



## **Noise Abatement Decision Report**

*I-80/SR 65 Interchange Improvements Project*  
*Placer County, Interstate 80 and State Route 65*  
*03-PLA-80-PM 1.9 to 6.1*  
*03-PLA-65-PM R4.8 to R7.3*

*EA 03-4E3200*

**May 2015**

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Placer County, Interstate 80 and State Route 65

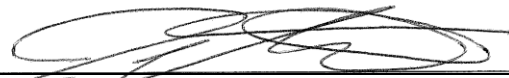
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EA 03-4E3200

**May 2015**

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## **List of Abbreviated Terms**

Benefited residence	A dwelling unit expected to receive a noise reduction of at least 5 dBA from the proposed abatement measure
Caltrans	California Department of Transportation
CE	Categorical Exemption
CEQA	California Environmental Quality Act
CFR	Code of Federal Regulations
Critical design receiver	The design receiver that is impacted and for which the absolute noise levels, build vs. existing noise levels, or achievable noise reduction will be at a maximum where noise abatement is considered
Date of public knowledge	The date that a project is approved—approval of the final environmental documentation (e.g., Record of Decision) is complete
dB	A measure of sound pressure level on a logarithmic scale
dBA	A-weighted sound pressure level
ED	Environmental document
FHWA	Federal Highway Administration
FONSI	Findings of No Significant Impact
HOV	high occupancy vehicle
I-	Interstate
$L_{eq}$	Equivalent sound level (energy averaged sound level)
$L_{eq}(h)$	A-weighted, energy average sound level during a 1-hour period
NAC	Noise abatement criteria
NADR	Noise Abatement Decision Report
NSR	Noise study report
Planned, designed, and programmed	A noise-sensitive land use is considered planned, designed, and programmed when it has received final development approval (generally the issuance of a building permit) from the local agency with jurisdiction
Protocol	Caltrans Traffic Noise Analysis Protocol
Reasonable allowance	A single dollar value—a reasonable allowance per benefited residence that embodies five reasonableness factors
ROD	Record of Decision
SR	State Route





# 1. Introduction

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The Noise Abatement Decision Report (NADR) presents the preliminary noise abatement decision as defined in the 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) (ICF International, 2014) was approved by Caltrans on October 22, 2014.

## 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 Traffic Noise Analysis Protocol (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.

Figure 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.

The Protocol establishes a process for assessing the reasonableness and feasibility of noise abatement. Before publication of the draft environmental document, 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 provides noise reduction of at least 5 a-weighted sound pressure level (dBA) at receivers subject to noise impacts. Other nonacoustical factors relating to geometric standards (e.g., sight distances), safety, maintenance, and security can also affect feasibility.

The preliminary reasonableness determination is made by calculating an allowance that is considered to be a reasonable amount of money, per benefited residence, 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, the preliminary determination is that the abatement is reasonable. If the cost estimate is higher than the allowance, the preliminary determination is that abatement is not reasonable.

The NADR presents the preliminary noise abatement decision based on acoustical and nonacoustical feasibility factors and reasonableness. 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 environmental document (ED) is published.

Noise abatement must be predicted to reduce noise by at least 5 dB at an impacted receptor to be considered feasible from an acoustical perspective. The determination of the reasonableness of noise abatement is more subjective than the determination of its feasibility. As defined in Section 772.5 of the 23CFR772, reasonableness is the combination of social, economic, and environmental factors considered in the evaluation of a noise abatement measure. As defined in the Protocol the overall reasonableness of noise abatement is determined by the following three factor:

- The noise reduction design goal.
- The cost of noise abatement.
- The viewpoints of benefited receptors (including property owners and residents of the benefited receptors).

The NADR addresses the noise reduction design goal (7 dB reduction at one or more benefited receptors) and the cost of noise abatement. Polling of benefited receptors is normally completed prior to circulation of the draft environmental document. The results of the polling and the final reasonableness determination are included in the Categorical Exemption (CE), Findings of No Significant Impact (FONSI), or Record of Decision (ROD).

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 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 proposes to improve the Interstate (I-)80/State Route (SR) 65 interchange in Placer County, California, to reduce future traffic congestion, improve operations and safety, and comply with current Caltrans and local agency design standards.

Project termini (i.e., limits) for the project were developed through an iterative process involving engineering design and traffic operations analysis. Preliminary design concepts were tested with the traffic operations analysis model to evaluate how lane transitions and vehicle weaving influenced peak-hour conditions. Refinements were made to ensure that mainline lane balance was logical and that transitions did not cause unacceptable traffic operations such as extensive queuing or reduced speeds.

The purpose and objectives of the project are listed below.

- Upgrade the I-80/SR 65 interchange and adjacent transportation facilities to reduce no-build traffic congestion.
- Upgrade the I-80/SR 65 interchange and adjacent transportation facilities to comply with current Caltrans and local agency design standards for safer and more efficient traffic operations while maintaining and, where feasible, improving the current level of community access at a minimum.
- Consider all travel modes and users in developing project alternatives.

The project is needed for the following reasons:

