# I-25 (US 36 to 104th Avenue)

# TRAFFIC NOISE TECHNICAL REPORT

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# LIST OF ABBREVIATIONS AND ACRONYMS

| Abbreviation or Acronym | Full Name |
|---|---|
| Ave | Avenue |
| CAD | Computer-aided Design |
| CDOT | Colorado Department of Transportation |
| CFR | Code of Federal Regulations |
| Ct | Court |
| dB | Decibels |
| dBA | A-weighted decibels |
| EA | Environmental Assessment |
| EB | Eastbound |
| FAQ | Frequently asked question |
| FHWA | Federal Highway Administration |
| $ft^2$ | Square feet |
| Guidance | FHWA's Highway Traffic Noise: Analysis and Abatement Guidance |
| HCM | Highway Capacity Manual |
| I- | Interstate |
| ID | Identification |
| Leq | One-hour equivalent sound level |
| LOS | Level of Service |
| MF | Multi-Family |
| mph | Miles per hour |
| NAC | Noise Abatement Criterion |
| NAAG | Noise Analysis and Abatement Guidelines |
| NB | Northbound |
| NEPA | National Environmental Policy Act |
| OTIS | Online Transportation Information System |
| Pkwy | Parkway |
| Pl | Place |
| PR | Proposed |
| SB | Southbound |
| SF | Single-Family |
| St | Street |

| Abbreviation or Acronym | Full Name |
|---|---|
| TNM | FHWA's Traffic Noise Model |
| US 36 | United States Highway 36 |
| WB | Westbound |

# 1 EXECUTIVE SUMMARY

This traffic noise technical report has been prepared in support of the I-25 (US 36 to 104th Avenue) Safety and Operations Improvements project. An overview of this project's traffic noise analysis and abatement evaluation is shown in Table 1.

**Table 1 Project Overview**

| | |
|---|---|
| **Project Location** | This project is on Interstate 25 (I-25) between United States Highway 36 (US 36) and 104th Avenue (Ave), including portions of the US 36 and I-270 interchange, and is located in Denver, Thornton, Northglenn, and unincorporated Adams County, Colorado (see Figure 1). |
| **Type I Status Explanation** | This project is Type I because it would include the addition of through-traffic lanes and auxiliary lanes. Specifically, a northbound through-traffic lane will be added starting at the interchange with I-270 to 104th Avenue, and a southbound through-traffic lane will be added from 104th Avenue to 84th Avenue. Continuous auxiliary lanes will be added in the following areas: 3,900 feet from 84th Ave NB to Thornton Pkwy, 3,900 feet from Thorton Pkwy NB to 104th Avenue, and 4,300 feet from Thornton Pkwy SB to 84th Ave. |
| **Noise Level and Impact Overview** | Existing condition (2024) modeled noise levels range from 44.9 to 75.3 A-weighted decibels (dBA) at 214 receivers[1], which represent 754 receptors.<br>Design year (2050) modeled noise levels for the No Action Alternative range from 45.2 dBA to 75.5 dBA at 214 receivers, which represent 754 receptors.<br>Design year (2050) modeled noise levels for the Proposed Action range from 46.6 dBA to 78.9 dBA at 214 receivers, which represent 754 receptors. The Proposed Action is expected to impact the following receivers and receptors:<br>16 Activity Category B receivers/60 receptors<br>19 Activity Category C receivers/78 receptors |
| **Noise Abatement Considerations and Commitments Overview** | Six noise walls were evaluated, as shown in Figures 6A-F. Two noise walls were found to be feasible and reasonable and will be recommended, as shown in Tables 10A-B. Two of the noise walls were analyzed due to the project's impact to an existing barrier that will be partially or fully demolished. Even though one of these walls did not meet the feasible and reasonable criteria, a new wall (PR-Wall 1) will be constructed to replace the partially demolished existing barrier (Wall 5). At a minimum, this new barrier needs to match the dimensions of the existing barrier to be replaced: 12 ft in height and 268 ft in length. |
| **Information for Local Officials** | This project's Noise Study Zone includes land that is unpermitted and undeveloped (i.e., Activity Category G). Therefore, Part 772.17 of Title 23 of the Code of Federal Regulations (23 CFR 772.17) is applicable and information needs to be provided to local officials, as described in Chapter 9. |

[1] A receiver is a modeled point that represents one or more receptors. Receptor types are listed in Table 3, in the column titled "Activity Description." A receiver that represents more than one receptor must represent receptors of the same Activity Category.

# 2 PROJECT INTRODUCTION

Colorado Department of Transportation (CDOT), in cooperation with the Federal Highway Administration (FHWA), is preparing NEPA documentation for this project. The improvements, which are described in Table 2 and hereafter called the Proposed Action, constitute a Type I project because the project proposes capacity improvements for more than three miles of I-25 between the US 36/I-76/I-270 interchange and 104th Ave. Type I related improvements include adding a fourth northbound and southbound general-purpose lane from approximately 84th Ave to 104th Avenue. Continuous 12-foot auxiliary lanes will also be added for about 3,900 feet between 84th Ave NB to Thornton Pkwy, about 3,900 feet between Thornton Pkwy NB and 104$^{th}$ Avenue, and for about 4,300 from Thornton Pkwy SB to 84th Ave.

Because the project is Type I and because there is at least one Activity Category A, B, C, D, and/or E receptor within the Noise Study Zone, a noise analysis is needed to determine if receptors will be impacted as a result of building the project. AtkinsRéalis, acting on behalf of CDOT, conducted a noise analysis for the project and prepared this report using the CDOT noise report template. Table 2 includes information about this project and provides context for this traffic noise analysis.

