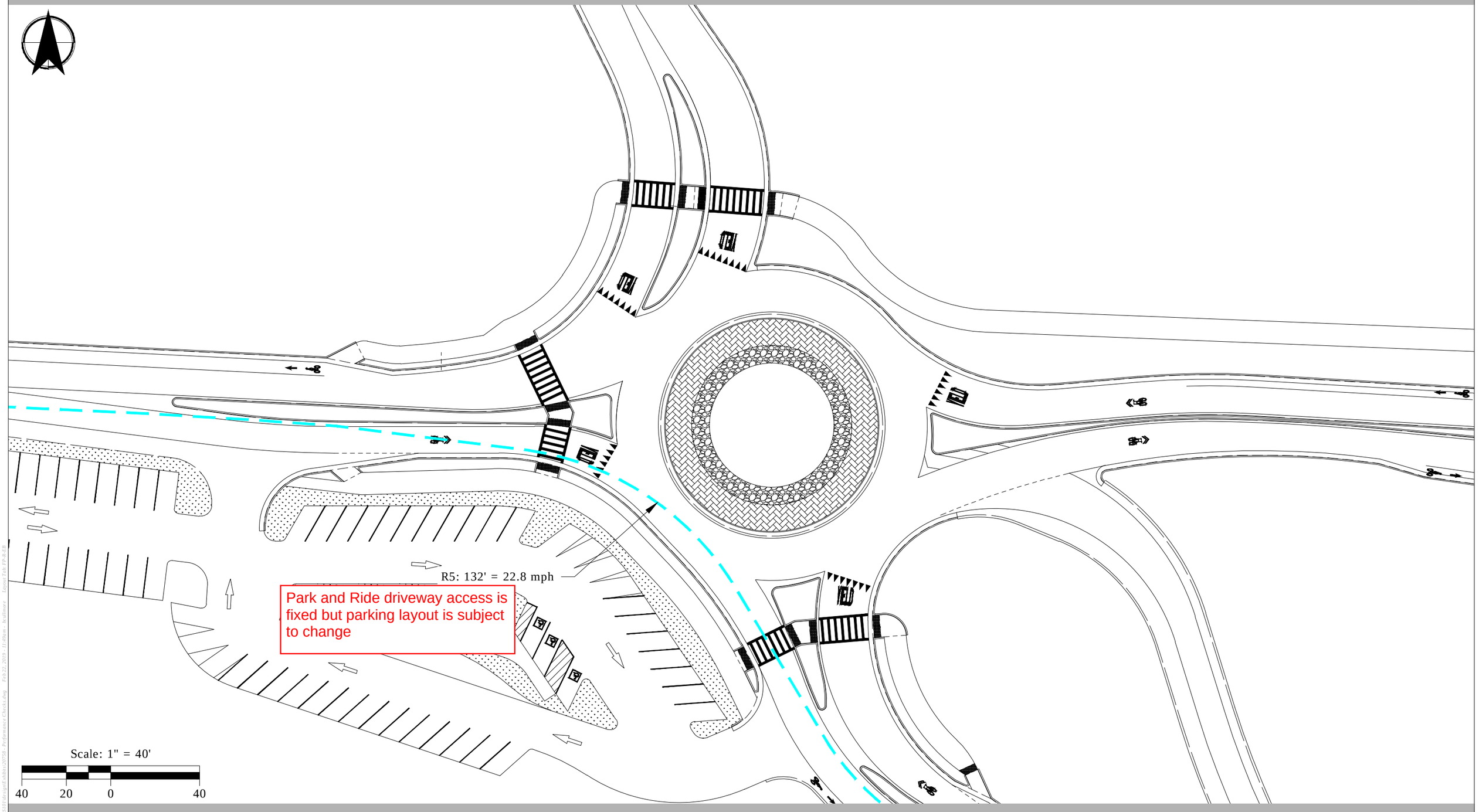
KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - Fastest Path Right Turn - EB

Preliminary Design Subject to Change
Date: February 18, 2019



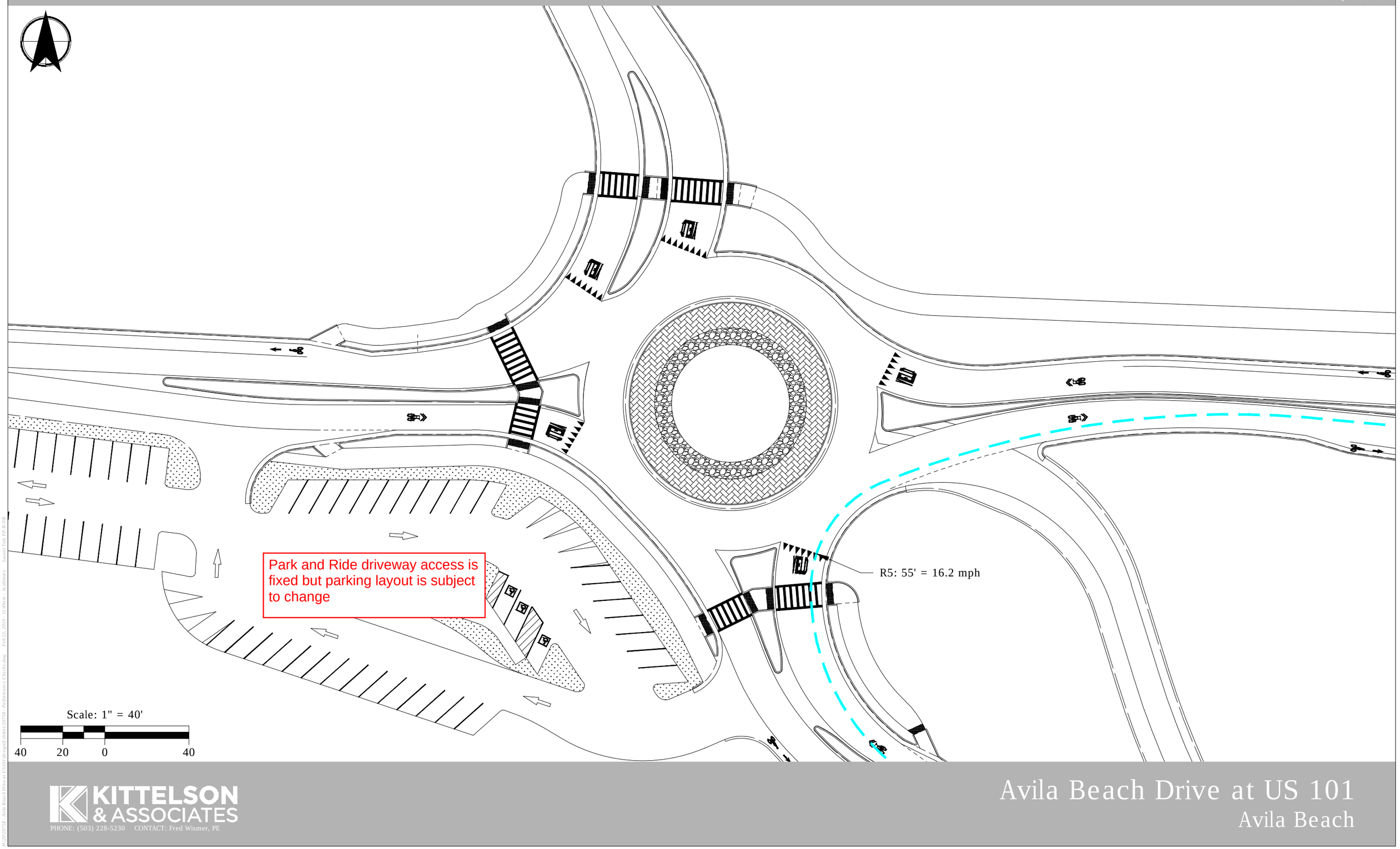
KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - Fastest Path Right Turn - NB

Preliminary Design Subject to Change
Date: February 18, 2019



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - Fastest Path Right Turn - NB Alternate

Preliminary Design Subject to Change
Date: February 18, 2019

Park and Ride driveway access is fixed but parking layout is subject to change

R5: 55' = 16.2 mph

Scale: 1" = 40'

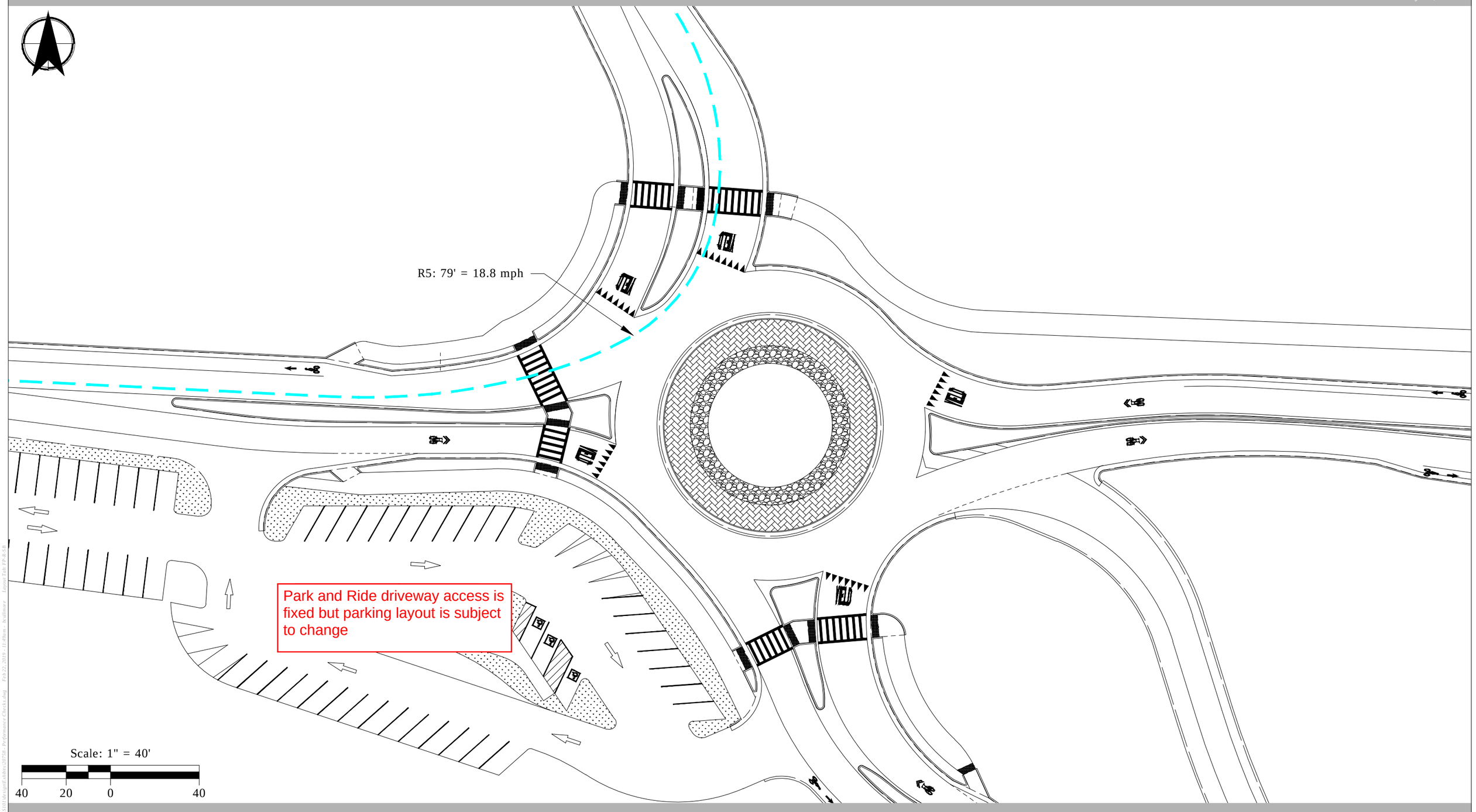
40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101
Avila Beach

Performance Checks - Fastest Path Right Turn - SB

Preliminary Design Subject to Change
Date: February 18, 2019



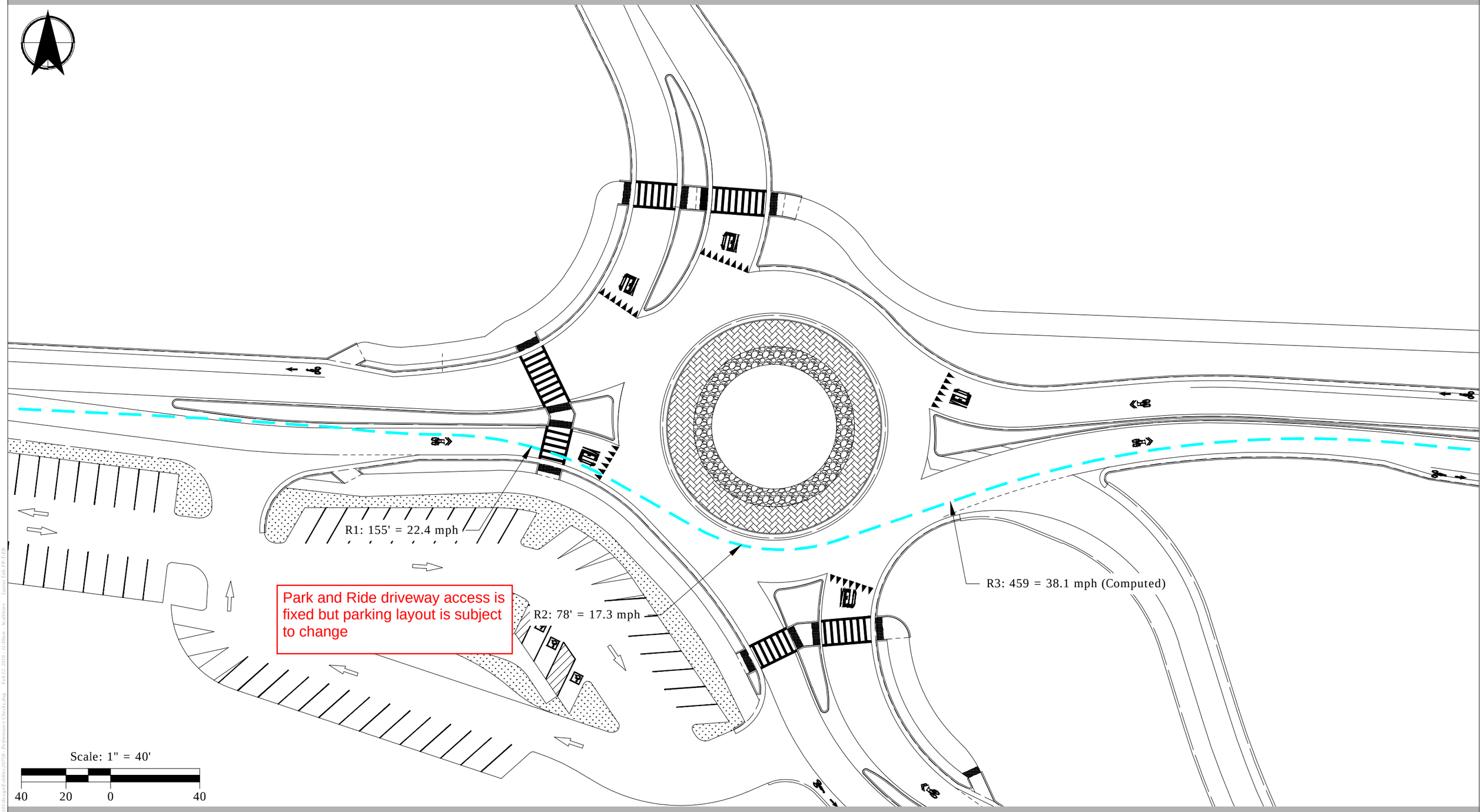
KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - Fastest Path Through Movement - EB

Preliminary Design Subject to Change
Date: February 18, 2019



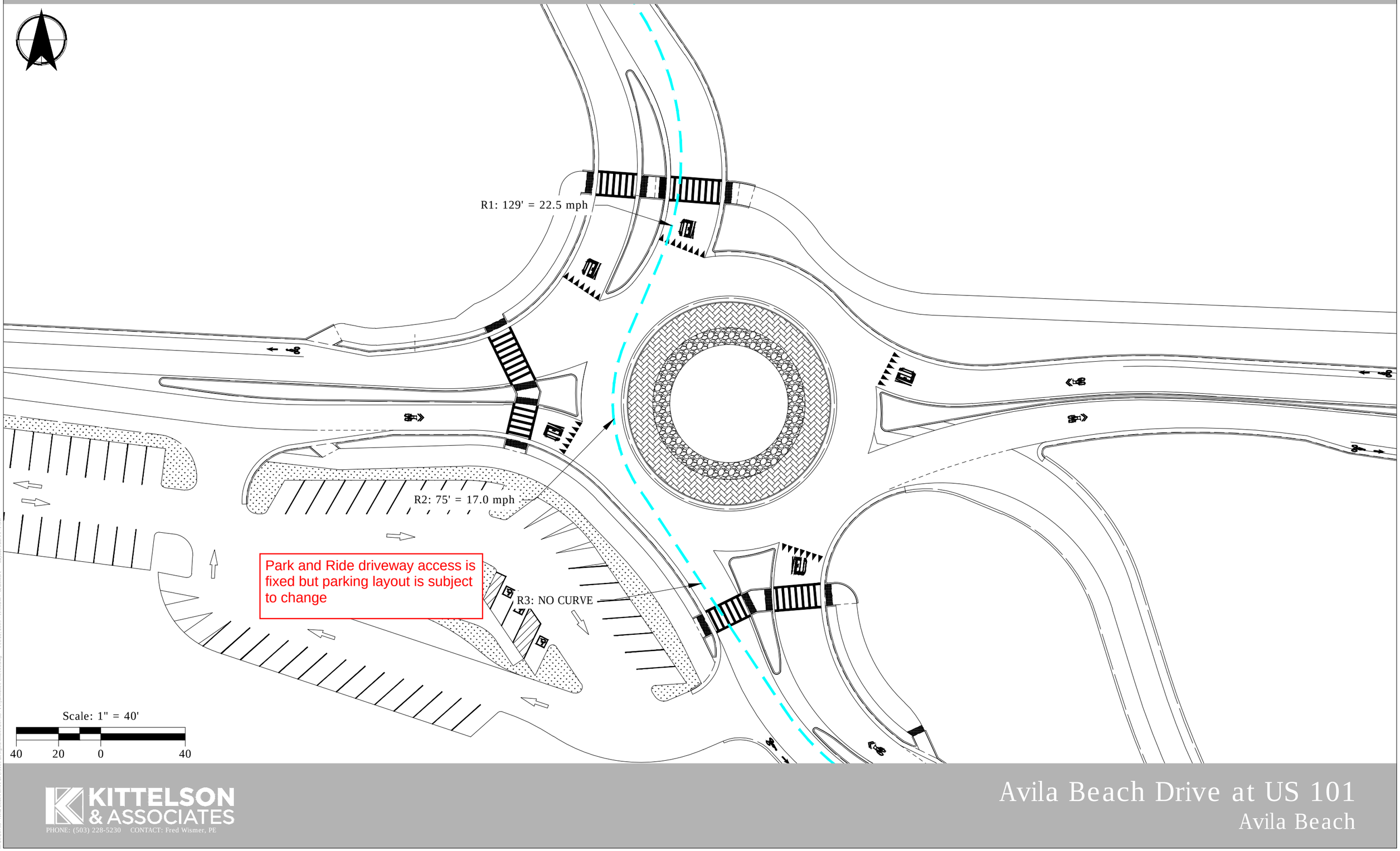
KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - Fastest Path Through Movement - SB

Preliminary Design Subject to Change
Date: February 18, 2019



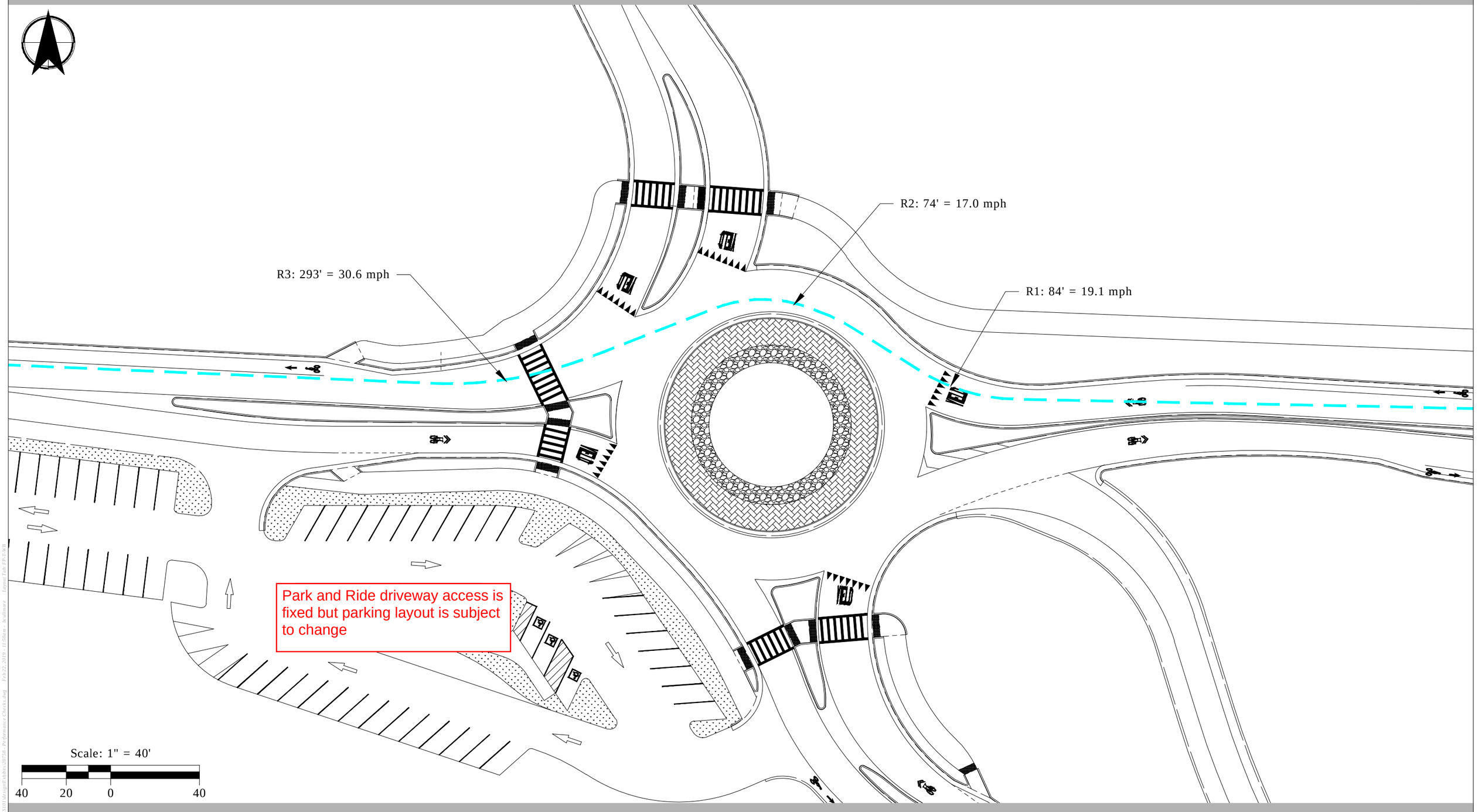
KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - Fastest Path Through Movement - WB

Preliminary Design Subject to Change
Date: February 18, 2019



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Design Vehicle Considerations
STAA Standard Truck

Performance Checks - STAA Left Turn - NB

Preliminary Design Subject to Change
Date: February 18, 2019

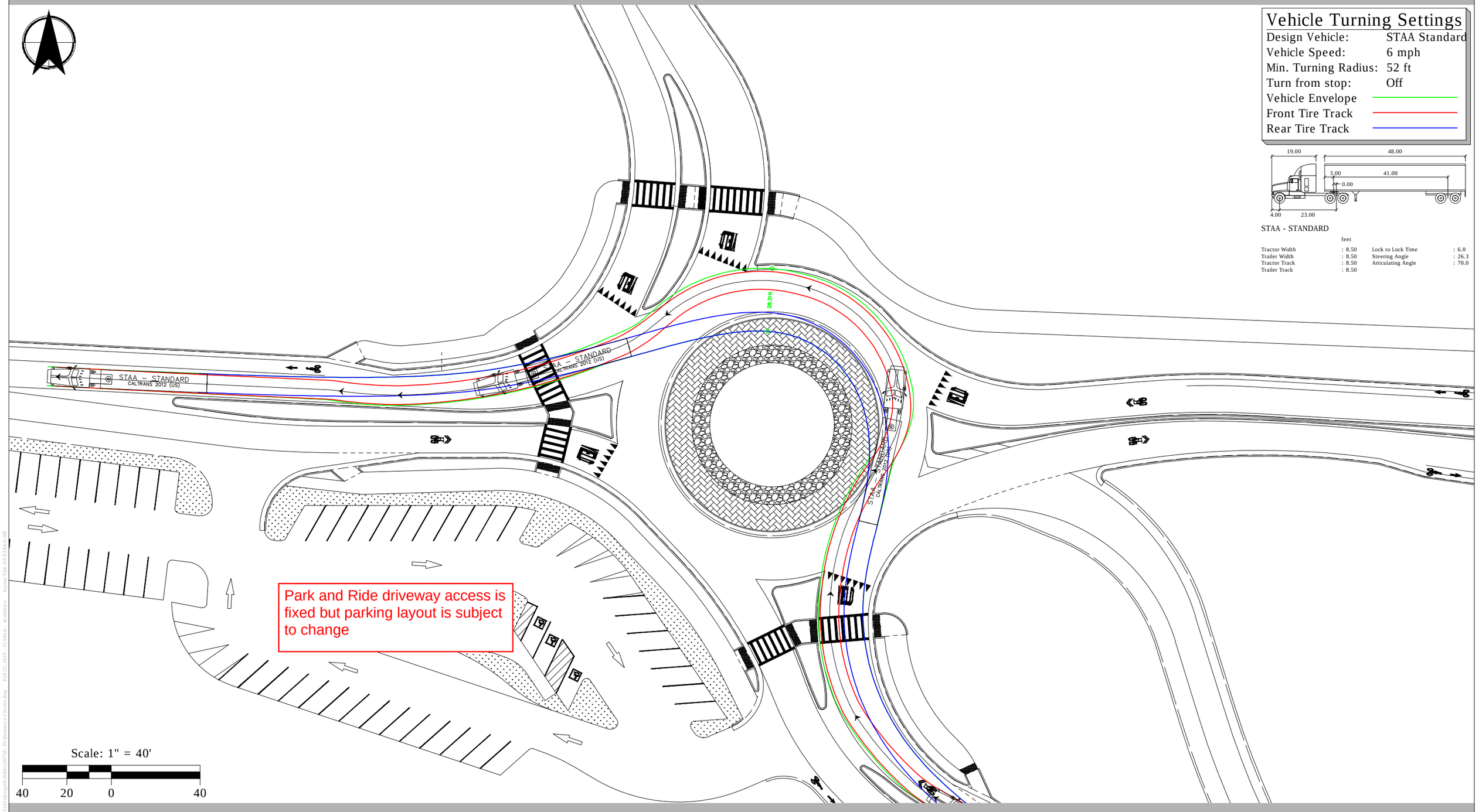
Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

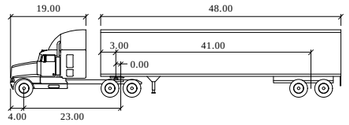
Avila Beach

Performance Checks - STAA Left Turn - SB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

STAA - STANDARD
CALTRANS 2012 (US)

STAA - STANDARD
CALTRANS 2012 (US)

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

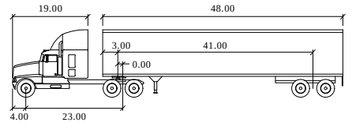
Avila Beach

Performance Checks - STAA Left Turn - SB Alternate

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

STAA - STANDARD
CALTRANS 2012 DESIGN

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

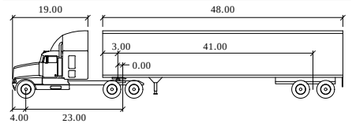
Avila Beach

Performance Checks - STAA Left Turn - WB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - STAA Left Turn - WB to SB On-Ramp

Preliminary Design Subject to Change
Date: February 18, 2019

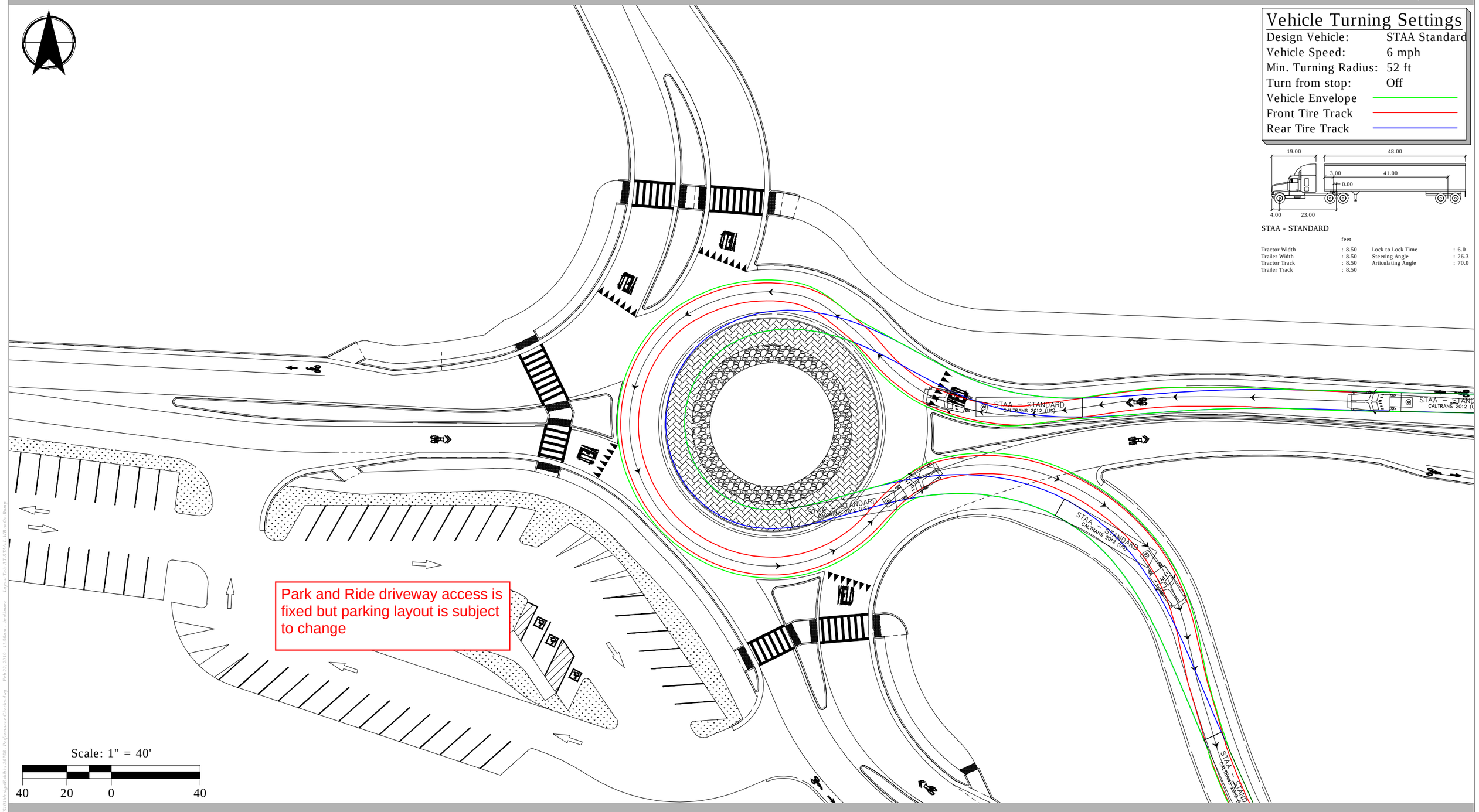
Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

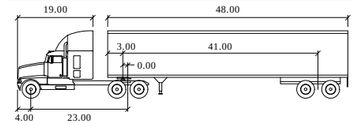
Avila Beach

Performance Checks - STAA Right Turn - EB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
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Avila Beach Drive at US 101

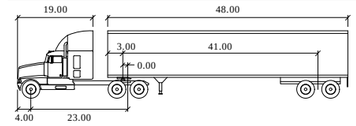
Avila Beach

Performance Checks - STAA Right Turn - NB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
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Avila Beach Drive at US 101

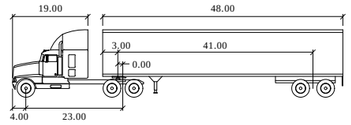
Avila Beach

Performance Checks - STAA Right Turn - SB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

STAA – STANDARD
CALTRANS 2012 (US)

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
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Avila Beach Drive at US 101

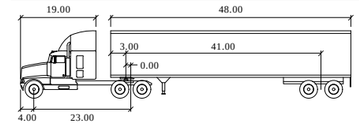
Avila Beach

Performance Checks - STAA Through Movement - EB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
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Avila Beach Drive at US 101

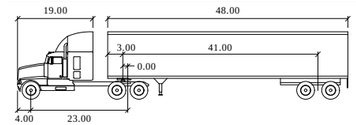
Avila Beach

Performance Checks - STAA Through Movement - EB Alternate

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
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Avila Beach Drive at US 101

Avila Beach

Performance Checks - STAA Through Movement - SB

Preliminary Design Subject to Change
Date: February 18, 2019

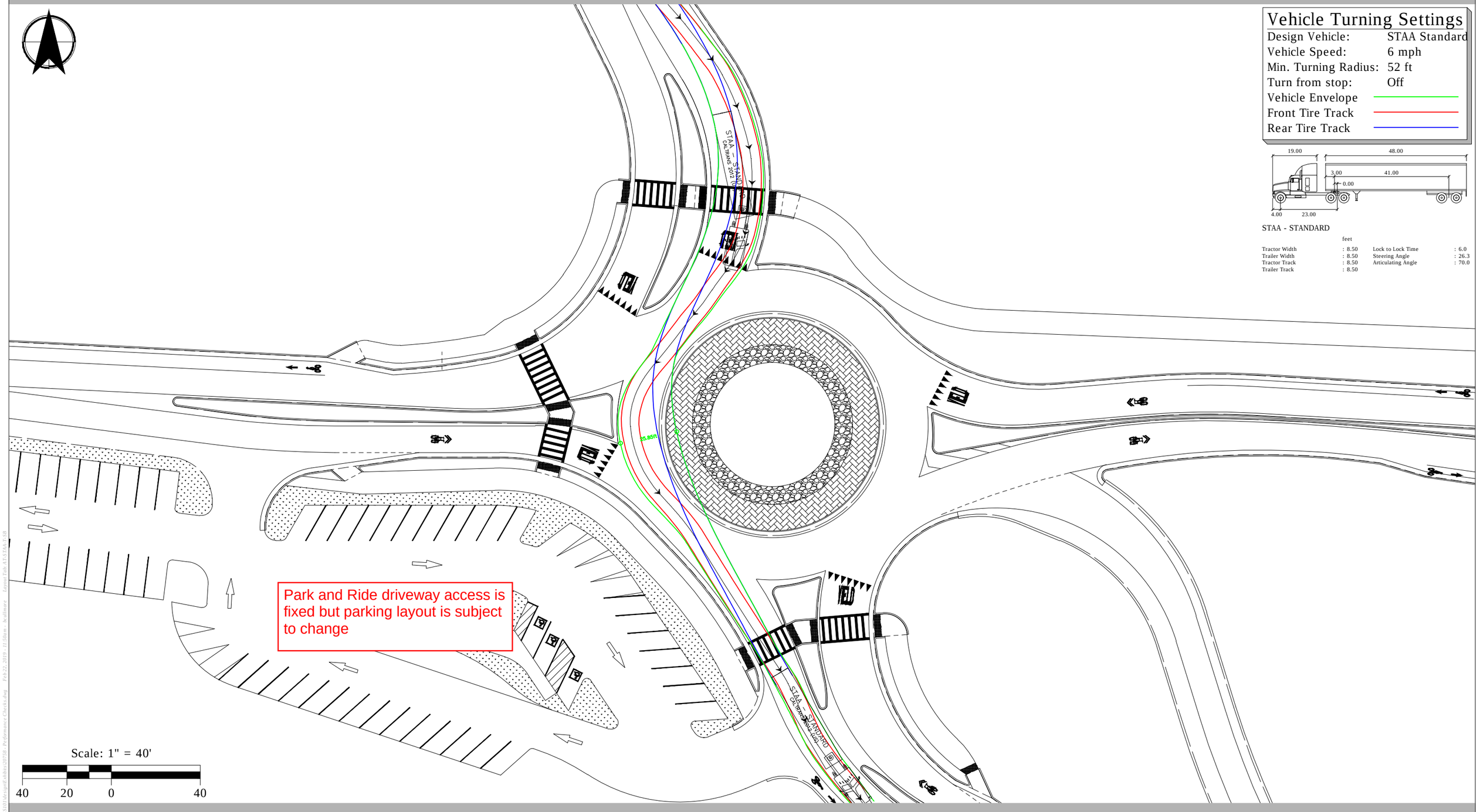
Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - STAA Through Movement - WB

Preliminary Design Subject to Change
Date: February 18, 2019

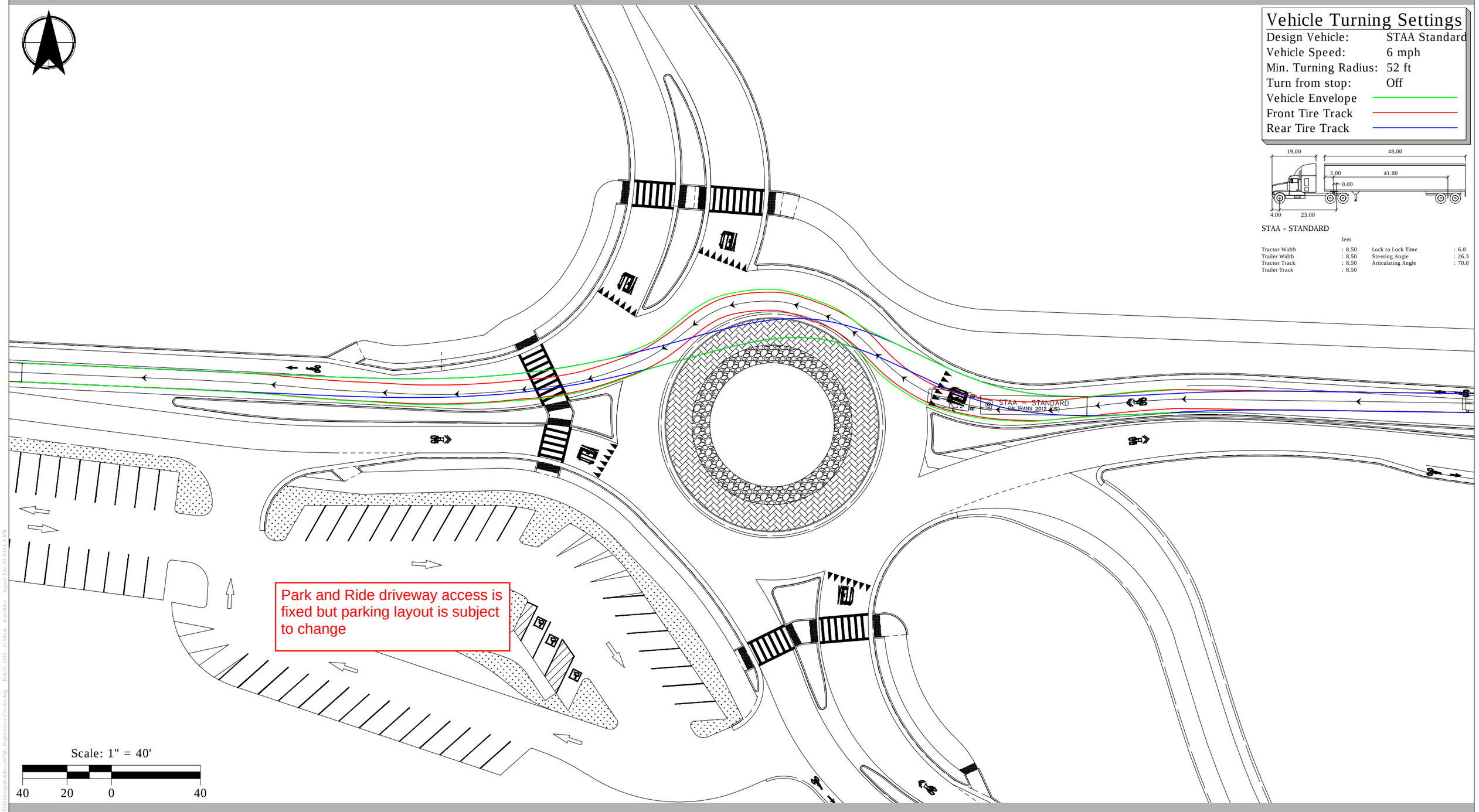
Vehicle Turning Settings

Design Vehicle:	STAA Standard
Vehicle Speed:	6 mph
Min. Turning Radius:	52 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

STAA - STANDARD

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Design Vehicle Considerations
CA Legal Truck

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Performance Checks - CA Legal Left Turn - NB

Preliminary Design Subject to Change
Date: February 18, 2019

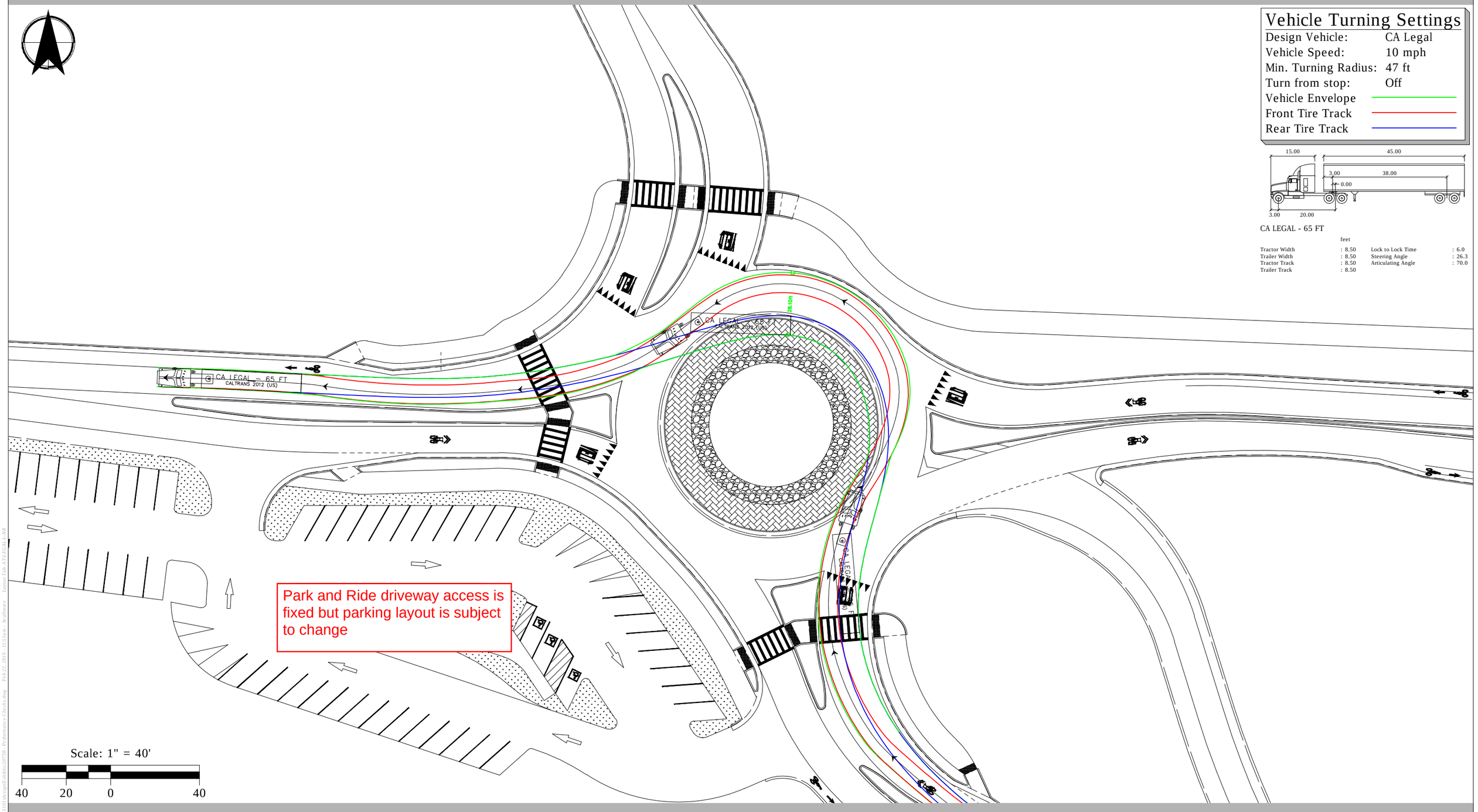
Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	10 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - CA Legal Left Turn - SB

Preliminary Design Subject to Change
Date: February 18, 2019

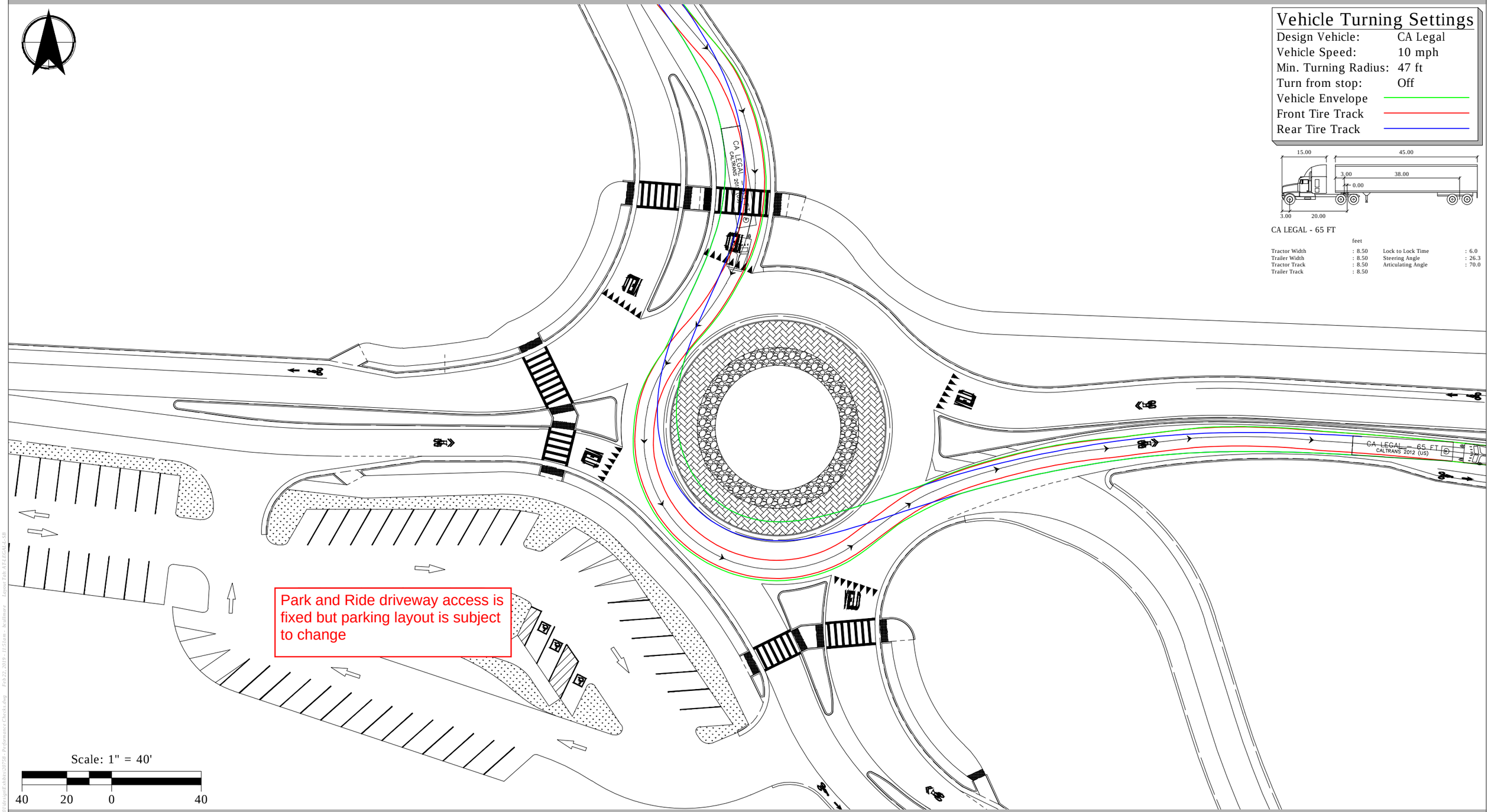
Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	10 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



KITTELSON & ASSOCIATES
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Avila Beach Drive at US 101

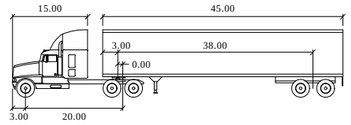
Avila Beach

Performance Checks - CA Legal Left Turn - SB Alternate

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	10 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - CA Legal Left Turn - WB

Preliminary Design Subject to Change
Date: February 18, 2019

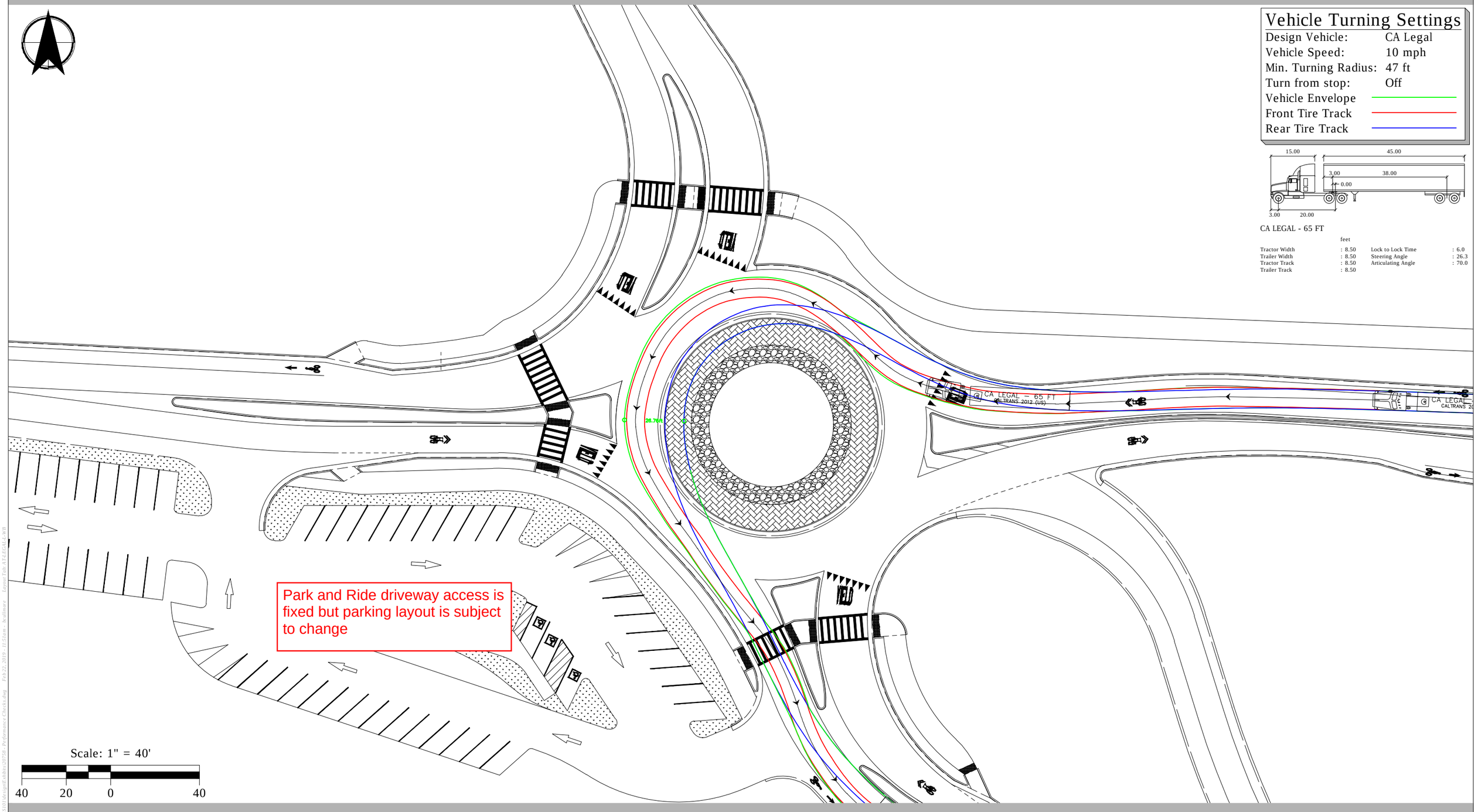
Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	10 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - CA Legal Left Turn - WB to SB On-Ramp

Preliminary Design Subject to Change
Date: February 18, 2019

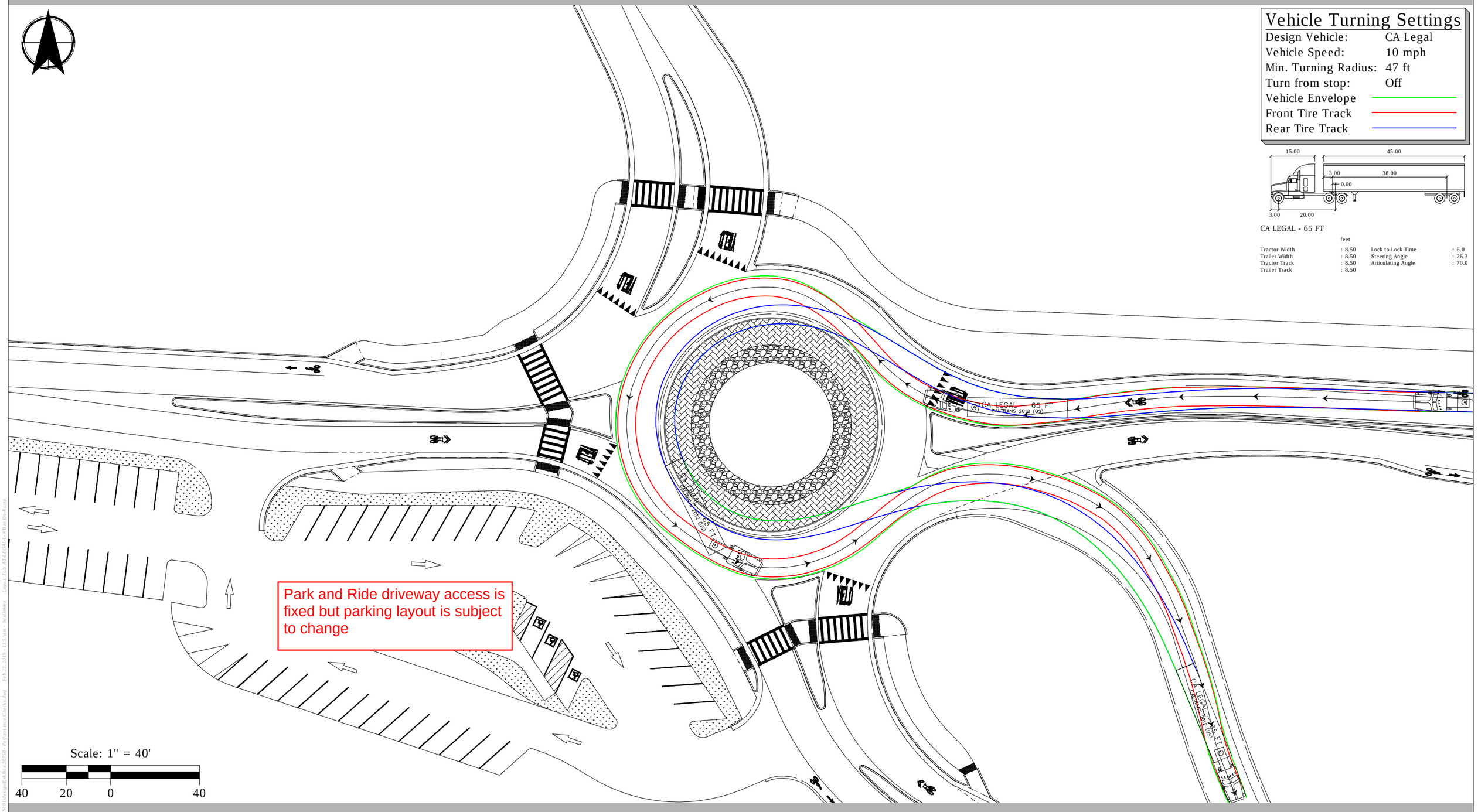
Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	10 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



