



CITY OF ENCINITAS

QUIET ZONE FEASIBILITY ANALYSIS

AUGUST 16, 2019





**CITY OF ENCINITAS
QUIET ZONE FEASIBILITY ANALYSIS**

JULY 2019

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1 PURPOSE & NEED

The City of Encinitas is conducting this *Quiet Zone Feasibility Analysis* to recommend upgrades to at-grade railroad crossings that will allow the establishment of a citywide “Quiet Zone”—in which train conductors are not required to sound train horns when approaching at-grade crossings under routine conditions. In the event of unsafe conditions, Quiet Zones do not apply and train conductors may sound their horns.

The recommended upgrades at each crossing are known as Supplemental Safety Measures (SSMs), which are federally defined infrastructure improvements that include pedestrian gates, auto gates, fencing, audible warning systems, and other elements.

The project area to create a comprehensive Quiet Zone spans four at-grade crossings of the rail corridor within the City: Leucadia Boulevard, Encinitas Station, D Street, and E Street (Figure 1). Improvements at these four locations would build upon the recently established Quiet Zone at Chesterfield Drive—the southernmost vehicular crossing in the City—to create a citywide Quiet Zone.

REPORT ORGANIZATION

This report evaluates and recommends SSMs for each of the four studied locations, and is divided into the following sections:

- **Section 2: Quiet Zone General Requirements** is a basic primer on Quiet Zone regulations and requirements.
- **Section 3: Implementation Next Steps** summarizes the next steps for project implementation, including a sample schedule and environmental considerations.
- **Section 4: Project Descriptions & Costs** describes the proposed SSMs at each location and their estimated total costs.
- The appendices contain additional technical details:
 - **Appendix A:** Concept design plans.
 - **Appendix B:** Detailed cost estimates.
 - **Appendix C:** Results of the Federal Railroad Administration (FRA) Quiet Zone Calculator.
 - **Appendix D:** Evaluation of improvements proposed in the initial site diagnostic meeting with stakeholders.

BACKGROUND: RAIL CORRIDOR VISION STUDY

The *Encinitas Rail Corridor Vision Study (RCVS)* was a comprehensive, stakeholder-driven effort to examine mobility issues and opportunities in the Encinitas coastal rail corridor. Completed in 2018, the *RCVS* took a broad perspective, coordinating multiple infrastructure elements to create a unified vision for the rail corridor with both near-term and long-term objectives.

A key element of the *RCVS* recommendations was achieving a quieter rail corridor by implementing a citywide Quiet Zone for trains. That recommendation set the stage for this analysis, which assesses the feasibility of a citywide Quiet Zone, estimates the costs of improvements, and outlines a potential implementation process.

“BOOKEND” REQUIREMENT AT CANNON ROAD TO ESTABLISH PERMANENT QUIET ZONE

To create a permanent, effective Quiet Zone throughout Encinitas—including any future at-grade crossings that may be constructed in the future—the segment of rail corridor north of Leucadia Boulevard must be “bookended” by a second at-grade roadway crossing with Quiet Zone status.

The nearest at-grade crossing to the north is at Cannon Road in the City of Carlsbad, approximately five miles from Leucadia Boulevard. Without Quiet Zone establishment at this location, any future at-grade pedestrian crossings north of Leucadia Boulevard would be outside the Quiet Zone limits, requiring train horns to be sounded.

However, this “bookend” requirement for Cannon Road only applies if a new at-grade pedestrian crossing is constructed north of Leucadia Boulevard. If this does not occur, improvements at Cannon Road would not be necessary to create an effective Quiet Zone throughout Encinitas.

RAIL CORRIDOR CONTEXT & GROWTH

The Encinitas coast is a resource enjoyed by many, populated with unique residential communities, business districts, and beaches. Paralleling the coast just 1,000-1,500 feet inland, the Los Angeles-San Diego-San Luis Obispo (LOSSAN) Corridor is a significant heavy railroad corridor traversed by over 60 daily trains in its San Diego County section, including Amtrak and COASTER passenger services as well as freight operations. It is the nation’s second-busiest intercity passenger rail corridor and rapidly growing.

With several double-tracking projects in progress to meet growing demand, the LOSSAN Corridor continues to accommodate more trains, with long-term plans to serve up to 101 daily trains by 2030 (Table 1). In Encinitas, double-tracking is complete south of G Street, and two additional projects to double-track the rest of the city are currently in development.

Table 1: Estimated Trains Per Day, 2020 and 2030

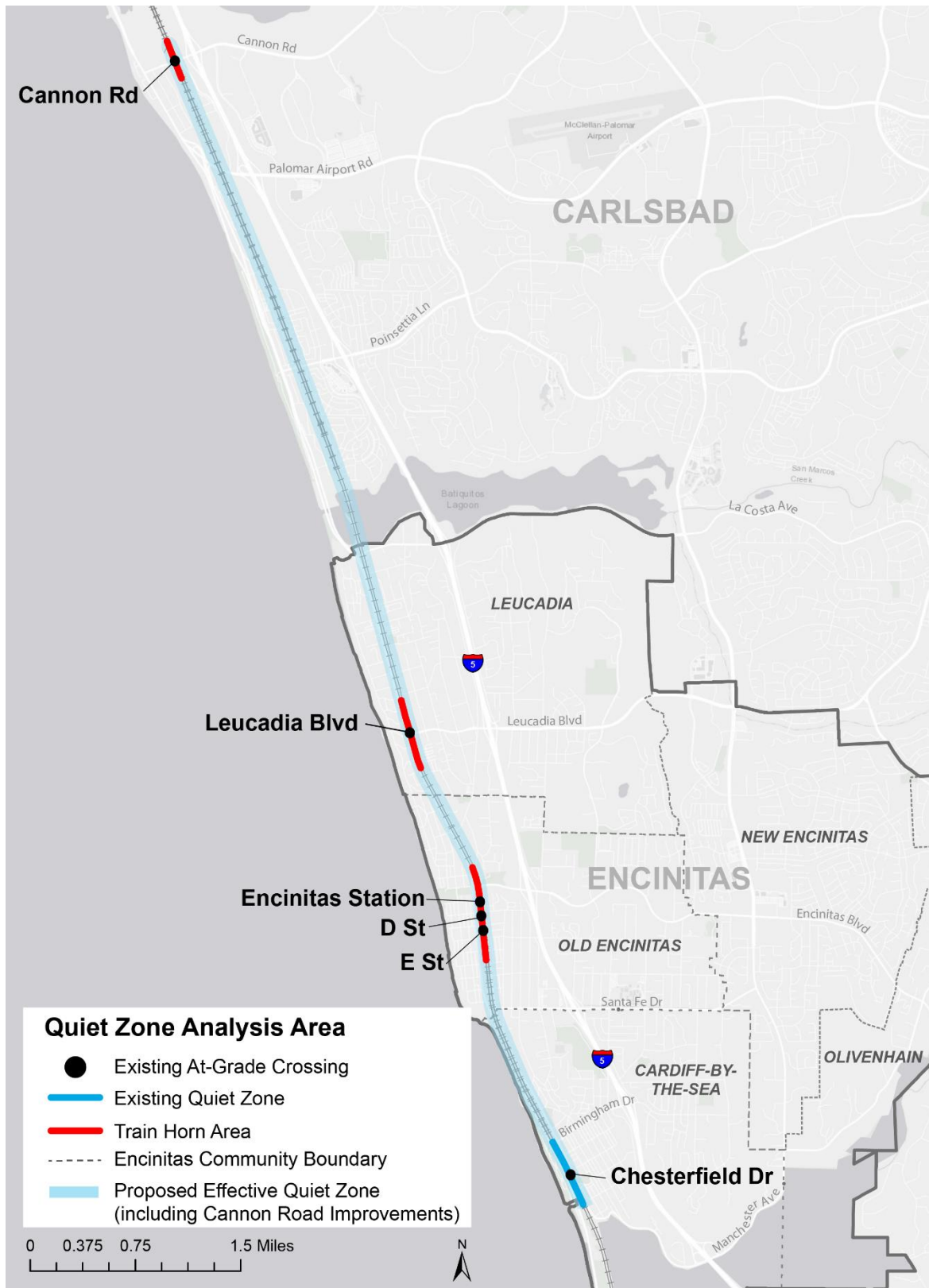
Service	2020 Planned	2030 Planned
Intercity (Amtrak)	26	36
Commuter (NCTD COASTER)	30	54
Freight (BNSF)	11	11
TOTAL	67	101

Source: LOSSAN Infrastructure Development Plan for San Diego County (SANDAG, 2013)

The rail corridor bisects each of the City’s coastal communities. The sound of train noise is a nuisance to many, diminishing quality of life through undesirable psychological effects—including stress and annoyance—as well as physiological health effects such as hearing impairments and sleep disturbance. The ability to cross the railroad corridor safely is another concern of the residents.

Implementing a citywide Quiet Zone in Encinitas can greatly improve quality of life for residents, visitors, business owners and employees’ alike. The result will be less noise on their properties as well as improved safety for pedestrians, cyclists, and motorists moving about the coastal corridor.

Figure 1: Quiet Zone Analysis Area



2 QUIET ZONE GENERAL REQUIREMENTS

WHY DO TRAINS USUALLY HAVE TO SOUND THEIR HORNS?

The federal Train Horn Rule (49 CFR Part 222) requires trains to sound their horns when approaching at-grade crossings to let people know the train is approaching and to stay clear. The Federal Railroad Administration (FRA) regulates roadway-rail grade crossings with the aim of reducing collisions between trains and autos/pedestrians/bicyclists. Train operators are required to sound their horns for 15-20 seconds and no more than one-quarter mile in advance of a roadway-rail grade crossing.

WHAT IS A QUIET ZONE?

A Quiet Zone is a section of a rail line at least one-half mile long with one or more vehicular at-grade rail crossings in which horns on heavy rail trains (e.g. COASTER, Amtrak and freight) are *not* routinely sounded when approaching at-grade crossings. Quiet Zones may be established at any roadway-rail grade crossing that meets federal requirements.

The aim of a Quiet Zone is to reduce noise around roadway-rail grade crossings for nearby residents and businesses. However, because train horns may still be sounded in unsafe conditions as determined by the train operator—and because Quiet Zones do not eliminate bells located at the crossings themselves—Quiet Zones may be more accurately described as “reduced noise zones.”

A Quiet Zone can be active 24 hours a day, or during part of the day (e.g. at night).

WHAT CONDITIONS ARE REQUIRED TO CREATE A QUIET ZONE?

Because the absence of train horns increases the risk of a crossing collision, Quiet Zones require additional safety features to be installed. These supplementary safety measures (SSMs) are defined in the federal Train Horn Rule, and include:

- Four-quadrant gates that fully block vehicular traffic from entering the crossing
- Gates with raised medians or other channelization devices (e.g. fencing)
- Wayside horns directed toward the crossing roadway
- Other infrastructure elements

In some cases, some or all SSMs may already be in place while in other situations, installation of some SSMs may be necessary prior to Quiet Zone establishment.

HOW ARE THE REQUIRED SUPPLEMENTARY SAFETY MEASURES DETERMINED?

The FRA offers a free, online Quiet Zone Calculator to assist local jurisdictions in assessing Quiet Zone eligibility and identifying specific SSMs that may be required. The calculator considers many characteristics including existing infrastructure, the number of passing trains per day, the speed of passing trains, the size of the roadway crossing, the volume of traffic on the roadway crossing, and historical safety data. The output is a Quiet Zone Risk Index score for each studied crossing.

The Quiet Zone Calculator allows the local jurisdiction to consider a variety of options in determining which SSMS make the most sense. Implementing agencies should first assess the level of risk at each crossing under existing conditions, and then reassess the crossings with one or more SSMS installed, to determine the change in the Quiet Zone Risk Index that would result from the improvements.

DO QUIET ZONES REQUIRE APPROVAL?

The FRA has established an automatic approval process known as Public Authority Designation to streamline Quiet Zone establishment for crossings with sufficiently low risk factors. Proposed Quiet Zones may qualify for this process if their Quiet Zone Risk Index, as calculated by the FRA Quiet Zone Calculator, is below the following standards:

- **Risk Index with Horns:** The level of risk that would exist if train horns were sounded at every public crossing in the proposed Quiet Zone.
- **Nationwide Significant Risk Threshold:** The average of the calculated risk at all public at-grade rail crossings where train horns are routinely sounded. Updated annually by the FRA.