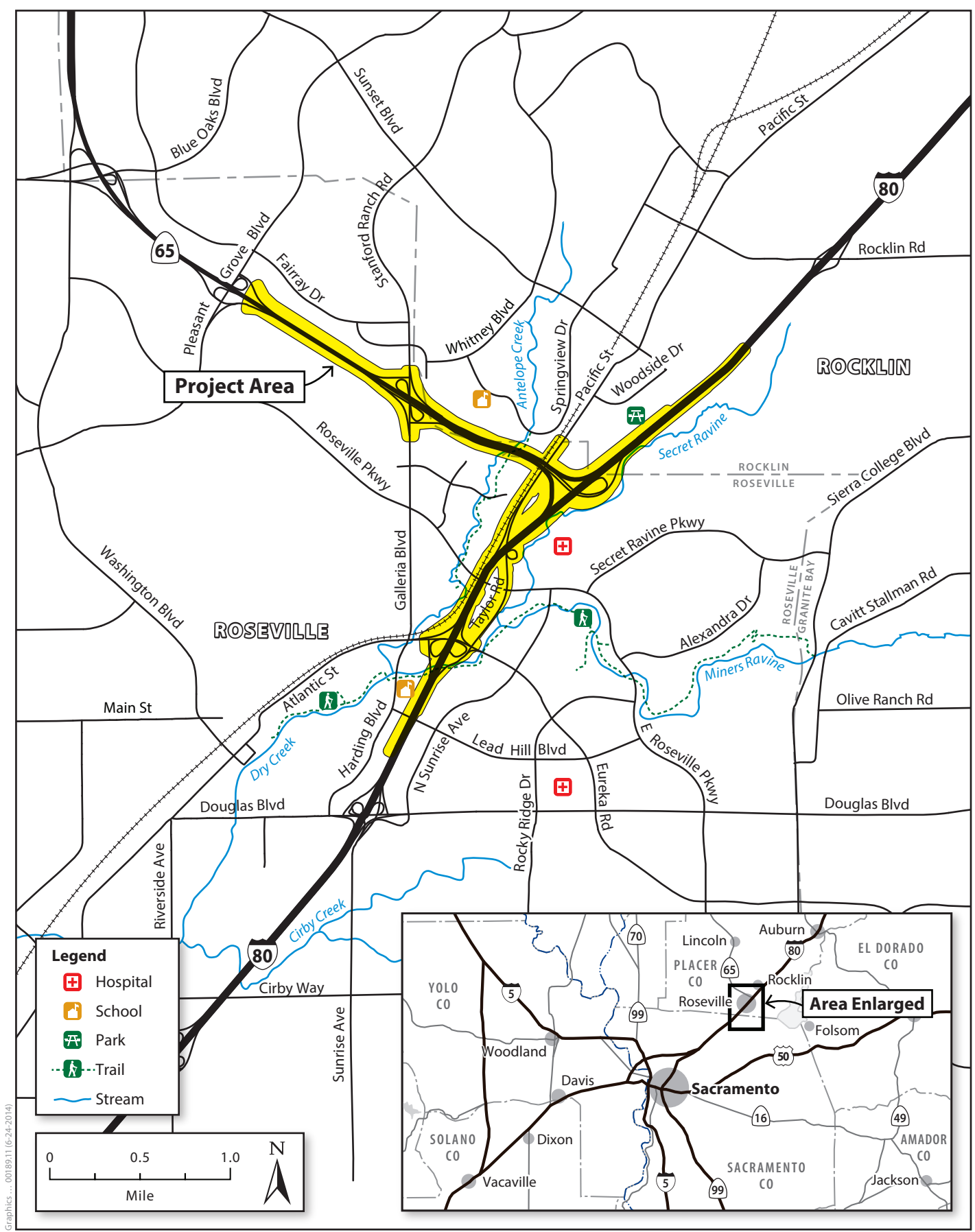
- Recurring morning and evening peak-period demand exceeds the current design capacity of the I 80/SR 65 interchange and adjacent transportation facilities, creating traffic operations and safety issues. These issues result in high delays, wasted fuel, and excessive air pollution and greenhouse gas emissions, all of which will be exacerbated by traffic from future population and employment growth.
- Interchange design features do not comply with current Caltrans design standards for safe and efficient traffic operations and limit existing community access to nearby land uses.
- Travel choices are limited in the project area because the transportation network does not include facilities for all modes and users consistent with the complete streets policies of Caltrans and local agencies.

### **1.3.1. Project Location**

The proposed project is located in Placer County in the cities of Roseville and Rocklin at the I-80/SR 65 interchange (Figure 1). The project limits consist of I-80 from the Douglas Boulevard interchange to the Rocklin Road interchange (post miles 1.9–6.1) and SR 65 from the I-80 separation to the Pleasant Grove Boulevard interchange (post miles R4.8–R7.3). The total length of the project is 2.5 miles along SR 65 and 4.2 miles along I-80. The project area also includes various local roads—specifically portions of Galleria Boulevard/Stanford Ranch Road, Pleasant Grove Boulevard, Eureka Road/Atlantic Street, East Roseville Parkway, Rocklin Road, and Taylor Road.

### **1.3.2. Project Alternatives**

The following build alternatives are under consideration and were designed to satisfy the purpose and need identified previously while avoiding or minimizing environmental impacts. The build alternatives include common design features and have similar phasing approaches, staging, storage, and site access. For alignment and other improvement features that differ between alternative, see the individual alternative descriptions below.



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**Figure 1**  
**Project Location**



**1.3.2.1. Alternative 1—Taylor Road Full Access Interchange**

This alternative would improve spacing and weaving movements between interchanges on I-80. The two existing Taylor Road interchange ramps would be relocated to the east and reconstructed in a Type L-1/L-12 interchange configuration, providing two additional ramp connections and improving access between the local streets and freeway system. The existing Taylor Road interchange ramps would be removed and the area would be re-graded.

**1.3.2.2. Alternative 2—Collector-Distributor System Ramps**

This alternative would improve spacing and weaving movements between interchanges on I-80 by collecting and redirecting eastbound ramp traffic onto a collector-distributor ramp system. The collector-distributor system would provide eastbound access to Taylor Road and from Eureka Road at the Atlantic Street/Eureka Road interchange and would restrict local traffic from leaving or entering I-80 mainline until after the critical weave area between Eureka Road and the I-80/SR 65 interchange.

