

3.5 NOISE

This section describes the current and predicted noise levels along the highway during the loudest hour. By predicting the noise levels associated with the proposed Build Alternatives, analysts can determine whether there would be impacts to nearby residences, businesses, parks, and other adjacent properties. If noise impacts are identified, options for reducing the amount of noise heard at impacted properties are examined.

3.5.1 Noise Abatement Guidelines

To address traffic-related noise, the CDOT follows FHWA regulations (23 Code of Federal Regulations [CFR] 772), the *Highway Traffic Noise Analysis and Abatement: Policy and Guidance* (FHWA, 1995), and the *CDOT Noise Analysis and Abatement Guidelines* (CDOT, 20011a). These guidelines establish “noise abatement criteria,” which represent the maximum noise impact thresholds that various land uses can be exposed to before considering noise reduction or abatement measures. The noise abatement criteria for different activity categories are shown in **Exhibit 3.5-1**.

Noise abatement criteria established by CDOT are expressed in A-weighted decibels (dBA). A dBA measures the magnitude of sounds at different frequencies, as perceived by the human ear.

According to FHWA guidelines, a traffic noise impact occurs when: 1) predicted noise levels at a location exceed the noise abatement criteria; or 2) predicted noise levels substantially exceed the current noise level (even though the predicted levels may not exceed noise abatement criteria). A substantial increase in noise level is defined by CDOT as 10 dBA or more, which is generally felt by the average human ear to be “twice as loud” as before. (Noise increases of 3 dBA or less are not typically perceived by the human ear.) If predicted noise levels at a location approach the noise abatement criteria within 1 dBA, CDOT guidelines consider that location to be impacted.

EXHIBIT 3.5-1
Colorado Department of Transportation Traffic Noise Abatement Criteria

Activity Category	L_{eq}^1 (dBA)	Description of Activity Category
A	56 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (Exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	71 (Exterior)	Developed lands, properties, or activities not included in Categories A or B above.
D	--	Undeveloped lands.
E	51 (Interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

Source: Hankard Environmental, Inc., 2004; 2010

dBA = A-weighted decibel

L_{eq} = equivalent level

¹ Road noise changes from moment to moment, but noise energy over time can be described in terms of its “equivalent level” (abbreviated L_{eq}). The L_{eq} is a single level that has the same sound energy as the fluctuating level over a stated time. The L_{eq} used for the noise abatement criteria is the hourly A-weighted equivalent level for the “noisiest hour” of the day in the design year.

3.5.2 Methodology

Traffic noise is primarily related to traffic volumes and speed. When more traffic is added to the highway, noise levels increase as long as there is no decrease in speed. At the point when capacity of the highway is met and congestion occurs, there is a decrease in both vehicular speeds and noise levels; therefore, the “loudest hour” for highway noise occurs just before and just after periods of congestion. This is known as level of service (LOS) C: significant traffic volume traveling at relatively high speeds. A more detailed description of LOS can be found in **Section 3.1 Transportation**. Traffic noise is the loudest when a high volume of vehicles are driving at the highest speeds. In terms of LOS, the level with the highest volume as well as the highest speed is a LOS C. LOS A and B have lower volumes, and LOS D, E, and F have lower speeds.

Mathematical models are used to predict noise levels for expected loudest-hour noise conditions. The STAMINA v2.0 noise prediction model, approved by FHWA for predicting noise levels on highway projects that began before May 2005, was used to predict noise levels for this project. Noise analysis will be rerun using FHWA’s approved Traffic Noise Model (TNM) prior to publication of the FEIS. The noise prediction model considers factors such as roadway geometry, terrain, location, and land use of noise-sensitive areas (called “receptors”), and current traffic data (for example, volumes, speeds, and vehicle mix).

Noise specialists selected 39 receptor locations near I-25 that were representative of the residences, parks, and businesses in the area (these are mapped in **Exhibits 3.5-4, 3.5-6, 3.5-8, and 3.5-9**). Noise levels were predicted for current conditions (year 2003), No Action Alternative conditions (year 2025 traffic volumes), and the two Build Alternative conditions (year 2025 traffic volumes). Noise levels throughout the entire corridor were predicted with the STAMINA model by looking at “noise contours,” a contour line on a map that indicates where noise levels would meet or exceed CDOT’s noise abatement criteria. Locations that fell within the 66 dBA contour for Category B

receptors and 71 dBA contour for Category C receptors were considered to be impacted in the future by one of the Build Alternatives. These impacts are discussed in Section 3.5.3.

The noise study conducted in 2004 (Hankard, 2004; 2010) analyzed noise levels using 2025 traffic volumes. Because the planning horizon now extends to 2035, CDOT conducted a traffic sensitivity analysis comparing 2025 and 2035 traffic volumes. The capacity of the highway does not change between 2025 and 2035; therefore, the definition of the traffic volume limits of LOS C does not change. The original noise model estimates remain accurate, and the model was not rerun. However, noise analysis will be rerun using 2035 traffic volumes in FHWA’s new TNM noise model prior to publication of the FEIS.

The STAMINA noise model was also used to predict the level of noise reduction that could be achieved with a barrier or wall. The location was then analyzed to determine whether it would be feasible to construct a noise wall at the impacted location. Finally, a cost-benefit analysis was conducted for each impacted location to determine whether the proposed walls were feasible and reasonable. The unit cost used in the cost-benefit analyses was \$30 per square foot of noise wall.

If they are both feasible and reasonable, mitigation measures must be considered by CDOT for areas that would be impacted by future noise levels. Feasibility refers to the engineering design and noise reduction value. For a noise reduction measure to be considered effective, the mitigation measure must reduce noise levels by 5 dBA or more (a level where the human ear could distinguish a real difference). Reasonableness is the cost-effectiveness of the measure, including the following factors: the number of receptors served; total cost of construction of the mitigation measure; severity of the noise impact (either overall levels or increase over current conditions); and community desires. Details regarding recommended mitigation associated with the Build Alternatives are included in Section 3.5.5.

