Interstate 80 / Gilman Street Interchange Improvement Project

Noise Abatement Decision Report

Supplemented by the July 2018 Noise Study Report

Caltrans District 04
04-ALA-80 - PM 6.38/6.95
EA 04-0A7700
Project ID 0400020155

August 2018

I-80 GILMAN
INTERCHANGE IMPROVEMENT PROJECT

Caltrans

ALAMEDA County Transportation Commission

CITY OF BERKELEY

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List of Acronyms and Abbreviated Terms

APE	Area of Potential Effects
Bay Trail	San Francisco Bay Trail
BCDC	San Francisco Bay Conservation and Development Commission
Benefited residence	A dwelling unit expected to receive a noise reduction of at least 5-dB from the proposed abatement measure
BMP	Best Management Practices
BSA	Biological Study Area
Caltrans	California Department of Transportation
CCD	Caltrans Cost Database
CEQA	California Environmental Quality Act
CFR	*Code of Federal Regulations*
CPI	Construction Price Index
CPUC	California Public Utilities Commission
CWA	Clean Water Act
dB	decibel—A measure of sound pressure level on a logarithmic scale
dBA	A-weighted decibel—A-weighted sound pressure level
EBMUD	East Bay Municipal Utility District
EBRPD	East Bay Regional Park District
ED	Environmental Document
ESA	Environmentally Sensitive Area
FHWA	Federal Highway Administration
ISA	Initial Site Assessment
NAC	Noise Abatement Criteria
NADR	Noise Abatement Decision Report
NEPA	National Environmental Protection Act
NES	Natural Environmental Study
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSR	Noise Study Report
Noise reduction design goal	7 dB of noise reduction at one or more benefited receptors
PCBs	Polychlorinated biphenyls

PG&E	Pacific Gas & Electric
Protocol	Caltrans Traffic Noise Analysis Protocol
Reasonable allowance	A single dollar value—a reasonable allowance per benefited residence that embodies three reasonableness factors
RHA	Rivers and Harbors Act
ROW	right-of-way
SRWCB	State Regional Water Control Board
TNM	Traffic Noise Model
UPRR	Union Pacific Railroad
VIA	Visual Impact Analysis
WB	Westbound
XPI	Extended Phase I

Chapter 1 Introduction

The Noise Abatement Decision Report (NADR) presents the preliminary noise abatement decision as defined in the California Department of Transportation (Caltrans) Traffic Noise Analysis Protocol (Protocol). This report has been approved by a California licensed professional civil engineer. The project-level noise study report (NSR) (Parsons, 2018) prepared for this project is hereby incorporated by reference.

1.1 Noise Abatement Assessment Requirements

Title 23, Code of Federal Regulations (CFR), Part 772 of the Federal Highway Administration (FHWA) standards (23 CFR 772) and the Caltrans Protocol require that noise abatement be considered for projects that are predicted to result in traffic noise impacts. A traffic noise impact is considered to occur when future predicted design-year noise levels with the project "approach or exceed" Noise Abatement Criteria (NAC) defined in 23 CFR 772 or when the predicted design-year noise levels with the project substantially exceed existing noise levels. A predicted design-year noise level is considered to "approach" the NAC when it is within 1 decibel (dB) of the NAC. A substantial increase is defined as being a 12-dB increase above existing conditions.

23 CFR 772 requires that noise abatement measures that are reasonable and feasible and are likely to be incorporated into the project be identified before adoption of the final environmental document (ED).

The Protocol establishes a process for assessing the reasonableness and feasibility of noise abatement. Before publication of the draft ED, a *preliminary noise abatement decision* is made. The preliminary noise abatement decision is based on the feasibility of evaluated abatement and the *preliminary reasonableness determination*. Noise abatement is considered to be acoustically feasible if it is predicted to provide noise reduction of at least 5-dBA at an impacted receptor. Other nonacoustical factors relating to geometric standards (e.g., sight distances), safety, maintenance, and security can also affect feasibility.

The overall reasonableness of noise abatement is determined by the following three factors:

- The viewpoints of benefited receptors;
- The cost of noise abatement; and
- The noise reduction design goal.

The preliminary reasonableness determination reported in this document is based on the noise reduction design goal and the cost of abatement. The viewpoints of benefited receptors are

determined by a survey that is normally conducted during the public review period for the project ED.

Caltrans' noise reduction design goal is that a barrier must be predicted to provide at least 7-dB of noise reduction at one or more benefited receptors. The cost reasonableness of abatement is determined by calculating a cost allowance that is considered to be a reasonable amount of money to spend on abatement. This *reasonable allowance* is then compared to the engineer's cost estimate for the abatement. If the engineer's cost estimate is less than the allowance and the abatement will provide at least 7-dB of noise reduction at one or more benefited receptors, then the preliminary determination is that the abatement is reasonable. If the cost estimate is higher than the allowance or if the design goal cannot be achieved, the preliminary determination is that abatement is not reasonable.

The NADR presents the preliminary noise abatement decision based on acoustical and nonacoustical feasibility factors, the design goal, and the relationship between noise abatement allowances and the engineer's cost estimate. The NADR does not present the final decision regarding noise abatement; rather, it presents key information on abatement to be considered throughout the environmental review process, based on the best available information at the time the draft ED is published. The final overall reasonableness decision will take this information into account, along with the results of the survey of benefited receptors conducted during the environmental review process.

At the end of the public review process for the ED, the final noise abatement decision is made and is indicated in the final ED. The preliminary noise abatement decision will become the final noise abatement decision unless compelling information received during the environmental review process indicates that it should be changed.

1.2 Purpose of the Noise Abatement Decision Report

The purpose of the NADR is to:

- Summarize the conclusions of the NSR relating to acoustical feasibility, the design goal, and the reasonable allowances for abatement evaluated;
- Present the engineer's cost estimate for evaluated abatement;
- Present the engineer's evaluation of nonacoustical feasibility issues;
- Present the preliminary noise abatement decision; and
- Present preliminary information on secondary effects of abatement (impacts on cultural resources, scenic views, hazardous materials, biology, etc).

The NADR does not address noise barriers or other noise-reducing treatments required as mitigation for significant adverse environmental effects identified under the California Environmental Quality Act (CEQA).

1.3 Project Description

The project is located in Alameda County at the I-80/Gilman Street interchange in the cities of Berkeley and Albany (PM 6.38 to 6.95). Within the limits of the proposed project, I-80 is a conventional 10-lane freeway with 12-foot-wide lanes and 11-foot-wide shoulders. Gilman Street is a 4-lane major arterial with 11-foot-wide lanes and 6-foot-wide shoulders that passes underneath I-80. The I-80/Gilman Street interchange is a four-lane arterial roadway (Gilman Street), with two lanes in the east/west direction that are intersected with four I-80 on- and off-ramps, West Frontage Road, and Eastshore Highway. The purpose of the project is to simplify and improve navigation, mobility, and traffic operations; reduce congestion, vehicle queues, and conflicts; improve local and regional bicycle connections and pedestrian facilities; and improve safety at the I-80/Gilman Street interchange. Current conditions, along with an overall increase in vehicle traffic, have created poor, confusing, and unsafe operations in the interchange area for vehicles, pedestrians, and bicyclists. The No-Build Alternative and Roundabout Alternative are under consideration.

1.3.1 No Build Alternative

The No Build Alternative consists of the future conditions with transportation improvements only as currently planned and programmed for funding. The No Build Alternative provides a basis for comparing the build alternatives. Under the National Environmental Protection Act (NEPA), the No Build Alternative can be used as the baseline for comparing environmental impacts; under CEQA, the baseline for environmental impact analysis consists of the existing conditions (2015) at the time the environmental studies began.