KITTELSON & ASSOCIATES
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Avila Beach Drive at US 101

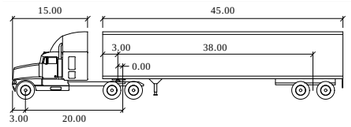
Avila Beach

Performance Checks - CA Legal Right Turn - EB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

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Avila Beach Drive at US 101

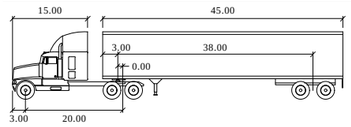
Avila Beach

Performance Checks - CA Legal Right Turn - NB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

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Avila Beach Drive at US 101

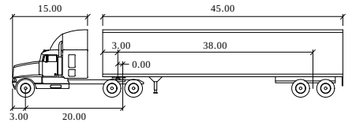
Avila Beach

Performance Checks - CA Legal Right Turn - SB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

CA LEGAL – 65 FT
CALTRANS 2012 (US)

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

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Avila Beach Drive at US 101

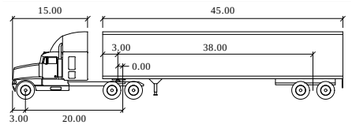
Avila Beach

Performance Checks - CA Legal Through Movement - EB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	10 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

CA LEGAL - 65 FT
CALTRANS 2012 (US)

Scale: 1" = 40'

40 20 0 40

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Avila Beach Drive at US 101

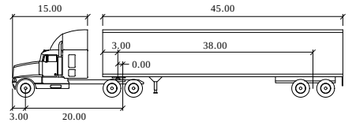
Avila Beach

Performance Checks - CA Legal Through Movement - EB Alternate

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	10 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

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Avila Beach Drive at US 101

Avila Beach

Performance Checks - CA Legal Through Movement - SB

Preliminary Design Subject to Change
Date: February 18, 2019

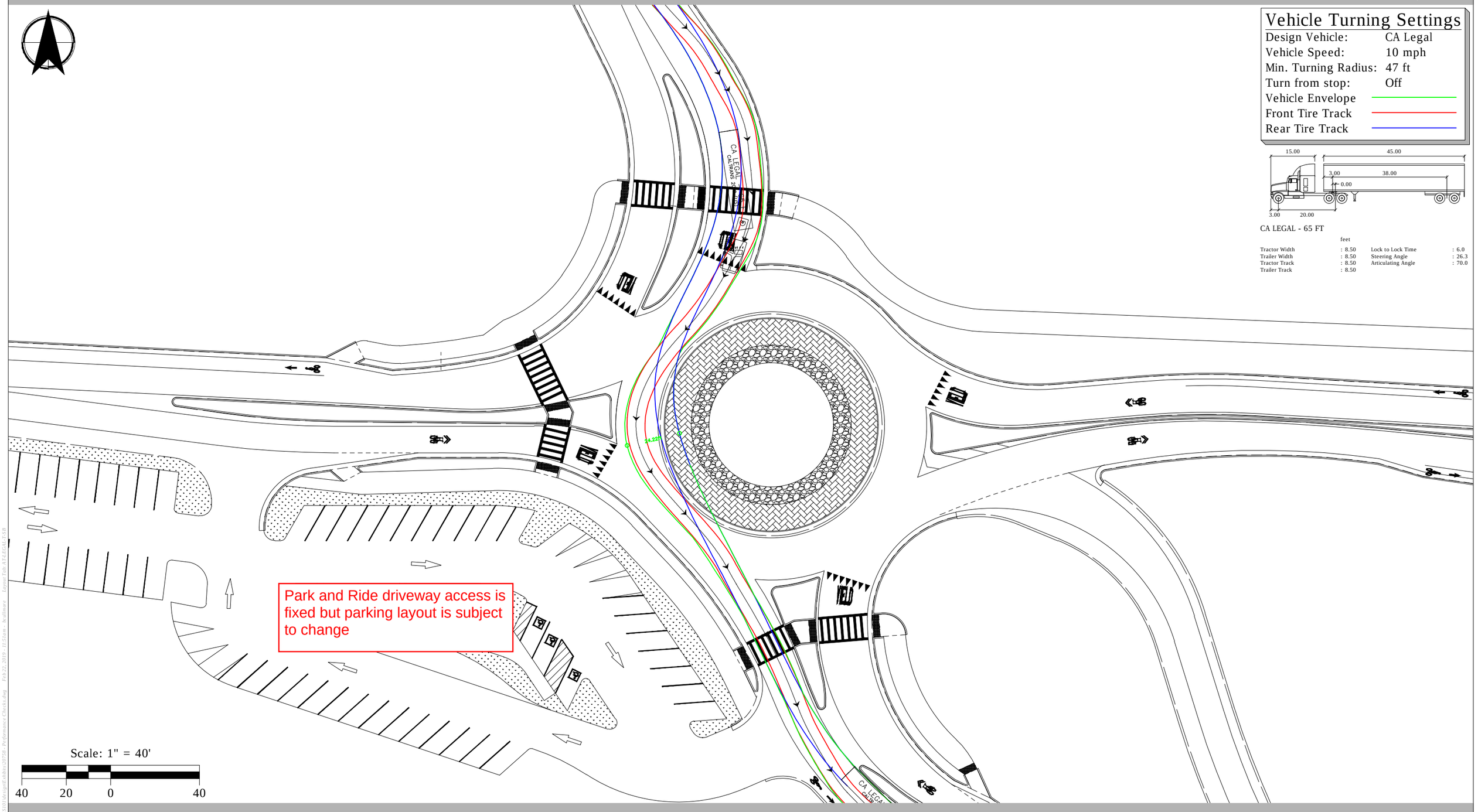
Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	10 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		



KITTELSON & ASSOCIATES
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Avila Beach Drive at US 101

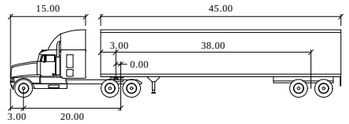
Avila Beach

Performance Checks - CA Legal Through Movement - WB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	CA Legal
Vehicle Speed:	10 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



CA LEGAL - 65 FT

feet

Tractor Width	: 8.50	Lock to Lock Time	: 6.0
Trailer Width	: 8.50	Steering Angle	: 26.3
Tractor Track	: 8.50	Articulating Angle	: 70.0
Trailer Track	: 8.50		

65 FT (US)

CA LEGAL - 65 FT
CALTRANS 2012 (US)

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

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Performance Checks - CA Legal Through Movement - WB

Avila Beach

Design Vehicle Considerations
45' Bus & Motorhome

Performance Checks - 45' Bus & Motorhome Left Turn - NB

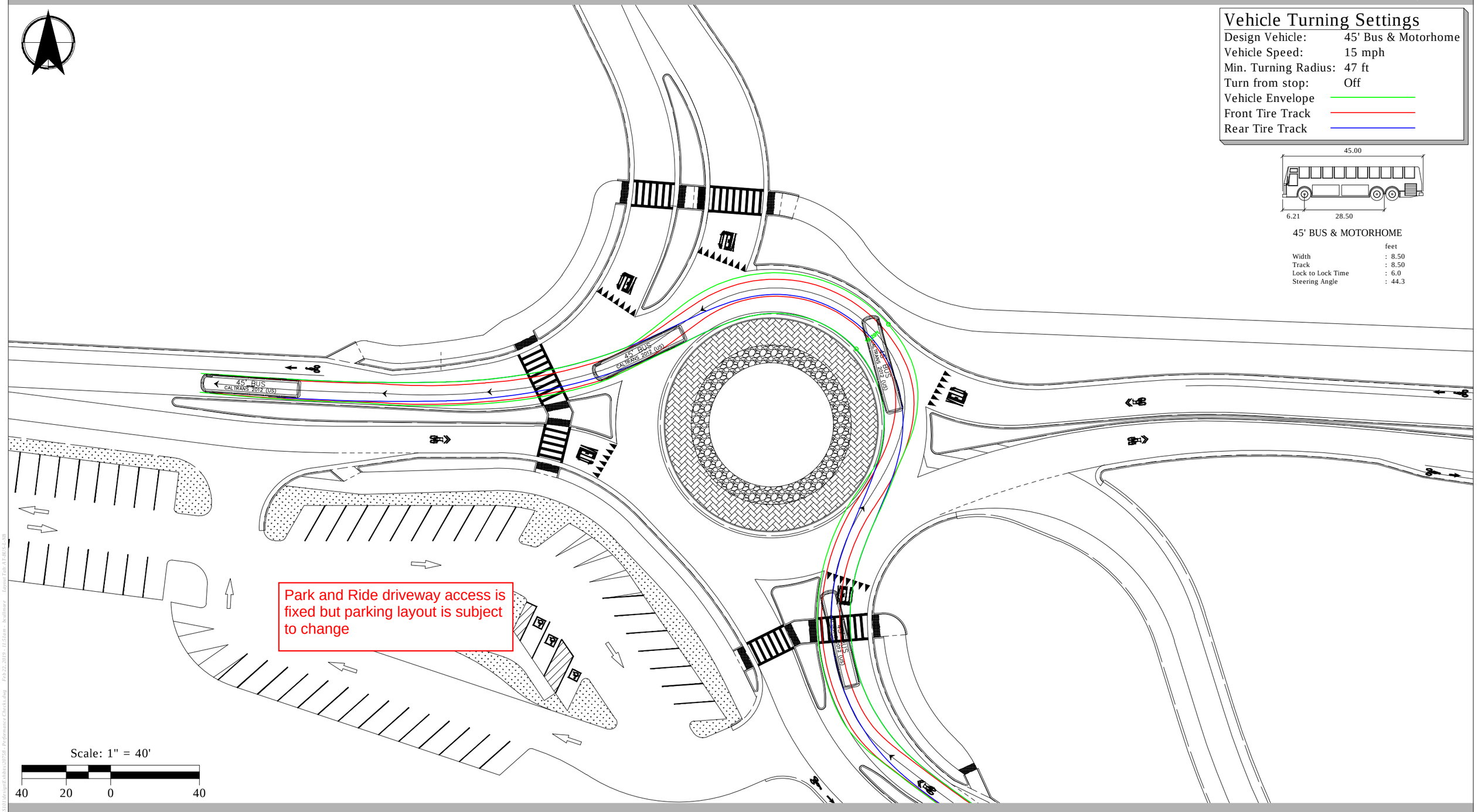
Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3



KITTELSON & ASSOCIATES
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Avila Beach Drive at US 101

Avila Beach

Performance Checks - 45' Bus & Motorhome Left Turn - SB

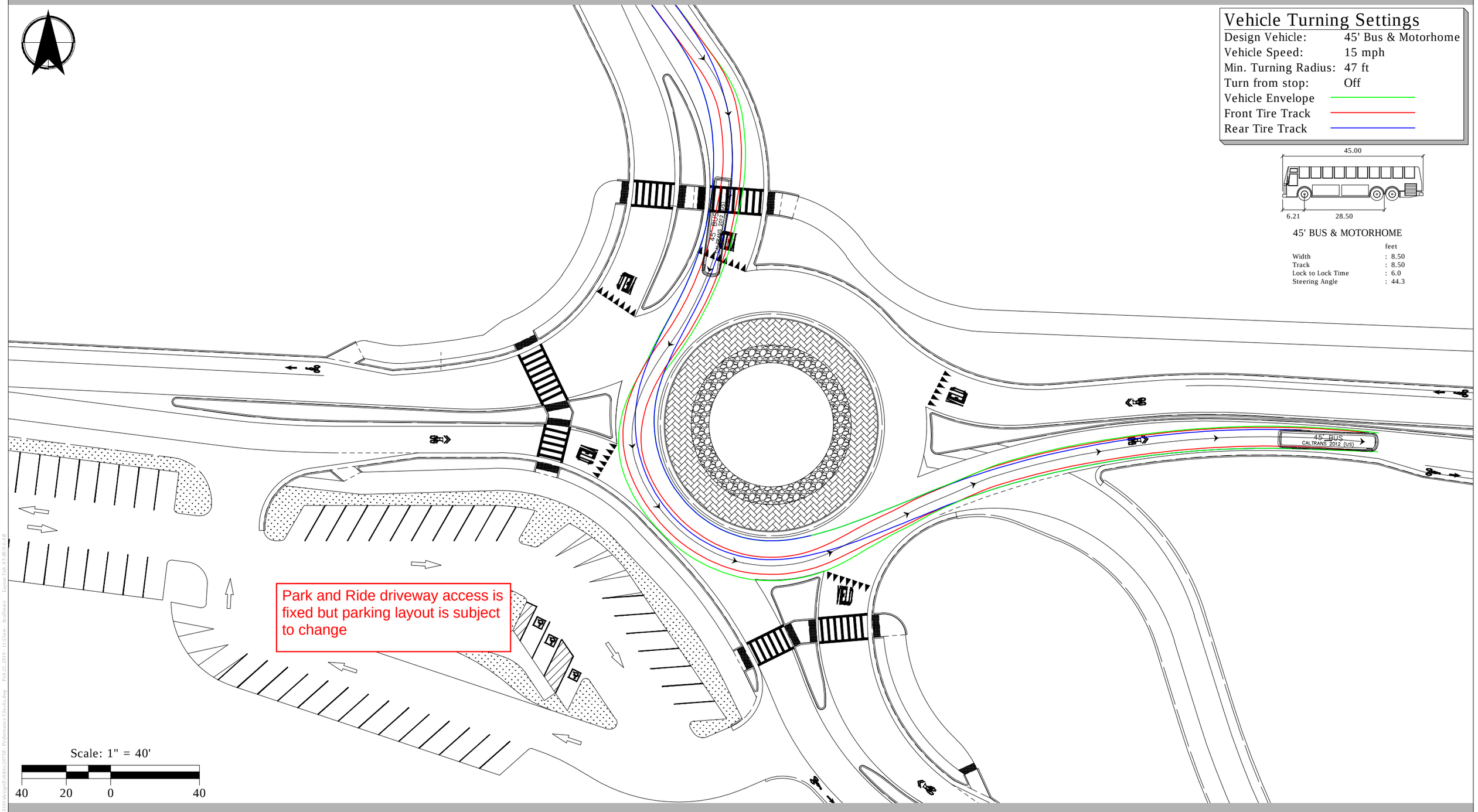
Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

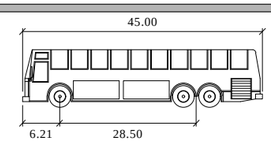
Avila Beach

Performance Checks - 45' Bus & Motorhome Left Turn - SB Alternate

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - 45' Bus & Motorhome Left Turn - WB

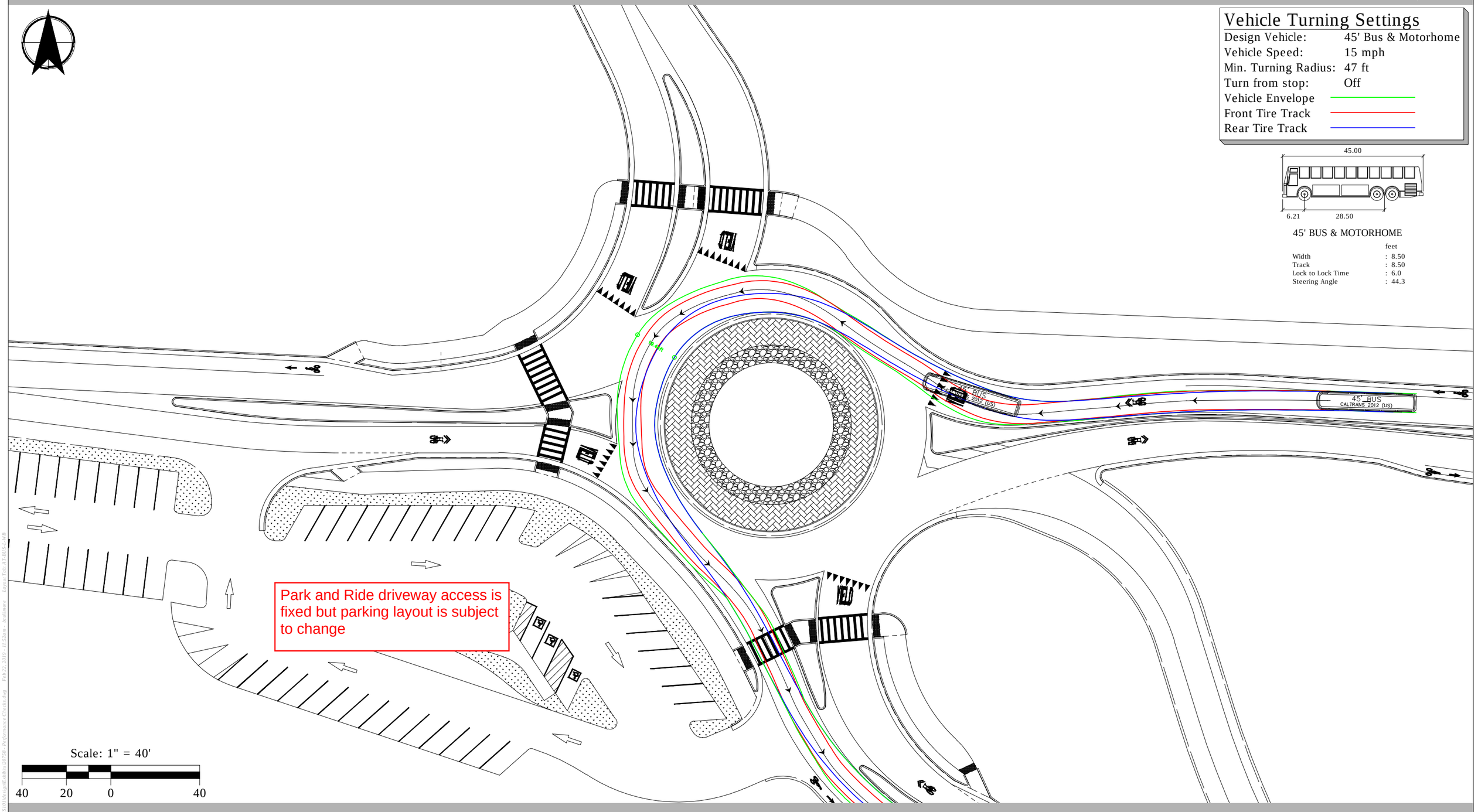
Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

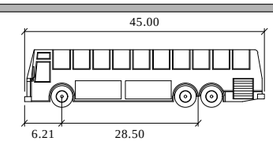
Avila Beach

Performance Checks - 45' Bus & Motorhome Right Turn - EB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

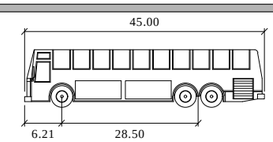
Avila Beach

Performance Checks - 45' Bus & Motorhome Right Turn - NB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

Park and Ride driveway access is fixed but parking layout is subject to change

45' BUS
CALTRANS_2012 (US)

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - 45' Bus & Motorhome Right Turn - SB

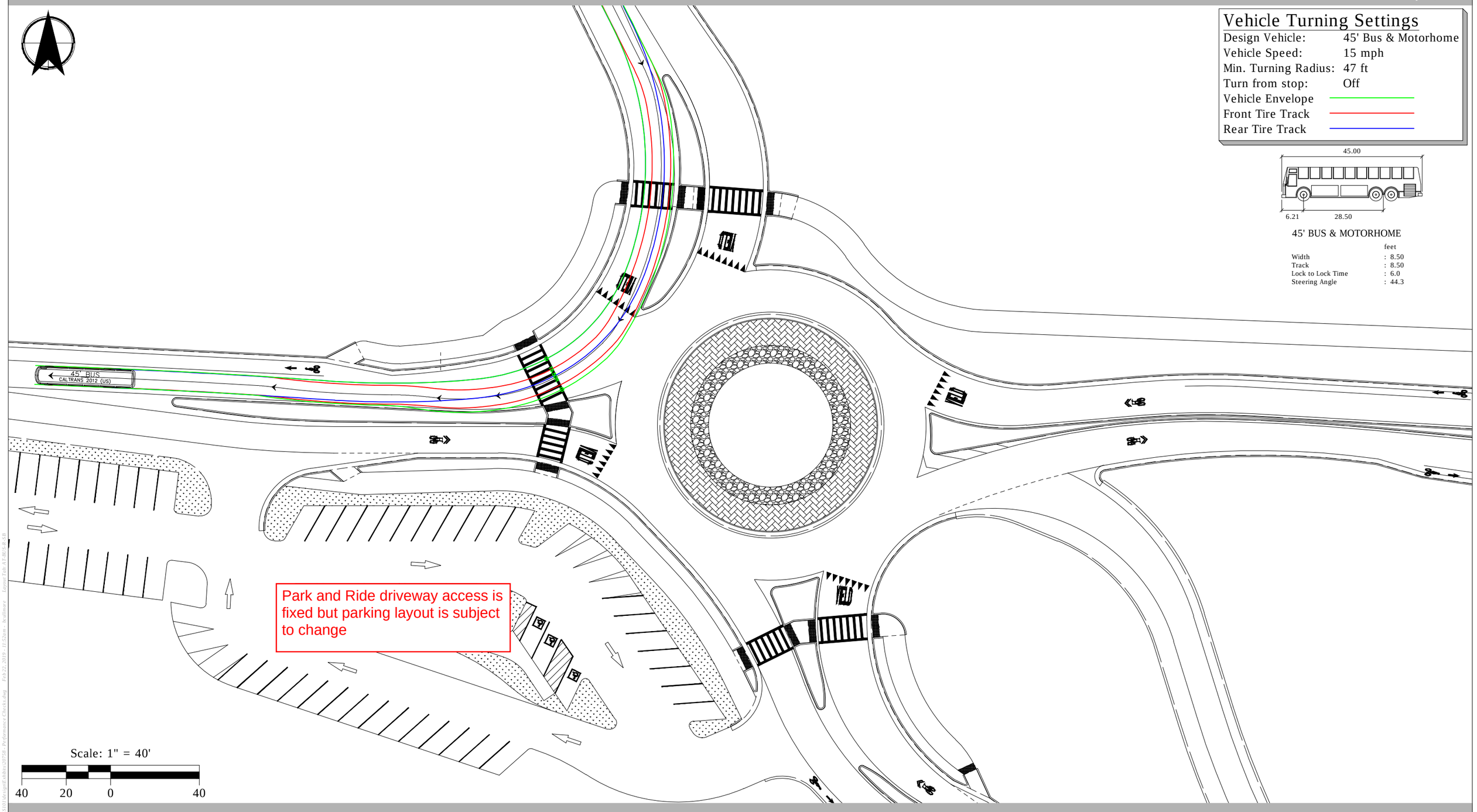
Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3



KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

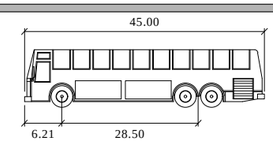
Avila Beach

Performance Checks - 45' Bus & Motorhome Through Movement - EB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

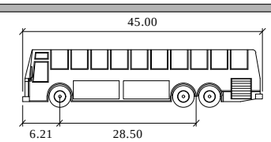
Avila Beach

Performance Checks - 45' Bus & Motorhome Through Movement - EB Alternate

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

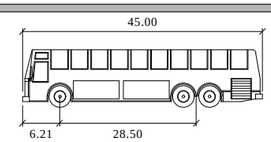
Avila Beach

Performance Checks - 45' Bus & Motorhome Through Movement - SB

Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	



45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

Park and Ride driveway access is fixed but parking layout is subject to change

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - 45' Bus & Motorhome Through Movement - WB

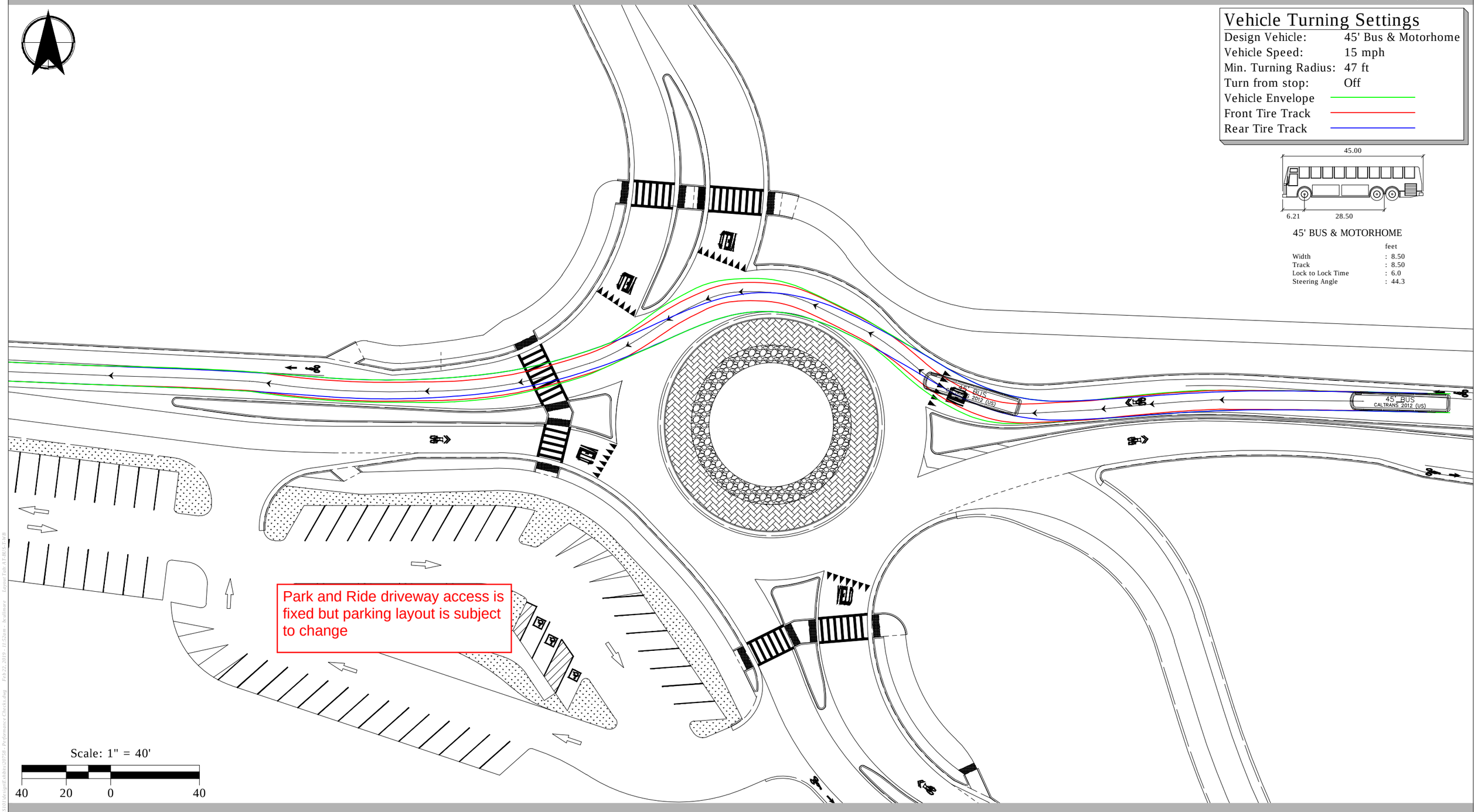
Preliminary Design Subject to Change
Date: February 18, 2019

Vehicle Turning Settings

Design Vehicle:	45' Bus & Motorhome
Vehicle Speed:	15 mph
Min. Turning Radius:	47 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

45' BUS & MOTORHOME

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3



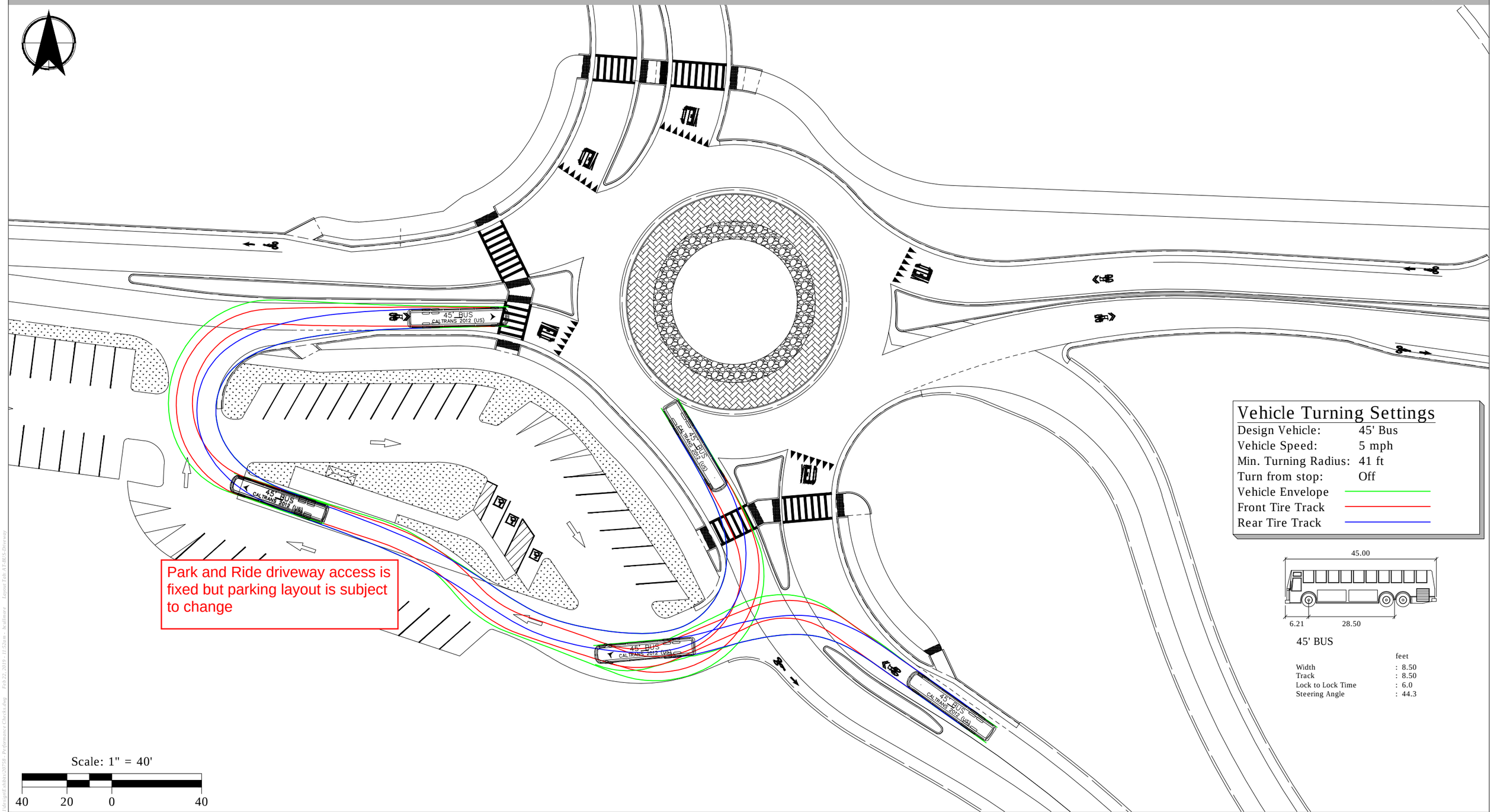
KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Performance Checks - 45' Bus

Preliminary Design Subject to Change
Date: February 18, 2019



Vehicle Turning Settings

Design Vehicle:	45' Bus
Vehicle Speed:	5 mph
Min. Turning Radius:	41 ft
Turn from stop:	Off
Vehicle Envelope	
Front Tire Track	
Rear Tire Track	

45' BUS

	feet
Width	: 8.50
Track	: 8.50
Lock to Lock Time	: 6.0
Steering Angle	: 44.3

Scale: 1" = 40'

40 20 0 40

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Stopping Sight Distances

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Stopping Sight Distance Design Check

Preliminary Design Subject to Change
Date: February 18, 2019

Scale: 1" = 80'

80 40 0 80

V = 35.0 mph, SSD = 247 ft

V = 15.9 mph, SSD = 83 ft

V = 15.9 mph, SSD = 83 ft

V = 30.0 mph, SSD = 197 ft

V = 45.0 mph, SSD = 362 ft

V = 15.9 mph, SSD = 83 ft

V = 15.9 mph, SSD = 83 ft

V = 40.0 mph, SSD = 302 ft

Park and Ride driveway access is fixed but parking layout is subject to change

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Intersection Sight Distance Design Check - NB/SB

Preliminary Design Subject to Change
Date: February 18, 2019

Scale: 1" = 30'

30 15 0 30

V = 15.9 mph, ISD = 113 ft

V = 19.1 mph, ISD = 112 ft

V = 22.4 mph, ISD = 145 ft

V = 15.9 mph, ISD = 104 ft

Park and Ride driveway access is fixed but parking layout is subject to change

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Intersection Sight Distance Design Check - NB/SB

Preliminary Design Subject to Change
Date: February 18, 2019

Scale: 1" = 30'

30 15 0 30

V = 22.5 mph, ISD = 137 ft

V = 15.9 mph, ISD = 103 ft

V = 15.9 mph, ISD = 135 ft

V = 16.2 mph, ISD = 99 ft

Park and Ride driveway access is fixed but parking layout is subject to change

KITTELSON & ASSOCIATES
PHONE: (503) 228-5230 CONTACT: Fred Wismer, PE

Avila Beach Drive at US 101

Avila Beach

Appendix C Collision Cost Analysis and Benefit / Cost Worksheet

Intersection Control Evaluation
Collision Cost Analysis and B/C

-- Fill in tan boxes along with 'Area' --

County	Rte	Postmile	Location Description
SLO	101	R21.1	SB Offramp @ Avila Beach Rd

Area
- (●) Rural
- ( ) Suburban
- ( ) Urban

Intersection Types:
F - Four-Legged
M - Multi-Legged
S - Offsett -Tee
Y - "Y" Wye

Existing Condition	# of Years for Analysis	Rate Group
Stop Control (Minor Leg), Type T, Y or Z	20	I17

Existing ADT (x1000)		Future ADT (x1000)			
Mainline	Cross St	Mainline	Cross St	Average ADT	VCF
9.2	4.3	13.7	8.0	17.6	1.30

Est. Capital Cost (x1000) for Desired Improvement

Desired Improvement	Const	R/W	Total
Yield Control (Roundabout 1-Lane)	$ 4,483	$ 221	$ 4,704
Yield Control (Roundabout 2-Lane)			$ -
Traffic Signal, Type F, M or S			$ -
All Way Stop, Type F, M or S		.	$ -

Existing Collision Data

Number of Years	3	Total Collisions	7
Injury	4	PDO	3
Fatal	0	Fat + Inj	4

	Collision Cost (x1000)					B/C
	Existing Condition		Desired Improvement		Projected Savings	
1	Stop Control (Minor Leg), Type T, Y or Z	$21,570	Yield Control (Roundabout 1-Lane)	$1,002	$20,567	4.37
2	Stop Control (Minor Leg), Type T, Y or Z	$21,570	Yield Control (Roundabout 2-Lane)	$2,542	$19,028	0.00
3	Stop Control (Minor Leg), Type T, Y or Z	$21,570	Traffic Signal, Type F, M or S	$13,200	$8,370	0.00
4	Stop Control (Minor Leg), Type T, Y or Z	$21,570	All Way Stop, Type F, M or S	$10,458	$11,111	0.00

NOTE: Only average collision costs are used for calculation purposes.

State of California
DEPARTMENT OF TRANSPORTATION

California State Transportation Agency

Memorandum

Making Conservation
a California Way of Life.

To: PAUL VALADAO, P.E.
Senior Transportation Engineer
Program Project Management

Date: June 18, 2019

File: 05-SLO-101-PM 21.1
0515000038
EA 05-1G4801

From: ROGER D. BARNES, R.C.E., T.E.
Senior Transportation Engineer
Traffic Operations Branch Chief

Subject: **US 101/AVILA BEACH DR. I/C: INTERSECTION CONTROL EVALUATION (STEP 2)**

The purpose of the Intersection Control Evaluation (ICE) is to facilitate the objective evaluation of intersection alternatives. This is a two-step evaluation process that supports the timely and efficient selection of intersection traffic control strategies and access configurations for a particular intersection or intersections. The Intersection Control Evaluation process is governed by Traffic Operations Policy Directive 13-02 (TOPD 13-2).

As stated in Traffic Operations Policy Directive 13-02 (TOPD 13-02), the authority to recommend the use of the single point interchange and yield-controlled roundabouts for particular intersections and interchanges is hereby delegated from the HQ Traffic Operations Liaison Engineers to the District Traffic Operations engineers responsible for the operation and performance of specific state highways and intersections. This transfer of authority is conditioned upon compliance with the engineering study, consultation and documentation requirements contained in and referenced by this directive. Finally, the Intersection Control Evaluation shall be approved or concurred in writing by the District Traffic Operations functional manager responsible for operating and managing the performance of specific State highway segments, corridors and intersections.

The objective of Step One evaluation activities is to identify access solution concepts meriting further consideration. The assessment effort should produce a concept-level understanding of the highway infrastructure work needed for each intersection control strategy. The result of Step Two activities include an engineering design evaluation and comparison of the system performance impacts and a collision benefit/cost analysis expected over the design or service life of each control strategy and the No Build or Control scenario.

Preliminary and/or intermediate consultations are encouraged for complex, innovative or non-conforming proposals to minimize the potential for significant or unexpected findings just prior to completing a project development phase or milestone. In some cases, a traffic sensitivity analysis may be required to estimate the service life of investment proposals that meet the project purpose and need, but do not require a 20-year design life. These include operational, safety, and traffic impact mitigation proposals regardless of funding source.

The District 5 Traffic Operations Branch concurs with the findings of the March 28, 2019 FINAL Traffic Operations Analysis Report (TOAR) and Intersection Control Evaluation (STEP 2) prepared by Kittelson & Associates for the County of San Luis Obispo. The Report has been prepared to the satisfaction of the District 5 Intersection Control Evaluation Coordinator in accordance with the requirements of Traffic Operations Policy Directive 13-02.

The Traffic Operations Branch will continue to work with our internal and external partners to develop projects that maximize the efficiency of the existing State Highway System and to serve the needs of all transportation modes.

Best Regards,

Roger D. Barnes

Roger D. Barnes, R.C.E., T.E.
Senior Transportation Engineer
Traffic Operations Branch Chief
Caltrans District 5 – San Luis Obispo
roger.d.barnes@dot.ca.gov

c: File
Sam Toh, Transportation Engineer, Traffic Operations Branch
Bing Yu, Transportation Engineer, Traffic Operations Branch

Attachment C
Layout

NOTES:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

LEGEND:

- MINOR CONCRETE (TRUCK APRON)
- MINOR CONCRETE (STAMPED CONCRETE)
- ROCK BLANKET

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SLO	US101	21.1	1	2

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER SARAH M. HUFFMAN No. 85233 FOR PLAN REVIEW ONLY NOT FOR CONSTRUCTION CIVIL STATE OF CALIFORNIA

THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

WALLACE GROUP
612 CLARION CT
SAN LUIS OBISPO, CA 93401

COUNTY OF SAN LUIS OBISPO
COUNTY GOVT CENTER, ROOM 206
SAN LUIS OBISPO, CA 93408

"R-23a" 503+20 MATCHLINE

SB OFF-RAMP

SB US 101 "NL (B)" LINE

NB US 101 "INR (B)" LINE

MONTE RD "F-21" LINE

"R-23a-2" LINE

RIGHT-TURN BYPASS

INSCRIBED CIRCLE DIAMETER=140'

CONFORM Ret WALL N1

Ret WALL W2

Exist R/W

CONFORM Exist EP

AVILA BEACH DR

SPLITTER ISLAND

STATE R/W COUNTY R/W PROPOSED Exist

Ped RAILING

"AV1" LINE

"AV1-2" LINE

"AV1-6" LINE

Exist EP

SHARED USE PATH

TRUCK APRON

OVERFLOW PARKING Ret WALL (Max H=4')

Ret WALL W1

NB OFF-RAMP

"R-20a" LINE

STAMPED Conc

BUS PAD

"L-22-R-15" LINE

STATE R/W COUNTY R/W PROPOSED Exist

"SBR-3" LINE

Conc BARRIER (TYPE 60)

CONFORM SB ON-RAMP

"R-22a" LINE

STATE R/W COUNTY R/W PROPOSED Exist

SHELL BEACH RD

"SBR" LINE

CONFORM

CONFORM

CONFORM

"R-23a" LINE

SB US 101

SB OFF-RAMP

"R-23a-2" LINE

MATCHLINE "R-23a" 503+20

ATTACHMENT C: LAYOUT

SCALE: 1" = 50'

REVISED BY	DATE REVISED
SARAH HUFFMAN	JORGE AGUILAR/ANDY LEE
CALCULATED-DESIGNED BY	CHECKED BY
CONSULTANT FUNCTIONAL SUPERVISOR	JORGE AGUILAR
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION	Caltrans

LAST REVISION 06/15/20

DATE PLOTTED => 06/19/20
TIME PLOTTED => 1:26 PM

BORDER LAST REVISED 7/2/2010

USERNAME => SARAHH
DGN FILE => 0019-0098 LAYT.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0515000038

NOTES:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SLO	US101	21.1	2	2

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

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WALLACE GROUP
612 CLARION CT
SAN LUIS OBISPO, CA 93401

COUNTY OF SAN LUIS OBISPO
COUNTY GOVT CENTER, ROOM 206
SAN LUIS OBISPO, CA 93408

"R-23a" 503+20 MATCHLINE

SB OFF-RAMP

SB US 101 "NL (B)" LINE

NB US 101 "NR (B)" LINE

MONTE RD

"R-23a-2" LINE

"AV1-2" LINE

"AV1-6" LINE

"R-20a" LINE

NB OFF-RAMP

"L-22a-R-151" LINE

"SBR-3" LINE

SB ON-RAMP

SHELL BEACH RD

AVILA BEACH DR

Exist COUNTY R/W

Exist STATE R/W

PROP STATE R/W

PROP COUNTY R/W

SB US 101

"R-23a-2" LINE

SB OFF-RAMP

MATCHLINE "R-23a" 503+20

ATTACHMENT C: RIGHT-OF-WAY

SCALE: 1" = 50'

REVISED BY	DATE REVISED
SARAH HUFFMAN	JORGE AGUILAR/ANDY LEE

CALCULATED-DESIGNED BY

CHECKED BY

SUPERVISOR

CONSULTANT FUNCTIONAL SUPERVISOR: JORGE AGUILAR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION | DATE PLOTTED => 06/19/20
02/12/20 | TIME PLOTTED => 1:27 PM

BORDER LAST REVISED 7/2/2010

USERNAME => SARAHH
DGN FILE => 0019-0098 RWAY.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0515000038

Attachment D
Typical Cross Sections

NOTE:

1. DIMENSIONS OF THE PAVEMENT STRUCTURES (STRUCTURAL SECTIONS) ARE SUBJECT TO TOLERANCES SPECIFIED IN THE STANDARD SPECIFICATIONS.

STRUCTURAL SECTIONS

1
- Exist
- 0.25′ AC (TYPE A)
- 0.50′ CL 2 AB
- 0.83′ CL 2 AS

2
- ROADWAY
- 0.20′ RHMA (GAP GRADED)
- 0.20′ HMA (TYPE A)
- 1.25′ CL 2 AB

3
- STAMPED CONCRETE
- 0.33′ Conc
- 0.33′ CL 2 AB

4
- 0.50′ ROCK BLANKET
- 0.20′ CL 2 AB

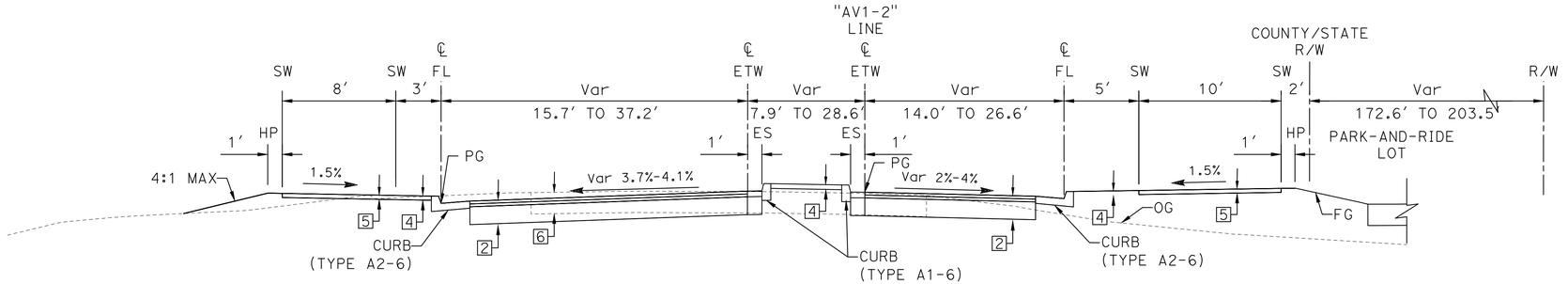
5
- SIDEWALK
- 0.33′ Conc
- 0.33′ CL 2 AB

6
- Exist
- 0.25′ AC (TYPE A)
- 0.50′ CL 2 AB
- 0.85′ CL 2 AS

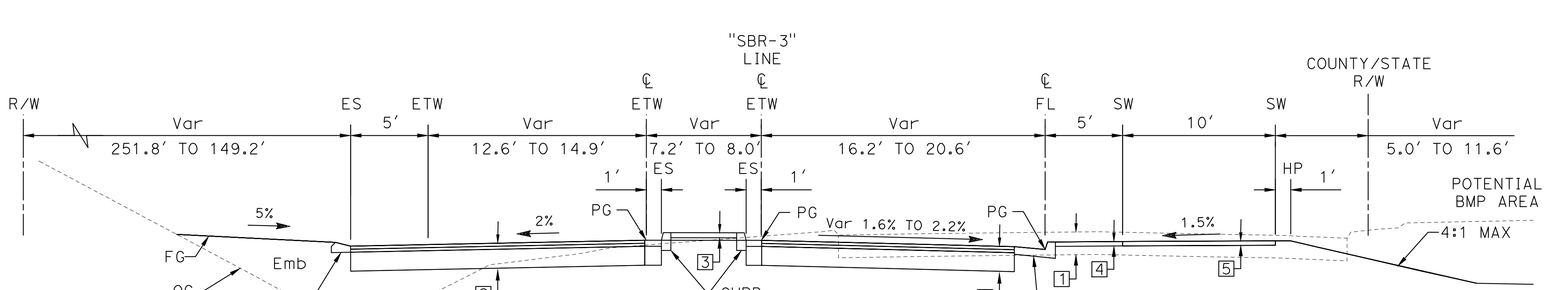
7
- TRUCK APRON
- 1.15′ JPCP
- 0.50′ LCB
- 0.50′ CL 2 AB

8
- Exist
- 0.25′ AC
- 0.50′ CL 2 AB
- 0.67′ AS

9
- ROADWAY
- 0.20′ RHMA
- 0.30′ HMA (TYPE A)
- 1.65′ CL 2 AB



SECTION B-B
AVILA BEACH DRIVE



SECTION A-A
SHELL BEACH ROAD

ATTACHMENT D: TYPICAL CROSS SECTIONS

NO SCALE

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SLO	US101	21.1	1	3

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER — SARAH M. HUFFMAN — No. 85233 — FOR PLAN REVIEW ONLY NOT FOR CONSTRUCTION — CIVIL — STATE OF CALIFORNIA

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612 CLARION CT
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COUNTY OF SAN LUIS OBISPO
COUNTY GOVT CENTER, ROOM 206
SAN LUIS OBISPO, CA 93408

REVISED BY	DATE REVISED
SARAH HUFFMAN	JORGE AGUILAR/ANDY LEE

CALCULATED-DESIGNED BY

CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR: JORGE AGUILAR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISION 06/19/20
DATE PLOTTED => 06/19/20
TIME PLOTTED => 1:28 PM

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SLO	US101	21.1	2	3

REGISTERED CIVIL ENGINEER DATE

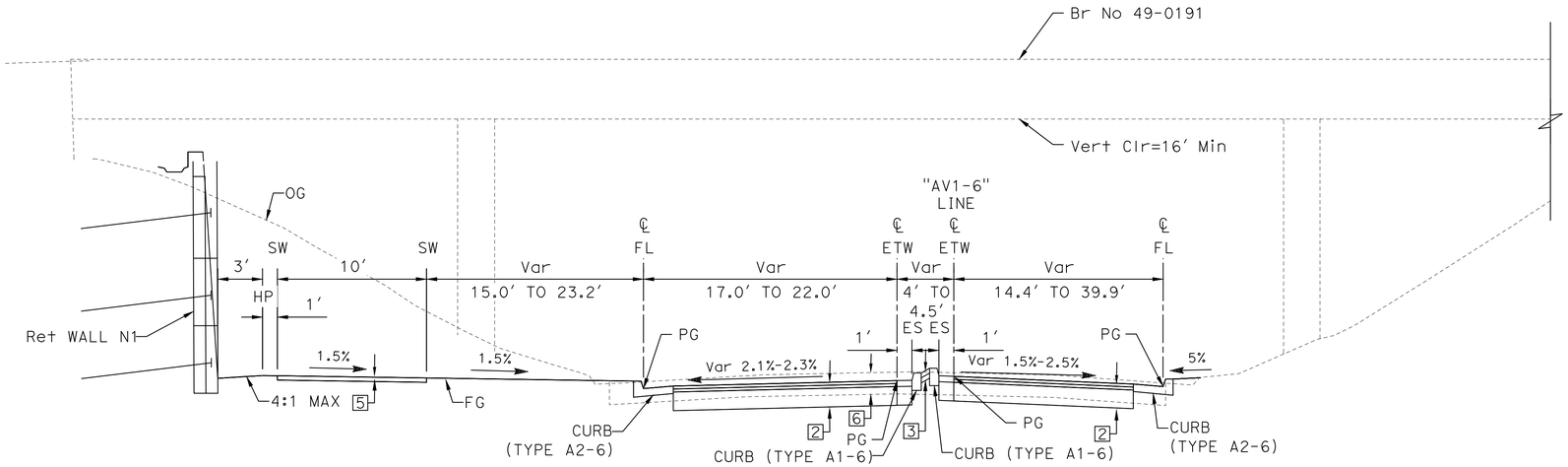
PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER
SARAH M. HUFFMAN
No. 85233
FOR PLAN REVIEW ONLY
NOT FOR CONSTRUCTION
CIVIL
STATE OF CALIFORNIA

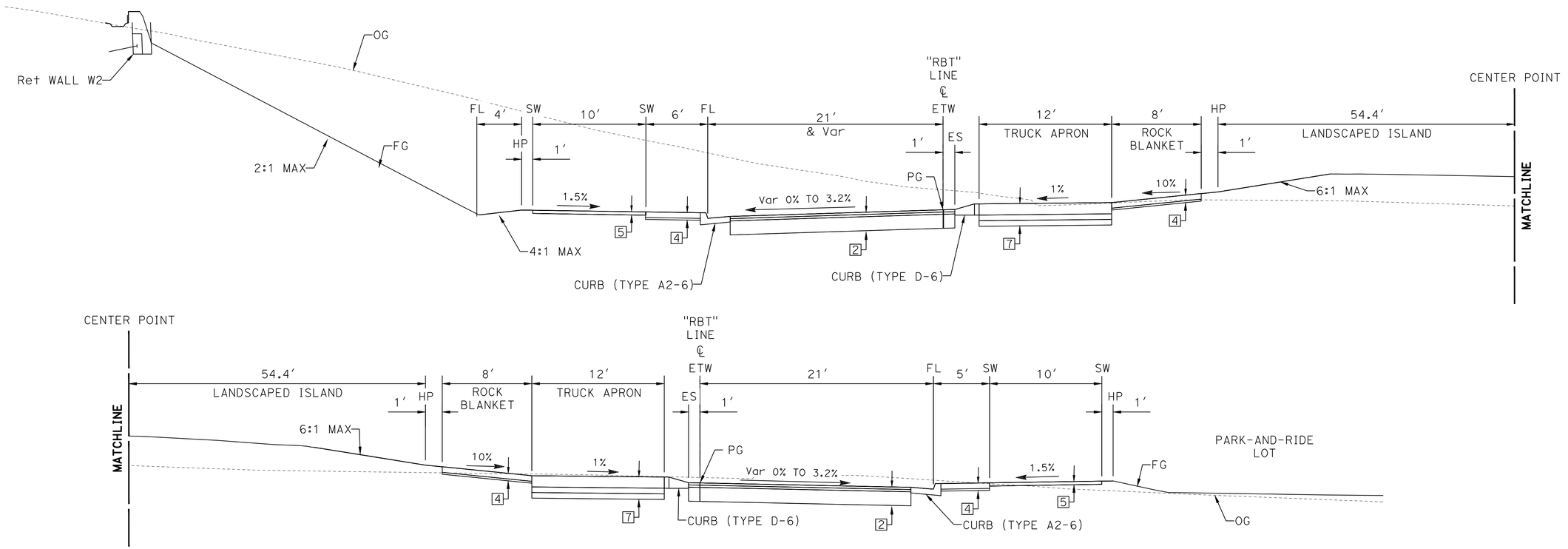
THE STATE OF CALIFORNIA OR ITS OFFICERS OR AGENTS SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF SCANNED COPIES OF THIS PLAN SHEET.