At many crossings—including all studied crossings in Encinitas—installation of one or more SSMS will be sufficient to lower the risk index to qualify for automatic approval via Public Authority Designation.

If the local jurisdiction opts not to install any of the SSMS defined in the Train Horn Rule—due to feasibility constraints or other local concerns—it may also consider the use of Alternative Safety Measures (ASMs) to achieve Quiet Zone status. ASMs include SSMS that have been modified to address unique local conditions, other infrastructure improvements that are not specific SSMS defined in the Train Horn Rule, and non-engineering methods such as education and enforcement. However, any use of ASMs renders the proposed Quiet Zone ineligible for automatic approval via Public Authority Designation, and instead requires formal application approval by the FRA, as well as continual monitoring and analysis to ensure the risk continues to be reduced.

WHO CAN ESTABLISH A QUIET ZONE IN ENCINITAS?

The City of Encinitas may implement Quiet Zones within city limits as the local public authority responsible for traffic control and law enforcement of at-grade crossings.

HOW MUCH DOES A QUIET ZONE COST TO IMPLEMENT AND WHO PAYS?

Costs will vary depending on the number of crossings being improved and the types of SSMS required. Section 4 includes descriptions and estimated costs for the proposed improvements at the four studied locations, and Appendix B contains more detailed cost estimates.

The implementing agency would be responsible for funding all costs associated with implementation, including construction of the required supplemental safety measures.

WHERE CAN I GET MORE INFORMATION ABOUT QUIET ZONES?

The FRA website has an overview of Quiet Zones including detailed regulations and instructions at <http://www.fra.dot.gov/Page/P0889>. The Quiet Zone Calculator is available <https://safetydata.fra.dot.gov/quiet> (requires free registration).

3 IMPLEMENTATION NEXT STEPS

Table 2 summarizes the recommended process and next steps to establish the proposed Quiet Zone. The project is estimated to take approximately three years, from the identification of project funding to ultimate activation of the Quiet Zone. Within this timeframe, final design and regulatory approvals are estimated to take a minimum of 18 months, selection of a construction contractor a minimum of three months, and actual construction a minimum of 12 months.

The FRA Quiet Zone Calculator results (Appendix C) indicate that installation of the SSMS described in Section 4 could reduce the risk index at all four locations to levels sufficient to qualify the proposed Quiet Zone for FRA’s automatic approval process via Public Authority Designation. Automatic Approval therefore is assumed in Table 2, which would save up to 6-12 months compared to the FRA’s formal application-based approval process. See Section 2 for more details on the FRA Quiet Zone Calculator and approval processes.

Table 2: Potential Project Schedule

Milestone	Current Status & Target Schedule
Identification of Crossings to Be Included in Quiet Zone	<i>Complete</i>
Determination of Required SSMS with FRA Quiet Zone Calculator	<i>Complete</i>
Preliminary Engineering	<i>Complete</i>
Initial Site Diagnostic Meeting	<i>Complete</i>
Conceptual Plan Development	<i>Complete</i>
Identification of Project Funding	TBD
Notice to Proceed (NTP) for Final Design & Environmental Clearance	TBD
Update U.S. DOT Crossing Inventory Form to Reflect Current Conditions	NTP + 3 Months
Environmental Clearance (3 Month Duration; Assumes CEQA & NEPA Exemptions)	NTP + 6-9 Months
Begin Final Design	NTP + 9 Months
Final Site Diagnostic Meeting	NTP + 9 Months
Quiet Zone Notice of Intent & 60-Day Comment Period (2 Month Duration)	NTP + 9-11 Months
CPUC General Order 88-B Application & Approval (5 Month Duration)	NTP + 10-15 months
End Final Design / Ready to List for Advertising	NTP + 18 Months
Selection of Construction Contractor	NTP + 20 Months
Construction (12 Month Duration)	NTP + 21-33 Months
Quiet Zone Notice of Establishment	NTP + 33 Months
Quiet Zone Activated (21 Days After Notice of Establishment)	NTP + 34 Months

CALIFORNIA PUBLIC UTILITIES COMMISSION (CPUC) REVIEW & GENERAL ORDER 88-B

The California Public Utilities Commission (CPUC) has regulatory authority over at-grade crossings statewide. Any modifications to at-grade crossings—including SSMs intended to establish a Quiet Zone—must be approved by CPUC in accordance with its General Order 88-B process.

Additionally, while Quiet Zones themselves do not require state approval, the CPUC's Rail Crossings and Engineering Branch is required to evaluate and provide written comments on all Quiet Zone notices of intent, establishment, or continuation. CPUC staff also must be included in site diagnostic meetings to review proposed improvements at any at-grade crossings.

ENVIRONMENTAL CLEARANCE

Projects to install SSMs and other infrastructure at railroad crossings are subject to applicable federal, state, and local environmental regulations and guidelines. Generally, locally funded and state-funded projects are subject to the California Environmental Quality Act (CEQA). Federally funded projects or projects that require permits or approvals from federal agencies are subject to the National Environmental Policy Act (NEPA) and the regulations applicable to those agencies.

Several jurisdictions that implemented Quiet Zones determined Quiet Zone SSMs to be categorically exempt from CEQA as improvements to existing facilities (CEQA Guidelines Section 15301(c)) and similarly exempt from NEPA if using federal funds or requiring federal approvals/permits. However, as lead agency for CEQA, each jurisdiction should evaluate the potential impacts of the specific SSMs proposed at each location—considering effects including, but not limited to, noise, visual resources, and traffic operations/circulation—to make its own determination regarding environmental review. If it is unclear whether SSMs could result in significant impacts under CEQA, an Initial Study could be prepared.

4 PROJECT DESCRIPTIONS & COSTS

The following sections describe the recommended improvements at each of the four project locations:

- Table 3 shows the estimated cost of improvements all crossing locations.
- Sections 4.1 through 4.4 summarize the improvements at each location.
- Appendix A contains detailed concept plans for each location.
- Appendix B contains detailed cost estimates for each location.
- Appendix C contains the results of the FRA Quiet Zone Calculator for all locations.
- Appendix D lists all additional scope items suggested by stakeholder agencies at a site diagnostic meeting held on January 24, 2018.

The initial basis for design is the analysis conducted with the FRA Quiet Zone Calculator (Appendix C), which identified SSMs sufficient to lower the risk index below the required thresholds.

As described in Appendix D, the recommended improvements also include additional scope items suggested by stakeholder agencies at a site diagnostic meeting held on January 24, 2018. Participants included the Federal Railroad Administration (FRA), California Public Utilities Commission (CPUC), and North County Transit District (NCTD).

The Cannon Road crossing (City of Carlsbad) is included in Table 3 since this roadway at-grade crossing is necessary to create a “bookend” for the Quiet Zone to cover any future at-grade crossings north of Leucadia Boulevard (see Section 1).

Table 3: Summary Cost Estimate

Location	Estimated Construction Cost	Estimated Total Project Cost
Leucadia Boulevard	\$ 1.16 million	\$ 2.66 million
Encinitas Station	\$ 0.25 million	\$ 0.60 million
D Street	\$ 1.10 million	\$ 2.56 million
E Street	\$ 0.89 million	\$ 1.96 million
Cannon Road (City of Carlsbad)	TBD	TBD
TOTAL	\$ 3.40 million	\$ 7.78 million

As detailed in Appendix B, the cost estimates include the following key assumptions:

- All costs include design, environmental, construction, and associated soft costs.
- Unit prices are based on Caltrans Contract Cost Database for District 11, 2018/2019.
- The Construction Cost Estimate is in 2019 dollars. The total Project Cost Estimate is in Year of Expenditure dollars.
- Annual escalation assumed to be 3% compounded for a design/construction period of 4 years, with Year of Expenditure starting in the 2nd quarter of 2019 and construction ending in 3rd quarter of 2023.

4.1 LEUCADIA BOULEVARD

EXISTING CONDITIONS

This rail crossing is at the signalized intersection of Vulcan Avenue, Leucadia Boulevard, and North Coast Highway 101. There currently are two gate arms, one on the east and west sides of the tracks, plus bell and warning lights. There is sidewalk on the north side of Leucadia Boulevard with an ADA ramp on the western portion to accommodate the steep grade.

RECOMMENDED SUPPLEMENTAL SAFETY MEASURES

The recommended SSMS that would allow for Quiet Zone establishment at Leucadia Boulevard are:

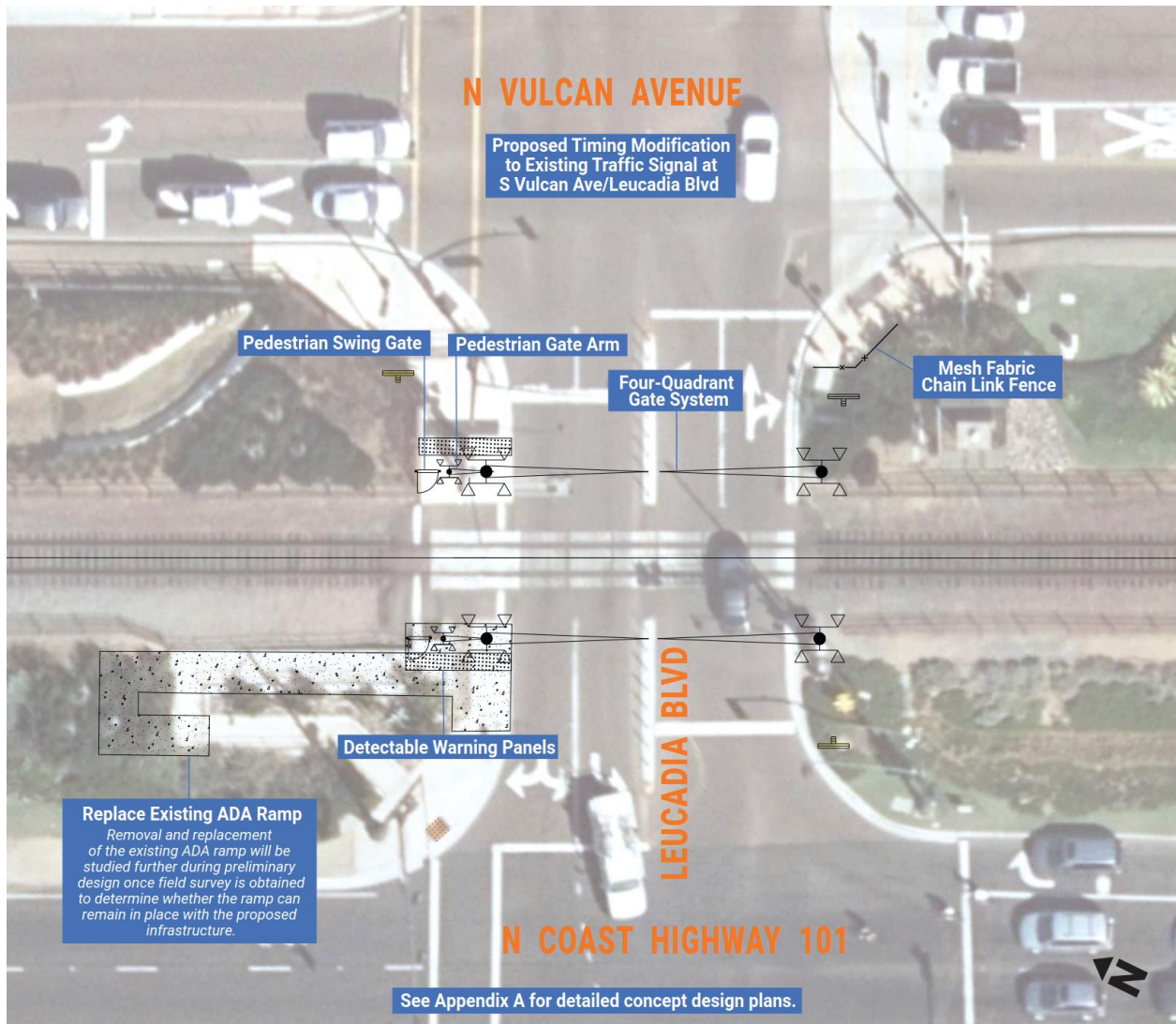
- Four quadrant gate system
- Pedestrian gate arms
- Pedestrian swing gates
- Fencing
- Sidewalk widening
- Detectable warning panels on pedestrian approaches
- Signage
- Pavement markings
- Potential timing modification to existing traffic signal at Leucadia Boulevard/North Coast Highway 101/Vulcan Avenue (requires coordination with adjacent 101 Streetscape and Coastal Rail Trail projects).