Figure 1. Project Vicinity Map

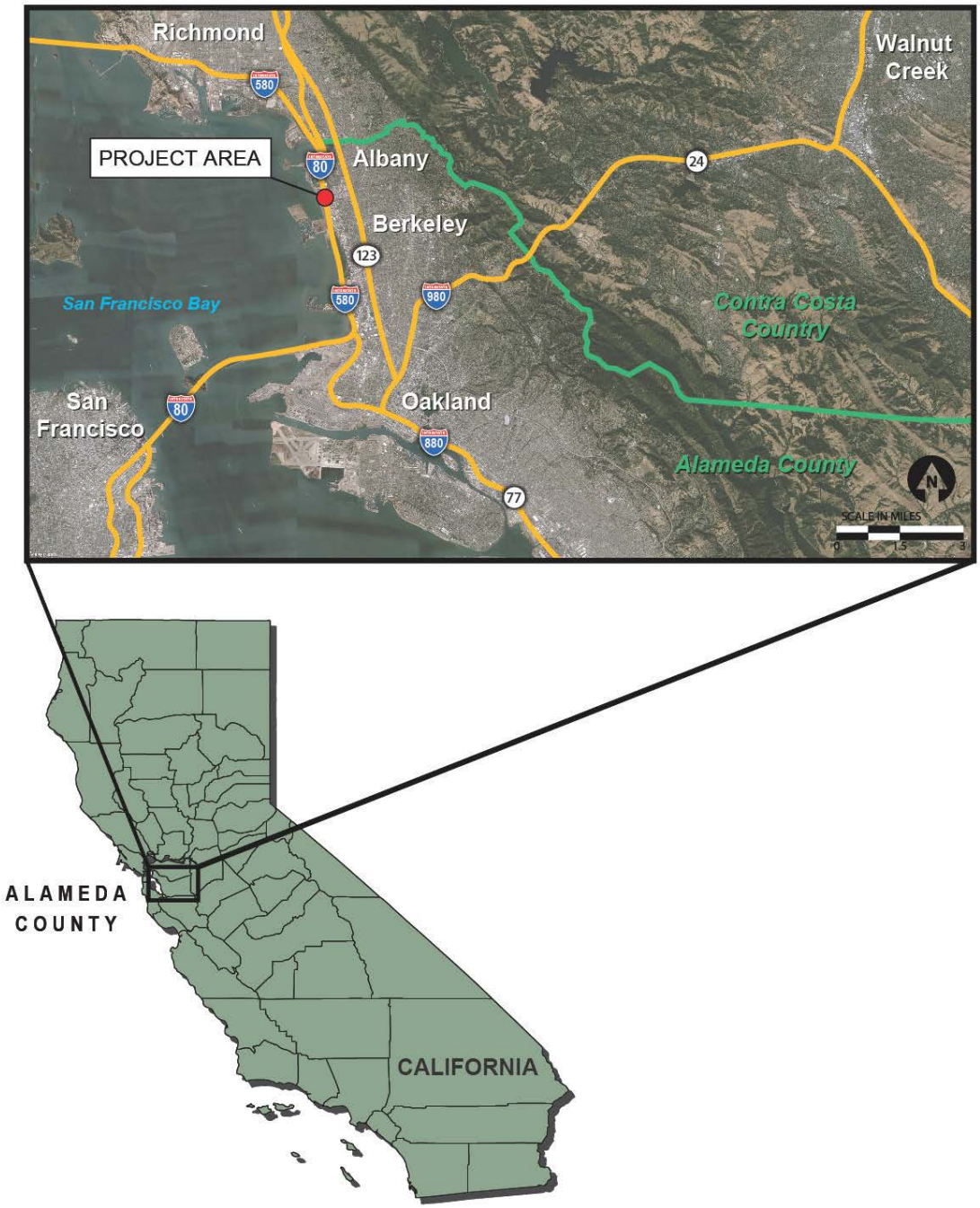
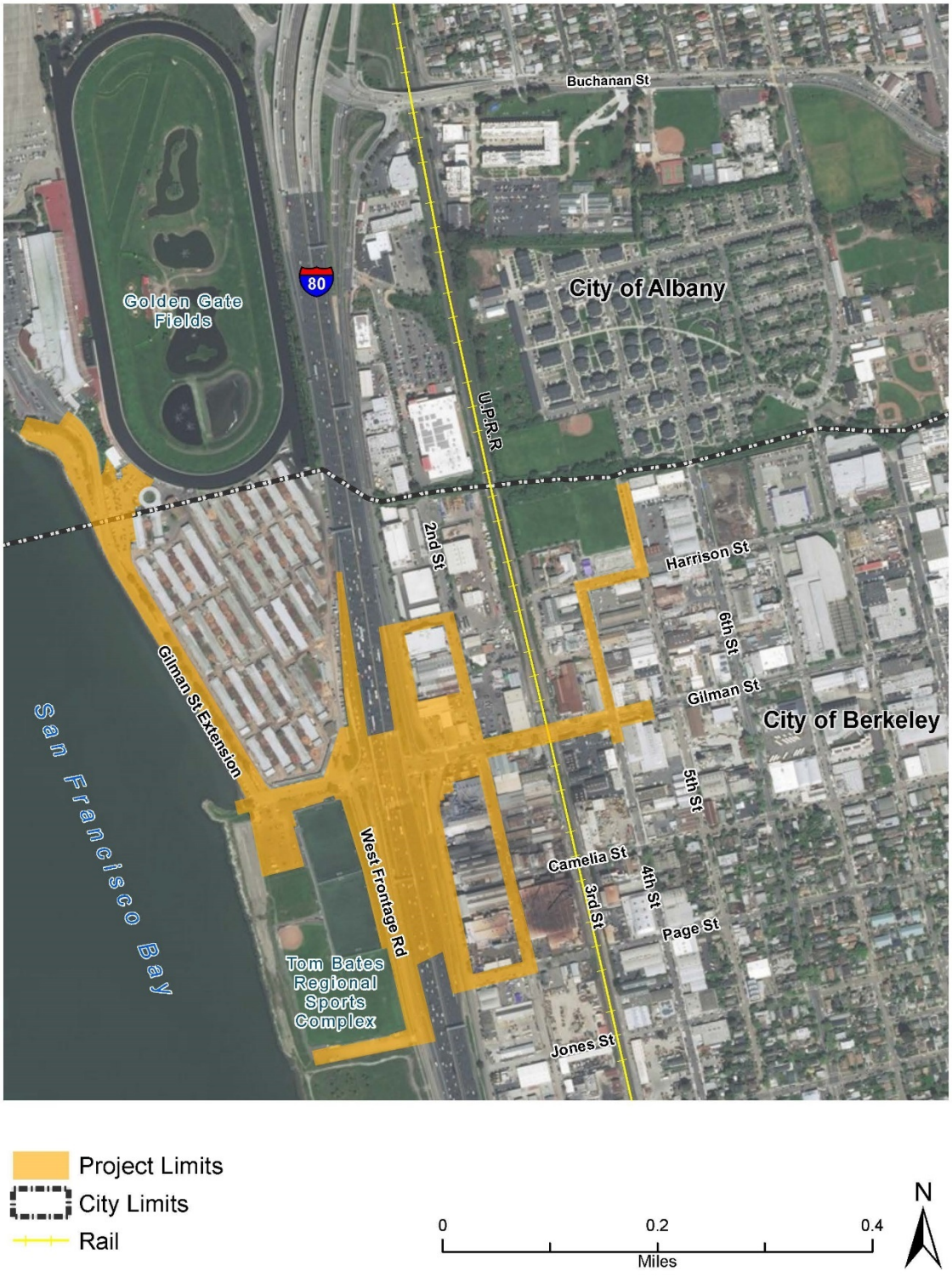


Figure 2. Project Location Map



1.3.2 Build Alternative

The Roundabout Alternative includes the reconfiguration of I-80 ramps and intersections at Gilman Street. The existing nonsignalized intersection configuration with stop-controlled ramp terminuses would be replaced with two hybrid single-lane roundabouts with multilane portions on Gilman Street at the I-80 ramp terminals. The I-80 ramps and frontage road intersections at each ramp intersection would be combined to form one single roundabout intersection on each side of I-80. Gilman Street would be reconstructed on the west from the parking lots at Tom Bates Regional Sports Complex along Gilman Street to the eastern side of the 4th Street intersection. Work would also include reconstruction of West Frontage Road and Eastshore within the project limits. In addition, the northern and southern legs of the eastern roundabout will be reduced from two lanes to one lane entering the roundabout. The southbound and northbound movements onto Eastshore Highway would instead be made via 2nd Street to Page Street or 2nd Street to Harrison Street.