**1.3.2.3. Alternative 3—Taylor Road Interchange Eliminated**

Similar to Alternative 2, this alternative would improve spacing and weaving movements between interchanges on I-80 by collecting eastbound Eureka Road on-ramp traffic. Weaving on I-80 would be significantly improved because ramp traffic would be redirected to a ramp braid system and restricted from entering and exiting I-80 mainline until after the critical weave area between Eureka Road and the I-80/SR 65 interchange. Unique to Alternative 3, the two existing Taylor Road interchange ramps would be eliminated, and access to the Taylor Road area would be accommodated by the adjacent local interchanges at the Atlantic Street/Eureka Road, Rocklin Road, and Galleria Boulevard/Stanford Ranch Road interchanges. The connector ramps serving I-80 and SR 65 (SW, EN, SE, WN, and high occupancy vehicle [HOV]) are the same between Alternatives 2 and 3.

**1.4. Affected Land Uses**

A field investigation was conducted to identify land uses that could be subject to traffic and construction noise impacts resulting from the proposed project. Single-family and multi-family residences were identified as Activity Category B land uses in the project area. Outdoor recreational uses, schools, places of worship, parks, and cemeteries were identified as Activity Category C land uses. Outdoor areas associated with hotels were identified as Activity Category E land uses. Several commercial

(Activity Category F) and undeveloped (Activity Category G) land uses are not subject to noise impacts.

As required by the Protocol, all developed land uses were evaluated in this analysis. However, 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 residential backyards and public outdoor use areas.



## 2. Results of the Noise Study Report

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The NSR for this project was prepared by Jason Volk in September 2014 and approved by Caltrans on October 22, 2014.

Modeling results in the NSR indicate that a substantial increase in noise levels over existing conditions is not predicted to occur under any of the build alternatives. Predicted traffic noise levels for design-year with-project conditions approach or exceed the NAC of 67 dBA- $L_{eq}(h)$  for Activity Category B and Activity Category C land uses. Therefore, traffic noise impacts are predicted to occur, and noise abatement was considered.

### 2.1. Noise Barrier A (I-80 Eastbound off-ramp to Atlantic Street sta. no. 3+40 to 12+10)

The traffic noise modeling results in Appendix B of the NSR indicate that noise levels of up to 67 dBA  $L_{eq}(h)$  are predicted at Olympic Pointe Sculpture Park. Traffic noise levels would increase by up to 1 dB relative to existing conditions, which would not result in a substantial increase in noise levels. Traffic noise levels would approach or exceed the NAC for Activity Category C land use at one receiver location. Therefore, traffic noise impacts are predicted to occur and noise abatement must be considered.

An acoustical analysis was conducted for Noise Barrier A, which would extend along the edge-of-shoulder of the eastbound I-80 off-ramp to Eureka Road. The total length of the barrier would be 870 feet. The location of Noise Barrier A is shown in Figure 2. At a height of 20 feet, the barrier would provide up to 6 dB of noise reduction, which would not meet the design goal of 7 dB. While the design goal cannot be achieved for this barrier, the minimum noise reduction requirement of 5 dB can be achieved, benefiting one receiver location at the park (Activity Category C). Therefore the barrier is considered feasible. Calculated noise reductions and reasonable allowances for each barrier height are summarized in Table 1.

**Table 1. Summary of Reasonableness Determination Data—Noise Barrier A**

Location: Olympus Pointe Sculpture Park, Roseville						
<b>Predicted Sound Level without Barrier</b>						
Design year noise level, dBA $L_{eq}(h)$ : 67 dBA (Alternatives 1–3)						
Design year noise level minus existing noise level: 1 dBA						
<b>Design Year with Barrier</b>	<b>10-Foot Barrier</b>	<b>12-Foot Barrier</b>	<b>14-Foot Barrier</b>	<b>16-Foot Barrier</b>	<b>18-Foot Barrier</b>	<b>20-Foot Barrier</b>
Barrier noise reduction, dB	2	4	5	5	6	6
Barrier design goal met?	No	No	No	No	No	No
Number of benefited receivers	0	0	1	1	1	1
Reasonable allowance per benefited receiver	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000
Total reasonable allowance	\$0	\$0	\$64,000	\$64,000	\$64,000	\$64,000

**2.2. Noise Barrier B  
(I-80 Eastbound sta. no. 84+00 to 87+70)**

The traffic noise modeling results in Appendix B of the NSR indicate that a noise levels of up to 68 dBA  $L_{eq}(h)$  are predicted at the Golfland miniature golf course. Traffic noise levels would increase by up to 2 dB relative to existing conditions, which would not result in a substantial increase in noise levels. Traffic noise levels would approach or exceed the NAC for Activity Category C land use at one receiver location. Therefore, traffic noise impacts are predicted to occur and noise abatement must be considered.

An acoustical analysis was conducted for Noise Barrier B, which would extend along the top of the I-80 right-of-way near the termination of the I-80 eastbound Eureka Road Slip on-ramp. The barrier would have a total length of 370 feet. The location of Noise Barrier B is shown in Figure 2. The barrier would meet the noise reduction design goal of 7 dB at a height of 16 feet. Calculated noise reductions and reasonable allowances for each barrier height are summarized in Table 2.



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**Figure 2**  
**Noise Barriers Evaluated in the I-80/SR 65 Noise Study Report**  
**Sheet 1**