WALLACE GROUP
612 CLARION CT
SAN LUIS OBISPO, CA 93401

COUNTY OF SAN LUIS OBISPO
COUNTY GOVT CENTER, ROOM 206
SAN LUIS OBISPO, CA 93408



SECTION D-D
AVILA BEACH DRIVE



SECTION C-C
ROUNDABOUT

ATTACHMENT D: TYPICAL CROSS SECTIONS

NO SCALE

CALCULATED-DESIGNED BY
CHECKED BY
CONSULTANT FUNCTIONAL SUPERVISOR
JORGE AGUILAR
STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION
Caltrans

REVISED BY	DATE REVISED
SARAH HUFFMAN	JORGE AGUILAR/ANDY LEE

LAST REVISION DATE PLOTTED => 06/19/20
06/19/20 TIME PLOTTED => 1:29 PM

BORDER LAST REVISED 7/2/2010

USERNAME => SARAHH
DGN FILE => 0019-0098 XSEC.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0515000038

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SLO	US101	21.1	3	3

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER SARAH M. HUFFMAN No. 85233 FOR PLAN REVIEW ONLY NOT FOR CONSTRUCTION CIVIL STATE OF CALIFORNIA

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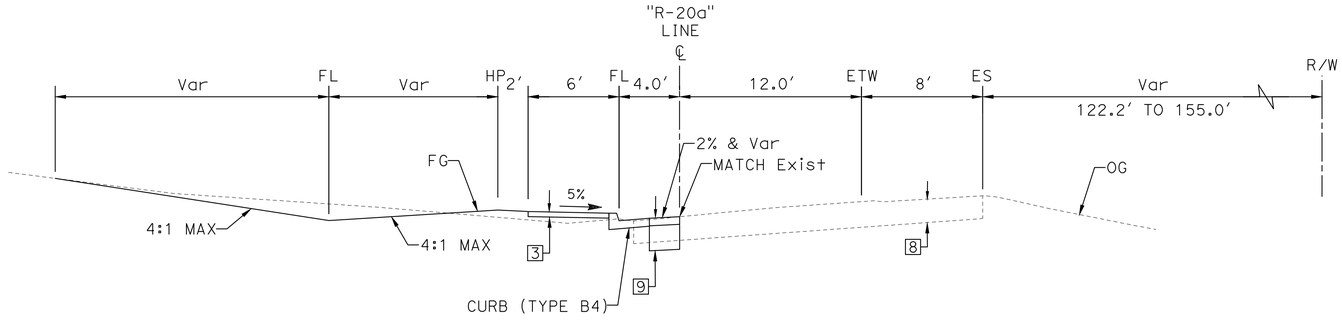
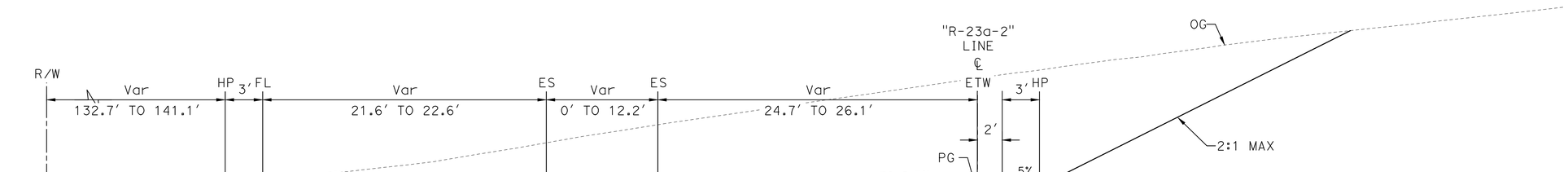
WALLACE GROUP
612 CLARION CT
SAN LUIS OBISPO, CA 93401

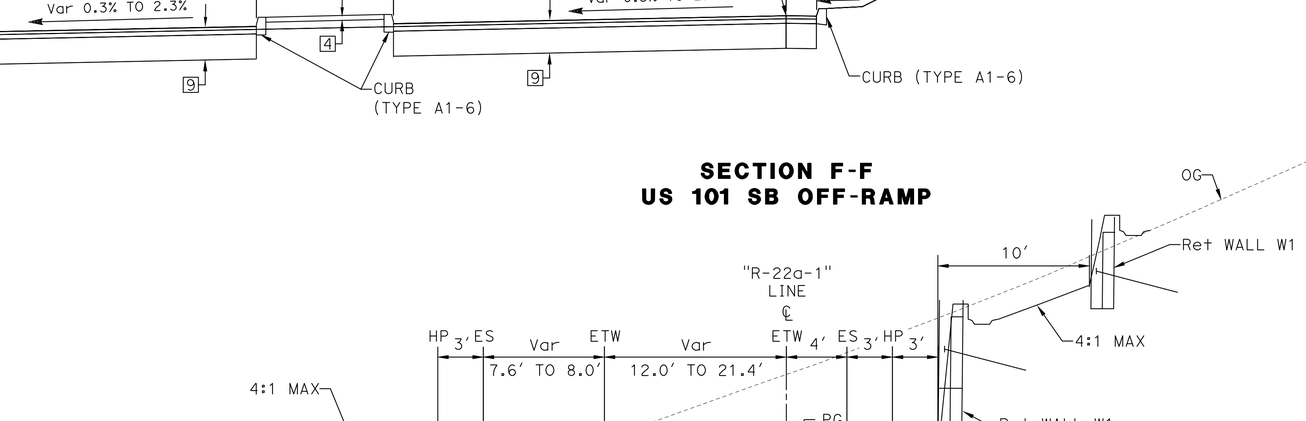
COUNTY OF SAN LUIS OBISPO
COUNTY GOVT CENTER, ROOM 206
SAN LUIS OBISPO, CA 93408



SECTION G-G
US 101 NB OFF-RAMP



SECTION F-F
US 101 SB OFF-RAMP



SECTION E-E
US 101 SB ON-RAMP

ATTACHMENT D: TYPICAL CROSS SECTIONS

NO SCALE

REVISED BY	DATE REVISED
SARAH HUFFMAN	JORGE AGUILAR/ANDY LEE

CALCULATED-DESIGNED BY
CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR: JORGE AGUILAR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

LAST REVISION 06/19/20
DATE PLOTTED => 06/19/20
TIME PLOTTED => 1:29 PM

BORDER LAST REVISED 7/2/2010

USERNAME => SARAHH
DGN FILE => 0019-0098 XSEC.DWG

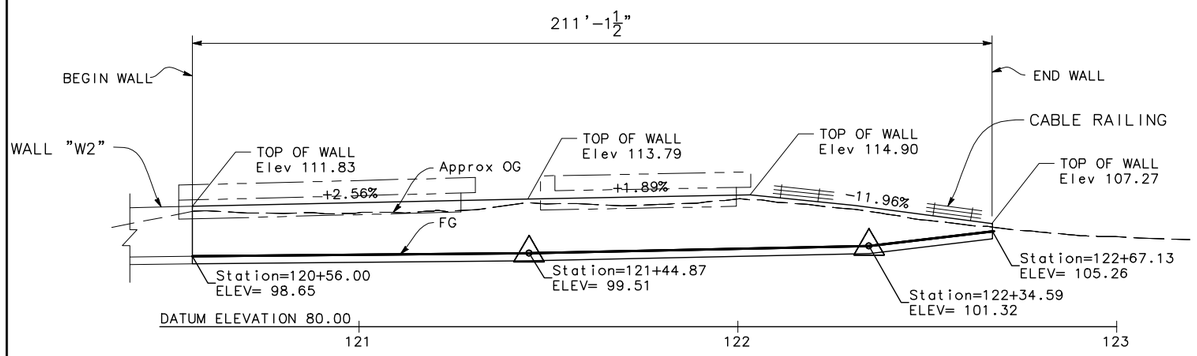
RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

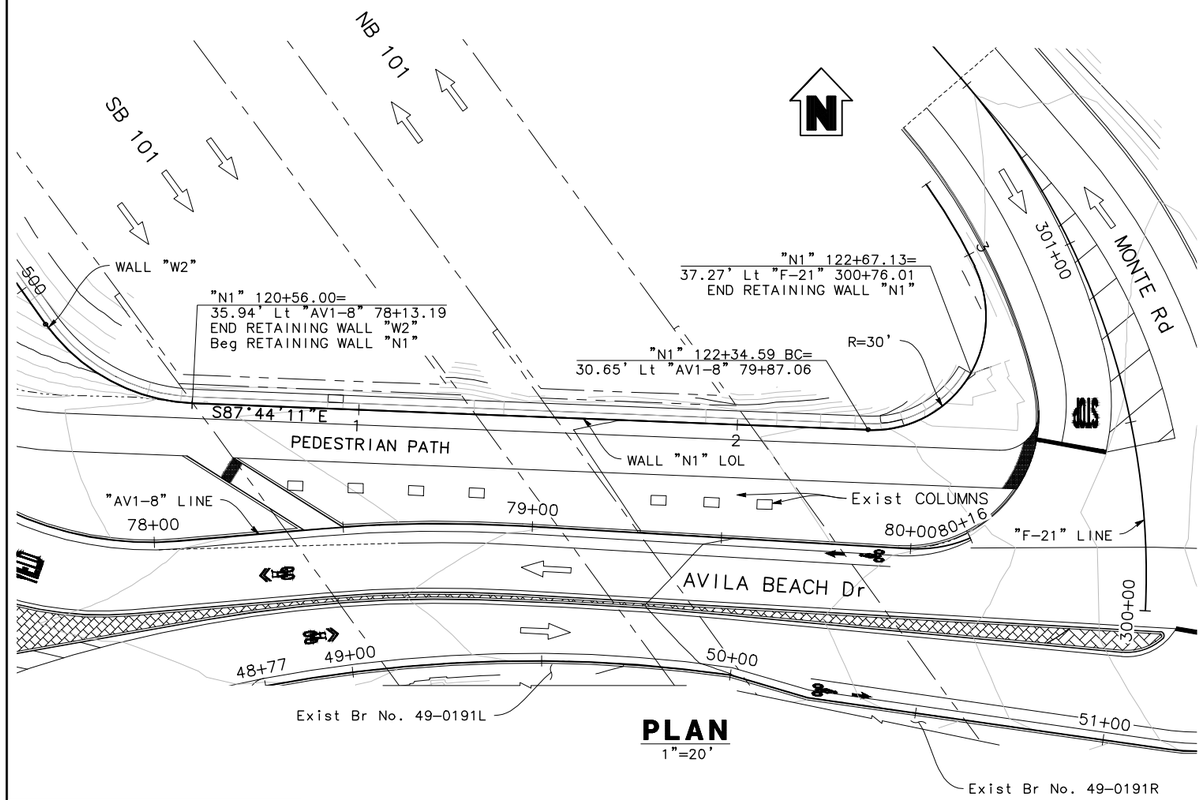
PROJECT NUMBER & PHASE 0515000038

Attachment E
Advance Planning Study, Retaining Walls

PREPARED FOR THE STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



DEVELOPED ELEVATION
1"=20'



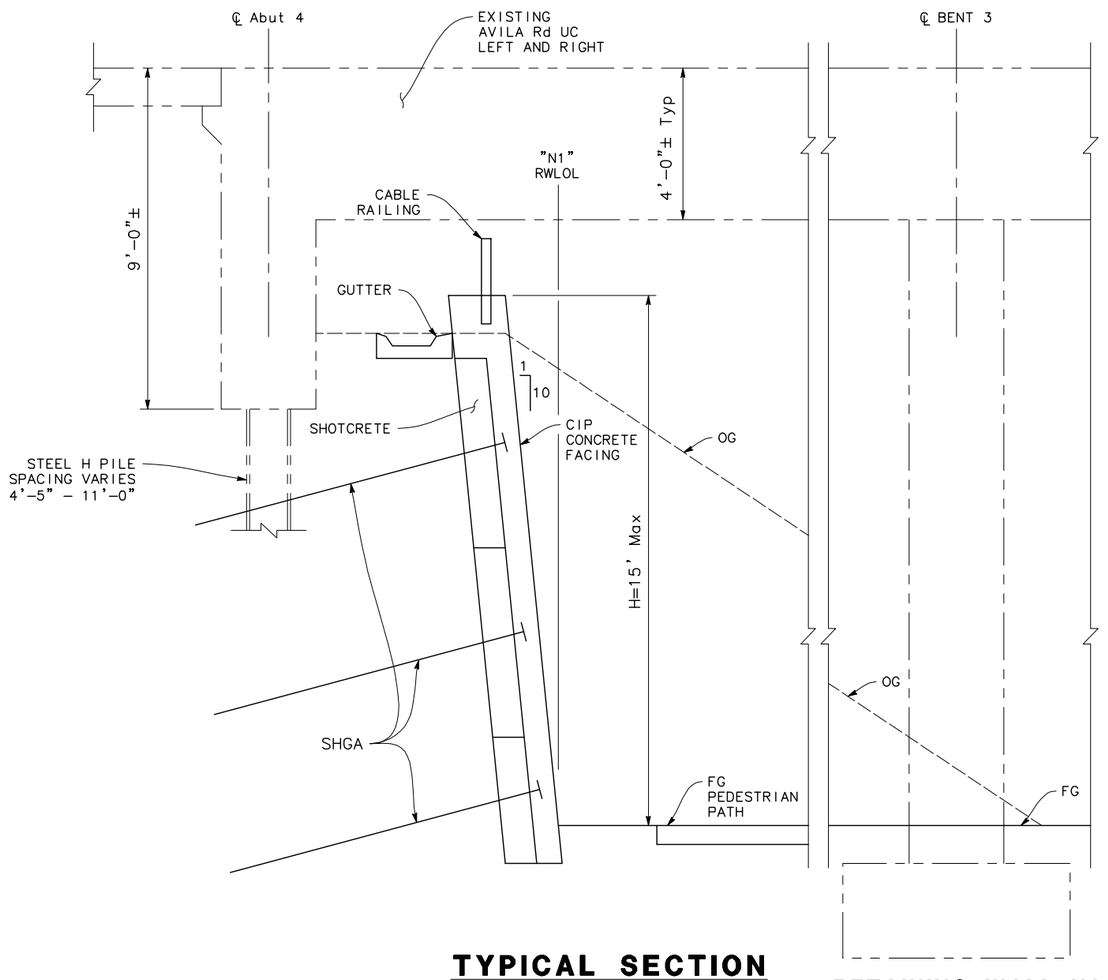
PLAN
1"=20'

DATE OF ESTIMATE	01-09-2019
BRIDGE REMOVAL	= -
STRUCTURE DEPTH	= -
LENGTH	= 211.1
Avg HEIGHT	= 13.4
AREA	= 2830
COST/ft² INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	= 280
TOTAL COST	= $792,400

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
05	SLO	101	

SAN LUIS OBISPO COUNTY DEPT. OF PW
976 OSOS STREET, ROOM 206
SAN LUIS OBISPO, CA 93408

MARK THOMAS
701 UNIVERSITY AVENUE, SUITE 200
SACRAMENTO, CA 95825



TYPICAL SECTION
NOT TO SCALE

RETAINING WALL N1

DESIGNED BY	E. FREDRICKSON	DATE	12/04/19
DRAWN BY	A. MILLAR	DATE	12/04/19
CHECKED BY	J. PASSALACQUA	DATE	12/04/19
APPROVED		DATE	

REGISTERED PROFESSIONAL ENGINEER
ERIC D. FREDRICKSON
No. C47290
Exp. 12/31/19
CIVIL
STATE OF CALIFORNIA

PLANNING STUDY

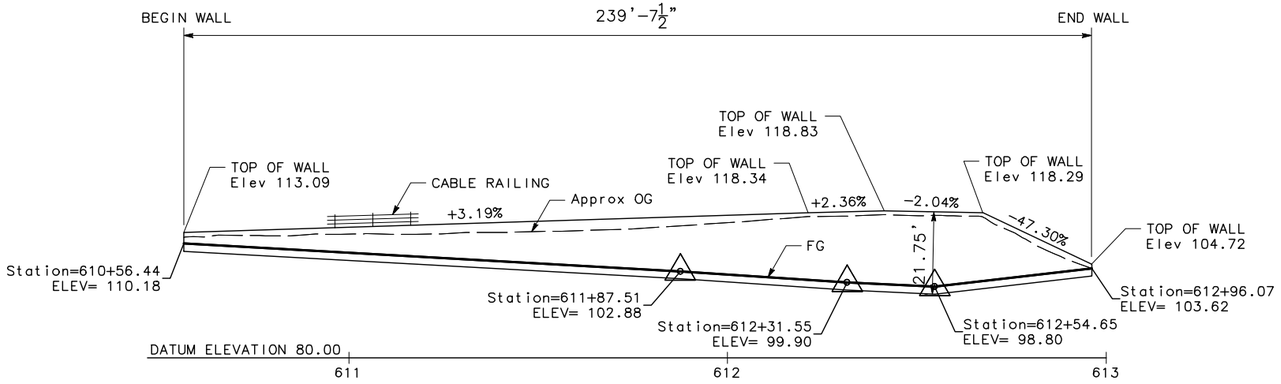
AVILA BEACH DR UNDERCROSSING

BRIDGE NO. 49ExxN1	UNIT:
SCALE:	PROJECT INUMBER & PHASE: 05-1G4800

SAYGUNN LOW
DESIGN OVERSIGHT
X
SIGN OFF DATE

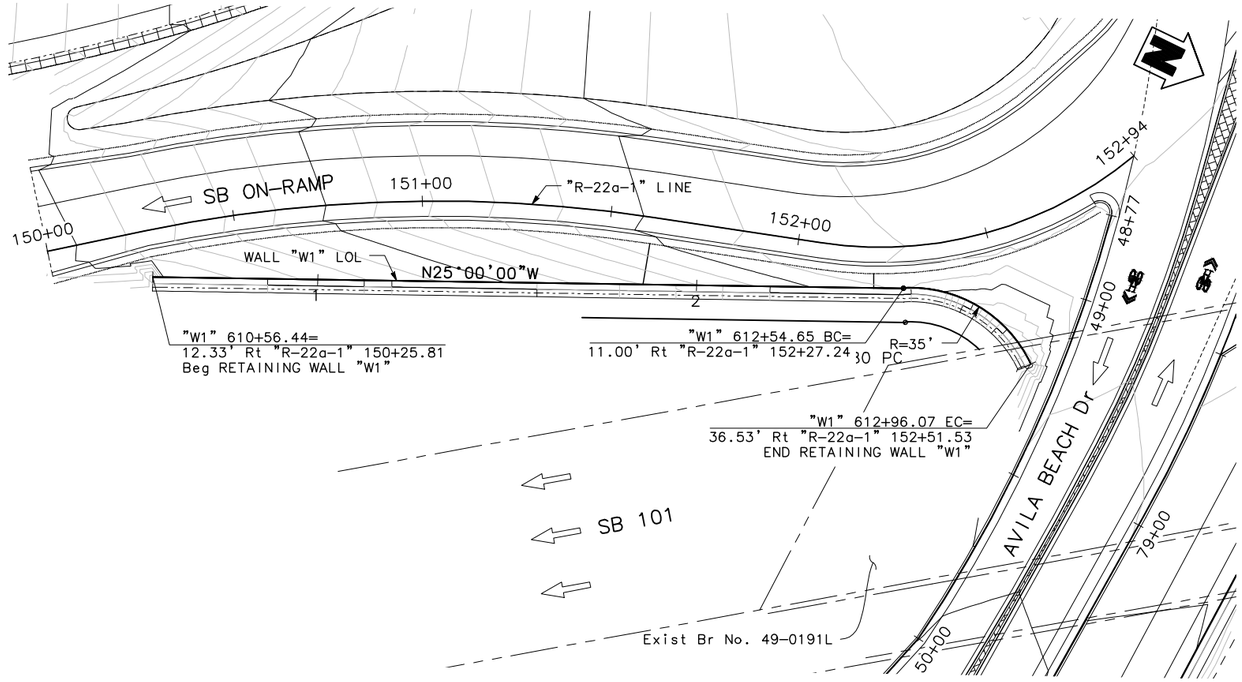
TIME PLOTTED => $TIME
DATE PLOTTED => $DATE
USERNAME => $USER

PREPARED FOR THE STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



DEVELOPED MIRROR ELEVATION

1"=20'



PLAN

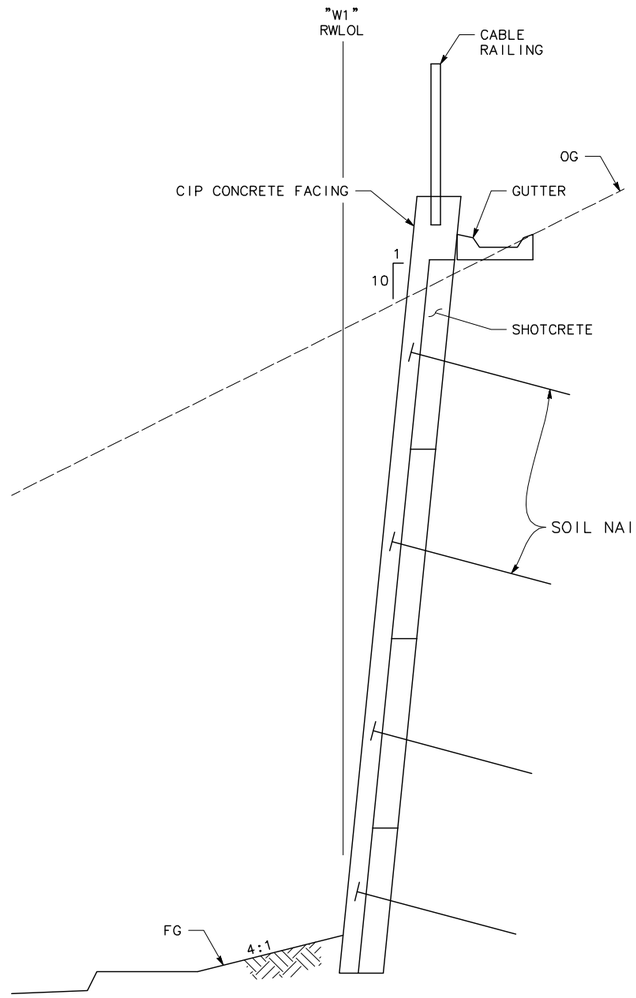
1"=20'

DATE OF ESTIMATE	01-09-2019
BRIDGE REMOVAL	= -
STRUCTURE DEPTH	= -
LENGTH	= 239.6
Avg HEIGHT	= 12.7
AREA	= 3043
COST/ft² INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	= 115
TOTAL COST	= $349,900

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
05	SLO	101	

SAN LUIS OBISPO COUNTY DEPT. OF PW
976 OSOS STREET, ROOM 206
SAN LUIS OBISPO, CA 93408

MARK THOMAS
701 UNIVERSITY AVENUE, SUITE 200
SACRAMENTO, CA 95825



TYPICAL SECTION

NOT TO SCALE

RETAINING WALL W1 - ALT 1

DESIGNED BY	E. FREDRICKSON	DATE	12/04/19
DRAWN BY	A. MILLAR	DATE	12/04/19
CHECKED BY	J. PASSALACQUA	DATE	12/04/19
APPROVED		DATE	

REGISTERED PROFESSIONAL ENGINEER
ERIC D. FREDRICKSON
No. C47290
Exp. 12/31/19
CIVIL
STATE OF CALIFORNIA

PLANNING STUDY

AVILA BEACH DR SB ON-RAMP

BRIDGE NO. 49ExW11	UNIT:
SCALE:	PROJECT INUMBER & PHASE: 05-1G4800

SAYGUNN LOW
DESIGN OVERSIGHT

X
SIGN OFF DATE

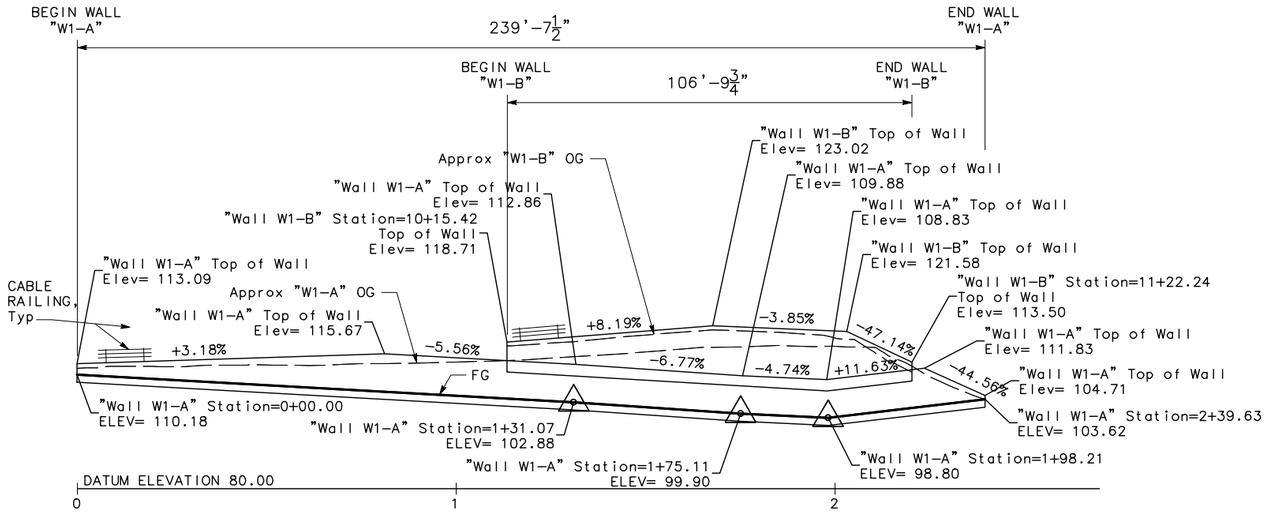
ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 7/16/10)

FILE => $REQUEST

CONTRACT NO.: X PROJECT ID: X

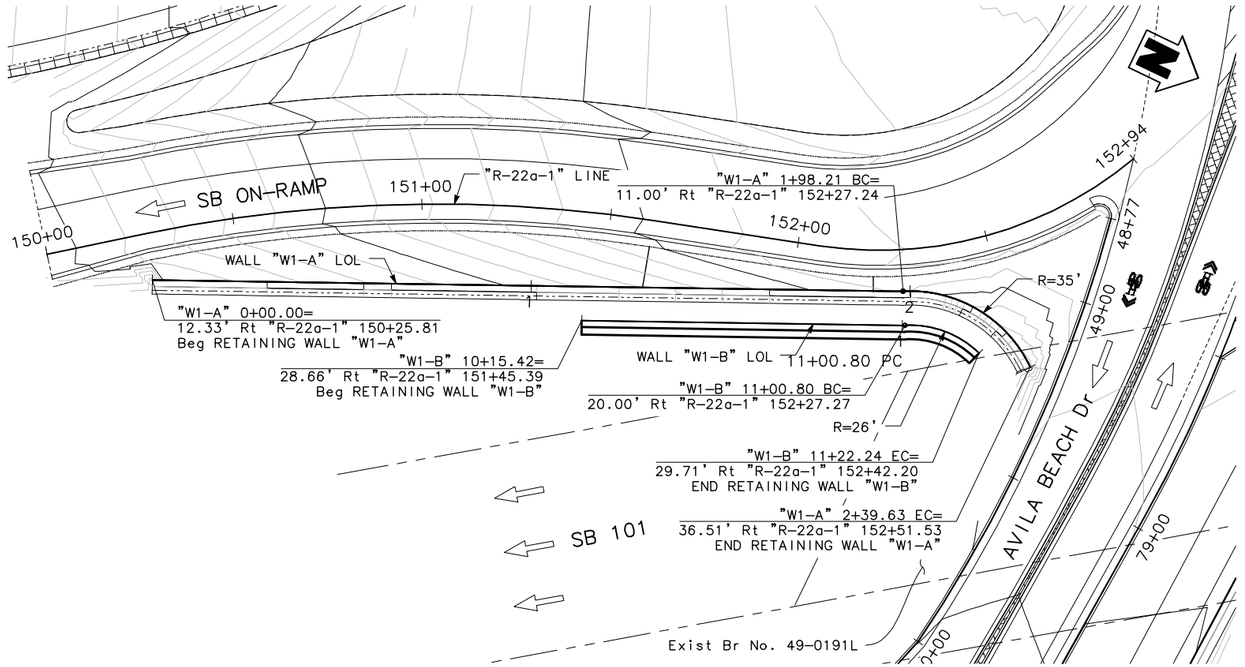
USERNAME => $USER DATE PLOTTED => $DATE TIME PLOTTED => $TIME

PREPARED FOR THE STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION



DEVELOPED MIRROR ELEVATION

1"=20'



PLAN

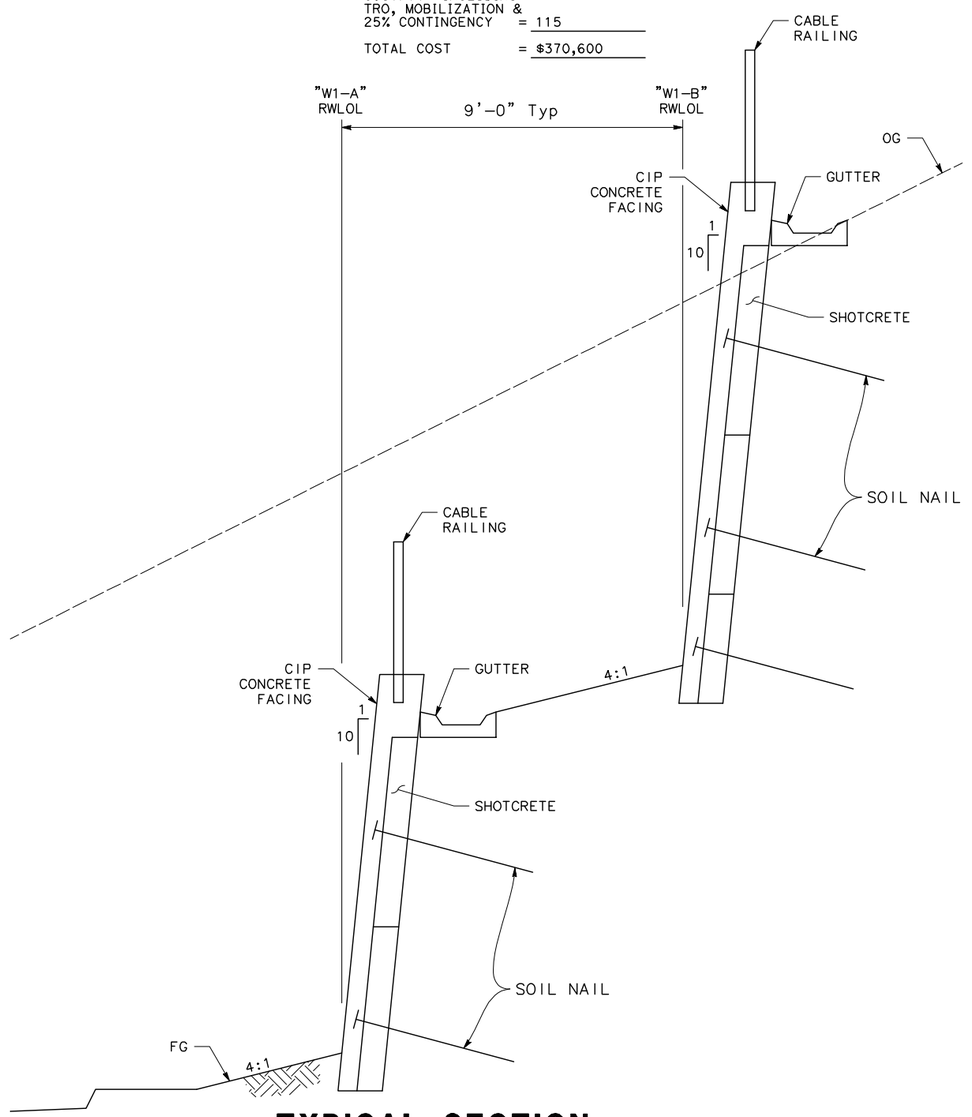
1"=20'

DATE OF ESTIMATE	01-10-2019
BRIDGE REMOVAL	= -
STRUCTURE DEPTH	= -
LENGTH	= 346.5
Avg HEIGHT	= 9.3
AREA	= 3223
COST/ft² INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY	= 115
TOTAL COST	= $370,600

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
05	SLO	101	

SAN LUIS OBISPO COUNTY DEPT. OF PW
976 OSOS STREET, ROOM 206
SAN LUIS OBISPO, CA 93408

MARK THOMAS
701 UNIVERSITY AVENUE, SUITE 200
SACRAMENTO, CA 95825



TYPICAL SECTION

NOT TO SCALE

RETAINING WALL W1 - ALT 2

PLANNING STUDY

AVILA BEACH DR SB ON-RAMP

BRIDGE NO. 49ExW12	UNIT:
SCALE:	PROJECT INUMBER & PHASE: 05-1G4800

DESIGNED BY	E. FREDRICKSON	DATE	12/04/19
DRAWN BY	A. MILLAR	DATE	12/04/19
CHECKED BY	J. PASSALACQUA	DATE	12/04/19
APPROVED		DATE	

REGISTERED PROFESSIONAL ENGINEER — ERIC D. FREDRICKSON — No. C47290 — Exp. 12/31/19 — CIVIL — STATE OF CALIFORNIA

SAYGUNN LOW
DESIGN OVERSIGHT
X
SIGN OFF DATE

ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 7/16/10)

FILE => $REQUEST

CONTRACT NO.: X

PROJECT ID: X

USERNAME => $USER

DATE PLOTTED => $DATE

TIME PLOTTED => $TIME

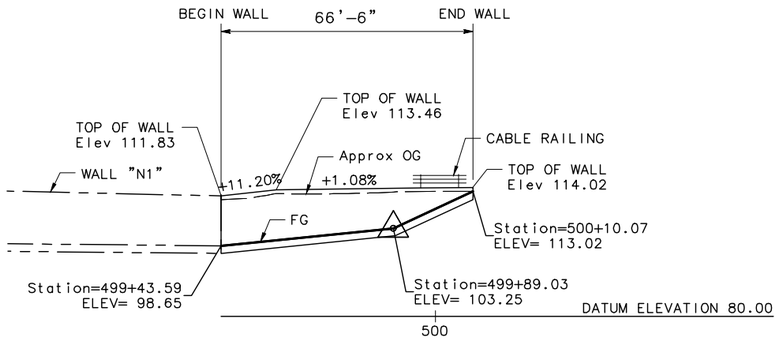
PREPARED FOR THE STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

DIST	COUNTY	ROUTE	POST MILES TOTAL PROJECT
05	SLO	101	

SAN LUIS OBISPO COUNTY DEPT. OF PW
976 OSOS STREET, ROOM 206
SAN LUIS OBISPO, CA 93408

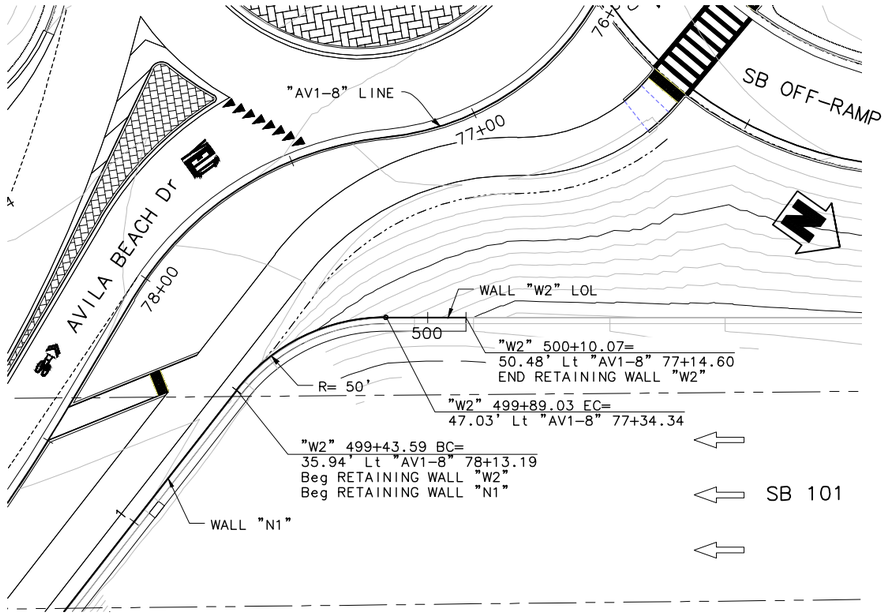
MARK THOMAS
701 UNIVERSITY AVENUE, SUITE 200
SACRAMENTO, CA 95825

DATE OF ESTIMATE 01-09-2019
BRIDGE REMOVAL = -
STRUCTURE DEPTH = -
LENGTH = 66.5
Avg HEIGHT = 10.6
AREA = 705
COST/ft² INCLUDING TRO, MOBILIZATION & 25% CONTINGENCY = 115
TOTAL COST = $81,100



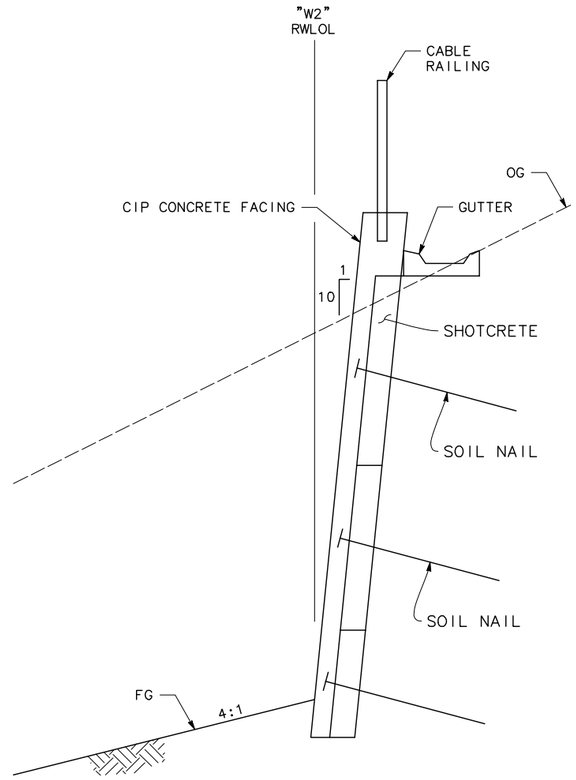
DEVELOPED MIRROR ELEVATION

1"=20'



PLAN

1"=20'



TYPICAL SECTION

NOT TO SCALE

SAYGUNN LOW
DESIGN OVERSIGHT
X
SIGN OFF DATE

ADVANCE PLANNING STUDY SHEET (ENGLISH) (REV. 7/16/10)

RETAINING WALL W2

DESIGNED BY	E. FREDRICKSON	DATE	12/04/19
DRAWN BY	A. MILLAR	DATE	12/04/19
CHECKED BY	J. PASSALACQUA	DATE	12/04/19
APPROVED		DATE	

REGISTERED PROFESSIONAL ENGINEER
ERIC D. FREDRICKSON
No. C47290
Exp. 12/31/19
CIVIL
STATE OF CALIFORNIA

PLANNING STUDY

AVILA BEACH DR SB OFF-RAMP

BRIDGE NO. 49ExxW2	UNIT:
SCALE:	PROJECT INUMBER & PHASE: 05-1G4800

FILE => $REQUEST

CONTRACT NO.: X PROJECT ID: X

USERNAME => $USER DATE PLOTTED => $DATE TIME PLOTTED => $TIME

Attachment F
Right of Way Data Sheet and Utility Plan

COUNTY OF SAN LUIS OBISPO - DEPARTMENT OF PUBLIC WORKS

RIGHT OF WAY DATA SHEET

To: Joshua Roberts
Transportation Division Manager

Date: 12/5/19

Attention: Genaro Diaz, Project Manager

Subject: Right of Way Estimate

Project WBS Number and Description: WBS 300506.01 Hwy 101 at Avila Beach Dr – Roundabout Alt.

Estimate Maps prepared by: Sara Huffman, Wallace Group, Feb 19, 2019

1. Right of Way Cost Estimate:	Current Value	Escalation Rate	Escalated Value
Acquisition, incl. Ex. Lands, Damages, Escrow, Goodwill			
Project Permit Fees (Est. by Project Manager)	$ 12,000		$ 12,000
Utility Relocation (Est. by Util. Coord.)	$317,000	4% 4 ys	$370,845
Relocation Assistance			
RW Clearance/Demolition			
Title and Escrow	$ 3,000	4% 4 ys	$ 3,510
SB 1210 Costs			
Total Estimated Cost (escalated, CON 2025)	$332,000		$386,355
Other Misc. Project Costs (*Staff):			$ 12,000

Construction Contract Work (RW Cost to Cure) N/A

Estimated RW Begin Date (Proj Apprvl, Maps, Env Clear, Funding): Summer 2020

Estimated RW & Utility Relocation Lead Time (months): 12 months

2. Proposed Right of Way Certification Date: Summer 2021

3. Parcel Data:

Type	Number	Dual/Appr.
X		
A		
B		
C		
D		
E		
Total	0	0

Utilities	
U4-1	3
-2	__
-3	__
-4	1
U5-7	2
-8	0
-9	4

RR Involvement	
None	X
C&M Agrmt	0
Svc Contract	0
Design	0
Const.	0
Lic/RE/Clauses	0

Misc. R/W Work	
RAP Displ	0

Area: In R/W: 0.00 Acres

No. excess Parcels N/A

Description of required right of way (zoning, use, remnants, major improvements, sensitive parcels, etc.): No right of way parcels are anticipated for acquisition. A portion of existing County right of way, which was relinquished to the County by the State on May 8, 1967, is to return to State jurisdiction by statute (see Streets and Highways Code 83). This action is to be accomplished outside of the ROW function.

Major items of construction contract work: None
Utility replacement easements required: None estimated. Relocation within County or State ROW assumed. It is noted by the Utility Coordinator that there is an existing JUA within the project limits and at this time it is unknow if any revision to said JUA will be required. See attachment "A".
Environmental concerns impacting replacement easements: At this time, it is assumed that no replacement easements will be required.
Railroad facilities or rights of way affected: None
Hazardous waste and/or material anticipated: None

RAP displacements required: None
No. of single family _____ No. of business/nonprofit _____
No. of multi-family _____ No. of farms _____
Draft/Final Relocation Impact Statement/Study dated _____. It is anticipated that sufficient replacement housing (will/will not) be available without Last Resort Housing.

Material Borrow and/or Disposal Sites to be acquired by RW: None
Potential relinquishments and/or abandonments associated with project: Portion of RW to return to State as noted.
Right of Way schedule and lead time concerns or assumptions: N/A

Right of Way work to be done by staff or consultant: *Staff RW Certification to be completed per CT standards. Utility Relocation portion of RW Cert completed by Utility Coordinator.

RW Evaluation Prepared By: _____ 12/5/2019
Phil Acosta, Right of Way Agent — Date

Utility Evaluation Prepared By: _____ 12/10/19
Joe Morris, Utility Coordinator — Date

Recommended for Approval:

County Project Manager: _____ 12/6/19
Genaro Diaz, Project Manager — Date

Reviewed and Approved based on information provided to date:

By: _____ 2/19/2020
PAULA PADEN
Senior Right of Way Agent
Right of Way Central Region

Attachment "A"

Estimate for Avila Beach Dr. at U.S. 101 Round-about 12-3-2019

Utility Owner	**Type**	**L.F. or item**	**$/L.F. or item**	**Estimated Cost**	**Utility Share**	**County Rds. Share**	**Remarks**
Gas Company	Gas	450'- 8"H SL	$255	$115,000	50% =$57,000	50% = **$57,000**	Slo r/w
Phillips 66	Oil	400'- 8"	$650	$260,0000		100% = **$260,000**	JUA
AT&T	Phone	900' buried 1 vault	$53 $2,000	$48,000 $ 2,000	100% = $50,000		Slo & ct r/w Adjust lid
SLO County Utilities Division	Water	900'- 8"pipe 2 – wv's Meter vault	$222 $500 $5,000	$200,000 $ 1,000 $ 5,000	100% = $206,000		Slo r/w Adjust box Adjust lid
City P.B.							No facilities
PG&E							No impacts
Charter							No impacts

Dist	COUNTY	ROUTE	POST MILES TOTAL PROJECT	SHEET No.	TOTAL SHEETS
05	SLO	US101	21.1	1	1

REGISTERED CIVIL ENGINEER DATE

PLANS APPROVAL DATE

REGISTERED PROFESSIONAL ENGINEER SARAH M. HUFFMAN No. 85233 FOR PLAN REVIEW ONLY NOT FOR CONSTRUCTION CIVIL STATE OF CALIFORNIA

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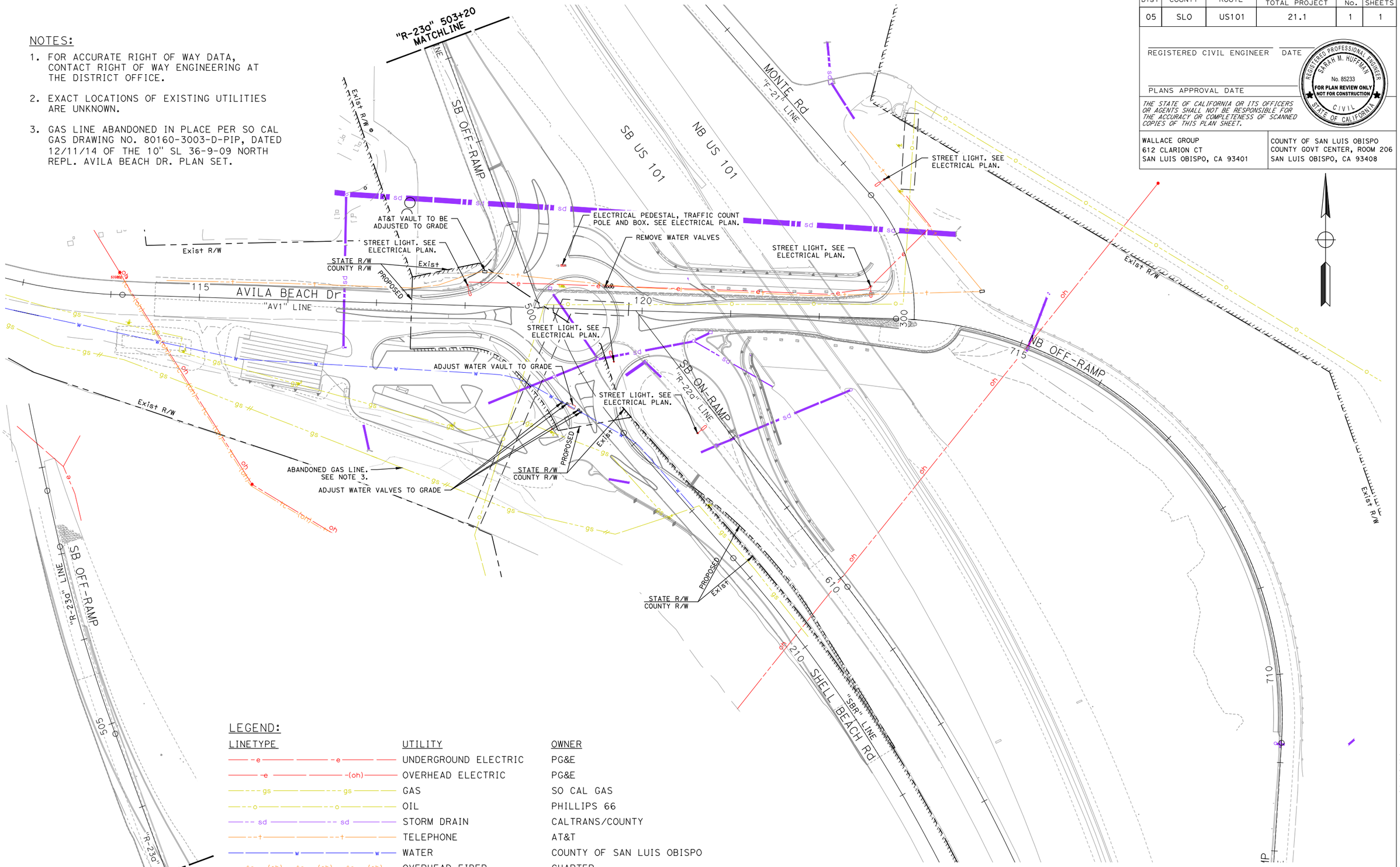
WALLACE GROUP
612 CLARION CT
SAN LUIS OBISPO, CA 93401

COUNTY OF SAN LUIS OBISPO
COUNTY GOVT CENTER, ROOM 206
SAN LUIS OBISPO, CA 93408

NOTES:

1. FOR ACCURATE RIGHT OF WAY DATA, CONTACT RIGHT OF WAY ENGINEERING AT THE DISTRICT OFFICE.
2. EXACT LOCATIONS OF EXISTING UTILITIES ARE UNKNOWN.
3. GAS LINE ABANDONED IN PLACE PER SO CAL GAS DRAWING NO. 80160-3003-D-PIP, DATED 12/11/14 OF THE 10" SL 36-9-09 NORTH REPL. AVILA BEACH DR. PLAN SET.