Figure 2 is a high-level conceptual exhibit. Appendix A contains more detailed engineering concept design plans.

The approximate cost is \$2.66 million which includes design, permitting, construction, and associated costs. Appendix B contains a detailed project cost estimate.

The Quiet Zone Calculator results (Appendix C) indicate that installation of these SSMS would reduce the risk index of the Leucadia Boulevard crossing to a level sufficient to qualify the proposed Quiet Zone for FRA's Automatic Approval process.

Figure 2: Leucadia Boulevard Conceptual Exhibit



4.2 ENCINITAS STATION

EXISTING CONDITIONS

This is an existing pedestrian railroad crossing with signals to warn of an approaching train, bell, warning lights, fencing, concrete sidewalk, and rubber panels to make walking over the tracks easier. This crossing connects the Encinitas Station parking lot (adjacent to Vulcan Avenue) to the platform west of the track.

RECOMMENDED SUPPLEMENTAL SAFETY MEASURES

The recommended SSMS that would allow for Quiet Zone establishment at Encinitas Station are:

- Pedestrian gate arms
- Pedestrian swing gates
- Replacement of existing rubber panels with concrete panels
- Detectable warning panels on pedestrian approaches
- Fencing
- Sidewalk widening

Figure 3 is a high-level conceptual exhibit. Appendix A contains more detailed engineering concept design plans.

The approximate cost is \$0.60 million which includes design, permitting, construction, and associated costs. Appendix B contains a detailed project cost estimate.

The Quiet Zone Calculator results (Appendix C) indicate that installation of these SSMS would reduce the risk index of the Encinitas Station crossing to a level sufficient to qualify the proposed Quiet Zone for FRA's Automatic Approval process.

Figure 3: Encinitas Station Conceptual Exhibit



4.3 D STREET

EXISTING CONDITIONS

The railroad crosses D Street mid-block. The crossing currently has a bell, warning lights, and two gate arms (which are primarily oriented to vehicles). There are concrete panels at the vehicular and pedestrian crossing, however the gaps between the rails and the concrete panels can be a tripping hazard.

RECOMMENDED SUPPLEMENTAL SAFETY MEASURES

The recommended SSMs that would allow for Quiet Zone establishment at D Street are:

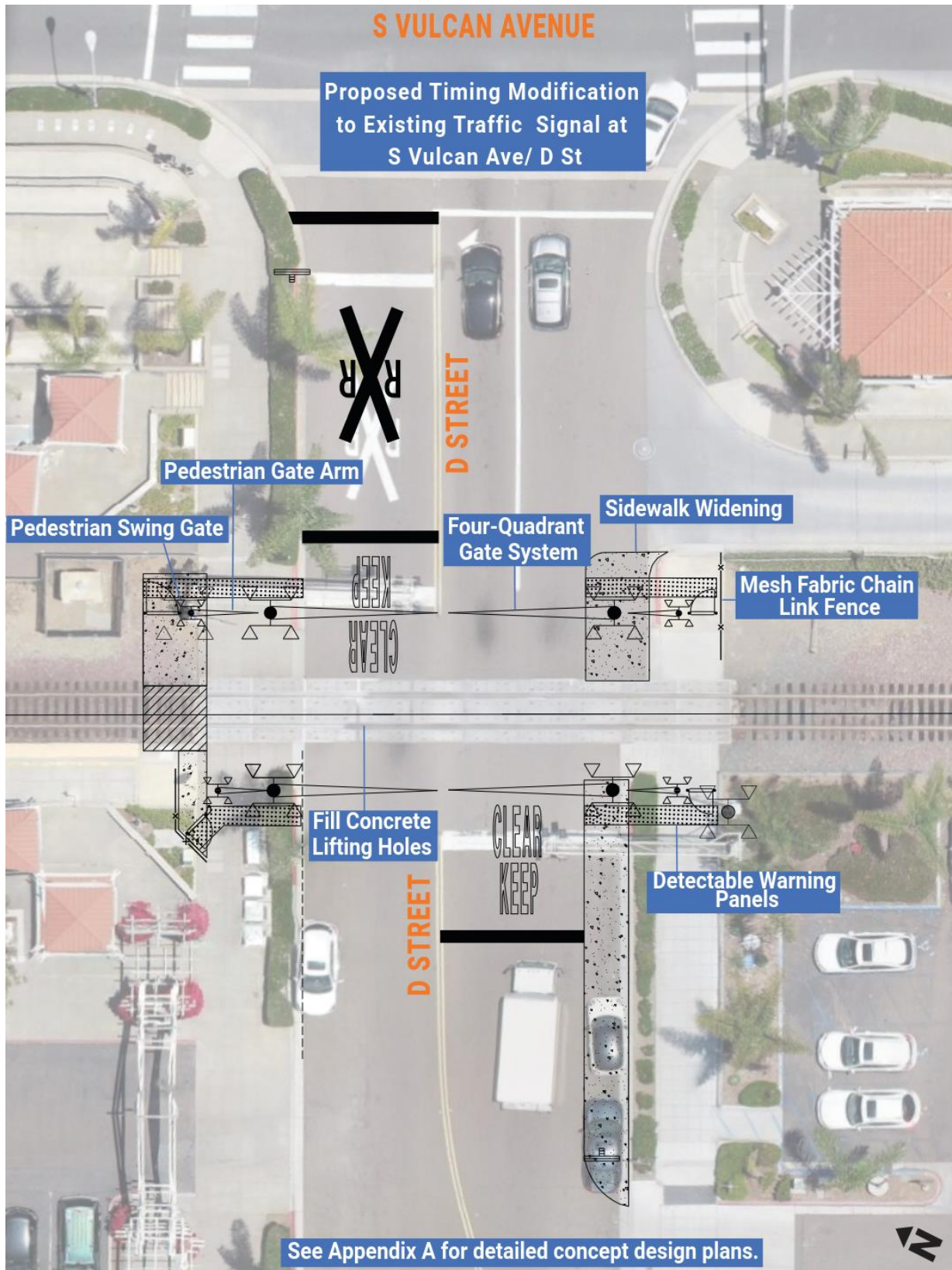
- Four quadrant gate system
- Pedestrian gate arms
- Pedestrian swing gates
- Fencing
- Sidewalk widening
- Detectable warning panels on pedestrian approaches
- Signage
- Pavement markings
- Potential timing modification to existing traffic signal at South Vulcan Avenue and D Street

Figure 4 is a high-level conceptual exhibit. Appendix A contains more detailed engineering concept design plans.

The approximate cost is \$2.56 million which includes design, permitting, construction, and associated costs. Appendix B contains a detailed project cost estimate.

The Quiet Zone Calculator results (Appendix C) indicate that installation of these SSMs would reduce the risk index of the D Street crossing to a level sufficient to qualify the proposed Quiet Zone for FRA's Automatic Approval process.

Figure 4: D Street Conceptual Exhibit



4.4 E STREET

EXISTING CONDITIONS

The crossing currently has a bell, warning lights, and two gate arms (which are primarily oriented to vehicles). There are concrete panels at the vehicular and pedestrian crossing, however the gaps between the rails and the concrete panels can be a tripping hazard.

RECOMMENDED SUPPLEMENTAL SAFETY MEASURES

The recommended SSMs that would allow for Quiet Zone establishment at E Street are:

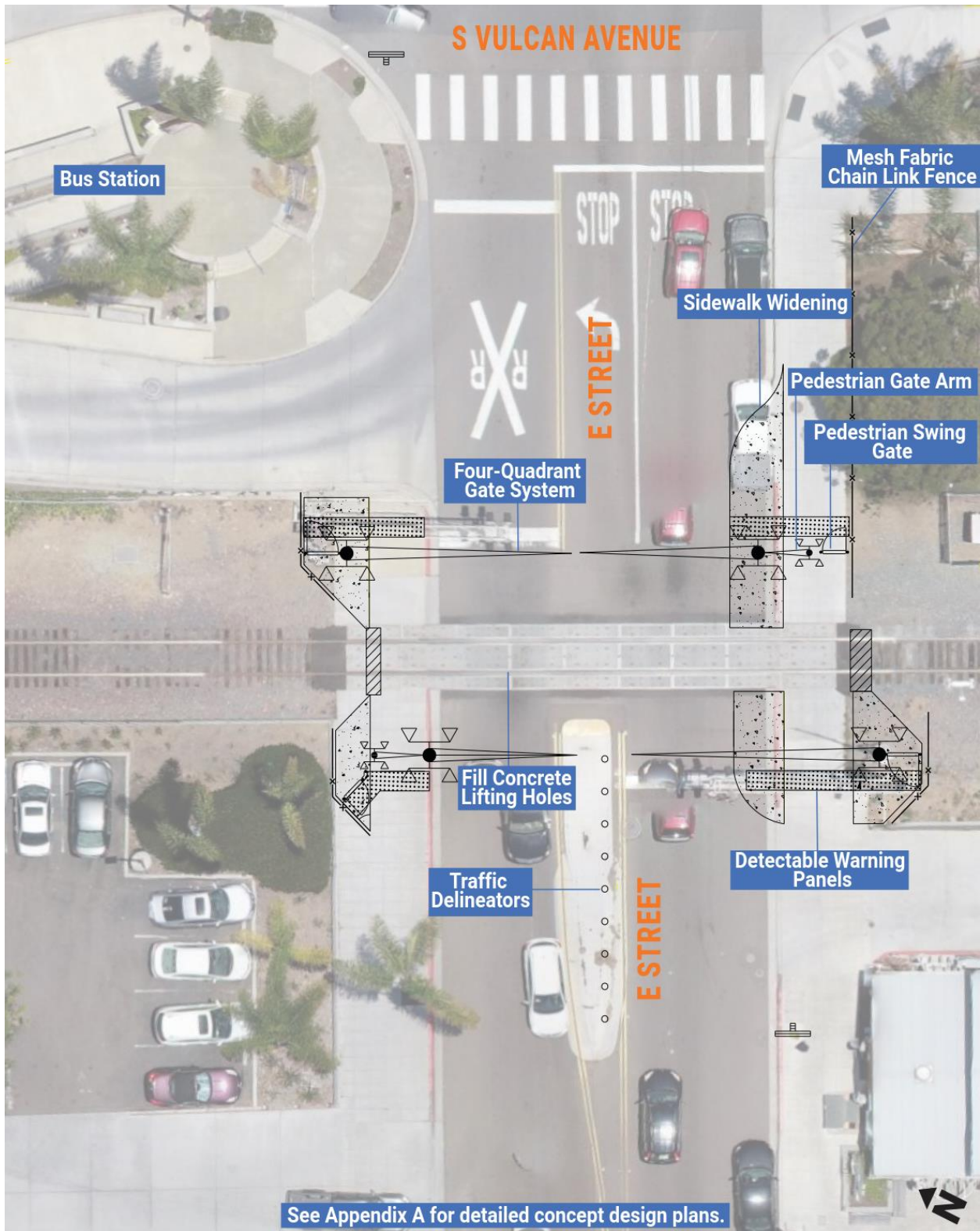
- Four-quadrant gate system
- Pedestrian gate arms
- Pedestrian swing gates
- Fencing
- Sidewalk widening
- Detectable warning panels
- Plastic traffic delineators in the median (required due to mountable median curb; alternatively, longer gate arms may require replacement of the existing gate mechanism or addition of a second gate mechanism)
- Signage

Figure 5 is a high-level conceptual exhibit. Appendix A contains more detailed engineering concept design plans.

The approximate cost is \$1.96 million which includes design, permitting, construction, and associated costs. Appendix B contains a detailed project cost estimate.

The Quiet Zone Calculator results (Appendix C) indicate that installation of these SSMs would reduce the risk index of the E Street crossing to a level sufficient to qualify the proposed Quiet Zone for FRA's Automatic Approval process.