3.5.3 Affected Environment

The noise study area extended approximately 500 feet beyond the project limits at the 29th Street interchange to the north and the Pueblo Boulevard interchange to the south. Current (2003) loudest-hour noise levels throughout the corridor were predicted as a baseline, against which the increase in future noise levels for each of the three alternatives could be compared. As shown in **Exhibit 3.5-2**, under current conditions (2003), seven of the 39 selected receptor locations representing sensitive land use areas near I-25 were predicted to meet or exceed CDOT's noise abatement criteria levels.

3.5.4 Environmental Consequences

3.5.4.1 No Action Alternative

Noise levels from I-25 would increase between current conditions and conditions for the design year (2025) primarily due to changes in traffic volume and traffic speed. Noise levels predicted for the No Action Alternative in the design year (2025) for the impacted representative receptor locations are shown in **Exhibits 3.5-3, 3.5-5, and 3.5-7** for the North, South, and Central areas, respectively.

The Central Area of the corridor is currently operating near peak capacity; therefore, this area cannot absorb additional traffic without increasing traffic congestion and lowering speeds. Lower speeds result in reductions in traffic noise levels.

Under the No Action Alternative, none of the receptor locations would experience a substantial noise increase as defined by CDOT's 10 dBA increase criterion; however, 17 of the 39 representative receptor locations would be considered impacted by noise because noise levels at these locations would meet or exceed the noise abatement criteria. Most of the impacted receptors are concentrated in the northern and southern parts of the project area between US 50 and 13th Street and Aqua Avenue and Pueblo Boulevard, respectively. In general, residential-type locations within approximately 250 to 300 feet of the highway centerline would be impacted by noise under the No Action Alternative if noise barriers were not constructed by 2025.

EXHIBIT 3.5-2

Receptors with Noise Impacts under Current (2003) Conditions

Noise Receptor #	Activity Category B Type ¹	General Location	Current Noise Level (dBA) ²
32	Residential	24th Street and Main Street	67
28	Park	Fountain Creek Park Land	67
22	Residential	Goat Hill Area – Bradford Street	66
19	Residential	Locust Street and Moffat Street	66
18	Residential	B Street and Rush Street	66
6	Residential	Emerson Avenue and Abriendo Avenue	70
4	Residential	Aqua Avenue and Evans Avenue	70

Source: Hankard Environmental, Inc., 2004; 2010.

dBA = A-weighted decibel

¹Activity Category B includes picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.

²CDOT's Traffic Noise Abatement Criteria for Activity Category B is 66 dBA.

3.5.4.2 Build Alternatives

Noise levels for both Build Alternatives are anticipated to increase up to 7 dBA over current (2003) conditions. None of the receptors would experience a substantial noise increase as defined by CDOT's 10 dBA increase criterion.

Noise level increases would be higher under the Build Alternatives than under the No Action Alternative primarily because the alignment of I-25 would be modified, thus bringing the highway closer to some receptors. Noise levels are predicted to decrease for areas where the Build Alternatives would shift away from that area. For the majority of areas, the noise levels are predicted to increase by an average of approximately 3 dBA under the Existing I-25 Alternative and 2 dBA under the Modified I-25 Alternative.

Thirteen of the 39 representative receptor locations would meet or exceed the noise abatement criteria under the Existing I-25 Alternative, and 13 of the 39 representative receptor locations would meet or exceed the noise abatement criteria under the Modified I-25 Alternative. Before the implementation of noise mitigation, the Existing I-25 Alternative would impact 160 residences, 5 commercial businesses, 1 industrial facility, 1 museum, and 3 parks. The Modified I-25 Alternative would impact 115 residences, 5 commercial businesses, 1 industrial facility, 1 museum, and 3 parks.

Under both Build Alternatives, construction would generate noise from construction equipment. Construction noise at receptor locations would be dependent on the equipment operating at any given moment. Noise levels from diesel-powered equipment range from 80 dBA to 95 dBA at a distance of 50 feet, while impact equipment such as rock

drills and pile drivers can generate louder noise levels. Construction noise impacts are temporary and can be mitigated as detailed in Section 3.5.5.

Impacts to noise receptors and general impact areas are discussed below for each separate area of the corridor: north, south, and central. The first exhibit provided for each area (**Exhibits 3.5-3, 3.5-5, and 3.5-7**) lists the receptors that would experience noise impacts under one or more of the alternatives. All of the receptors subject to the Category B noise abatement criteria of 66 dBA are residences or parks. Some commercial or industrial receptors may exceed 66 dBA but do not exceed the criteria for Category A receptors. Noise measurements noted with an asterisk in these tables indicate that noise levels meet or exceed the Category B 66 dBA noise abatement criteria. The second exhibit provided for each area (**Exhibits 3.5-4, 3.5-6, 3.5-8, and 3.5-9**) geographically illustrates the locations of the receptors and locations identified as impacted using the noise contours.

North Area

The predicted noise levels for noise receptors in the North Area would be the same under both Build Alternatives because the alternatives share the same alignment in the North Area. Seven representative receptors, identified in **Exhibit 3.5-3** with asterisks, would meet or exceed CDOT's noise abatement criteria. The North Area would experience greater impacts than other areas of the corridor because this area contains more receptors with higher existing noise levels than other areas of the corridor; therefore, even a small increase in future noise levels would cause noise levels to meet or exceed the noise abatement criteria at many receptors in this area.

EXHIBIT 3.5-3

North Area Noise-Impacted Representative Receptors by Alternative

Noise Receptor #	General Location	Current Conditions (2003)	No Action Alternative (2025)	Existing and Modified I-25 Alternatives (2025) ¹
NORTH AREA				
22	Goat Hill Area – Kelly Street	66*	66*	70*
23	Goat Hill Area – Bradford Street	61	63	65 ²
27	Mineral Palace Park	65	67*	68*
28	Fountain Creek Park Land	67*	69*	69*
30	20th Street and Santa Fe Avenue	65	67*	66*
31	22nd Street and Main Street	65	66*	61
32	24th Street and Main Street	67*	69*	63
34	25th Street and Main Street	65	67*	66*
37	27th Street and Court Street	65	68*	66*
38	28th Street and Grand Avenue	64	66*	65
39	Tony's Mobile Home Park	65	69*	68*

Source: Hankard Environmental, Inc., 2004; 2010.

dBA = A-weighted decibel

I-25 = Interstate 25

* Indicates that noise levels would meet or exceed CDOT's Category B noise abatement criterion of 66 dBA.