LEGEND:

LINETYPE	UTILITY	OWNER
-e-e-	UNDERGROUND ELECTRIC	PG&E
-e-(oh)-	OVERHEAD ELECTRIC	PG&E
gs gs	GAS	SO CAL GAS
o o	OIL	PHILLIPS 66
sd sd	STORM DRAIN	CALTRANS/COUNTY
t t	TELEPHONE	AT&T
w w	WATER	COUNTY OF SAN LUIS OBISPO
-tc-(oh)-tc-(oh)-tc-(oh)-	OVERHEAD FIBER	CHARTER

APPROVED FOR UTILITY INFORMATION ONLY

ATTACHMENT F: UTILITY PLAN

SCALE: 1" = 50'

REVISED BY	DATE REVISED
SARAH HUFFMAN	JORGE AGUILAR/ANDY LEE

CALCULATED-DESIGNED BY

CHECKED BY

CONSULTANT FUNCTIONAL SUPERVISOR: JORGE AGUILAR

STATE OF CALIFORNIA - DEPARTMENT OF TRANSPORTATION

Caltrans

LAST REVISION DATE PLOTTED => 06/19/20
TIME PLOTTED => 2109 PM
12/11/19

BORDER LAST REVISED 7/2/2010

USERNAME => SARAHH
DGN FILE => 0019-0098 UTIL.DWG

RELATIVE BORDER SCALE IS IN INCHES 0 1 2 3

UNIT 0000

PROJECT NUMBER & PHASE 0515000038

Attachment G
Highway Planting Exhibits

LOW HEIGHT (1’TO 2’)


Foothill sedge (*Carex tumuicola)*


Dwarf coyote brush *(Baccharis pilularis ‘Pigeon Point’)*


Creeping sage *(Salvia sonomensis)*

MEDIUM HEIGHT (>2’TO 4’)


Bush monkeyflower *(Diplacus aurantiacus)*

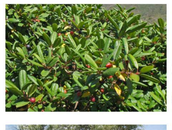

Seacliff Buckwheat *(Eriogonum parvifolium)*


Coyote Brush *(Baccharis pilularis ‘Twin Peaks No. 2’)*

HIGH HEIGHT (>4’)


Blue elderberry *(Sambucus nigra ssp. caerulea)*


Toyon *(Heteromeles arbutifolia)*


California coffeeberry *(Frangula californica ssp. californica)*


Coast live oak *(Quercus agrifolia)*


Coyote brush *(Baccharis pilularis)*

HYDROSEED


California brome *(Bromus carinatus)*


California poppy *(Eschscholzia californica)*


Goldfields *(Lasthenia californica)*


Sky lupine (*Lupinus nanus*)

Small fescue *(Festuca microstachys)* OTHERS
Tomcat clover *(Trifolium willdenovii)*

WATER TREATMENT


Common yarrow *(Achillea millefolium)*


Field sedge *(Carex praegracilis)*


Deergrass *(Muhlenbergia rigens)*


Common rush *(Juncus patens)*

SB OFFRAMP
US HWY 101
AVILA BEACH DRIVE
YIELD
STOP
SB ONRAMP
SHELL BEACH ROAD
SURFACE TEXTURED CONCRETE (TYP)
CONCRETE (TYP)

CONCEPT PLANTING PLAN
AVILA BEACH DRIVE & US 101 INTERCHANGE
03-29-2019

SCALE: 1” = 20’

WALLACE GROUP

Attachment H
Storm Water Data Report-Signed Cover Sheet

APPENDIX E

Long Form - Storm Water Data Report

Dist-County-Route: 05-SLO-101
Post Mile Limits: R21.1
Type of Work: Roundabout- Safety Improvements
Project ID (EA): 05-1500-0038-0 (05-1G4800)
Program Identification: 400.100

Phase: ☐ PID ☒ PA/ED ☐ PS&E

Regional Water Quality Control Board(s): Central Coast, Region 3

Total DSA: 5.6 acres_____ PCTA: 1.25 acres_____ NIS: 1.25 acres_____

Alternative Compliance (acres) N/A ATA 2 (50% Rule)? Yes ☐ No ☒

Estimated Const. Start Date: 9/1/2021 Estimated Const. Completion Date: 12/1/2023

Risk Level: RL 1 ☐ RL 2 ☒ RL 3 ☐ WPCP ☐ Other: ____

Is MWELO applicable? Yes ☐ No ☒

Does Project require a Rapid Stability Assessment? Yes ☐ No ☒

Is the Project within a TMDL area where Caltrans is a named stakeholder? Yes ☐ No ☒

TMDL Compliance Units (acres)___N/A (Project is not located in an Attachment IV TMDL watershed)

Notification of ADL reuse (if yes, provide date): Yes ☐ Date: TBD at PS&E____ No ☒

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

2-18-2020

Craig Campbell PE C34405, Registered Project Engineer — Date

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

2/18/2020

Paul Valadao, Project Manager — *Date*

2/27/2020

Enrique Castillo Ramirez, Designated Maintenance Representative — *Date*

2/26/2020

Scott Dowlan, Designated Landscape Architect Representative — *Date*

(Stamp Required for PS&E only)

2/27/2020

FOR *Mazin Al Ali, Regional SW Coordinator or Designee* — *Date*

Attachment I
Project Report Cost Estimate

PROJECT

PRELIMINARY PROJECT COST ESTIMATE SUMMARY

EA: 05-1G480 PID: 515000038

EA: 05-1G480

PID: 515000038

District-County-Route: 05-SLO-101

PM: 21.1

Type of Estimate : Draft Project Report Cost Estimate

Program Code : 20-10-400-620

Project Limits : In San Luis Obispo County at Route 101 intersections at Avila Beach Drive

Project Description: Conversion of the southbound ramp termini intersections into a single-lane roundabout and construction of a park-and-ride lot

Scope : Roadway realignment, pavement widening, grinding, and overlay; retaining walls; raised medians; strorm drain, curb, gutter, and sidewalk; landscaping

Alternative : Build Alternative

SUMMARY OF PROJECT COST ESTIMATE

	Current Year Cost	Escalated Cost
TOTAL ROADWAY COST	$ 7,950,600	$ 9,057,721
TOTAL STRUCTURES COST	$ 1,244,468	$ 1,417,761
SUBTOTAL CONSTRUCTION COST	$ 9,195,068	$ 10,475,482
TOTAL RIGHT OF WAY COST	$ 332,000	$ 390,000
TOTAL CAPITAL OUTLAY COSTS	**$ 9,528,000**	**$ 10,866,000**
PA/ED SUPPORT	$ 690,000	$ 690,000
PS&E SUPPORT	$ 800,000	$ 882,000
RIGHT OF WAY SUPPORT	$ 12,000	$ 13,230
CONSTRUCTION SUPPORT	$ 700,000	$ 810,338
TOTAL SUPPORT COST	**$ 2,202,000**	**$ 2,396,000**
TOTAL PROJECT COST	**$ 11,750,000**	**$ 13,300,000**

Programmed Amount

	Month	/	Year
Date of Estimate (Month/Year)	6	/	2020
Estimated Construction Start (Month/Year)	1	/	2022
Number of Working Days =	500		
Estimated Mid-Point of Construction (Month/Year)	1	/	2023
Estimated Construction End (Month/Year)	12	/	2023
Number of Plant Establishment Days	1095		

Estimated Project Schedule

PID Approval	5/9/16
PA/ED Approval	1/27/20
PS&E	9/24/21
RTL	12/31/21
Begin Construction	1/10/22

Prepared by Project Engineer — Sarah Huffman — 6/19/2020 — (805) 544-4011

Sarah Huffman, P.E., Project Engineer | **Date** | **Phone**

Approved by Project Manager — Jorge Aguilar — 6/19/2020 — (805) 544-4011

Jorge Aguilar, P.E., Project Manager | **Date** | **Phone**

I. ROADWAY ITEMS SUMMARY

	Section		Cost
1	Earthwork	$	493,900
2	Pavement Structural Section	$	2,242,000
3	Drainage	$	893,200
4	Specialty Items	$	52,300
5	Environmental	$	444,700
6	Traffic Items	$	832,500
7	Detours	$	112,600
8	Minor Items	$	304,300
9	Roadway Mobilization	$	537,600
10	Supplemental Work	$	263,800
11	State Furnished	$	187,400
12	Time-Related Overhead	$	261,200
13	Roadway Contingency	$	1,325,100
	TOTAL ROADWAY ITEMS	**$**	**7,950,600**

Estimate Prepared By : Sarah Huffman — 6/19/2020 — (805) 544-4011

Sarah Huffman, P.E., Project Engineer — Date — Phone

Estimate Reviewed By : Jorge Aguilar — 6/19/2020 — (805) 544-4011

Jorge Aguilar, P.E., Project Manager — 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	17,600	x	26.00	=	$	457,600
190185	Shoulder Backing	TON	18	x	527.00	=	$	9,486
16010X	Clearing & Grubbing	LS	1	x	16,800.00	=	$	16,800
100100	Develop Water Supply	LS	1	x	10,000.00	=	$	10,000

TOTAL EARTHWORK SECTION ITEMS $ 493,900

SECTION 2: PAVEMENT STRUCTURAL SECTION

Item code		Unit	Quantity		Unit Price ($)			Cost
200114	Rock Blanket	SQFT	7,578	x	17.00	=	$	128,826
260203	Class 2 Aggregate Base	CY	5,003	x	134.00	=	$	670,402
280000	Lean Concrete Base	CY	60	x	190.00	=	$	11,400
390132	Hot Mix Asphalt (Type A)	TON	2,026	x	135.00	=	$	273,510
390136	Minor Hot Mix Asphalt	TON	2,026	x	150.00	=	$	303,900
390137	Rubberized Hot Mix Asphalt (Gap Graded)	TON	1,148	x	180.00	=	$	206,640
394076	Place Hot Mix Asphalt Dike (Type E)	LF	2,802	x	1.20	=	$	3,362
398200	Cold Plane Asphalt Concrete Pavement	SQYD	1,498	x	42.00	=	$	62,916
401050	Jointed Plain Concrete Pavement	CY	164	x	722.00	=	$	118,408
730010	Minor Concrete (Curb, Type A1-6)	LF	3,115	x	40.00	=	$	124,600
730010	Minor Concrete (Curb, Type D-6)	LF	315	x	80.00	=	$	25,200
730070	Detectable Warning Surface	SQFT	561	x	40.00	=	$	22,440
731504	Minor Concrete (Curb and Gutter, Type A2-6)	LF	1,436	x	70.00	=	$	100,520
731504	Minor Concrete (Curb and Gutter, Type B-4)	LF	636	x	70.00	=	$	44,520
731519	Minor Concrete (Stamped Concrete)	SQFT	5,068		11.00	=	$	55,748
731521	Minor Concrete (Sidewalk)	CY	128	x	700.00	=	$	89,600

TOTAL PAVEMENT STRUCTURAL SECTION ITEMS $ 2,242,000

SECTION 3: DRAINAGE

Item code		Unit	Quantity		Unit Price ($)			Cost
510502	Minor Concrete (Minor Structure)	CY	31	x	2,300.00	=	$	71,300
641101	12" Plastic Pipe	LF	182	x	200.00	=	$	36,400
641113	24" Plastic Pipe	LF	1,361	x	260.00	=	$	353,860
641119	30" Perforated Plastic Pipe	LF	982	x	350.00	=	$	343,700
700615	Corrugated Steel Pipe Inlet	LF	31	x	700.00	=	$	21,700
700617	Drainage Inlet Marker	EA	11	x	120.00	=	$	1,320
705015	24" Steel Flared End Section	EA	1	x	5,300.00	=	$	5,300
710136	Remove Pipe	LF	578	x	35.00	=	$	20,230
710150	Remove Inlet	EA	9	x	1,500.00	=	$	13,500
710196	Adjust Inlet	EA	1	x	2,800.00	=	$	2,800
750001	Miscellaneous Iron and Steel	LB	8,234	x	2.80	=	$	23,055

TOTAL DRAINAGE ITEMS $ 893,200

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
800340	Chain Link Fence (Type CL-5)	LF	479	x	20.00	=	$	9,580
833088	Tubular Handrailing	LF	34	x	260.00	=	$	8,840
839701	Concrete Barrier (Type 60)	LF	100	x	96.00	=	$	9,600
513553	Retaining Wall (Park and Ride)	SQFT	257	x	75.00	=	$	19,275

TOTAL SPECIALTY ITEMS $ 52,300

SECTION 5: ENVIRONMENTAL

5A - ENVIRONMENTAL MITIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost		
	Biological Mitigation	LS		x		=	$	-		
141000	Temporary Fence (Type ESA)	LF	1,000	x	5.00	=	$	5,000		
								Subtotal Environmental Mitigation	*$*	*5,000*

5B - LANDSCAPE AND IRRIGATION

Item code		Unit	Quantity		Unit Price ($)			Cost		
20XXXX	Highway Planting	LS	1	x	135,000.00	=	$	135,000		
20XXXX	Irrigation System	LS	1	x	106,500.00	=	$	106,500		
204099	Plant Establishment Work	LS	1	x	36,000.00	=	$	36,000		
								Subtotal Landscape and Irrigation	*$*	*277,500*

5C - EROSION CONTROL

Item code		Unit	Quantity		Unit Price ($)			Cost		
210010	Move In/Move Out (Erosion Control)	EA	2	x	800.00	=	$	1,600		
210350	Fiber Rolls	LF	3,400	x	2.60	=	$	8,840		
210360	Compost Sock	LF		x		=	$	-		
2102XX	Rolled Erosion Control Product (X)	SQFT		x		=	$	-		
21025X	Bonded Fiber Matrix	QFT/ACRE		x		=	$	-		
210300	Hydromulch	SQFT		x		=	$	-		
210420	Straw	SQFT		x		=	$	-		
210430	Hydroseed	SQFT	49,000	x	0.15	=	$	7,350		
210600	Compost	SQFT		x		=	$	-		
210630	Incorporate Materials	SQFT		x		=	$	-		
								Subtotal Erosion Control	*$*	*17,790*

5D - NPDES

Item code		Unit	Quantity		Unit Price ($)			Cost		
130300	Prepare SWPPP	LS	1	x	4,000.00	=	$	4,000		
130100	Job Site Management	LS	1	x	40,000.00	=	$	40,000		
130330	Storm Water Annual Report	EA	5	x	1,500.00	=	$	7,500		
130310	Rain Event Action Plan (REAP)	EA	45	x	300.00	=	$	13,500		
130320	Storm Water Sampling and Analysis Day	EA	45	x	300.00	=	$	13,500		
130520	Temporary Hydraulic Mulch	SQYD		x		=	$	-		
130550	Temporary Hydroseed	SQYD		x		=	$	-		
130505	Move-In/Move-Out (Temporary Erosion Control)	EA	2	x	800.00	=	$	1,600		
130640	Temporary Fiber Roll	LF		x		=	$	-		
130900	Temporary Concrete Washout	LS	1	x	6,300.00	=	$	6,300		
130710	Temporary Construction Entrance	EA	2	x	7,000.00	=	$	14,000		
130610	Temporary Check Dam	LF		x		=	$	-		
130620	Temporary Drainage Inlet Protection	EA	18	x	220.00	=	$	3,960		
130730	Street Sweeping	LS	1	x	40,000.00	=	$	40,000		
								Subtotal NPDES	*$*	*144,360*
								TOTAL ENVIRONMENTAL	**$**	**444,700**

Supplemental Work for NPDES

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

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

**Applies to both SWPPPs and WPCP projects.

*** Applies only to project with SWPPPs.

SECTION 6: TRAFFIC ITEMS

6A - Traffic Electrical

Item code		Unit	Quantity		Unit Price ($)			Cost
128605	Temporary Signal and Lighting	LS	1	x	80,000.00	=	$	80,000
870201A	Lighting (County Street)	LS	1	x	75,000.00	=	$	75,000
872130	Modifying Existing Electrical System	LS	1	x	145,000.00	=	$	145,000

Subtotal Traffic Electrical $ *300,000*

6B - Traffic Signing and Striping

Item code		Unit	Quantity		Unit Price ($)			Cost
566011	Roadside Sign - One Post	EA	40	x	200.00	=	$	8,000
566012	Roadside Sign - Two Post	EA	12	x	300.00	=	$	3,600
846030	Remove Thermoplastic Traffic Stripe	LF	17,255	x	1.20	=	$	20,706
846035	Remove Thermoplastic Pavement Marking	SQFT	673	x	5.00	=	$	3,365
820250	Remove Roadside Sign	EA	14	x	125.00	=	$	1,750
820530	Reset Roadside Sign	EA	6	x	250.00	=	$	1,500
820610	Relocate Roadside Sign	EA	17	x	280.00	=	$	4,760
840501	Thermoplastic Traffic Stripe	LF	9,343	x	2.00	=	$	18,686
840515	Thermoplastic Pavement Marking	SQFT	1,444	x	6.00	=	$	8,664
120090	Construction Area Signs	LS	1	x	2,300.00	=	$	2,300

Subtotal Traffic Signing and Striping $ *73,331*

6C - Traffic Management Plan

Item code		Unit	Quantity		Unit Price ($)			Cost
128651	Portable Changeable Message Signs	LS	1	x	5,000.00	=	$	5,000

Subtotal Traffic Management Plan $ *5,000*

6C - Stage Construction and Traffic Handling

Item code		Unit	Quantity		Unit Price ($)			Cost
120100	Traffic Control System	LS	1	x	100,000.00	=	$	100,000
129100	Temporary Crash Cushion	EA	42	x	280.00	=	$	11,760
129000	Temporary Railing (Type K)	LF	5,280	x	60.00	=	$	316,800
120149	Temporary Pavement Marking (Paint)	SQFT	463	x	8.00	=	$	3,704
120159	Temporary Traffic Stripe (Paint)	LF	8,753	x	2.50	=	$	21,883

Subtotal Stage Construction and Traffic Handling $ *454,147*

TOTAL TRAFFIC ITEMS **$ 832,500**

SECTION 7: DETOURS

Includes constructing, maintaining, and removal

Item code		Unit	Quantity		Unit Price ($)		Cost
190101	Roadway Excavation	CY	585	x	26.00	= $	15,210
390132	Hot Mix Asphalt (Type A)	TON	277	x	135.00	= $	37,395
26020X	Class 2 Aggregate Base	TON/CY	447	x	134.00	= $	59,898

* Includes constructing, maintaining, and removal

TOTAL DETOURS **$ 112,600**

SUBTOTAL SECTIONS 1 through 7 $ 5,071,200

SECTION 8: MINOR ITEMS

8A - Americans with Disabilities Act Items					
ADA Items			0.0%	$	-
8B - Bike Path Items					
Bike Path Items			0.0%	$	-
8C - Other Minor Items					
Other Minor Items			6.0%	$	304,272
Total of Section 1-7	$	5,071,200	x 6.0%	= $	304,272

TOTAL MINOR ITEMS **$ 304,300**

SECTIONS 9: MOBILIZATION

Item code							
999990	Total Section 1-8	$	5,375,500	x	10%	= $	537,550

TOTAL MOBILIZATION **$ 537,600**

SECTION 10: SUPPLEMENTAL WORK

Item code		Unit	Quantity		Unit Price ($)		Cost
066670	Payment Adjustments For Price Index Fluctuations	LS	1	x	13,700.00	= $	13,700
066094	Value Analysis	LS	1	x	10,000.00	= $	10,000
066921	Dispute Resolution Advisor	LS	1	x	5,000.00	= $	5,000
066610	Partnering	LS	1	x	20,000.00	= $	20,000
	*Cost of **NPDES** Supplemental Work specified in Section 5D*					= $	-
	Total Section 1-8	$	5,375,500		4%	= $	215,020

TOTAL SUPPLEMENTAL WORK **$ 263,800**

SECTION 11: STATE FURNISHED MATERIALS AND EXPENSES

Item code		Unit	Quantity		Unit Price ($)		Cost
066105	Resident Engineers Office	LS	1	x	72,200.00	=	$72,200
066063	Traffic Management Plan - Public Information	LS	1	x	2,000.00	=	$2,000
066901	Water Expenses	LS	1	x		=	$0
066062	COZEEP Contract	LS	1	x	5,000.00	=	$5,000
066916	Annual Construction General Permit Fee	LS	1	x	652.00	=	$652
	Total Section 1-8		$ 5,375,500		2%	=	$ 107,510

TOTAL STATE FURNISHED	$187,400

SECTION 12: TIME-RELATED OVERHEAD

Total of Roadway and Structures Contract Items excluding Mobilization $6,527,786 (used to calculate TRO)

Total Construction Cost (excluding TRO and Contingency) $7,608,768 (used to check if project is greater than $5 million excluding contingency)

Estimated Time-Related Overhead (TRO) Percentage (0% to 10%) = **4.0%**

Item code		Unit	Quantity		Unit Price ($)		Cost
090100	Time-Related Overhead	WD	500	X	$522	=	$261,200

TOTAL TIME-RELATED OVERHEAD	$261,200

SECTION 13: ROADWAY CONTINGENCY

Risk Amount from Risk Register	(for Known Risks)			0%		$0
Additional or Residual Contingency	(for Unknown/Undefined Risks)			20%		$1,325,100
Total Section 1-12	$	6,625,500	x	**20%**	=	$1,325,100

TOTAL CONTINGENCY	$1,325,100

EA: 05-1G480 PID: 515000038

II. STRUCTURE ITEMS

	Ret Wall-N1	Ret Wall-W1 (Alt 2)	Ret Wall-W2
DATE OF ESTIMATE	01/09/19	01/09/19	01/09/19
Bridge Name	Ret Wall - N1	Ret Wall - W1 (Alt 2)	Ret Wall - W2
Bridge Number	49ExxN1	49ExW12	49ExxW2
Structure Type	SHGA Wall	Soil Nail Wall	Soil Nail Wall
Width (Feet) [out to out]	13.4 LF	9.3 LF	10.6 LF
Total Bridge Length (Feet)	211.2 LF	346.5 LF	66.5 LF
Total Area (Square Feet)	2830 SQFT	3222 SQFT	705 SQFT
Structure Depth (Feet)	0 LF	0 LF	0 LF
Footing Type (pile or spread)	n/a	n/a	n/a
Cost Per Square Foot	$204	$88	$88
COST OF EACH	**$578,185**	**$281,964**	**$61,679**

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

TOTAL COST OF WALLS		**$921,828**
TOTAL COST OF BUILDINGS		**$0**
Structures Mobilization Percentage	10%	**$92,183**
Structures Contingency Percentage	25%	**$230,457**
TOTAL COST OF STRUCTURES		**$1,244,468**

Estimate Prepared By: Eric Fredrickson, P.E. — Structural Engineer

1/9/19 — Date

EA: 05-1G480 PID: 515000038

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	$	12,000
	A2)	SB-1210	$	0
B)		Acquisition of Offsite Mitigation	$	0
C)	C1)	Utility Relocation (State Share)	$	0
	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	$	3,000
H)		Environmental Review	$	0
I)		Condemnation Settlements 0%	$	0
J)		Design Appreciation Factor 0%	$	0
K)		Utility Relocation (Construction Cost)	$	317,000

L)	**TOTAL RIGHT OF WAY ESTIMATE**	**$332,000**
M)	**TOTAL R/W ESTIMATE: Escalated**	**$390,000**
N)	**RIGHT OF WAY SUPPORT**	**$13,230**

Support Cost Estimate Prepared By	Genaro Diaz Project Manager	(805) 781-5279 Phone
Utility Estimate Prepared By	Joe Morris Utility Coordinator	(805) 781-4246 Phone
R/W Acquisition Estimate Prepared By	Phil Acosta Right of Way Agent	(805) 781-5290 Phone

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

Attachment J
IS/MND and NEPA CE

Avila Beach Drive at SR-101 Interchange Improvement Project

SAN LUIS OBISPO COUNTY, CALIFORNIA
5–SLO–101–21.1
05-1G480
CMFERP16-5949(161)

Initial Study with Mitigated Negative Declaration

Prepared by
The State of California, Department of Transportation
and County of San Luis Obispo Department of Public Works

The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.

February 2020

FHWA Highway ID No. 05-1G480

SCH#2019120684
05-SLO-101-PM 21.1

Avila Beach Drive at SR-101 Interchange Improvement, Avila Beach, San Luis Obispo County

INITIAL STUDY with Mitigated Negative Declaration

Submitted Pursuant to: (State) Division 13, California Public Resources Code
(Federal) 42 USC 4332(2)(C), 49 USC 303, and/or 23 USC 138

THE STATE OF CALIFORNIA
Department of Transportation
and
The County of San Luis Obispo Department of Public Works

Responsible Agencies: California Transportation Commission

2/26/20
Date of Approval

Keith Miller
Environmental Division Manager
County of San Luis Obispo Dept of Public Works

The following persons may be contacted for more information about this document:

Matthew Willis, Environmental Specialist
County of San Luis Obispo Dept of Public Works
County Government Center, Room 206
San Luis Obispo, CA 93408
(805) 781-5252

SCH: 2019120684

MITIGATED NEGATIVE DECLARATION

Pursuant to: Division 13, Public Resources Code

Project Description

The County of San Luis Obispo Department of Public Works (County) proposes the Avila Beach Drive at SR-101 Interchange Improvement Project (project), located in San Luis Obispo County at the Avila Beach Drive and SR-101 interchange approximately 2 miles east of the community of Avila Beach, and approximately 0.5 mile west of the City of Pismo Beach.

The purpose of the proposed project is to improve the operations and multimodal access of the SR-101/Avila Beach Drive interchange northbound and southbound intersections. The project is needed because the five-legged intersection of the southbound ramps, Avila Beach Drive and Shell Beach Road experiences operational issues during weekday afternoon peak travel times and the summer tourist seasons due to the intersection's geometry.

Project Description

The project includes three components:

1. Roundabout intersection improvements at the SR-101 southbound Ramps, Avila Beach Drive, and Shell Beach Road intersection;

2. Modifications to the SR-101 northbound off-ramp; and

3. Construction of a Park-and-Ride lot located southwest of the interchange.

Determination

This Mitigated Negative Declaration (MND) is included to give notice to interested agencies and the public that it is the County's intent to adopt an MND for this project. This does not mean that the County's decision regarding the project is final. This MND is subject to change based on comments received by interested agencies and the public, and project details may change as the project and plans progress.

The County has prepared an Initial Study for this project, and following public review, has determined from this study that the proposed project would not have a significant effect on the environment for the following reasons:

The proposed project would have no impact on Agriculture and Forest Resources, Air Quality, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Mineral Resources, Population and Housing, Public Services, Recreation, Transportation and Traffic, Tribal Cultural Resources, or Mandatory Findings of Significance.

In addition, the proposed project would have less than significant impacts on Geology and Soils, Land Use and Planning, Noise, Utilities and Service Systems.

By implementing mitigation measures, the proposed project would have less than significant impacts on Aesthetics, Biological Resources, and Cultural Resources.

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Chapter 1 Proposed Project

Introduction

California participated in the “Surface Transportation Project Delivery Pilot Program” (Pilot Program) pursuant to 23 United States Code (USC) 327, for more than five years, beginning July 1, 2007, and ending September 30, 2012. MAP-21 (P.L. 112-141), signed by President Obama on July 6, 2012, amended 23 USC 327 to establish a permanent Surface Transportation Project Delivery Program. As a result, the California Department of Transportation (Caltrans) entered into a Memorandum of Understanding (MOU) pursuant to 23 USC 327 (National Environmental Policy Act [NEPA] Assignment MOU) with the Federal Highway Administration (FHWA). The NEPA Assignment MOU became effective October 1, 2012 and was renewed on December 23, 2016 for a term of five years. In summary, Caltrans continues to assume FHWA responsibilities under NEPA and other federal environmental laws in the same manner as was assigned under the Pilot Program, with minor changes. With NEPA Assignment, FHWA assigned and Caltrans assumed all the United States Department of Transportation (USDOT) Secretary's responsibilities under NEPA. This assignment includes projects on the State Highway System and Local Assistance Projects off the State Highway System within the State of California, except for certain categorical exclusions that FHWA assigned to Caltrans under the 23 USC 326 CE Assignment MOU, projects excluded by definition, and specific project exclusions.

The County of San Luis Obispo Department of Public Works (County) is the lead agency for the Avila Beach Drive at SR-101 Interchange Project (project) under the California Environmental Quality Act (CEQA). Caltrans designated the County as the lead agency in May 2016.

The County and Caltrans have identified the project as a capital improvement project. They have proposed the evaluation of proper control for this intersection with strong consideration given to the construction of a roundabout. San Luis Obispo Council of Governments (SLOCOG) and the County are considering a future parking lot and Regional Transit Authority (RTA) bus stop at the southwest corner of Avila Beach Drive and Shell Beach Drive that could serve recreational and commuter purposes.

On May 21, 2012, the City of Pismo Beach held a community workshop, which identified a roundabout at this intersection as the desired alternative along with a city gateway enhancement. In January 2015, SLOCOG, Caltrans, and the County initiated a Project Study Report-Project Development Support (PSR-PDS) effort corresponding to the County’s capital improvement project and the recommendations listed in SLOCOG’s 2014 SR-101 Corridor Mobility Master Plan. For Avila Beach Drive, the plan identified the simplification of the intersections of Avila Beach Drive, Shell Beach Road, and SR-101 southbound ramps, and better access to park and ride lots. The SR-101/Avila Beach Drive interchange northbound ramp intersection was included in order to analyze and address bicycle needs.

The project is included in SLOCOG’s *SLOCOG 2014 Regional Transportation Plan* (RTP). Local funds (County) will be used during the Project Approval and Environmental Document (PA&ED) phase. Additional funding for final design, right-of-way (ROW), and construction costs will be proposed in future programming cycles.

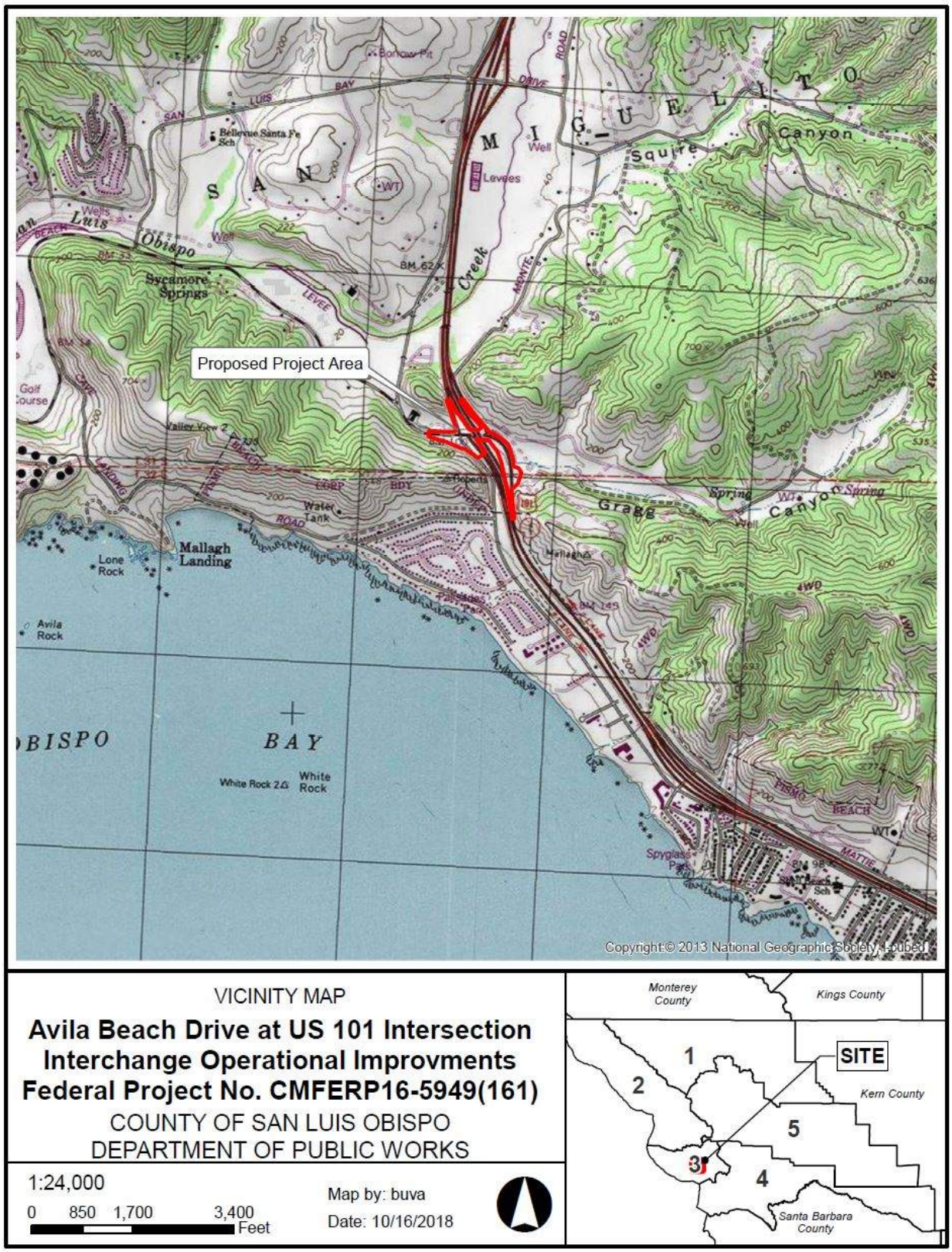


Figure 1. Project Vicinity Map

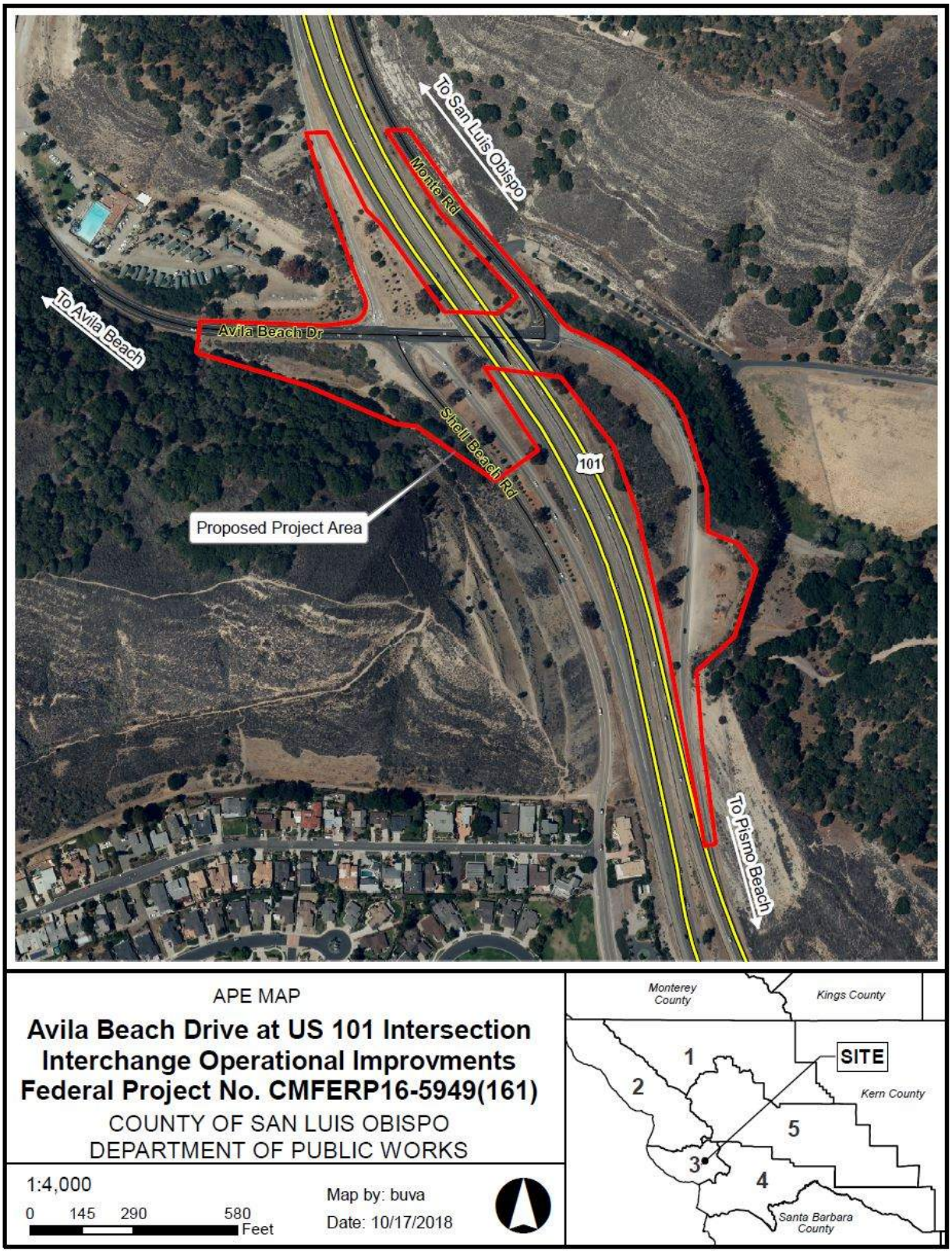


Figure 2. Proposed Project Area Map

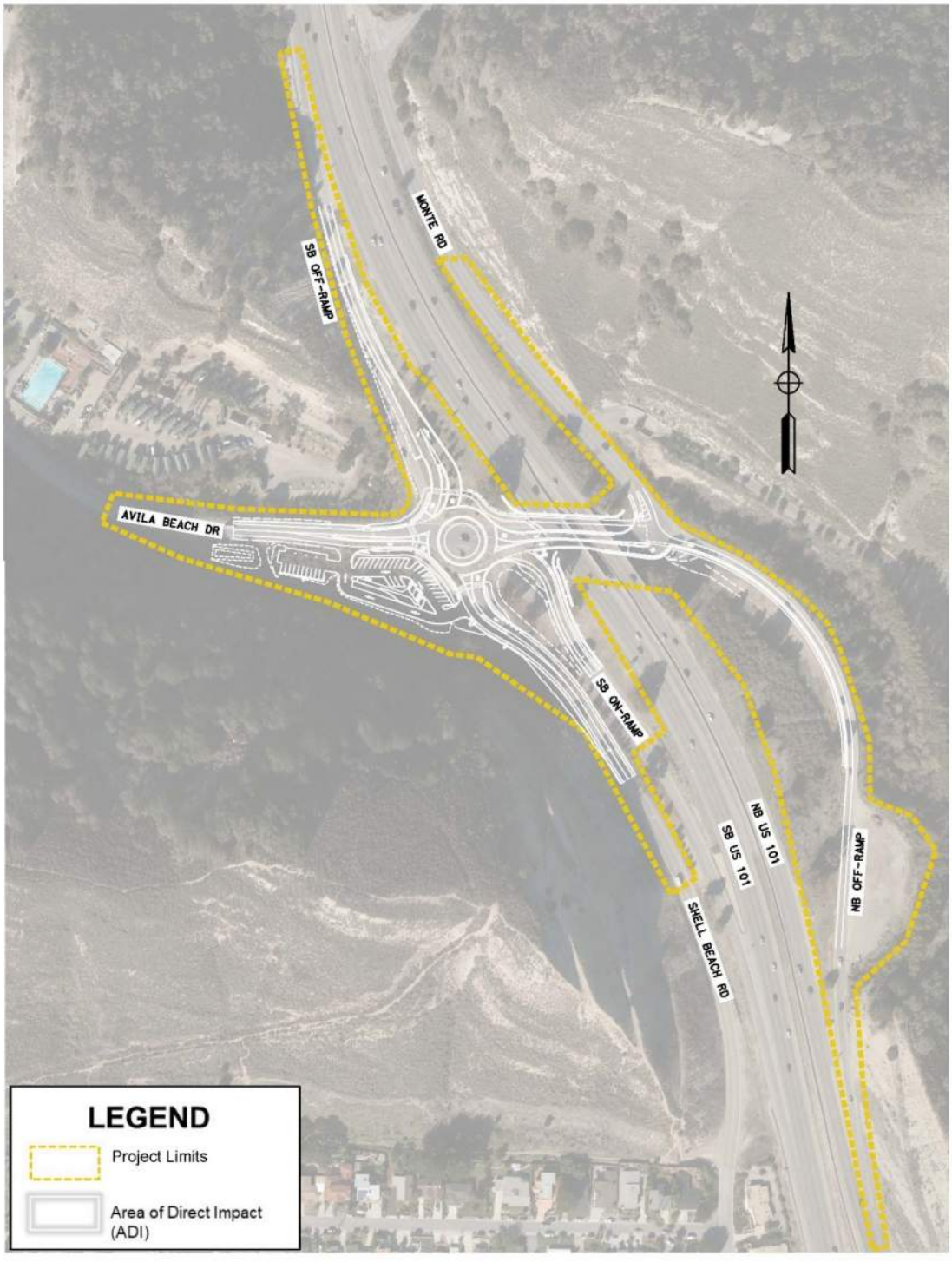


Figure 3: Avila Beach Drive at SR-101 Interchange Project Impact Map

Figure 3: Avila Beach Drive at SR-101 Interchange Project Impact Map

Purpose and Need

The purpose of the proposed project is to improve the Avila Beach Drive at SR-101 Interchange northbound and southbound ramp intersections to address traffic operational and safety deficiencies and improve multimodal access.

The County has identified the intersection of Avila Beach Drive/SR-101 southbound ramps/Shell Beach Road as operationally deficient at certain times of the day/year. The intersection is currently operating at Level of Service (LOS) “F” during p.m. peak periods. The three-year collision rate is slightly below the statewide collision average; however, the three-year fatality and injury rate for the southbound offramp is above State average. The corner sight distance is limited for the left turn and through movements at the terminus of the southbound off-ramp.

Traffic patterns at the SR-101 northbound off-ramp, Avila Beach Drive and Monte Road intersection are challenging, especially for bicyclists. Vehicles on the northbound off-ramp, which are not required to yield, approach the intersection at high speeds. The corner sight distance is limited for the minor movement turning left (the only movement possible) onto Monte Road from eastbound Avila Beach Drive. Vehicles exiting on the northbound off-ramp, which becomes westbound Avila Beach Drive, passes through the northbound intersection and onto the southbound intersection without the requirement to yield to the other minor movements.

The project has independent utility, in that it addresses forecasted future operational deficiencies at the interchange and existing safety deficiencies without requiring any additional transportation improvements in the area. In other words, no other related projects are required for the project to be effective.

Project Description

This section describes the proposed project to meet the purpose and need of the project, while avoiding or minimizing environmental impacts. Project description details may change as the project and plans progress.

The project is located in San Luis Obispo County at the Avila Beach Drive and SR-101 interchange, approximately 2 miles east of the community of Avila Beach and approximately 0.5 mile west of the City of Pismo Beach (community of Shell Beach). The project is comprised of three main components:

1. A roundabout at the southbound ramp intersection.
2. Modifications to the northbound off-ramp.
3. A park-and-ride lot and Regional Transit Authority bus stop at the southwest corner of Avila Beach Drive and Shell Beach Road.

While final design is pending and Contractor construction operations are not yet defined, the preliminary Area of Potential Effect (APE) contains approximately 15.25 acres of which approximately 5.6 acres are within anticipated ground disturbance limits and of that area approximately 3.4 acres will have permanent hardscaped improvements.

Roundabout Intersection

The roundabout design features converting the two closely spaced intersections of Avila Beach Drive, SR-101 southbound Ramps and Shell Beach Drive to a 4-leg single-lane modern roundabout. Bike lanes on Avila Beach Drive and Shell Beach Road will terminate

approximately 100 feet in advance of the circulatory roadway with bike ramps. The ramps will allow cyclists the option to 1) merge with vehicular traffic, take the lane and navigate the roundabout as a vehicle; or, 2) exit the roadway using the bike ramp to the shared use path and use the crosswalks as a pedestrian. The shared-use paths will be 8-feet-wide with 2-foot buffers between the paths and circulatory roadway curb and gutter. Pedestrian crossings will be set back 20-25 feet (approximately one car length) from the circulatory roadway and the pedestrian refuges at the splitter islands are at least 10-feet wide by 6-feet deep.

Preliminary traffic engineering reports showed that the Avila Beach Drive/SR-101 southbound off-ramp/Shell Beach Road intersection was operating at unacceptable Level of Service during some periods. The report concluded that a 4-leg single lane roundabout at the existing two-way stop-controlled southbound ramp intersection would operate better than an all-way stop or traffic signal control. The entry and departure legs of Shell Beach Road and the southbound ramps will be reconstructed to conform to the proposed roundabout. Landscaped trees will be removed to accommodate the realignment. The center island of the roundabout will create a potential location for landscaping or other treatments and will feature a truck apron to accommodate large truck trailers. The roundabout will also include median islands with crosswalks and shared-use paths offset from the roundabout for safer connectivity for bicyclists and pedestrians. Retaining walls will be required between the southbound ramps and the SR-101 mainline due to the realignment of the ramps. The slope adjacent to the northerly abutments beneath SR-101 will be excavated and a tie-back wall constructed to allow for a shared use path.

Northbound Off-ramp Improvements

Modifications to the northbound off-ramp are proposed to alert motorists of a change in roadway characteristics in advance of the ramp termini intersections. A strategic system of modifications including optical speed bars, cross section edge treatment and advance warning signs are proposed to help reduce speeds and alert motorists prior to the Monte Road intersection. These modifications are consistent with strategies contained in current engineering guidance documents.

Park-and-Ride Lot

The project includes a park-and-ride lot and transit stop for the Avila Beach Trolley and RTA bus at the southwest corner of Avila Beach Drive and Shell Beach Road. The lot will serve recreational and commuter purposes. The location of this lot is close to freeway ramp terminals and has good visibility. The lot will be accessible from the freeway, with driveways along Avila Beach Drive and Shell Beach Road and will provide multi-modal accessibility. The current design of the park-and-ride lot includes paved and unpaved parking spaces, a bus loading bay and an accessible bicycle/pedestrian path between them. Overhead and other security lighting and equipment will be installed. Clearing and grubbing of vegetation will be necessary in this area.

Other Design Features

Retaining Walls

The project includes various retaining walls, with the following taller walls presumed to be constructed using top-down techniques due to the close proximity of the freeway:

- Wall W1: Approximately 240 feet long with an approximate maximum height of 22 feet in the existing freeway embankment south of the overpass between the southbound on-

ramp and southbound SR-101 mainline. Two alternatives are being considered for this retaining feature a single taller wall or a two-wall alternative using a shorter stepped configuration. This will likely be a soil nail wall.

- Wall W2: Approximately 67 feet long with an approximate maximum height of 14 feet in the existing freeway embankment north of the overpass between the southbound off-ramp and the southbound SR-101 mainline. This will likely be a soil nail wall.
- Wall N1: Approximately 212 feet long with an approximate maximum height of 15 feet in the existing freeway embankment under the overpass on the north side of the shared use path and Avila Beach Drive. This will likely be a sub-horizontal ground anchor wall.
- Wall W3: Approximately 110 feet long with an approximate maximum height of 5 feet in the park-and-ride lot.
- Wall W4: Approximately 100 feet long with an approximate maximum height of 3 feet on the west side of Shell Beach Road.

Stormwater Detention Basin

Two stormwater basins are currently planned for the project; a subsurface infiltrator system for stormwater quality, and a detention basin for peak flow management. The detention basin is planned as a shallow aggregate surface area that will also serve to accommodate overflow parking in dry weather. A diversion box is intended for the site stormwater system to direct flow to the basin during high storms. An outlet structure and pipe will deliver metered flow back to the storm drain system, reducing peak flows. The basin will be shallow (approximately 2 feet deep) and will be unfenced. The parking lot will be signed flooded during storms. The infiltrator system will be a system of perforated storm drainpipes with a design based on County standards modified to use a common diversion box which will deliver low flows from the storm drain system into the infiltrators. The infiltrator system will be placed in trenches within the parking lot. Construction will be conventional trench excavation and backfill, with a zone of float rock and filter fabric around the pipe.

Utility Considerations

Multiple utilities are located within the project area that will require relocation. These utilities include but are not limited to oil pipelines, water lines, electrical service, cable, and fiberoptic lines.

Construction Methodology

Clearing and grubbing of ramp gore areas and the park-and-ride area is expected to be accomplished with traditional bull dozer and dump truck equipment. Standard traffic handling techniques will be used in areas where public traffic is near a work zone. Construction zone traffic handling will include advanced warning signs, changeable message signs, flagging and temporary K-rail when warranted. Where applicable, Environmentally Sensitive Area (ESA) fencing will also be used to designate areas where construction is prohibited. Excavation by backhoe, bulldozer, scraper or similar equipment is expected for wall and new pavement construction areas. Roadway excavation for ramp realignment and roundabout construction is expected to range between 20,000 and 30,000 cubic yards. Drill rigs, drivers and concrete trucks are expected to be used for wall construction and spreaders and pavers will be needed for the roadway surface construction. Hydroseeding of generally disturbed areas will be accomplished with locally approved seed mixes and some streetscape (consisting of native plants) will be planted around the parking lot and the roundabout.

Staging

Materials and equipment may be staged at the existing maintenance pullout area along the northbound off-ramp at the southeast end of the project. The future park-and-ride area may also be used as a staging area once the vegetation has been cleared.

Schedule

Construction is anticipated to take approximately 2.5 years with most activities occurring in the first 2 years.

Permits and Approvals Needed

The permits, licenses, agreements, and certifications (PLACs) are required for project construction are described below in Table 1:

Table 1: Project Permits, Licenses, Agreements, and Certifications

Agency	PLAC	Status
County of San Luis Obispo	Coastal Development Permit (CDP)	Application for CDP expected after FED approval.
California Coastal Commission	Federal Coastal Consistency Certification	Consistency Certification expected after draft ED distribution.
California Transportation Commission	CTC vote to approve funds; AND/OR CTC vote to approve a new public road connection; AND/OR CTC vote to approve a route adoption.	Following the approval of the FED, the California Transportation Commission will be required to vote to approve funding for the project, as well as approve the project design.
RWQCB	SWPPP	To be developed prior to construction.

ED = Environmental Document

FED = Final Environmental Document

Chapter 2 – Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

As part of the scoping and environmental analysis done for the project, the following environmental issues were considered, but no adverse impacts were identified. There is no further discussion of these issues in this document.

Wild and Scenic Rivers: The project is not near or next to any Wild and Scenic Rivers. (Source: Geoview Mapping Application).

Agriculture and Forest Resources: There is no farmland or forest resources within the project area. The eastern portion of the project area is bound by agriculturally designated land use. (Source: Rural Land Use Category map).

Farmlands/Timberlands: The project will not be acquiring or result in impacts to farmland or timberland because they do not exist within the project area. (Source: Geoview Mapping Application)

Growth: The project will accommodate existing demands and anticipated future demands based on forecasts prepared by SLOCOG in their *2014 Corridor Mobility Master Plan*. (Source: Project Description).

No minority or low-income populations that would be adversely affected by the proposed project have been identified as determined above. Therefore, this project is not subject to the provisions of Executive Order (EO) 12898.

Community Character and Cohesion: The project will not affect the character or cohesion of the community because it is located outside of the developed community of Avila Beach and the City of Pismo Beach and involves the replacement of an existing interchange within existing State and local rights-of-way. Alterations of the visual character of the project area are addressed in the Visual/Aesthetics section and were analyzed in Visual Impacts Assessment. (Source: Project Description)

Environmental Justice: No minority or low-income populations will be adversely affected by the project. Therefore, this project is not subject to the provisions of EO 12898.

Hydrology and Floodplain: There will be no effects to hydrology because no hydrologic features are present within the project area. A realigned, engineered unnamed tributary to San Luis Obispo Creek occurs adjacent to the project area but will not be adversely affected by the proposed project. There will be no effects to floodplains because the project is not located within a 100-year base floodplain. The nearest 100 Year Flood Zone is located approximately 0.23 mile/1,200 feet to the north of the project area.

Human Environment

LAND USE

Existing and Future Land Use

Regulatory Setting

The project area exists within an area that does not contain any designated land use as it is located within the SR-101 corridor. The project is bound to the east by land use designations of Agriculture and Rural Lands, is bound to the west by Recreation and Rural Lands and is bound to the south by the City of Pismo Beach. The proposed project will not change or affect existing land uses. (Source: Geoview Mapping Application)

The County is the lead agency under CEQA. Caltrans, as assigned by the FHWA, is the lead agency under NEPA. The project will be consistent with the San Luis Obispo County General Plan and Title 23, the Coastal Zone Land Use Ordinance (CZLUO).

Affected Environment

The land use surrounding the proposed project falls primarily within the SR-101 highway corridor and is entirely within Caltrans and County ROW. The southwestern portion of the project area, where the Park and Ride is planned, is designated as Rural Lands. The southeastern portion of the project area, at the northbound SR-101 off ramp, is within the City of Pismo Beach ROW. The northwestern portion of the project area, adjacent to the Avila Hot Springs Resort is located within the Recreational land use category. Figure 4 shows the land uses, as designated by the San Luis Obispo County General Plan, within the study area and as confirmed by various site visits.

The San Luis Obispo County General Plan divides San Luis Obispo County into sub-county planning areas to better develop and implement goals, policies, and programs specific to each planning area. The project study area straddles both the San Luis Obispo Planning Area – San Luis Bay Inland Sub Area North, and the San Luis Bay Coastal Planning Area – Coastal Zone.

The proposed project falls within the San Luis Obispo Planning Area, mostly within the San Luis Bay Coastal Planning Area Coastal Zone, and to a much lesser extent in the San Luis Bay Inland Sub Area North of the San Luis Obispo County General Plan, and Coastal Plan Policies. The Coastal Plan Policies were adopted March 1, 1988 and were revised in 2007.

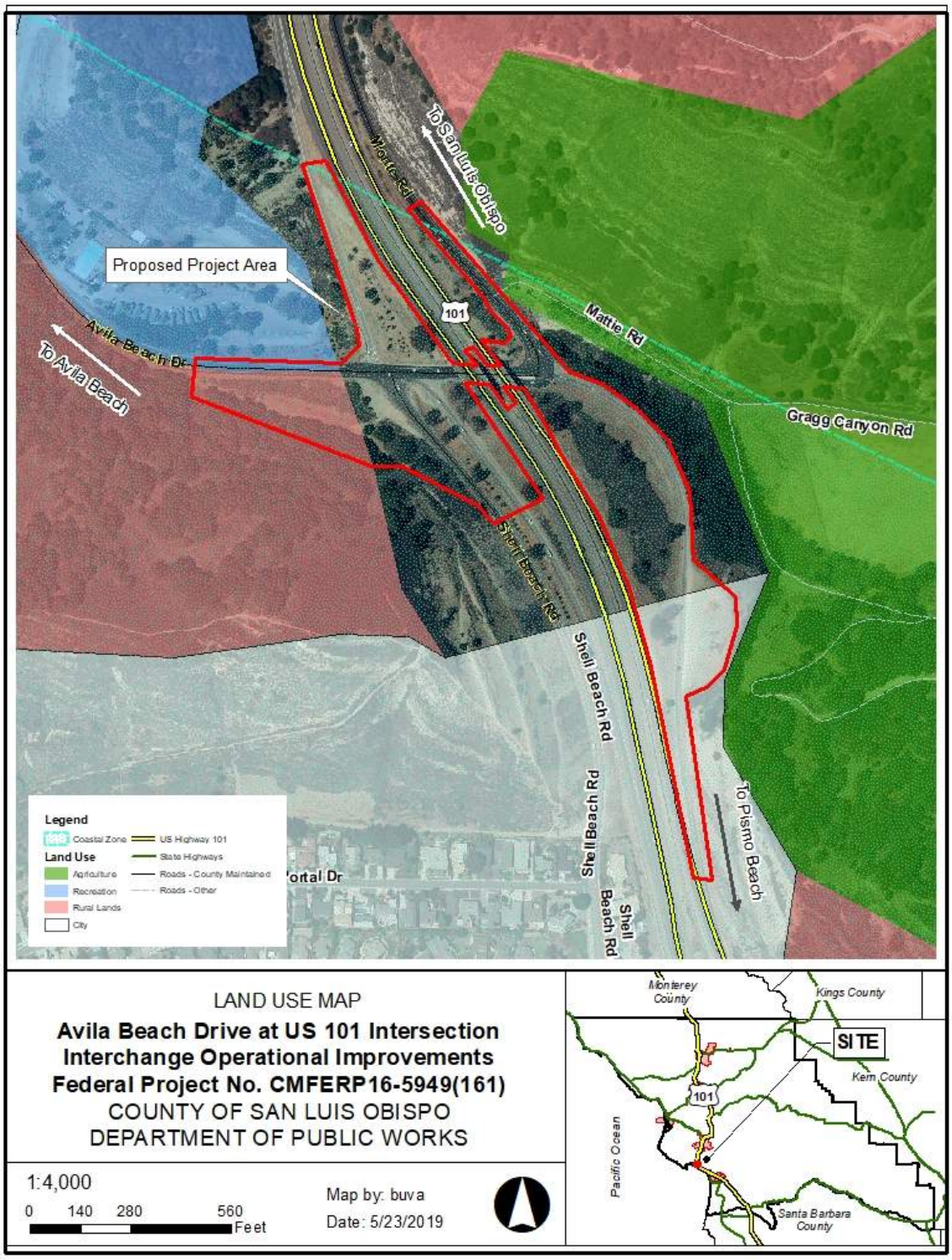


Figure 4. Land Use Map

The project is not within or adjacent to a Habitat Conservation Plan (HCP) area. The project is consistent or compatible with the surrounding uses as summarized above. The project is subject to the San Luis Obispo Planning Area Standards.

The project is subject to the following standards from the County's CZLUO:

- CZLUO Section 23.05.036 – Sedimentation and Erosion Control
- CZLUO Section 23.05.140 – Archeological Resources Discovery
- CZLUO Sections 23.070.160 thru 23.07.174 – Sensitive Resource Area, Environmentally Sensitive Habitats, Wetlands, and Streams and Riparian Vegetation

Additionally, the project is subject to the following polices from the County's Coastal Plan Policies Document:

- Environmentally Sensitive Habitat Policies
- Visual and Scenic Resource Policies
- Hazard Policies
- Archaeology Policies
- Air Quality

No inconsistencies were identified and no project-related impacts to land uses are anticipated. The project is consistent with the pursuant LUO policies because no new development will occur as a result of project implementation and no change to the current land use regimes on-site will ensue.

Avoidance, Minimization, and/or Mitigation Measures

No inconsistencies were identified and therefore no additional measures above what will already be required were determined necessary.

COASTAL ZONE

Regulatory Setting

This project has the potential to affect resources protected by the Coastal Zone Management Act (CZMA) of 1972. The CZMA is the primary federal law enacted to preserve and protect coastal resources. The CZMA sets up a program under which coastal states are encouraged to develop coastal management programs. States with an approved coastal management plan are able to review federal permits and activities to determine if they are consistent with the state's management plan.

California has developed a coastal zone management plan and has enacted its own law, the California Coastal Act of 1976, to protect the coastline. The policies established by the California Coastal Act are similar to those for the CZMA: They include the protection and expansion of public access and recreation; the protection, enhancement, and restoration of

environmentally sensitive areas; the protection of agricultural lands; the protection of scenic beauty; and the protection of property and life from coastal hazards. The California Coastal Commission (CCC) is responsible for implementation and oversight under the California Coastal Act.

Just as the federal CZMA delegates power to coastal states to develop their own coastal management plans, the California Coastal Act delegates power to local governments to enact their own local coastal programs (LCPs). This project is subject to the County's LCP which contains the ground rules for development and protection of coastal resources in their jurisdiction consistent with the California Coastal Act goals. A Federal Consistency Certification will be needed as well. The Federal Consistency Certification process will be initiated prior to the Final Environmental Document (FED) and will be completed to the maximum extent possible during the NEPA process.

Affected Environment

The proposed project falls within the San Luis Bay Area Plan of the Land Use Element and Local Coastal Plan of the San Luis Obispo County General Plan. Specifically, the project is located within the San Luis Obispo Planning Area and straddles both the San Luis Bay Coastal Planning area (approximately 85 percent) and the San Luis Bay Inland Sub Area North (approximately 15 percent). The San Luis Bay Area Plan was originally adopted in 1988 and revised in August 2009. The specific policies from the County's Coastal Plan Policies and California Coastal Act Chapter Three Policies that are relevant to this project are identified in Table 2. The project's anticipated impacts to coastal resources was analyzed, and Table 2 describes project features that have been incorporated into the project to avoid or minimize the project's environmental consequences.

The project area is located approximately 0.5 mile from the ocean. While this location is outside the Original Jurisdiction of the California Coastal Commission, it is almost entirely within the coastal zone. There are no lagoons, estuaries, or wetlands within the project area. Riparian habitats exist to the east and north of the project area; however, no impacts to riparian habitats would result from the project. There are no Environmentally Sensitive Habitat Areas within the project area.

Table 2. Consistency with California Coastal Act and San Luis Obispo Local Coastal Plan

Plan Policy No.	***Subject of Policy***	***Discussion***
Local Coastal Plan (LCP) Policies:1, 2, 3, 20, 21, 26, 30 California Coastal Act (CCA) Policies: 30231, 30240, 30253	***Environmentally Sensitive Habitats*** *1. Land Uses Within or Adjacent to Environmentally Sensitive Habitats* *2. Permit Requirements* *3. Habitat Restoration* *20. Coastal Streams & Riparian Vegetation* *21. Development in or Adjacent to a Coastal Stream* *26. Riparian Vegetation* *30. Protection of Native Vegetation*	*Consistent* *The project will occur adjacent to locations of environmentally sensitive habitats and shall not significantly disrupt the resource(s). As a condition of permit approval, the County will demonstrate that there will be no significant impact of sensitive habitats, and that the proposed activity will be consistent with the biological continuance of the habitat. The County shall require the restoration of damaged habitats as a condition of approval when feasible. The coastal stream and adjoining riparian vegetation in the project area and the stream's natural hydrological system and ecological function shall be protected and preserved. The proposed*

		development adjacent to a coastal stream shall be sited and designed to prevent and/or minimize adverse impacts which would degrade the coastal habitat. Cutting or alteration of naturally occurring vegetation that protects riparian habitat is not permitted. Native trees and plant cover shall be protected wherever possible, and native plants shall be used where vegetation is removed. Biological productivity and stream quality shall be maintained.
LCP Policies: 2, 5, 7 CCA Policies: 30252, 30254	***Public Works*** *2. New or Expanded Public Works Facilities* *5.Capital Improvement Program* *7. Permits Requirements*	*Consistent* *The project is a new Public Works Facility & shall be designed to accommodate the needs generated by projected development. This Capital Improvement Project will institute a coordinated review process. The County shall require a permit for this project. The project, expanding a Public Works facility, will enhance public access to the coast by facilitating extension of transit service by promoting non-automobile circulation, providing adequate parking facilities and by providing substitute means of public transportation.*
LCP Policies:8, 10	***Coastal Watersheds*** *8. Timing of Construction & Grading* *10. Drainage Provisions*	*Consistent* *The project will conduct land clearing/grading outside of the rainy season and will utilize appropriate erosion control measures. The project will ensure that drainage onsite does not increase erosion through on-site conveyance to storm drains or suitable watercourses.*
LCP Policies: 1, 5, 7 CCA Policies: 30251	***Visual and Scenic Resources*** *1. Protection of Visual & Scenic Resources* *5. Landform Alterations* *7. Preservation of Trees & Native Vegetation*	*Consistent* *Unique/attractive scenic and visual features of the landscape within the project area are to be preserved and protected. Grading, earthmoving or other landform alterations within public view corridors are to be minimized to achieve a consistent grade and natural appearance. The project shall minimize the need for tree removal.*
LCP Policies: 2, 9	***Hazards*** *2. Erosion and Geologic Stability* *9. High Fire Risk Area*	*Consistent* *The project shall ensure structural stability while not exacerbating or contribute to erosion or geological instability. The County shall designate and show on the Hazards maps those high-risk fire areas.*
LCP Policies: 1, 4, 6 CCA Policies: 30244	***Archaeological Resources*** *1. Protection of Archaeological Resources* *4. Preliminary Site Survey for Development within Archaeological Sensitive Area* *6. Archaeological Resources Discovered during Construction*	*Consistent* *The project shall provide for the protection of both known and potential archaeological resources. The project area shall require a preliminary site survey by a qualified archaeologist who is knowledgeable in Chumash culture. Where substantial archaeological resources are discovered during construction, all activities shall cease until a qualified archaeologist can determine the significance of the resource and submit alternative mitigation measures.*
LCP Policies: 1	***Air Quality*** *1. Air Quality*	*Consistent* *The project proponent will provide adequate administration and enforcement of air quality programs and regulations to be consistent with*

		the County's Air Pollution Control District, and the State Air Resources Control Board.