These improvements associated with the installation of the roundabouts would extend approximately 280 feet south on West Frontage Road from the Gilman Street interchange and 250 feet north and 1,010 feet south on Eastshore Highway from the Gilman Street interchange. Work associated with the reconfiguration of the eastbound I-80 off-ramp and on-ramp would extend approximately 820 feet south and 280 feet north of the interchange. Work associated with the reconfiguration of the westbound I-80 off-ramp and on-ramp would extend 370 feet north and 230 feet south of the interchange. There are no proposed improvements to the freeway mainline. A metering light would be installed on West Frontage Road to regulate the volume of northbound traffic that enters the western roundabout.

The western roundabout intersection would consist of four approaching legs: eastbound and westbound Gilman Street, West Frontage Road and I-80 westbound off-ramp. The eastern roundabout intersection would include five approaching legs: I-80 eastbound off-ramp, northbound and southbound Eastshore Highway, and eastbound and westbound Gilman Street. A left-turn pocket would be provided on Gilman Street for vehicles traveling eastbound turning onto northbound 2nd Street. Left turns will be restricted from westbound Gilman Street turning onto southbound 2nd Street.

Improvements on 2nd Street north of Gilman Street include reduced crossing distances, new striping, signing, new pavement, additional landscaping, and new light poles. South of Gilman Street, improvements on 2nd Street include a bulb-out on the southeast corner of the intersection and converting the road to one-lane southbound, while the other lane would be used as a designated parking/loading zone for businesses.

All modified roadways including ramps, frontage roads, and arterials would be improved. Improvements would include mill and overlay of pavement, striping, relocation of drainage inlets, lighting, and signage.

Several operational improvements would be incorporated in to the project. A metering signal would be installed on the northbound leg of the western roundabout to limit the volume of traffic that is bypassing the freeway using West Frontage Road. A queue cutting signal will be placed on the eastbound leg of the Union Pacific Railroad (UPRR) crossing at 3rd Street to prevent traffic from extending across the UPRR tracks.

Pedestrian and Bicycle Facilities

A shared-use Class I path consisting of a 10-foot-wide travel way with a 2-foot-wide shoulder for pedestrians and bicyclists would be constructed on the south side of the Gilman Street from 2nd Street to the eastern roundabout. The shared-use path would extend south along Eastshore Highway, where it would then connect to a proposed bicycle/pedestrian overcrossing. The overcrossing would be constructed over I-80, merging into the existing San Francisco Bay Trail (Bay Trail) that runs parallel to West Frontage Road. The at-grade shared-use path would continue on the south side of Gilman Street under I-80 and terminate at the Bay Trail on the west side of the interchange.

The bicycle/pedestrian overcrossing would be similar to the existing bicycle/pedestrian overcrossing over I-80 at University Avenue. The structure would be located south of Gilman Street and have a minimum of three spans with a maximum span length of approximately 230 feet over I-80. The foundations for the pedestrian bridge would be located on 2-foot diameter Cast-In-Drilled-Hole piles 120 feet below the existing ground surface. There would be two staircases incorporated into the overcrossing, one on each side of I-80. They would be approximately 45 feet long with a height of 25 feet to connect to the overcrossing. There would also be retaining walls on the east and west side of the overcrossing; they would be approximately 6 feet tall at the highest point and taper down to zero. The maximum depth of the retaining wall piles are expected to be 50 feet below the ground surface.

Improvements would be made along 4th Street to Harrison Street to 5th Street to provide bicycle connectivity between the Codornices Creek Path and the two-way cycle track on Gilman Street. These improvements would consist of painted shared-lane markings, also known as sharrows, on the pavement throughout this corridor. Bicycle signage and pedestrian scale lighting would be constructed as part of the improvements.

Approximately 125 feet of new curb, gutter, and sidewalk beginning at the corner of Harrison Street and 4th Street and ending half-way down the block towards 5th Street would be

constructed. Parallel parking would be added along this new section of curb and sidewalk. The bus stop located at the corner of 4th Street and Gilman Street would be removed.

The Build Alternative includes a two-way cycle track on the south side of Gilman Street between the eastern I-80/Gilman Street ramps and 4th Street. The two-way cycle track is separated from vehicle traffic with a minimum 3-foot-wide striped buffer and a parking lane in some locations. The addition of the two-way cycle track would require installation of a traffic signal at the intersection of 4th Street and Gilman Street. The northern curb line on Gilman Street would also be shifted 2 to 5 feet north. Along Eastshore Highway, the sidewalk, curb, and gutter would be replaced between Page Street and Gilman Street.

West of the I-80/Gilman Street interchange, the existing Bay Trail would be extended approximately 660 feet west along the south side of Gilman Street from its current terminus at the intersection of West Frontage Road and Gilman Street to just beyond Berkeley city limits. The proposed Bay Trail extension would be 10 feet wide, unstriped, with 2-foot-wide unpaved shoulders on either side of the trail. On-street parking would be reduced by approximately 18 spaces at the end of Gilman Street as a result of the new trail extension.

Additional pedestrian and bicycle improvements include upgrading the 3rd Street/UPRR crossing at Gilman Street to accommodate the cycle track. Improvements would include relocating the gate, flashing beacons, addition of a bicycle signal, installation of medians, and improved striping and signage. All improvements will be approved by the UPRR and the California Public Utilities Commission (CPUC).

Utilities, Landscaping, and Drainage

Existing Pacific Gas & Electric (PG&E) overhead electric lines along Gilman Street, West Frontage Road, and Eastshore Highway would be relocated under the Roundabout Alternative. Some of these overhead lines may be placed underground. Minor drainage modifications would also be required to conform to the new roundabout alignment and drainage improvements associated with the two-way cycle track along Gilman Street would also be required. Utility relocations and new drainage systems may require trenching to a depth of approximately 6 feet.

A separation device would be installed underground along Gilman Street to separate trash, mercury, and polychlorinated biphenyls (PCBs). A tidal flap gate would be installed at the existing headwall of the 60” reinforced concrete pipe at the west end terminus of Gilman Street. Replacement of the existing headwall and associated rip rap may include in-water work. Work below the ordinary mean high water mark may be required. Dewatering or a coffer dam may also be required

New light pole foundations and ramp metering would be 2 feet in diameter and would range from 5 to 13 feet deep near the roundabout. An existing East Bay Municipal Utility District (EBMUD) recycled water transmission line would be relocated and extended as part of the project. Approximately 1,100 feet of a new 12 inch recycled water transmission pipeline within Eastshore Highway from Page Street to Gilman Street and approximately 1,050 feet of pipeline within Gilman Street from 2nd Street to the Buchanan Street extension are part of the Roundabout Alternative. The maximum excavations for the pipe trench would be approximately 24 inches by 60 inches deep. Approximately 1,100 feet of an existing 10 inch EBMUD recycled water pipeline located within Caltrans ROW along the eastbound Gilman Street off-ramp shoulder would be abandoned in place or removed. A new City of Berkeley sewer line would be installed underneath Gilman Street beginning at a point east of the Interchange and ending on the west side I-80 at the approximate entrance to the Tom Bates Sports Complex parking lots.