**Table 2 Project Background**

| | |
|---|---|
| **Project Location** | Denver; Thornton; and Northglenn; and Adams County, Colorado (See Figure 1) |
| **Affected Roadways** | I-25 mainline<br>I-76 EB to I-25 NB ramp, US 36 EB to I-25 NB ramp, I-270 WB, and I-270 WB on-ramp to I-25 NB<br>I-25 on- and off-ramps to 84th Ave and Thornton Pkwy Intersections<br>I-25 NB off-ramp to and I-25 SB on-ramp from 104th Ave Intersection<br>88th Avenue over I-25 |
| **Project Purpose** | The purpose of this project on I-25 between US 36 and 104th Avenue is to improve safety and traffic operations. |
| **Project Need** | Project needs include the following:<br>Improve safety<br>Improve traffic operations |
| **Proposed Action Description** | The Proposed Action elements are described as:<br>Adding a fourth northbound general-purpose lane to the three existing general-purpose lanes from the I-76 entrance ramp to 104th Avenue.<br>Adding a fourth southbound general-purpose lane to the three existing general-purpose lanes from 104th Avenue to just south of 84th Avenue.<br>The buffer between the express lanes and their nearest general-purpose lane will be expanded from one to 4 feet between approximately US 36 and 104th Ave.<br>Adding continuous auxiliary lanes in both directions between the 84th Avenue and Thornton Pkwy interchanges. The auxiliary lane from 84th Ave NB to Thornton Pkwy is about 3,900 feet or 0.74 miles. The auxiliary lane from Thornton Pkwy SB to 84th Ave is about 4,300 feet or around 0.81 miles.<br>Adding a new continuous northbound auxiliary lane between I-270 and 84th Avenue, for a distance of approximately one mile.<br>Replace the existing bridge along 88th Avenue over I-25. The new bridge will consist of one lane of traffic and a bike lane in each direction, compared to the existing four-lane bridge, and 88th Avenue will be restriped as a two-lane section with a bike lane. The proposed bridge will be approximately 3.5 feet higher in elevation over I-25 than existing conditions.<br>Bring corridor up to standard with expanded inside and outside shoulders with typical 10-foot widths, and minimum 6.5-foot inside and 7-foot outside widths in restricted locations.<br>Expansion of the I-270 exit to northbound I-25 from one to two lanes; I-270 merge with I-25 shifted further north.<br>Removal of a direct bus access slip ramp at the Thornton Park-n-Ride. While buses will be routed differently, they will still have access to the Park-n-Ride.<br>Realignment of the I-25 adjacent existing trail and pedestrian network within the Niver Creek open space. |
| **No Action Alternative Description** | The 2050 transportation plan includes the Direct Connection Project between the I-25 and I-270 express lanes, which may be built within the southern limits of the project area. However, the Direct Connection Project has not yet been designed or funded and was therefore not included in the No Action or Proposed Action noise analysis. |
| **Prior National Environmental Policy Act (NEPA) Approvals** | Not applicable. This project is a new action. |

# 3 BACKGROUND

This noise analysis was done as required by 23 CFR 772 in accordance with CDOT's **Noise Analysis and Abatement Guidelines** (NAAG) (CDOT, 2020) and FHWA's **Highway Traffic Noise: Analysis and Abatement Guidance** (Guidance) (FHWA, 2011). The analysis determines whether 2050 traffic noise levels from the Proposed Action will exceed applicable impact thresholds at properties (i.e., receptors) within the Proposed Action Noise Study Zone (this zone is described in Section 4.1). Traffic noise abatement is evaluated for any such impacted receptors. The analysis was conducted based on design files provided by AtkinsRéalis. The draft files were received by the noise analyst in December 2024, with updated portions obtained in March 2025 and again in August 2025 and June 2026 to reflect the preferred alternative. The analysis is based on a 30 percent, or FIR, level of design.

This noise analysis included the following tasks:

- Conducting field measurements of existing condition sound levels (see Section 4.3)
- Validating an existing condition noise model using field measurement results (see Section 4.4)
- Modeling existing noise levels for existing roadways (see Chapter 5)
- Modeling Proposed Action and a design year No Action Alternative noise levels for design roadways (see Chapter 5)
- Evaluating noise abatement (see Chapter 6)
- Modeling noise contour lines for unpermitted, undeveloped land (see Chapter 9).

## 3.1 Characteristics of Noise

Fundamental information about noise, such as terminology, how sound travels, and sound intensity, is included in Appendix B of The CDOT NAAG. It is incorporated by reference to supplement this report.

## 3.2 Applicable Regulations, Guidelines, and Tools

The following regulation, guidelines, and tools were used to complete this noise analysis:

- **23 CFR Part 772 (Procedures for Abatement of Highway Traffic Noise and Construction Noise)** (23 CFR §772, 2010): Federal highway noise standard that must be followed in analyzing and abating highway traffic noise. This regulation required states to adopt state-specific guidelines, which included adopting specific parameters such as the noise reduction design goal.
- **CDOT NAAG** (CDOT, 2020): Fulfilled Federal requirement to adopt state-specific guidelines. Provides Colorado's procedural and technical requirements for analyzing highway project traffic noise and evaluating noise abatement.
- **FHWA Guidance** (FHWA, 2011): Provides FHWA guidance for applying 23 CFR Part 772 in the analysis and abatement of highway traffic noise.
- **Noise Measurement Handbook** (FHWA, 2018): Includes procedures for measuring highway noise.
- **FHWA Traffic Noise Model (TNM) Version 2.5** (FHWA, February 2004): Model used to determine existing condition and design year noise levels.

## 3.3 CDOT Noise Abatement Criteria and Land Use Activity Categories

A traffic noise impact occurs if either of the following conditions is met:

- Predicted design year traffic noise level approaches (i.e., equals) or exceeds CDOT's Noise Abatement Criteria (NAC) at any receptor
- Predicted design year traffic noise level substantially exceeds the existing condition highway traffic noise level at any receptor. "Substantial" is defined as a noise increase of 10 dB or more between the existing condition and design year noise levels.