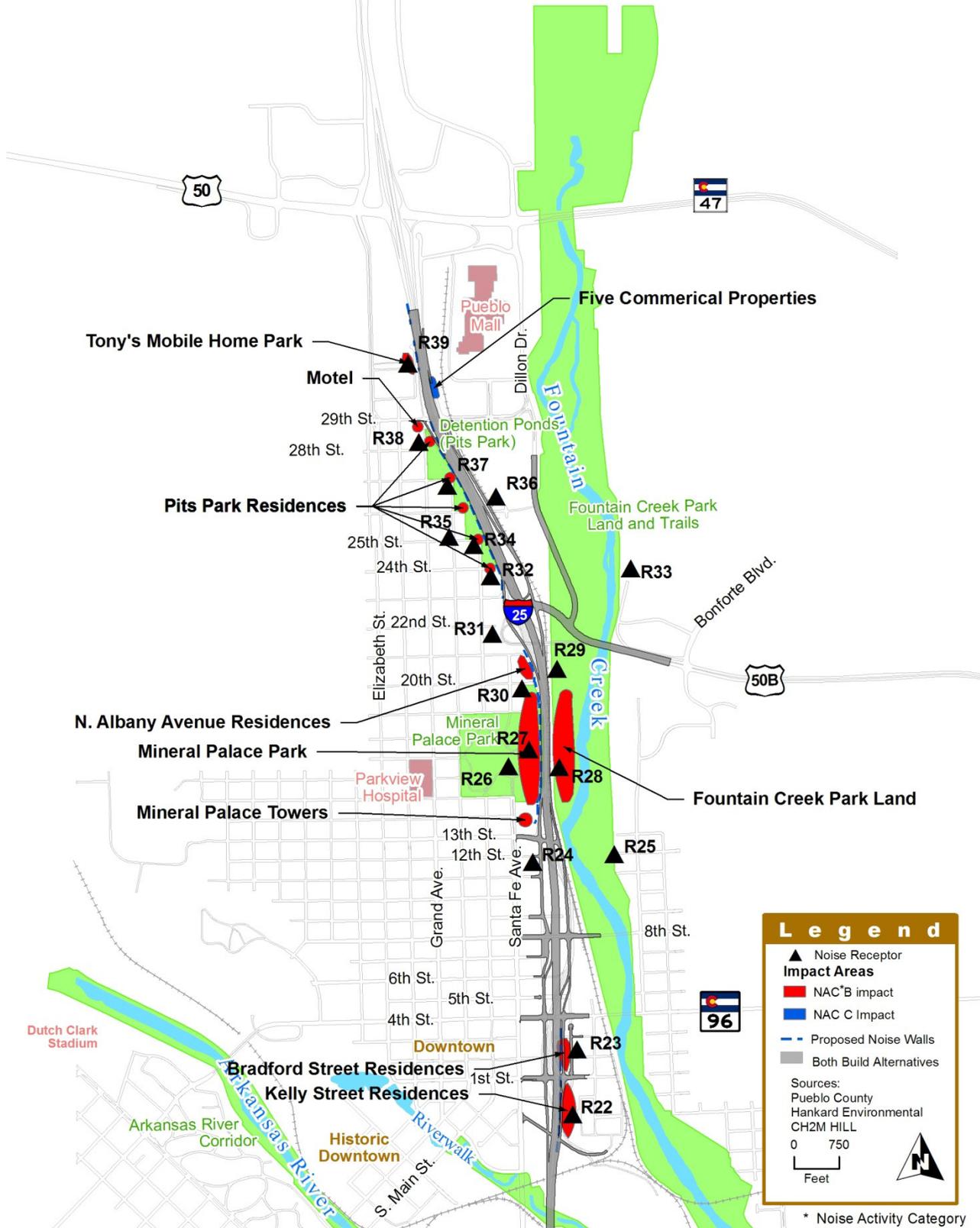
¹ These measurements differ from those presented in the *Noise Technical Memorandum, New Pueblo Freeway* (Hankard Environmental, Inc., 2004; 2010) due to rounding. Predicted measurements differed by up to 0.2 dBA between the Build Alternatives, and the reported measurement was different between the two alternatives. For example, 65.4 was rounded to 65 for one alternative, and 65.5 was rounded to 66 for the other alternative. Because these differences were small, the higher dBA measurement is used in this table to represent the noise level for both Build Alternatives.

² This measurement was taken at receptor R23, which represents the second row of homes. Noise contours indicate that noise levels for the first row of homes would be higher, resulting in a NAC B impact as shown in Exhibit 3.5-4.

Exhibit 3.5-4 illustrates areas of noise contour-defined impacts in the North Area, where noise contours indicate that noise levels would exceed the noise abatement criteria at sensitive receptors. The red-shaded areas are areas where noise levels would meet or exceed CDOT's Category B noise abatement criterion of 66 dBA, which applies to residential-type receptors. The blue-shaded area is an area

where noise levels would meet or exceed CDOT's Category C noise abatement criterion of 71 dBA, which applies to commercial-type receptors. **Exhibit 3.5-4** also shows the locations of proposed noise walls in the North Area. Noise walls are discussed in detail in Section 3.5.5.

EXHIBIT 3.5-4
North Area Build Alternative Representative Receptors



South Area

The predicted noise levels at representative receptors in the South Area were the same for both Build Alternatives because they share the same alignment in the South Area. Two representative receptors, shown in **Exhibit 3.5-5**, would meet or exceed CDOT's noise abatement criteria.