Existing vegetation is sparse in the project footprint and consists of ornamental plantings or ruderal vegetation. The Roundabout Alternative would remove existing landscaping and trees on the sidewalk along Eastshore Highway from Page Street to Gilman Street. In addition, trees and/or shrubs would be removed at the I-80 off-ramps, westbound I-80 on-ramp, and along the Bay Trail. Opportunities for new landscaping or artwork would be available in the center of each roundabout. Opportunities for tree replacements on site will be available.

Golden Gate Fields Access

The existing driveway entrance to the Golden Gate Fields is located immediately adjacent to the westbound I-80 off-ramp at the end of the curb return on Gilman Street. Construction of the roundabout would expand the ramp intersection to the north and would require relocation of the Golden Gate Fields entrance and exit gate to their stables.

Alternate entrance and exit gate options for Golden Gate Fields were evaluated and discussed with Golden Gate Fields management in a series of meetings.

The Build Alternative would relocate the entrance and exit gate to the Gilman Street Extension. The existing gate would be connected to Golden Gate Fields Access Road allowing for the existing security shed to remain in place. The intersection of Gilman Street Extension with Golden Gate Fields Access Road would be improved and Gilman Street would be widened to the south to provide space for two – two lane roads separated by a median. The Golden Gate Fields north east parking lot would be re-sized and re-striped to allow room for the Gilman Street Extension/Golden Gate Fields Access Road intersection. The existing security shed leading to the north east and northwest parking lots would be moved north and reconstructed with new gates. The Golden Gate Fields north west parking lot would be restriped to maximize

the parking spaces. Both parking lots would be repaved, restriped, and lighting and landscaping elements would be added. Golden Gate Fields internal access road and the Gilman Street Extension would be repaved and restriped between Gilman Street and the north east and north west parking lots. Fifteen new parallel parking spaces would be striped along the Gilman Street access road. There would be no net loss of parking for Golden Gate Fields.

Partial Property Acquisitions

Partial acquisitions will be required for right-of-way (ROW) from Golden Gate Fields and East Bay Regional Park District (EBRPD). Relocation of the driveway would be required from a property located on the south side of Gilman and 2nd Streets. Additionally, a permit to construct from Golden Gate Fields would be required to complete improvements on their property. Temporary Construction Easements would be required for construction equipment storage, staging, and laydown from EBRPD and various property owners along Gilman Street, 4th Street, Harrison Street, and 5th Street.

Construction Activities

Construction is anticipated to begin in 2019 and last for 24 months.

Construction work for the Roundabout Alternative would be done primarily during daylight hours from 7:00 a.m. to 6:00 p.m.; however, there may be some work during night-time hours to avoid temporary roadway closures for tasks that could interfere with traffic or create safety hazards. Work hours along the internal access road in Golden Gate Field property will be limited to after 10:00 am to 5:00 pm. and night work will be restricted within or adjacent to Golden Gate Fields property. Examples of work activities include striping operations, traffic control setup, installation of storm drain crossings, and asphalt pavement mill and overlay.

Temporary lane and ramp closures and detours would occur. It is anticipated that temporary closure of existing bicycle or pedestrian facilities would occur at times and may require temporary rerouting of transit service due to intersection work. A Transportation Management Plan would be developed and implemented as part of the project construction planning phase. The Transportation Management Plan would address potential impacts to circulation of all modes of travel (i.e., transit, bicycles, pedestrians, and private vehicles). Roadway and/or pedestrian access to all occupied businesses and respective parking lots would be maintained during project construction. The Transportation Management Plan would include an evaluation of potential impacts because of diverting traffic to alternate routes, and it would also include measures to minimize, avoid and/or mitigate impacts to alternate routes, such as agreements with local agencies to provide enhanced infrastructure on arterial roads or intersections to deal with detoured traffic. The Transportation Management Plan may provide for contracting with

local agencies for traffic personnel, especially for special event traffic through or near the construction zone.

The anticipated construction staging areas available include areas within the existing roadway ROW construction limits. An additional staging area may be required west of the project on Gilman Street in one or two parking lots owned by East Bay Regional Parks.

The following equipment is anticipated to be used during construction: auger drill rig, backhoe, compactor, concrete pump, crane, dozer, excavator, front end loader, grader, heavy duty dump trucks, jackhammer, vibratory roller, and pavement breaker.

1.4 Affected Land Uses

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts from the proposed project. The following land uses were identified in the project area:

- Tom Bates Regional Sports Complex and Bay Trail: Activity Category C
- Horse stable area of Golden Gate Fields, restaurant, and general commercial land uses: Activity Category E
- Industrial, commercial, and retail uses, Activity Category F

Although all developed land uses are evaluated in this analysis, noise abatement is only considered for areas of frequent human use that would benefit from a lowered noise level. Accordingly, this impact analysis focuses on locations with defined outdoor activity areas, such as the Tom Bates Regional Sports Complex.

Land uses in the project area have been grouped into a series of lettered analysis areas that are identified in Figure 1 of Appendices A. Each of these analysis areas is considered to be acoustically equivalent.

Area A: Area A is located west of West Frontage Road and I-80 and south of Gilman Street. The Tom Bates Regional Sports Complex as well as the Bay Trail (Activity Category C) are located in this area. This area is flat and no noise barriers are located or topographic shielding occurs between the roadways and this area.

Area B: Area B is located west of I-80 and north of Gilman Street. The stable area of Golden Gates Fields (Activity Category E) is located in this area. Area B is flat and noise barriers are not located or topographic shielding occurs between the roadways and the land use.

Area C: Area C is located east of Eastshore Highway as well as I-80 and south of Gilman Street. This area is mainly industrial (Activity Category F) with a commercial establishment (Activity Category E) on Gilman Street. This area is flat. There are no noise barriers or topographic shielding that occurs between the roadway and the land uses.

Area D: Area D is located south of Gilman Street between 2nd Street and 4th Street. This area is a mix of commercial land uses including a restaurant (Activity Category E) as well as industrial land uses (Activity Category F). This area is flat and no noise barriers are located or topographic shielding occurs between the roadway and the land uses.

Area E: Area E is located north of Gilman Street between 2nd Street and 4th Street. This area contains industrial as well as retail land uses (Activity Category F). This area is flat. There are no noise barriers or topographic shielding that occurs between the roadway and the land uses.

Area F: Area F is located east of Eastshore Highway as well as I-80 and north of Gilman Street. This area is a mix of commercial (Activity Category E) and industrial (Activity Category F) land uses. This area is flat. There are not any noise barriers or topographic shielding that occurs between the roadways and the land uses.

Chapter 2 Results of the Noise Study Report

The NSR for this project was prepared by Parsons on July 9, 2018 and approved by Allen Baradar on July 11, 2018.

The noise study was conducted to determine future traffic noise impacts of the proposed project at frequent outdoor human use areas within the project area. The future worst-case traffic noise impact at frequent outdoor human use areas along the project corridor was modeled for the No Build Alternative and Build Alternative to determine appropriate abatement measures.

In accordance with Title 23 CFR 772, noise abatement is considered where traffic noise impacts are predicted in areas of frequent human use that would benefit from a lowered noise level.