Environmental Consequences

The proposed project was reviewed for consistency with the applicable policies of the San Luis Obispo County General plan with a focus on consistency with the LCP. The applicable policies and the project impacts to the resources identified are listed in Table 2.

Although this project would result in some minor impacts to coastal resources, measures are included as part of this project to minimize those impacts. With those measures included the project is consistent with state, regional and local plans.

Avoidance, Minimization, and/or Mitigation Measures

The project is consistent with state, regional, and local plans and does not cause adverse impacts with respect to land use. Avoidance, minimization, and mitigation measures will be used to minimize impacts during construction.

All development and land divisions within or adjacent to an Environmentally Sensitive Habitat Area (ESHA) shall be designated and located in a manner which avoids any significant disruption or degradation of habitat values. In some cases where development within the ESHA cannot be avoided, the development shall be modified as necessary so that it is the lease environmentally damaging feasible alternative.

Parks and Recreational Facilities

Section 4(f) refers to the original section within the USDOT Act of 1966 which provided for consideration of park and recreation lands, wildlife and waterfowl refuges, and historic sites during transportation project development. The law, now codified in 49 U.S.C. §303 and 23 U.S.C. §138, applies only to the USDOT and is implemented by the FHWA and the Federal Transit Administration through the regulation.

Parks and other recreational facilities within 0.5 mile of the project include:

Bob Jones Bike Path Ontario Road Access Point and Parking Area. The eastern terminus of the Bob Jones Trail and an associated parking facility are located approximately 0.4 mile north of the project area. The Class I bikeway connects the parking/staging area to the community of Avila beach, approximately 2.5 miles to the west.

Avila Hot Springs Spa and Recreational Vehicle (RV) Park. This private facility is located immediately north and west of the project area. The facility allows tent camping, has cabins, and allows RVs. There is a pool, mineral bath, playground, and barbeque facilities.

Avila/Pismo Beach Kampgrounds of America (KOA). The KOA offers cabins and RV hook-ups. And is approximately 0.3 mile from the project. The facility also has a movie theater, pool, store and related amenities. It provides access to the Bob Jones Bike Path.

Ontario Ridge Trail. The Ontario Ridge Trail is located approximately 0.2 mile south of the project area. The trail is a popular coastal access point linking the informal trailhead on Shell

Beach Road to Pirate's Cove and the eastern edge of the community of Avila Beach. A rough and relatively unused volunteer trail has been started near the proposed park-and-ride facility and connects to the Ontario Ridge Trail near the trailhead.

The project would not acquire or otherwise affect any facility protected by the Park Preservation Act. There are no Section 4(f) public resource types within the project vicinity. There are Section 4(f) resources eligible for the National Register of Historic Places (NRHP) within the project vicinity; however, the project would not "use" or otherwise affect them in any way, therefore resulting in a *de minimis* impact.

UTILITIES/EMERGENCY SERVICES

Affected Environment

Emergency services in the project area are provided by the California Highway Patrol, San Luis Obispo County Sheriff's Department, the San Luis Obispo County Fire Department, and Cal Fire.

The southernmost section of the project area is located within the incorporated City Limits of Pismo Beach, while most of the project area is located in unincorporated San Luis Obispo County. In this area it is expected that utilities will be served by both the City and other regional entities. The relative location of existing utility components, infrastructure or systems in the project area, including water, sewer, natural gas, electric power, and telecommunications has been determined. The County sent Requests for Utilities in the project area to various utility providers that may have facilities within the project area and have to potential to be impacted or relocated by the proposed project. Any existing utility component or facility that would be impacted by the project would be relocated or replaced in kind.

Environmental Consequences

Several of the above listed utility facilities have the potential to conflict with the proposed work, therefore it will be necessary to identify each utility facility in the field via potholing activities, and require that the facilities are protected in place, or relocated from the proposed project work area. The water line meter vault and sampling station may require relocation within the project impact area.

During project construction emergency service access and emergency access to PG&E's Diablo Canyon will be maintained. Traffic control will be in place throughout the project. Traffic will be separated from construction activities by various temporary railings. Access to Avila Beach Drive, Monte Road and Shell Beach Road will not be impacted.

Coordination between the Resident Engineer, responsible for construction and the local emergency service providers is a standard practice on construction sites. This coordination results in delay times being as minimal as possible in the event of an emergency vehicle needing access through the construction site.

The surrounding vicinity is served by CalFire for fire protection; however, no fire protection services exist within the project area and CalFire maintains a 0-5-minute emergency response time from the nearest fire station. The proposed project will maintain acceptable service ratios, response times or performance objectives for fire protection services, and therefore will have no impact.

The surrounding vicinity is served by the County Sheriff; however, no police stations or substations exist within the project area, and the nearest police protection services exist in the communities of Pismo Beach and San Luis Obispo. The proposed project will maintain acceptable service ratios, response times or performance objectives for police protection services, and therefore will have no impact.

Avoidance, Minimization, and/or Mitigation Measures

Coordination between the County and the utility companies will be conducted to ensure minimal disruption to services during project construction. Coordination will take place between the Resident engineer and local emergency service providers before and during project construction to minimize potential delays through the construction site.

Coordination will take place between the Caltrans Resident Engineer and local emergency service providers during project construction to minimize delays through the construction site.

TRAFFIC AND TRANSPORTATION/PEDESTRIAN AND BICYCLE FACILITIES

Regulatory Setting

The Department, as assigned by the FHWA, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of Federal-aid highway projects (see 23 CFR 652). It further directs that the special needs of the elderly and the disabled must be considered in all Federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the USDOT issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the USDOT regulations (49 CFR 27) implementing Section 504 of the Rehabilitation Act (29 USC 794). The FHWA has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to federal-aid projects, including Transportation Enhancement Activities.

California Street and Highway Code §§660-711, 670-695. Requires permits from County Public Works for any roadway encroachment during truck transportation and delivery, includes regulations for the care and protection of state and county highways and provisions for the issuance of written permits, and requires permits for any load that exceeds Caltrans weight, length, or width standards for public roadways.

SLOCOG Regional Transportation Plan. Contains goals and objectives for state highways, major local routes of significance, alternative transportation modes and strategies for transportation system and demand management. The Congestion Management Plan adopted by SLOCOG, has polices for integrating land use planning and transportation planning.

This project is being proposed to address traffic and transportation deficiencies by improving traffic operations, safety deficiencies, and multimodal (i.e., pedestrian and bicycle) access in the area. In general, when the County and Caltrans improve a road, the design includes all

necessary improvements to accommodate all roadway users. As such the latest edition of the following references will be used in the development and design of the roadway, interchange, and park-and-ride lot improvement:

- County Public Improvements Standards
- Caltrans Highway Design Manual
- Caltrans Standard Plans (CALSP)
- NCHRP Report 672, 2nd Edition (NCHRP 672)
- AASHTO Geometric Design of Highways and Streets
- AASHTO Roadside Design Guide
- 2017 SLOCOG Park & Ride Lot Study (PRLS)
- DIB 78
- County General Plan Circulation Element
- Area and Specific Plans
- County Sidewalk Ordinance
- County Bikeways Plan

Affected Environment

Avila Beach Drive and the SR-101/Avila Beach Drive interchange are heavily used for weekend travel between the beach community and surrounding cities, particularly during the summer months. The five-legged intersection of the southbound ramps, Avila Beach Drive, and Shell Beach Road (Figure 3) experiences operational issues during the weekend peak travel times and the summer tourist seasons. The intersection is currently operating at LOS D during the weekend peak period. The general increase in traffic, coupled with the anticipated future traffic from planned projects in the area, is forecast to degrade the southbound ramp terminal intersection from LOS D to F in the years from 2018 to 2032.

According to the Intersection Control Evaluation (ICE) Step 1 in support of the May 2016 PSR-PDS approved by Caltrans, the recommended control strategy at the southbound ramp terminal intersection was a yield (roundabout) controlled intersection. The roundabout design will convert the two closely spaced intersections of Avila Beach Drive, SR-101 southbound ramps, and Shell Beach Road to a single-lane roundabout. The ICE Step 2 (March 2019) includes engineering analyses of the control strategies advanced from ICE Step 1 and considered roundabout configurations that fit within the constrained site conditions and completed performance checks (design vehicle, fastest path, and sight distance). The ICE Step 2 validates the ICE Step 1 findings and concludes the roundabout is the optimal intersection form to serve non-motorized and motorized users. The roundabout will have entry speeds of less than 25 miles per hour and have adequate intersection stopping sight distance and corner sight distance. The roundabout will accommodate the Surface Transportation Assistance Act (STAA) vehicles without external truck aprons. All approaches of the roundabout will readily serve a California Legal 65-foot Truck for all through and turning movements. All approaches of the roundabout will allow a 45-foot bus & motorhome design vehicle to circulate all through and turning movements without tracking over the truck apron. Deflection on entry will introduce varying degrees of advance roadway curvature that create speed management features.

The LOS for the single lane roundabout can be summarized as:

- Overall LOS for future weekday a.m. and p.m. traffic conditions is A and B, respectively.
- Adequate to meet 2042 weekend as well as a.m. and p.m. forecast traffic (LOS B); the existing configuration (two-way stop control) will not.

- With the construction of the right-turn yield lane as detailed in the Traffic Report (March 2019), could operate until 2048 under the weekday and weekend peak hour volumes before exceeding the Caltrans' performance criteria of LOS C.

The ICE Step 2 Report analyzed crash report data from Caltrans Traffic Accident Surveillance and Analysis System and California Statewide Integrated Traffic Records System and found that the northbound ramp terminal intersections have more total crash rates compared to the state-wide average for similar facilities. A roundabout intersection would reduce crash frequency and severity compared to the existing two-way stop condition (by 61% to 83%). The roundabout at the southbound ramp terminal and associated treatments (e.g., reducing speeds and improving sight lines) at the northbound ramp terminal will eliminate the free flow condition for through movements passing under SR-101 and reduce travel speeds within the interchange. The combined use of advance warning signs, optical speed markings, and a curbed cross section will reinforce the transitioning roadway environment and encourage deceleration.

The roundabout will serve as a gateway and terminal vista for the Avila Beach and Pismo Beach communities while supporting an environment conducive to a park-and-ride facility and increased pedestrian and bicyclist activity. Bike lanes on Avila Beach Drive and Shell Beach Road will terminate in advance of the roundabout with bike ramps which will allow cyclists the option to 1) merge with vehicular traffic, take the lane, and navigate the roundabout as a vehicle; or, 2) exit the roadway using the bike ramp to the shared-use path and use the crosswalks as a pedestrian. Pedestrian and bicycle circulation through the roundabout have been accommodated with the use of shared use paths, bike ramps, bike lanes, and high-visibility crosswalks The shared use path is routed on the north side of the interchange to avoid conflicts with the southbound on-ramp and the northbound off-ramp.

The proposed park-and-ride lot will allow for a bicycle, pedestrian, transit, and motor vehicle interface that is consistent with planning for the area. As discussed in the 2017 SLOCOG Park and Ride Lot Study (PRLS), the location of a park-and-ride lot is the most important characteristic for success. The proposed location of this lot is close to freeway ramp terminals, has good visibility, and will be accessible to all modes of transportation from SR-101, Avila Beach Drive, and Shell Beach Road. This lot will accommodate a transit stop for the Pismo Trolley and an RTA bus. The design of the park-and-ride lot seeks to maximize parking capacity (26 paved angled parking spaces and 14 additional spaces in the unpaved overflow parking area), minimize conflict points, and optimize circulation for vehicles and transit buses. It will have a loading bay with three adjacent accessible (and ADA-compliant) parking with an accessible/ADA-compliant path provided between them.

Environmental Consequences

The project will result in beneficial impacts to the transportation and alternative transportation network through the construction of a more efficient intersection and congestion relief. Minor delays should be expected during construction of the project. With implementation of the roundabout corridor, average delays and LOS are expected to improve. This is true of the project individually and as part of the overall corridor improvements. The projects will not result in an increase in the local population and will not construct any facility that requires ongoing public safety services. Construction will result in minor traffic delays as lane closures are needed during construction. Construction of the project will involve temporary disturbance, partial or full closure of existing roadways, materials storage, and potentially the development of temporary contractor staging areas. The project does not conflict with any congestion management program or any plans or programs regarding public transit, bicyclist, or pedestrian facilities. The project would not result in any road closures and at least one lane of traffic will remain open during all phases of

construction.

Avoidance, Minimization, and/or Mitigation Measures

Mitigation/Conclusion. No significant traffic impacts were identified and features to benefit the transportation network here are incorporated into the design of the project. However, the following measure will be implemented:

TRANS-1. A Transportation Management Plan will be prepared in advance of construction that will provide detour routes and notification to the public, and emergency and medical providers in the project location of possible alternate access routes during possible lane closures.

VISUAL/AESTHETICS

Regulatory Setting

NEPA of 1969, as amended, establishes that the federal government use all practicable means to ensure all Americans safe, healthful, productive, and *aesthetically* (emphasis added) and culturally pleasing surroundings (42 USC 4331[b][2]). To further emphasize this point, the FHWA, in its implementation of NEPA (23 USC 109[h]), directs that final decisions on projects are to be made in the best overall public interest taking into account adverse environmental impacts, including among others, the destruction or disruption of aesthetic values.

CEQA establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of *aesthetic*, natural, scenic and historic environmental qualities" (CA Public Resources Code [PRC] Section 21001[b]).

Affected Environment

A Visual Impact Assessment (VIA) was documented in a technical report (May 2019) to assess the visual impacts of the proposed project. The existing visual context is characterized by hillsides covered in moderately dense vegetation surrounding the interchange, with more sparse vegetation and typical interchange signage and lighting in the immediate vicinity of the interchange. Campground facilities are present and partially visible northwest of the project area. The response viewers solicit to changes in their visual environment and change to visual resources determine the extent of visual impacts. Viewer sensitivity and response to change is expected to be moderate to moderate-high. In combination with the moderate to moderate-high sensitivity and response to change of the various viewer groups, the overall visual impact is characterized as moderate to moderate-high.

Avila Beach Drive and SR-101 are identified as Suggested Scenic Corridors, and the stretch of SR-101 through the project area is an Identified Community Separator. The areas of separation between the communities in the County are identified as typically rural and scenic. SR-101 is also eligible for designation as a State Scenic Highway.

Environmental Consequences

The project will alter (moderate change) the visual character of the project study area and surroundings by constructing a roundabout and new park-and-ride facility, increasing hardscape and nighttime lighting in the area. The project would maintain a similar scale and height as the existing intersection components and would not obstruct views of the surrounding hillsides and vegetation in the project study area. The project will increase the developed condition of the area and add to the diversity of the landscape by introducing more urbanized design features and nighttime lighting.

The project will alter (moderate change) the visual quality. The scale of the improvements would not interrupt views of the primary features of the landscape, but the roundabout and new park-and-ride facility would be prominent in certain views, and consequently would alter the intactness of some views. Increases in nighttime lighting and establishment of retaining walls would alter the overall vividness and unity of views of the surrounding landscape.

Visual impacts during phases of construction would include lighting to provide visibility for construction workers, roadside staging areas, and grading and removal of vegetation, which may result in dust generation. The intersection would remain in operation throughout construction and potential visual impacts during construction would be temporary and, therefore, low in degree.

There are no visual effects of public views to the shoreline or coastal resources.

Avoidance, Minimization, and/or Mitigation Measures

The following measures include features that would lessen the negative visual change to the corridor and reduce the project's visual impact by reducing the urbanizing effect of the project. However, some of the less than significant visual impacts would remain because of the increased hard surface, loss of vegetative character, and increased nighttime lighting. With implementation of the following measures, the project would be consistent with the aesthetic and visual resource protection goals along SR-101 and the community as defined by the State Scenic Highway goals as well as Coastal Act policies:

AES-1. Retaining walls will be designed to be aesthetically pleasing based on the stakeholder input process, incorporating locally appropriate context sensitive solutions to enhance their continuity with similar features used in the project site vicinity and local community, and to reduce their overall visual impact.

AES-2. A landscaping plan consisting of drought tolerant native species shall be planted within the first six months following project completion. Implementation of this plan shall be overseen for a period of 3 years by a qualified biologist or landscape architect.

AES-3. Native trees will be preserved and protected to the maximum extent feasible. Coast live oaks will be incorporated into the landscaping plant palette to be planted within the project area at the end of construction.

AES-4. A signage plan shall consolidate signs as appropriate, avoid redundancy and locate traffic control cabinets out of sight. A lighting plan shall require project lighting to be appropriately shielded, eliminate redundancy of lighting standards and use context sensitive street lighting designs. The plan will be consistent with Caltrans and County lighting guidelines and standards, developed in compliance

with the Illuminating Engineering Society's design guidelines and International Dark-Sky Association approved lighting features.

CULTURAL RESOURCES

Regulatory Setting

The term "cultural resources," as used in this document, refers to the "built environment" (e.g., structures, bridges, railroads, water conveyance systems, etc.), places of traditional or cultural importance, and archaeological sites (both prehistoric and historic), regardless of significance. Under federal and state laws, cultural resources that meet certain criteria of significance are referred to by various terms including "historic properties," "historic sites," "historical resources," and "tribal cultural resources." Laws and regulations dealing with cultural resources include:

The National Historic Preservation Act (NHPA) of 1966, as amended, sets forth national policy and procedures for historic properties, defined as districts, sites, buildings, structures, and objects included in or eligible for listing in the NRHP. Section 106 of the NHPA requires federal agencies to take into account the effects of their undertakings on historic properties and to allow the Advisory Council on Historic Preservation (ACHP) the opportunity to comment on those undertakings, following regulations issued by the ACHP (36 CFR 800). On January 1, 2014, the First Amended Section 106 Programmatic Agreement (PA) among the FHWA, the ACHP, the California State Historic Preservation Officer (SHPO), and the Department went into effect for Department projects, both state and local, with FHWA involvement. The PA implements the ACHP's regulations, 36 CFR 800, streamlining the Section 106 process and delegating certain responsibilities to the Department. The FHWA's responsibilities under the PA have been assigned to the Department as part of the Surface Transportation Project Delivery Program (23 USC 327).

The Archaeological Resources Protection Act (ARPA) applies when a project may involve archaeological resources located on federal or tribal land. The ARPA requires that a permit be obtained before excavation of an archaeological resource on such land can take place.

CEQA requires the consideration of cultural resources that are historical resources and tribal cultural resources, as well as "unique" archaeological resources. California PRC Section 5024.1 established the California Register of Historical Resources (CRHR) and outlined the necessary criteria for a cultural resource to be considered eligible for listing in the CRHR and, therefore, a historical resource. Historical resources are defined in PRC Section 5020.1(j). In 2014, Assembly Bill 52 (AB 52) added the term "tribal cultural resources" to CEQA, and AB 52 is commonly referenced instead of CEQA when discussing the process to identify tribal cultural resources (as well as identifying measures to avoid, preserve, or mitigate effects to them). Defined in PRC Section 21074(a), a tribal cultural resource is a CRHR or local register eligible site, feature, place, cultural landscape, or object which has a cultural value to a California Native American tribe. Tribal cultural resources must also meet the definition of a historical resource. Unique archaeological resources are referenced in PRC Section 21083.2.

PRC Section 5024 requires state agencies to identify and protect state-owned historical resources that meet the NRHP listing criteria. It further requires the Department to inventory state-owned structures in its rights-of-way. Sections 5024(f) and 5024.5 require state agencies to provide notice to and consult with the SHPO before altering, transferring, relocating, or demolishing state-owned historical resources that are listed on or are eligible for inclusion in the NRHP or are registered or eligible for registration as California Historical Landmarks.

Procedures for compliance with PRC Section 5024 are outlined in a MOU[1] between the Department and SHPO, effective January 1, 2015. For most Federal-aid projects on the State Highway System, compliance with the Section 106 PA will satisfy the requirements of PRC Section 5024.

Affected Environment

An Archaeological Survey Report (ASR) was completed in March 2019 (Laurie, 2019). As part of the ASR preparation, a records search from the California Historical Resources Information System (CHRIS) Central Coast Information Center (CCIC), located at the University of California, Santa Barbara was requested on March 20, 2018. The CCIC completed the records search on April 9, 2018. The California Native American Heritage Commission (NAHC) was contacted on March 20, 2018, requesting a search of their Sacred Lands File for traditional cultural resources. The NAHC provided a list of 10 Native American groups and/or individuals who may have knowledge about cultural resources in the area. A letter requesting information to these contacts was sent on October 19, 2018. Follow-up correspondence (email and phone calls were made on November 28 and 29, 2019. Assembly Bill 52 Native American Consultation Request letters were sent to 17 Native American groups and/or individuals on October 18th, 2018. An intensive pedestrian survey of the archaeological Area of Potential Effects was conducted on May 2 and 3, 2018.

The purpose of the project APE is to assist in the location and identification of significant cultural resources that may be listed in, determined eligible for, or appear to be eligible for listing in the NRHP and/or CRHR that may be affected, either directly or indirectly, by the proposed project. The archaeological APE includes approximately 15.25 acres consisting of ROW for the proposed project, all areas of ground disturbance, habitat mitigation area, and potential staging areas. Staging is proposed within either paved areas or previously disturbed areas and will not require improvements (ex. grading, leveling, graveling). Depths of disturbance will vary from less than 1 foot in temporary use areas and potentially greater than 10 feet for retaining wall construction and utility relocation.

The CCIC records searches revealed that two previously conducted studies overlapped with a small (less than 10%) portion of the APE, an additional 126 studies have been conducted within 0.5 mile of the APE. None of the 128 studies on file with the CCIC identified archaeological resources within or adjacent to the APE. In addition to the CCIC reports on file, a *Negative Historic Property Survey Report* (HPSR) was conducted and prepared by Caltrans (Levulett, 2002) for proposed improvements within the Caltrans ROW from post mile 13.2 to 21, on SR-101, which overlaps with 95% of the current project's APE, during separate field efforts in 2000 and 2001. No archaeological resources were identified within or adjacent to the APE as a result of those field surveys and therefore resulted in a finding of "No Historic Properties Affected". An additional ASR was prepared for the proposed Avila Park and Ride (Ballantyne, 2011) which falls within the current project's APE and resulted in negative archaeological findings.

No significant resources exist within the project's APE. Nine previously identified archaeological resources exist within 0.5 mile of the APE but will not be impacted as part of this project. Of the nine resources, eight are located greater than 0.25 mile from the APE. A large archaeological resource exists in the vicinity and remains highly sensitive to Northern Chumash Groups and Individuals. Details of the survey are documented in the ASR (Laurie, 2018).

[1] The MOU is located on the SER at http://www.dot.ca.gov/ser/vol2/5024mou_15.pdf

Previous studies did not identify any historical built resources eligible for listing in the National Register. One bridge within the project limits (Avila Road UC, Bridge Number 49-0191) has been previously evaluated and determined as a Category 5 bridge (not eligible for listing in the NRHP) on the Caltrans Historic Highway Bridge Inventory. Similarly, the bridge does not meet the criteria for listing in the CRHR and is not a historical resource for the purposes of CEQA.

One additional property located outside of the project area (Avila Hot Springs Resort) was determined not to be directly or indirectly impacted as part of the proposed project. A Historic Resource Evaluation Report was not required as part of this project as no historical properties, historic sites, or historical resources are located within the APE, resulting in a finding of "No Historic Properties Affected".

Environmental Consequences

Within the project APE, there are no cultural resources that have been determined eligible for inclusion to the NRHP. Thus, the project has a "No Historic Properties Affected" finding. Overall, the project (undertaking) as whole has no effect on historic properties.

Consultation with SHPO

Under the *First Amended Programmatic Agreement among the Federal Highway Administration, the Advisory Council on Historic Preservation, the California State Historic Preservation Officer, and the California Department of Transportation Regarding Compliance with Section 106 of the National Historic Preservation Act, as it Pertains to the Administration of the Federal-Aid Highway Program in California* (Section 106 PA) (Caltrans 2014), Caltrans is responsible for compliance with Section 106 of the NHPA.

The Native American Heritage Commission was contacted on March 20th, 2018, requesting a search of their Sacred Lands File for traditional cultural resources. The NAHC responded on March 21st, 2018, indicating the results of the Sacred Lands File search were negative. The NAHC also provided a list of 10 Native American groups. Letters were mailed to these contacts on October 19th, 2019 in support of the Section 106 process. Follow-up calls and emails were made on November 28th and 29th, 2018.

Native American Outreach and Caltrans coordination determined that the shell scatter isolated find did not constitute an intact or culturally significant site. Therefore, there are no historic properties affected (no sites or eligible bridges within the project area) and the project is exempt from evaluation as described in the Programmatic Agreement between FWHA and SHPO.

Assembly Bill 52 Native American Consultation letters were sent to 17 Native American groups and/or individuals on October 18th, 2018. The following tribes requested consultation, and/or provided comments for the proposed project:

- Northern Chumash Tribal Council - responded by email on October 22nd, 2018 and requested consultation.
- Salinan Tribe - responded by email on November 9th, 2018 and requested consultation and that a Native American monitor be present during ground disturbing activities.
- Santa Ynez Band of Chumash Indians - responded by telephone on November 7th, 2018, and deferred comments to the local tribes.
- Xolon Salinan Tribe - responded by email on November 4th, 2018 with no comments.

- *yak tityu tityu yak tilhini* Northern Chumash Tribe of San Luis Obispo County and Region - responded via email on November 27th, 2018 and requested consultation and recommended that an archaeologist and a Northern Chumash monitor be present during excavation.

Section 4(f) of the 1966 Department of Transportation Act prohibits use of land from any historic property on or eligible for the NRHP unless there is no feasible and prudent alternative to the use of land from the affected historic property *and* the project includes all possible planning to minimize harm. The implementing regulations for Section 4(f) appear in 23 CFR 774. No historic properties, or protected Section 4(f) resources exist in the project APE.

Avoidance, Minimization, and/or Mitigation Measures

The following measures include will ensure the project has less than significant impact on cultural resources:

Arch-1. Due to the archaeological sensitivity of the project area, and the potential to encounter previously disturbed cultural materials during construction, an archaeological briefing will be conducted prior to construction. The briefing will alert construction crews of the possibility of unearthing cultural materials and the appropriate process to follow.

Arch-2. If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find. Additional archaeological reconnaissance survey will be needed if project limits are extended beyond the present survey limits.

Arch-3. If human remains are discovered, California Health and Safety Code (H&SC) Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), who, pursuant to PRC Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact Keith Miller, Environmental Division Manager at 805-781-5714 and Damon Haydu, Caltrans District 5 Archaeologist at 805-542-4799 so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.

Physical Environment

WATER QUALITY AND STORM WATER RUNOFF

Regulatory Setting

Federal Requirements: Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (U.S.) from any point source[2] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act (CWA). Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the NPDES permit scheme. The following are important CWA sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.

- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).

- Section 402 establishes the NPDES, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards (RWQCBs) administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).

- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers (USACE).

The goal of the CWA is “to restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of the USACE’s Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. Environmental Protection Agency’s (U.S. EPA) Section 404 (b)(1) Guidelines (40 CFR Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE and allow the discharge of dredged or fill material into the

[2] A point source is any discrete conveyance such as a pipe or a man-made ditch.

aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the Guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The Guidelines also restrict permitting activities that violate water quality or toxic effluent[3] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the USACE, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 CFR 320.4. A discussion of the LEDPA determination, if any, for the document is included in the Wetlands and Other Waters section.

State Requirements: Porter-Cologne Water Quality Control Act

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the CWA and regulates discharges to waters of the state. Waters of the state include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined, and this definition is broader than the CWA definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the CWA.

The State Water Resources Control Board (SWRCB) and RWQCBs are responsible for establishing the water quality standards (objectives and beneficial uses) required by the CWA and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable RWQCB Basin Plan. In California, RWQCBs designate beneficial uses for all water body segments in their jurisdictions and then set criteria necessary to protect those uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the SWRCB identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with CWA Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (NPDES permits or WDRs), the CWA requires the establishment of Total Maximum Daily Loads (TMDLs). TMDLs specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The SWRCB administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, TMDLs, and NPDES permits. RWCQBs are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

[3] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

- **National Pollutant Discharge Elimination System (NPDES) Program**

  Municipal Separate Storm Sewer Systems (MS4)

  Section 402(p) of the CWA requires the issuance of NPDES permits for five categories of storm water discharges, including MS4s. An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or used for collecting or conveying storm water." The SWRCB has identified the Department as an owner/operator of an MS4 under federal regulations. The Department's MS4 permit covers all Department rights-of-way, properties, facilities, and activities in the state. The SWRCB or the RWQCB issues NPDES permits for five years, and permit requirements remain active until a new permit has been adopted.

  The Department's MS4 Permit, Order No. 2012-0011-DWQ (adopted on September 19, 2012 and effective on July 1, 2013), as amended by Order No. 2014-0077-DWQ (effective July 1, 2014) and Order No. 2015-0036-EXEC (effective April 7, 2015) has three basic requirements:

  1. The Department must comply with the requirements of the Construction General Permit (see below);

  2. The Department must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and

  3. The Department storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) Best Management Practices (BMPs), to the maximum extent practicable, and other measures as the SWRCB determines to be necessary to meet the water quality standards.

  To comply with the permit, the Department developed the Statewide Storm Water Management Plan (SWMP) to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The SWMP assigns responsibilities within the Department for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The SWMP describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of BMPs. The proposed project will be programmed to follow the guidelines and procedures outlined in the latest SWMP to address storm water runoff.

  Construction General Permit

  Construction General Permit, Order No. 2009-2009-DWQ (adopted on September 2, 2009 and effective on July 1, 2010), as amended by Order No. 2010-0014-DWQ (effective February 14, 2011) and Order No. 2012-0006-DWQ (effective on July 17, 2012). The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must

comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the RWQCB. Operators of regulated construction sites are required to develop Storm Water Pollution Prevention Plans (SWPPPs); to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective SWPPP. In accordance with the Department's SWMP and Standard Specifications, a Water Pollution Control Program (WPCP) is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the CWA, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are CWA Section 404 permits issued by the USACE. The 401 permit certifications are obtained from the appropriate RWQCB, dependent on the project location, and are required before the USACE issues a 404 permit.

In some cases, the RWQCB may have specific concerns with discharges associated with a project. As a result, the RWQCB may issue a set of requirements known as WDRs under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. WDRs can be issued to address both permanent and temporary discharges of a project.

Affected Environment

A Water Quality Assessment has determined that no water quality impacts are anticipated for the project. The project is near, but does not include, a realigned engineered unnamed tributary to San Luis Obispo creek (associated with Gragg Canyon). This section of creek travels 2.5 miles before discharging into Port San Luis. Grading, paving, and vegetation grubbing are activities that could generate stormwater pollutants. Standard construction practices such as linear barriers, waste management procedures, and other Best Management Practices (BMPs) should be incorporated into the plans to minimize potential risk of runoff from construction activities. The project will increase the net area of impervious surface, mostly as a result of the park-and-ride lot. Because the project will result in over one acre of soil disturbance, a SWPPP will be required and implemented. By incorporating proper and accepted engineering controls, BMPs, and implementing a SWPPP, the project will not result in significant impacts to water quality. A Water Quality Memorandum of Assumptions (WQMOA) has been developed (Campbell, 2018). The intent of the WQMOA is early identification for discussion and concurrence of the Post Construction Treatment BMPs for the project, with consideration of each agency's requirements.

The project area is located within the Sea Canyon Watershed, and San Luis Obispo Avila Water Planning Area (GeoView). The estimated mean annual precipitation for the Lower San Luis Obispo Creek Watershed is 19.9 inches (GeoView). The WQMOA determined that the project APE contains four hydrologic soils groups: Elder sandy loam (2 to 5 percent slopes), Lopez very shaly clay loam (30 to 75 percent slopes), Santa Lucia channery clay loam (30 to 50 percent slopes, MLRA 15), and Xerets-Xerolls-Urban land complex (0 to 15 percent slopes). The proposed Park and Ride falls within Watershed Management Zone – 1, as demarcated by the NPDES. The project area does not appear to be located in a mapped ground water basin as demarcated by the Department of Water Resources (DWR).

Environmental Consequences

Agency Jurisdiction

Both Caltrans and the County have storm water programs and regulations which implement orders by the SWRCB. Within each jurisdiction, water quality requirements are evaluated according to the respective SWRCB orders and based on an evaluation of existing and proposed surface areas for various components. It is anticipated that the ROW line between Caltrans and County will be adjusted to fit the project, and that the water quality regulations would be evaluated based on the adjusted ROW line.

Existing Drainage Facilities

Existing storm drains exist in the project area. Caltrans culvert inspection reports indicate that the existing Caltrans 60-inch corrugated metal pipe (CMP) culvert (MP 21.19) is partially filled with sediment at the downstream end. This culvert receives flows from both the east side of the interchange as well as from a cross culvert at Avila Beach Drive. From those outlets the flows continue to the northwest in an overland swale and mix with other overland flows to then enter the inlet for the culvert crossing Avila Beach Drive. Flows collected in that existing inlet are conveyed north across Avila Beach Drive and into the 60-inch CMP upstream of the 60-inch CMP outlet. It is anticipated that this flow path will be maintained with the overland flow conveyed in new culverts to allow the construction of the Park and Ride facility. Maintenance of the culvert and/or drainage will be the responsibility of the County and any future sediment removal will be performed as a maintenance activity and is not part of the interchange project. Specifically, this project does not include improvements at either the inlet or outlet areas of the 60-inch culvert system.

Stormwater Treatment Areas- Caltrans ROW

The requirements for storm water quality treatment will be evaluated based on the Caltrans Stormwater Project Planning and Design Guide and related documents. A preliminary Storm water data Report (SWDR) has been prepared by Caltrans and this will be revised and updated as the project design is refined. Design strategies that may reduce the thresholds that trigger treatment requirements include: utilizing existing pavement to reduce Replaced Impervious Surfaces (RIS), utilizing bike lane and pedestrian pathway exemptions to reduce the post project impervious surface under consideration, and utilizing pervious surfaces where feasible.

A review of the preliminary project design and the preliminary SWDR indicates that there is a slight possibility that these considerations will reduce the project’s postconstruction runoff control thresholds to a level where treatment facilities are not required within the Caltrans ROW, but that it is more likely that area thresholds that trigger requiring treatment facilities will be

reached. This will be confirmed either way as the design progresses. Within the Caltrans ROW, there are two areas of interest for Treatment BMP's (TBMP): along the northbound offramp and within the gore space between the southbound onramp and the Shell Beach Road

Storm Water Treatment Areas – County Row

The requirements for storm water quality treatment will be evaluated based on the RWQCB Board Orders and the County Post Construction Requirements Handbook (PCRH). A Park and Ride facility is proposed in the southwest quadrant of the project limits. The Park and Ride site is within an MS4 area, in Watershed Management Zone 1 (WMZ-1) and does not overlie a DWR mapped groundwater basin. New and replaced impervious surfaces are expected to exceed 22,500 sf. Based on this, it is anticipated that the project will be required to meet Performance Requirements 1, 2,3, and 4 of the PCRH:

- Performance Requirement 1 "Site Design and Runoff Reduction"
- Performance Requirement 2 "Water Quality Treatment"
- Performance Requirement 3 "Runoff Retention"
- Performance Requirement 4 "Peak Management"

It is anticipated that there will be limited room in that County ROW for treatment and retention BMP's. Only the west side of the proposed Park and Ride location has potential room for retention. Runoff to the north side of Avila Beach Drive is proposed to not be retained, but the retention be accounted for on the south side with additional volume. If required, low flow runoff from the north side could be delivered to the south side in a new storm drain. Within the Park and Ride site, the parking spaces (or portions of them) could be constructed of pervious materials to lessen the impervious area and also potentially to provide runoff retention. The driving lanes, and accessible parking spaces are anticipated to be paved. The Hydrologic Soil Group of this area has not been identified by the Natural Resources Conservation Service and the infiltration capability should be tested identified to verify the viability of infiltration BMPs. The County has also anticipated that the use of underground infiltrator systems may be a viable option as Road Side Infiltrator (RSI) systems has become more widespread and successfully implemented by the County.

Storm Water Quality Coordination

In general, it seems that the project can be developed with each jurisdiction addressing its own storm water quality requirements within its own right of way. Some small tributary area trade-offs are approximately equal and reduce project complexity.

There appears to be adequate room in Caltrans ROW to include the potential TBMPs without directly affecting proposed project geometrics. For the Park and Ride, the space available for TBMPs is limited. Addressing the TBMPs will affect and need to be integrated into the Park and Ride layout, such as using pervious surfaces or reducing the footprint. This will be evaluated more fully as the design progresses and the infiltration testing is performed. Small areas may drain from paved areas across the ROW line as they do now. If the project is required to separate Caltrans drainage flow from Park and Ride treatment flow, the Caltrans storm drains that currently exit onto the Park and Ride site should be extended to connect directly to the existing storm drain crossing Avila Beach Drive. All area flows eventually drain away from Caltrans ROW and into the County ROW.

Avoidance, Minimization, and/or Mitigation Measures

In addition to the measure below, implementation of the measures specified in the Biological Resources Section will ensure that the are no impacts to hydrology or water quality:

WQ-1: A Stormwater Pollution Prevention Plan will be prepared to minimize on-site sedimentation and erosion.

GEOLOGY/SOILS/SEISMIC/TOPOGRAPHY

Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under the CEQA.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. Structures are designed using the Department's Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see the Department's Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

The following relates to the geologic aspects or conditions within the project site:

Topography: Nearly Level with downward sloping trends from the elevated north-bound and south-bound US 101 off-ramps.

Within County's Geologic Study Area: No

Geologic Formations: Miguelito Member of Pismo Formation (Tpm)- Low Liquefaction Potential; Latest Pleistocene to Holocene alluvium, undifferentiated (Qa)- Moderate Liquefaction Potential; Gragg Member of Pimso Formation (Tpg)- Low Liquefaction Potential.

The project site is located within the southern portion of the Coast Ranges Geological Province on the southwestern margin of the San Luis Range which is a prominent west-northwest trending topographic and structural high that is one of several structural blocks of the Los Osos/Santa Maria tectonic domain. The project site is directly underlain by unconsolidated sediments and bedrock.

Landslide Risk Potential: Moderate to High Potential

Liquefaction Potential: Low to Moderate Potential

Nearby potentially active faults: Yes, one existing fault that is classified as "Potentially Capable Inferred" is located in close proximity to the project area. This fault is located approximately 3.5 miles west from a second fault that is classified as "Capable."

Distance from Faults: The project area is located approximately 0.4 mile east of a “Potentially Capable Inferred” fault line. The project area is located approximately 3.07 miles southwest from the nearest section of a “Capable” classified fault, which is located just south of the city of San Luis Obispo.

Area known to contain serpentine or ultramafic rock or soils: No serpentine or ultramafic rock or soils are located within or adjacent to the project area.

Soils: Xererts -Xerolls-Urban land complex, 0 to 15 percent slopes. This complex consists of nearly level to strongly sloping soils and miscellaneous areas that are covered by urban structures. The soil materials have been modified by earthmoving equipment or covered by urban structures so that much of their original shape and physical characteristics have been altered.

Shrink/Swell potential of soil: Dependent upon changes in moisture content- has slow permeability. When used for urban development, the shrink-swell potential of the Xererts soils and the Xerolls subsoils and the very slow and slow permeability of the Xerolls subsoil need to be considered in the design and building of foundations, concrete structures, and paved area. These limitations can be minimized by backfilling, using blankets of crushed rock and sand beneath concrete structures, using vapor barriers and diverting runoff away from structures. Replanting disturbed areas as soon as possible helps to control erosion.

The project site is not within the County Geologic Study Area designation or within a high liquefaction area. Potential sedimentation and erosion issues will be addressed in the SWPPP (or Water Pollution Control Plan [WPCP]), which will be prepared for the project. Likewise, a Hazardous Materials Prevention and Response Plan will be prepared to allow for a prompt and effective response to any accidental spills, should they occur. These plans are also required to avoid and minimize potential impacts to state and federally jurisdictional waters and other sensitive habitat types present on-site.

The project site has a low to high potential for landslides and liquefaction. It is situated in relatively close proximity to one existing “Capable Inferred” faults and one “Capable” fault. However, these factors are insignificant because project implementation does not entail any permanent impacts from new development.

Environmental Consequences

The APE consists of approximately 15.25 acres. Preliminary calculations indicate that implementation of the project has potential to result in approximately 3.4 acres of permanent ground disturbance and approximately 2.2 acres of temporary ground disturbance. However, most of the potential disturbance will be limited to the construction phase of the project. No permanent impacts to geology and soils will occur. Potential sedimentation and erosion issues will be addressed, avoided, and minimized through implementation of the SWPPP or WPCP and Hazardous Materials Prevention and Response Plan that will be prepared for the project prior to construction (refer to the Biological Resources section). Implementation of the project will improve the structural integrity of the slopes around the interchange with installation of retaining walls and improved onsite drainage. There is no indication at this time that standard measures to address geologic hazards (e.g., compliance with American Association of State Highway and Transportation Officials [AASHTO] standards) will be required for this project. Consistent with Caltrans policy, a geotechnical study will be prepared to provide guidance for project design. Technical justification for the project design and explanations of the associated assessments conducted in support of the project will be provided in the forthcoming Geotechnical study and report expected before early 2020.

Development of the project would meet or exceed the most current requirements of the American Association of State Highway and Transportation Officials (AASHTO), which have been developed to establish the minimum requirements necessary for project design to safeguard the public health, safety and general welfare through structural strength, stability, access, and other standards. The project would be designed to meet Caltrans SDC and AASHTO Standards.

Compliance with AASHTO, Caltrans, and other applicable standards typically indicates that risks to people and structures, including those related to unstable soil conditions, were properly safeguarded against. Through compliance with these current standards, the project will be designed to withstand anticipated seismic and geologic stresses according to current established engineering practices. Therefore, potential impacts related to unstable soil conditions are considered less than significant.

Avoidance, Minimization, and/or Mitigation Measures

The project site is located within the Avila Beach MS4 coverage area. Projects involving more than one acre of disturbance are subject to preparing a SWPPP to minimize on-site sedimentation, runoff and erosion.

Although SWPPP and geotechnical studies will be required, no significant impacts to geology and soils are anticipated and no mitigation measures are required.

PALEONTOLOGY

Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils. Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or un-mineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Paleontological resources include not only the fossils themselves, but also the physical characteristics of the fossils' associated sedimentary matrix. Fossils are considered nonrenewable resources because the organisms they represent no longer exist.

A number of federal statutes specifically address paleontological resources, their treatment, and funding for mitigation as a part of federally authorized projects.

Paleontological resources are limited, nonrenewable resources of scientific, cultural, and educational value and are afforded protection under federal and state laws and regulations. This analysis conducted as part of the project also complies with guidelines and significance criteria specified by the Society of Vertebrate Paleontology (SVP) (1995, 2010).

CEQA is the principal statute governing environmental review of projects occurring in the state and is codified at PRC Section 21000 et seq. CEQA requires lead agencies to

determine if a proposed project would have a significant effect on the environment, including significant effects on paleontological resources. The current State CEQA Guidelines define procedures, types of activities, persons, and public agencies required to comply with CEQA, and include the following as one of the questions to be answered in the Appendix G Environmental Checklist: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?"

Requirements for paleontological resource management are included in the PRC Division 5, Chapter 1.7, Section 5097.5, and Division 20, Chapter 3, Section 30244, which states:

> *No person shall knowingly and willfully excavate upon, or remove, destroy, injure or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.*

These statutes prohibit the removal, without permission, of any paleontological site or feature from lands under the jurisdiction of the state or any city, county, district, authority, or public corporation, or any agency thereof. Consequently, local agencies are required to comply with PRC 5097.5 for their own activities, including construction and maintenance, as well as for permit actions (e.g., encroachment permits) undertaken by others. PRC Section 5097.5 also establishes the removal of paleontological resources as a misdemeanor and requires reasonable mitigation of adverse impacts to paleontological resources from developments on public (state, county, city, and district) lands.

The Conservation and Open Space Element of the County General Plan (2010) states as one of its intents the "increased protection of . . . paleontological and other cultural features that contribute to 'sense of place'" (County of San Luis Obispo 2010:18).
The General Plan identifies the following cultural resources goal relating to paleontological resources and relevant to the current project:

> ***Goal CR 4.5****: Protect paleontological resources from the effects of development by avoiding disturbance where feasible.*

Under this goal, the County identifies two strategies for implementation:

> ***Implementation Strategy CR 4.5.1 Paleontological Studies****: Require a paleontological resource assessment and mitigation plan to 1) identify the extent and potential significance of the resources that may exist within the proposed development and 2) provide mitigation measures to reduce potential impacts when existing information indicates that a site proposed for development may contain biological, paleontological, or other scientific resources.*
>
> ***Implementation Strategy CR 4.5.2 Paleontological Monitoring****: Require a paleontologist and/or registered geologist to monitor site-grading activities when paleontological resources are known or likely to occur. The monitor will have the authority to halt grading to determine the appropriate protection or mitigation measures. Measures may include collection of paleontological resources, curation of any resources collected with an appropriate repository, and documentation with the County.*

16 USC 431-433 (the “Antiquities Act”) prohibits appropriating, excavating, injuring, or destroying any object of antiquity situated on federal land without the permission of the Secretary of the Department of Government having jurisdiction over the land. Fossils are considered “objects of antiquity” by the Bureau of Land Management, the National Park Service, the Forest Service, and other federal agencies.

16 USC 461-467 established the National Natural Landmarks (NNL) program. Under this program property owners agree to protect biological and geological resources such as paleontological features. Federal agencies and their agents must consider the existence and location of designated NNLs, and of areas found to meet the criteria for national significance, in assessing the effects of their activities on the environment under NEPA.

16 USC 470aaa (the Paleontological Resources Preservation Act) prohibits the excavation, removal, or damage of any paleontological resources located on federal land under the jurisdiction of the Secretaries of the Interior or Agriculture without first obtaining an appropriate permit. The statute establishes criminal and civil penalties for fossil theft and vandalism on federal lands.

23 USC 1.9(a) requires that the use of Federal-aid funds must be in conformity with all federal and state laws.

23 USC 305 authorizes the appropriation and use of federal highway funds for paleontological salvage as necessary by the highway department of any state, in compliance with 16 USC 431-433 above and state law***.***

Under California law, paleontological resources are protected by CEQA.

Affected Environment

A paleontological investigation and associated report were conducted and prepared in May 2019 (Bell 2019). The report is based on a desktop review of available scientific literature, geologic maps, a records search from the Natural History Museum of Los Angeles County, and a review of the online collections database of the University of California Museum of Paleontology. This report conforms to industry standards as developed by the SVP (1995, 2010). The purpose of the analysis was to: (1) determine whether any previously recorded fossil localities occur in the project area; (2) assess the potential for disturbance of these localities during construction; and (3) evaluate the paleontological sensitivity of the project area.

The project area is located on the eastern side of the San Luis Mountains, at the opening of Gragg Canyon and near San Luis Obispo Creek. Recent sedimentation to the site is sourced from the nearby mountains and deposited by San Luis Obispo Creek. The geology in the vicinity of the project area has been mapped. The surficial geology of the project area is mapped as primarily Younger Alluvium (Qa), with outcrops of the Pismo Formation occurring along the north and south margins. These sediments are associated with valley floors but are too young to preserve fossil resources in the upper layers, but deeper layers of the deposit may be of an age to preserve fossil resources (i.e., over 5,000 years old, as per the SVP 2010). While the exact depth at which the transition to older sediments is not known, fossils have been discovered in valley settings as shallow as 5–10 feet below the surface in similar sediments. Younger Alluvium is therefore assigned low-to-high paleontological sensitivity, increasing with depth. The entire project area is situated on fill from when the freeway and interchange was originally constructed. The amount of fill varies in depth around the project area, but some areas (near the overpass) can be over sixty feet deep.

The Pismo Formation, including the Squire Sandstone, Gregg Member, and Miguelito Member, are assigned high paleontological sensitivity.

Environmental Consequences

Given the highly disturbed project locality it is unlikely that 'original ground' (i.e., native material) that could potentially contain paleontological resources will be disturbed as there is documented evidence of up to 60 feet of fill in the project area.

Avoidance, Minimization, and/or Mitigation Measures

As currently designed, it is unlikely that the project would impact paleontological resources. The following mitigation measure has been developed in accordance with the SVP (2010) standards and meets the paleontological requirements of CEQA and the guidelines of the County General Plan. This measure has been used throughout California and have been demonstrated to be successful in protecting unanticipated paleontological resources while allowing timely completion of construction.

PALEO-1: Once a final design for the project has been determined, and prior to construction, a Project Paleontologist (meeting SVP standards) will prepare a Paleontological Resources Monitoring and Mitigation Plan (PRMMP). This PRMMP will include development of a Worker's Environmental Awareness Program for project personnel, and will address specifics of monitoring (e.g., when and where monitoring is needed, the level of effort needed, Native American involvement, etc.), if needed. The PRMMP will also include the process to be followed in the event of a fossil discovery. The Project Paleontologist will also prepare a report of the findings of the PRMMP after construction is completed.

HAZARDOUS WASTE/MATERIALS

Regulatory Setting

Hazardous materials, including hazardous substances and wastes, are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health, and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) of 1980, and the Resource Conservation and Recovery Act (RCRA) of 1976. The purpose of CERCLA, often referred to as "Superfund," is to identify and cleanup abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act of 1992
- Clean Water Act
- Clean Air Act

- Safe Drinking Water Act
- Occupational Safety and Health Act
- Atomic Energy Act
- Toxic Substances Control Act
- Federal Insecticide, Fungicide, and Rodenticide Act

In addition to the acts listed above, EO 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires cleanup of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and cleanup of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

Affected Environment

The information in this section is from the Initial Site Assessment (ISA) (May 2019) and Preliminary Site Investigation (PSI) (April 2019) prepared for the project. The ISA includes a review of federal, state, and local regulatory records for reports of hazardous wastes, as well as a visual inspection of the project site from publicly accessible sidewalks and streets to check for evidence of potential environmental concerns such as debris piles, leaks, or stains, monitoring wells or evidence of ongoing environmental work, chemical storage, poor housekeeping, active underground storage tanks, aboveground storage tanks, or dry cleaners with onsite storage of solvents. The objective of the PSI was to assess the shallow soils within the project within the State ROW that are proposed to be disturbed by grading activities for the presence of aerially deposited lead (ADL), and to compare the results of soil sample analytical results to applicable regulatory thresholds regarding handling and re-use/disposal.

Adjacent land uses include U.S. Highway 101, agriculture (grazing land), a hot springs facility and undeveloped land. The study area contains lead contamination in the soil from motor vehicle exhaust. Past uses of the surrounding area are not readily apparent based on the site assessment. The project site contains no structures. No hazardous substances, storage tanks, odors, drums, unidentified substance containers, indication of polychlorinated biphenyls, or other conditions of concern were identified during site assessment.

According to the National Pipeline Mapping Service (NPMS) online map viewer, there is an active hazardous liquid pipeline (4.55 miles in length) containing crude oil located along Avila Beach Drive. In addition, there is an active natural gas pipeline (0.73 mile in length) located

along Shell Beach Road. No unauthorized releases were identified on the NPMS website or in other online databases.

Based on a sampling report of ADL conducted in February 2019, ADL was detected at the subject property. However, based on the statistical analysis using the 95 percent Upper Confidence Limit (UCL) for lead and for soluble lead, the detected concentrations of lead are low enough that the soil can be reused onsite as “clean” soil.

Environmental Consequences

ADL Contamination

ADL from the historical use of leaded gasoline, exists along roadways throughout California. There is the likely presence of soils with elevated concentrations of lead as a result of ADL on the state highway system right of way within the limits of the project alternatives. Soil determined to contain lead concentrations exceeding stipulated thresholds must be managed under the July 1, 2016, ADL Agreement between Caltrans and the California Department of Toxic Substances Control (DTSC). This ADL Agreement allows such soils to be safely reused within the project limits as long as all requirements of the ADL Agreement are met.

In July 2018 and January 2019, soil samples were collected at 23 locations at the surface, and between 1 and 2 feet below ground surface depending on site conditions and refusal. A total of 57 samples were submitted to the laboratory to be chemically analyzed for total lead by EPA Method 6010. A total of 13 samples were further analyzed for Soluble Threshold Limit Concentration (STLC) by a California Waste Extraction Test. Six of the 13 samples were further analyzed by the Toxicity Characteristics Leaching Procedure. Select soil samples were also analyzed for pH by EPA Method 9045C.

Per the DTSC/CalTrans Agreement the chemical analytical results for soil samples collected from all 23 drill holes were evaluated statistically using the U.S. EPA’s statistical analysis to appropriately categorize the ADL containing soil for on-site re-use or offsite disposal. All 57 total lead results were included in the data set for the statistical analysis to calculate the 95% Upper Confidence Limit (UCL) for total lead. Soil at the project site contains soil with a calculated 95% UCL for total lead less than 80 mg/kg and calculated 95% UCL for STLC lead less than 5 mg/L. Therefore, the project site soil is defined as Clean Soil and may be reused onsite with no restrictions.

Avoidance, Minimization, and/or Mitigation Measures

Although ADL was detected onsite, it has been properly characterized and addressed. Therefore, no avoidance, minimization, and/or mitigation measures are necessary for the project for hazardous waste/materials.

AIR QUALITY

Regulatory Setting

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act is its companion state law. These laws, and related regulations by the U.S. EPA and the California Air Resources Board (ARB), set standards for

the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO_2), ozone (O_3), particulate matter (PM)—which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM_{10}) and particles of 2.5 micrometers and smaller ($PM_{2.5}$)—and sulfur dioxide (SO_2). In addition, national and state standards exist for lead (PB), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H_2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under NEPA. In addition to this environmental analysis, a parallel “Conformity” requirement under the FCAA also applies.

Conformity
The conformity requirement is based on FCAA Section 176(c), which prohibits the USDOT and other federal agencies from funding, authorizing, or approving plans, programs, or projects that do not conform to State Implementation Plan (SIP) for attaining the NAAQS. “Transportation Conformity” applies to highway and transit projects and takes place on two levels: the regional (or planning and programming) level and the project level. The proposed project must conform at both levels to be approved.

Conformity requirements apply only in nonattainment and “maintenance” (former nonattainment) areas for the NAAQS, and only for the specific NAAQS that are or were violated. U.S. EPA regulations at 40 CFR 93 govern the conformity process. Conformity requirements do not apply in unclassifiable/attainment areas for NAAQS and do not apply at all for state standards regardless of the status of the area.

Regional conformity is concerned with how well the regional transportation system supports plans for attaining the NAAQS for CO, NO_2, O_3, PM_{10} and $PM_{2.5}$, and in some areas (although not in California), SO_2. California has nonattainment or maintenance areas for all of these transportation-related “criteria pollutants” except SO_2, and also has a nonattainment area for lead (Pb); however, lead is not currently required by the FCAA to be covered in transportation conformity analysis. Regional conformity is based on emission analysis of RTPs and Federal Transportation Improvement Programs (FTIPs) that include all transportation projects planned for a region over a period of at least 20 years (for the RTP) and 4 years (for the FTIP). RTP and FTIP conformity uses travel demand and emission models to determine whether or not the implementation of those projects would conform to emission budgets or other tests at various analysis years showing that requirements of the FCAA and the SIP are met. If the conformity analysis is successful, the Metropolitan Planning Organization (MPO), FHWA, and Federal Transit Administration make the determinations that the RTP and FTIP are in conformity with the SIP for achieving the goals of the FCAA. Otherwise, the projects in the RTP and/or FTIP must be modified until conformity is attained. If the design concept and scope and the “open-to-traffic” schedule of a proposed transportation project are the same as described in the RTP and FTIP, then the proposed project meets regional conformity requirements for purposes of project-level analysis.