Table 3 shows CDOT's NAC. The CDOT NAAG requires that the one-hour equivalent sound level (Leq) be used in the analysis.

The NAC for Activity Category D applies to interior areas of frequent human use. All other NACs apply to exterior areas of frequent human use. Examples of exterior areas include yards for Activity Category B, park activity areas for Activity Category C, and exterior restaurant dining areas for Activity Category E.

Undeveloped lands for which development has been permitted before the Date of Public Knowledge must be treated as though the development has already been constructed. CDOT considers a proposed development to be permitted when a formal building permit has been issued to the developer.

**Table 3 CDOT Noise Abatement Criteria**

| Activity Category | Activity $L_{eq}$ (dBA) [1, 2] | Evaluation Location | Activity Description |
|---|---|---|---|
| A | 56.0 | 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 [3] | 66.0 | Exterior | Residential |
| C [3] | 66.0 | Exterior | Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreational areas, Section 4(f) sites, schools, television studios, trails, and trail crossings. |
| D | 51.0 | Interior | Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios. |
| E [3] | 71.0 | Exterior | Hotels, motels, time-share resorts [4], offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F. |
| F | Not Applicable | Not Applicable | Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship yards, utilities (water [5] resources, water treatment, electrical), warehousing, malls [5], stores [5], shops [5], and Government managed land. [4, 6] |
| G | Not Applicable | Not Applicable | Undeveloped lands that are not permitted. |

**Notes:**

1. Table 1 of 23 CFR 772 allows state highways agencies to use either Leq(h) or L10(h) on a project, but not both. CDOT uses Leq(h), which is an Hourly A-weighted sound level in dBA.
2. NACs are for impact determination only. They are not design standards for noise abatement measures.
3. Includes undeveloped lands permitted for this activity category.
4. This activity description is not listed in Table 1 of 23 CFR 772.
5. This activity description is not listed in Table 1 of 23 CFR 772, but is in FHWA's FAQ D7.
6. Areas of frequent human use within the Government (Federal, State, and County) managed land will be treated as the appropriate land use (e.g., a campground would be Activity Category C, as described in Section 3.5.4 of the CDOT NAAG).

# 4 NOISE ANALYSIS METHODS

The noise analysis includes identifying the Noise Study Zone, identifying the land uses within the Noise Study Zone, taking noise measurements within the Noise Study Zone, validating the existing condition noise model, and inputting several parameters into the noise model. These steps are described in this chapter.

## 4.1 Noise Study Zone Identification

The Noise Study Zone for this project extends 500 feet in all directions from the proposed edge of travel lanes of freeways or expressways, as shown on Figures 2A-C. Although the Noise Study Zone would only extend 300 feet for other types of roads, the 300-foot boundary for all areas with other types of roads that are part of the project are within the boundary from I-25.

## 4.2 Land Use Identification

Table 4 identifies the land use categories, receivers, and receptors included in the noise analysis. Figures 2A-C identifies land uses in the Noise Study Zone.

**Table 4 Land Use Considerations**

| | |
|---|---|
| **Receiver Activity Category Summary (see Table 9)** | Receivers with the following Activity Categories were modeled in the existing condition and design year scenarios:<br>Activity Category B: 178 receivers representing 590 receptors<br>Activity Category C: 30 receivers representing 149 receptors<br>Activity Category E: 6 receivers representing 15 receptors |
| **Other Considerations** | The Noise Study Zone does not contain any permitted receptors that have not been built.<br>The Noise Study Zone contains Activity Category F activities and Activity Category G land. Activity Category F activities and Activity Category G land are not considered noise sensitive, so receivers are not required for these locations. However, contour lines must be provided for Activity Category G lands. These are shown on Figures 7A-C.<br>The Noise Study Zone has nine Section 4(f) sites with frequent human use, which were modeled as receivers R-65E, R-74W-76W, and R-91E–R-97E.<br>The Noise Study Zone has three historic properties protected by Section 106, which may require noise information for Section 106 purposes that may differ from highway traffic noise requirements. These are discussed in the Section 106 Technical Report. |

## 4.3 Field Noise Measurements

Field noise measurements performed for this analysis are summarized in Tables 5 and 6. Noise measurements were performed at different locations, as shown on Figures 2A-C, to acquire data for validation of the existing condition model. Associated traffic counts and speeds are listed in Table A-1 of Appendix A. Field noise measurement data sheets are in Appendix A.

**Table 5 Field Noise Measurement Summary**

| Measurement Location ID | Location | Date | Start Time (a.m. or p.m.) | Stop Time (a.m. or p.m.) | Length (minutes) |
|---|---|---|---|---|---|
| Site 1 | Mapleton Schools Complex | 01/03/25 | 10:50 a.m. | 11:05 a.m. | 15 |
| Site 2 | 8184 Sherman St | 01/03/25 | 11:20 a.m. | 11:35 a.m. | 15 |
| Site 3 | Pinnacle Athletic Complex | 01/03/25 | 12:00 p.m. | 12:15 p.m. | 15 |
| Site 4 | Olinger Cemetery | 01/03/25 | 2:20 p.m. | 2:35 p.m. | 15 |