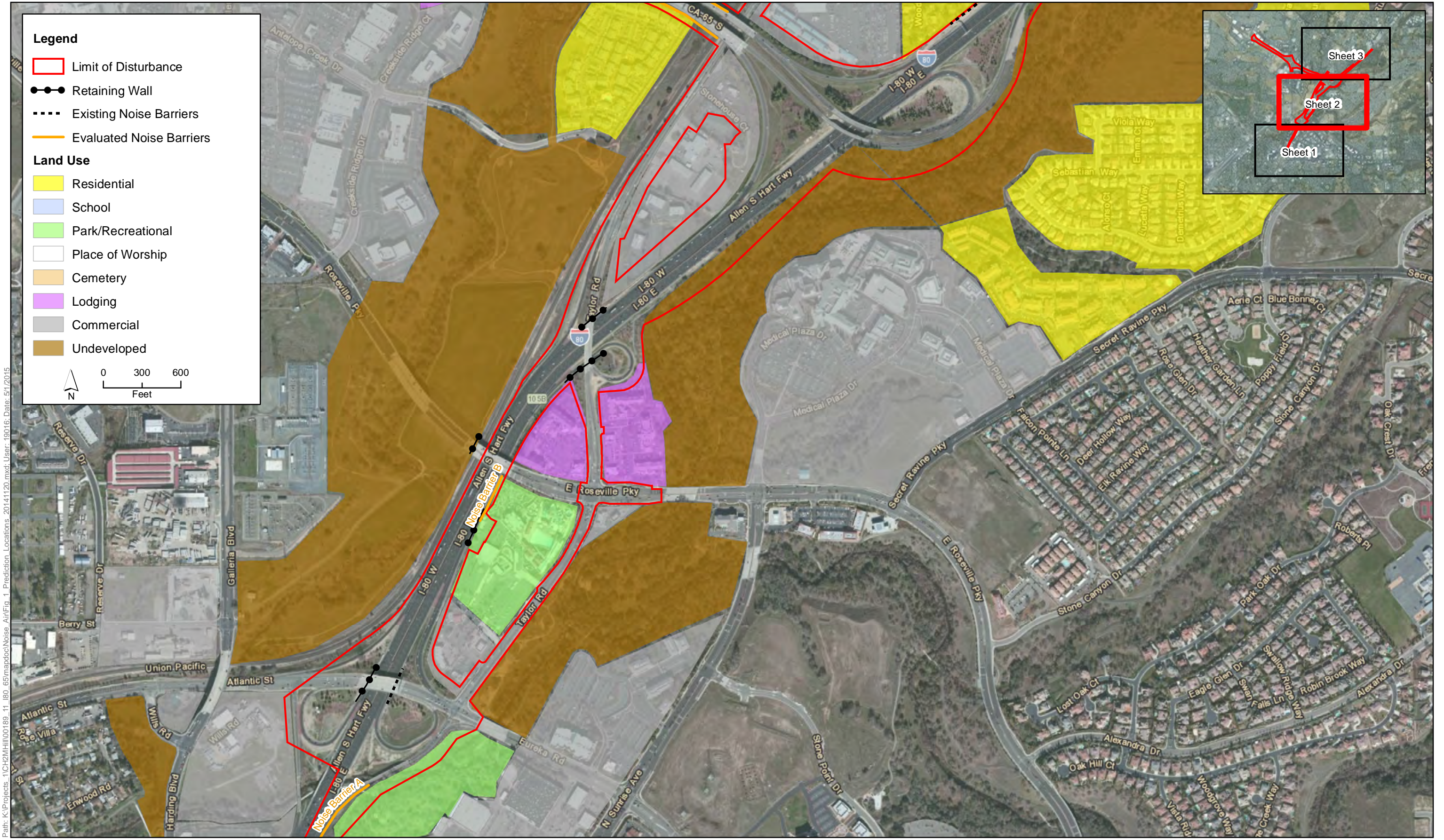
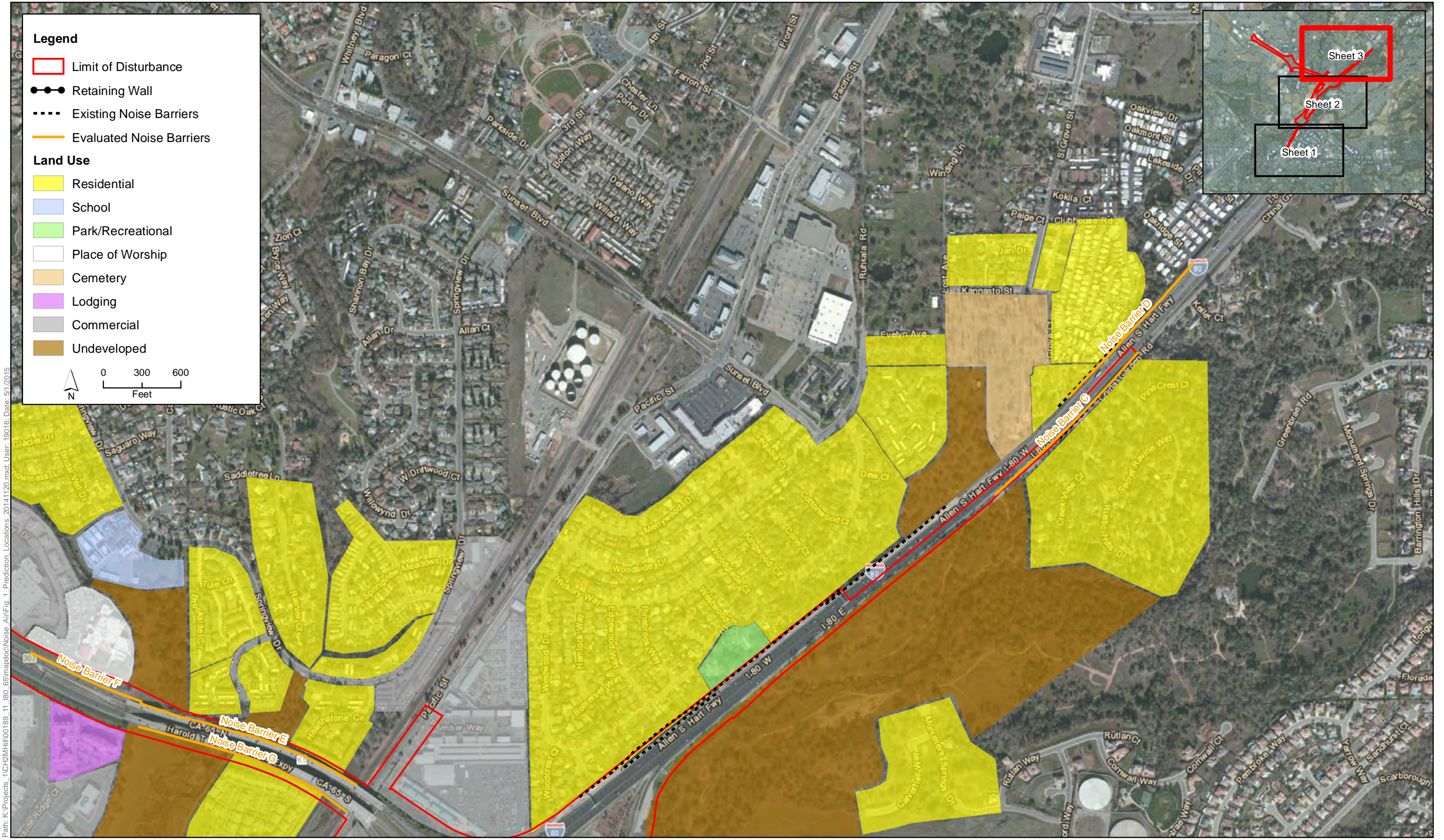