Project-level conformity is achieved by demonstrating that the project comes from a conforming RTP and TIP; the project has a design concept and scope[4] that has not changed significantly from those in the RTP and TIP; project analyses have used the latest planning assumptions and EPA-approved emissions models; and in PM areas, the project complies with any control measures in the SIP. Furthermore, additional analyses (known as hot-spot analyses) may be required for projects located in CO and PM nonattainment or maintenance areas to examine localized air quality impacts.

Affected Environment

The proposed project is located in the South-Central Coast Air Basin in San Luis Obispo County which is in attainment and/or unclassified for all Federal Standards. According to 40CFR Section 93.127 Table 3, this project is considered as an Intersection channelization and is exempted from the regional emission analysis requirements. Project level emission analysis is not required because the County is in attainment for carbon monoxide, PM10 and PM2.5. Therefore, conformity requirements do not apply and no further investigation concerning air quality is needed.

The San Luis Obispo Air Pollution Control District (APCD) has developed and updated their CEQA Air Quality Handbook (2012) to evaluate project specific impacts and help determine if air quality mitigation measures are needed, or if potentially significant impacts could result. To evaluate long-term emissions, cumulative effects, and establish countywide programs to reach acceptable air quality levels, a Clean Air Plan has been adopted and prepared by the APCD.

On February 8, 2019 the APCD for the County was contacted to comment on the project. On February 22, 2019 the APCD provided their comments on the proposed project. The APCD commended the County for improving multimodal access and providing congestion relief through construction of a roundabout and park-and-ride lot; the project was found to be consistent with APCD's Clean Air Plan transportation strategies intended to reduce emissions and vehicle miles traveled. The APCD found that the project is consistent with helping meet the emission reduction target set in SB 32.

The APCD evaluated the construction phase emissions and found that the construction phase would likely be less than the APCD's significance threshold identified in Table 2-1 of the *CEQA Air Quality Handbook* (April 2012) and did not require any construction phase mitigation measures. The APCD provided guidance on encountering lead or asbestos during the course of the project and prohibited developmental burning of vegetative material.

Environmental Consequences

The project is located in an attainment/unclassified area for all current NAAQS. This project is exempted from the regional emission analysis requirements. Project level emission analysis is not required because the County is in attainment for CO, $PM_{10,}$ and $PM_{2.5}$. Therefore, conformity requirements do not apply and no further investigation concerning air quality is needed.

However, during construction, short-term degradation of air quality may occur due to the release of particulate emissions (airborne dust) generated by excavation, grading, hauling, and other construction-related activities.

Avoidance, Minimization, and/or Mitigation Measures

The APCD provided guidance and mitigation measures to manage fugitive dust emissions such that they do not exceed the APCD's 20% opacity limit (APCD Rule 401) or prompt nuisance violations (APCD Rule 402):

AQ-1. Reduce the amount of the disturbed area where possible.

AQ-2. Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site and from exceeding the APCD's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible. **Please note that since water use is a concern due to drought conditions, the contractor or builder shall consider the use of an APCD-approved dust suppressant where feasible to reduce the amount of water used for dust control.**

AQ-3. All dirt stockpile areas should be sprayed daily and covered with tarps or other dust barriers as needed.

AQ-4. Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible, following completion of any soil disturbing activities.

AQ-5. Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading should be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established.

AQ-6. All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the APCD.

AQ-7. All roadways, driveways, sidewalks, etc. to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used.

AQ-8. Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site.

AQ-9. All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with California Vehicle Code Section 23114.

AQ-10. To prevent "track out" (sand or soil that adheres to and/or agglomerates on the exterior surfaces of motor vehicles and/or equipment [including tires] that may then fall onto any highway or street), the contractor should designate access points and require all employees, subcontractors, and others to use them. Install

and operate a 'track-out prevention device' where vehicles enter and exit unpaved roads onto paved streets. The 'track-out prevention device' can be any device or combination of devices that are effective at preventing track out, located at the point of intersection of an unpaved area and a paved road. Rumble strips or steel plate devices need periodic cleaning to be effective. If paved roadways accumulate tracked out soils, the track-out prevention device may need to be modified.

AQ-11. Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Where feasible, water sweepers shall be used with reclaimed water. Roads shall be pre-wetted prior to sweeping when feasible.

AQ-12. All PM_{10} mitigation measures required should be shown on grading and building plans.

AQ-13. The contractor or builder shall designate a person or persons whose responsibility is to ensure any fugitive dust emissions do not result in a nuisance and to enhance the implementation of the mitigation measures as necessary to minimize dust complaints and reduce visible emissions below the APCD's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Their duties shall include holidays and weekend periods when work may not be in progress (for example, wind-blown dust could be generated on an open dirt lot).

AQ-14. Portable equipment, 50 horsepower or greater, such as diesel engines and portable generators, used during construction activities may require California statewide portable equipment registration (issued by the California Air Resources Board) or an APCD permit.

AQ-15. Depending on lead-based paint removal method, an APCD permit may be required. Contact the APCD Engineering & Compliance Division at 805-781-5912 for more information.

AQ-16. If this project will include demolition activities of potentially asbestos containing material (ACM), then it may be subject to various regulatory jurisdictions, including the requirements stipulated in the National Emission Standard for Hazardous Air Pollutants (40CFR61, Subpart M - asbestos NESHAP). These requirements include but are not limited to 1) written notification to the APCD within at least 10 business days of activities commencing, 2) asbestos survey conducted by a Certified Asbestos Consultant, and 3) applicable removal and disposal requirements of identified ACM.

Climate Change

Neither the U.S. EPA, nor the FHWA has issued explicit guidance or methods to conduct project-level greenhouse gas analysis. FHWA emphasizes concepts of resilience and sustainability in highway planning, project development, design, operations, and maintenance. Because there have been requirements set forth in California legislation and EOs on climate change, the issue is addressed in the CEQA chapter of this document. The CEQA analysis may be used to inform the NEPA determination for the project.

Greenhouse Gas (GHG) Emissions are said to result in an increase in the earth's average surface temperature. This is commonly referred to as global warming or climate change. The rise in global temperature is associated with long-term changes in precipitation, temperature, wind patterns, and other elements of the earth's climate system. These changes are now thought to be broadly attributed to GHG emissions, particularly those emissions that result from the human production and use of fossil fuels.

The passage of Assembly Bill 32, the California Global Warming Solutions Act (2006), recognized the need to reduce GHG emissions and set the GHG emissions reduction goal for the State of California into law. The law required that by 2020, State emissions must be reduced to 1990 levels. This is to be accomplished by reducing GHG emissions from significant sources via regulation, market mechanisms, and other actions. Subsequent legislation (e.g., SB 97-Greenhouse Gas Emissions bill) directed the California Air Resources Board (CARB) to develop statewide thresholds.

In March 2012, the San Luis Obispo County APCD approved thresholds for GHG emission impacts, and these thresholds have been incorporated the APCD's CEQA Air Quality Handbook. APCD determined that a tiered process for residential / commercial land use projects was the most appropriate and effective approach for assessing the GHG emission impacts. The tiered approach includes three methods, any of which can be used for any given project:

1. Qualitative GHG Reduction Strategies (e.g. Climate Action Plans): A qualitative threshold that is consistent with AB 32 Scoping Plan measures and goals; or,
2. Bright-Line Threshold: Numerical value to determine the significance of a project's annual GHG emissions; or,
3. Efficiency-Based Threshold: Assesses the GHG impacts of a project on an emissions per capita basis.

For most projects the Bright-Line Threshold of 1,150 Metric Tons CO2/year (MT CO2e/yr) will be the most applicable threshold. In addition to the residential/commercial threshold options proposed above, a brightline numerical value threshold of 10,000 MT CO2e/yr was adopted for stationary source (industrial) projects.

It should be noted that projects that generate less than the above mentioned thresholds will also participate in emission reductions because air emissions, including GHGs, are under the purview of CARB (or other regulatory agencies) and will be "regulated" either by CARB, the Federal Government, or other entities. For example, new vehicles will be subject to increased fuel economy standards and emission reductions, large and small appliances will be subject to more strict emissions standards, and energy delivered to consumers will increasingly come from renewable sources. Other programs that are intended to reduce the overall GHG emissions include Low Carbon Fuel Standards, Renewable Portfolio standards and the Clean Car standards. As a result, even the emissions that result from projects that produce fewer emissions than the threshold will be subject to emission reductions.

NOISE

Regulatory Setting

NEPA of 1969 and CEQA provide the broad basis for analyzing and abating highway traffic noise effects. The intent of these laws is to promote the general welfare and to foster a healthy

environment. The requirements for noise analysis and consideration of noise abatement and/or mitigation, however, differ between NEPA and CEQA.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a proposed project is determined to have a significant noise impact under CEQA, then CEQA dictates that mitigation measures must be incorporated into the project unless those measures are not feasible. The rest of this section will focus on the 23 CFR 772 noise analysis; please see Chapter 3 of this document for further information on noise analysis under CEQA.

NATIONAL ENVIRONMENTAL POLICY ACT AND 23 CFR 772

For highway transportation projects with FHWA involvement (and the Department, as assigned), the Federal-Aid Highway Act of 1970 and its implementing regulations (23 CFR 772) govern the analysis and abatement of traffic noise impacts. The regulations require that potential noise impacts in areas of frequent human use be identified during the planning and design of a highway project. The regulations include noise abatement criteria (NAC) that are used to determine when a noise impact would occur. The NAC differ depending on the type of land use under analysis. For example, the NAC for residences (67 dBA) is lower than the NAC for commercial areas (72 dBA). The following table lists the noise abatement criteria for use in the 23 CFR 772 analysis.

COUNTY OF SAN LUIS OBISPO NOISE ELEMENT

Construction noise is typically exempt from Noise Element standards, and construction activities performed by the Department of Public Works in the road ROW are generally exempt from the County's LUO. The ordinance limits construction hours to 7:00 A.M. and 6:00 P.M. Monday through Friday, and from 9:00 A.M. and 5:00 P.M. on Saturday. Construction is prohibited on Sundays.

Table 3: Noise Abatement Criteria

Activity Category	NAC, Hourly A- Weighted Noise Level, Leq(h)	Description of activity category
A	57 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B[1]	67 (Exterior)	Residential.
C[1]	67 (Exterior)	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording

		studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	52 (Interior)	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E	72 (Exterior)	Hotels, motels, offices, restaurants/bars, and other developed lands, properties, or activities not included in A–D or F.
F	No NAC—reporting only	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical, etc.), and warehousing.
G	No NAC—reporting only	Undeveloped lands that are not permitted.
[1] Includes undeveloped lands permitted for this activity category.		

Figure 5 lists the noise levels of common activities to enable readers to compare the actual and predicted highway noise levels discussed in this section with common activities.

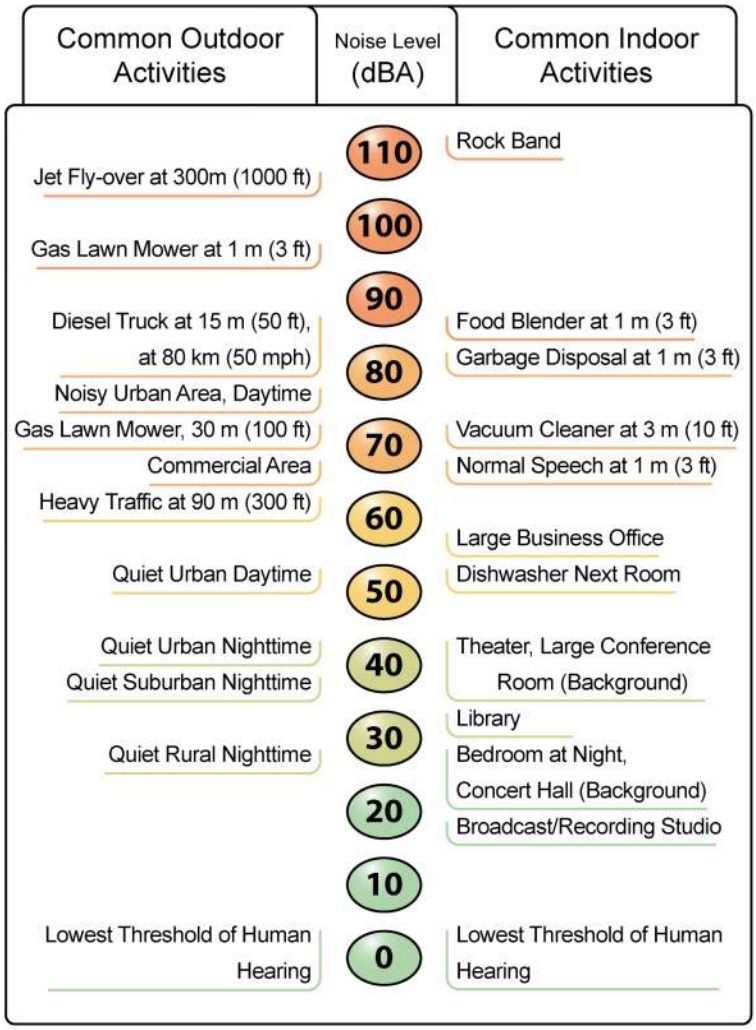


Figure 5: Noise Levels of Common Activities

According to the Department's *Traffic Noise Analysis Protocol for New Highway Construction and Reconstruction Projects, May 2011*, a noise impact occurs when the predicted future noise level with the project substantially exceeds the existing noise level (defined as a 12 dBA or more increase) or when the future noise level with the project approaches or exceeds the NAC. Approaching the NAC is defined as coming within 1 dBA of the NAC.

If it is determined that the project will have noise impacts, then potential abatement measures must be considered. Noise abatement measures that are determined to be reasonable and feasible at the time of final design are incorporated into the project plans and specifications. This document discusses noise abatement measures that would likely be incorporated in the project.

The Department's *Traffic Noise Analysis Protocol* sets forth the criteria for determining when an abatement measure is reasonable and feasible. Feasibility of noise abatement is basically an engineering concern. A minimum 5 dBA reduction for all impacted receptors in the future noise levels must be achieved for an abatement to be considered feasible. Other considerations include topography, access requirements, other noise sources, and safety considerations. Additionally, a noise reduction of at least 7 dBA must be achieved at one or more benefited

receptors for an abatement measure to be considered reasonable. The reasonableness determination is basically a cost-benefit analysis. Factors used in determining whether a proposed noise abatement measure is reasonable include: residents' acceptance and the cost per benefited residence.

Affected Environment

Because the proposed project is not considered a Type I or Type II project, as it will not construct a highway on a new location, significantly change the alignment of the existing highway, or involve construction of noise abatement on an existing highway with no changes to the highway capacity or alignment, it is not subject to Caltrans Traffic Noise Analysis Protocol.

Though it is not subject to noise analysis, this project may generate temporary construction-related noise impacts. Noise generated by construction activities will be intermittent and its intensity will vary depending on the construction activity.

The project is located in a semi-rural area at an existing interchange. The nearest sensitive receptor is the Avila Hot Spring Spa and RV Resort to the north and west of the project. Outdoor areas at this facility include picnic tables, waterslides, pool, spa, lawn etc. Additional sensitive receptors (residential homes) are located over 1,000 feet from the project area. The degree of construction noise impacts may vary for different areas of the project site and vary depending on the construction activities. Based on the County of San Luis Obispo's General Plan Noise Element, due to the high volume of traffic on SR-101, noise levels at the site are already above 65 to 70 decibels on average. During construction of the project, noise from construction activities may intermittently dominate the noise environment in the immediate area of construction, although it is likely that in most cases construction noise may be imperceptible from existing traffic noise.

Environmental Consequences

The proposed project is not considered a Type I or Type II project. Temporary construction-related noise impacts may be generated by the project. Noise generated by construction activities will be intermittent and its intensity will vary depending on the construction activity. The Avila Beach Hot Springs Resort is adjacent to the project area and may intermittently be affected by construction noise.

Avoidance, Minimization, and/or Abatement Measures

No measures for noise abatement are required or proposed for the project.

> Based on the studies completed to date and input from the public, the Department is not requiring noise abatement barriers or berms. Construction hours will be limited to 7:00 A.M. and 6:00 P.M. Monday through Friday, and from 9:00 A.M. and 5:00 P.M. on Saturday. Construction is prohibited on Sundays. There may be some exceptions but in general there will be peak period and holiday limitations.

Biological Environment

NATURAL COMMUNITIES

Regulatory Setting

This section of the document discusses natural communities of concern (NCC). The focus of this section is on biological communities, not individual plant or animal species. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in the Threatened and Endangered Species section. Wetlands and other waters are also discussed below.

Affected Environment

County Environmental Division staff prepared a Natural Environment Study (Minimal Impacts) (NES[MI]) for the project in May 2019. The NES(MI) details the literature review and the findings of various survey efforts.

Few natural landscapes occur within the project area and much of it is paved roadway or bare ground associated with the roadway. Vegetation along the roadsides are influenced by the existing roadway infrastructure and the periodic mowing or disking operations. Primarily non-native grasses and forbs with landscaped trees and shrubs occur within the project area. Several patches of coastal scrub also occur on the southwest and southeastern portions of the project area. The hillside in the southwestern portion supports a coast live oak woodland. There are no natural drainage features or wetlands within the project area. Riparian habitat associated with Gragg Canyon is adjacent to, but not part of the project area.

Vegetation and land cover types in the project area include Developed/Bare Ground, Ruderal (Wild oats grassland), Coastal Scrub (Coyote brush scrub), Landscaped, and Coast Live Oak Woodland. None of these habitat types is considered an NCC.

One NCC is mapped within five miles of the project area – Central Maritime Chaparral. However, this vegetation community, or any other NCC, do not occur within the project area. Although the project area is located within the coastal zone, none of the habitat types found within the project area qualify as ESHA.

Environmental Consequences

Developed/Bare Ground. Within the project area, this cover type includes the roadways (i.e., SR-101 main lines and ramps, Avila Beach Drive, Shell Beach Road, Monte Road) and the existing unpaved parking lot at the future Park-and-Ride lot and the existing unpaved maintenance pullout along the northbound offramp. These areas are devoid of vegetation or contain minimal amounts of ruderal species. These developed areas have negligible value as habitat for native plants and most animals. The paved roadways likely have negative effects on local wildlife populations through mortality due to collisions with vehicles. Because of the highly disturbed nature of this land cover type, it is of little to no value to wildlife. Most of the ground disturbance associated with this project will occur in developed/bare ground.

Ruderal (Wild Oats Grassland). A large portion of the project area consists of ruderal vegetation associated with unpaved highway ROW and waste areas that are routinely maintained by human-generated disturbances (e.g., mowing, disking, and herbicide application). Vegetation in this cover type includes primarily nonnative grasses and forbs that establish quickly after disturbance activities. Because of the consistently disturbed nature of this land cover type, it is not particularly valuable to wildlife species. Much of the ruderal vegetation will be adversely affected by this project except for the areas closest to the main lines of SR-101.

Coastal Scrub (Coyote Brush Scrub). Coastal scrub habitat occurs in the southwestern portion of the project area in the proposed park-and-ride lot and between the northbound off-ramp and main lines of SR-101. These areas were both established in association with the construction of the highway and interchange. Coastal scrub communities provide cover and nesting habitat for a variety of animals, such as reptiles, songbirds, and small mammals. The field surveys indicate the presence of these types of animals. However, due to the relatively small patch size of the coastal scrub, it is not expected to provide high-quality foraging or nesting habitat for common or special-status wildlife species known to occur in the region. The coastal scrub in the southwestern portion of the project area (associated with the park-and-ride lot) will be cleared and grubbed. The coastal scrub between the northbound off-ramp and main lines of SR-101 will likely not be adversely affected by the project.

Landscaped. Planted trees and shrubs occur within the unpaved highway ROW as part of the landscaping process associated with the existing interchange. These areas are immediately surrounded by ruderal vegetation and the developed roadways. Because of the highly disturbed or developed areas surrounding the landscaped vegetation, this cover type is of little value to wildlife, although some trees and large shrubs may support nesting birds during the nesting season. Much of the landscaped vegetation, especially west of SR-101 will be removed as a result of project activities.

Coast Live Oak Woodland. Coast live oak woodland occurs in the southwestern portion of the project area along the boundary of the proposed park-and-ride lot. Coast live oak woodland communities provide cover, foraging, and nesting habitat for a variety of animals, such as reptiles, songbirds, raptors, and mammals. The field surveys indicate the presence of these types of animals. While most of the coast live oak woodland habitat occurs outside the project footprint, impacts to coast live oak woodland will occur at the entrance to the proposed park-and-ride lot.

The project area is not in or adjacent to California Essential Habitat Connectivity mapped Natural Landscape Block or Essential Connectivity Areas. The project area and its associated land cover types do not provide an important wildlife movement corridor for local and regional terrestrial or aquatic animals. The disturbed nature of the project area and its proximity to busy roadways makes it unlikely that wildlife would access this area for local or long-distance movements.

Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, and/or mitigation measures are proposed; however, coast live oak trees will be incorporated into the landscaping plant palette to be planted within the project area at the end of construction.

WETLANDS AND OTHER WATERS

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the CWA (33 USC 1344), is the primary law regulating wetlands and surface waters. One purpose of the CWA is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas, and other waters that may be used in interstate or foreign commerce. The lateral limits of jurisdiction over non-tidal water bodies extend to the ordinary high water mark (OHWM), in the absence of adjacent wetlands. When adjacent wetlands are present, CWA jurisdiction extends beyond the OHWM to the limits of the adjacent wetlands. To classify wetlands for the purposes of the CWA, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the CWA.

Section 404 of the CWA establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the USACE with oversight by the U.S. EPA.

The USACE issues two types of 404 permits: General and Individual. There are two types of General permits: Regional and Nationwide. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Regional or Nationwide Permit may be permitted under one of USACE's Individual permits. There are two types of Individual permits: Standard permits and Letters of Permission. For Individual permits, the USACE decision to approve is based on compliance with U.S. EPA's Section 404(b)(1) Guidelines (40 CFR 230), and whether permit approval is in the public interest. The Section 404 (b)(1) Guidelines (Guidelines) were developed by the U.S. EPA in conjunction with the USACE, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The Guidelines state that the USACE may not issue a permit if there is a "least environmentally damaging practicable alternative" (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The EO for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, EO 11990 states that a federal agency, such as FHWA and/or the Department, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: (1) that there is no practicable alternative to the construction and (2) the proposed project includes all practicable measures to minimize harm. A Wetlands Only Practicable Finding must be made.

At the state level, wetlands and waters are regulated primarily by the SWRCB, the RWQCBs, and the California Department of Fish and Wildlife (CDFW). In certain circumstances, the Coastal Commission may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct

the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify CDFW before beginning construction. If CDFW determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. CDFW jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the USACE may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the CDFW.

The RWQCBs were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by WDRs and may be required even when the discharge is already permitted or exempt under the CWA. In compliance with Section 401 of the CWA, the RWQCBs also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see the Water Quality section for more details.

Affected Environment

A Jurisdictional Delineation report was not prepared for the project because there are no natural drainage features or wetlands within the project area. Riparian habitat associated with Gragg Canyon is adjacent to, but not part of the project area. No adverse impacts to wetlands or other waters will occur with implementation of the project.

Environmental Consequences

This project will not require a Section 404 Permit or a Section 401 Water Quality Certification pursuant to the CWA, or a Section 1600 Streambed Alteration Agreement because no wetlands or jurisdictional waters are present within the project area and no work associated with the project will be conducted within the bed or bank of a waterway or its associated riparian habitat.

Avoidance, Minimization, and/or Mitigation Measures

No adverse impacts to wetlands or other waters will occur with implementation of the project. Therefore, no avoidance, minimization, and/or mitigation measures are proposed.

PLANT SPECIES

Regulatory Setting

The United States Fish and Wildlife Service (USFWS) and CDFW have regulatory responsibility for the protection of special-status plant species. “Special-status” species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act (FESA) and/or the California Endangered Species Act (CESA). Please see the Threatened and Endangered Species section in this document for detailed information about these species.

This section of the document discusses all other special-status plant species, including CDFW species of special concern (SSC), USFWS candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for FESA can be found at 16 USC Section 1531, et seq. See also 50 CFR Part 402. The regulatory requirements for CESA can be found at California Fish and Game Code, Section 2050, et seq. Department projects are also subject to the Native Plant Protection Act, found at California Fish and Game Code, Section 1900-1913, and CEQA, found at California PRC, Sections 21000-21177.

Affected Environment

County Environmental Division staff prepared an NES(MI) for the project in March 2019. The NES(MI) describes 33 special-status plant species documented in the vicinity of the project area, nine of which were determined to have marginal or suitable habitat and growing conditions in the project area. Those species include Hoover's bent grass (*Agrostis hooveri*), Pecho manzanita (*Arctostaphylos pechoensis*), Santa Margarita manzanita *(Arctostaphylos pilosula*), San Luis Obispo sedge (*Carex obispoensis*), Congdon's tarplant (*Centromadia parryi* ssp. *congdonii*), Pismo clarkia (*Clarkia speciosa* ssp*. immaculata*), mesa horkelia (*Horkelia cuneata* var*. puberula*), woodland woollythreads (*Monolopia gracilens*), and black-flowered figwort (*Scrophularia atrata*). The remaining species were determined to be absent because the project area is outside of the species' range or it does not support the appropriate vegetation, soil, or elevation requirements.

Although coast live oak is not a special-status species, mitigation is often required for projects where oak trees will be removed. Most of the coast live oak trees occurring within the project area are planted individuals as part of the landscaping associated with SR-101; mitigation is not required for removal of these trees. However, several naturally occurring oaks in the southwestern portion of the project area associated with the park-and-ride lot will be mitigated for upon their removal.

Reconnaissance-level and focused botanical surveys were conducted in 2016 and 2018 during the appropriate seasons for detecting the target species (and other species). None of the special-status plant species evaluated for the proposed project were detected within the project area. Local reference sites for Pismo clarkia, mesa horkelia, black-flowered figwort, and Congdon's tarplant were checked in conjunction with the botanical surveys. Each of these special-status species were observed within their reference sites, but none were observed within the project area.

Environmental Consequences

Vegetation will be removed as a result of this project. However, special-status plants were not observed within the project area during appropriately timed focused botanical surveys. Therefore, no special-status plants are expected to occur within the project area and no impacts to special-status plants are anticipated as a result of this project.

Avoidance, Minimization, and/or Mitigation Measures

Biological conditions within the project area may change between the time when surveys were conducted to when the project goes to construction. Therefore, the following avoidance and minimization efforts are recommended to ensure no impacts to special-status plant species occur as a result of the project:

BIO-1. Prior to initial ground disturbance construction, all construction personnel will attend an environmental education program delivered by a qualified biologist. At a minimum, the program will include a description of invasive species, potential special-status species, and other protected natural resources, as well as an explanation of the regulatory and legal compliance setting for the project.

BIO-2. All work, including construction access and equipment staging areas, will be confined to the project area.

BIO-3. Prior to ground disturbance, a qualified biologist will conduct a preconstruction survey to ensure site conditions haven't changed and no special-status plants occur within the project area.

BIO-4. Coast live oak trees will be incorporated into the landscaping plant palette to be planted within the project area at the end of construction.

ANIMAL SPECIES

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The USFWS, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NMFS), and the CDFW are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or endangered are discussed in the Threatened and Endangered Species Section below. All other special-status animal species are discussed here, including CDFW fully protected species and SSC, and USFWS or NMFS candidate species.

Federal laws and regulations relevant to wildlife include the following:

- NEPA
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act

State laws and regulations relevant to wildlife include the following:

- CEQA
- Sections 1600 – 1603 of the California Fish and Game Code
- Sections 4150 and 4152 of the California Fish and Game Code

Affected Environment

County Environmental Division staff prepared an NES(MI) for the project in May 2019. The NES(MI) describes 36 special-status animal species documented in the vicinity of the project

area, one of which was determined to have marginal or suitable upland habitat conditions in the project area (California red-legged frog [*Rana draytonii*]). The remaining species were determined to be absent because they are marine or aquatic species, the project area is outside of the species' range, or the project area does not support the appropriate vegetation, soil, or elevation requirements. No special-status species were observed or are expected to occur within the project area.

Although no nesting birds or other evidence of nesting activities (e.g., inactive nests) were observed within the project area during the field surveys, the project area contains suitable habitat for a variety of more common nesting bird species that are afforded protection under the California Fish and Game Code and the Migratory Bird Treaty Act.

A woodrat midden (i.e., nest) belonging to big-eared woodrat (*Neotoma macrotis*) was observed in the coast live oak woodland near the proposed park-and-ride. This area will be cleared of vegetation; therefore, the midden will require relocation or dismantling. No woodrats were observed or handled during the survey efforts, so it could not be determined which subspecies of *N. macrotis* this is and whether it is considered a special-status species (*N. macrotis* ssp. *luciana* is a SSC, while *N. macrotis* ssp. *macrotis* does not have a special-status; both subspecies occur in the County).

Environmental Consequences

Vegetation removal and ground disturbance could directly destroy active nests or indirectly contribute to nest failure by exposing active nests to the elements and/or predators. Human activity close to an active nest could attract potential nest predators and/or disrupt the normal nesting activities of adult birds and contribute to nest failure. Clearing vegetation containing woodrat nests would impact woodrat foraging habitat and could destroy nests as well as directly kill individual woodrats.

Avoidance, Minimization, and/or Mitigation Measures

Biological conditions within the project area may change between the time when surveys were conducted to when the project goes to construction. Therefore, the following avoidance and minimization measures will be implemented to avoid, minimize, or mitigate potential project-related adverse effects to special-status animal species, including nesting birds and woodrats:

BIO-5. To the greatest extent feasible, vegetation removal and ground disturbance should be conducted during the non-breeding season for birds (i.e., between September 2 and January 31). This will discourage birds from nesting in construction areas and will greatly reduce the potential for nesting birds to delay the construction schedule.

BIO-6. If construction activities are proposed during the typical nesting season (February 1 to September 1), a nesting bird survey will be conducted by a qualified biologist no more than one week prior to the start of construction to determine presence/absence of nesting birds within the biological study area and immediate vicinity.

BIO-7. If an active nest is found, a qualified biologist will establish an appropriate avoidance buffer. If necessary, the biologist will consult with the USFWS/CDFW to determine an appropriate buffer size. Construction within the buffer will be prohibited until the qualified biologist determines that the nest is no longer active.

BIO-8. Prior to vegetation removal, the area will be surveyed for woodrat nests. If nests are found within areas to be impacted, woodrat nests will be picked up whole with a piece of equipment and relocated out of the impact area. If this is not feasible, a qualified biologist will dismantle the nest by hand or with hand tools (preferably during the non-breeding season) to allow woodrats in the nest to escape into adjacent undisturbed habitat. Equipment may also be used to dismantle the nest at the discretion of the qualified biologist. The nest material will then be moved out of the work area and stacked where it is accessible to the woodrats.

THREATENED AND ENDANGERED SPECIES

Regulatory Setting

The primary federal law protecting threatened and endangered species is the FESA: 16 USC Section 1531, et seq. See also 50 CFR Part 402. This act and later amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend. Under Section 7 of this act, federal agencies, such as the FHWA (and the Department, as assigned), are required to consult with the USFWS and the NMFS to ensure that they are not undertaking, funding, permitting, or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement or a Letter of Concurrence. Section 3 of FESA defines take as “harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct.”

California has enacted a similar law at the state level, the CESA, California Fish and Game Code Section 2050, et seq. CESA emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project-caused losses of listed species populations and their essential habitats. The CDFW is the agency responsible for implementing CESA. Section 2080 of the California Fish and Game Code prohibits "take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the California Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by CDFW. For species listed under both FESA and CESA requiring a Biological Opinion under Section 7 of FESA, the CDFW may also authorize impacts to CESA species by issuing a Consistency Determination under Section 2080.1 of the California Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for the purposes of exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

Affected Environment

County Environmental Division staff prepared an NES(MI) for the project in March 2019. No federally designated critical habitat or Essential Fish Habitat occurs within the project area. A "no effects" determination was made for all federally listed species known to occur or that potentially occur in the region. ESHAs occur in the vicinity, but not within the project area.

Although no California red-legged frog protocol-level surveys were conducted, multiple survey efforts were conducted between 2016 and 2018 by County staff with extensive knowledge and experience with this species. No California red-legged frogs were observed during these surveys. The project area is not located within designated critical habitat for California red-legged frog and the two within two miles of the project area are associated with the riparian and aquatic habitats which do not occur with the project area. The habitats within the project area would only be considered marginal upland habitat because they are isolated from the riparian and aquatic habitat by steep fill slopes and existing busy roadways and there is no aquatic habitat beyond. It is extremely unlikely that California red-legged frog would or could successfully move through the project area.

Environmental Consequences

Marginally suitable upland habitat (coastal scrub and coast live oak woodland) will be removed as part of the project, but no riparian or aquatic habitat will be adversely affected because none occurs within the project area. Therefore, California red-legged frog is not expected to occur within the project area and no impacts to this species are anticipated as a result of this project.

Avoidance, Minimization, and/or Mitigation Measures

Implementation of BIO-1 through BIO-7 provided above will be sufficient to ensure California red-legged frog occur is not adversely affected by the project. In the extremely unlikely event that a California red-legged frog is found within the project area, work will cease in that area until the animal has left the area on its own volition. The County will immediately notify the USFWS for further direction before work can resume.

INVASIVE SPECIES

Regulatory Setting

On February 3, 1999, President William J. Clinton signed EO 13112 requiring federal agencies to combat the introduction or spread of invasive species in the United States. The order defines invasive species as "any species, including its seeds, eggs, spores, or other biological material capable of propagating that species, that is not native to that ecosystem whose introduction does or is likely to cause economic or environmental harm or harm to human health." FHWA guidance issued August 10, 1999 directs the use of the State's invasive species list, maintained by the California Invasive Species Council to define the invasive species that must be considered as part of NEPA analysis for a proposed project.

Affected Environment

County Environmental Division staff prepared an NES(MI) for the project in March 2019. The NES(MI) describes the 36 plant species listed as high, moderate, or limited on the California Invasive Plant Council (Cal-IPC) inventory that occur within the project area. Three of these

species (French broom [*Genista monspessulana*], foxtail brome [*Bromus madritensis* ssp. *rubens*], and freeway iceplant [*Carpobrotus edulis*]) have a Cal-IPC rating of high, but all have low amount of coverage (i.e., not a dominant species in any land cover type). The Cal-IPC rated species occur throughout the project area, but primarily adjacent to the existing roadways.

Environmental Consequences

Ground disturbance associated with project construction can create optimal conditions for the spread of invasive plants by removing and/or disturbing vegetation and soil. Construction equipment contaminated with soil containing invasive plant seeds from other areas can result in the spread of such species to new areas (e.g., the project area). Invasive species may be included in seed mixtures and mulch, and invasive species may be improperly removed and disposed of so that seed is spread. The project is not expected to facilitate the movement or spread of invasive fish or wildlife species.

Avoidance, Minimization, and/or Mitigation Measures

The County should comply with EO 13112 to reduce the spread of invasive, non-native plant species and minimize the potential decrease of palatable vegetation for wildlife by implementing the following avoidance and minimization measures in addition to BIO-1:

BIO-9 Prior to initial ground disturbance construction, all construction personnel will attend an environmental education program delivered by a qualified biologist. At a minimum, the program will include a description of invasive species, potential special-status species, and other protected natural resources, as well as an explanation of the regulatory and legal compliance setting for the project.

BIO-10 Immediately prior to construction, the contractor, with assistance from a qualified biologist will identify the "work area" limits with brightly-colored flagging or fencing to prevent unnecessary direct impacts. Flagging will be maintained in good repair for the duration of the Project. All trees and shrubs to be removed will be identified and clearly marked. The biologist will remain onsite to monitor the initial ground disturbance especially in the naturally vegetated area associated with the park-and-ride lot.

BIO-11 During construction, soil and vegetation disturbance will be minimized to the minimum area necessary to construct the project.

BIO-12 Invasive plant species that have been identified within the project footprint will be removed and transported to an approved disposal facility as trash (not green waste) during construction activities and will not be replanted.

BIO-13 During construction, the project will make all reasonable efforts to limit the use of imported soils for fill. Soils currently existing onsite will be used for fill material to the maximum extent practicable. If the use of imported fill material is necessary, the imported material must be obtained from a source that is known to be free of invasive plant species or the material must consist of purchased clean material such as crushed aggregate, sorted rock, or other similar substances.

BIO-14 All erosion control materials including straw bales, straw wattles, or mulch used onsite must be free of invasive species seed.

Cumulative Impacts

Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of the proposed project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

CEQA Guidelines Section 15130 describes when a cumulative impact analysis is necessary and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts under CEQA can be found in Section 15355 of the CEQA Guidelines. A definition of cumulative impacts under NEPA can be found in 40 CFR Section 1508.7.

Affected Environment

Caltrans guidance for CEQA cumulative impacts assessments includes defining a Resource Study Area (RSA). An RSA is the geographic area within which impacts on a particular resource are analyzed. The boundaries of RSAs for cumulative impacts analysis are often broader than the boundaries used for project specific analysis. The project study area surroundings are mostly developed for recreational, agricultural, and rural uses as designated in the County General Plan. The project area is primarily a previously disturbed area associated with SR-101 situated on a massive quantity of fill material.

Other Projects in the Resource Study Area

Information on current and probable future projects was requested from the County of San Luis Obispo and California Department of Transportation District 5.

The County is aware of one other project within the RSA:

- US Route 101 Pismo Congestion Relief Project, Pismo Beach, San Luis Obispo County, California. Caltrans proposes congestion relief measures along a 5.94-mile stretch of US Rout 101 in San Luis Obispo County, California. The project will extend a truck lane, reconfigure ramps, and add an auxiliary lane between the Mattie Road on-ramp and the State Route 1 (Dolliver Street) Price Street southbound off-ramp on SR-101. Work will also include reconstruction of the inside shoulder to serve as a managed shoulder (part-time travel lane during peak periods). The Archaeological Survey Report for the proposed project was drafted in May 2018.

Environmental Consequences

Identification of the resources to consider is the first step in preparing a cumulative impact analysis. The proposed project will not impact existing and future land uses and policies, cultural or paleontological resources, special-status biological resources, geologic conditions, water quality, or air quality. Planned and foreseeable development in the RSA has low potential to change the visual character of the area. The visual impacts of the project would not result in a cumulatively considerable contribution to visual impacts from planned development in the project study area vicinity. Planned and foreseeable development in the RSA would have a beneficial impact on traffic and transportation/pedestrian and bicycle facilities by improving the efficiency and safety of the intersection as well as relieving traffic congestion.

Avoidance, Minimization, and/or Mitigation Measures

No additional measures are proposed beyond those identified in the Avoidance, Minimization and/or Mitigation Measures in Chapter 2.

Chapter 3 – California Environmental Quality Act (CEQA) Evaluation

Determining Significance under CEQA

The proposed project is a joint project by the Department and the FHWA and is subject to state and federal environmental review requirements. Project documentation, therefore, has been prepared in compliance with both CEQA and NEPA. FHWA's responsibility for environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 United States Code Section 327 (23 USC 327) and the MOU dated December 23, 2016 and executed by FHWA and Caltrans. The County is the lead agency under CEQA, and the Department is the lead agency under NEPA.

One of the primary differences between NEPA and CEQA is the way significance is determined. Under NEPA, significance is used to determine whether an Environmental Impact Statement (EIS), or a lower level of documentation, will be required. NEPA requires that an EIS be prepared when the proposed federal action (project) *as a whole* has the potential to "significantly affect the quality of the human environment." The determination of significance is based on context and intensity. Some impacts determined to be significant under CEQA may not be of sufficient magnitude to be determined significant under NEPA. Under NEPA, once a decision is made regarding the need for an EIS, it is the magnitude of the impact that is evaluated and no judgment of its individual significance is deemed important for the text. NEPA does not require that a determination of significant impacts be stated in the environmental documents.

CEQA, on the other hand, does require the Department to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an EIR must be prepared. Each and every significant effect on the environment must be disclosed in the EIR and mitigated if feasible. In addition, the CEQA Guidelines list a number of "mandatory findings of significance," which also require the preparation of an EIR. There are no types of actions under NEPA that parallel the findings of mandatory significance of CEQA. This chapter discusses the effects of this project and CEQA significance.

CEQA Environmental Checklist

This checklist identifies physical, biological, social, and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects will indicate that there are no impacts to a particular resource. A NO IMPACT answer in the last column reflects this determination. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

Project features, which can include both design elements of the project, and standardized measures that are applied to all or most Caltrans projects such as BMPs and measures included in the Standard Plans and Specifications or as Standard Special Provisions, are considered to be an integral part of the project and have been considered prior to any significance determinations documented below; see Chapters 1 and 2 for a detailed discussion of these features. The annotations to this checklist are summaries of information contained in Chapter 2 in order to provide the reader with the rationale for significance determinations; for a more detailed discussion of the nature and extent of impacts, please see Chapter 2. This checklist incorporates by reference the information contained in Chapters 1 and 2.

AESTHETICS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

CEQA Significance Determinations for Aesthetics

a, b) <u>No Impact</u>

The proposed project would not have a substantial adverse impact on a scenic vista because the project area does not include any scenic vistas.

The project will not substantially damage scenic resources.

c) <u>Less Than Significant with Mitigation Incorporated</u>

As discussed in the Visual/Aesthetics section in Chapter 2, the proposed project would alter (moderate change) the visual character of the project study area by changing the intactness of some views, but not obstructing views. The project will increase the developed condition of the area and add to the diversity of the landscape by introducing more urbanized design features and nighttime lighting. The project would also include the construction of several retaining walls along the project limits. Viewer sensitivity in the area is considered moderate to moderate-high.

The proposed project includes context-sensitive design solutions, including incorporating tree species that will be removed into the landscaping plan and also the use of aesthetic treatments on the retaining walls. These project features would result in no net loss of trees along the project site and would blend the retaining walls into the project setting.

The proposed project would not diminish the views that make the highway eligible for scenic status. Therefore, the project as designed would not substantially degrade the visual character and quality of the site and would have less than significant impacts to scenic resources and visual character. Features to reduce visual impacts have been included into the project design, but no mitigation is required.

d) Less Than Significant

The proposed project includes a lighting plan to appropriately shield the project area, eliminate redundancy of lighting standards, and use context sensitive street lighting designs. The plan will be consistent with Caltrans and County lighting guidelines and standards.

AGRICULTURE AND FOREST RESOURCES

In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board.				
Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☐	☒
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒

CEQA Significance Determinations for Agriculture and Forest Resources

a) <u>No Impact</u>

Based on the National Resource Conservation Service soils maps, the soil type within the project area is "Xerets-Xeroll-Urban land complex". The soils are not Prime Farmland, Unique Farmland, or Farmland of Statewide Importance. The project would have no impact to these soils.

b) <u>No Impact</u>

There are no parcels under a Williamson Act contract within the project limits.

c, d) <u>No Impact</u>

There are no forest or timberlands within the project limits.

e) <u>No Impact</u>

There are no other changes anticipated to farmland or forest land.

AIR QUALITY

Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations.				
Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☒	☐	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

CEQA Significance Determinations for Air Quality

a) <u>No Impact</u>

The proposed project is consistent with the APCD's CEQA Air Quality Handbook and other applicable air quality plans, and therefore will have no impact.

b) <u>Less Than Significant with Mitigation Incorporated</u>

The project is exempted from the regional emission analysis requirements and no further investigation concerning air quality is needed. Temporary construction activities could generate fugitive dust from the operation of construction equipment. The project will comply with construction standards adopted by the San Luis Obispo County APCD as well as Caltrans standardized procedures for minimizing air pollutants during construction. Several mitigation measures to ensure no impacts to air quality will be implemented, to reduce impacts to less than significant levels.

c) <u>Less Than Significant Impact</u>

San Luis Obispo County has been designated as in nonattainment; the proposed project will not result in a cumulative considerable net increase of any criteria pollutant. Construction related pollutants may occur during the proposed bridge replacement, but this does not constitute a considerable regional net increase as work will be temporary in nature and compliant with the APCD Air Quality Guidelines, and therefore will have a less than significant impact.

d) Less Than Significant Impact

The Avila Hot Springs Resort is located adjacent to the project area. The Resort is considered a sensitive receptor. Sensitive receptors within the project area may be exposed to pollutant concentrations during the construction phase of the project, however the exposure will be temporary in nature and therefore will have a less than significant impact.

e) Less Than Significant Impact

The proposed project is not expected to result in other emissions (such as those leading to objectionable odors) adversely affecting a substantial number of people and therefore will have a less than significant impact.

BIOLOGICAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	☐	☒

CEQA Significance Determinations for Biological Resources

a) <u>Less Than Significant with Mitigation Incorporated</u>

Although none were observed during appropriately timed botanical surveys of the project area, the proposed project will impact habitat that may support special-status plants. Although none were observed during various survey efforts and none are expected to occur within the project area, the proposed project will impact marginally suitable upland habitat for California red-legged frog, a federally listed threatened species. In addition, nesting birds may occur throughout the project area. With implementation of the measures described in

the Biological Resources section in Chapter 2, project impacts to special-status species would be less than significant.

b) No Impact

This project will not affect riparian habitat or other sensitive natural communities.

c) No Impact

This project will not affect federally protected wetlands.

d) No Impact

This project will not affect any migratory wildlife corridors or the movement of any native resident or migratory fish or wildlife species. This project will not impede the use of native wildlife nursery sites.

e) No Impact

This project will not conflict with any local policies or ordinances protecting biological resources.

f) No Impact

This project will not conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

CULTURAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☒	☐	☐
d) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	☐	☐	☒

CEQA Significance Determinations for Cultural Resources

a) No Impact

There are no historical resources within the project limits. The project area is adjacent to the historically developed Avila Hot Springs (formerly known as the Ontario Hot Springs. It was determined that the project will not impact the Avila Hot Springs, therefore no historical resources will be impacted.

b) Less Than Significant Impact

A low-density marine shell scatter (less than one fragment per square meter) was observed in the central portion of the APE within a heavily disturbed context. This area was subject to extensive, documented land modification from the construction of the SR-101 and the Avila Beach Drive interchange. Given the low density, lack of context, and no evidence of any intact archaeological deposits, the scatter was determined not to constitute an archaeological resource and was not formally recorded or documented. This determination is supported by a 2002 archaeological study that occurred in the area. Therefore, no significant archaeological resources were identified within the project area and will not be significantly impacted by the proposed project.

Comments received from Native American contracts expressed concern that the area is sensitive, but no specific knowledge regarding cultural resources within or adjacent to the APE was provided.

If previously unidentified cultural materials are unearthed during construction, work will be halted in that area until a qualified archaeologist can assess the significance of the find.

c) Less Than Significant with Mitigation Incorporated

There are no paleontological resources or unique geologic features were identified within the project limits. And as currently designed paleontological resources are not expected to be encountered during project implementation. A paleontological analysis of the project area determined that the Younger Alluvium formation that occurs within the project area is assigned a low-to-high paleontological sensitivity, increasing with depth. The Pismo Formation, including Squire Sandstone, Gregg Member, and Miguelito Member, all which occur in the project area, are assigned a high paleontological sensitivity. Therefore, with implementation of the measure described in the Paleontology section in Chapter 2, project impacts to paleontological resources would be less than significant.

d) <u>No Impact</u>

Human remains have not been identified at the project location. The likelihood of unearthing human remains are low given the highly disturbed nature, and documentation of imported fill within the project site. The discovery of human remains is always a possibility during ground disturbance; therefore, the State of California Health and Safety Code Section 7050.5 and PRC Section 5097.98 will be followed in the event that human remains are inadvertently discovered. If the remains are determined to be prehistoric, the County Coroner will notify the NNAHC, which will designate and notify a MLD whom shall complete the inspection of the site within 48 hours of notification and provide recommendations.

GEOLOGY AND SOILS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☐	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☒	☐
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒

CEQA Significance Determinations for Geology and Soils

a.i) No Impact

The site does not lie within an Alquist- Priolo Earthquake Fault Zone, and no known active faults are mapped within or through the project area. Based on the mapping, the potential for fault rupture at the site is considered to be low. The project site is not located within 500 feet of any potentially active faults, or by an Alquist-Priolo Earthquake Fault Zone and therefore will have no impact.

a.ii) <u>Less Than Significant Impact</u>

The proposed projected will not result in strong seismic ground shaking, and no active faults that could produce strong ground shaking are located within the project area. Some ground shaking related to increased vehicle loads (heavy equipment) and ground disturbance related to constructing the interchange improvements may occur during the construction phase of the project. These impacts will be temporary in nature and will not introduce permanent strong seismic ground shaking, therefore resulting in a less than significant impact.

a.iii) **Less Than Significant Impact**

The central portion of the project area is considered to have moderate liquefaction potential. The potential for liquefaction to occur increases when sandy or loose to moderately saturated granular soils with poor drainage are present. The project has been designed to meet Caltrans SDC and will therefore have a less than significant impact related to seismic-related ground failure.

a.iv) Less Than Significant Impact

The project area has mapped low to high landslide potential. The lands surrounding the project area do contain moderately steep hills as well as flatter area, therefore a low to high landslide potential is expected. The project is not expected to increase or exacerbate the risk of potential landslide and will have a less than significant impact.

b) Less Than Significant Impact

Grading, vegetation removal, excavation, and placement of fill materials required for the project could result in temporary soil erosion, sedimentation, and/or stormwater runoff. No substantial changes in the existing site topography will occur and all disturbed areas will be restored to pre-project conditions, to the extent feasible, upon completion of construction activities. When construction is completed, the project site would be restored and revegetated. The project will not require excessive grading and is not going to result in significant geologic impacts related to erosion or displacement/loss of topsoil and will therefore result in a less than significant impact.

c) No Impact

The majority of the project area is located on mapped Quaternary age Surficial sediments (Qa) geologic formation that consists of alluvial sand and gravel. The project is designed to meet the most current requirements of the AASHTO. The project is not located on a geologic unit or soils that are unstable or would become unstable as a result of the project and therefore will have no impact.

d) Less Than Significant Impact

Xererts soils are located in majority of the project area. This soil type has cracks that regularly close and open each year. Because these soils become dry every summer and moisten in winter, damage to structures and roads is very significant. The project has been designed to meet AASHTO standards, and therefore the impact of expansive soils will be reduced to less than significant levels.

e) No Impact

The use of septic tanks or alternative wastewater disposal systems are not proposed for the project and therefore will have no impact.

GREENHOUSE GAS EMISSIONS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	Caltrans has used the best available information based to the extent possible on scientific and factual information, to describe, calculate, or estimate the amount of greenhouse gas emissions that may occur related to this project. The analysis included in the climate change section of this document provides the public and decision-makers as much information about the project as possible. It is Caltrans' determination that in the absence of statewide-adopted thresholds or GHG emissions limits, it is too speculative to make a significance determination regarding an individual project's direct and indirect impacts with respect to global climate change. Caltrans remains committed to implementing measures to reduce the potential effects of the project. These measures are outlined in the climate change section that follows the CEQA checklist and related discussions.			
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				

a) <u>Less Than Significant Impact</u>

Using the GHG threshold information described in the Setting section, the project is expected to generate less than the Bright-Line Threshold of 1,150 metric tons of GHG emissions. Therefore, the project's potential direct and cumulative GHG emissions are found to be less significant and less than a cumulatively considerable contribution to GHG emissions. Section 15064(h)(2) of the CEQA Guidelines provide guidance on how to evaluate cumulative impacts. If it is shown that an incremental contribution to a cumulative impact, such as global climate change, is not 'cumulatively considerable', no mitigation is required. Because this project's emissions fall under the threshold, no mitigation is required and will have a less than significant impact.

b) <u>Less Than Significant Impact</u>

The project is consistent with the general level of development anticipated and projected in the Clean Air Plan. Based on Table 1-1 of the CEQA Air Quality Handbook (2012), the project will not exceed operational thresholds triggering mitigation. The proposed project would not generate any greenhouse gases except those typically associated with construction activities, which will be short term and are considered a less than significant impact.

HAZARDS AND HAZARDOUS MATERIALS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	☐	☒
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☐	☒
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

CEQA Significance Determinations for Hazards and Hazardous Materials

a, b, c, d, e, f, g, h) <u>No Impact</u>

See discussion of Hazardous Waste/Materials in Chapter 2. Although ADL was detected onsite, it has been properly characterized and addressed. Therefore, the project site soil is defined as clean soil and may be reused onsite with no restrictions. No unauthorized releases of the active hazardous crude oil pipeline active natural gas pipeline have been documented and are not expected.

The project will not emit hazardous emissions within on-quarter mile of an existing school. The project is not located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. The project is not located within an airport land use plan, within two miles of a public airport or public use airport nor within the vicinity of a private airstrip.

The project will not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. Any disruption to regular vehicular traffic flow during construction will be controlled by on-site flaggers.

The project will not expose people or structures to a significant loss, injury or death involving wildland fires.

HYDROLOGY AND WATER QUALITY

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☐	☒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☐	☐	☒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒

CEQA Significance Determinations for Hydrology and Water Quality

a, b, c, d, e, f, g, h) No Impact

See discussion of Water Quality and Stormwater Runoff in Chapter 2. This project will not affect wetlands, waterways, or the floodplain. The drainage plan being incorporated into the project design addresses stormwater runoff as will the SWPPP.

LAND USE AND PLANNING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☒	☐
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

CEQA Significance Determinations for Land Use and Planning

a, c) <u>No Impact</u>

There is no established community within the project area. The project will not conflict with any HCP or Natural Community Conservation Plan.

b) <u>Less Than Significant Impact</u>

As described in Chapter 2, the project is consistent with state, regional, and local plans and does not cause adverse impacts with respect to land use. Avoidance, minimization, and mitigation measures associated with biological resources and aesthetics will be implemented. The project is within the coastal zone, so a CDP will be required for the project.

MINERAL RESOURCES

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

CEQA Significance Determinations for Mineral Resources

a, b) <u>No Impact</u>

There are no known mineral resources or sites in the project area.

NOISE

Would the project result in:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

CEQA Significance Determinations for Noise

a, b, c, d, e, f) <u>No Impact and Less Than Significant Impact</u>

The existing noise level at the project area ranges between 65db to 70db due to the existing SR-101. Although during construction, noise levels would increase, the predicted noise level upon completion of the project is not expected to change. Therefore, under CEQA, no noise impact would occur as a result of the project and no mitigation is required.

POPULATION AND HOUSING

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

CEQA Significance Determinations for Population and Housing

a, b, c) <u>No Impact</u>

The project will not induce substantial population growth, nor will it displace existing housing or people.

PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Fire protection?	☐	☐	☐	☒
Police protection?	☐	☐	☐	☒
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☐	☒

CEQA Significance Determinations for Public Services

a) <u>No Impact</u>

There project will not create or alter existing governmental facilities serving the public. In fact, the increased efficiencies associated with the project may benefit these facilities. A Transportation Management Plan will be implemented to reduce impacts to Public Services.

RECREATION

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

CEQA Significance Determinations for Recreation

a, b) <u>No Impact</u>

There project does not include recreational facilities other than providing a safer route for cyclists and pedestrians.

TRANSPORTATION/TRAFFIC

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☐	☒
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

CEQA Significance Determinations for Transportation/Traffic

a, b, c, d, e, f) <u>Less Than Significant Impact</u>

As described in Chapter 2, the project will be designed to ensure there are no significant impacts. And overall, the project is seen as a benefit to transportation and traffic by increasing efficiency at the interchange and providing congestion relief for motorists and non-motorists. The project does not conflict with any transportation plans, congestion management program, or transportation policies. The project will not change air traffic patterns or increase hazards due to project design (it will reduce them).