Figure 5: E Street Conceptual Exhibit



APPENDIX

A CONCEPT DESIGN PLANS



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CPUC_exhibit+ Leucadia Blvd.dgn

NOTES

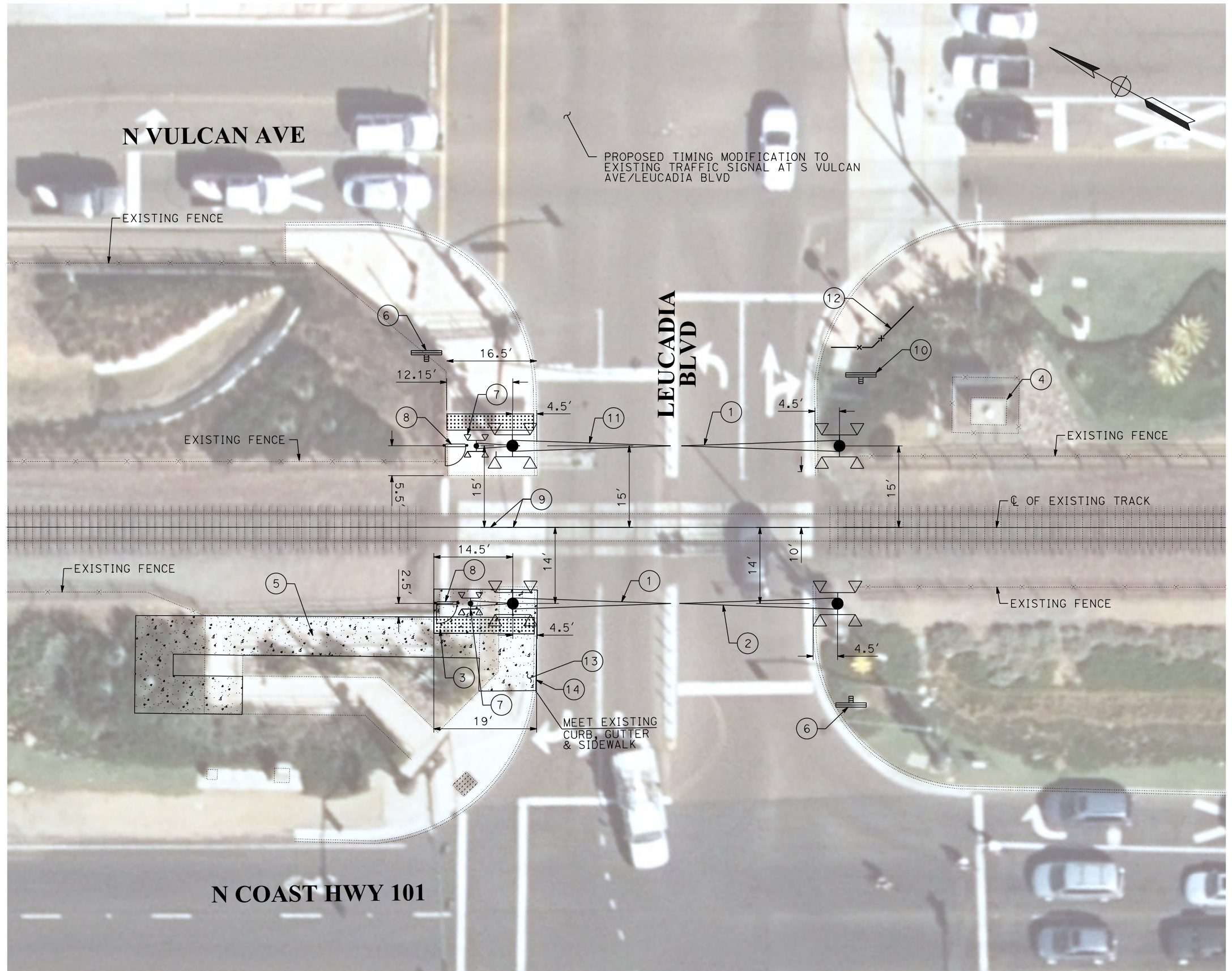
- ① PROPOSED CPUC Std 9-E EXIT GATE
- ② EXISTING CPUC Std 9-A ENTRANCE GATE TO REMAIN
- ③ 3' WIDE DETECTABLE WARNING STRIP
- ④ EXISTING FENCED UTILITY BOX
- ⑤ EXISTING ADA RAMP TO BE REMOVED AND REPLACED TO ACCOMODATE RAILROAD SIGNAL AND EXIT GATE - LIMITS SHOWN ARE CONCEPTUAL.
- ⑥ EXISTING W10-1, W10-5, W10-5P, R8-8 AND R9-3 SIGNS
- ⑦ PEDESTRIAN GATE ARM (TYP) PER CPUC Std GATE 9
- ⑧ 4' Min SWING GATE (Typ)
- ⑨ FILL CONCRETE PANEL LIFTING HOLES AT PEDESTRIAN AREAS
- ⑩ INSTALL ADDITIONAL SIGNAGE DUE TO LACK OF PEDESTRIAN FACILITY
- ⑪ PROPOSED CPUC Std 9 ENTRANCE GATE
- ⑫ 4' HIGH 1" MESH FABRC CHAIN LINK FENCE (Typ)
- ⑬ INSTALL PCC SIDEWALK PER STD DWG SDG-155
- ⑭ INSTALL CURB AND GUTTER PER STD DWG SDG-151

LEGEND

-  DETECTABLE WARNING PANEL
-  PROPOSED CONCRETE

NOTE

REMOVAL AND REPLACEMENT OF THE EXISTING ADA RAMP WILL BE STUDIED FURTHER DURING PRELIMINARY DESIGN ONCE FIELD SURVEY IS OBTAINED TO DETERMINE WHETHER THE RAMP CAN REMAIN IN PLACE WITH THE PROPOSED INFRASTRUCTURE.



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RELATIVE BORDER SCALE IS IN INCHES 

CONCEPT
 NOT FOR
 CONSTRUCTION

JUNE 2019



PRELIMINARY CONCEPT PLANS FOR
 CITY OF ENCINITAS QUIET ZONE

LEUCADIA Blvd
 AT-GRADE CROSSING

SCALE
 1" = 10'

delacruz

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
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CPUC Exhibit Encinitas Station.dgn

NOTES:

- ① PEDESTRIAN GATE ARM (TYP) PER CPUC STD GATE 9
- ② 4' Min SWING GATE (Typ)
- ③ 3' WIDE DETECTABLE WARNING STRIP
- ④ EXISTING CROSSING PANELS
- ⑤ PROPOSED 4' HIGH 1" MESH FABRIC CHAIN LINK FENCE (Typ)
- ⑥ EXISTING 3'-6" X 2'-8" SIGNAL BOX
- ⑦ REMOVE EXISTING SIGNAL
- ⑧ REPLACE EXISTING RUBBER PANELS WITH CONCRETE PANELS
- ⑨ INSTALL PCC SIDEWALK PER STD DWG SDG-155

LEGEND

-  DETECTABLE WARNING PANEL
-  PROPOSED CONCRETE
-  CONCRETE PANEL



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RELATIVE BORDER SCALE 0 1 2
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PRELIMINARY CONCEPT PLANS FOR
CITY OF ENCINITAS QUIET ZONE





ENCINITAS STATION
AT-GRADE PEDESTRIAN CROSSING

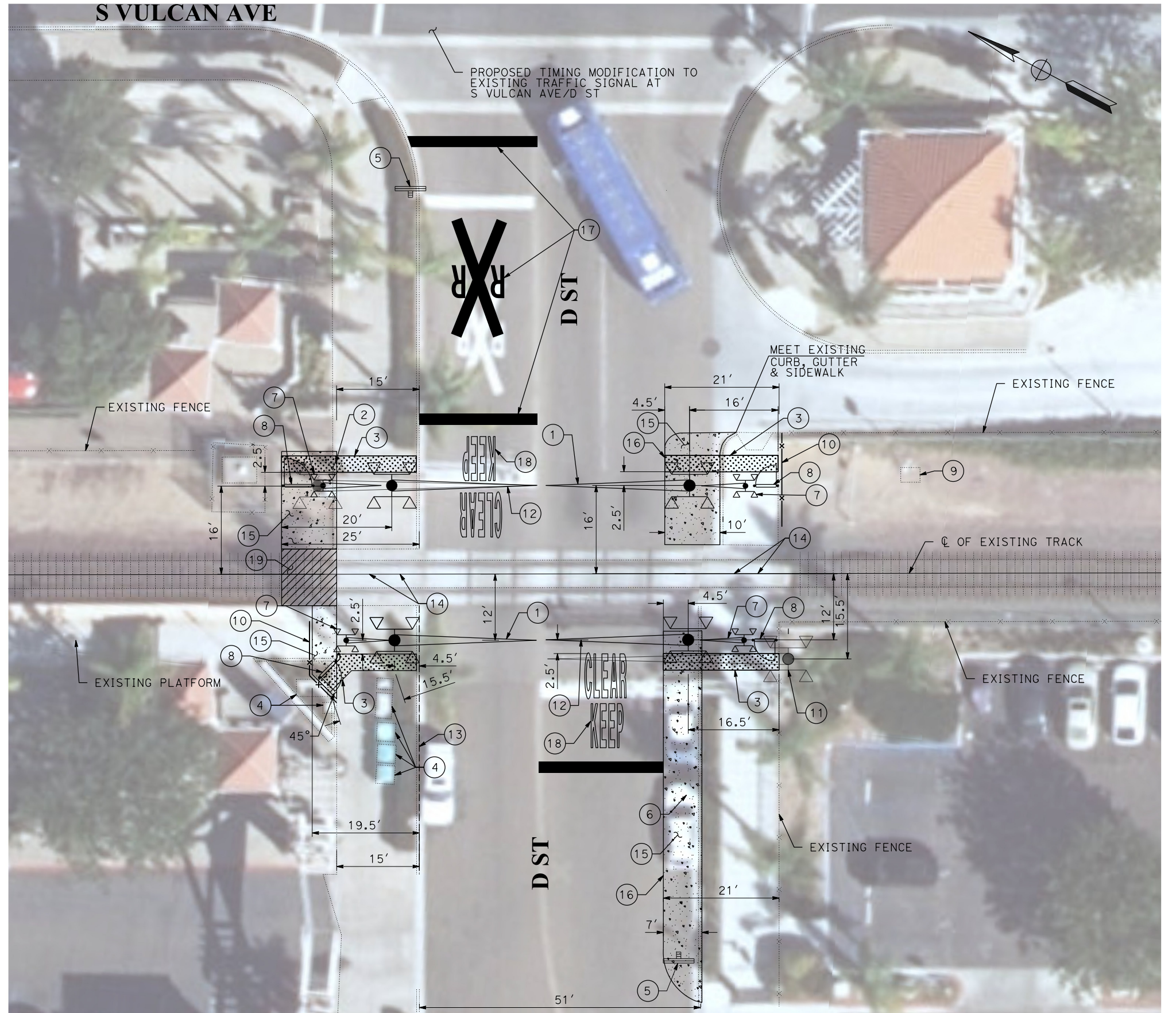
SCALE
1" = 10'

NOTES:

- ① PROPOSED CPUC S+d 9-E EXIT GATE
- ② EXISTING CPUC S+d 9-A ENTRANCE GATE TO BE REMOVED
- ③ 3' WIDE DETECTABLE WARNING STRIP
- ④ EXISTING UTILITY BOXES TO REMAIN
- ⑤ RELOCATE AND/OR INSTALL WR8(CA) AND W10-9P SIGNS BELOW EXISTING W10-1 SIGN ON EXISTING POST TO MEET NUMBER OF TRACKS PER MUTCD STANDARDS
- ⑥ REMOVE EXISTING PARKING STALLS
- ⑦ PEDESTRIAN GATE ARM (TYP) PER CPUC S+d GATE 9
- ⑧ 4' Min SWING GATE (Typ)
- ⑨ EXISTING 3'-6" X 2'-8" SIGNAL BOX
- ⑩ 4' HIGH 1" MESH FABRIC CHAIN LINK FENCE (Typ)
- ⑪ EXISTING CPUC S+d 9 ENTRANCE GATE TO BE REMOVED, S+d 9-A CANTILEVER SHALL REMAIN.
- ⑫ PROPOSED CPUC S+d 9 ENTRANCE GATE
- ⑬ PAINT CURB RED
- ⑭ FILL IN CONCRETE PANEL LIFTING HOLES
- ⑮ INSTALL PCC SIDEWALK PER S+d DWG SDG-155
- ⑯ INSTALL CURB AND GUTTER PER S+d DWG SDG-151
- ⑰ GRADE CROSSING PAVEMENT MARKING PER MUTCD FIGURE 8B-7
- ⑱ PAVEMENT MARKINGS PER S+d DWG A24E
- ⑲ EXTEND CONCRETE PANEL

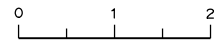
LEGEND

-  DETECTABLE WARNING PANEL
-  PROPOSED CONCRETE
-  24" WIDE WHITE LINE
-  CONCRETE PANEL



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PRELIMINARY CONCEPT PLANS FOR
CITY OF ENCINITAS QUIET ZONE

D St
AT-GRADE CROSSING

SCALE
1" = 10'

APPENDIX

B DETAILED COST ESTIMATES



MEMO

TO: Stephanie Kellar, City of Encinitas
FROM: Pete Ruscitti & Karen Kosup, WSP
SUBJECT: Quiet Zone Improvements Project Cost Opinion
DATE: July 31, 2019

This Project Cost Opinion is a component of the larger Quiet Zone Feasibility Analysis, which is providing the City with recommendations to reduce train horn noise along the coastal rail corridor by installing Supplemental Safety Measures (SSMs) and related infrastructure.