Traffic noise impacts are predicted to occur at the Tom Bates Regional Sports complex as well as the Bay Trail under both build alternatives; therefore, noise abatement has been considered in the form of a noise barrier. The noise barrier was evaluated for feasibility based on achievable noise reduction (5-dB or more). For each noise barrier determined to be acoustically feasible and meeting the design goal of achieving 7-dB noise reduction for at least one location, the estimated cost and total cost allowance for the noise barrier were calculated. If the estimated cost is found to be equal to or less than the total cost allowance, then that noise barrier would have met the reasonableness cost criteria. The total cost allowance is calculated by multiplying the number of benefited residences by the cost allowance per benefited receptor/outdoor use area. A $95,000 cost allowance per benefited receptor/outdoor use area, which is based on the published Caltrans annual Construction Price Index (CPI), was used

The noise analysis considered barrier heights ranging from 8 to 16 feet. The barrier heights and locations were evaluated to determine if a minimum 5-dB attenuation at the outdoor frequent use areas of the representative receptors could be achieved. The minimum barrier height required to cut the line-of-sight from each receptor to the exhaust stacks of heavy trucks has been calculated for all feasible barriers. These heights were evaluated through calculations performed by Traffic Noise Model, Version 2.5 (TNM 2.5).

The minimum heights and locations of the soundwalls that would provide feasible abatement and meet the design goal are shown graphically in Appendix F of the NSR. Table 2-1 presents feasible soundwalls that were considered for the Roundabout Alternative and summarizes the data used to assess the reasonableness allowances at each of the considered barrier heights.

Table 2-1. Summary of Barrier Evaluation from Noise Study Report

Barrier (System)	Location	Station	Height (feet)	Acoustically Feasible (5-dB)?	Number of Benefited Residences	Design Goal Achieved (7-dB)?	Reasonable Allowance per Residence	Total Reasonable Allowance
S169 and S175	Shoulder (WB I-80)	163+00 to 175+00 and 170+00 to 178+60	8	Yes	1	No	$95,000	$95,000
			10	Yes	1	No	$95,000	$95,000
			12	Yes	3	Yes	$95,000	$285,000
			14	Yes	3	Yes	$95,000	$285,000
			16	Yes	5	Yes	$95,000	$475,000
Notes: WB – Westbound								

Chapter 3 Preliminary Noise Abatement Decision

3.1 Summary of Key Information

The NSR analyzed noise barriers with heights from 8 to 16 feet to determine the feasibility of noise abatement. Table 3-1 summarizes the preliminary noise abatement decision for the Roundabout Alternative by investigating acoustical feasibility, number of benefited outdoor use areas, total reasonableness allowance ($95,000 per benefitted receiver/residence), engineer's cost estimate for the abatement, comparison of the estimated construction cost versus allowance, and if the 7-dB reduction design goal is met.

Wall construction cost estimates are based on masonry walls in accordance with Caltrans' standard plans and specifications. Cost estimates are based on the Caltrans Cost Database (CCD) (Caltrans, 2017), which tabulates average unit costs of construction-related items from recent state transportation projects. Cost calculations for soundwalls include the cost of the wall, piles, earthwork, and traffic control. The final cost estimate also includes a 30 percent contingency. Tables in Appendix B summarize the engineer's cost estimate for constructing these walls.

Costs of related activities, such as clearing and grubbing, vine landscaping, and typical aesthetic treatments, have not been estimated because these items are variable and could change substantially depending on several factors.

Table 3-1. Summary of Abatement Key Information

Barrier (System)	Height (feet)	Acoustically Feasible (5-dB)?	Number of Benefited Residences	Design Goal Achieved (7-dB)?	Total Reasonable Allowance	Estimated Construction Cost	Cost Less than Allowance?
S169 and S175	8	Yes	1	No	$95,000	$2,555,000	No
	10	Yes	1	No	$95,000	$3,158,000	No
	12	Yes	3	Yes	$285,000	$3,683,000	No
	14	Yes	3	Yes	$285,000	$4,207,000	No
	16	Yes	5	Yes	$475,000	$4,811,000	No

3.2 Nonacoustical Factors Relating to Feasibility

Based on the preliminary project and abatement design, no nonacoustical factors related to feasibility have been identified that would be considered out of the ordinary for soundwall construction. The nonacoustical factors considered are geometric standards (e.g., sight distances), safety, maintenance, security, geotechnical issues, and utility relocations. Some of these nonacoustical factors, including geotechnical issues, will have to be investigated at the design phase.

3.3 Preliminary Recommendation and Decision

Several factors were considered in making soundwall recommendations if the soundwalls are determined to be reasonable from a cost perspective:

- Line-of-sight break between a receptor and an 11.5-foot-high truck stack (per Chapter 1100 of the Highway Design Manual;
- Number of benefited receptors;
- Cost per benefited receptor;
- Degree of noise reduction (a barrier that provides only 1-dB of improved noise reduction over a lower barrier and costs substantially more may not be favored over the lower barrier); and
- 15-year minimum life cycle.

The preliminary noise abatement decision presented in this report is based on preliminary project alignments and profiles, which may be subject to change. As such, the physical characteristics of noise abatement described herein also may be subject to change. If pertinent parameters change substantially during the final project design, the preliminary noise abatement decision may be changed or eliminated from the final project design. A final decision to construct noise abatement will be made upon completion of the project design.

The preliminary noise abatement decision presented here will be included in the draft ED, which will be circulated for public review.

Based on the information summarized in Table 3-1 and noise reductions specified in the NSR, the following discussion presents the engineer's recommendation on the proposed height and reasonableness of the feasible and proposed soundwall for the Roundabout Alternative.

Soundwalls S169 and S175: Soundwalls S169 and S175 would work as a system. Soundwall S169 would be located on the shoulder of the westbound I-80 on-ramp and would replace the existing safety barrier separating the westbound I-80 on-ramp from West Frontage Road.

Soundwall S175 would be located on the shoulder of westbound I-80 mainline. Soundwall S169 would be between Stations 163+00 and 175+00 and would be 1,200 feet long. Soundwall S175 would be between Stations 170+00 and 178+60 and would be 660 feet long. Figure 1 in Appendix A shows the location, minimum length, and height of Soundwalls S169 and S175 to provide feasible abatement and meet the design goal. The estimated total construction cost of the recommended 12-foot-high soundwalls is $3,683,000, which is more than the reasonable allowance of $285,000; therefore, these two soundwalls are not reasonable.

With consideration of the acoustic benefit and the incremental cost, Soundwalls S169 and S175 are not reasonable; therefore, they are not recommended.

Chapter 4 Secondary Effects of Abatement

The noise abatement in the preliminary noise abatement decision would result in secondary effects on visual resources/aesthetics if the soundwalls were constructed. Secondary effects from noise abatement would not result on cultural resources, biological resources, hydrology/water quality, hazardous materials, or other environmental resources.

4.1 Visual Resources/Aesthetics

A Visual Impact Assessment (VIA) was prepared for the proposed I-80/Gilman Street Interchange Improvement Project. The east side of I-80 is comprised primarily of small industrial businesses, and further east and south of the I-80/Gilman Street interchange, the land use becomes more residential in nature. The west side of I-80 is dominated by the Tom Bates Regional Sports Complex and Golden Gate fields which are adjacent to San Francisco Bay, I-80, and Gilman Street. San Francisco Bay Conservation and Development Commission's (BCDC) San Francisco Bay Plan identifies I-80 as a Scenic Drive through the project area. According to the VIA, overall viewer sensitivity and response to visual changes in the project area is moderate. The project would partially block views of San Francisco Bay, a distant view of San Francisco, and Golden Gate Bridge for varying period of travel. It would also partially block views from the sports complex and fields to the West Berkeley neighborhood on the opposite side of the Freeway; however, it would have little effect on the industrial businesses or residences to the east.