Exhibit 3.5-6 shows the areas of noise contour-defined impacts in the South Area, where noise contours indicate that noise levels would exceed the noise abatement criteria

at sensitive receptors. Both of the impact areas (shaded red) are areas where noise levels would meet or exceed CDOT's Category B noise abatement criterion of 66 dBA, which applies to residential-type receptors. There would be no noise impacts to other types of receptors, such as commercial properties. **Exhibit 3.5-6** also shows the locations of proposed noise walls in the South Area. Noise walls are discussed in detail in Section 3.5.5.

EXHIBIT 3.5-5

South Area Noise-Impacted Representative Receptors by Alternative

Noise Receptor #	General Location	Current Conditions (2003)	No Action Alternative (2025)	Existing and Modified I-25 Alternative (2025) ¹
SOUTH AREA				
2	JJ Raigoza Park	64	67*	67*
3	Iowa Avenue and Evans Avenue	64	67*	66*

Source: Hankard Environmental, Inc., 2004; 2010.

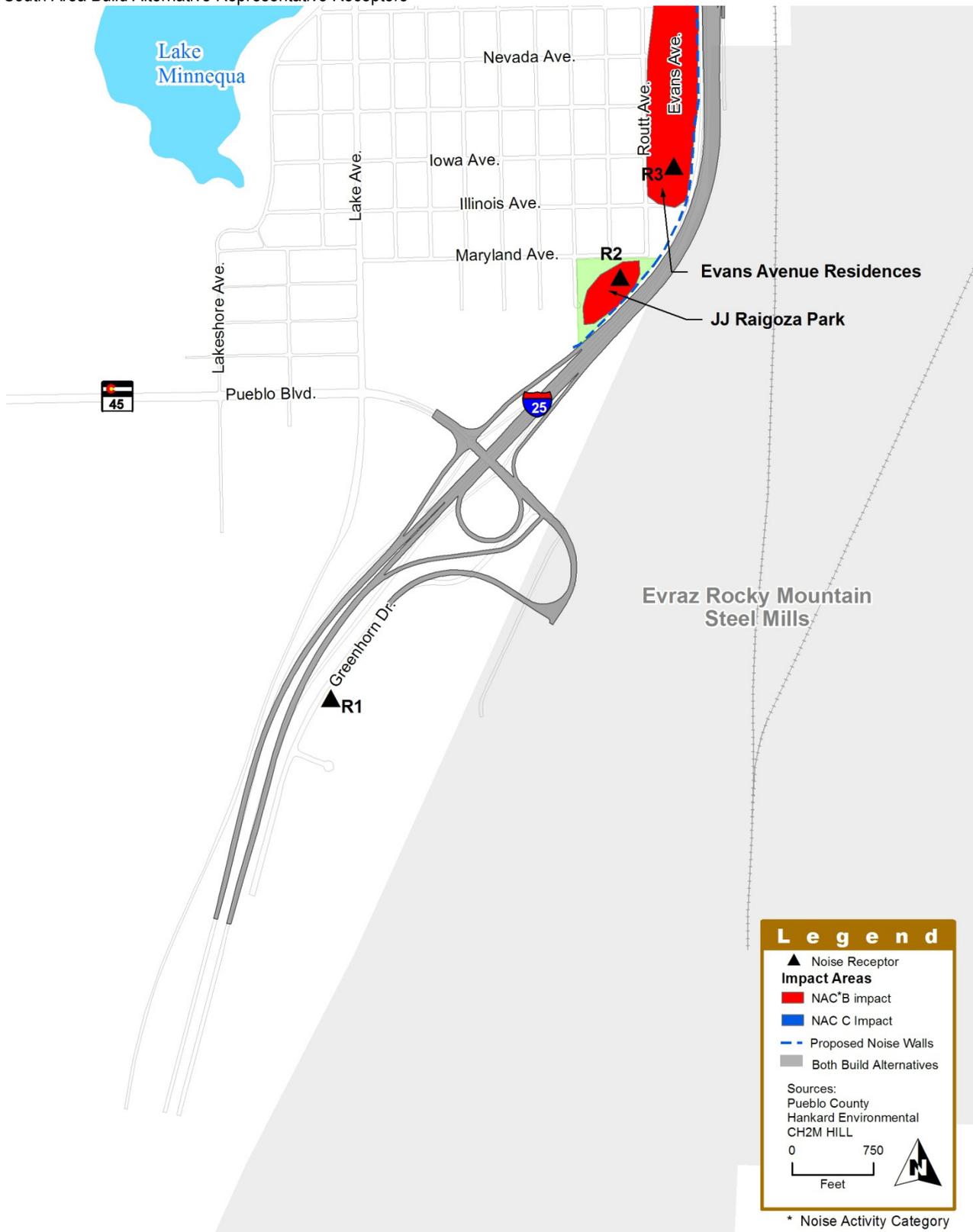
dBA = A-weighted decibel

I-25 = Interstate 25

* Indicates that noise levels would meet or exceed CDOT's Category B noise abatement criterion of 66 dBA.

¹ These measurements differ from those presented in the *Noise Technical Memorandum, New Pueblo Freeway* due to rounding (Hankard Environmental, Inc., 2004; 2010). Predicted measurements differed by up to 0.2 dBA between the Build Alternatives, and the reported measurement was different between the two alternatives. For example, 65.4 was rounded to 65 for one alternative, and 65.5 was rounded to 66 for the other alternative. Because these differences were small, the higher dBA measurement is used in this table to represent the noise level for both Build Alternatives.

EXHIBIT 3.5-6
 South Area Build Alternative Representative Receptors



Central Area

The predicted noise levels for noise receptors in the Central Area would differ between the two Build Alternatives because the alternatives would follow different alignments. **Exhibit 3.5-7** shows that under both Build Alternatives, four receptors would meet or exceed CDOT's noise abatement criteria; however, the impacted receptors differ by alternative.

Exhibit 3.5-8 shows the areas of noise contour-defined impacts for the Existing I-25 Alternative in the Central Area, where contours indicate that noise levels would exceed the noise abatement criteria at sensitive receptors.