**Table 6 Field Noise Measurement Details**

| | |
|---|---|
| **Number of Field Measurement Locations** | 4 |
| **Field Measurement Locations** | Traffic noise field measurement locations are shown on Figures 2A-C. These measurement locations were selected because they represented noise sensitive areas with areas of frequent outdoor use (i.e., school, athletic field, and cemetery), and for all but one instance, were not influenced by an existing noise wall. Site 2 was chosen to measure the noise levels within a residential neighborhood, which are all currently located behind existing noise walls. |
| **Basis for Measurement Length** | Steady-state reading was obtained after 15 minutes while traffic on the road was at a high-volume. |
| **Method to Estimate Traffic Volume During Field Measurement** | Video was obtained for the highway and vehicle counts and were tallied in the office after the validation readings. Some traffic volume counts (single lane or ramp volumes) were collected in the field with pen and paper at the time of the validation readings. |
| **Method to Estimate Traffic Speed** | Drove test vehicle through traffic within 15 minutes of noise measurement; traffic was still representative of when measurements were taken. |
| **Weather Conditions Summary (See Appendix A)** | Field measurements were made during weather conditions acceptable according to FHWA guidance (FHWA, 2018). Weather conditions, including wind speed, were monitored during the measurements. |
| **Sound Level Meter Used** | 3M SE-401; Type 1 |
| **Sound Level Meter Laboratory Calibration Date** | 2/16/2024 |
| **Field Calibrator Used** | 3M AC-300<br>Calibrations traceable to the United States National Institute of Standards and Technology were performed in the field before each set of measurements and checked in the field after each set of measurements. |
| **Height of Noise Measurement Above Grade** | 5 feet |

## 4.4 Validation of Existing Condition Model

Existing condition noise levels were measured in the field, as described in Section 4.3, and compared to computer noise level predictions that were based on traffic data measured in the field. This was done to verify the accuracy of the existing condition noise model. This process is called validation of the existing condition noise model. The model may be described as being an initial existing condition model during the validation process because it is not required to include any receivers except those representing the noise measurement locations.

If predicted and measured noise levels are within ±3.0 dB of each other, the existing condition noise model is within the accepted level of accuracy and is considered to have been validated. Measured noise levels, corresponding modeled noise levels, and the differences between the two are presented in Table 7.

**Table 7 Existing Condition Model Validation Summary**

| Noise Measurement Location ID | Location (see Figures 2A-C) | Measured Leq (dBA) | Modeled Leq (dBA) | Difference (dB) |
|---|---|---|---|---|
| Site 1 | Mapleton Schools Complex | 77.0 | 74.2 | 2.8 |
| Site 2 | 8184 Sherman St | 62.6 | 61.5 | 1.1 |
| Site 3 | Pinnacle Athletic Complex | 73.4 | 71.9 | 1.5 |
| Site 4 | Olinger Cemetery | 72.1 | 74.9 | 2.8 |

Differences between measured and predicted levels are all within the allowable ±3.0 dB tolerance. Therefore, the existing condition noise model is considered to be validated for this project.

## 4.5 TNM Model Inputs

The noise model software being used on this project was TNM Version 2.5. It was used to analyze existing condition (2024) and design year (2050) noise levels. As part of the analysis, the model calculated noise levels at receivers that are in the Noise Study Zone. Each receiver represented one or more receptors. Modeling results represent predicted traffic conditions during worst-hour noise periods. Table 8 describes model inputs and methods.

**Table 8 TNM Model Inputs and Methods**

| | |
|---|---|
| **Noise Sensitive Receptors** | Noise sensitive receptors are defined according to Table 3. Receivers (modeled points) have been selected to represent these receptors within the Noise Study Zone. |
| **Receivers** | Receivers are listed in Table 9 and shown on Figures 4A-J, 5A-K, and 6A-H. |
| **Modeled Roadways** | The following roadways were modeled:<br>I-25 mainline<br>I-25 on- and off-ramps<br>US 36/I-270 interchange<br>84th Ave<br>88th Ave<br>Thornton Pkwy<br>104th Ave<br>For the Proposed Action, the analysis included roads that would be changed or newly built by the project or would be important local traffic noise sources. |
| **Differences in How Roadways Were Modeled Between Alternatives** | The only difference between the Existing and No Action conditions was the traffic volumes in instances where the LOS C/D threshold was not reached. If the peak hour volume on an existing link was less than a LOS C/D threshold, and the volume increased in the future condition, the volume was modeled at the higher value in the future models. If the LOS C/D threshold was met under the Existing and future conditions, then the volumes stayed the same in 2050 (which was mainly seen on the I-25 mainline). Between the Proposed Action model and the Existing conditions, the Proposed Action model reflected the Proposed Action design elements described in Table 2 and the associated loudest hour Proposed Action Condition traffic volumes. |
| **TNM Objects and Elevations** | The following objects were modeled: terrain lines, buildings modeled as building rows and as noise barriers, pavement and water features modeled as ground zones, shoulders modeled as roadways without traffic, and median and shoulder jersey barriers modeled as noise barriers. These are shown on Figures 3A-C. |
| **Existing Noise Barriers** | The Noise Study Zone contains the following existing noise walls:<br>Wall 1 - CDOT Barrier ID: N025A217388RRA<br>The existing noise wall is located to the east of the I-25 northbound lanes. It stretches south of E 76th Ave and runs along part of Del Norte Street (St). Made of cast-in-place-concrete, the wall is 575 feet in length. Moving from south to north, it is 14 feet in height for 235 feet and then 12 feet in height for 340 feet. The noise wall will not be demolished or replaced by the proposed project.<br>Wall 2 - CDOT Barrier ID: N025A217723RRA<br>The concrete existing noise wall is split into two parts, located east of I-25 NB and near the CDOT Maintenance Facility. The wall is located along Del Norte St approximately between Pennsylvania Court (Ct) and E 77th Place (Pl). The south-western part of the wall is 14 feet in height and 240 feet in length. The northern part is 10 feet high for about 195 ft in length, and then 8 feet high for about 105 feet in length. The proposed project will not demolish the wall. However, as part of the proposed project, one panel (about 15 feet) on the most south-eastern end of the wall will be removed to ensure continued access to the CDOT Maintenance Facility. |