Viewer groups for this transportation project include neighbors, recreational facility users, and transportation users. Groups sensitive to changes in the visual environment would include travelers along I-80; travelers along Gilman Street, West Frontage Road, the westbound on-ramp, and Bay Trail; local residents of the West Berkeley neighborhood; eastside business users; users of the sports complex and fields on the west and east sides; and pedestrians/bicyclists on the new overcrossing.

If constructed, the noise abatement evaluated in this report (Soundwalls S169 and S175) would result in secondary effects on visual resources within the study area. The addition of soundwalls along I-80, on the westbound on-ramp and mainline shoulder, would be a new element in the visual environment. The soundwalls would disrupt the existing visual character of the study area due to their length and height. While soundwalls would not dominate the visual environment, they would block views, most critically views to San Francisco Bay, and would appear to transform the study area into a more urban, highway-dominated area. Blocking views from I-80 of the San Francisco Bay, Golden Gate Bridge, and San Francisco, may be contrary to the goals of the BCDC's San Francisco Bay Plan for this stretch of I-80, which is identified

as a Scenic Drive. The overall visual impact of these soundwalls would be moderate, resulting in a moderate impact. The resulting view, while maintaining the overall visual quality, would be of different visual character with a more urban visual character than the current view, if the considered soundwalls are implemented.

4.2 Hazardous Materials

An Initial Site Assessment (ISA) was prepared for this project in 2018. The ISA identifies the potential of hazardous materials releases along westbound I-80 including lead and other metal deposits in the soil, chemical leakage from the UPRR, and chlorinated solvent in the groundwater. If constructed, the proposed soundwalls would be constructed partly along the eastern extent of the McLaughlin East Shore State Park, south of Gilman Street, adjacent to Tom Bates Regional Sports Complex, which is a site with confirmed historical releases of hazardous materials. There was a two-year site investigation and clean-up of the McLaughlin East Shore State Park areas, and then the site was transferred to East Bay Regional Parks District in 1999. Cleanup of the site involved excavation of contaminated shallow soil at 17 locations, along all of McLaughlin East Shore State Park. These excavation locations were then backfilled with clean soil. Currently there is ongoing verification monitoring, and the recent inspection in December 2016 showed no negative erosional pattern in the meadow or shoreline areas and the capped areas were almost entirely vegetated compared to the historical photographs. Additionally, no environmental issues of concern were identified during the inspection.

Secondary effects from construction of Soundwalls S169 and S175 could result from hazardous materials along I-80. Construction crews could be exposed to groundwater contamination due to subsurface activities that would encounter groundwater or make contact with soils. In addition, impacts from lead contamination in the soil could occur where construction or maintenance of the roadway involves disturbing or exposing surface soils adjacent to the existing roadway. Direct contact with contaminated soil and subsequent hand to mouth activities (e.g., smoking, drinking or eating) could result in the inadvertent ingestion of contaminated soil. Construction or maintenance activities could produce dust, which could expose workers or nearby residents and business occupants to lead via inhalation. Project features and avoidance and minimization would apply to construction of the proposed soundwalls, including provisions for personal protective equipment and decontamination measures that would be utilized by workers installing the soundwalls, thereby minimizing secondary effects associated with the soundwalls.

4.3 Cultural Resources

A Historic Property Survey Report, Archaeological Study Report, and Historic Resources, Evaluation Report, Extended Phase 1 (XPI) Archaeological Study Report, and an

Environmentally Sensitive Area (ESA) Action Plan were prepared to evaluate potential cultural resources within the study area and support the project findings. The Area of Potential Effects (APE) contains 10 historic-age built environment cultural resources that were evaluated or previously evaluated for eligibility for listing on the National Register of Historic Places (NRHP). Nine resources were found not eligible for the NRHP (eight resources were evaluated as part of this project and one resource was previously determined to be ineligible for the NRHP); therefore, they are not considered Historic Properties under Section 106 of the NHPA. One resource, the Manasse-Block Tannery, was found eligible for listing in the NRHP but would not be adversely affected by the project. The proposed soundwalls are located within the project's APE. The Manasse-Block Tannery is not located adjacent to the considered soundwalls and therefore will not be subjected to secondary effects. Two archaeological resources, a prehistoric site and a historic deposit, are identified within the project's APE. The prehistoric archaeological site is assumed eligible for the NRHP for the purposes of the project and will protected with a vertical ESA. The prehistoric archaeological site is not located in the vicinity of the proposed soundwalls and would therefore not be impacted by the proposed soundwall system. Caltrans determined that the historic period archaeological deposit did not warrant evaluation as it met the criteria for property types exempted from further evaluation (Stipulation VIII.C.1) under the January 2014 Programmatic Agreement. While there is the potential for the soundwall excavations to encounter material from this historic-era deposit, such historic-era archaeological materials, if encountered, would be considered to be associated with the deposit that was determined exempt from evaluation and thus, would not warrant further investigation. The project's cultural resource investigations concluded that portions of the APE are sensitive for buried archaeological resources. The XPI identification effort resulted in the excavation of several cores located near the vicinity of the proposed sound walls. Geoarchaeological information from the results of a separate, unrelated Caltrans project- a 2011 I-80 investigation by Meyer (Meyer 2011), was also considered for this analysis. The results of the XP1 effort demonstrated that the areas surrounding the potential soundwalls have been sufficiently and thoroughly investigated for the presence of buried archaeological resources and that the specific locations considered are not sensitive for the presence of cultural resource properties of any type. Therefore, no secondary effects are anticipated to occur to historic architectural (built environment) or archaeological resources.

4.4 Biological Resources

A Natural Environment Study (NES) and a Wetlands Delineation Report and an Addendum Wetland Delineation Report were prepared for the proposed project. The Biological Study Area (BSA) is comprised of industrial, commercial, residential, and recreational properties, as well as beach and riparian areas within a highly urbanized area. The results of the Wetland Delineation Report and Addendum Report indicate that there are section 404 Clean Water Act

(CWA) regulated waters of the U.S. and section 10 of the Rivers and Harbors Act (RHA) jurisdiction within the study area boundary, located along the San Francisco Bay, adjacent to Gilman Street Extension, and there are no regulated wetlands within the study area boundary. The proposed locations of the soundwalls are not within the section 404 CWA regulated waters or the section 10 of the RHA jurisdiction.

The proposed location of the soundwalls falls entirely within portions of the BSA that are mapped as urban. Landscape vegetation with these areas provides nesting habitat for birds protected under the federal Migratory Bird Treaty Act. There are no areas of habitat for threatened and endangered species in the vicinity of the proposed location of the soundwalls. At the vicinity of where the soundwalls are considered, adjacent land uses consist of landscaped recreational areas and surfaced roadways. The soundwalls would not result in the removal of additional trees beyond what was originally planned for and discussed in the environmental document. Invasive plant species are also present in the BSA and could be spread by construction equipment. However, with implementation of avoidance and minimization measures, secondary effects of soundwall implementation on biological resources are anticipated to be very low.

4.5 Hydrology/Water Quality

A Water Quality Study Report was prepared for this project. Test borings completed in 2016 identified groundwater approximately 7 to 8 feet below grade. The proposed soundwalls would involve excavations that could temporarily affect groundwater resources due to potential dewatering during construction activities. However, the proposed soundwalls are not expected to have permanent water quality impacts on the existing aquatic environment or watershed drainage patterns. In the project study area, proposed drainage facilities would ultimately connect to existing drainage facilities, which connects to the existing outfalls to the San Francisco Bay or Schoolhouse Creek. San Francisco Bay is west of the proposed locations of the soundwalls; and Schoolhouse Creek is north of Virginia Street, which is south of the proposed locations of the soundwalls. Within the project limits, existing drainage facilities are expected to be modified or removed, capped, or abandoned, and new drainage features installed to convey runoff.