Exhibit 3.5-9 shows similar information for the Modified I-25 Alternative. All of the impact areas (shaded red) are areas where noise levels would meet or exceed CDOT's Category

B noise abatement criterion of 66 dBA, which applies to residential type receptors. There would be no noise impacts to other types of receptors, such as businesses, under either alternative. **Exhibits 3.5-8 and 3.5-9** also include the locations of proposed noise walls in the Central Area. Noise walls are discussed in detail in Section 3.5.5.

3.5.4.3 Indirect Effects

Indirect impacts would be limited to the noise barriers proposed for noise abatement (see Section 3.5.5). These barriers might interfere with the passage of air, interrupt scenic views, or create objectionable shadows. They could also create maintenance access problems, make it difficult to maintain landscaping, create drainage problems, and provide pockets for trash to accumulate.

EXHIBIT 3.5-7

Central Area Noise-Impacted Representative Receptors by Alternative

Noise Receptor #	General Location	Current Conditions (2003)	No Action Alternative (2025)	Existing I-25 Alternative (2025) ¹	Modified I-25 Alternative (2025) ¹
CENTRAL AREA					
4	Aqua Avenue and Evans Avenue	70*	73*	72*	71*
6	Emerson Avenue and Abriendo Avenue	70*	73*	73*	67*
10	Benedict Park	59	60	62 ²	66*
15	Fairview Avenue and Currie Street	60	62	67*	64
18	B Street and Rush Street	66*	68*	66*	65
19	Locust Street and Moffat Street	66*	66*	65	68*

Source: Hankard Environmental, Inc., 2004; 2010.

dBA = A-weighted decibel

I-25 = Interstate 25

* Indicates that noise levels would meet or exceed CDOT's Category B noise abatement criterion of 66 dBA.

¹ These measurements differ from those presented in the *Noise Technical Memorandum, New Pueblo Freeway* due to rounding (Hankard Environmental, Inc., 2004; 2010). Predicted measurements differed by up to 0.2 dBA between the Build Alternatives, and the reported measurement was different between the two alternatives. (For example, 65.4 was rounded to 65 for one alternative, and 65.5 was rounded to 66 for the other alternative.) Because these differences were small, the higher dBA measurement is used in this table to represent the noise level for both Build Alternatives.

² This measurement was taken at receptor R10, located east of the Benedict Park site. Noise contours indicate that noise levels within the current Benedict Park site would be higher, resulting in a NAC B impact as shown in Exhibit 3.5-8.

EXHIBIT 3.5-8
Existing I-25 Alternative Central Area Noise Representative Receivers