Figure 2  
Noise Barriers Evaluated in the I-80/SR 65 Noise Study Report  
Sheet 2







**Figure 2**  
**Noise Barriers Evaluated in the I-80/SR 65 Noise Study Report**  
**Sheet 3**







**Table 2. Summary of Reasonableness Determination Data—Noise Barrier B**

Location: Golfland miniature golf course, Roseville					
<b>Predicted Sound Level without Barrier</b>					
Design year noise level, dBA $L_{eq}(h)$ : 68 dBA (Alternatives 1–3)					
Design year noise level minus existing noise level: 2 dBA					
<b>Design Year with Barrier</b>	<b>8-Foot Barrier</b>	<b>10-Foot Barrier</b>	<b>12-Foot Barrier</b>	<b>14-Foot Barrier</b>	<b>16-Foot Barrier</b>
Barrier noise reduction, dB	5	5	6	6	7
Barrier design goal met?	No	No	No	No	Yes
Number of benefited receivers	1	1	1	1	1
Reasonable allowance per benefited residence	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000
Total reasonable allowance	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000

**2.3. Noise Barrier C  
(I-80 Eastbound sta. no. 178+00 to 193+30)**

The traffic noise modeling results in Appendix B of the NSR indicate that noise levels of up to 72 dBA  $L_{eq}(h)$  are predicted at the residential neighborhood on Rustic Hills Drive. Traffic noise levels would increase by up to 2 dB relative to existing conditions, which would not result in a substantial increase in noise levels. Traffic noise levels would approach or exceed the NAC for Activity Category B land use at five receiver locations representing a total of 10 residential units. Therefore, traffic noise impacts are predicted to occur and noise abatement must be considered.

An acoustical analysis was conducted for Noise Barrier C, which would extend along I-80 eastbound adjacent to the northern terminus of the project. Noise Barrier C would extend the existing wall by 610 linear feet to the west, for a total wall length of 1,530 feet. The barrier would meet the noise reduction design goal of 7 dB at a height of 12 feet.

The location of Noise Barrier C is shown in Figure 2. Calculated noise reductions and reasonable allowances for each barrier height are summarized in Table 3.

**Table 3. Summary of Reasonableness Determination Data—Noise Barrier C**

Location: Rustic Hills Drive, Rocklin					
<b>Predicted Sound Level without Barrier</b>					
Design year noise level, dBA $L_{eq}(h)$ : 72 dBA (Alternatives 1–3)					
Design year noise level minus existing noise level: 2 dBA					
<b>Design Year with Barrier</b>	<b>8-Foot Barrier</b>	<b>10-Foot Barrier</b>	<b>12-Foot Barrier</b>	<b>14-Foot Barrier</b>	<b>16-Foot Barrier</b>
Barrier noise reduction, dB	5	6	8	9	9
Barrier design goal met?	No	No	Yes	Yes	Yes
Number of benefited receivers	2	4	7	10	10
Reasonable allowance per benefited residence	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000
Total reasonable allowance	\$128,000	\$256,000	\$448,000	\$640,000	\$640,000

## 2.4. Noise Barrier D (I-80 Westbound sta. no. 201+00 to 186+80)

The traffic noise modeling results in Appendix B of the NSR indicate that noise levels of up to 78 dBA  $L_{eq}(h)$  are predicted at Rocklin Mobile Home Park. Traffic noise levels would increase by up to 2 dB relative to existing conditions, which would not result in a substantial increase in noise levels. Traffic noise levels would approach or exceed the NAC for Activity Category B land use at nine receiver locations representing a total of 53 residential units. Therefore, traffic noise impacts are predicted to occur and noise abatement must be considered.

An acoustical analysis was conducted for Noise Barrier D, which would extend along I-80 westbound adjacent to the northern terminus of the project. The barrier would replace the existing wall that currently extends along a portion of the neighborhood frontage. The location of Noise Barrier D is shown in Figure 2. Noise Barrier D would be 1,450 feet in total length. The barrier would meet the noise reduction design goal of 7 dB at a height of 12 feet. Calculated noise reductions and reasonable allowances for each barrier height are summarized in Table 4.

**Table 4. Summary of Reasonableness Determination Data—Noise Barrier D**

Location: Rocklin Mobile Home Park					
<b>Predicted Sound Level without Barrier</b>					
Design year noise level, dBA $L_{eq}(h)$ : 78 dBA (Alternatives 1–3)					
Design year noise level minus existing noise level: 2 dBA					
<b>Design Year with Barrier</b>	<b>8-Foot Barrier</b>	<b>10-Foot Barrier</b>	<b>12-Foot Barrier</b>	<b>14-Foot Barrier</b>	<b>16-Foot Barrier</b>
Barrier noise reduction, dB	3	5	7	10	11
Barrier design goal met?	No	No	Yes	Yes	Yes
Number of benefited receivers	0	4	13	13	20
Reasonable allowance per benefited residence	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000
Total reasonable allowance	\$0	\$256,000	\$832,000	\$832,000	\$1,280,000

**2.5. Noise Barrier E  
(SR 65 Northbound sta. no. 133+00 to 151+70)**

The traffic noise modeling results in Appendix B of the NSR indicate that noise levels of up to 69 dBA  $L_{eq}(h)$  are predicted at multi-family residential apartment buildings and condominiums adjacent to the East Roseville Viaduct. Traffic noise levels would increase by up to 4 dB relative to existing conditions, which would not result in a substantial increase in noise levels. Traffic noise levels would approach or exceed the NAC for Activity Category B land use at three receiver locations representing a total of 64 residential units and for Activity Category C land use at one receiver location representing park use. Therefore, traffic noise impacts are predicted to occur and noise abatement must be considered.