The design features to address water quality impacts are a condition of Caltrans' National Pollutant Discharge Elimination System (NPDES) permit with the State Regional Water Control Board (SRWCB) and other regulatory and local agency requirements. The soundwalls are not expected to have water quality impacts on Schoolhouse Creek or other drainage crossings in the study area. Implementation of details for these design features/Best Management Practices (BMPs), would be developed and incorporated into the project design and operations prior to the project startup. With proper implementation of these design features

or BMPs, related water quality impacts and permanent water quality impacts would be avoided or minimized.

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Chapter 5 References

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Chapter 6 List of Preparers

Greg Berg, Senior Scientist - Noise and Vibration, B.A. Acoustics, Columbia College Chicago; 13 years of experience. Contribution: Author of Noise Study Report and Noise Abatement Decision Report.

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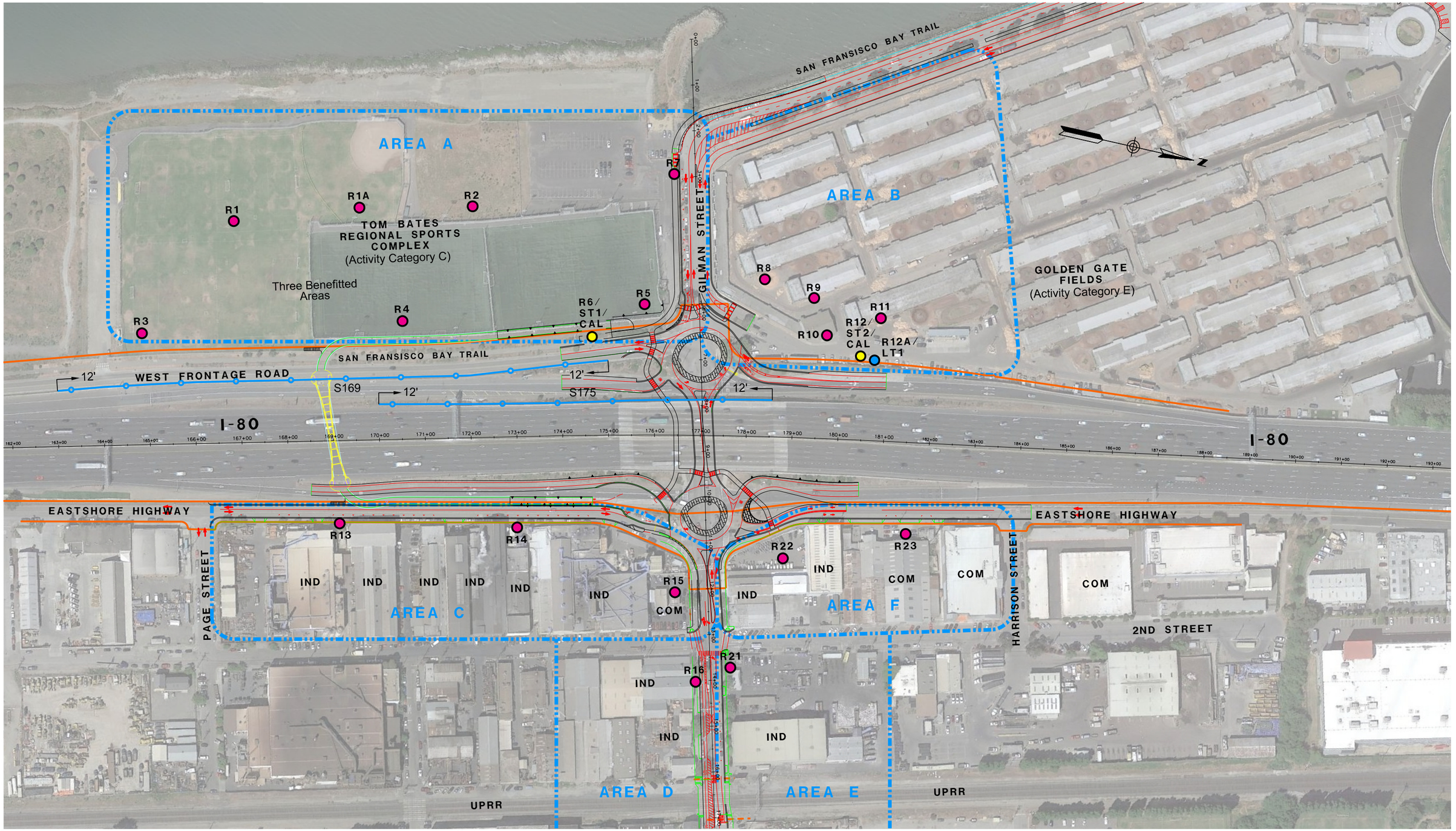
Appendix A Figure Showing Land Use and Noise Receptor Locations