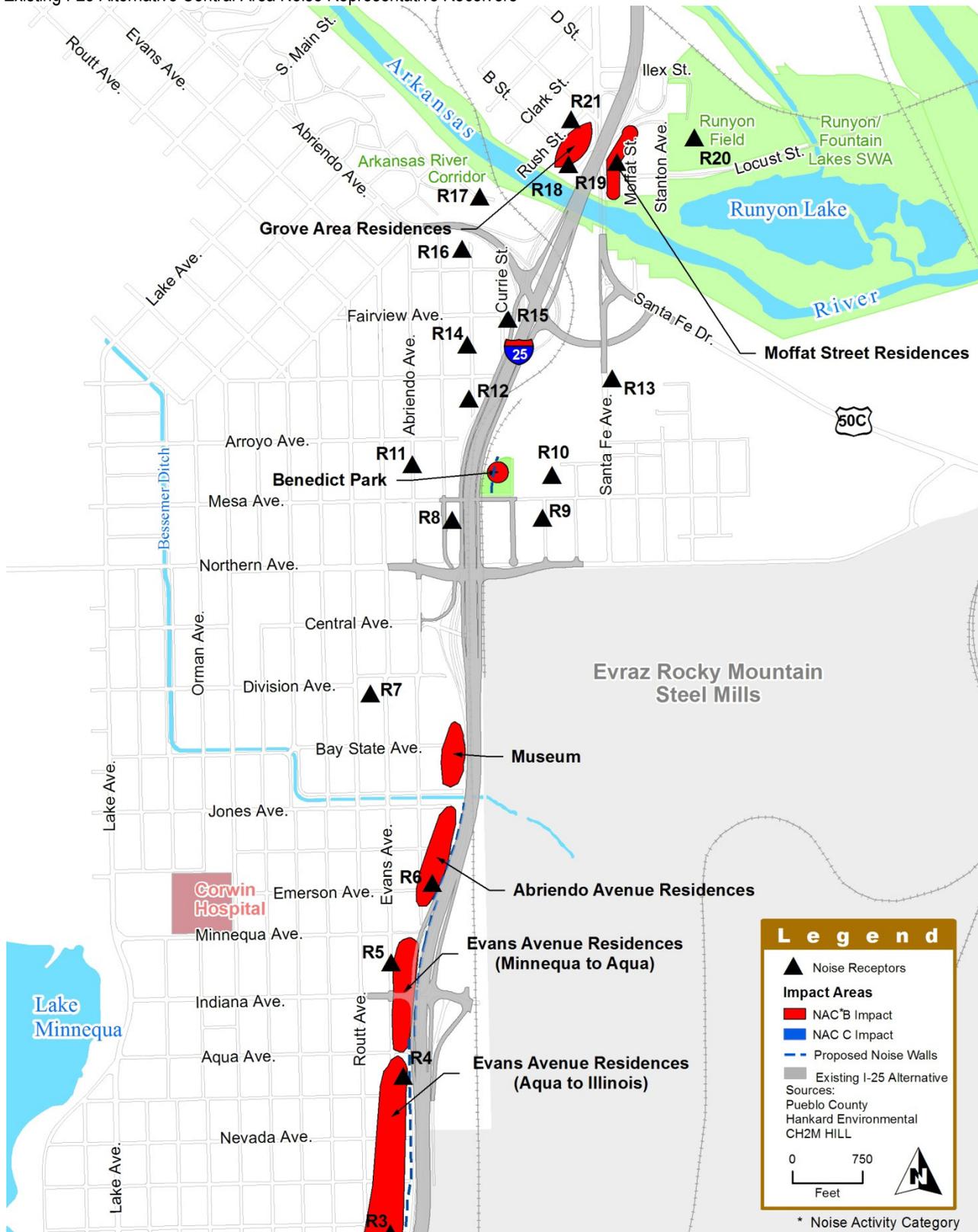
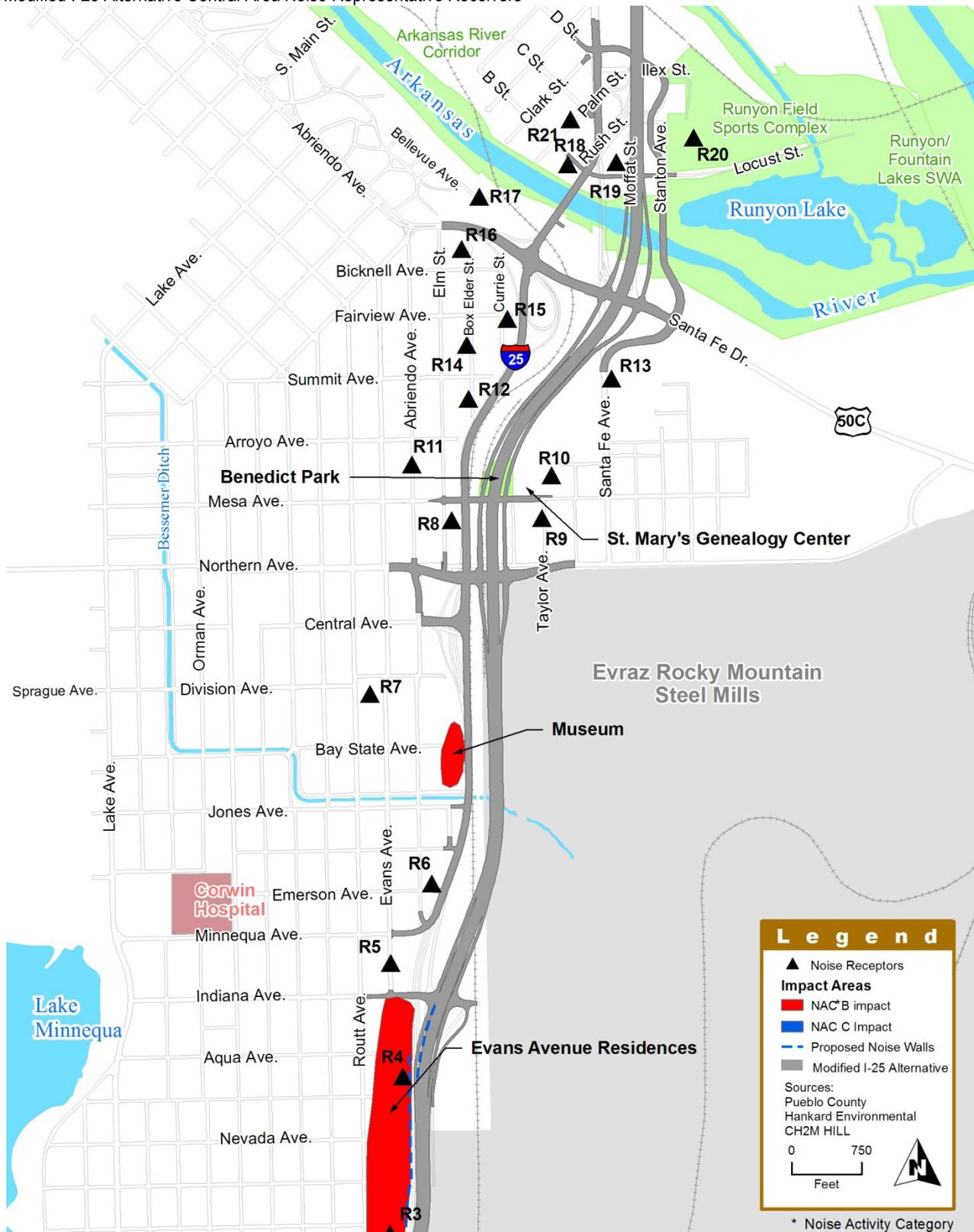


EXHIBIT 3.5-9
 Modified I-25 Alternative Central Area Noise Representative Receivers



3.5.5 Mitigation

Unless otherwise specified, the following mitigations apply to both the Existing I-25 Alternative and the Modified I-25 Alternative. Details regarding the predicted noise level reductions with mitigation, barrier effectiveness, cost, and other criteria used to determine the reasonableness and feasibility of noise mitigation are included in the *Noise Technical Memorandum, New Pueblo Freeway* (Hankard Environmental, Inc., 2004; 2010).

Some sites also qualify as Section 4(f) resources and are further protected by regulations that manage impacts to qualifying resources. Mineral Palace Park, Benedict Park, and JJ Raigoza Park area all recommended for mitigation and have been evaluated for noise barriers. While the Fountain Creek Park Land is also a Section 4(f) resource, there are no active recreational uses within the area impacted by noise, and mitigation is not recommended at this time. **Chapter 4 – Section 4(f) Evaluation** provides additional details on Section 4(f) resources.

Due to the limited space adjacent to the I-25 corridor, only noise walls were analyzed for mitigation in most locations. Conceptual drawings of the look of these noise walls are shown in **Exhibits 3.5-10 and 3.5-11**. The *New Pueblo Freeway Aesthetic Guidelines* (see **Appendix C**) provide additional details on the aesthetics of these walls. Other types of mitigation measures, such as landscape berms, require more space than would be available and were therefore not considered. The one exception is Mineral Palace Park, where space is available and there is a public desire for berms, which better fit the context of the park. In this case, both noise walls and landscape berms are proposed for noise mitigation. Although a noise impact occurs in the Fountain Creek Park Land (receptor #28), this area is undeveloped parkland and there are no active uses in this area; therefore, mitigation is not proposed.

Mitigation of impacts to commercial areas did not meet the reasonableness criterion for noise walls because: 1) there was no evidence of outdoor use at these locations; 2) interior noise levels would be below noise abatement criteria standards; and 3) walls would block visibility of the businesses from I-25.