TRIBAL CULTURAL RESOURCES

Would the project cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k), or	☐	☐	☐	☒
b) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	☐	☐	☒

CEQA Significance Determinations for Tribal Cultural Resources

a, b) <u>No Impact</u>

Local Tribal representatives were notified of the project under the requirements of Senate Bill AB-52. Several responses were received and are documented in Chapter 4.

There are no listed or eligible for listing Historical Resources or significant tribal resources within the project area.

UTILITIES AND SERVICE SYSTEMS

Would the project:	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☒	☐
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐
e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☐	☒

CEQA Significance Determinations for Utilities and Service Systems

a, b, e, f, g) <u>No Impact</u>

As described in Chapter 2, the project will not exceed wastewater treatment requirements, will not construct new or expand water or wastewater treatment facilities and will meet project wastewater demands. The project will comply with federal, state, and local statutes and regulations related to solid waste and be served by a landfill permitted to accommodate the project's solid waste disposal needs

C, d) <u>Less Than Significant Impact</u>

Two new stormwater basins are currently planned for the project; a subsurface infiltrator system for stormwater quality, and a detention basin for peak flow management. The detention basin is planned as a shallow aggregate surface area that will also serve to accommodate overflow parking in dry weather. A diversion box is intended for the site stormwater system to direct flow to the basin during high storms. The construction of these basins will not cause significant environmental effects.

Water will be imported to the project site, but not new or expanded entitlements are needed.

MANDATORY FINDINGS OF SIGNIFICANCE

	Significant and Unavoidable Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☐	☒
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

CEQA Significance Determinations for Mandatory Findings of Significance

a, b, c) <u>No Impact</u>

The project will not degrade the existing environment which is already an existing freeway interchange. Habitat and populations of local fish, wildlife, and plants will not be substantially impacted. There are no cumulative impacts to these resources either. The project will not substantially adversely affect human beings.

Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to GHG emissions, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to GHG emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity, including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation.[5] In California, however, transportation sources (including passenger cars, light-duty trucks, other trucks, buses, and motorcycles) are the largest contributors of GHG emissions.[6] The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

Two terms are typically used when discussing how we address the impacts of climate change: “greenhouse gas mitigation” and “adaptation.” "Greenhouse gas mitigation" is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. “Adaptation" refers to planning for and responding to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels).

Regulatory Setting

This section outlines federal and state efforts to comprehensively reduce GHG emissions from transportation sources.

Federal

To date, no national standards have been established for nationwide mobile-source GHG reduction targets, nor have any regulations or legislation been enacted specifically to address climate change and GHG emissions reduction at the project level.

NEPA (42 USC Part 4332) requires federal agencies to assess the environmental effects of their proposed actions prior to making a decision on the action or project.

The FHWA recognizes the threats that extreme weather, sea-level change, and other changes in environmental conditions pose to valuable transportation infrastructure and those who depend on it. FHWA therefore supports a sustainability approach that assesses vulnerability to climate risks and incorporates resilience into planning, asset management, project development and design, and operations and maintenance practices.[7] This approach encourages planning for sustainable highways by addressing climate risks while balancing environmental, economic,

[5] https://www.epa.gov/ghgemissions/us-greenhouse-gas-inventory-report-1990-2014
[6] https://www.arb.ca.gov/cc/inventory/data/data.htm
[7] https://www.fhwa.dot.gov/environment/sustainability/resilience/

and social values—"the triple bottom line of sustainability."[8] Program and project elements that foster sustainability and resilience also support economic vitality and global efficiency, increase safety and mobility, enhance the environment, promote energy conservation, and improve the quality of life. Addressing these factors up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making.

Various efforts have been promulgated at the federal level to improve fuel economy and energy efficiency to address climate change and its associated effects.

The Energy Policy Act of 1992 (EPACT92, 102nd Congress H.R.776.ENR): With this act, Congress set goals, created mandates, and amended utility laws to increase clean energy use and improve overall energy efficiency in the United States. EPACT92 consists of 27 titles detailing various measures designed to lessen the nation's dependence on imported energy, provide incentives for clean and renewable energy, and promote energy conservation in buildings. Title III of EPACT92 addresses alternative fuels. It gave the U.S. Department of Energy administrative power to regulate the minimum number of light-duty alternative fuel vehicles required in certain federal fleets beginning in fiscal year 1993. The primary goal of the Program is to cut petroleum use in the United States by 2.5 billion gallons per year by 2020.

Energy Policy Act of 2005 (109th Congress H.R.6 (2005–2006): This act sets forth an energy research and development program covering: (1) energy efficiency; (2) renewable energy; (3) oil and gas; (4) coal; (5) Indian energy; (6) nuclear matters and security; (7) vehicles and motor fuels, including ethanol; (8) hydrogen; (9) electricity; (10) energy tax incentives; (11) hydropower and geothermal energy; and (12) climate change technology.

Energy Policy and Conservation Act of 1975 (42 USC Section 6201) and Corporate Average Fuel Standards: This act establishes fuel economy standards for on-road motor vehicles sold in the United States. Compliance with federal fuel economy standards is determined through the Corporate Average Fuel Economy (CAFE) program on the basis of each manufacturer's average fuel economy for the portion of its vehicles produced for sale in the United States.

Executive Order (EO) 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, 74 *Federal Register* 52117 (October 8, 2009): This federal EO set sustainability goals for federal agencies and focuses on making improvements in their environmental, energy, and economic performance. It instituted as policy of the United States that federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities.

Executive Order (EO) 13693, *Planning for Federal Sustainability in the Next Decade*, 80 Federal Register 15869 (March 2015): This EO reaffirms the policy of the United States that federal agencies measure, report, and reduce their GHG emissions from direct and indirect activities. It sets sustainability goals for all agencies to promote energy conservation, efficiency, and management by reducing energy consumption and GHG emissions. It builds on the adaptation and resiliency goals in previous EOs to ensure agency operations and facilities prepare for impacts of climate change. This order revokes EO 13514.

U.S. EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts* v. *EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling,

[8] https://www.sustainablehighways.dot.gov/overview.aspx

U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six GHGs constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions.

U.S. EPA in conjunction with the National Highway Traffic Safety Administration (NHTSA) issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010[9] and significantly increased the fuel economy of all new passenger cars and light trucks sold in the United States. The standards required these vehicles to meet an average fuel economy of 34.1 miles per gallon by 2016. In August 2012, the federal government adopted the second rule that increases fuel economy for the fleet of passenger cars, light-duty trucks, and medium-duty passenger vehicles for model years 2017 and beyond to average fuel economy of 54.5 miles per gallon by 2025. Because NHTSA cannot set standards beyond model year 2021 due to statutory obligations and the rules' long timeframe, a mid-term evaluation is included in the rule. The Mid-Term Evaluation is the overarching process by which NHTSA, EPA, and ARB will decide on CAFE and GHG emissions standard stringency for model years 2022–2025. NHTSA has not formally adopted standards for model years 2022 through 2025. However, the EPA finalized its mid-term review in January 2017, affirming that the target fleet average of at least 54.5 miles per gallon by 2025 was appropriate. In March 2017, President Trump ordered EPA to reopen the review and reconsider the mileage target.[10]

NHTSA and EPA issued a Final Rule for "Phase 2" for medium- and heavy-duty vehicles to improve fuel efficiency and cut carbon pollution in October 2016. The agencies estimate that the standards will save up to 2 billion barrels of oil and reduce CO_2 emissions by up to 1.1 billion metric tons over the lifetimes of model year 2018–2027 vehicles.

Presidential EO 13783, *Promoting Energy Independence and Economic Growth*, of March 28, 2017, orders all federal agencies to apply cost-benefit analyses to regulations of GHG emissions and evaluations of the social cost of carbon, nitrous oxide, and methane.

State

With the passage of legislation including State Senate and Assembly bills and EOs, California has been innovative and proactive in addressing GHG emissions and climate change.

Assembly Bill 1493, Pavley Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

EO S-3-05 (June 1, 2005): The goal of this EO is to reduce California's GHG emissions to: (1) year 2000 levels by 2010, (2) year 1990 levels by 2020, and (3) 80 percent below year 1990 levels by 2050. This goal was further reinforced with the passage of Assembly Bill 32 in 2006 and SB 32 in 2016.

Assembly Bill 32 (AB 32), Chapter 488, 2006: Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 codified the 2020 GHG emissions reduction goals as outlined in

[9]] http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq

[10] http://www.nbcnews.com/business/autos/trump-rolls-back-obama-era-fuel-economy-standards-n734256 and https://www.federalregister.gov/documents/2017/03/22/2017-05316/notice-of-intention-to-reconsider-the-final-determination-of-the-mid-term-evaluation-of-greenhouse

EO S-3-05, while further mandating that ARB create a scoping plan and implement rules to achieve “real, quantifiable, cost-effective reductions of greenhouse gases.” The Legislature also intended that the statewide GHG emissions limit continue in existence and be used to maintain and continue reductions in emissions of GHGs beyond 2020 (Health and Safety Code Section 38551(b)). The law requires ARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions.

EO S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the (Cal/EPA) and state agencies with regard to climate change.

EO S-01-07 (January 18, 2007): This order sets forth the low carbon fuel standard (LCFS) for California. Under this EO, the carbon intensity of California’s transportation fuels is to be reduced by at least 10 percent by the year 2020. ARB re-adopted the LCFS regulation in September 2015, and the changes went into effect on January 1, 2016. The program establishes a strong framework to promote the low-carbon fuel adoption necessary to achieve the Governor's 2030 and 2050 GHG reduction goals.

Senate Bill 97 (SB 97), Chapter 185, 2007, Greenhouse Gas Emissions: This bill requires the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the CEQA Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires ARB to set regional emissions reduction targets for passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" that integrates transportation, land-use, and housing policies to plan how it will achieve the emissions target for its region.

Senate Bill 391 (SB 391), Chapter 585, 2009, California Transportation Plan: This bill requires the State’s long-range transportation plan to meet California’s climate change goals under AB 32.

EO B-16-12 (March 2012) orders State entities under the direction of the Governor, including ARB, the California Energy Commission, and the Public Utilities Commission, to support the rapid commercialization of zero-emission vehicles. It directs these entities to achieve various benchmarks related to zero-emission vehicles.

EO B-30-15 (April 2015) establishes an interim statewide GHG emission reduction target of 40 percent below 1990 levels by 2030 in order to ensure California meets its target of reducing GHG emissions to 80 percent below 1990 levels by 2050. It further orders all state agencies with jurisdiction over sources of GHG emissions to implement measures, pursuant to statutory authority, to achieve reductions of GHG emissions to meet the 2030 and 2050 GHG emissions reductions targets. It also directs ARB to update the Climate Change Scoping Plan to express the 2030 target in terms of million metric tons of carbon dioxide equivalent ($MMTCO_2e$). Finally, it requires the Natural Resources Agency to update the state’s climate adaptation strategy, *Safeguarding California*, every 3 years, and to ensure that its provisions are fully implemented.

Senate Bill 32, (SB 32) Chapter 249, 2016, codifies the GHG reduction targets established in EO B-30-15 to achieve a mid-range goal of 40 percent below 1990 levels by 2030.

Environmental Setting

In 2006, the Legislature passed the California Global Warming Solutions Act of 2006 (AB 32), which created a comprehensive, multi-year program to reduce GHG emissions in California. AB 32 required ARB to develop a Scoping Plan that describes the approach California will take to achieve the goal of reducing GHG emissions to 1990 levels by 2020. The Scoping Plan was first approved by ARB in 2008 and must be updated every 5 years. ARB approved the ***First Update to the Climate Change Scoping Plan*** on May 22, 2014. ARB is moving forward with a discussion draft of an updated Scoping Plan that will reflect the 2030 target established in EO B-30-15 and SB 32.

The AB 32 Scoping Plan and the subsequent updates contain the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, ARB released the GHG inventory for California.[11] ARB is responsible for maintaining and updating California's GHG Inventory per H&SC Section 39607.4. The associated forecast/projection is an estimate of the emissions anticipated to occur in the year 2020 if none of the foreseeable measures included in the Scoping Plan were implemented.

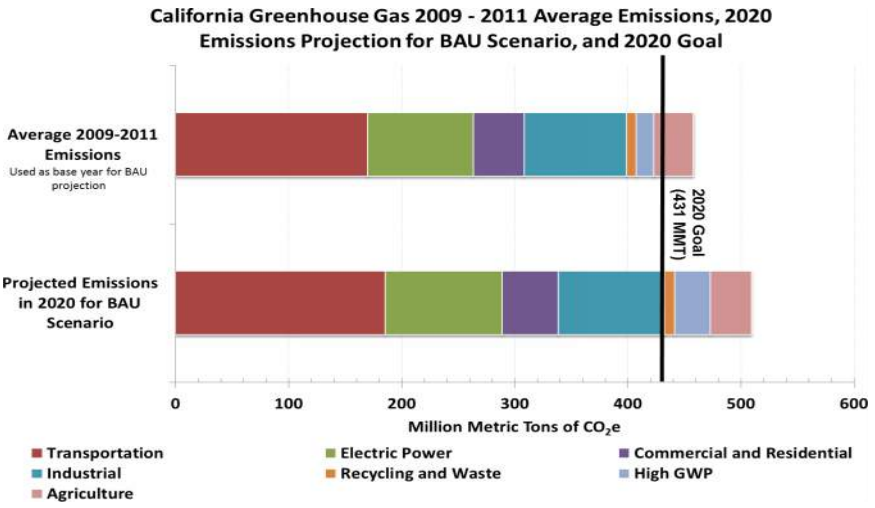
An emissions projection estimates future emissions based on current emissions, expected regulatory implementation, and other technological, social, economic, and behavioral patterns. The projected 2020 emissions provided in Figure ## represent a business-as-usual (BAU) scenario assuming none of the Scoping Plan measures are implemented. The 2020 BAU emissions estimate assists ARB in demonstrating progress toward meeting the 2020 goal of 431 MMTCO2e[12]. The 2017 edition of the GHG emissions inventory (released June 2017) found total California emissions of 440.4 $MMTCO_2e$, showing progress towards meeting the AB 32 goals.

The 2020 BAU emissions projection was revisited in support of the First Update to the Scoping Plan (2014). This projection accounts for updates to the economic forecasts of fuel and energy demand as well as other factors. It also accounts for the effects of the 2008 economic recession and the projected recovery. The total emissions expected in the 2020 BAU scenario include reductions anticipated from Pavley I and the Renewable Electricity Standard (30 $MMTCO_2e$ total). With these reductions in the baseline, estimated 2020 statewide BAU emissions are 509 $MMTCO_2e$.

[11] 2016 Edition of the GHG Emission Inventory Released (June 2016): https://www.arb.ca.gov/cc/inventory/data/data.htm

[12] The revised target using Global Warming Potentials (GWP) from the IPCC Fourth Assessment Report (AR4)

FIGURE 6 2020 Business as Usual (BAU) Emissions Projection 2014 Edition



https://www.arb.ca.gov/cc/inventory/data/bau.htm

Project Analysis

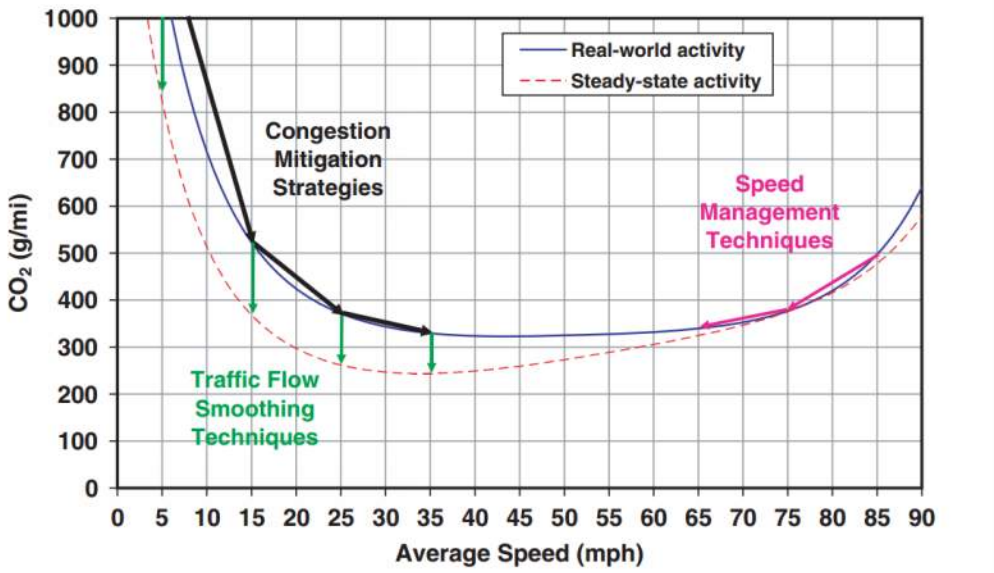
An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its *incremental* change in emissions when combined with the contributions of all other sources of GHG.[13] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task.

GHG emissions for transportation projects can be divided into those produced during operations and those produced during construction. The following represents a best faith effort to describe the potential GHG emissions related to the proposed project.

[13] This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the US Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

Operational Emissions
The proposed project is a congestion relief project that addresses future demand volumes.

FIGURE 7 POSSIBLE USE OF TRAFFIC OPERATION STRATEGIES IN REDUCING ON-ROAD CO_2 EMISSIONS



Source: Matthew Barth and Kanok Boriboonsomsin, University of California, Riverside, May 2010 (http://uctc.berkeley.edu/research/papers/846.pdf)

Four primary strategies can reduce GHG emissions from transportation sources: (1) improving the transportation system and operational efficiencies, (2) reducing travel activity), (3) transitioning to lower GHG-emitting fuels, and (4) improving vehicle technologies/efficiency. To be most effective all four strategies should be pursued concurrently.

FHWA supports these strategies to lessen climate change impacts, which correlate with efforts that the state of California is undertaking to reduce GHG emissions from the transportation sector.

The highest levels of CO_2 from mobile sources such as automobiles occur at stop-and-go speeds (0–25 miles per hour) and speeds over 55 miles per hour; the most severe emissions occur from 0–25 miles per hour (see Figure 7 above). To the extent that a project relieves congestion by enhancing operations and improving travel times in high-congestion travel.

While EMFAC has a rigorous scientific foundation and has been vetted through multiple stakeholder reviews, its emission rates are based on tailpipe emission test data. The numbers are estimates of CO_2 emissions and not necessarily the actual CO_2 emissions. The model does not account for factors such as the rate of acceleration and the vehicles' aerodynamics, which would influence CO_2 emissions. To account for CO_2 emissions, ARB's GHG Inventory follows the IPCC guideline by assuming complete fuel combustion, while still using EMFAC data to calculate CH_4 and N_2O emissions. Though EMFAC is currently the best available tool for use in calculating GHG emissions, it is important to note that the CO_2 numbers provided are only useful for a comparison of alternatives.

Construction Emissions

Construction GHG emissions would result from material processing, on-site construction equipment, and traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better transportation management during construction phases.

In addition, with innovations such as longer pavement lives, improved transportation management plans, and changes in materials, the GHG emissions produced during construction can be offset to some degree by longer intervals between maintenance and rehabilitation activities.

CEQA Conclusion

The project will not have a significant impact on the various aspects of climate change.

Greenhouse Gas Reduction Strategies

Statewide Efforts
In an effort to further the vision of California's GHG reduction targets outlined an AB 32 and SB 32, Governor Brown identified key climate change strategy pillars (concepts). These pillars highlight the idea that several major areas of the California economy will need to reduce emissions to meet the 2030 GHG emissions target. These pillars are (1) reducing today's petroleum use in cars and trucks by up to 50 percent; (2) increasing from one-third to 50 percent our electricity derived from renewable sources; (3) doubling the energy efficiency savings achieved at existing buildings and making heating fuels cleaner; (4) reducing the release of methane, black carbon, and other short-lived climate pollutants; (5) managing farm and rangelands, forests, and wetlands so they can store carbon; and (6) periodically updating the state's climate adaptation strategy, *Safeguarding California*.

FIGURE 8 THE GOVERNOR'S CLIMATE CHANGE PILLARS: 2030 GREENHOUSE GAS REDUCTION GOALS

The transportation sector is integral to the people and economy of California. To achieve GHG emission reduction goals, it is vital that we build on our past successes in reducing criteria and toxic air pollutants from transportation and goods movement activities. GHG emission reductions will come from cleaner vehicle technologies, lower-carbon fuels, and reduction of vehicle miles traveled. One of Governor Brown's key pillars sets the ambitious goal of reducing today's petroleum use in cars and trucks by up to 50 percent by 2030.

Governor Brown called for support to manage natural and working lands, including forests, rangelands, farms, wetlands, and soils, so they can store carbon. These lands have the ability to remove carbon dioxide from the atmosphere through biological processes, and to then sequester carbon in above- and below-ground matter.

Caltrans Activities

Caltrans continues to be involved on the Governor's Climate Action Team as the ARB works to implement EOs S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. EO B-30-15, issued in April 2015, and SB 32 (2016), set a new interim target to cut GHG emissions to 40 percent below 1990 levels by 2030. The following major initiatives are underway at Caltrans to help meet these targets.

California Transportation Plan (CTP 2040)

The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce GHG emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future statewide, integrated, multimodal transportation system. It serves as an umbrella document for all of the other statewide transportation planning documents.

SB 391(Liu 2009) requires the CTP to meet California's climate change goals under AB 32. Accordingly, the CTP 2040 identifies the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the state's transportation needs. While MPOs have primary responsibility for identifying land use patterns to help reduce GHG

emissions, CTP 2040 identifies additional strategies in Pricing, Transportation Alternatives, Mode Shift, and Operational Efficiency.

Caltrans Strategic Management Plan
The Strategic Management Plan, released in 2015, creates a performance-based framework to preserve the environment and reduce GHG emissions, among other goals. Specific performance targets in the plan that will help to reduce GHG emissions include:

- Increasing percentage of non-auto mode share
- Reducing vehicle miles traveled per capita
- Reducing Caltrans' internal operational (buildings, facilities, and fuel) GHG emissions

Funding and Technical Assistance Programs
In addition to developing plans and performance targets to reduce GHG emissions, Caltrans also administers several funding and technical assistance programs that have GHG reduction benefits. These include the Bicycle Transportation Program, Safe Routes to School, Transportation Enhancement Funds, and Transit Planning Grants. A more extensive description of these programs can be found in *Caltrans Activities to Address Climate Change* (2013).

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012) is intended to establish a department policy that will ensure coordinated efforts to incorporate climate change into departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013) provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce GHG emissions resulting from agency operations.

Project-Level GHG Reduction Strategies
The following measures will also be implemented in the project to reduce GHG emissions and potential climate change impacts from the project.

Adaptation Strategies
"Adaptation strategies" refer to how Caltrans and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage—or, put another way, planning and design for resilience. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and their intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. These types of impacts to the transportation infrastructure may also have economic and strategic ramifications.

Federal Efforts
At the federal level, the Climate Change Adaptation Task Force, co-chaired by the Council on Environmental Equality, the Office of Science and Technology Policy, and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011[14], outlining the federal government's progress in expanding and strengthening the nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provided an update on actions in key areas of federal

[14] https://obamawhitehouse.archives.gov/administration/eop/ceq/initiatives/resilience

adaptation, including: building resilience in local communities, safeguarding critical natural resources such as fresh water, and providing accessible climate information and tools to help decision-makers manage climate risks.

The USDOT issued *U.S. DOT Policy Statement on Climate Adaptation* in June 2011, committing to "integrate consideration of climate change impacts and adaptation into the planning, operations, policies, and programs of DOT in order to ensure that taxpayer resources are invested wisely and that transportation infrastructure, services and operations remain effective in current and future climate conditions."[15]

To further the DOT Policy Statement, in December 15, 2014, FHWA issued order 5520 (*Transportation System Preparedness and Resilience to Climate Change and Extreme Weather Events*).[16] This directive established FHWA policy to strive to identify the risks of climate change and extreme weather events to current and planned transportation systems. The FHWA will work to integrate consideration of these risks into its planning, operations, policies, and programs in order to promote preparedness and resilience; safeguard federal investments; and ensure the safety, reliability, and sustainability of the nation's transportation systems.

FHWA has developed guidance and tools for transportation planning that fosters resilience to climate effects and sustainability at the federal, state, and local levels.[17]

State Efforts

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea-level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea-level rise and directed all state agencies planning to construct projects in areas vulnerable to future sea-level rise to consider a range of sea-level rise scenarios for the years 2050 and 2100, assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea-level rise. Sea-level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, and storm surge and storm wave data.

Governor Schwarzenegger also requested the National Academy of Sciences to prepare an assessment report to recommend how California should plan for future sea-level rise. The final report, *Sea-Level Rise for the Coasts of California, Oregon, and Washington* (Sea-Level Rise Assessment Report)[18] was released in June 2012 and included relative sea-level rise projections for the three states, taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge, and land subsidence rates; and the range of uncertainty in selected sea-level rise projections. It provided a synthesis of existing information on projected sea-level rise impacts to state infrastructure (such as roads, public facilities, and beaches), natural areas, and coastal and marine ecosystems; and a discussion of future research needs regarding sea-level rise.

In response to EO S-13-08, the California Natural Resources Agency (Resources Agency), in coordination with local, regional, state, federal, and public and private entities, developed *The California Climate Adaptation Strategy* (Dec 2009),[19] which summarized the best available

[15] https://www.fhwa.dot.gov/environment/sustainability/resilience/policy_and_guidance/usdot.cfm
[16] https://www.fhwa.dot.gov/legsregs/directives/orders/5520.cfm
[17] https://www.fhwa.dot.gov/environment/sustainability/resilience/
[18] *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at: http://www.nap.edu/catalog.php?record_id=13389.
[19] http://www.climatechange.ca.gov/adaptation/strategy/index.html

science on climate change impacts to California, assessed California's vulnerability to the identified impacts, and outlined solutions that can be implemented within and across state agencies to promote resiliency. The adaptation strategy was updated and rebranded in 2014 as *Safeguarding California: Reducing Climate Risk* (Safeguarding California Plan).

Governor Jerry Brown enhanced the overall adaptation planning effort by signing EO B-30-15 in April 2015, requiring state agencies to factor climate change into all planning and investment decisions. In March 2016, sector-specific Implementation Action Plans that demonstrate how state agencies are implementing EO B-30-15 were added to the Safeguarding California Plan. This effort represents a multi-agency, cross-sector approach to addressing adaptation to climate change-related events statewide.

EO S-13-08 also gave rise to the *State of California Sea-Level Rise Interim Guidance Document* (SLR Guidance), produced by the Coastal and Ocean Working Group of the California Climate Action Team, of which Caltrans is a member. First published in 2010, the document provided "guidance for incorporating sea-level rise (SLR) projections into planning and decision making for projects in California," specifically, "information and recommendations to enhance consistency across agencies in their development of approaches to SLR." The March 2013 update[20] finalizes the SLR Guidance by incorporating findings of the National Academy's 2012 final Sea-Level Rise Assessment Report; the policy recommendations remain the same as those in the 2010 interim SLR Guidance. The guidance will be updated as necessary in the future to reflect the latest scientific understanding of how the climate is changing and how this change may affect the rates of SLR.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation, and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. Caltrans is actively engaged in in working towards identifying these risks throughout the state and will work to incorporate this information into all planning and investment decisions as directed in EO B-30-15.

Although the proposed project is within the coastal zone, it is not in an area subject to sea-level rise. Accordingly, direct impacts to transportation facilities due to projected sea-level rise are not expected.

[20] http://www.opc.ca.gov/2013/04/update-to-the-sea-level-rise-guidance-document/

Chapter 4 – Comments and Coordination

Early and continuing coordination with the general public and public agencies is an essential part of the environmental process. It helps planners determine the necessary scope of environmental documentation and the level of analysis required, and to identify potential impacts and avoidance, minimization, and/or mitigation measures and related environmental requirements. Agency and tribal consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including interagency coordination meetings, public meetings, public notices, and Project Development Team meetings. This chapter summarizes the results of the County's efforts to fully identify, address, and resolve project-related issues through early and continuing coordination.

Coordination with the following individuals was conducted by the County on April 4th, 2016 by regarding utilities within the project area:

- Autumn Woolworth of Caltrans: A search of the Caltrans CALTREC records database found that several facilities, that are operated by various agencies, exist in Caltrans ROW that is within the project area. Per Caltrans records, the companies that operate various facilities within the Caltrans ROW include, for example: PG&E, AT&T, Southern California Gas Company, and Union Oil Company.

- Andrea Montes of the County Utilities Division: San Luis Obispo County Flood Control and Water Conservation District waterline connects to the Lopez Water Supply traverses along the southern portion of the project area.

- Steve Plemons of AT&T: AT&T has buried phone cables within the project area. The buried cables traverse along Avila Beach Drive.

- Jeff Davis of Charter Communications: Charter has fiber optic line and coax mounted to overhead power poles that perpendicularly cross Avila Beach Drive at the westernmost section of the project area.

- Leo Martinez of the Conoco-Phillips (Phillips 66): Phillips 66 has a focus oil pipeline within the project area that traverses along Monte Road and Avila Beach Drive under the Highway 101 and continues southwest along Ontario Ridge. They have provided the County with General Encroachment Guidelines which will be adhered to.

- Claudia Turner of the Southern California Gas Company – Distribution: The Gas Company operates and maintains various buried natural gas mains within the limits of the proposed project.

- Rosalyn Squires of the Southern California Gas Company – Transmission: The Gas Company does not have any facilities within the limits of the proposed project.

- Tim Pearson of PG&E, Los Padres Division: PG&E operates lines that are within the project area. The existing PG&E lines perpendicularly cross both Highway 101 and Avila Beach Drive.

- Ben Fine of the City of Pismo Beach: The City of Pismo Beach does not have any facilities within the vicinity of the project location.

- Dan Migliazzo of the San Miguelito Mutual Water Company (SMMWC): SMMWC does not have any facilities within the vicinity of the project location.

During the scoping process, the County participated in the following meetings with the Avila Valley Advisory Council:

- September 11, 2017: General meeting where the project was introduced to the community.
- November 5, 2018: General meeting and conceptual presentation.
- May 24, 2019: Meeting with land use committee to discuss Visual/Aesthetics design and concerns.
- January 13, 2020: Follow-up meeting to provide updated conceptual design and results of various technical studies as well as notify that the Draft IS/MND is out for public review during this time.

No formal consultation with resource agencies has been necessary due to the location of the project impact area and incorporation of design features to avoid resources and environmentally sensitive areas. However, on October 18th, 2018, seventeen local Tribal representatives were notified of the project under the requirements of Senate Bill AB-52. Responses are summarized here:

- Northern Chumash Tribal Council - requested consultation.
- Salinan Tribe - requested consultation and that a Native American monitor be present during ground disturbing activities.
- Santa Ynez Band of Chumash Indians - deferred comments to the local tribes.
- Xolon Salinan Tribe - no comments.
- yak tityu tityu yak tilhini Northern Chumash Tribe of San Luis Obispo County and Region - requested consultation and recommended that an archaeologist and a Northern Chumash monitor be present during excavation.

Newspaper notices/articles and web-based information have been distributed notifying the public that the environmental document review period closed February 5, 2020. Comments on the document were only received from the Department of Toxic Substances Control (DTSC). Their comments and the applicable responses are listed below:

1. Comment: The MND should acknowledge the potential for project site activities to result in the release of hazardous wastes/substances. In instances in which releases may occur, further studies should be carried out to delineate the nature and extent of the contamination, and the potential threat to public health and/or the environment should be evaluated. The MND should also identify the mechanism(s) to initiate any required investigation and/or remediation and the government agency who will be responsible for providing appropriate regulatory oversight.

Response: The Geology/Soils/Seismic/Topography section discusses a Hazardous Materials Prevention and Response Plan to be prepared to allow for a prompt and effective response to any accidental spills, should they occur.

2. Comment: If any sites within the project area or sites located within the vicinity of the project have been used or are suspected of having been used for mining activities, proper investigation for mine waste should be discussed in the MND. DTSC recommends that any project sites with current and/or former mining operations onsite or in the project site area should be evaluated for mine waste according to DTSC's 1998 Abandoned Mine Land Mines Preliminary Assessment Handbook (https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/11/aml_handbook.pdf).

   Response: No sites within the project area have been used or are suspected of having been used for mining activities.

3. Comment: Refiners in the United States started adding lead compounds to gasoline in the 1920s in order to boost octane levels and improve engine performance. This practice did not officially end until 1992 when lead was banned as a fuel additive in California. Tailpipe emissions from automobiles using leaded gasoline contained lead and resulted in aerially deposited lead (ADL) being deposited in and along roadways throughout the state. ADL-contaminated soils still exist along roadsides and medians and can also be found underneath some existing road surfaces due to past construction activities. Due to the potential for ADL-contaminated soil DTSC, recommends collecting soil samples for lead analysis prior to performing any intrusive activities for the project described in the MND.

   Response: The recommended effort (for ADL) has already been conducted and is discussed in the Hazardous Waste/Materials section of the MND.

4. Comment: If buildings or other structures are to be demolished on any project sites included in the proposed project, surveys should be conducted for the presence of lead-based paints or products, mercury, asbestos containing materials, and polychlorinated biphenyl caulk. Removal, demolition and disposal of any of the above-mentioned chemicals should be conducted in compliance with California environmental regulations and policies. In addition, sampling near current and/or former buildings should be conducted in accordance with DTSC's 2006 *Interim Guidance Evaluation of School Sites with Potential Contamination from Lead Based Paint, Termiticides, and Electrical Transformers* (https://dtsc.ca.gov/wpcontent/uploads/sites/31/2018/09/Guidance_Lead_Contamination_050118.pdf).

   Response: No building or structures will be demolished as a result of the proposed project. Regardless, Measure AQ-16 in the Air Quality section of the MND discusses asbestos.

5. Comment: If any projects initiated as part of the proposed project require the importation of soil to backfill any excavated areas, proper sampling should be conducted to ensure that the imported soil is free of contamination. DTSC recommends the imported materials be characterized according to *DTSC's 2001 Information Advisory Clean Imported Fill Material* (https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/09/SMP_FS_Cleanfill-Schools.pdf).

Response: Measure Bio-13 in the Biological Environment section of the MND discusses clean imported fill.

6. Comment: If any sites included as part of the proposed project have been used for agricultural, weed abatement or related activities, proper investigation for organochlorinated pesticides should be discussed in the MND. DTSC recommends the current and former agricultural lands be evaluated in accordance with DTSC's 2008 *Interim Guidance for Sampling Agricultural Properties (Third Revision)* (https://dtsc.ca.gov/wp-content/uploads/sites/31/2018/09/Ag-Guidance-Rev-3-August-7-2008-2.pdf).

   Response: The project site has not been used for agricultural or weed abatement activities.

Chapter 5 – List of Preparers

The following is a list of state and local agency personnel, including consultants, who were primarily responsible for preparing the environmental document and technical studies:

Personnel	Affiliation	Role
Paul Valadao	Caltrans District 5	Caltrans Project Manager
Julie McGuigan	Caltrans District 5	Environmental Document review and preparation
Damon Haydu	Caltrans District 5	Cultural Resource Report reviews
Isaac Leyva	Caltrans District 5	Paleontological Resource Report review
Andrew Domingos	Caltrans District 5	NES (MI) (biological report) review
Amy Millan	Caltrans District 5	NES (MI) (biological report) review
Joel Kloth	Caltrans District 5	Hazardous Material Reports review
Bing Yu	Caltrans District 5	Traffic Operations Reports review
Bob Carr	Caltrans District 5	Visual Impact Assessment review
Genaro Diaz	County of SLO Department of Public Works	County Project Manager
Matthew Willis	County of SLO Department of Public Works	Environmental Document and NES(MI) (biological report) preparation
Blaize Uva	County of SLO Department of Public Works	Environmental Document preparation
Keith Miller	County of SLO Department of Public Works	Environmental Document preparation and review
Jorge Aguilar	Wallace Group	Project design and engineering oversight
Sarah Huffman	Wallace Group	Project design and engineer
Matthew Parker	Wallace Group	Visual simulations and planting plans
Judd King	Yeh and Associates	Geotechnical/Geological expertise
Chris Bersbach	Rincon Consultants	Initial Site Assessment and Visual Impact Assessment preparation
Leroy Laurie	SWCA	Cultural Resource Report preparation
Alyssa Bell	SWCA	Paleontological Resources Report preparation

Chapter 6 – Distribution List

In addition to the general public, the County has or will contact the following federal, state, and local agencies and entities, as well as Native American tribes for their comments on the proposed project.

County Environmental Health Services

County Agricultural Commissioner's Office

Air Pollution Control District

County Sheriff's Department

Regional Water Quality Control Board

CA Coastal Commission

CA Department of Fish and Wildlife

CA Department of Forestry (Cal Fire)

CA Department of Transportation

Community Services District

Avila Valley Advisory Council

Northern Chumash Tribal Council

Salinan Tribe of San Luis Obispo, Monterey, & San Benito Counties

yak tityu tityu - Northern Chumash Tribe

Port San Luis Harbor District

Pacific Gas & Electric

City of Pismo Beach

Notice posted in the Tribune

Notice posted at the County Clerk

Appendix A. Title VI Policy Statement

STATE OF CALIFORNIA—CALIFORNIA STATE TRANSPORTATION AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
OFFICE OF THE DIRECTOR
P.O. BOX 942873, MS-49
SACRAMENTO, CA 94273-0001
PHONE (916) 654-6130
FAX (916) 653-5776
TTY 711
www.dot.ca.gov

Making Conservation a California Way of Life.

April 2018

NON-DISCRIMINATION POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964, ensures *"No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance."*

Related federal statutes and state law further those protections to include sex, disability, religion, sexual orientation, and age.

For information or guidance on how to file a complaint, please visit the following web page: http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

To obtain this information in an alternate format such as Braille or in a language other than English, please contact the California Department of Transportation, Office of Business and Economic Opportunity, 1823 14th Street, MS-79, Sacramento, CA 95811. Telephone (916) 324-8379, TTY 711, email Title.VI@dot.ca.gov, or visit the website www.dot.ca.gov.

LAURIE BERMAN
Director

"Provide a safe, sustainable, integrated and efficient transportation system to enhance California's economy and livability"

Appendix B. Avoidance, Minimization and/or Mitigation Summary

In order to be sure that all the avoidance and minimization measures (AMMs) identified in this document are executed at the appropriate times, the following mitigation program would be implemented. During project design, these AMMs will be incorporated into the project's final plans, specifications, and cost estimates, as appropriate. All permits (i.e., a Coastal Development Permit) will be obtained prior to implementation of the project. During construction, environmental and construction/engineering staff will ensure that the commitments contained herein are fulfilled. Following construction and appropriate phases of project delivery, long-term mitigation maintenance and monitoring will take place, as applicable. The following summary is a draft; conditional measures not listed below may be added because they are currently unknown. The list below is categorized by resource type, but some measures may apply to more than one resource area. Duplicative or redundant measures are not included.

Protected or Regulated Resource	Proposed Avoidance and Minimization Measures
Aesthetics/Visual	**AMM AES-1:** Retaining walls shall be designed to be aesthetically pleasing based on the stakeholder input process, incorporating locally appropriate context sensitive solutions to enhance their continuity with similar features used in the project site vicinity and local community, and to reduce their overall visual impact. **AMM AES-2:** A landscaping plan consisting of drought tolerant native species shall be planted within the first six months following project completion. Implementation of this plan shall be overseen for a period of 3 years by a qualified biologist or landscape architect. **AMM AES-3**: Native trees shall be preserved and protected to the maximum extent feasible. Coast live oaks will be incorporated into the landscaping plant palette to be planted within the project area at the end of construction. **AMM AES-4**: A signage plan shall consolidate signs as appropriate, avoid redundancy, and locate traffic control cabinets out of sight. A lighting plan shall require project lighting to be appropriately shielded, eliminate redundancy of lighting standards, and use context sensitive street lighting designs. The plan will be consistent with Caltrans and County lighting guidelines and standards, developed and in compliance with the Illuminating Engineering Society's design guidelines and International Dark-Sky Association approved lighting features.
Air Quality	**AMM AQ-1**: Reduce the amount of the disturbed area where possible. **AMM AQ-2:** Use of water trucks or sprinkler systems in sufficient quantities to prevent airborne dust from leaving the site and from exceeding the APCD's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Increased watering frequency would be required whenever wind speeds exceed 15 mph. Reclaimed (non-potable) water should be used whenever possible. Please note that since water use is a concern due to drought conditions, the contractor or builder shall consider the use of an APCD-approved dust suppressant where feasible to reduce the amount of water used for dust control. **AMM AQ-3**: All dirt stock pile areas should be sprayed daily and covered with tarps or other dust barriers as needed. **AMM AQ-4:** Permanent dust control measures identified in the approved project revegetation and landscape plans should be implemented as soon as possible, following completion of any soil disturbing activities. **AMM AQ-5:** Exposed ground areas that are planned to be reworked at dates greater than one month after initial grading should be sown with a fast germinating, non-invasive grass seed and watered until vegetation is established.

Air Quality	**AMM AQ-6:** All disturbed soil areas not subject to revegetation should be stabilized using approved chemical soil binders, jute netting, or other methods approved in advance by the APCD. **AMM AQ-7:** All roadways, driveways, sidewalks, etc. to be paved should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders are used. **AMM AQ-8:** Vehicle speed for all construction vehicles shall not exceed 15 mph on any unpaved surface at the construction site. **AMM AQ-9:** All trucks hauling dirt, sand, soil, or other loose materials are to be covered or should maintain at least two feet of freeboard (minimum vertical distance between top of load and top of trailer) in accordance with California Vehicle Code (CVC) Section 23114. **AMM AQ-10:** To prevent "track out" (sand or soil that adheres to and/or agglomerates on the exterior surfaces of motor vehicles and/or equipment [including tires] that may then fall onto any highway or street), the contractor should designate access points and require all employees, subcontractors, and others to use them. Install and operate a 'track-out prevention device' where vehicles enter and exit unpaved roads onto paved streets. The 'track-out prevention device' can be any device or combination of devices that are effective at preventing track out, located at the point of intersection of an unpaved area and a paved road. Rumble strips or steel plate devices need periodic cleaning to be effective. If paved roadways accumulate tracked out soils, the track-out prevention device may need to be modified. **AMM AQ-11:** Sweep streets at the end of each day if visible soil material is carried onto adjacent paved roads. Where feasible, water sweepers shall be used with reclaimed water. Roads shall be pre-wetted prior to sweeping when feasible. **AMM AQ-12:** All PM10 mitigation measures required should be shown on grading and building plans. **AMM AQ-13:** The contractor or builder shall designate a person or persons whose responsibility is to ensure any fugitive dust emissions do not result in a nuisance and to enhance the implementation of the mitigation measures as necessary to minimize dust complaints and reduce visible emissions below the APCD's limit of 20% opacity for greater than 3 minutes in any 60-minute period. Their duties shall include holidays and weekend periods when work may not be in progress (for example, wind-blown dust could be generated on an open dirt lot). **AMM AQ-14:** Portable equipment, 50 horsepower or greater, such as diesel engines and portable generators, used during construction activities may require California statewide portable equipment registration (issued by the California Air Resources Board) or an APCD permit. **AMM AQ-15:** Depending on lead-based paint removal method, an APCD permit may be required. Contact the APCD Engineering & Compliance Division at 805-781-5912 for more information. **AMM AQ-16:** If this project will include demolition activities of potentially asbestos containing material (ACM), then it may be subject to various regulatory jurisdictions, including the requirements stipulated in the National Emission Standard for Hazardous Air Pollutants (40CFR61, Subpart M - asbestos NESHAP). These requirements include but are not limited to 1) written notification to the APCD within at least 10 business days of activities commencing, 2) asbestos survey conducted by a Certified Asbestos Consultant, and 3) applicable removal and disposal requirements of identified ACM.
Biological Resources	No AMMs Required for Natural Communities No AMMs Required for Wetlands and Other Waters Plant Species Avoidance and Minimization Measures: **AMM BIO-1:** Prior to initial ground disturbance construction, all construction personnel will attend an environmental education program delivered by a qualified biologist. At a

Biological Resources	minimum, the program will include a description of invasive species, potential special-status species, and other protected natural resources, as well as an explanation of the regulatory and legal compliance setting for the project. **AMM BIO-2:** All work, including construction access and equipment staging areas, will be confined to the project area. **AMM BIO-3:** Prior to ground disturbance, a qualified biologist will conduct a preconstruction survey to ensure site conditions haven't changed and no special-status plants occur within the project area. **AMM BIO-4:** Coast live oak trees will be incorporated into the landscaping plant palette to be planted within the project area at the end of construction. Animal Species Avoidance and Minimization Measures: **AMM BIO-5**: To the greatest extent feasible, vegetation removal and ground disturbance should be conducted during the non-breeding season for birds (i.e., between September 2 and January 31). This will discourage birds from nesting in construction areas and will greatly reduce the potential for nesting birds to delay the construction schedule. **AMM BIO-6:** If construction activities are proposed during the typical nesting season (February 1 to September 1), a nesting bird survey will be conducted by a qualified biologist no more than one week prior to the start of construction to determine presence/absence of nesting birds within the biological study area and immediate vicinity. **AMM BIO-7:** If an active nest is found, a qualified biologist will establish an appropriate avoidance buffer. If necessary, the biologist will consult with the USFWS/CDFW to determine an appropriate buffer size. Construction within the buffer will be prohibited until the qualified biologist determines that the nest is no longer active. **AMM BIO-8:** Prior to vegetation removal, the area will be surveyed for woodrat nests. If nests are found within areas to be impacted, woodrat nests will be picked up whole with a piece of equipment and relocated out of the impact area. If this is not feasible, a qualified biologist will dismantle the nest by hand or with hand tools (preferably during the non-breeding season) to allow woodrats in the nest to escape into adjacent undisturbed habitat. Equipment may also be used to dismantle the nest at the discretion of the qualified biologist. The nest material will then be moved out of the work area and stacked where it is accessible to the woodrats. No AMMs for Threatened and Endangered Species Required Invasive Species Avoidance and Minimization Measures: **AMM BIO-9:** Prior to initial ground disturbance construction, all construction personnel will attend an environmental education program delivered by a qualified biologist. At a minimum, the program will include a description of invasive species, potential special-status species, and other protected natural resources, as well as an explanation of the regulatory and legal compliance setting for the project. **AMM BIO-10:** Immediately prior to construction, the contractor, with assistance from a qualified biologist will identify the "work area" limits with brightly-colored flagging or fencing to prevent unnecessary direct impacts. Flagging will be maintained in good repair for the duration of the Project. All trees and shrubs to be removed will be identified and clearly marked. The biologist will remain onsite to monitor the initial ground disturbance especially in the naturally vegetated area associated with the park-and-ride lot. **AMM BIO-11:** During construction, soil and vegetation disturbance will be minimized to the minimum area necessary to construct the project. **AMM BIO-12:** Invasive plant species that have been identified within the project footprint will be removed and transported to an approved disposal facility as trash (not green waste) during construction activities and will not be replanted.
Biological Resources	**AMM BIO-13:** During construction, the project will make all reasonable efforts to limit the use of imported soils for fill. Soils currently existing onsite will be used for fill material to the maximum extent practicable. If the use of imported fill material is necessary, the imported

	material must be obtained from a source that is known to be free of invasive plant species or the material must consist of purchased clean material such as crushed aggregate, sorted rock, or other similar substances. **AMM BIO-14:** All erosion control materials including straw bales, straw wattles, or mulch used onsite must be free of invasive species seed.
Coastal Zone	**AMM CZ-1:** All development and land divisions within or adjacent to an Environmentally Sensitive Habitat Area (ESHA) shall be designated and located in a manner which avoids any significant disruption or degradation of habitat values. In some cases where development within the ESHA cannot be avoided, the development shall be modified as necessary so that it is the lease environmentally damaging feasible alternative**.**
Cultural Resources	**AMM CULT-1:** Due to the archaeological sensitivity of the project area, the potential to encounter previously disturbed cultural materials during construction, an archaeological briefing will be conducted prior to construction. The briefing will alert construction crews of the possibility of unearthing cultural materials and the appropriate process to follow. **AMM CULT-2**: If cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find. Additional archaeological reconnaissance survey will be needed if project limits are extended beyond the present survey limits. **AMM CULT-3:** If human remains are discovered, California Health and Safety Code (H&SC) Section 7050.5 states that further disturbances and activities shall stop in any area or nearby area suspected to overlie remains, and the County Coroner contacted. If the remains are thought by the coroner to be Native American, the coroner will notify the Native American Heritage Commission (NAHC), who, pursuant to PRC Section 5097.98, will then notify the Most Likely Descendent (MLD). At this time, the person who discovered the remains will contact Keith Miller, Environmental Division Manager at 805-781-5714 and Damon Haydu, Caltrans District 5 Archaeologist at 805-542-4799 so that they may work with the MLD on the respectful treatment and disposition of the remains. Further provisions of PRC 5097.98 are to be followed as applicable.
Geology/Soils/ Seismic/Topography	No AMMs Required
Hazardous Waste/Materials	No AMMs Required
Land Use	No AMMs Required
Noise	No AMMs Required
Paleontology	**AMM PALEO-1:** Once a final design for the project has been determined, and prior to construction, a Project Paleontologist (meeting SVP standards) will prepare a Paleontological Resources Monitoring and Mitigation Plan (PRMMP). This PRMMP will include development of a Worker's Environmental Awareness Program for project personnel, and will address specifics of monitoring (e.g., when and where monitoring is needed, the level of effort needed, Native American involvement, etc.), if needed. The PRMMP will also include the process to be followed in the event of a fossil discovery. The Project Paleontologist will also prepare a report of the findings of the PRMMP after construction is completed.
Traffic & Transportation	**AMM TRANS-1**: A Transportation Management Plan will be prepared in advance of construction that will provide detour routes and notification to the public, and emergency and medical providers in the project location of possible alternate access routes during possible lane closures.
Utilities/Emergency Services	**AMM UTIL-1**: Coordination between the County and the utility companies will be conducted to ensure minimal disruption to services during project construction. Coordination will take place between the Resident engineer and local emergency service providers before and during project construction to minimize potential delays through the construction site. **AMM UTIL-2**: Coordination will take place between the Caltrans Resident Engineer and local emergency service providers during project construction to minimize delays through the construction site.
Water Quality & Storm Water Runoff	**AMM WQ-1:** A Stormwater Pollution Prevention Plan will be prepared to minimize on-site sedimentation and erosion.

Appendix C. List of Acronyms and Abbreviations

AASHTO	American Association of State Highway and Transportation Officials
AB	Assembly Bill
ACHP	Advisory Council on Historic Preservation
ACM	Asbestos Containing Material
ADA	Americans with Disabilities Act
ADL	Aerially Deposited Lead
AMM	Avoidance and Minimization Measure
APCD	Air Pollution Control District
APE	Area of Potential Effects
ARB	Air Resources Board
ARPA	Archaeological Resources Protection Act
ASR	Archaeological Survey Report
BAU	Business-As-Usual
BMP	Best Management Practices
BO	Biological Opinion
BSA	Biological Study Area
CAFE	Corporate Average Fuel Economy
Cal/EPA	California Environmental Protection Agency
CALFIRE	California Department of Forestry and Fire Protection
Cal-IPC	California Invasive Plant Council
CALSP	Caltrans Standard Plans
Caltrans	California Department of Transportation
CARB	California Air Resources Board
CCA	California Coastal Act

CCC	California Coastal Commission
CCIC	Central Coast Information Center
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEQA	California Environmental Quality Act
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CH4	Methane
CHRIS	California Historic Resources Information System
CMP	Corrugated metal pipe
CNDDB	California Natural Diversity Database
CNPS	California Native Plant Society
CO	Carbon Monoxide
CO2	Carbon Dioxide
County	County of San Luis Obispo Department of Public Works
CRHR	California Register of Historical Places
CTP	California Transportation Plan
CWA	Clean Water Act / Federal Water Pollution Control Act
CZLUO	Coastal Zone Land Use Ordinance
CZMA	Coastal Zone Management Act of 1972
dBA	A-Weighted Decibels, Abbreviated
DSA	Disturbed Soil Area
DTSC	California Department of Toxic Substances Control
DWQ	Diversion of Water Quality
DWR	Department of Water Resources

ECR	Environmental Commitments Record
ED	Environmental Document
EIR	Environmental Impact Report
EIS	Environmental Impact Statement
EMFAC	Emission Factors Model
EO	Executive Order
EPA	US Environmental Protection Agency
EPACT92	Energy Policy Act of 1992
ESA	Environmentally Sensitive Area
ESHA	Environmentally Sensitive Habitat Area
FCAA	The Federal Clean Air Act
FED	Final Environmental Document
FESA	Federal Endangered Species Act
FHWA	Federal Highway Administration
FTIP	Federal Transportation Improvement Program
GHG	Greenhouse Gas
H&SC	Health and Safety Code
H2S	Hydrogen Sulfide
HCP	Habitat Conservation Plan
HPSR	Historic Property Survey Report
ICE	Intersection Control Evaluation
IPCC	Intergovernmental Panel on Climate Change
IS	Initial Study
ISA	Initial Site Assessment
KOA	Kampgrounds of America
LCFS	Low Carbon Fuel Standard

LCP	Local Coastal Program
LEDPA	Least Environmentally Damaging Practicable Alternative
LOS	Level of Service
LUO	Land Use Ordinance
MLD	Most Likely Descendent
MMTCO2e	Million Metric Tons of Carbon Dioxide Equivalent
MND	Mitigated Negative Declaration
MOU	Memorandum of Understanding
MP	Mile Post
MPH	Miles Per Hour
MPO	Metropolitan Planning Organization
MS4	Municipal Separate Storm Sewer System
MT	Metric Tons
N20	Nitrous Oxide
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NAHC	Native American Heritage Commission
NCC	Natural Communities of Concern
NEPA	National Environmental Policy Act
NES(MI)	Natural Environment Study (Minimal Impacts)
NESHAP	National Emission Standard for Hazardous Air Pollutants
NHPA	National Historic Preservation Act of 1966
NHTSA	National Highway Traffic Safety Administration
NMFS	National Marine Fisheries Service
NNL	National Natural Landmarks
NO2	Nitrogen Dioxide

NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollution Discharge Elimination System
NPMS	National Pipeline Mapping Service
NRHP	National Register of Historic Places
O3	Ozone
OHWM	Ordinary High-Water Mark
OPR	Office of Planning and Research
OSTP	Office of Science and Technology Policy
PA	Programmatic Agreement
PA&ED	Project Approval and Environmental Document
PB	Lead
PCRH	Post Construction Requirements Handbook
PG&E	Pacific Gas and Electric
PLACs	Permits, Licenses, Agreements and Certifications
PM	Particulate Matter
PM10	Particles of 10-Micrometers or Smaller
PM2.5	Particles of 2.5 Micrometers or Smaller
PRC	Public Resources Code
PRLS	Park and Ride Lot Study
PRMMP	Paleontological Resources Monitoring and Mitigation Plan
PSI	Preliminary Site Investigation
PSR-PDS	Project Study Report- Project Development Support
Qa	Quaternary Age Surficial Sediments
RCRA	Resource Conservation and Recovery Act of 1976
RIS	Replaced Impervious Surfaces
ROW	Right-of-Way

RSA	Resource Study Area
RSI	Roadside Infiltrator
RTA	Regional Transit Authority
RTIP	Regional Transportation Improvement Program
RTP	Regional Transportation Plan
RV	Recreational Vehicle
RWQCB	Regional Water Quality Control Board
SB	Senate Bill
SDC	Seismic Design Criteria
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SLOCOG	San Luis Obispo Council of Governments
SLR	Sea-Level Rise
SMMWC	San Miguelito Mutual Water Company
SO2	Sulfur Dioxide
SR	State Route
SSC	Species of Special Concern
STAA	Surface Transportation Assistance Act
STLC	Soluble Threshold Limit Concentration
SVP	Society of Vertebrate Paleontology
SWDR	Storm Water Data Report
SWMP	Statewide Storm Water Management Plan
SWPPP	Stormwater Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TBMP	Treatment Best Management Practice
TMDL	Total Maximum Daily Loads

Tpg	Gragg Member of Pismo Formation
Tpm	Miguelito Member of the Pismo Formation
UCL	Upper Confidence Limit
US	United States
USACE	United States Army Corps of Engineers
USC	United States Code
USDOT	United States Department of Transportation
U.S. EPA	U.S. Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
VIA	Visual Impact Assessment
WDR	Waste Discharge Requirements
WMZ	Water Management Zone
WPCP	Water Pollution Control Program
WQMOA	Water Quality Memorandum of Assumptions

Appendix D. Comment Letters and Responses

See Chapter 4 for all comments and coordination.