LEGEND

- RXX – NOISE RECEPTOR
- ST – SHORT–TERM MEASUREMENT
- LT – LONG–TERM MEASUREMENT
- PB – TRAIN PASS–BY MEASUREMENT SITE

- COM – COMMERCIAL
- RTL – RETAIL
- IND – INDUSTRAIL
- CAL – CALIBRATION SITE

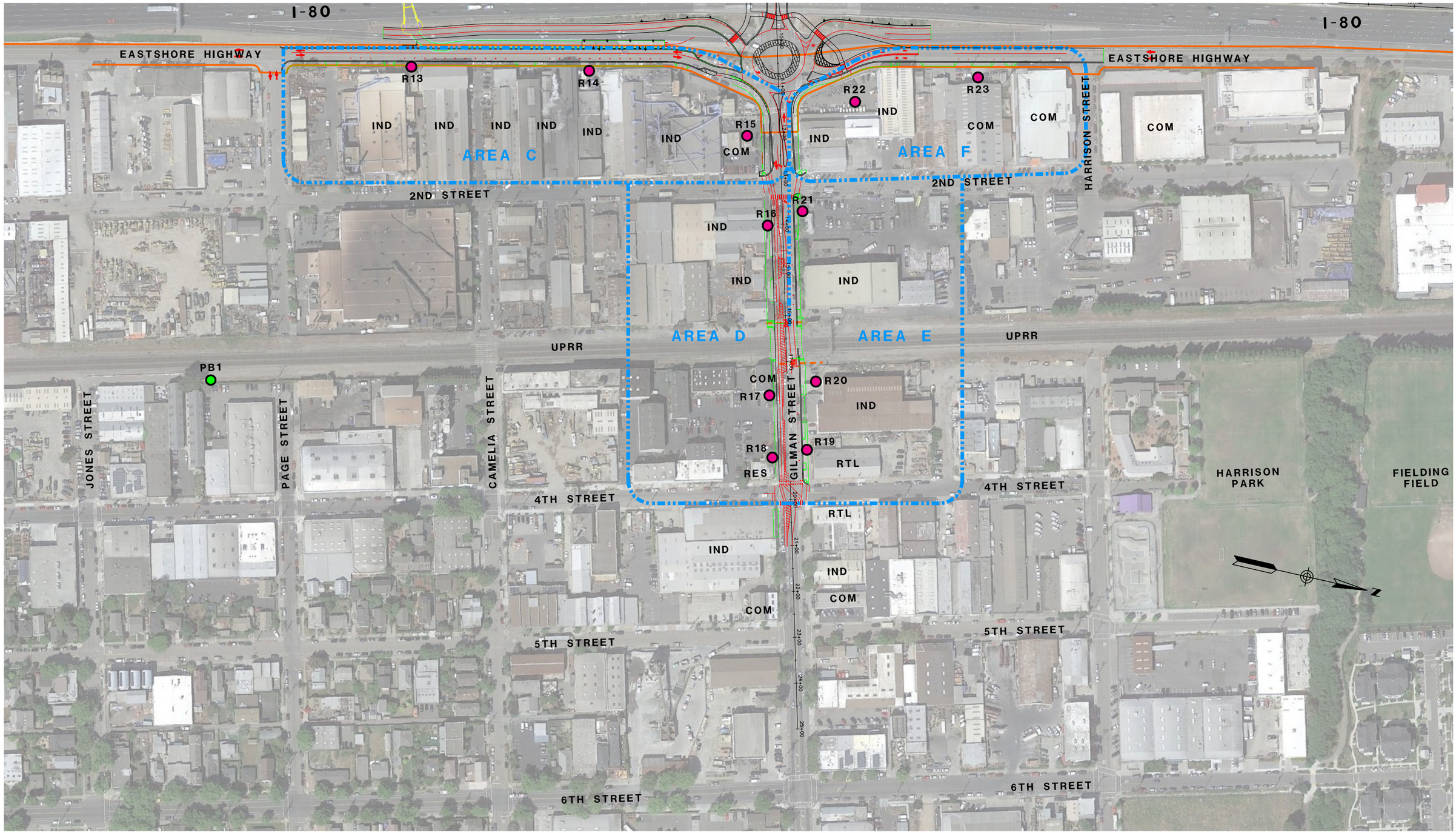
- RES – RESTAURANT
- EVALUATED SOUNDWALL
- ANALYSIS AREA BOUNDARY

1in : 200ft

0 ft 100ft 200ft 300ft

I-80/ GILMAN STREET INTERCHANGE IMPROVEMENT PROJECT NOISE NADR RECOMMENDED NOISE BARRIER HEIGHTS AND LOCATIONS

JULY 2018 | FIGURE 1



LEGEND

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1in : 200ft

0 ft 100ft 200ft 300ft

I-80/ GILMAN STREET INTERCHANGE IMPROVEMENT PROJECT NOISE NADR RECOMMENDED NOISE BARRIER HEIGHTS AND LOCATIONS

JULY 2018

FIGURE 2

Appendix B Cost Analysis

Cost Estimate for Soundwall S169

Length of wall: 1200'

Type of Soundwall: **Masonry block soundwall on Spread Footing**

Are Perm Easement & TCE Required? No If yes, length of easement needed: 0'

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
Width of Spread Footing	4	5	5.75	6.5	7.5
Sound Wall Area (SQFT)	9600	12000	14400	16800	19200
Masonry Cost[2] [$30/SQFT]	$288,000	$360,000	$432,000	$504,000	$576,000
Wall Footing (CF)	4800.0	6000.0	6900.0	7800.0	9000.0
Wall Footing (Minor Conc) [$64/CF]	$307,200	$384,000	$441,600	$499,200	$576,000
Structure Excavation (CF)	10800.0	12600.0	13950.0	15300.0	17100.0
Struct Excavat & Backfill Cost [$4/CF]	$43,200	$50,400	$55,800	$61,200	$68,400
Wall Cost Subtotal (Masonry)	$638,400	$794,400	$929,400	$1,064,400	$1,220,400
Utilities	95760	119160	139410	159660	183060
Traffic Control	$14,300	$14,300	$14,300	$14,300	$14,300
Contingencies (30%)[3]	$191,520	$238,320	$278,820	$319,320	$366,120
Permanent Easement	$0	$0	$0	$0	$0
TCE	$0	$0	$0	$0	$0
Clearing & Grubbing and Landscaping of TCE Area [$30K/Acre]	$0	$0	$0	$0	$0
Total Wall Cost	$939,980	$1,166,180	$1,361,930	$1,557,680	$1,783,880
Total Wall Cost ($ Rounded)	**$940,000**	**$1,166,000**	**$1,362,000**	**$1,558,000**	**$1,784,000**

Notes:

1. Estimates are based on Caltrans Database cost for 2017
2. Includes cost for masonry and steel
3. Includes cost for scaffolding, and mobilization

Cost Estimate for Soundwall S175 - Section on Fill

Length of wall: 550'

Type of Soundwall: **Masonry Block Soundwall on Top of Retaining Wall**

Are Perm Easement & TCE Required? No If yes, length of easement needed: 0'

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
Width of Spread Footing	4	5	5.75	6.5	7.5
Sound Wall Area (SQFT)	4400	5500	6600	7700	8800
Masonry Cost[2] [$30/SQFT]	$132,000	$165,000	$198,000	$231,000	$264,000
Wall Footing (CF)	2200.0	2750.0	3162.5	3575.0	4125.0
Wall Footing (Minor Conc) [$64/CF]	$140,800	$176,000	$202,400	$228,800	$264,000
Struct Reinforcement	$272,800	$341,000	$400,400	$459,800	$528,000
Wall Cost Subtotal (Masonry)	$545,600	$682,000	$800,800	$919,600	$1,056,000
Traffic Control	$65,000	$65,000	$65,000	$65,000	$65,000
Contingencies (30%)[3]	$163,680	$204,600	$240,240	$275,880	$316,800
Permanent Easement	$0	$0	$0	$0	$0
TCE	$0	$0	$0	$0	$0
Clearing & Grubbing and Landscaping of TCE Area [$30K/Acre]	$0	$0	$0	$0	$0
Total Wall Cost	$774,280	$951,600	$1,106,040	$1,260,480	$1,437,800
Total Wall Cost ($ Rounded)	**$774,000**	**$952,000**	**$1,106,000**	**$1,260,000**	**$1,438,000**

Notes:

1. Estimates are based on Caltrans Database cost for 2017
2. Includes cost for masonry and steel
3. Includes cost for scaffolding, and mobilization

Cost Estimate for Soundwall S175 - Gilman Structure Section

Length of wall: 310'
Type of Soundwall: **Masonry Block Soundwall on Structure**
Are Perm Easement & TCE Required? No If yes, length of easement needed: 0'

Unit Cost[1]	Barrier Height, ft				
	8	10	12	14	16
Width of Spread Footing	4	5	5.75	6.5	7.5
Sound Wall Area (SQFT)	2480	3100	3720	4340	4960
Masonry Cost[2] [$30/SQFT]	$74,400	$93,000	$111,600	$130,200	$148,800
Wall Footing (CF)	1240.0	1550.0	1782.5	2015.0	2325.0
Wall Footing (Minor Conc) [$64/CF]	$79,360	$99,200	$114,080	$128,960	$148,800
Struct Reinforcement	$461,280	$576,600	$677,040	$777,480	$892,800
Wall Cost Subtotal (Masonry)	$615,040	$768,800	$902,720	$1,036,640	$1,190,400
Traffic Control	$41,000	$41,000	$41,000	$41,000	$41,000
Contingencies (30%)[3]	$184,512	$230,640	$270,816	$310,992	$357,120
Permanent Easement	$0	$0	$0	$0	$0
TCE	$0	$0	$0	$0	$0
Clearing & Grubbing and Landscaping of TCE Area [$30K/Acre]	$0	$0	$0	$0	$0
Total Wall Cost	$840,552	$1,040,440	$1,214,536	$1,388,632	$1,588,520
Total Wall Cost ($ Rounded)	**$841,000**	**$1,040,000**	**$1,215,000**	**$1,389,000**	**$1,589,000**

Notes:

1. Estimates are based on Caltrans Database cost for 2017
2. Includes cost for masonry and steel
3. Includes cost for scaffolding, and mobilization