Construction noise impacts will be mitigated by restricting construction to daylight hours when possible and requiring contractors to use well-maintained equipment. Additional noise analysis will be performed during final design to refine the final mitigation measures and dimensions.

North Area

Exhibit 3.5-12 lists the properties in the North Area that were evaluated for noise wall feasibility and reasonableness. **Exhibit 3.5-4** shows the locations of the noise contour-defined impact areas and the noise walls that will be constructed for mitigation.

- ❖ Approximately 10,525 linear feet of noise walls will be constructed by CDOT to reduce the noise impact for either of the Build Alternatives in the North Area.

South Area

Exhibit 3.5-13 lists the properties that were evaluated for noise wall feasibility and reasonableness. **Exhibit 3.5-6** shows the locations of the noise contour-defined impact areas and the noise walls that will be constructed for mitigation.

- ❖ Approximately 1,150 linear feet of noise walls will be constructed by CDOT to reduce the noise impact at JJ Raigoza Park in the South Area of the corridor for either Build Alternative.
- ❖ Approximately 2,120 linear feet of noise walls will be constructed by CDOT to reduce the noise impact to the Evans Residential area between Maryland Avenue and Nevada Avenue.

Central Area

Under the Existing I-25 Alternative, there were two areas in the Grove Neighborhood – Grove Residential Area (B Street to C Street) and Moffat Street (Locust Street to Juniper Street) – for which noise mitigation was not included because a 5 dBA noise reduction could not be achieved with a noise wall. These areas are located on both sides of I-25 just north of the Arkansas River crossing. A total of 71 residences in these two areas would be impacted by noise levels exceeding the Category B noise abatement criterion. Some of the noise impact in the Grove Neighborhood is due to traffic noise on Santa Fe Avenue outside the project limits.

EXHIBIT 3.5-10
Noise Wall Mitigation Concepts



EXHIBIT 3.5-11
Noise Wall Mitigation from the New Pueblo Freeway Aesthetic Guidelines

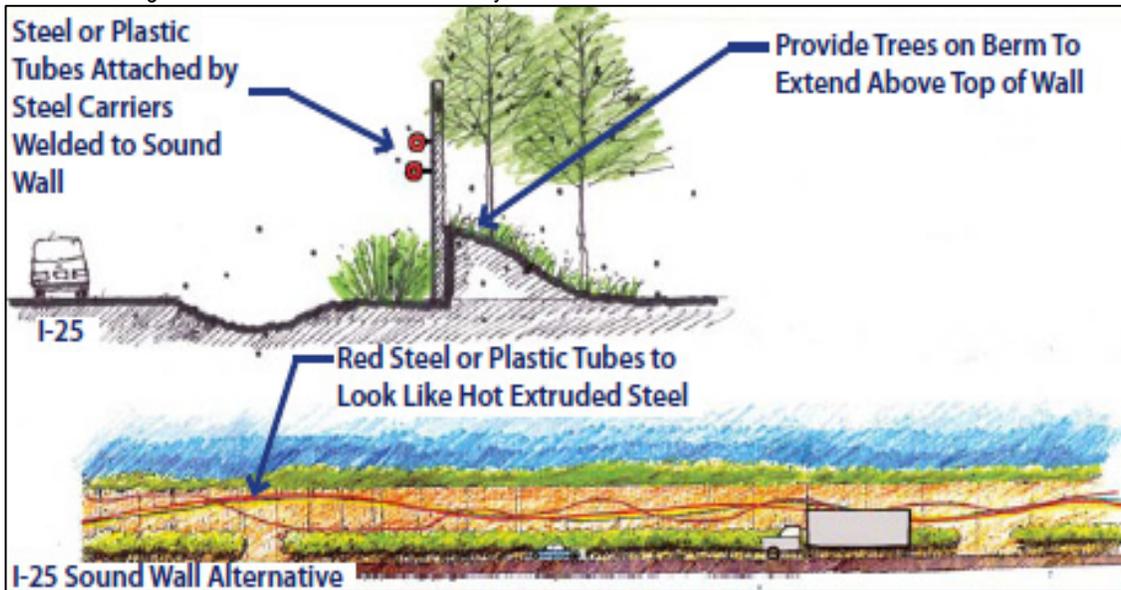


EXHIBIT 3.5-12

Summary of Noise Mitigation for Noise Contour-Defined Impact Areas under the Build Alternatives – North Area

General Location of Noise Contour-Defined Impact	Noise Abatement Criteria Category/Type	Noise Wall Analyzed (length [feet] x height [feet])	Mitigation to be Included in Project?	Notes
Tony's Mobile Home Park (31st Street and West of I-25)	Category B/ Residential	515 x 20	Yes	--
Motel (29th Street and I-25)	Category B/Motel	None	No	No active outdoor use.
Five Commercial Properties (North of 29th Street and East of I-25)	Category C/ Commercial	None	No	No active outdoor use at these five commercial properties, and typically these properties desire visibility from the highway.
Pits Park Residences (24th Street to 29th Street and West of I-25)	Category B/ Residential	3,265 x 15	Yes	--
N. Albany Avenue Residences (20th Street to 21st Street and West of I-25)	Category B/ Residential	1,190 x 20	Yes	The noise walls that are recommended at Mineral Palace Park would mitigate some of the impacts at the North Albany Avenue residences.
Fountain Creek Park Land (15th Street to 20th Street and East of I-25)	Category B/Park	None	No	The parkland is owned and maintained by the City as an undeveloped open space without any outdoor recreation uses that could be impaired due to noise. There are trails and picnic areas east of Fountain Creek; however, the area east of the creek is not impacted by noise.
Mineral Palace Park (15th Street to 19th Street and West of I-25)	Category B/Park	3,050 x 15 to 20	Yes	This would be mitigated by a combination of noise walls and noise berms.
Mineral Palace Towers (14th Street and West of I-25)	Category B/ Residential	None	No	No noise walls are proposed specifically for Mineral Palace Towers. The noise walls that are recommended for Mineral Palace Park would eliminate the noise impact at Mineral Palace Towers.
Kelly Street Residences (Beech Street to 1st Street and East of I-25)	Category B/ Residential	900 x 13	Yes	--
Bradford Street Residences (Beech Street to 1st Street and East of I-25)	Category B/ Residential	1,255 x 15	Yes	--

Source: Hankard Environmental, Inc., 2004; 2010.