The original Project Cost Opinion was issued in February 2018. It has been updated as a result of the project team’s review and analysis of additional scope items suggested by stakeholder agencies at a site diagnostic meeting held on January 24, 2018. This site diagnostic meeting evaluated at-grade crossings at Leucadia Boulevard, D Street, E Street, Encinitas Station, and Chesterfield Drive. Chesterfield Drive costs are not included in this memo as these improvements are already constructed. Stakeholders included the Federal Railroad Administration (FRA), California Public Utilities Commission (CPUC) and North County Transit District (NCTD). This revision also reflects current unit prices and soft costs for each improvement location.

The attached worksheets contain separate Project Cost Opinions for each improvement location, with the totals summarized in the table below. The Cannon Road crossing (City of Carlsbad) is included because this vehicular at-grade crossing is necessary to create a “bookend” for the quiet zone to cover any future at-grade crossings north of Leucadia Boulevard. Without improvements at Cannon Road, any future at-grade crossings north of Leucadia Boulevard would be outside the quiet zone limits, requiring train horns to be sounded.

LOCATION	ESTIMATED CONSTRUCTION COST	ESTIMATED TOTAL PROJECT COST
Leucadia Boulevard	\$ 1.16 million	\$ 2.66 million
Encinitas Station	\$ 0.25 million	\$ 0.60 million
D Street	\$ 1.10 million	\$ 2.56 million
E Street	\$ 0.89 million	\$ 1.96 million
Cannon Road (City of Carlsbad)	TBD	TBD
TOTAL	\$ 3.40 million	\$ 7.78 million

These cost estimates include the following key assumptions:

- All costs include design, environmental, construction, and associated soft costs.
- Unit prices are based on Caltrans Contract Cost Database for District 11, 2018/2019.
- The Construction Cost Estimate is in 2019 dollars. The total Project Cost Estimate is in Year of Expenditure dollars.
- Annual escalation assumed to be 3% compounded for a design/construction period of 4 years, with Year of Expenditure starting in the 2nd quarter of 2019 and construction ending in 3rd quarter of 2023.



**Leucadia Boulevard At-Grade Rail Crossing Quiet Zone Improvements
Encinitas, CA**

**Project Cost Opinion Including Site Diagnostic
Preliminary Engineering & Environmental through Final Design & Construction**

**Prepared by WSP
June 2019**

DESIGN COSTS

1	Design Fees	0% to 60%	10.0% of Engineer's Estimate (Line 5)	\$81,390
		60% to 100%	15.0% of Engineer's Estimate (Line 5)	\$122,085
		Total Design Fees		\$203,475
2	Design Contingency		15.0% of Total Design Fees	\$30,521
3	Permitting & Review Fees			\$10,000
4	Total Design Costs			\$244,000

CONSTRUCTION COSTS

5	Engineer's Estimate (Attached)			\$813,900
6	Construction Contingency		20.0% of Engineer's Estimate (Line 5)	\$162,780
7	Mobilization/Demobilization		10.0% of Engineer's Estimate (Line 5)	\$81,390
8	Traffic Handling		10.0% of Engineer's Estimate (Line 5)	\$81,390
9	Traffic Flagging		(200hrs at \$75/hr)	\$15,000
10	Total Construction Costs			\$1,154,500

ESCALATION COSTS

11	Q2 2019 - Q2 2022		9.00% of Total Construction Costs (Line 10)	\$103,905
12	Q3 2022 - Q3 2023		3.00% of Total Construction Costs (Line 10)	\$34,635
13	Total Escalation Costs			\$138,500

NON-CONSTRUCTION COSTS

14	City Administration		2.5% of Total Construction Costs (Line 10)	\$28,863
15	Construction Management		20.0% of Total Construction Costs (Line 10)	\$230,900
16	Project Manangement		10.0% of Total Construction Costs (Line 10)	\$115,450
17	General Construction Overhead & Profit		10.0% of Total Construction Costs (Line 10)	\$115,450
18	Materials Testing		1.0% of Total Construction Costs (Line 10)	\$11,545
19	Construction Staking			\$40,000
20	Inspection Services			\$20,000
21	Environmental Mitigation			\$5,000
22	Design Support During Construction		5.0% of Total Construction Costs (Line 10)	\$57,725
23	Utilities (Franchise)		7.0% of Total Construction Costs (Line 10)	\$80,815
24	Force Account			\$5,000
25	Safety Training			\$10,000
26	Total Non-Construction Costs			\$720,700

27 **Subtotal Construction, Escalation and Non-Construction Costs** **\$2,013,700**

28 Project Contingency 20.0% of Subtotal (Line 26) \$402,740

29 **Total Construction, Escalation and Non-Construction Costs** **\$2,416,400**

30 **Total Project Cost (Design, Construction & Non-Construction)** **\$2,660,400**

NOTES

- 1 Estimates are based on preliminary exhibits dated June 2019. Recommendations provided at Site Diagnostic Meeting on Jan. 24, 2018 and approved by the City of Encinitas are included.
- 2 Estimates assume minor utility relocations will be necessary. Field survey, design and potholes is required to determine the full extent of any relocations.



Engineer's Estimate

**Leucadia Boulevard
 Quiet Zone Improvements**

ITEM NO.	ITEM	UNIT	QUANTITY	UNIT COST	AMOUNT
GENERAL					
1	Water Pollution Control (2.5% of Total Construction Costs)	LS	1.00	\$27,540	\$27,540
2	Temp Pedestrian Walkway	LS	1.00	\$40,000	\$40,000
SUBTOTAL - GENERAL					\$67,540
DEMOLITION					
3	Total Demolition and Removal	LS	1.00	\$39,000	\$39,000
SUBTOTAL - DEMOLITION					\$39,000
CIVIL IMPROVEMENTS					
4	Minor Concrete (Curb and Gutter)	LF	19.00	\$50	\$950
5	Minor Concrete (Sidewalk, 6" THK)	SF	195.00	\$30	\$5,850
6	Pedestrian Ramp Walkway	SF	669.00	\$70	\$46,830
7	Detectable Warning Strip (includes entire width of ped gate arm)	SF	54.00	\$70	\$3,780
8	Emergency Exit Swing Gate	EA	2.00	\$5,000	\$10,000
9	Landscaping & Irrigation	LS	1.00	\$10,000	\$10,000
10	Handrail	LF	184.00	\$200	\$36,800
11	Fill concrete panels lifting holes at pedestrian areas by NCTD	LF	33.00	\$50	\$1,650
12	Wooden Fence	LF	5.00	\$100	\$500
13	Reconfigure fencing and channelization of pedestrians	LS	1.00	\$10,000	\$10,000
14	Furnish and Install new Concrete Crossing Panels Installed by NCTD	TF	10.00	\$1,000	\$10,000
15	Utility Relocations	LS	1.00	\$50,000	\$50,000
SUBTOTAL - CIVIL IMPROVEMENTS					\$186,360
ROADWAY IMPROVEMENTS					
16	Install additional signage	LS	1.00	\$5,000	\$5,000
17	Pavement Marking (KEEP CLEAR)	EA	4.00	\$500	\$2,000
SUBTOTAL - ROADWAY IMPROVEMENTS					\$7,000
SIGNALING					
18	CPUC No. 9E Warning Device Exit Gat - Complete Assembly with 1-Way lamps	EA	2.00	\$20,000	\$40,000
19	CPUC No. 9 Warning Device Entrance Gate	EA	1.00	\$18,000	\$18,000
20	Remove CPUC No 9 gate	EA	1.00	\$25,000	\$25,000
21	Controller & Signal House	EA	1.00	\$200,000	\$200,000
22	Labor - Signal Equipment Installation including Conduit Runs	DAY	10.00	\$10,000	\$100,000
23	Machinery Rental	DAY	10.00	\$5,000	\$50,000
24	Vehicle detection system and conduit improvements	LS	1.00	\$20,000	\$20,000
25	Traffic Signal Timing Modification	LS	1.00	\$25,000	\$25,000
26	Pedestrian gate arm assembly including flashers	EA	2.00	\$18,000	\$36,000
SUBTOTAL - SIGNALING					\$514,000

TOTAL **\$813,900**



**Encinitas Station At-Grade Rail Crossing Quiet Zone Improvements
Encinitas, CA**

**Project Cost Opinion Including Site Diagnostic
Preliminary Engineering & Environmental through Final Design & Construction**

**Prepared by WSP
June 2019**

DESIGN COSTS

1	Design Fees	0% to 60%	10.0% of Engineer's Estimate (Line 5)	\$16,457
		60% to 100%	15.0% of Engineer's Estimate (Line 5)	\$24,686
		Total Design Fees		\$41,143
2	Design Contingency		15.0% of Total Design Fees	\$6,171
3	Permitting & Review Fees			\$10,000
4	Total Design Costs			\$57,300

CONSTRUCTION COSTS

5	Engineer's Estimate (Attached)			\$164,570
6	Construction Contingency		20.0% of Engineer's Estimate (Line 5)	\$32,914
7	Mobilization/Demobilization		10.0% of Engineer's Estimate (Line 5)	\$16,457
8	Traffic Handling		10.0% of Engineer's Estimate (Line 5)	\$16,457
9	Traffic Flagging		(200hrs at \$75/hr)	\$15,000
10	Total Construction Costs			\$245,400

ESCALATION COSTS

11	Q2 2019 - Q2 2022		9.00% of Total Construction Costs (Line 10)	\$22,086
12	Q3 2022 - Q3 2023		3.00% of Total Construction Costs (Line 10)	\$7,362
13	Total Escalation Costs			\$29,400

NON-CONSTRUCTION COSTS

14	City Administration		2.5% of Total Construction Costs (Line 10)	\$6,135
15	Construction Management		20.0% of Total Construction Costs (Line 10)	\$49,080
16	Project Mananagement		10.0% of Total Construction Costs (Line 10)	\$24,540
17	General Construction Overhead & Profit		10.0% of Total Construction Costs (Line 10)	\$24,540
18	Materials Testing		1.0% of Total Construction Costs (Line 10)	\$2,454
19	Construction Staking			\$10,000
20	Inspection Services			\$10,000
21	Environmental Mitigation			\$5,000
22	Design Support During Construction		5.0% of Total Construction Costs (Line 10)	\$12,270
23	Utilities (Franchise)		7.0% of Total Construction Costs (Line 10)	\$17,178
24	Force Account			\$5,000
25	Safety Training			\$10,000
26	Total Non-Construction Costs			\$176,200

27 **Subtotal Construction, Escalation and Non-Construction Costs** **\$451,000**

28 Project Contingency 20.0% of Subtotal (Line 26) \$90,200

29 **Total Construction, Escalation and Non-Construction Costs** **\$541,200**

30 **Total Project Cost (Design, Construction & Non-Construction)** **\$598,500**

NOTES

- 1 Estimates are based on preliminary exhibits dated June 2019. Recommendations provided at Site Diagnostic Meeting on Jan. 24, 2018 and approved by the City of Encinitas are included.
- 2 Estimates assume minor utility relocations will be necessary. Field survey, design and potholes is required to determine the full extent of any relocations.