An acoustical analysis was conducted for Noise Barrier E, which would extend along the northbound SR 65 structure edge-of-pavement. The location of Noise Barrier E is shown in Figure 2. The total length of Noise Barrier E would be 1,870 feet. For safety reasons, noise barriers with footings located within 15 feet of travel lanes cannot exceed 14 feet in height (Caltrans 2012). However, since SR 65 is on an elevated structure in this area, it is possible to break receiver line-of-sight to heavy truck exhaust stacks with a lower wall. Noise Barrier E would meet the noise reduction design goal of 7 dB at a height of 10 feet. Calculated noise reductions and reasonable allowances for each barrier height are summarized in Table 5.

**Table 5. Summary of Reasonableness Determination Data—Noise Barrier E**

Location: North of SR 65, east of Stanford Ranch Road				
<b>Predicted Sound Level without Barrier</b>				
Design year noise level, dBA $L_{eq}(h)$ : 69 dBA (Alternatives 2 and 3); 67 dBA (Alternative 1)				
Design year noise level minus existing noise level: 4 dBA				
<b>Design Year with Barrier</b>	<b>8-Foot Barrier</b>	<b>10-Foot Barrier</b>	<b>12-Foot Barrier</b>	<b>14-Foot Barrier</b>
Barrier noise reduction, dB	6	7	7	8
Barrier design goal met?	No	Yes	Yes	Yes
Number of benefited receivers	235	250	263	279
Reasonable allowance per benefited residence	\$64,000	\$64,000	\$64,000	\$64,000
Total reasonable allowance	\$15,040,000	\$16,000,000	\$16,832,000	\$17,856,000

**2.6. Noise Barrier F  
(SR 65 Northbound sta. no. 151+70 to 161+20)**

The traffic noise modeling results in Appendix B of the NSR indicate that noise levels of up to 71 dBA  $L_{eq}(h)$  are predicted at the outdoor playground at Destiny Christian Church. Traffic noise levels would increase by up to 2 dB relative to existing conditions, which would not result in a substantial increase in noise levels. Traffic noise levels would approach or exceed the NAC for Activity Category C land use at one receiver location. Therefore, traffic noise impacts are predicted to occur and noise abatement must be considered.

An analysis was conducted for Noise Barrier F, which would extend along northbound SR 65 within the right-of-way. The total length of the barrier would be 950 feet. The location of Noise Barrier F is shown in Figure 2. At a height of 20 feet, the barrier would provide up to 6 dB of noise reduction, which would not meet the design goal of 7 dB. While the design goal cannot be achieved for this barrier, the minimum noise reduction requirement of 5 dB can be achieved, benefiting one receiver location at the playground (Activity Category C). Therefore the barrier is considered feasible. Calculated noise reductions and reasonable allowances for each barrier height are summarized in Table 6.

**Table 6. Summary of Reasonableness Determination Data—Noise Barrier F**

Location: Destiny Christian Church						
<b>Predicted Sound Level without Barrier</b>						
Design year noise level, dBA $L_{eq}(h)$ : 71 dBA (Alternatives 1-3)						
Design year noise level minus existing noise level: 2 dBA						
<b>Design Year with Barrier</b>	<b>10-Foot Barrier</b>	<b>12-Foot Barrier</b>	<b>14-Foot Barrier</b>	<b>16-Foot Barrier</b>	<b>18-Foot Barrier</b>	<b>20-Foot Barrier</b>
Barrier noise reduction, dB	3	4	5	5	6	6
Barrier design goal met?	No	No	No	No	No	No
Number of benefited receivers	0	0	1	1	1	1
Reasonable allowance per benefited residence	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000
Total Reasonable Allowance	\$0	\$0	\$64,000	\$64,000	\$64,000	\$64,000

**2.7. Noise Barrier G  
(SR 65 Southbound sta. no. 151+00 to 130+00)**

The traffic noise modeling results in Appendix B of the NSR indicate that noise levels of up to 70 dBA  $L_{eq}(h)$  are predicted at multi-family residential apartment buildings and condominiums adjacent to the elevated section of SR 65 east of Stanford Ranch Road. Traffic noise levels would increase by up to 9 dB relative to existing conditions, which would not result in a substantial increase in noise levels. Traffic noise levels would approach or exceed the NAC for Activity Category B land use at six receiver locations representing a total of 144 residential units. Therefore, traffic noise impacts are predicted to occur and noise abatement must be considered.

An acoustical analysis was conducted for Noise Barrier G, which would extend along the southbound SR 65 structure edge-of-pavement. The total length of Noise Barrier G would be 1,800 feet. The location of Noise Barrier G is shown in Figure 2. For safety reasons, noise barriers with footings located within 15 feet of travel lanes cannot exceed 14 feet in height (Caltrans 2012). However, since SR 65 is on an elevated structure in this area, it is possible to break receiver line-of-sight to heavy truck exhaust stacks with a lower wall. Noise Barrier G would meet the noise reduction design goal of 7 dB at a height of 10 feet. Calculated noise reductions and reasonable allowances for each barrier height are summarized in Table 7.