I-25 = Interstate 25

EXHIBIT 3.5-13

Summary of Noise Mitigation for Noise Contour-Defined Impact Areas under the Build Alternatives – South Area

General Location of Noise Contour-Defined Impact	Noise Abatement Criteria Category/Type	Noise Wall Analyzed (length [feet] x height [feet])	Mitigation to be Included in Project?	Notes
JJ Raigoza Park (Maryland Avenue to Reno Avenue and West of I-25)	Category B/Park	1,150 x 20	Yes	For both the Existing I-25 Alternative and the Modified I-25 Alternative, a 20-foot-tall barrier would only be 13-feet taller than I-25 because the terrain slopes 7 feet between I-25 and the proposed noise wall location.
Evans Avenue Residences (Indiana Avenue to Illinois Avenue and West of I-25)	Category B/Residential	2,120 x 21	Yes	--

Source: Hankard Environmental, Inc., 2004; 2010.

I-25 = Interstate 25

The Modified I-25 Alternative would not create noise impacts in the Grove Neighborhood at Moffat Street (Locust Street to Juniper Street) because it would acquire all of the homes in the vicinity of the new alignment; thus, there would be no homes to impact). The Grove Area Residences from B Street to C Street would not be impacted because the alignment would shift to the east and away from these residences.

The Modified I-25 Alternative would not create noise impacts for the existing Benedict Park because the entire park would be acquired and relocated; thus, there would be no park at that location to impact. The relocated Benedict Park would not be impacted by noise.

Exhibit 3.5-14 and Exhibit 3.5-15 list the properties that were evaluated for noise wall feasibility and reasonableness for the Existing I-25 Alternative and the Modified I-25 Alternative, respectively.

Exhibit 3.5-8 and Exhibit 3.5-9 show the locations of the noise contour-defined impact areas and the noise walls that will be constructed for mitigation for the Existing I-25 Alternative and the Modified I-25 Alternative, respectively.

- ❖ Under the Existing I-25 Alternative, CDOT will construct approximately 9,915 linear feet of noise walls in the Central Area to reduce noise impacts.
- ❖ Under the Modified I-25 Alternative, CDOT will construct approximately 7,730 linear feet of noise walls to reduce noise impacts.

EXHIBIT 3.5-14**Summary of Noise Mitigation for Noise Contour-Defined Impact Areas under the Existing I-25 Alternative – Central Area**

General Location of Noise Contour-Defined Impact	Noise Abatement Criteria Category/Type	Noise Wall Analyzed (length [feet] x height [feet])	Mitigation to be Included in Project?	Notes
Moffat Street Residences (Locust Street to Juniper Street and East of I-25)	Category B/ Residential	970 x 21	No	Noise walls along I-25 could not achieve 5 dBA of noise reduction.
Grove Area Residences (on Palm Street from B Street to C Street)	Category B/ Residential	925 x 21	No	Noise walls along I-25 could not achieve 5 dBA of noise reduction.
Benedict Park (Mesa Avenue and East of I-25)	Category B/Park	500 x 15	Yes	Mitigation is recommended for the portion of the new Benedict Park located north of Mesa Avenue.
Museum (Bessemer Ditch to Bay State Avenue and West of I-25)	Category B/ Museum	Not evaluated	No	Noise mitigation was not desired for this area in order to maintain visual connection to Steel Mill site.
Abriendo Avenue Residences (Minnequa Avenue to Jones Avenue)	Category B/ Residential	1,690 x 15	Yes	--
Rocky Mountain Steel Mill (Northern Avenue to Pueblo Boulevard and East of I-25)	Category C/ Commercial	Not evaluated	No	No active outdoor use occurs at this receptor.
Evans Avenue Residences (Minnequa Avenue to Aqua Avenue and West of I-25)	Category B/ Residential	1,100 x 15	Yes	--
Evans Avenue Residences (Aqua Avenue to Illinois Avenue)	Category B/ Residential	980 x 21	Yes	--

Source: Hankard Environmental, Inc., 2004; 2010.

dBA = A-weighted decibel

I-25 = Interstate 25

EXHIBIT 3.5-15

Summary of Noise Mitigation for Noise Contour-Defined Impact Areas under the Modified I-25 Alternative – Central Area

General Location of Noise Contour-Defined Impact	Noise Abatement Criteria Category/Type	Noise Wall Analyzed (length [feet] x height [feet])	Mitigation to be Included in Project?	Notes
St. Mary's Genealogy Center and Gornick Slovenian Library (adjacent to current Benedict Park)	Category B/ Park	Not evaluated	To be determined	Noise levels inside the library will be measured to ensure that traffic noise is less than 51 dBA.
Museum (Bessemer Ditch to Bay State Avenue and West of I-25)	Category B/ Museum	Not evaluated	No	Noise mitigation was not desired for this area to maintain visual connection to Steel Mill site.
Abriendo Avenue Residences (Minnequa Avenue to Jones Avenue)	Category B/ Residential	Not evaluated	No	The design of the Modified I-25 Alternative at this location includes a combination of retaining walls and concrete barriers which reduce the noise levels at this location between the Category B noise abatement criterion. No further noise mitigation is necessary.
Rocky Mountain Steel Mill (Northern Avenue to Pueblo Boulevard and East of I-25)	Category C/ Commercial	Not evaluated	No	No active outdoor use occurs at this receptor.
Evans Avenue Residences (Indiana Avenue to Illinois Avenue and West of I-25)	Category B/ Residential	1,730 x 21	Yes	--

Source: Hankard Environmental, Inc., 2004; 2010.

dBA = A-weighted decibel

I-25 = Interstate 25