| | |
|---|---|
| | Wall 3 - CDOT Barrier ID: N025A217702RRA<br>Located to the east of the I-25 northbound lanes, this existing noise wall begins south of E 78th Dr and extends 1,700 feet along the mainline, ending north of E 80th Ave. Made of precast concrete, the wall is 12 feet in height. This wall will not be demolished or replaced by the project.<br>Wall 4 - CDOT Barrier ID: N025A218016RRA<br>This noise wall is located east of the I-25 northbound lanes, south of Grant St, in between Wall 3 and Wall 5. The wall is made of precast concrete, and it is 12 feet in height and 228 feet in length. This wall will not be demolished or replaced by the project.<br>Wall 5 - CDOT Barrier ID: N025A218055RRA<br>The noise wall is located east of the I-25 northbound lanes, from south of Grant St to the beginning of the I-25 off-ramp to 84th Ave/north of Grant Way. The wall is made of precast concrete, and it is 12 feet in height and 1,186 feet in length. Due to the proposed roadway, about 268 feet of this wall will be removed and replaced, specifically from 194 Grant Way to 180 Grant Way.<br>The associated proposed replacement barrier ID is PR-Wall 1.<br>Wall 6 - CDOT Barrier ID: N025A219035RRA<br>The existing noise wall is east of the I-25 northbound lanes. It begins north of E 88th Ave and ends near the address of 101 E 88th Ave H111. Made of stone masonry, the barrier is 13 feet in height and 1,240 feet in length, with a 50 foot east-west panel at the northern end. Due to the additional lanes that will be constructed, the entire noise wall will be removed and replaced to accommodate the widened roadway. The majority of the proposed noise wall will be replaced within several feet of its original location, but the northern end will extend an extra 75 feet north of its existing end point alongside I-25, rather than end with an east-west segment.<br>The associated proposed replacement barrier ID is PR-Wall 2.<br>Wall 7 - CDOT Barrier ID: N025A221062RRA<br>The existing noise wall is located east of the E 104th Ave on-ramp to I-25 NB and ends before the ramp fully connects to the mainline. Made of cast-in-place concrete, it is 7 feet in height and 743 feet in length. This wall will not be demolished or replaced by the project.<br>Wall 8 - CDOT Barrier ID: N025A220246LRA<br>This wall stretches west of the I-25 southbound lanes, starting south of 10190 Bannock St to Croke Lake. Made of precast concrete, it is 2,640 feet in length. The north section of the wall is 14 ft in height for about 1,650 ft. The remainder of the wall is 12 ft in height. This wall will not be demolished or replaced by the project.<br>Wall 9 - CDOT Barrier ID: N025A217311LRA<br>On the west side of the I-25 southbound lanes, this existing wall begins north of 8184 Sherman St and stretches down to 7510 Sherman St. The wall is made from stone masonry, and is 4,892 ft in length. While there are a few panels that are 16 feet in height, most of the wall (about 4,314 feet in length) has a height of 14 feet. This wall will not be demolished or replaced by the project. |
| **Modeled Pavement Type** | Average |
| **Default Ground Type** | Lawn |

| | |
|---|---|
| **Traffic Data (See Appendix B)** | Roadway coordinates were generated in computer-aided design (CAD). Conditions for the existing and build models were based on survey data and proposed roadway design, respectively.<br>Traffic volumes are from:<br>Modeled TransCAD PM Peak (Existing, No Action, and Build) link segment outputs.<br>Vehicle mixes are from:<br>CDOT Online Transportation Information System (OTIS) for available roadways (2024 and 2050).<br>Loudest hour volumes for Existing, No Action, and Proposed Action conditions were calculated using HCM methodology (based on segment speed limits, truck percentages, and roadway geometry) to determine a LOS C/D threshold for when traffic volumes were the highest, while vehicles were free-flowing. Volumes used in the model were based on the loudest hour volume (between PM peak hour or the LOS C/D threshold) for each highway segment, road, or ramp. Since volumes could be free-flowing equally in both directions, directional splits were not utilized. For the express lane, the highest existing volume during non-peak (free-flow) hours was used based on traffic data obtained for the project. |

# 5 TNM RESULTS

Modeled noise levels for the existing condition and design year scenarios are shown in Table 9. This data was used to identify which, if any, receptors would be impacted as a result of the Proposed Action.