**Table 7. Summary of Reasonableness Determination Data—Noise Barrier G**

Location: South of SR 65, east of Stanford Ranch Road				
<b>Predicted Sound Level without Barrier</b>				
Design year noise level, dBA $L_{eq}(h)$ : 74 dBA (Alternatives 2 and 3); 73 dBA (Alternative 1)				
Design year noise level minus existing noise level: 4 dBA				
<b>Design Year with Barrier</b>	<b>8-Foot Barrier</b>	<b>10-Foot Barrier</b>	<b>12-Foot Barrier</b>	<b>14-Foot Barrier</b>
Barrier noise reduction, db	6	7	7	8
Barrier design goal met?	No	Yes	Yes	Yes
Number of benefited receivers	128	128	128	128
Reasonable allowance per benefited residence	\$64,000	\$64,000	\$64,000	\$64,000
Total reasonable allowance	\$8,192,000	\$8,192,000	\$8,192,000	\$8,192,000

**2.8. Noise Barrier H  
(I-80 Westbound sta. no. 8+00 to 16+60)**

The traffic noise modeling results in Appendix B of the NSR indicate that noise levels of up to 69 dBA  $L_{eq}(h)$  are predicted at the outdoor playground at John Adams Academy on Harding Boulevard. Traffic noise levels would increase by up to 2 dB relative to existing conditions, which would not result in a substantial increase in noise levels. Traffic noise levels would approach or exceed the NAC for Activity Category C land use at one receiver location. Therefore, traffic noise impacts are predicted to occur and noise abatement must be considered.

An acoustical analysis was conducted for Noise Barrier H, which would extend along the school frontage facing I-80 westbound. The total length of the barrier would be 860 feet. The barrier would meet the noise reduction design goal of 7 dB at a height of 12 feet. Calculated noise reductions and reasonable allowances for each barrier height are summarized in Table 8.

**Table 8. Summary of Reasonableness Determination Data—Noise Barrier H**

Location: John Adams Academy, Harding Boulevard					
<b>Predicted Sound Level without Barrier</b>					
Design year noise level, dBA $L_{eq}(h)$ : 69 dBA (Alternatives 1–3)					
Design year noise level minus existing noise level: 2 dBA					
<b>Design Year with Barrier</b>	<b>8-Foot Barrier</b>	<b>10-Foot Barrier</b>	<b>12-Foot Barrier</b>	<b>14-Foot Barrier</b>	<b>16-Foot Barrier</b>
Barrier noise reduction, dB	4	5	7	8	8
Barrier design goal met?	No	No	Yes	Yes	Yes
Number of benefited receivers	0	1	1	1	1
Reasonable allowance per benefited residence	\$64,000	\$64,000	\$64,000	\$64,000	\$64,000
Total reasonable allowance	\$0	\$64,000	\$64,000	\$64,000	\$64,000





## 3. Preliminary Noise Abatement Decision

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### 3.1. Summary of Key Information

For each of the barriers evaluated, noise abatement allowances were calculated for a range of barrier heights. Allowances were only calculated for barrier heights that were acoustically feasible (i.e., provided at least 5 dB of noise reduction at one or more noise-sensitive receivers). Table 9 summarizes the calculated noise abatement allowances for barrier heights of 6 to 16 feet. Barrier heights of over 16 feet evaluated in the NSR are not allowed for this project and were not considered further. The estimated cost to construct each barrier was calculated by the project engineer, CH2M Hill (2014).

### 3.2. Nonacoustical Factors Relating to Feasibility

As discussed in Chapter 2, the existing sound wall along eastbound I-80 frontage in the Rustic Hills neighborhood would need to be modified or retrofitted if Noise Barrier C is built. Similarly, the existing privacy wall along westbound I-80 frontage in the Rocklin Mobile Home Park neighborhood would need to be modified or retrofitted if Noise Barrier D is built.

### 3.3. Preliminary Recommendation and Decision

As shown in Table 9, estimated construction costs for barrier heights of 12 to 16 feet for Noise Barrier C and Noise Barrier D are projected to be within cost-reasonableness allowances. The same is true for Noise Barrier E and Noise Barrier G, at barrier heights of 8 to 14 feet. Accordingly, these barrier designs are considered to be reasonable from a cost perspective. The recommended height of Noise Barrier C is 14 feet. This height would match the existing noise barrier along the neighborhood frontage of Rustic Hills Drive and would meet both the noise abatement and noise reduction criteria. At a height of 14 feet, Noise Barrier C would benefit 10 residences at a reasonable allowance of \$64,000 per residence, yielding a total reasonable allowance of \$640,000. The estimated construction cost to build the 14-foot barrier is \$223,495, which is within the barrier cost allowance.

The recommended height of Noise Barrier D is 16 feet. This height would meet both the noise abatement and noise reduction criteria. At a height of 16 feet, Noise Barrier

D would benefit 20 residences at a reasonable allowance of \$64,000 per residence, yielding a total reasonable allowance of \$1,280,000. The estimated construction cost to build the 16-foot barrier is \$590,317, which is within the barrier cost allowance.

The recommended height of Noise Barrier E is 14 feet. This height would meet both the noise abatement and noise reduction criteria. At a height of 14 feet, Noise Barrier E would benefit 279 residences at a reasonable allowance of \$64,000 per residence, yielding a total reasonable allowance of \$17,856,000. The estimated construction cost to build the 14-foot barrier is \$564,117, which is within the barrier cost allowance.

The recommended height of Noise Barrier G is 10 feet. This height would meet both the noise abatement and noise reduction criteria. At a height of 10 feet, Noise Barrier G would benefit 128 residences at a reasonable allowance of \$64,000 per residence, yielding a total reasonable allowance of \$8,192,000. The estimated construction cost to build the 10-foot barrier is \$399,000, which is within the barrier cost allowance.

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 environmental document, which will be circulated for public review.