**Encinitas Station
 Quiet Zone Improvements**

ITEM NO.	ITEM	UNIT	QUANTITY	UNIT COST	AMOUNT
DEMOLITION					
1	Total Demolition and Removal	LS	1.00	\$400	\$400
SUBTOTAL - DEMOLITION					\$400
CIVIL IMPROVEMENTS					
2	Minor Concrete (Sidewalk, 6" THK)	SF	44.00	\$30	\$1,320
3	Detectable Warning Strip (includes entire width of ped gate arm)	SF	43.00	\$70	\$3,010
4	Fence (Type TBD)	LF	68.00	\$130	\$8,840
5	Emergency Exit Swing Gate	EA	2.00	\$5,000	\$10,000
6	Utility Relocations	LS	1.00	\$20,000	\$20,000
7	Replace existing rubber panels with concrete panels by NTC	TF	16.00	\$625	\$10,000
SUBTOTAL - CIVIL IMPROVEMENTS					\$53,170
SIGNALING					
8	CPUC No. 9 Warning Device - Pedestrian Gate 1-Way (Front Lights)	EA	2.00	\$18,000	\$36,000
9	Labor - Signal Equipment Installation including Conduit Runs	DAY	5.00	\$10,000	\$50,000
10	Machinery Rental	DAY	5.00	\$5,000	\$25,000
SUBTOTAL - SIGNALING					\$111,000

TOTAL **\$164,570**



**D Street At-Grade Rail Crossing Quiet Zone Improvements
Encinitas, CA**

**Project Cost Opinion Including Site Diagnostic
Preliminary Engineering & Environmental through Final Design & Construction**

**Prepared by WSP
June 2019**

DESIGN COSTS

1	Design Fees	0% to 60%	10.0% of Engineer's Estimate (Line 5)	\$77,659
		60% to 100%	15.0% of Engineer's Estimate (Line 5)	\$116,488
		Total Design Fees		\$194,146
2	Design Contingency		15.0% of Total Design Fees	\$29,122
3	Permitting & Review Fees			\$10,000
4	Total Design Costs			\$233,300

CONSTRUCTION COSTS

5	Engineer's Estimate (Attached)			\$776,585
6	Construction Contingency		20.0% of Engineer's Estimate (Line 5)	\$155,317
7	Mobilization/Demobilization		10.0% of Engineer's Estimate (Line 5)	\$77,659
8	Traffic Handling		10.0% of Engineer's Estimate (Line 5)	\$77,659
9	Traffic Flagging		(200hrs at \$75/hr)	\$15,000
10	Total Construction Costs			\$1,102,200

ESCALATION COSTS

11	Q2 2019 - Q2 2022		9.00% of Total Construction Costs (Line 10)	\$99,198
12	Q3 2022 - Q3 2023		3.00% of Total Construction Costs (Line 10)	\$33,066
13	Total Escalation Costs			\$132,300

NON-CONSTRUCTION COSTS

14	City Administration		2.5% of Total Construction Costs (Line 10)	\$27,555
15	Construction Management		20.0% of Total Construction Costs (Line 10)	\$220,440
16	Project Mananagement		10.0% of Total Construction Costs (Line 10)	\$110,220
17	General Construction Overhead & Profit		10.0% of Total Construction Costs (Line 10)	\$110,220
18	Materials Testing		1.0% of Total Construction Costs (Line 10)	\$11,022
19	Construction Staking			\$40,000
20	Inspection Services			\$30,000
21	Environmental Mitigation			\$5,000
22	Design Support During Construction		5.0% of Total Construction Costs (Line 10)	\$55,110
23	Utilities (Franchise)		7.0% of Total Construction Costs (Line 10)	\$77,154
24	Force Account			\$5,000
25	Safety Training			\$10,000
26	Total Non-Construction Costs			\$701,700

27 **Subtotal Construction, Escalation and Non-Construction Costs** **\$1,936,200**

28 Project Contingency 20.0% of Subtotal (Line 26) \$387,240

29 **Total Construction, Escalation and Non-Construction Costs** **\$2,323,400**

30 **Total Project Cost (Design, Construction & Non-Construction)** **\$2,556,700**

NOTES

- 1 Estimates are based on preliminary exhibits dated June 2019. Recommendations provided at Site Diagnostic Meeting on Jan. 24, 2018 and approved by the City of Encinitas are included.
- 2 Estimates assume minor utility relocations will be necessary. Field survey, design and potholes is required to determine the full extent of any relocations.



Engineer's Estimate

**D Street
 Quiet Zone Improvements**

ITEM NO.	ITEM	UNIT	QUANTITY	UNIT COST	AMOUNT
GENERAL					
1	Water Pollution Control (2.5% of Total Construction Costs)	LS	1.00	\$27,165	\$27,165
SUBTOTAL - GENERAL					\$27,165
DEMOLITION					
2	Total Demolition and Removal	LS	1.00	\$24,000	\$24,000
SUBTOTAL - DEMOLITION					\$24,000
CIVIL IMPROVEMENTS					
3	Minor Concrete (Curb and Gutter)	LF	92.00	\$50	\$4,600
4	Minor Concrete (Sidewalk, 6" THK)	SF	902.00	\$30	\$27,060
5	Detectable Warning Strip (includes entire width of ped gate arm)	SF	90.00	\$70	\$6,300
6	Fence (Type TBD)	LF	37.00	\$130	\$4,810
7	Emergency Exit Swing Gate	EA	4.00	\$5,000	\$20,000
8	Landscaping & Irrigation	LS	1.00	\$10,000	\$10,000
9	Fill concrete panels lifting holes at pedestrian areas by NCTD	LF	33.00	\$50	\$1,650
10	Install barriers at platform/sidewalk for channelization, includes pedestrian traffic study	LS	1.00	\$10,000	\$10,000
11	Utility Relocations	LS	1.00	\$30,000	\$30,000
SUBTOTAL - CIVIL IMPROVEMENTS					\$114,420
ROADWAY IMPROVEMENTS					
12	Regulatory Sign W10-9P (On Existing Post)	EA	2.00	\$250	\$500
13	Regulatory Sign W48(CA)(2) (On Existing Post)	EA	2.00	\$250	\$500
14	Pavement Marking (KEEP CLEAR)	EA	2.00	\$500	\$1,000
15	Type B raised Median	LF	250.00	\$40	\$10,000
16	Painted Curb	LF	20.00	\$5	\$100
SUBTOTAL - ROADWAY IMPROVEMENTS					\$12,000
SIGNALING					
17	Single Mast Crossing Cantilever Assembly	EA	1.00	\$20,000	\$20,000
18	CPUC No. 9E Warning Device - Complete Assembly with 1-Way lamps	EA	2.00	\$20,000	\$40,000
19	CPUC No. 9 Warning Device Pedestrian Gate 1-Way (Front Lights)	EA	4.00	\$18,000	\$72,000
20	CPUC No. 9 Warning Device Entrance Gate	EA	2.00	\$18,000	\$36,000
21	Remove existing vehicle gate No. 9-A	EA	2.00	\$18,000	\$36,000
22	Controller & Signal House	EA	1.00	\$200,000	\$200,000
23	Labor - Signal Equipment Installation including Conduit Runs	DAY	10.00	\$10,000	\$100,000
24	Machinery Rental	DAY	10.00	\$5,000	\$50,000
25	Vehicle detection system and conduit improvements	LS	1.00	\$20,000	\$20,000
26	Traffic Signal Timing Modification	LS	1.00	\$25,000	\$25,000
SUBTOTAL - SIGNALING					\$599,000

TOTAL **\$776,585**



**E Street At-Grade Rail Crossing Quiet Zone Improvements
Encinitas, CA**

**Project Cost Opinion Including Site Diagnostic
Preliminary Engineering & Environmental through Final Design & Construction**

**Prepared by WSP
June 2019**

DESIGN COSTS

1	Design Fees	0% to 60%	10.0% of Engineer's Estimate (Line 5)	\$62,391
		60% to 100%	15.0% of Engineer's Estimate (Line 5)	\$93,586
		Total Design Fees		\$155,977
2	Design Contingency		15.0% of Total Design Fees	\$23,397
3	Permitting & Review Fees			\$10,000
4	Total Design Costs			\$189,400

CONSTRUCTION COSTS

5	Engineer's Estimate (Attached)			\$623,908
6	Construction Contingency		20.0% of Engineer's Estimate (Line 5)	\$124,782
7	Mobilization/Demobilization		10.0% of Engineer's Estimate (Line 5)	\$62,391
8	Traffic Handling		10.0% of Engineer's Estimate (Line 5)	\$62,391
9	Traffic Flagging		(200hrs at \$75/hr)	\$15,000
10	Total Construction Costs			\$888,500

ESCALATION COSTS

11	Q2 2019 - Q2 2022		9.00% of Total Construction Costs (Line 10)	\$79,965
12	Q3 2022 - Q3 2023		3.00% of Total Construction Costs (Line 10)	\$26,655
13	Total Escalation Costs			\$106,600

NON-CONSTRUCTION COSTS

14	City Administration		2.5% of Total Construction Costs (Line 10)	\$22,213
15	Construction Management		20.0% of Total Construction Costs (Line 10)	\$177,700
16	Project Manangement		10.0% of Total Construction Costs (Line 10)	\$88,850
17	General Construction Overhead & Profit		10.0% of Total Construction Costs (Line 10)	\$88,850
18	Materials Testing		1.0% of Total Construction Costs (Line 10)	\$8,885
19	Construction Staking			\$40,000
20	Inspection Services			\$30,000
21	Environmental Mitigation			\$5,000
22	Design Support During Construction		5.0% of Total Construction Costs (Line 10)	\$44,425
23	Utilities (Franchise)		7.0% of Total Construction Costs (Line 10)	\$62,195
24	Force Account			\$5,000
25	Safety Training			\$10,000
26	Total Non-Construction Costs			\$583,100

27 **Subtotal Construction, Escalation and Non-Construction Costs** **\$1,471,600**

28 Project Contingency 20.0% of Subtotal (Line 26) \$294,320

29 **Total Construction, Escalation and Non-Construction Costs** **\$1,765,900**

30 **Total Project Cost (Design, Construction & Non-Construction)** **\$1,955,300**

NOTES

- Estimates are based on preliminary exhibits dated June 2019. Recommendations provided at Site Diagnostic Meeting on Jan. 24, 2018 and approved by the City of Encinitas are included.
- Estimates assume minor utility relocations will be necessary. Field survey, design and potholes is required to determine the full extent of any relocations.



Engineer's Estimate

**E Street
 Quiet Zone Improvements**

ITEM NO.	ITEM	UNIT	QUANTITY	UNIT COST	AMOUNT
GENERAL					
1	Water Pollution Control (2.5% of Total Construction Costs)	LS	1.00	\$21,968	\$21,968
SUBTOTAL - GENERAL					\$21,968
DEMOLITION					
2	Total Demolition and Removal	LS	1.00	\$24,000	\$24,000
SUBTOTAL - DEMOLITION					\$24,000
CIVIL IMPROVEMENTS					
3	Minor Concrete (Curb and Gutter)	LF	58.00	\$50	\$2,900
4	Minor Concrete (Sidewalk, 6" THK)	SF	505.00	\$30	\$15,150
5	Detectable Warning Strip (includes entire width of ped gate arm)	SF	126.00	\$70	\$8,820
6	Fence (Type TBD)	LF	43.00	\$130	\$5,590
7	Emergency Exit Swing Gate	EA	4.00	\$5,000	\$20,000
8	Fill concrete panels lifting holes at pedestrian areas by NCTD	LF	33.00	\$50	\$1,650
9	Replace existing rubber track panels with concrete track panels	TF	10.00	\$500	\$5,000
10	Utility Relocations	LS	1.00	\$30,000	\$30,000
SUBTOTAL - CIVIL IMPROVEMENTS					\$89,110
ROADWAY IMPROVEMENTS					
11	Regulatory Sign W10-9P (On Existing Post)	EA	2.00	\$250	\$500
12	Regulatory Sign W48(CA)(2) (On Existing Post)	EA	2.00	\$250	\$500
13	Pavement Marking (KEEP CLEAR)	EA	2.00	\$500	\$1,000
14	Painted Curb	LF	58.00	\$5	\$290
15	Plastic Delineator (Class 1)	EA	9.00	\$60	\$540
SUBTOTAL - ROADWAY IMPROVEMENTS					\$2,830
SIGNALING					
16	Single Mast Crossing Cantilever Assembly	EA	2.00	\$20,000	\$40,000
17	CPUC No. 9E Warning Device - Complete Assembly with 1-Way lamps	EA	2.00	\$20,000	\$40,000
18	CPUC No. 9 Warning Device Pedestrian Gate 1-Way (Front Lights)	EA	2.00	\$18,000	\$36,000
19	Controller & Signal House	EA	1.00	\$200,000	\$200,000
20	Labor - Signal Equipment Installation including Conduit Runs	DAY	10.00	\$10,000	\$100,000
21	Machinery Rental	DAY	10.00	\$5,000	\$50,000
22	Vehicle detection system and conduit improvements	LS	1.00	\$20,000	\$20,000
SUBTOTAL - SIGNALING					\$486,000

TOTAL **\$623,908**

APPENDIX

C QUIET ZONE CALCULATOR RESULTS

Update and Verify Crossing Information

CONTINUE

Create New Zone

Zone:

Manage Existing Zones

Quiet Zone Type : **New 24-hour Quiet Zone**

Log Off

026827V LEUCADIA BOULEVARD

Step by Step Instructions:

Step 1: To add more crossings to the zone Click the ADD CROSSING,

Step 2: To Make changes to the default information, select the crossing from list. Enter the changes in the appropriate box, then click the UPDATE button.