**Table 9 Modeled Noise Levels Not Considering Potential New Abatement [1]**

| Receiver ID | Receiver Description | Activity Category/C DOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-1W | Clear Creek Trail Crossing (West Side) | C/66 | 1 | 69.9 | 69.9 | 70.2 | +0.3 | **Yes** |
| R-2W | 7350 N Broadway; Mapleton Public School Sports Field | C/66 | 10 | 59.8 | 59.8 | 60.8 | +1.0 | No |
| R-3W | 7480 Broadway; Mapleton Public School Basketball Court | C/66 | 10 | 59.9 | 59.9 | 60.9 | +1.0 | No |
| R-4W | 7840 Broadway; Mapleton Public School Entrance | C/66 | 10 | 54.4 | 54.4 | 54.4 | 0.0 | No |
| R-5W | 7840 Broadway; Mapleton Public School Gaga Ball Area/Playground | C/66 | 4 | 61.2 | 61.2 | 62.5 | +1.3 | No |
| R-6W | 7840 Broadway; Mapleton Public School Basketball Court | C/66 | 10 | 64.6 | 64.6 | 66.0 | +1.4 | **Yes** |
| R-7W | 7840 Broadway; Mapleton Public School Basketball Court | C/66 | 10 | 68.1 | 68.1 | 69.2 | +1.1 | **Yes** |
| R-8W | 7840 Broadway; Mapleton Public School Four Square Area | C/66 | 10 | 70.6 | 70.6 | 71.4 | +0.8 | **Yes** |
| R-9W | 7840 Broadway; Mapleton Public School Tetherball Area | C/66 | 6 | 64.9 | 64.9 | 66.2 | +1.3 | **Yes** |
| R-10W | 7840 Broadway; Mapleton Public School Basketball Court | C/66 | 10 | 69.9 | 69.9 | 70.8 | +0.9 | **Yes** |
| R-11W | 7840 Broadway; Mapleton Public School Outdoor Picnic Tables | C/66 | 3 | 65.9 | 65.9 | 67.1 | +1.2 | **Yes** |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-12W | 7840 Broadway; Mapleton Public School Entrance | C/66 | 10 | 56.5 | 56.5 | 57.4 | +0.9 | No |
| R-13W | 7510 Sherman St; Central Latin American District Church - Place of Worship | C/66 | 10 | 60.3 | 60.3 | 60.6 | +0.3 | No |
| R-14W | 200 Grace Pl; Multi-family (MF) Residential | B/66 | 4 | 63.3 | 63.3 | 64.1 | +0.8 | No |
| R-15W | 7524 Sherman St; MF Residential | B/66 | 12 | 65.3 | 65.3 | 65.6 | +0.3 | No |
| R-16W | 7546 Sherman St; Neighborhood Park - Playground and Swings | C/66 | 5 | 63.4 | 63.4 | 64.0 | +0.6 | No |
| R-17W | 7556 Sherman St; Neighborhood Park -Picnic Tables | C/66 | 5 | 63.5 | 63.5 | 64.0 | +0.5 | No |
| R-18W | 143 Grace Pl; MF Residential | B/66 | 8 | 61.1 | 61.1 | 61.8 | +0.7 | No |
| R-19W | 7556 Sherman St; MF Residential | B/66 | 11 | 64.8 | 64.8 | 65.2 | +0.4 | No |
| R-20W | 7615 Sherman St; Single-Family (SF) Residential | B/66 | 3 | 61.9 | 61.9 | 62.3 | +0.4 | No |
| R-21W | 7624 Sherman St; SF Residential | B/66 | 4 | 65.4 | 65.4 | 65.4 | 0.0 | No |
| R-22W | 7626 Sherman Pl; SF Residential | B/66 | 4 | 60.8 | 60.8 | 61.4 | +0.6 | No |
| R-23W | 7645 Sherman St; SF Residential | B/66 | 3 | 62.0 | 62.0 | 62.4 | +0.4 | No |
| R-24W | 7654 Sherman St; SF Residential | B/66 | 4 | 64.2 | 64.2 | 64.3 | +0.1 | No |
| R-25W | 766 Sherman Pl; SF Residential | B/66 | 5 | 59.0 | 59.0 | 59.7 | +0.7 | No |
| R-26W | 7685 Sherman St; SF Residential | B/66 | 4 | 60.8 | 60.8 | 61.2 | +0.4 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-27W | 7704 Sherman St; SF Residential | B/66 | 4 | 62.5 | 62.5 | 62.7 | +0.2 | No |
| R-28W | 7735 Sherman St; SF Residential | B/66 | 3 | 60.3 | 60.4 | 60.5 | +0.2 | No |
| R-29W | 7746 Sherman Pl; SF Residential | B/66 | 6 | 59.1 | 59.1 | 59.3 | +0.2 | No |
| R-30W | 7744 Sherman St; SF Residential | B/66 | 3 | 61.3 | 61.3 | 61.2 | -0.1 | No |
| R-31W | 7765 Sherman St; SF Residential | B/66 | 3 | 60.1 | 60.1 | 60.1 | 0.0 | No |
| R-32W | 7774 Sherman St; SF Residential | B/66 | 3 | 61.7 | 61.7 | 61.5 | -0.2 | No |
| R-33W | 163 E Delta St; SF Residential | B/66 | 4 | 58.8 | 58.8 | 58.7 | -0.1 | No |
| R-34W | 160 Joan Dr; SF Residential | B/66 | 2 | 59.7 | 59.7 | 59.7 | 0.0 | No |
| R-35W | 7806 Sherman St; SF Residential | B/66 | 2 | 62.6 | 62.6 | 62.5 | -0.1 | No |
| R-36W | 141 Joan Dr; SF Residential | B/66 | 4 | 58.7 | 58.7 | 59.0 | +0.3 | No |