Appendix E. List of Technical Studies

Negative Historic Property Survey Report (for nearby portion of SR-101). Caltrans, 2002.

Archaeological Survey Report (for the proposed Avila Park and Ride). County of SLO Department of Public Works, 2011.

Archaeological Survey Report. SWCA, 2019.

Paleonotological Resources Report. SWCA, 2019.

Natural Environment Study (Minimal Impacts). County of SLO Department of Public Works, 2019.

Water Quality Memorandum of Assumptions. Wallace Group, 2018.

Initial Site Assessment. Rincon Consultants. 2019.

Preliminary Site Investigation. Padre Associates, Inc. 2019.

Intersection Control Evaluation (ICE) Step 1 Report. 2015.

ICE Step 2 Report. Kittleson & Associates, 2019.

Design Criteria Memo. Wallace Group, 2019.

Visual Impact Assessment. Rincon Consultants, 2019.

Draft Project Report. Wallace Group, 2019.

CATEGORICAL EXEMPTION/CATEGORICAL EXCLUSION DETERMINATION FORM

05-SLO-101	20/21	1G480	0515000038
Dist.-Co.-Rte. (or Local Agency)	P.M./P.M.	E.A/Project No.	Federal-Aid Project No. (Local Project)/Project No.

PROJECT DESCRIPTION: (Briefly describe project including need, purpose, location, limits, right-of-way requirements, and activities involved in this box. *Use Continuation Sheet, if necessary.)*

The proposed project is located on US 101 in San Luis Obispo County at Avila Beach Drive, between Shell Beach Drive and Monte Road, PM 20.9/21.3.

The proposed project would replace the two-way stop-controlled southbound ramp terminal that includes two closely spaced intersections of Avila Beach Drive, US 101 SB Ramps, and Shell Beach Drive to a single-lane roundabout. The project would also include roundabout warning signs towards the terminus of the northbound off-ramp as well as the eastbound roundabout approach and a new park-and-ride lot at the southwest corner of Avila Beach Drive and Shell Beach Road.

Shell Beach Road and the southbound ramps will be realigned to intersect and accommodate the proposed roundabout. The roundabout design includes median islands (i.e. splitter islands) with pedestrian refuges at the crosswalks. Pedestrian crossings would be set back 20'-25' (approximately one car length) from the roundabout's circulatory roadway and the pedestrian refuges at the splitter islands would be 10' wide by 6' deep. 8' wide shared-use paths would be offset by 2' from the roundabout using a landscaped buffer. A central island in the center of the roundabout with an inscribed diameter (ICD) of 140' features a 12'-wide truck apron for the off-tracking of the back tires of truck trailers. Beneath the US 101 freeway, the shared-use path will be separated from Avila Beach Drive behind the bridge support columns. The abutment fill will be retained with ground anchor (tie-back) walls. The tie-back walls will be approximately 211' long and 9' high. Adjacent to the SB on-ramp two retaining walls will be constructed, the first wall will be approximately 239' long and approximately 9' tall the second wall will be approximately 106' long and approximately 9' tall. Adjacent to the SB off-ramp a retaining wall will be constructed that is approximately 66.5' long and approximately 11' tall. Within Caltrans right of way all improvements will follow Caltrans standards.

The park-and-ride lot would have access openings on Avila Beach Drive and Shell Beach Road and would provide multi-modal accessibility with a transit stop for the Avila-Pismo Beach Trolley and a San Luis Obispo Regional Transit Authority (SLORTA) bus. It will have a right-in/right-out driveway on Avila Beach Drive and a driveway on Shell Beach Road that accommodates left and right-turn movements. The parking lot is set back from the roundabout's shared-use path 16'-17' and minimizes impacts to the southern swale along the base of the hillside. With a total of 40 parking spaces, the primary park-and-ride lot would consist of up to 26 angled parking spaces (3 of which would be ADA accessible) and paved with hot mix asphalt. The separate parking area located west of the driveway on Avila Beach Drive would consist of up to 14 parallel parking spaces would remain unpaved with decomposed granite (or similar) to reduce impacts to water quality. All parking dimensions would follow the most current County of SLO Public Improvements Standards (2019), sections 4.1 Design Standards and 4.1.6 Angled Parking.

The project will be constructed in both Caltrans and SLO County right of way. No additional right of way will be required.

CALTRANS CEQA DETERMINATION (Check one)

☒ **Not Applicable – Caltrans is not the CEQA Lead Agency**

☐ **Not Applicable – Caltrans has prepared an Initial Study or Environmental Impact Report under CEQA**

Based on an examination of this proposal, supporting information, and the above statements, the project is:

☐ **Exempt by Statute.** (PRC 21080[b]; 14 CCR 15260 et seq.)

☐ **Categorically Exempt. Class** . (PRC 21084; 14 CCR 15300 et seq.)

Based on an examination of this proposal and supporting information, the following statements are true and exceptions do not apply:

- If this project falls within exempt class 3, 4, 5, 6 or 11, it does not impact an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law.
- There will not be a significant cumulative effect by this project and successive projects of the same type in the same place, over time.
- There is not a reasonable possibility that the project will have a significant effect on the environment due to unusual circumstances.
- This project does not damage a scenic resource within an officially designated state scenic highway.
- This project is not located on a site included on any list compiled pursuant to Govt. Code § 65962.5 ("Cortese List").
- This project does not cause a substantial adverse change in the significance of a historical resource.

☐ **Common Sense Exemption.** [This project does not fall within an exempt class, but it can be seen with certainty that there is no possibility that the activity may have a significant effect on the environment (14 CCR 15061[b][3].)

Print Name: Senior Environmental Planner or Environmental Branch Chief	Print Name: Project Manager
Signature Date	Signature Date

CATEGORICAL EXEMPTION/CATEGORICAL EXCLUSION DETERMINATION FORM
Continuation Sheet

05-SLO-101	20/21	1G480	0515000038
Dist.-Co.-Rte. (or Local Agency)	P.M./P.M.	E.A/Project No.	Federal-Aid Project No. (Local Project)/Project No.

NEPA COMPLIANCE

In accordance with 23 CFR 771.117, and based on an examination of this proposal and supporting information, the State has determined that this project:

- does not individually or cumulatively have a significant impact on the environment as defined by NEPA, and is excluded from the requirements to prepare an Environmental Assessment (EA) or Environmental Impact Statement (EIS), and
- has considered unusual circumstances pursuant to 23 CFR 771.117(b).

CALTRANS NEPA DETERMINATION (Check one)

☒ **23 USC 326:** The State has determined that this project has no significant impacts on the environment as defined by NEPA, and that there are no unusual circumstances as described in 23 CFR 771.117(b). As such, the project is categorically excluded from the requirements to prepare an EA or EIS under the National Environmental Policy Act. The State has been assigned, and hereby certifies that it has carried out the responsibility to make this determination pursuant to Chapter 3 of Title 23, United States Code, Section 326 and a Memorandum of Understanding dated May 31, 2016, executed between the FHWA and the State. The State has determined that the project is a Categorical Exclusion under:

- ☒ **23 CFR 771.117(c): activity (c)(_26_)**
- ☐ **23 CFR 771.117(d): activity (d)(___)**
- ☐ **Activity ___ listed in Appendix A of the MOU between FHWA and the State**

☐ **23 USC 327:** Based on an examination of this proposal and supporting information, the State has determined that the project is a Categorical Exclusion under 23 USC 327. The environmental review, consultation, and any other actions required by applicable Federal environmental laws for this project are being, or have been, carried out by Caltrans pursuant to 23 USC 327 and the Memorandum of Understanding dated December 23, 2016 and executed by FHWA and Caltrans.

Matthew Fowler		Paul Valadao	
Print Name: Senior Environmental Planner or Environmental Branch Chief		Print Name: Project Manager/DLA Engineer	
Signature	Date: 5/22/20	Signature	Date: 5/22/20

Date of Categorical Exclusion Checklist completion: 8/8/19	Date of ECR or equivalent : 4/11/18

Visual Avoidance and Minimization Measures

Retaining walls shall be designed to be aesthetically pleasing based on the stakeholder input process, incorporating locally appropriate context sensitive solutions to enhance their continuity with similar features used in the project site vicinity and local community, and to reduce their overall visual impact.

A landscaping plan consisting of drought tolerant native species shall be planted within the first six months following project completion. Implementation of this plan shall be overseen for a period of 3 years by a qualified biologist or landscape architect.

Native trees shall be preserved and protected to the maximum extent feasible. Coast live oaks will be incorporated into the landscaping plant palette to be planted within the project area at the end of construction.

A signage plan shall consolidate signs as appropriate, avoid redundancy, and locate traffic control cabinets out of sight. A lighting plan shall require project lighting to be appropriately shielded, eliminate redundancy of lighting standards, and use context sensitive street lighting designs. The plan will be consistent with Caltrans and County lighting guidelines and standards, developed and in compliance with the Illuminating Engineering Society's design guidelines and International Dark-Sky Association approved lighting features.

Water Quality Avoidance and Minimization Measures

A Stormwater Pollution Prevention Plan will be prepared to minimize on-site sedimentation and erosion.

Plant Avoidance and Minimization Measures

Prior to initial ground disturbance construction, all construction personnel will attend an environmental education program delivered by a qualified biologist. At a minimum, the program will include a description of invasive species, potential special-status species, and other protected natural resources, as well as an explanation of the regulatory and legal compliance setting for the project.

All work, including construction access and equipment staging areas, will be confined to the project area.

Prior to ground disturbance, a qualified biologist will conduct a preconstruction survey to ensure site conditions haven't changed and no special-status plants occur within the project area.

Coast live oak trees will be incorporated into the landscaping plant palette to be planted within the project area at the end of construction.

Animal Avoidance and Minimization Measures

To the greatest extent feasible, vegetation removal and ground disturbance should be conducted during the non-breeding season for birds (i.e., between September 2 and January 31). This will discourage birds from nesting in construction areas and will greatly reduce the potential for nesting birds to delay the construction schedule.

If construction activities are proposed during the typical nesting season (February 1 to September 1), a nesting bird survey will be conducted by a qualified biologist no more than one week prior to the start of construction to determine presence/absence of nesting birds within the biological study area and immediate vicinity.

If an active nest is found, a qualified biologist will establish an appropriate avoidance buffer. If necessary, the biologist will consult with the USFWS/CDFW to determine an appropriate buffer size. Construction within the buffer will be prohibited until the qualified biologist determines that the nest is no longer active.

Prior to vegetation removal, the area will be surveyed for woodrat nests. If nests are found within areas to be impacted, woodrat nests will be picked up whole with a piece of equipment and relocated out of the impact area. If this is not feasible, a qualified biologist will dismantle the nest by hand or with hand tools (preferably during the non-breeding season) to allow woodrats in the nest to escape into adjacent undisturbed habitat. Equipment may also be used to dismantle the nest at the discretion of the qualified biologist. The nest material will then be moved out of the work area and stacked where it is accessible to the woodrats.

Invasive Species Avoidance and Minimization Measures

Prior to initial ground disturbance construction, all construction personnel will attend an environmental education program delivered by a qualified biologist. At a minimum, the program will include a description of invasive species, potential special-status species, and other protected natural resources, as well as an explanation of the regulatory and legal compliance setting for the project.

Immediately prior to construction, the contractor, with assistance from a qualified biologist will identify the "work area" limits with brightly-colored flagging or fencing to prevent unnecessary direct impacts. Flagging will be maintained in good repair for the duration of the Project. All trees and shrubs to be removed will be identified and clearly marked. The biologist will remain onsite to monitor the initial ground disturbance especially in the naturally vegetated area associated with the park-and-ride lot.

During construction, soil and vegetation disturbance will be minimized to the minimum area necessary to construct the project. Invasive plant species that have been identified within the project footprint will be removed and transported to an approved disposal facility as trash (not green waste)

During construction, the project will make all reasonable efforts to limit the use of imported soils for fill. Soils currently existing onsite will be used for fill material to the maximum extent practicable. If the use of imported fill material is necessary, the imported material must be obtained from a source that is known to be free of invasive plant species or the material must consist of purchased clean material such as crushed aggregate, sorted rock, or other similar substances.

All erosion control materials including straw bales, straw wattles, or mulch used onsite must be free of invasive species seed.

Attachment K
Cooperative Agreement

COOPERATIVE AGREEMENT COVER SHEET

Work Description

The US 101/Avila Beach Drive Interchange ramp improvements.

Contact Information

CALTRANS

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COUNTY OF SAN LUIS OBISPO

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San Luis Obispo, CA 93408
Office Phone: 805-781-1406

Table of Contents

Please note:
1. Caltrans administered funds must be expended proportionally with all other funds. All project funds must be shown in the Funding Summary. Local funds committed to the project cannot be omitted from the funding summary.
2. COUNTY may only be designated CEQA lead agency with written approval of the District Director. It is the District's responsibility to obtain this approval before execution of the agreement.

COOPERATIVE AGREEMENT

State Independent Quality Assurance

This AGREEMENT, effective on 10/31/2016, is between the State of California, acting through its Department of Transportation, referred to as CALTRANS, and:

County of San Luis Obispo, a political subdivision of the State of California, referred to hereinafter as COUNTY.

RECITALS

1. PARTNERS are authorized to enter into a cooperative agreement for improvements to the state highway system (SHS) per the California Streets and Highways Code sections 114 and 130.

2. For the purpose of this AGREEMENT, *the US 101/Avila Beach Drive Interchange ramp improvements* will be referred to hereinafter as PROJECT. The project scope of work is defined in the PROJECT initiation and approval documents (e.g. Project Study Report, Permit Engineering Evaluation Report, or Project Report).

3. All responsibilities assigned in this AGREEMENT to complete the following PROJECT COMPONENTS will be referred to hereinafter as OBLIGATIONS:

   - Project Approval and Environmental Document (PA&ED)

4. This AGREEMENT is separate from and does not modify or replace any other cooperative agreement or memorandum of understanding between PARTNERS regarding the PROJECT.

5. No PROJECT deliverables have been completed prior to this AGREEMENT.

6. In this AGREEMENT capitalized words represent defined terms, initialisms, or acronyms.

7. PARTNERS hereby set forth the terms, covenants, and conditions of this AGREEMENT, under which they will accomplish OBLIGATIONS.

RESPONSIBILITIES

Sponsorship

8. COUNTY is the SPONSOR for the PROJECT COMPONENT in this AGREEMENT.

Funding

9. Funding sources, funding amounts, and invoicing/payment details are documented in the FUNDING SUMMARY. The FUNDING SUMMARY is incorporated and made an express part of this AGREEMENT.

   PARTNERS will execute a new FUNDING SUMMARY each time the funding details change. The FUNDING SUMMARY will be executed by a legally authorized representative of the respective PARTNERS. The most current fully executed FUNDING SUMMARY supersedes any previous FUNDING SUMMARY created for this AGREEMENT.

   Replacement of the FUNDING SUMMARY will not require an amendment to the body of this AGREEMENT unless the funding changes require it.

10. Each PARTNER is responsible for the costs they incur in performing the OBLIGATIONS of this AGREEMENT unless otherwise stated in this AGREEMENT.

Implementing Agency

11. COUNTY is the IMPLEMENTING AGENCY for PA&ED.

12. The IMPLEMENTING AGENCY for a PROJECT COMPONENT will provide a Quality Management Plan (QMP) for that component as part of the PROJECT MANAGEMENT PLAN. The Quality Management Plan describes the IMPLEMENTING AGENCY's quality policy and how it will be used. The Quality Management Plan is subject to CALTRANS review and approval.

13. Any PARTNER responsible for completing WORK shall make its personnel and consultants that prepare WORK available to help resolve WORK-related problems and changes for the entire duration of the PROJECT including PROJECT COMPONENT work that may occur under separate agreements.

Independent Quality Assurance

14. CALTRANS will provide Independent Quality Assurance for the portions of WORK within the existing and proposed SHS right-of-way.

    CALTRANS' Independent Quality Assurance efforts are to ensure that COUNTY's quality assurance activities result in WORK being developed in accordance with the applicable standards and within an established Quality Management Plan. Independent Quality Assurance does not include any efforts necessary to develop or deliver WORK or any validation by verifying or rechecking work performed by another party.

When CALTRANS performs Independent Quality Assurance it does so for its own benefit. No one can assign liability to CALTRANS due to its Independent Quality Assurance.

Environmental Document Quality Control (EDQC) Program

15. Per NEPA assignment and CEQA statutes, CALTRANS will perform Environmental Document Quality Control and NEPA Assignment Review Procedures for environmental documentation. CALTRANS quality control and quality assurance procedures for all environmental documents are described in the Jay Norvell Memos dated October 1, 2012 (available at http://www.dot.ca.gov/ser/memos.htm#LinkTarget_705). This also includes the independent judgment analysis and determination under CEQA that the environmental documentation meets CEQA requirements.

CEQA/NEPA Lead Agency

16. COUNTY is the CEQA Lead Agency for the PROJECT.

17. CALTRANS is a CEQA Responsible Agency for the PROJECT.

18. CALTRANS is the NEPA Lead Agency for the PROJECT.

Environmental Permits, Approvals and Agreements

19. PARTNERS will comply with the commitments and conditions set forth in the environmental documentation, environmental permits, approvals, and applicable agreements as those commitments and conditions apply to each PARTNER's responsibilities in this AGREEMENT.

20. Unless otherwise assigned in this AGREEMENT, the IMPLEMENTING AGENCY for a PROJECT COMPONENT is responsible for all PROJECT COMPONENT WORK associated with coordinating, obtaining, implementing, renewing, and amending the PROJECT permits, agreements, and approvals whether they are identified in the planned project scope of work or become necessary in the course of completing the PROJECT.

21. The PROJECT requires the following environmental requirements/approvals:

ENVIRONMENTAL PERMITS/REQUIREMENTS
404, US Army Corps Of Engineers
401, Regional Water Quality Control Board
Coastal Development Permit, California Coastal Commission
1602 California Department of Fish and Wildlife

Project Approval and Environmental Document (PA&ED)

22. As IMPLEMENTING AGENCY for PA&ED, COUNTY is responsible for all PA&ED WORK except those PA&ED activities and responsibilities that are assigned to another PARTNER in this AGREEMENT and those activities that may be specifically excluded.

23. CALTRANS will be responsible for completing the following PA&ED activities:

CALTRANS Work Breakdown Structure Identifier (If Applicable)
Independent Quality Assurance
165.15.15.xx Section 7 Consultation
165.25.25 Approval to Circulate Resolution
180.15.05 Record of Decision (NEPA)

24. Any PARTNER preparing environmental documentation, including studies and reports, will ensure that qualified personnel remain available to help resolve environmental issues and perform any necessary work to ensure that the PROJECT remains in environmental compliance.

California Environmental Quality Act (CEQA)

25. COUNTY will determine the type of CEQA documentation and will cause that documentation to be prepared in accordance with CEQA requirements.

26. Any PARTNER involved in the preparation of CEQA environmental documentation will prepare the documentation to meet CEQA requirements and follow COUNTY's standards that apply to the CEQA process.

27. CALTRANS is a CEQA Responsible Agency for the PROJECT and will review, comment, and concur on all environmental documentation (including, but not limited to, studies, reports, public notices, and public meeting materials, determinations, administrative drafts, and final environmental documents) at appropriate stages of development prior to approval and public availability.

28. Any PARTNER preparing any portion of the CEQA environmental documentation, including any studies and reports, will submit that portion of the documentation to the CEQA Lead Agency for review, comment, and approval at appropriate stages of development prior to public availability.

29. If COUNTY makes any changes to the CEQA documentation, COUNTY will allow CALTRANS to review, comment, and concur on those changes prior to the COUNTY's approval at appropriate stages of development prior to public availability.

30. If the CEQA lead agency, COUNTY, makes any changes to CEQA-related public notices, then COUNTY will allow CALTRANS to review, comment, and concur on those changes prior to publication and circulation.

31. COUNTY will attend all CEQA-related public meetings.

32. If a PARTNER who is not the CEQA lead agency holds a public meeting about the PROJECT, that PARTNER must clearly state its role in the PROJECT and the identity of the CEQA lead agency on all meeting publications. All meeting publications must also inform the attendees that public comments collected at the meetings are not part of the CEQA public review process.

    That PARTNER will submit all meeting advertisements, agendas, exhibits, handouts, and materials to the CEQA lead agency for review, comment, and approval at least ten (10) working days prior to publication or use. If that PARTNER makes any changes to the materials, it will allow the CEQA lead agency to review, comment on, and approve those changes at least three (3) working days prior to the public meeting date.

    The CEQA lead agency maintains final editorial control with respect to text or graphics that could lead to public confusion over CEQA-related roles and responsibilities.

National Environmental Policy Act (NEPA)

33. Pursuant to Chapter 3 of Title 23, United States Code (23 U.S.C. 326) and 23 U.S.C. 327, CALTRANS is the NEPA lead agency for the PROJECT. CALTRANS is responsible for NEPA compliance, will determine the type of NEPA documentation, and will cause that documentation to be prepared in accordance with NEPA requirements.

    CALTRANS, as the NEPA lead agency for PROJECT, will review, comment, and approve all environmental documentation (including, but not limited to, studies, reports, public notices, and public meeting materials, determinations, administrative drafts, and final environmental documents) at appropriate stages of development prior to approval and public availability.

    When required as NEPA lead agency, CALTRANS will conduct consultation and coordination and obtain, renew, or amend approvals pursuant to the Federal Endangered Species Act, and Essential Fish Habitat.

    When required as NEPA lead agency, CALTRANS will conduct consultation and coordination approvals pursuant to Section 106 of the National Historic Preservation Act.

34. Any PARTNER involved in the preparation of NEPA environmental documentation will follow FHWA and CALTRANS STANDARDS that apply to the NEPA process including, but not limited to, the guidance provided in the FHWA Environmental Guidebook (available at www.fhwa.dot.gov/hep/index.htm) and the CALTRANS Standard Environmental Reference.

35. Any PARTNER preparing any portion of the NEPA environmental documentation (including, but not limited to, studies, reports, public notices, and public meeting materials, determinations, administrative drafts, and final environmental documents) will submit that portion of the documentation to CALTRANS for CALTRANS' review, comment, and approval prior to public availability.

36. COUNTY will prepare, publicize, and circulate all NEPA-related public notices, except Federal Register notices. COUNTY will submit all notices to CALTRANS for CALTRANS' review, comment, and approval prior to publication and circulation.

    CALTRANS will work with the appropriate federal agency to publish notices in the Federal Register.

37. CALTRANS will attend all NEPA-related public meetings.

38. COUNTY will submit all NEPA-related public meeting materials to CALTRANS for CALTRANS' review, comment, and approval at least ten (10) working days prior to the public meeting date.

39. If a PARTNER who is not the NEPA lead agency holds a public meeting about the PROJECT, that PARTNER must clearly state its role in the PROJECT and the identity of the NEPA lead agency on all meeting publications. All meeting publications must also inform the attendees that public comments collected at the meetings are not part of the NEPA public review process.

    That PARTNER will submit all meeting advertisements, agendas, exhibits, handouts, and materials to the NEPA lead agency for review, comment, and approval at least ten (10) working days prior to publication or use. If that PARTNER makes any changes to the materials, it will allow the NEPA lead agency to review, comment on, and approve those changes at least three (3) working days prior to the public meeting date.

    The NEPA lead agency has final approval authority with respect to text or graphics that could lead to public confusion over NEPA-related roles and responsibilities.

Schedule

40. PARTNERS will manage the schedule for OBLIGATIONS through the work plan included in the PROJECT MANAGEMENT PLAN.

Additional Provisions

41. PARTNERS will perform all OBLIGATIONS in accordance with federal and California laws, regulations, and standards; FHWA STANDARDS; and CALTRANS STANDARDS.

42. CALTRANS retains the right to reject noncompliant WORK, protect public safety, preserve property rights, and ensure that all WORK is in the best interest of the SHS.

43. Each PARTNER will ensure that personnel participating in OBLIGATIONS are appropriately qualified or licensed to perform the tasks assigned to them.

44. PARTNERS will invite each other to participate in the selection of any consultants who participate in OBLIGATIONS.

45. CALTRANS will issue, upon proper application, the encroachment permits required for WORK within SHS right-of-way. Contractors and/or agents, and utility owners will not work within the SHS right-of-way without an encroachment permit issued in their name. CALTRANS will provide encroachment permits to PARTNERS, their contractors, consultants and agents, and utility owners at no cost. If the encroachment permit and this AGREEMENT conflict, the requirements of this AGREEMENT shall prevail.

46. The IMPLEMENTING AGENCY for a PROJECT COMPONENT will coordinate, prepare, obtain, implement, renew, and amend any encroachment permits needed to complete the PROJECT COMPONENT WORK.

47. If any PARTNER discovers unanticipated cultural, archaeological, paleontological, or other protected resources during WORK, all WORK in that area will stop and that PARTNER will notify all PARTNERS within twenty-four (24) hours of discovery. WORK may only resume after a qualified professional has evaluated the nature and significance of the discovery and a plan is approved for its removal or protection.

48. PARTNERS will hold all administrative drafts and administrative final reports, studies, materials, and documentation relied upon, produced, created, or utilized for the PROJECT in confidence to the extent permitted by law and where applicable, the provisions of California Government Code section 6254.5(e) shall protect the confidentiality of such documents in the event that said documents are shared between PARTNERS.

    PARTNERS will not distribute, release, or share said documents with anyone other than employees, agents, and consultants who require access to complete the PROJECT without the written consent of the PARTNER authorized to release them, unless required or authorized to do so by law.

49. If a PARTNER receives a public records request pertaining to OBLIGATIONS, that PARTNER will notify PARTNERS within five (5) working days of receipt and make PARTNERS aware of any disclosed public documents. PARTNERS will consult with each other prior to the release of any public documents related to the PROJECT.

50. If HM-1 or HM-2 is found during a PROJECT COMPONENT, the IMPLEMENTING AGENCY for that PROJECT COMPONENT will immediately notify PARTNERS.

51. CALTRANS, independent of the PROJECT, is responsible for any HM-1 found within the existing SHS right-of-way. CALTRANS will undertake, or cause to be undertaken, HM MANAGEMENT ACTIVITIES related to HM-1 with minimum impact to the PROJECT schedule.

    CALTRANS, independent of the PROJECT will pay, or cause to be paid, the cost of HM MANAGEMENT ACTIVITIES related to HM-1 found within the existing SHS right-of-way.

52. COUNTY, independent of the PROJECT, is responsible for any HM-1 found within the PROJECT limits and outside the existing SHS right-of-way. COUNTY will undertake, or cause to be undertaken, HM MANAGEMENT ACTIVITIES related to HM-1 with minimum impact to the PROJECT schedule.

    COUNTY, independent of the PROJECT, will pay, or cause to be paid, the cost of HM MANAGEMENT ACTIVITIES related to HM-1 found within the PROJECT limits and outside of the existing SHS right-of-way.

53. If HM-2 is found within the PROJECT limits, the public agency responsible for the advertisement, award, and administration (AAA) of the PROJECT construction contract will be responsible for HM MANAGEMENT ACTIVITIES related to HM-2.

54. CALTRANS' acquisition or acceptance of title to any property on which any HM-1 or HM-2 is found will proceed in accordance with CALTRANS' policy on such acquisition.

55. COUNTY will accept, reject, compromise, settle, or litigate claims of any non-AGREEMENT parties hired to complete OBLIGATIONS.

56. PARTNERS will confer on any claim that may affect OBLIGATIONS or PARTNERS' liability or responsibility under this AGREEMENT in order to retain resolution possibilities for potential future claims. No PARTNER will prejudice the rights of another PARTNER until after PARTNERS confer on the claim.

57. If the PROJECT expends state or federal funds, each PARTNER will comply with the federal Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards of 2 CFR, Part 200. PARTNERS will ensure that any for-profit party hired to participate in the OBLIGATIONS will comply with the requirements in 48 CFR, Chapter 1, Part 31. When state or federal funds are expended on the PROJECT these principles and requirements apply to all funding types included in this AGREEMENT.

58. If the PROJECT expends state or federal funds, each PARTNER will undergo an annual audit in accordance with the Single Audit Act and the federal Office of Management and Budget (OMB) Circular A-133.

59. If the PROJECT expends federal funds, any PARTNER that hires an A&E consultant to perform WORK on any part of the PROJECT will ensure that the procurement of the consultant and the consultant overhead costs are in accordance with Chapter 10 of the *Local Assistance Procedures Manual*.

60. If WORK stops for any reason, IMPLEMENTING AGENCY will place the PROJECT right-of-way in a safe and operable condition acceptable to CALTRANS.

61. If WORK stops for any reason, each PARTNER will continue to implement all of its applicable commitments and conditions included in the PROJECT environmental documentation, permits, agreements, or approvals that are in effect at the time that WORK stops, as they apply to each PARTNER's responsibilities in this AGREEMENT, in order to keep the PROJECT in environmental compliance until WORK resumes.

62. Fines, interest, or penalties levied against a PARTNER will be paid by the PARTNER whose action or lack of action caused the levy.

63. If there are insufficient funds available in this AGREEMENT to place PROJECT right-of-way in a safe and operable condition, the appropriate IMPLEMENTING AGENCY will fund these activities until such time as PARTNERS amend this AGREEMENT.

    That IMPLEMENTING AGENCY may request reimbursement for these costs during the amendment process.

64. COUNTY will furnish CALTRANS with the Project History Files related to the PROJECT facilities on SHS within sixty (60) days following the completion of each PROJECT COMPONENT. COUNTY will prepare the Project History File in accordance with the Project Development Procedures Manual, Chapter 7. All material will be submitted neatly in a three-ring binder and on a CD ROM in PDF format.

GENERAL CONDITIONS

65. PARTNERS understand that this AGREEMENT is in accordance with and governed by the Constitution and laws of the State of California. This AGREEMENT will be enforceable in the State of California. Any PARTNER initiating legal action arising from this AGREEMENT will file and maintain that legal action in the Superior Court of the county in which the CALTRANS district office that is signatory to this AGREEMENT resides, or in the Superior Court of the county in which the PROJECT is physically located.

66. All CALTRANS' OBLIGATIONS under this AGREEMENT are subject to the appropriation of resources by the Legislature, the State Budget Act authority, and the allocation of funds by the California Transportation Commission.

67. Neither COUNTY nor any officer or employee thereof is responsible for any injury, damage or liability occurring by reason of anything done or omitted to be done by CALTRANS, its contractors, sub-contractors, and/or its agents under or in connection with any work, authority, or jurisdiction conferred upon CALTRANS under this AGREEMENT. It is understood and agreed that CALTRANS, to the extent permitted by law, will defend, indemnify, and save harmless COUNTY and all of its officers and employees from all claims, suits, or actions of every name, kind, and description brought forth under, but not limited to, tortious, contractual, inverse condemnation, or other theories and assertions of liability occurring by reason of anything done or omitted to be done by CALTRANS, its contractors, sub-contractors, and/or its agents under this AGREEMENT.

68. Neither CALTRANS nor any officer or employee thereof is responsible for any injury, damage, or liability occurring by reason of anything done or omitted to be done by COUNTY, its contractors, sub-contractors, and/or its agents under or in connection with any work, authority, or jurisdiction conferred upon COUNTY under this AGREEMENT. It is understood and agreed that COUNTY, to the extent permitted by law, will defend, indemnify, and save harmless CALTRANS and all of its officers and employees from all claims, suits, or actions of every name, kind, and description brought forth under, but not limited to, tortious, contractual, inverse condemnation, or other theories and assertions of liability occurring by reason of anything done or omitted to be done by COUNTY, its contractors, sub-contractors, and/or its agents under this AGREEMENT.

69. PARTNERS do not intend this AGREEMENT to create a third party beneficiary or define duties, obligations, or rights in parties not signatory to this AGREEMENT. PARTNERS do not intend this AGREEMENT to affect their legal liability by imposing any standard of care for fulfilling OBLIGATIONS different from the standards imposed by law.

70. PARTNERS will not assign or attempt to assign OBLIGATIONS to parties not signatory to this AGREEMENT without an amendment to this AGREEMENT.

71. COUNTY will not interpret any ambiguity contained in this AGREEMENT against CALTRANS. COUNTY waives the provisions of California Civil Code section 1654.

    A waiver of a PARTNER's performance under this AGREEMENT will not constitute a continuous waiver of any other provision.

72. A delay or omission to exercise a right or power due to a default does not negate the use of that right or power in the future when deemed necessary.

73. If any PARTNER defaults in its OBLIGATIONS, a non-defaulting PARTNER will request in writing that the default be remedied within thirty (30) calendar days. If the defaulting PARTNER fails to do so, the non-defaulting PARTNER may initiate dispute resolution.

74. PARTNERS will first attempt to resolve AGREEMENT disputes at the PROJECT team level. If they cannot resolve the dispute themselves, the CALTRANS district director and the executive officer of COUNTY will attempt to negotiate a resolution. If PARTNERS do not reach a resolution, PARTNERS' legal counsel will initiate mediation. PARTNERS agree to participate in mediation in good faith and will share equally in its costs.

    Neither the dispute nor the mediation process relieves PARTNERS from full and timely performance of OBLIGATIONS in accordance with the terms of this AGREEMENT. However, if any PARTNER stops fulfilling OBLIGATIONS, any other PARTNER may seek equitable relief to ensure that OBLIGATIONS continue.

    Except for equitable relief, no PARTNER may file a civil complaint until after mediation, or forty-five (45) calendar days after filing the written mediation request, whichever occurs first.

    PARTNERS will file any civil complaints in the Superior Court of the county in which the CALTRANS district office signatory to this AGREEMENT resides or in the Superior Court of the county in which the PROJECT is physically located.

75. PARTNERS maintain the ability to pursue alternative or additional dispute remedies if a previously selected remedy does not achieve resolution.

76. If any provisions in this AGREEMENT are found by a court of competent jurisdiction to be, or are in fact, illegal, inoperative, or unenforceable, those provisions do not render any or all other AGREEMENT provisions invalid, inoperative, or unenforceable, and those provisions will be automatically severed from this AGREEMENT.

77. If during performance of WORK additional activities or environmental documentation is necessary to keep the PROJECT in environmental compliance, PARTNERS will amend this AGREEMENT to include completion of those additional tasks.

78. Except as otherwise provided in the AGREEMENT, PARTNERS will execute a formal written amendment if there are any changes to OBLIGATIONS.

79. When WORK performed on the PROJECT is done under contract and falls within the Labor Code section 1720(a)(1) definition of "public works" in that it is construction, alteration, demolition, installation, or repair; or maintenance work under Labor Code section 1771, PARTNERS shall conform to the provisions of Labor Code sections 1720 through 1815, and all applicable provisions of California Code of Regulations found in Title 8, Division 1, Chapter 8, Subchapter 3, Articles 1-7. PARTNERS shall include prevailing wage requirements in contracts for public work and require contractors to include the same prevailing wage requirements in all subcontracts. Work performed by a PARTNER's own employees is exempt from the Labor Code's Prevailing Wage requirements.

80. If WORK is paid for, in whole or part, with federal funds and is of the type of work subject to federal prevailing wage requirements, PARTNERS shall conform to the provisions of the Davis-Bacon and Related Acts, 40 U.S.C. § 276(a).

    When applicable, PARTNERS shall include federal prevailing wage requirements in contracts for public work. WORK performed by a PARTNER's employees is exempt from federal prevailing wage requirements.

81. PARTNERS agree to sign a CLOSURE STATEMENT to terminate this AGREEMENT. However, all indemnification, document retention, audit, claims, environmental commitment, legal challenge, maintenance and ownership articles will remain in effect until terminated or modified in writing by mutual agreement or expire by the statute of limitations.

82. PARTNERS intend this AGREEMENT to be their final expression that supersedes any oral understanding or writings pertaining to the OBLIGATIONS. The requirements of this AGREEMENT shall preside over any conflicting requirements in any documents that are made an express part of this AGREEMENT.

DEFINITIONS

AGREEMENT – This agreement including any attachments, exhibits, and amendments.

CALTRANS STANDARDS – CALTRANS policies and procedures, including, but not limited to, the guidance provided in the Project Development Procedures Manual (PDPM) and the CALTRANS Workplan Standards Guide for the Delivery of Capital Projects (WSG) [which contains the CALTRANS Work Breakdown Structure (WBS) and was previously known as the WBS Guide] and is available at http://www.dot.ca.gov/hq/projmgmt/guidance.htm.

CEQA (California Environmental Quality Act) – The act (California Public Resources Code, sections 21000 et seq.) that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those significant impacts, if feasible.

CFR (Code of Federal Regulations) – The general and permanent rules published in the Federal Register by the executive departments and agencies of the federal government.

CLOSURE STATEMENT – A document signed by PARTNERS that verifies the completion of all OBLIGATIONS included in this AGREEMENT and in all amendments to this AGREEMENT.

EDQC (Environmental Document Quality Control) - CALTRANS quality control and quality assurance procedures for all environmental documents as described in the Jay Norvell Memos dated October 1, 2012 (available at http://www.dot.ca.gov/ser/memos.htm#LinkTarget_705). This also includes the independent judgment analysis and determination under CEQA that the environmental documentation meets CEQA requirements.

FHWA – Federal Highway Administration.

FHWA STANDARDS – FHWA regulations, policies and procedures, including, but not limited to, the guidance provided at www.fhwa.dot.gov/topics.htm.

FUNDING PARTNER – A PARTNER that commits funds in this AGREEMENT to fulfill OBLIGATIONS. A FUNDING PARTNER accepts the responsibility to provide the funds it commits in this Agreement.

FUNDING SUMMARY – An executed document that includes a FUNDING TABLE and invoicing and payment methods.

FUNDING TABLE – The table that designates funding sources, types of funds, and the PROJECT COMPONENT in which the funds are to be spent. Funds listed on the FUNDING TABLE are "not-to-exceed" amounts for each FUNDING PARTNER.

GAAP (Generally Accepted Accounting Principles) – Uniform minimum standards and guidelines for financial accounting and reporting issued by the Federal Accounting Standards Advisory Board that serve to achieve some level of standardization. See http://www.fasab.gov/accepted.html.

HM-1 – Hazardous material (including, but not limited to, hazardous waste) that may require removal and disposal pursuant to federal or state law whether it is disturbed by the PROJECT or not.

HM-2 – Hazardous material (including, but not limited to, hazardous waste) that may require removal and disposal pursuant to federal or state law only if disturbed by the PROJECT.

HM MANAGEMENT ACTIVITIES – Management activities related to either HM-1 or HM-2 including, without limitation, any necessary manifest requirements and disposal facility designations.

IMPLEMENTING AGENCY – The PARTNER responsible for managing the scope, cost, and schedule of a PROJECT COMPONENT to ensure the completion of that component.

IQA (Independent Quality Assurance) – CALTRANS' efforts to ensure that another PARTNER's quality assurance activities are in accordance with the applicable standards and the PROJECT's Quality Management Plan (QMP). When CALTRANS performs Independent Quality Assurance it does not develop, produce, validate, verify, re-check, or quality control another PARTNER's work products.

NEPA (National Environmental Policy Act of 1969) – This federal act establishes a national policy for the environment and a process to disclose the adverse impacts of projects with a federal nexus.

OBLIGATIONS – All WORK responsibilities and their associated costs.

OBLIGATION COMPLETION – PARTNERS have fulfilled all OBLIGATIONS included in this AGREEMENT and have signed a CLOSURE STATEMENT.

PA&ED (Project Approval and Environmental Document) – See PROJECT COMPONENT

PARTNER – Any individual signatory party to this AGREEMENT.

PARTNERS – The term that collectively references all of the signatory agencies to this AGREEMENT. This term only describes the relationship between these agencies to work together to achieve a mutually beneficial goal. It is not used in the traditional legal sense in which one PARTNER's individual actions legally bind the other PARTNER.

PROJECT COMPONENT – A distinct portion of the planning and project development process of a capital project as outlined in California Government Code, section 14529(b).

- PID (Project Initiation Document) – The work required to deliver the project initiation document for the PROJECT in accordance with CALTRANS STANDARDS.
- PA&ED (Project Approval and Environmental Document) – The work required to deliver the project approval and environmental documentation for the PROJECT in accordance with CALTRANS STANDARDS.
- PS&E (Plans, Specifications, and Estimate) – The work required to deliver the plans, specifications, and estimate for the PROJECT in accordance with CALTRANS STANDARDS.
- R/W (Right of Way) –The project components for the purpose of acquiring real property interests for the PROJECT in accordance with CALTRANS STANDARDS.
    - R/W (Right of Way) SUPPORT –The work required to obtain all property interests for the PROJECT.
    - R/W (Right of Way) CAPITAL – The funds for acquisition of property rights for the PROJECT.
- CONSTRUCTION – The project components for the purpose of completing the construction of the PROJECT in accordance with CALTRANS STANDARDS.
    - CONSTRUCTION SUPPORT – The work required for the administration, acceptance, and final documentation of the construction contract for the PROJECT.
    - CONSTRUCTION CAPITAL – The funds for the construction contract.

PROJECT MANAGEMENT PLAN – A group of documents used to guide the PROJECT's execution and control throughout that project's lifecycle.

QMP (Quality Management Plan) – An integral part of the PROJECT MANAGEMENT PLAN that describes IMPLEMENTING AGENCY's quality policy and how it will be used.

SHS (State Highway System) – All highways, right-of-way, and related facilities acquired, laid out, constructed, improved, or maintained as a state highway pursuant to constitutional or legislative authorization.

SPONSOR – Any PARTNER that accepts the responsibility to establish scope of the PROJECT and the obligation to secure financial resources to fund the PROJECT COMPONENTS in this AGREEMENT. A SPONSOR is responsible for adjusting the PROJECT scope to match committed funds or securing additional funds to fully fund the PROJECT COMPONENTS in this AGREEMENT. If this AGREEMENT has more than one SPONSOR, funding adjustments will be made by percentage (as outlined in Responsibilities). Scope adjustments must be developed through the project development process and must be approved by CALTRANS as the owner/operator of the SHS.

WORK – All efforts to complete the OBLIGATIONS included in this AGREEMENT as described by the activities in the CALTRANS Workplan Standards Guide for the Delivery of Capital Projects (WSG).

SIGNATURES

PARTNERS are empowered by California Streets and Highways Code section 114 and 130 to enter into this AGREEMENT and have delegated to the undersigned the authority to execute this AGREEMENT on behalf of the respective agencies and covenants to have followed all the necessary legal requirements to validly execute this AGREEMENT.

Signatories may execute this AGREEMENT through individual signature pages provided that each signature is an original. This AGREEMENT is not fully executed until all original signatures are attached.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Timothy M. Gubbins
District Director

Certified as to funds:

Julia Bolger
District Budget Manager

COUNTY OF SAN LUIS OBISPO

Lynn Compton
Chairperson of the Board of Supervisors

Attest:

TOMMY GONG

Tommy Gong
Clerk of the Board of Supervisors
By: Deputy Clerk

Approved as to form and procedure:

Rita L. Neal
County Counsel

FUNDING SUMMARY NO. 01

v. 1

FUNDING TABLE

		IMPLEMENTING AGENCY →	COUNTY	
Source	FUNDING PARTNER	Fund Type	PA&ED	Totals
Federal	COUNTY	CMAQ *	300,000	300,000
Federal	COUNTY	HPP *	200,000	200,000
Local	COUNTY	Local *	480,000	480,000
Totals			980,000	980,000

* This fund type includes federal funds

Funding

1. In accordance with the Caltrans Federal-Aid Project Funding Guidelines, COUNTY must obtain approval from the Federal Highway Administration prior to any PROJECT funding changes that that will change the federal share of funds.

Invoicing and Payment

Project Approval and Environmental Document (PA&ED)

2. No invoicing or reimbursement will occur for the PA&ED PROJECT COMPONENT.

Signatures

PARTNERS are empowered by California Streets and Highways Code sections 114 and 130 to enter into this AGREEMENT and have delegated to the undersigned the authority to execute this FUNDING SUMMARY on behalf of the respective agencies and covenants to have followed all the necessary legal requirements to validly execute this FUNDING SUMMARY.

Signatories may execute this FUNDING SUMMARY through individual signature pages provided that each signature is an original. This FUNDING SUMMARY is not fully executed until all original signatures are attached.

STATE OF CALIFORNIA
DEPARTMENT OF TRANSPORTATION

Paul Valadao
Project Manager

Date 10/21/2016

District Budget Manager

Tamara R. Warren
HQ Accounting

COUNTY OF SAN LUIS OBISPO

Dave Flynn
Deputy Director

Date 9/8/16

CLOSURE STATEMENT INSTRUCTIONS

1. Did PARTNERS complete all scope, cost and schedule commitments included in this AGREEMENT and any amendments to this AGREEMENT?

YES / NO

2. Did CALTRANS accept and approve all final deliverables submitted by COUNTY?

YES / NO

3. Did the CALTRANS HQ Office of Accounting verify that all final accounting for this AGREEMENT and any amendments to this AGREEMENT were completed?

YES / NO

4. If construction is involved, did the CALTRANS District Project Manager verify that all claims and third party billings (utilities, etc.) have been settled before termination of the AGREEMENT?

YES / NO

5. Did PARTNERS complete and transmit the As-Built Plans, Project History File, and all other required contract documents?

YES / NO

If ALL answers are "YES", this form may be used to TERMINATE this AGREEMENT.

CLOSURE STATEMENT

PARTNERS agree that they have completed all scope, cost, and schedule commitments included in Agreement 05-0309 and any amendments to the agreement.

The final signature date on this document terminates Agreement 05-0309 except survival articles.

All survival articles in Agreement 05-0309 will remain in effect until expired by law, terminated or modified in writing by PARTNER's mutual agreement, whichever occurs earlier.

The people signing this Agreement have the authority to do so on behalf of their public agencies.

CALTRANS

_____

Name:

District Director

Date: _____

CERTIFIED AS TO ALL FINANCIAL OBLIGATIONS/TERMS AND POLICIES

_____

Name:

District Budget Manager

COUNTY OF SAN LUIS OBISPO

_____

Name:

Chairperson of the Board of Supervisors

Date: _____

Attachment L
Transportation Management Plan Data Sheet

DISTRICT 5
TRANSPORTATION MANAGEMENT PLAN DATA SHEET/CHECKLIST

District / EA: 05/1G4800
Project Engineer: Jorge Aguilar
Date Prepared: 4/15/19

Co.-Rte-PM: SLO-101-R21.1
Description: Avila Roundabout
Working Days: 135 days - 5 nights requiring ramp closures

Check each box and reference your attachments to the item(s) number(s) shown on the list.

	Required	Recommended	Not required	COMMENTS
1.0 Public Information				
1.1 Public Awareness Campaign	x			Include $2000
1.2 Other strategies			x	
2.0 Motorist Information Strategies				
2.1 Changeable Message Signs - Portable	x			Estimate $5,000
2.2 Construction Area Signs	x			
2.3 Planned Lane Closure Web Site	x			Construction to provide information to TMC
2.4 Caltrans Highway Information Network (CHIN)	x			Construction to provide information to TMC
3.0 Incident Management				
3.1 COZEEP (during k-rail moving & work in live traffic)	x			Estimate $5000
3.2 Freeway Service Patrol			x	
4.0 Traffic Management Strategies				
4.1 Lane/Ramp Closures Charts	x			Charts for ramp closures provided in PS&E
4.2 Total Facility Closure/ Number of days?			x	
4.3 Coordination with adjacent construction			x	
4.4 Contingency Plan	x			Standard SSP
4.4.1 Material/Equipment Standby			x	Contruction/Contractor to provide
4.4.2 Emergency Detour Plan			x	Contruction/Contractor to provide
4.4.3 Emergency Notification Plan			x	Contruction/Contractor to provide
4.5 Speed Limit Reduction Request			x	
4.6 Special Days:	x			Amgen Tour of CA, AIDS Lifecycle Ride
4.7 Other items:				
Advance notification and detours required for closure of ramps.	x			
4.8 Bicycle and Pedestrian Accommodations*	x			
5.0 Anticipated Delays				
5.1 Lane Closure Review Committee (for anticipated delays over 30 minutes)			x	
5.2 Planned freeway closures			x	
6.0 Demand Management & Alternate Route Strategies				
6.1			x	
6.2				

Planning for all road users must be included in this process. Bicyclists and Pedestrians shall not be led into direct conflicts with mainline traffic, work site vehicles, or equipment moving through or around the TTC zone. Contact Dario Senor w/ questions.

5.3 Minimal delay anticipated - no further action required

[x] yes [ ] no If no, explain additional measures on attached sheet.

Shayne Sandeman
District 5 TMP Coordinator

Attachment M
Risk Register

LEVEL 2 - RISK REGISTER				Project Name:	US 101/Avila Beach Drive Interchange		DIST- EA	05-1G480	Project Manager	Jorge Aguilar, P.E.						
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	Environmental	Scope Changes	If the project scope changes requiring additional site reviews, additional hours may be required negatively affecting the project scope (hours).		3-Moderate	4 -Moderate	12	4 -Moderate	12		Accept	Include ample APE area within Env studies, monitor for scope changes.	PM, DM, EM	
Active	2	Opportunity	Environmental	Oak Avoidance	If impacts within the project area can avoid or reduce the impact to oaks, then the cost (oak replanting) may be able to be avoided or reduced. This is an Opportunity.		3-Moderate	2 -Low	6	2 -Low	6		Avoid	The team will strive to avoid oak impacts as much as possible starting with early identification of possible impacts.	DM, EM	
Active	3	Threat	ROW	Utility Relocations	Relocation of utility facilities (especially underground) takes longer than provided lead time.		3-Moderate	8 -High	24	8 -High	24		Accept	During the PA&ED phase, the PDT should strive to find ways to avoid or mitigate this risk.	DM, RM	
Active	4	Threat	ROW	Utility Relocation Liability	Utility relocation liability will not be fully known until after programming		3-Moderate	2 -Low	6	2 -Low	6		Accept	R/W to work with utility companies and keep PM apprised of any potential cost increases.	R/W Utilities	
Active	5	Threat	Design	Change in Scope	Changes in the scope of work may result in additional surveys, design, environmental studies, Right of Way Engineering, or construction staking.		2-Low	4 -Moderate	8	8 -High	16		Mitigate	This risk can be mitigated by careful monitoring of the work plan as the project progresses. The PM can assess the impact and adjust per CT change management policies	PM, DM	
Active	6	Threat	Design	Survey Crew Schedule	Possible delay in completing design survey if survey crews are busy doing construction staking work.		2-Low	4 -Moderate	8	4 -Moderate	8		Mitigate	This risk can be mitigated by careful monitoring of surveys planned work as the project progresses. The PM can assess upcoming work and coordinate with the Field Surveys department.	PM	
Active	7	Threat	ROW	Utilities	Possibility that not all utilities have been identified		2-Low	4 -Moderate	8	4 -Moderate	8		Accept	R/W and Design will closely coordinate to assure any project changes are correctly shown on mapping.	R/W Utilities	
Active	8	Threat	Construction	Cost increase	Preparing CCO's during construction.		2-Low	8 -High	16	2 -Low	4		Mitigate	Careful attention to the construction phase budget prior to award will help to mitigate this risk.	County, DM	
Active	9	Threat	Construction	Survey Schedule	Surveys receiving a late or incomplete Survey File from Design may cause a delay in preparing a construction staking notes package for a survey crew, which could delay a contractor's work schedule.		2-Low	2 -Low	4	2 -Low	4		Mitigate	This risk can be mitigated by careful monitoring of submittal quality.	DM	
Active	10	Threat	Environmental	NRHP eligibility	Studies may identify built environment resources in the project APE that are eligible for the NRHP and a FOE/MOA and mitigation will be required.		1-Very Low	4 -Moderate	4	4 -Moderate	4		Accept		EM	
Active	11	Threat	Construction	Funding	This project is listed as constrained in SLOCOG's 2019 RTP, it relies heavily on construction funding from SB 1's Congested Corridors Program. This is a statewide competitive program and, as such, the project's construction funding could be at risk if no other federal or state fund source is available.		3-Moderate	8 -High	24	8 -High	24		Accept	This project is one of the top 3 priorities for the County with strong support from SLOCOG, District 5, and the County of San Luis Obispo. These agencies will continue to advocate for SB 1 Funding for this project. This project is a component of the Congested Corridors Relief Project for Southbound 101.	County, SLOCOG, Caltrans PM	
Retired	12	Threat	Environmental	Biological Assessment	If listed plant and animal species are found within the BSA and the project cannot be designed to avoid impacts, then additional hours will be required to prepare a Biological Assessment for Section 7 consultation with USFWS during the 0 phase, negatively impacting the schedule and scope (hours) for the project.		2-Low	8 -High	16	8 -High	16		Accept	Start studies as early as possible in the Env phase.	DM, EM	
Retired	13	Opportunity	Environmental	Wetland Permits	If impacts within the project area can avoid the wetland area, then the: 404 Nationwide Permit Coordination, 401 Permit Coordination, and the 1602 Permit Coordination may be able to be avoided, resulting in a savings to the project in cost (mitigation), scope (hours), and schedule (time to complete tasks). This is an Opportunity.		4-High	4 -Moderate	16	4 -Moderate	16		Avoid	Identify impacts as early as possible and work to modify the design if possible to avoid impacts.	DM, EM	
Retired	14	Threat	Environmental		The project will identify archaeological deposits in the project APE that are eligible to the NRHP and a FOE/MOA and mitigation will be required.		3-Moderate	8 -High	24	8 -High	24		Accept	Begin cultural studies as early in the Env studies phase as possible.	EM	
Retired	15	Threat	Design	Traffic	Expand analysis beyond project scope or agreed upon conditions		4-High	2 -Low	8	8 -High	32		Mitigate	Conduct focused review sessions with agency representatives to reach consensus	DM	

Attachment N
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	SHOPP-Roadway Preservations - 130, 131, 150	Dave Changizi	1
	STIP	Patti-jo Dickinson	1
HQ Transportation Programming	STIP	Rambabu Bavirisetty	1
	SHOPP	Donna Berry	1
HQ Traffic Operations	SHOPP-Mobility - 201.310	John Holzhauser	1
HQ Traffic Operations	SHOPP-Mobility - 201.315	Patrick Leung	1
HQ Traffic Ops/Traffic Safety Pgm	SHOPP-Safety - 201.010	Abdel Beshair	1
HQ Traffic Ops/Traffic Safety Pgm	SHOPP-ADA - 201.361	Larry Wooster	1
HQ SHOPP Program Advisor	For other prog	SHOPP Contacts	
Project Manager	All Projects	Project Manager	1
Design Manager	All Projects	Design Manager	2
Resident Engineer	All Projects	Resident Engineer	1
District Maintenance	All Projects	Zeke Dellamas	1
	D6 Eastern Kern		
	Pavement		
	Bridge & Culvert		
	SHOPP	Kelly Mcclain	1
District Traffic Operations	All Projects	Roger Barnes	1
District Traffic Management	All Projects	Jacques Van Zeventer	1
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District Traffic Safety	Mon	Mark Ballentine	1
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District Traffic Safety	SB	Anthony Deanda	
District Traffic Safety	SCR	Michael Grolle **(Electronic Copies Only)**	1

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CR PJD Support | **Last Revised 07/12/2019**