Step 3: To permanently remove a crossing from the zone, select Crossing from list. Click the DELETE CROSSING button.

Step 4: Verify All Crossing Information Provided is correct. Then Click the Check Box, then CONTINUE button .

*** Note:** To see a list of SSMs, click on "Pre-Existing SSM".

026827V LEUCADIA BOULEVARD
026828C *ENCINITAS BOULEVARD
026829J EAST D STREET
026830D EAST E STREET

* = Not Public At Grade Crossing
** = Closed Crossing

To verify ALL CROSSING INFORMATION PROVIDED is correct, click on the check box here.

ADD CROSSING

DELETE CROSSING

Present warn device: Gates	Gates ▼
Number of highway vehicles per day: 004896	4896
Total trains: 50	50
Day through trains : 32	32
Total Switching Trains : 6	6
Number of main tracks: 1	1
Number of other tracks: 0	0
Urban(U.)/Rural(R.): U.Local	U.Local ▼
Highways paved: Yes	Yes ▼
Maximum timetable speed mph: 90	90
Number of highway lanes: 4	4
Number of years accident data: 5	5
Number of accidents in accident data years: 0	0
Wayside horn:	No ▼
Pre-Existing SSM:	No ▼

UPDATE

Note: Updating Crossing information on the Quiet Zone Calculator **DOES NOT** update the crossing inventory. Be sure that an updated current and accurate inventory form is also submitted.

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Change Scenario: ENCINITAS_48731 ▼

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026827V	LEUCADIA BOULEVARD	4896	Gates	0	0	63,494.30	<input type="button" value="MODIFY"/>

Create New Zone

Manage Existing Zones

Log Off

* Only Public At Grade Crossings are listed.

Click for Supplementary Safety Measures [SSM]

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the MODIFY Button

Step 2: Select proposed warning device or SSM. Then click the UPDATE button. To generate a spreadsheet of the values on this page, click on ASM button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

Summary	
Proposed Quiet Zone:	ENCINITAS QZ 3
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48731
Estimated Total Cost:	\$0.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	38066.13
Quiet Zone Risk Index:	63494.3

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Change Scenario: ENCINITAS_48731 ▼

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026827V	LEUCADIA BOULEVARD	4896	Gates	0	4	11,428.97	<input type="button" value="MODIFY"/>

Create New Zone

Manage Existing Zones

Log Off

* Only Public At Grade Crossings are listed.

ALERT: Quiet Zone qualifies because SSM has been applied in each crossing.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

Step 2: Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

Summary	
Proposed Quiet Zone:	ENCINITAS QZ 3
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48731
Estimated Total Cost:	\$100,000.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	38066.13
Quiet Zone Risk Index:	11428.97
<input type="button" value="Select"/>	

Update and Verify Crossing Information

CONTINUE

Create New Zone

Zone:

Manage Existing Zones

Quiet Zone Type : **New 24-hour Quiet Zone**

923771D ENCINITAS STATION

Log Off

026829J EAST D STREET
026830D EAST E STREET
923771D ENCINITAS STATION

Step by Step Instructions:

Step 1: To add more crossings to the zone Click the ADD CROSSING.

Step 2: To Make changes to the default information, select the crossing from list. Enter the changes in the appropriate box, then click the UPDATE button.

Step 3: To permanently remove a crossing from the zone, select Crossing from list. Click the DELETE CROSSING button.

Step 4: Verify All Crossing Information Provided is correct. Then Click the Check Box, then CONTINUE button .

*** Note:** To see a list of SSMs, click on "Pre-Existing SSM".

* = Not Public At Grade Crossing
** = Closed Crossing

To verify ALL CROSSING INFORMATION PROVIDED is correct, click on the check box here.

ADD CROSSING **DELETE CROSSING**

Flashing Lights

Flashing Lights ▼

Present warn device:
Number of highway vehicles per day:

0

Total trains: 50

50

Day through trains : 32

32

Total Switching Trains : 6

6

Number of main tracks: 1

1

Number of other tracks: 0

0

Urban(U.)/Rural(R.):

▼

Highways paved: Yes

Yes ▼

Maximum timetable speed mph: 80

80

Number of highway lanes:

0

Number of years accident data: 5

5

Number of accidents in accident data years: 0

0

Wayside horn:

No ▼

Pre-Existing SSM:

No ▼

UPDATE

Note: Updating Crossing information on the Quiet Zone Calculator **DOES NOT** update the crossing inventory. Be sure that an updated current and accurate inventory form is also submitted.

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Change Scenario:

Create New Zone

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
923771D	ENCINITAS STATION	0	Gates	0	0	179.83	<input type="button" value="MODIFY"/>

Manage Existing Zones

Log Off

* Only Public At Grade Crossings are listed.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

Step 2: Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the [SELECT](#) button is shown at the bottom right side of this page. Note that the [SELECT](#) button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the [SELECT](#) button

Summary	
Proposed Quiet Zone:	ENCINITAS QZ 8
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48736
Estimated Total Cost:	\$0.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	107.81
Quiet Zone Risk Index:	179.83
<input type="button" value="Select"/>	

Update and Verify Crossing Information

CONTINUE

Create New Zone

Zone:

Manage Existing Zones

Quiet Zone Type : **New 24-hour Quiet Zone**

Log Off

026829J EAST D STREET

026829J EAST D STREET

Step by Step Instructions:

Step 1: To add more crossings to the zone Click the ADD CROSSING.

Step 2: To Make changes to the default information, select the crossing from list. Enter the changes in the appropriate box, then click the UPDATE button.

Step 3: To permanently remove a crossing from the zone, select Crossing from list. Click the DELETE CROSSING button.

Step 4: Verify All Crossing Information Provided is correct. Then Click the Check Box, then CONTINUE button .

*** Note:** To see a list of SSMs, click on "Pre-Existing SSM".

* = Not Public At Grade Crossing
** = Closed Crossing

To verify ALL CROSSING INFORMATION PROVIDED is correct, click on the check box here.

ADD CROSSING

DELETE CROSSING

Present warn device: **Gates**

Number of highway vehicles per day: **003157**

Total trains: **50**

Day through trains : **32**

Total Switching Trains : **6**

Number of main tracks: **1**

Number of other tracks: **0**

Urban(U.)/Rural(R.): **U.Local**

Highways paved: **Yes**

Maximum timetable speed mph: **80**

Number of highway lanes: **2**

Number of years accident data: **5**

Number of accidents in accident data years: **0**

Wayside horn:

Pre-Existing SSM:

UPDATE

Note: Updating Crossing information on the Quiet Zone Calculator **DOES NOT** update the crossing inventory. Be sure that an updated current and accurate inventory form is also submitted.

Change Scenario:

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026829J	EAST D STREET	3157	Gates	0	0	46,320.10	<input type="button" value="MODIFY"/>

Create New Zone

Manage Existing Zones

Log Off

** Only Public At Grade Crossings are listed.*

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: ** Note: The use of ASMs requires an application to and approval from the FRA.*

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

Step 2: Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

Summary	
Proposed Quiet Zone:	ENCINITAS QZ D STREET
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48741
Estimated Total Cost:	\$0.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	27769.85
Quiet Zone Risk Index:	46320.1

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Change Scenario: ENCINITAS_48741 ▼

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026829J	EAST D STREET	3157	Gates	0	4	8,337.62	<input type="button" value="MODIFY"/>

Create New Zone

Manage Existing Zones

Log Off

* Only Public At Grade Crossings are listed.

ALERT: Quiet Zone qualifies because SSM has been applied in each crossing.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

Step 2: Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

Summary	
Proposed Quiet Zone:	ENCINITAS QZ D STREET
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48741
Estimated Total Cost:	\$100,000.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	27769.85
Quiet Zone Risk Index:	8337.62
<input type="button" value="Select"/>	

Update and Verify Crossing Information

CONTINUE

Create New Zone

Zone:

Manage Existing Zones

Quiet Zone Type : **New 24-hour Quiet Zone**

Log Off

026830D EAST E STREET

026830D EAST E STREET

Step by Step Instructions:

Step 1: To add more crossings to the zone Click the ADD CROSSING.

Step 2: To Make changes to the default information, select the crossing from list. Enter the changes in the appropriate box, then click the UPDATE button.

Step 3: To permanently remove a crossing from the zone, select Crossing from list. Click the DELETE CROSSING button.

Step 4: Verify All Crossing Information Provided is correct. Then Click the Check Box, then CONTINUE button .

*** Note:** To see a list of SSMs, click on "Pre-Existing SSM".

* = Not Public At Grade Crossing
** = Closed Crossing

To verify ALL CROSSING INFORMATION PROVIDED is correct, click on the check box here.

ADD CROSSING

DELETE CROSSING

Crossing Updated!

Present warn device: Gates

Number of highway vehicles per day: 005000

Total trains: 18

Day through trains : 12

Total Switching Trains : 0

Number of main tracks: 1

Number of other tracks: 0

Urban(U.)/Rural(R.): U.Local

Highways paved: Yes

Maximum timetable speed mph: 80

Number of highway lanes: 2

Number of years accident data: 5

Number of accidents in accident data years: 0

Wayside horn:

Pre-Existing SSM:

UPDATE

Note: Updating Crossing information on the Quiet Zone Calculator **DOES NOT** update the crossing inventory. Be sure that an updated current and accurate inventory form is also submitted.

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Change Scenario:

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026830D	EAST E STREET	5000	Gates	0	0	50,873.29	<input type="button" value="MODIFY"/>

Create New Zone

Manage Existing Zones

Log Off

* Only Public At Grade Crossings are listed.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

Step 2: Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

Summary	
Proposed Quiet Zone:	ENCINITAS QZ E
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48742
Estimated Total Cost:	\$0.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	30499.58
Quiet Zone Risk Index:	50873.29

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Change Scenario: ENCINITAS_48742 ▼

Create New Zone

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026830D	EAST E STREET	5000	Gates	0	4	9,157.19	<input type="button" value="MODIFY"/>

Manage Existing Zones

Log Off

* Only Public At Grade Crossings are listed.

ALERT: Quiet Zone qualifies because SSM has been applied in each crossing.

Click for Supplementary Safety Measures [SSM]

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the MODIFY Button

Step 2: Select proposed warning device or SSM. Then click the UPDATE button. To generate a spreadsheet of the values on this page, click on ASM button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

Summary	
Proposed Quiet Zone:	ENCINITAS QZ E
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48742
Estimated Total Cost:	\$100,000.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	30499.58
Quiet Zone Risk Index:	9157.19
<input type="button" value="Select"/>	

Change Scenario:

[Create New Zone](#)
[Manage Existing Zones](#)
[Log Off](#)

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026829J	EAST D STREET	3157	Gates	0	0	46,320.10	<input type="button" value="MODIFY"/>
026830D	EAST E STREET	5000	Gates	0	0	50,873.29	<input type="button" value="MODIFY"/>
923771D	ENCINITAS STATION	0	Gates	0	0	179.83	<input type="button" value="MODIFY"/>

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

Step 2: Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

* Only Public At Grade Crossings are listed.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
Proposed Quiet Zone:	ENCINITAS QZ 11
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48737
Estimated Total Cost:	\$0.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	19459.08
Quiet Zone Risk Index:	32457.74

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Change Scenario:

[Create New Zone](#)
[Manage Existing Zones](#)
[Log Off](#)

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026829J	EAST D STREET	3157	Gates	0	0	46,320.10	<input type="button" value="MODIFY"/>
026830D	EAST E STREET	5000	Gates	0	4	9,157.19	<input type="button" value="MODIFY"/>
923771D	ENCINITAS STATION	0	Gates	0	0	179.83	<input type="button" value="MODIFY"/>

* Only Public At Grade Crossings are listed.