| R-37W | 181 Joan Dr; SF Residential | B/66 | 2 | 59.6 | 59.6 | 59.6 | 0.0 | No |
| R-38W | 161 Joan Dr; SF Residential | B/66 | 2 | 59.3 | 59.3 | 59.5 | +0.2 | No |
| R-39W | 7846 Sherman St; SF Residential | B/66 | 4 | 64.0 | 64.0 | 63.9 | -0.1 | No |
| R-40W | 7810 Mona Ct; SF Residential | B/66 | 2 | 58.8 | 58.8 | 58.9 | +0.1 | No |
| R-41W | 7820 Mona Ct; SF Residential | B/66 | 4 | 57.8 | 57.9 | 58.1 | +0.3 | No |
| R-42W | 7841 Grace Ct; SF Residential | B/66 | 2 | 59.8 | 59.8 | 59.9 | +0.1 | No |
| R-43W | 7886 Sherman St; SF Residential | B/66 | 4 | 64.1 | 64.1 | 64.2 | +0.1 | No |
| R-44W | 7902 Grace Ct; SF Residential | B/66 | 2 | 60.4 | 60.5 | 60.6 | +0.2 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-45W | 7922 Grace Ct; SF Residential | B/66 | 4 | 58.2 | 58.2 | 59.1 | +0.9 | No |
| R-46W | 7913 Sherman Way; SF Residential | B/66 | 2 | 59.3 | 59.3 | 59.6 | +0.3 | No |
| R-47W | 7936 Sherman St; SF Residential | B/66 | 4 | 64.6 | 64.6 | 64.8 | +0.2 | No |
| R-48W | 7975 Sherman St; SF Residential | B/66 | 5 | 60.8 | 60.8 | 61.1 | +0.3 | No |
| R-49W | 7984 Sherman Way; SF Residential | B/66 | 4 | 58.4 | 58.4 | 58.7 | +0.3 | No |
| R-50W | 7976 Sherman St; SF Residential | B/66 | 4 | 65.0 | 65.0 | 65.3 | +0.3 | No |
| R-51W | 8026 Sherman Way; SF Residential | B/66 | 3 | 58.0 | 58.1 | 58.4 | +0.4 | No |
| R-52W | 8025 Sherman St; SF Residential | B/66 | 3 | 60.6 | 60.7 | 61.4 | +0.8 | No |
| R-53W | 8014 Sherman St; SF Residential | B/66 | 4 | 63.9 | 64.0 | 64.3 | +0.4 | No |
| R-54W | 8057 Sherman Way; SF Residential | B/66 | 5 | 55.9 | 56.0 | 56.7 | +0.8 | No |
| R-55W | 8064 Sherman St; SF Residential | B/66 | 4 | 63.0 | 63.1 | 63.7 | +0.7 | No |
| R-56W | 8065 Sherman St; SF Residential | B/66 | 2 | 58.9 | 59.0 | 59.6 | +0.7 | No |
| R-57W | 127 E 81st Ave; SF Residential | B/66 | 2 | 57.4 | 57.5 | 58.3 | +0.9 | No |
| R-58W | 88 E 81st Pl; SF Residential | B/66 | 4 | 55.5 | 55.6 | 56.3 | +0.8 | No |
| R-59W | 147 E 81st Ave; SF Residential | B/66 | 2 | 58.8 | 58.8 | 59.6 | +0.8 | No |
| R-60W | 8114 Sherman St; SF Residential | B/66 | 4 | 63.3 | 63.4 | 64.3 | +1.0 | No |
| R-61W | 109 E 81st Pl; SF Residential | B/66 | 2 | 58.1 | 58.2 | 59.3 | +1.2 | No |
| R-62W | 129 E 81st Pl; SF Residential | B/66 | 2 | 59.4 | 59.4 | 60.9 | +1.5 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-63W | 80 E Marigold Dr; SF Residential | B/66 | 4 | 56.2 | 56.3 | 57.3 | +1.1 | No |
| R-64W | 8154 Sherman St; SF Residential | B/66 | 4 | 63.7 | 63.7 | 65.1 | +1.4 | No |
| R-65W | 8174 Sherman St; SF Residential | B/66 | 2 | 63.7 | 63.8 | 65.5 | +1.8 | No |
| R-66W | 71 E Marigold Dr; SF Residential | B/66 | 1 | 57.5 | 57.6 | 58.7 | +1.2 | No |
| R-67W | 91 E Marigold Dr; SF Residential | B/66 | 1 | 59.4 | 59.4 | 60.6 | +1.2 | No |
| R-68W | 51 E Marigold Dr; SF Residential | B/66 | 1 | 56.9 | 57.0 | 58.1 | +1.2 | No |
| R-69W | 111 E Marigold Dr; SF Residential | B/66 | 1 | 61.5 | 61.6 | 63.1 | +1.6 | No |
| R-70W | 6 W 83rd Pl; Motel 6 Pool | E/71 | 10 | 54.8 | 54.8 | 56.2 | +1.4 | No |
| R-71W | 6 W 83rd Pl; Motel 6 South Outdoor Corridor - Second Floor | E/71 | 1 | 64.9 | 64.9 | 66.2 | +1.3 | No |
| R-72W | 6 W 83rd Pl; Motel 6 North Outdoor Corridor - First Floor | E/71 | 1 | 59.8 | 59.8 | 61.5 | +1.7 | No |
| R-73W | 8650 Conifer Rd; Soccer/Football Field | C/66 | 10 | 69.0 | 69.1 | 70.8 | +1.8 | **Yes** |
| R-74W | Niver Creek Trailhead | C/66 | 1 | 72.0 | 72.2 | 76.2 | +4.2 | **Yes** |
| R-75W | 9580 Fred Dr; SF Residential | B/66 | 1 | 59.8 | 59.9 | 61.2 | +1.4 | No |
| R-76W | 9600 Fred Dr; SF Residential | B/66 | 1 | 59.0 | 59.1 | 60.3 | +1.3 | No |
| R-77W | 9830 Melody Dr; SF Residential | B/66 | 6 | 63.8 | 63.8 | 65.2 | +1.4 | No |
| R-78W | 9841 Melody Dr; SF Residential | B/66 | 6 | 58.8 | 58.8 | 60.2 | +1.4 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-79W | 9860 Melody Dr; SF Residential | B/66 | 3 | 63.6 | 63.6 | 65.0 | +1.4 | No |