Table 9. Summary of Cost Reasonableness of Evaluated Barriers

Noise Barrier	Type	Barrier Height (feet)	Total Noise-Sensitive Receptors Benefited	Barrier Length (feet)	Barrier Surface Area (sq feet)	Barrier Cost Allowance (dollars per benefited receptor)	Barrier Cost Allowance (total dollars)	Engineer's Cost Estimate (total dollars)	Design Goal Met	Is Barrier Cost-Reasonable?
A (Alt. 3 only)	Miners Ravine Bridge (Widen - Alt 3)	14	1	870	12,180	\$64,000	\$64,000	\$262,450	No	No
A (Alt. 3 only)	Miners Ravine Bridge (Widen - Alt 3)	16	1	870	13,920	\$64,000	\$64,000	\$297,250	No	No
A (Alt. 1 & 2 only)	Miners Ravine Bridge (Exist Bridge - Alt 1 & 2)	14	1	870	12,180	\$64,000	\$64,000	\$612,450	No	No
A (Alt. 1 & 2 only)	Miners Ravine Bridge (Exist Bridge - Alt 1 & 2)	16	1	870	13,920	\$64,000	\$64,000	\$647,250	No	No
B	On Grade (Along EB I-80)	8	1	370	2,960	\$64,000	\$64,000	\$85,267	No	No
B	On Grade (Along EB I-80)	10	1	370	3,700	\$64,000	\$64,000	\$101,967	No	No
B	On Grade (Along EB I-80)	12	1	370	4,440	\$64,000	\$64,000	\$118,667	No	No
B	On Grade (Along EB I-80)	14	1	370	5,180	\$64,000	\$64,000	\$135,367	No	No
B	On Grade (Along EB I-80)	16	1	370	5,920	\$64,000	\$64,000	\$151,117	Yes	No
C	On grade (along EB I-80)	8	2	612	4,896	\$64,000	\$128,000	\$140,630	No	No
C	On grade (along EB I-80)	10	4	612	6,120	\$64,000	\$256,000	\$168,210	No	Yes
C	On grade (along EB I-80)	12	7	612	7,344	\$64,000	\$448,000	\$195,790	Yes	Yes
C	On grade (along EB I-80)	14	10	612	8,568	\$64,000	\$640,000	\$223,370	Yes	Yes
C	On grade (along EB I-80)	16	10	612	9,792	\$64,000	\$640,000	\$249,400	Yes	Yes
D	On Grade (Along WB I-80)	10	4	1,450	14,500	\$64,000	\$256,000	\$398,067	No	No

Noise Barrier	Type	Barrier Height (feet)	Total Noise-Sensitive Receptors Benefited	Barrier Length (feet)	Barrier Surface Area (sq feet)	Barrier Cost Allowance (dollars per benefited receptor)	Barrier Cost Allowance (total dollars)	Engineer's Cost Estimate (total dollars)	Design Goal Met	Is Barrier Cost-Reasonable?
D	On Grade (Along WB I-80)	12	13	1,450	17,400	\$64,000	\$832,000	\$463,367	Yes	Yes
D	On Grade (Along WB I-80)	14	13	1,450	20,300	\$64,000	\$832,000	\$528,667	Yes	Yes
D	On Grade (Along WB I-80)	16	20	1,450	23,200	\$64,000	\$1,280,000	\$590,317	Yes	Yes
E	E. Roseville Viaduct (on NB Widen)	8	235	1,870	14,960	\$64,000	\$15,040,000	\$339,717	No	Yes
E	E. Roseville Viaduct (on NB Widen)	10	250	1,870	18,700	\$64,000	\$16,000,000	\$414,517	Yes	Yes
E	E. Roseville Viaduct (on NB Widen)	12	263	1,870	22,440	\$64,000	\$16,832,000	\$489,317	Yes	Yes
E	E. Roseville Viaduct (on NB Widen)	14	279	1,870	26,180	\$64,000	\$17,856,000	\$564,117	Yes	Yes
F	On Grade (Along NB SR-65)	14	1	950	13,300	\$64,000	\$64,000	\$346,583	No	No
F	On Grade (Along NB SR-65)	16	1	950	15,200	\$64,000	\$64,000	\$386,983	No	No
G	E. Roseville Viaduct (on SB Widen)	8	128	1,800	14,400	\$64,000	\$8,192,000	\$327,000	No	Yes
G	E. Roseville Viaduct (on SB Widen)	10	128	1,800	18,000	\$64,000	\$8,192,000	\$399,000	Yes	Yes
G	E. Roseville Viaduct (on SB Widen)	12	128	1,800	21,600	\$64,000	\$8,192,000	\$471,000	Yes	Yes
G	E. Roseville Viaduct (on SB Widen)	14	128	1,800	25,200	\$64,000	\$8,192,000	\$543,000	Yes	Yes
H	On Grade (Along WB I-80)	10	1	860	8,600	\$64,000	\$64,000	\$236,308	No	No
H	On Grade (Along WB I-80)	12	1	860	10,320	\$64,000	\$64,000	\$275,058	Yes	No
H	On Grade (Along WB I-80)	14	1	860	12,040	\$64,000	\$64,000	\$313,808	Yes	No
H	On Grade (Along WB I-80)	16	1	860	13,760	\$64,000	\$64,000	\$350,383	Yes	No

## 4. Secondary Effects of Abatement

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Noise has the potential to result in secondary effects on cultural resources, scenic views, hazardous materials, biology, or other resources. Noise barriers described in this report would have a top elevation of no more than 16 feet above ground, and would be located along the frontage of residences and outdoor areas that face I-80 or SR 65. It is not anticipated that noise barriers would adversely affect any scenic views or otherwise result in visual impacts. In addition, since the barriers would be built within the State right-of-way, it is not anticipated that any other secondary effects related to other resources will occur. Therefore no secondary effects of abatement are anticipated.



## 5. References

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CH2M Hill. 2014. 80/65 Interchange Project Estimated Cost of Sound Walls. Memorandum received October 30, 2014.

Caltrans. 2012. *Highway Design Manual*. Publications Unit.

ICF International, 2014. Noise Study Report I-80/SR 65 Interchange Improvements Project Placer County, Interstate 80 and State Route 65. Sacramento, CA. September.