ALERT: Quiet Zone qualifies because QZRI is less than Risk Index with Horns.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Summary	
Proposed Quiet Zone:	ENCINITAS QZ 11
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48737
Estimated Total Cost:	\$100,000.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	19459.08
Quiet Zone Risk Index:	18552.38
<input type="button" value="Select"/>	

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

Step 2: Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

Update and Verify Crossing Information

CONTINUE

Create New Zone

Zone:

Manage Existing Zones

Quiet Zone Type : **New 24-hour Quiet Zone**

Log Off

026849V CHESTERFIELD DRIVE

026849V CHESTERFIELD DRIVE

Crossing Updated!

Present warn device: Gates

Number of highway vehicles per day: 004000

Total trains: 50

Day through trains : 32

Total Switching Trains : 6

Number of main tracks: 1

Number of other tracks: 0

Urban(U.)/Rural(R.): U.Local

Highways paved: Yes

Maximum timetable speed mph: 90

Number of highway lanes: 4

Number of years accident data: 5

Number of accidents in accident data years: 1

Wayside horn:

Pre-Existing SSM:

Step by Step Instructions:

Step 1: To add more crossings to the zone Click the ADD CROSSING,

Step 2: To Make changes to the default information, select the crossing from list. Enter the changes in the appropriate box, then click the UPDATE button.

Step 3: To permanently remove a crossing from the zone, select Crossing from list. Click the DELETE CROSSING button.

Step 4: Verify All Crossing Information Provided is correct. Then Click the Check Box, then CONTINUE button .

*** Note:** To see a list of SSMs, click on "Pre-Existing SSM".

* = Not Public At Grade Crossing
** = Closed Crossing

To verify ALL CROSSING INFORMATION PROVIDED is correct, click on the check box here.

ADD CROSSING

DELETE CROSSING

UPDATE

Note: Updating Crossing information on the Quiet Zone Calculator **DOES NOT** update the crossing inventory. Be sure that an updated current and accurate inventory form is also submitted.

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Change Scenario:

Create New Zone

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026849V	CHESTERFIELD DRIVE	4000	Gates	0	0	143,145.31	<input type="button" value="MODIFY"/>

Manage Existing Zones

Log Off

* Only Public At Grade Crossings are listed.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

Step 2: Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

Summary	
Proposed Quiet Zone:	ENCINITAS QZ 5
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48734
Estimated Total Cost:	\$0.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	85818.53
Quiet Zone Risk Index:	143145.31

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Change Scenario:

Crossing	Street	Traffic	Warning Device	Pre-SSM	SSM	Risk	
026849V	CHESTERFIELD DRIVE	4000	Gates	0	4	25,766.16	<input type="button" value="MODIFY"/>

Create New Zone

Manage Existing Zones

Log Off

* Only Public At Grade Crossings are listed.

ALERT: Quiet Zone qualifies because SSM has been applied in each crossing.

Click for [Supplementary Safety Measures \[SSM\]](#)

Click for ASM spreadsheet: * Note: The use of ASMs requires an application to and approval from the FRA.

Step by Step Instructions:

Step 1: To specify New Warning Device (For Pre-Rule Quiet Zone Only) and/or SSM, click the [MODIFY](#) Button

Step 2: Select proposed warning device or SSM. Then click the [UPDATE](#) button. To generate a spreadsheet of the values on this page, click on [ASM](#) button—This spreadsheet can then be used for ASM calculations.

Step 3: Repeat Step (2) until the SELECT button is shown at the bottom right side of this page. Note that the SELECT button is shown ONLY when the Quiet Zone Risk Index falls below the NSRT or the Risk Index with Horn.

Step 4: To save the scenario and continue, click the SELECT button

Summary	
Proposed Quiet Zone:	ENCINITAS QZ 5
Type:	New 24-hour QZ
Scenario:	ENCINITAS_48734
Estimated Total Cost:	\$100,000.00
Nationwide Significant Risk Threshold:	14347 .00
Risk Index with Horns:	85818.53
Quiet Zone Risk Index:	25766.16
<input type="button" value="Select"/>	

APPENDIX

D EVALUATION OF SITE DIAGNOSTIC COMMENTS



Project Cost Opinion: Site Diagnostic Comments

Prepared by WSP
June 2019

	Engineer's Estimate	
	All Items	Recommended
TOTAL FOR ALL CROSSINGS	\$ 1,771,480	\$ 221,980

Site Diagnostic Meeting Comment	WSP Recommendation	WSP Remarks	Qty	Unit	Unit Price	Engineer's Estimate	
						All Items	Recommended
						\$ 84,440	\$ 64,440
LEUCADIA BOULEVARD							
Replace existing rubber panels with concrete panels	Included in original Project Cost Opinion						
Fill concrete panels lifting holes at pedestrian areas	RECOMMENDED	This is not strictly required for the Quiet Zone and is more of a "wish list" item. Estimated total of ~100 LF for Leucadia/D/E, split evenly.	33	LF	\$ 20	\$ 660	\$ 660
Extend tactile warning strip to cover entire width of pedestrian automatic gate arm and swing gate	RECOMMENDED	Includes the entire width of the pedestrian gate arm	54	SF	\$ 70	\$ 3,780	\$ 3,780
Reconfigure fencing and channelization of pedestrians on SE corner	RECOMMENDED	This is a planning-level estimate only, as no design was done to determine fencing configuration.	1	LS	\$ 10,000	\$ 10,000	\$ 10,000
Revise existing pedestrian ramps and tactile warning strips on NE and SE side to match revised orientation	NOT RECOMMENDED	This is not strictly required for the Quiet Zone and is more of a "wish list" item.	2	EA	\$ 10,000	\$ 20,000	
Add pedestrian gate arm assembly including flashers in NE quadrant. Possibly relocate vehicular gate arm	RECOMMENDED	Requires more width on sidewalk and relocation of the vehicular arm.	2	EA	\$ 10,000	\$ 20,000	\$ 20,000
Relocate CPUC No 9 gate	RECOMMENDED		1	EA	\$ 25,000	\$ 25,000	\$ 25,000
Modify signal timing to clear tracks	Included in original Project Cost Opinion						
Install additional signage on south side due to lack of pedestrian facility	RECOMMENDED		1	LS	\$ 5,000	\$ 5,000	\$ 5,000

						\$ 1,083,000	\$ 8,000
ENCINITAS STATION							
Replace existing rubber panels with concrete panels	RECOMMENDED	Replacing panels only, not the entire crossing. 2 panels x 8 feet long	16	TF	\$ 500	\$ 8,000	\$ 8,000
Extend tactile warning strip to cover entire width of pedestrian automatic gate arm and swing gate	Included in original Project Cost Opinion						
Platform modifications	NOT RECOMMENDED	This is not strictly required for the Quiet Zone and is more of a "wish list" item that may be triggered if other platform improvements occur. Additionally, FRA did not describe the scope of requested modifications; it could be anything from simple fixes to replacement of the entire platform.	1	LS	\$ 1,000,000	\$ 1,000,000	
ADA requirements if federal funding is used	NOT RECOMMENDED	This is not strictly required for the Quiet Zone and is more of a "wish list" item that may be triggered if other platform improvements occur. Funding sources are not decided.	1	LS	\$ 75,000	\$ 75,000	
Site Diagnostic Meeting Comment	WSP Recommendation	WSP Remarks	of Total Construction Costs (Line 13)	Unit	Unit Price	Engineer's Estimate	
						All Items	Recommended

Site Diagnostic Meeting Comment	WSP Recommendation	WSP Remarks	Qty	Unit	Unit Price	Engineer's Estimate	
						All Items	Recommended
D STREET						\$ 370,060	\$ 135,060
Replace existing panels to meet NCTD gap requirements where additional panels are added	RECOMMENDED		90	TF	\$ 500	\$ 45,000	\$ 45,000
Fill concrete panels lifting holes at pedestrian areas	RECOMMENDED	This is not strictly required for the Quiet Zone and is more of a "wish list" item. Estimated total of 100 LF for Leucadia/D/E, split evenly.	33	LF	\$ 20	\$ 660	\$ 660
Extend tactile warning strip to cover entire width of pedestrian automatic gate arm and swing gate	RECOMMENDED		90	SF	\$ 70	\$ 6,300	\$ 6,300
At NE corner, relocate vehicle gate closer to the street and provide pedestrian gate and treatments	RECOMMENDED	Existing gate length exceeds current standard.	1	EA	\$ 18,000	\$ 18,000	\$ 18,000
Add pedestrian gate at NE corner	RECOMMENDED	This is not strictly required for the Quiet Zone but since the other 3 quadrants are adding the pedestrian gate, it makes sense to complete the crossing by adding this gate. Cost is for the gate only.	3	EA	\$ 18,000	\$ 54,000	\$ 54,000
Install median island on both sides of track	NOT RECOMMENDED	This is not strictly required for the Quiet Zone per the FRA calculator. Since we are proposing quad gates, a driver should not be able to drive around the gates, which is also the intent of the median.	250	LF	\$ 40	\$ 10,000	
Add bus signal for SE side	NOT RECOMMENDED	This is not strictly required for the Quiet Zone. It is an operational issue that NCTD needs to look further into, but the City should not be required to install this for the Quiet Zone.	1	EA	\$ 200,000	\$ 200,000	
Modify signal for increased preemption time	Included in original Project Cost Opinion						
Add "Keep Clear" markings	RECOMMENDED		2	EA	\$ 500	\$ 1,000	\$ 1,000
Add physical barriers between platform and sidewalk to channelize pedestrians	RECOMMENDED	Could consist of railing to channelize pedestrians.	1	LS	\$ 10,000	\$ 10,000	\$ 10,000
Conduct pedestrian traffic study from D Street to the Station platform	NOT RECOMMENDED	This is not strictly required for the Quiet Zone. FRA may request it to verify the impacts of pedestrian channelization.	1	LS	\$ 5,000	\$ 5,000	
Possible shift of mini-high platform to allow pedestrian circulation	NOT RECOMMENDED	This is not strictly required for the Quiet Zone. There are other ways to channelize pedestrians without disturbing the mini-high platform.	1	LS	\$ 20,000	\$ 20,000	
Add parking prohibition - red curb on north side	RECOMMENDED		20	LF	\$ 5	\$ 100	\$ 100
E STREET						\$ 233,980	\$ 14,480
Replace existing rubber panels with concrete panels	RECOMMENDED	Concrete panels already exist but could be extended. This is not strictly required for the Quiet Zone and is more of a "wish list" item.	10	TF	\$ 500	\$ 5,000	\$ 5,000
Fill concrete panels lifting holes at pedestrian areas	RECOMMENDED	This is not strictly required for the Quiet Zone and is more of a "wish list" item. Estimated total of 100 LF for Leucadia/D/E, split evenly.	33	LF	\$ 20	\$ 660	\$ 660
Extend tactile warning strip to cover entire width of pedestrian automatic gate arm and swing gate	RECOMMENDED		126	SF	\$ 70	\$ 8,820	\$ 8,820
Add median island east of the track. Check bus turn	NOT RECOMMENDED	This is not strictly required for the Quiet Zone per the FRA calculator. Since we are proposing quad gates, a driver should not be able to drive around the gates, which is also the intent of the median. Buses can make the turn without the median.	300	LF	\$ 35	\$ 10,500	
Modify existing mountable median to a non-mountable median	NOT RECOMMENDED	Demolish where it is mountable only and add delineators.	150	LF	\$ 60	\$ 9,000	
Signalize intersection of E Street and Vulcan Ave	NOT RECOMMENDED	This is not strictly required for the Quiet Zone and is more of a "wish list" item. We have 4 quad gates plus "do not stop on tracks" signage.	1	LS	\$ 200,000	\$ 200,000	
Correct roadway profile	NOT RECOMMENDED	Issue with the roadway profile unknown. Need clarification on this item in order to price it.					