| R-80W | 9960 Melody Dr; SF Residential | B/66 | 5 | 65.8 | 65.8 | 67.1 | +1.3 | **Yes** |
| R-81W | 9971 Melody Dr; SF Residential | B/66 | 7 | 61.0 | 61.1 | 62.6 | +1.6 | No |
| R-82W | 10020 Brigitte Dr; SF Residential | B/66 | 5 | 64.2 | 64.1 | 65.3 | +1.1 | No |
| R-83W | 10011 Brigitte Dr; SF Residential | B/66 | 3 | 62.9 | 62.9 | 63.7 | +0.8 | No |
| R-84W | 10030 Melody Dr; SF Residential | B/66 | 3 | 60.2 | 60.2 | 61.1 | +0.9 | No |
| R-85W | 242 Brigitte Dr; SF Residential | B/66 | 2 | 61.1 | 61.1 | 62.0 | +0.9 | No |
| R-86W | 302 Brigitte Dr; SF Residential | B/66 | 4 | 60.1 | 60.1 | 60.8 | +0.7 | No |
| R-87W | 10070 Brigitte Dr; SF Residential | B/66 | 4 | 63.7 | 63.7 | 64.9 | +1.2 | No |
| R-88W | 243 Brigitte Dr; SF Residential | B/66 | 4 | 62.4 | 62.4 | 63.5 | +1.1 | No |
| R-1E | Clear Creek Trail Crossing (East Side) | C/66 | 1 | 66.4 | 66.4 | 66.5 | +0.1 | **Yes** |
| R-2E | 410 E 76th Ave; SF Residential | B/66 | 1 | 62.0 | 62.0 | 63.0 | +1.0 | No |
| R-3E | 390 E 76th Ave; SF Residential | B/66 | 1 | 64.7 | 64.7 | 65.7 | +1.0 | No |
| R-4E | 415 E 76th Ave; SF Residential | B/66 | 1 | 61.6 | 61.6 | 62.3 | +0.7 | No |
| R-5E | 411 E 76th Ave; SF Residential | B/66 | 1 | 62.9 | 62.9 | 63.6 | +0.7 | No |
| R-6E | 401 E 76th Ave; SF Residential | B/66 | 1 | 64.2 | 64.2 | 64.9 | +0.7 | No |
| R-7E | 7610 Pennsylvania Ct; SF Residential | B/66 | 1 | 65.2 | 65.2 | 65.9 | +0.7 | No |
| R-8E | 7616 Pennsylvania Ct; SF Residential | B/66 | 1 | 64.4 | 64.4 | 65.0 | +0.6 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-9E | 7620 Pennsylvania Ct; SF Residential | B/66 | 1 | 63.6 | 63.6 | 64.1 | +0.5 | No |
| R-10E | 405 E 76th Ave; SF Residential | B/66 | 1 | 61.0 | 61.0 | 61.6 | +0.6 | No |
| R-11E | 7622 Pennsylvania Ct; SF Residential | B/66 | 1 | 62.6 | 62.6 | 63.1 | +0.5 | No |
| R-12E | 7626 Pennsylvania Ct; SF Residential | B/66 | 1 | 62.2 | 62.2 | 62.6 | +0.4 | No |
| R-13E | 7630 Pennsylvania Ct; SF Residential | B/66 | 1 | 61.6 | 61.6 | 61.9 | +0.3 | No |
| R-14E | 7632 Pennsylvania Ct; SF Residential | B/66 | 1 | 60.8 | 60.8 | 61.1 | +0.3 | No |
| R-15E | 7615 Pennsylvania Ct; SF Residential | B/66 | 1 | 62.4 | 62.4 | 62.7 | +0.3 | No |
| R-16E | 7625 Pennsylvania Ct; SF Residential | B/66 | 1 | 61.9 | 61.9 | 62.1 | +0.2 | No |
| R-17E | 7633 Pennsylvania Ct; SF Residential | B/66 | 3 | 61.0 | 61.0 | 61.2 | +0.2 | No |
| R-18E | 7657 Logan St; SF Residential | B/66 | 2 | 61.0 | 61.0 | 61.3 | +0.3 | No |
| R-19E | 7670 Logan St; SF Residential | B/66 | 4 | 60.6 | 60.6 | 60.4 | -0.2 | No |
| R-20E | 7667 Logan St; SF Residential | B/66 | 4 | 60.5 | 60.5 | 60.2 | -0.3 | No |
| R-21E | Logan St Trailhead | B/66 | 1 | 60.3 | 60.3 | 59.9 | -0.4 | No |
| R-22E | 412 E 77th Ave; SF Residential | B/66 | 2 | 60.2 | 60.2 | 59.8 | -0.4 | No |
| R-23E | 432 E 77th Ave; SF Residential | B/66 | 1 | 59.5 | 59.5 | 59.2 | -0.3 | No |
| R-24E | 7687 Logan St; SF Residential | B/66 | 3 | 59.9 | 59.9 | 59.5 | -0.4 | No |
| R-25E | 405 E 77th Ave; SF Residential | B/66 | 2 | 59.3 | 59.3 | 59.1 | -0.2 | No |
| R-26E | 425 E 77th Ave; SF Residential | B/66 | 5 | 58.4 | 58.4 | 58.0 | -0.4 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-27E | 7745 Grant St; SF Residential | B/66 | 3 | 55.3 | 55.3 | 55.1 | -0.2 | No |
| R-28E | 427 E 77th Pl; SF Residential | B/66 | 2 | 55.9 | 55.9 | 56.2 | +0.3 | No |
| R-29E | 7775 Grant St; SF Residential | B/66 | 3 | 54.8 | 54.8 | 54.9 | +0.1 | No |
| R-30E | 7795 Grant St; SF Residential | B/66 | 3 | 56.0 | 56.0 | 56.2 | +0.2 | No |
| R-31E | 418 E 78th Dr; SF Residential | B/66 | 3 | 61.8 | 61.8 | 61.5 | -0.3 | No |
| R-32E | 411 E 77th Dr; SF Residential | B/66 | 4 | 56.0 | 56.0 | 56.3 | +0.3 | No |
| R-33E | 7801 Patricia Dr; SF Residential | B/66 | 2 | 64.1 | 64.1 | 64.0 | -0.1 | No |
| R-34E | 433 E 78Th Dr; SF Residential | B/66 | 2 | 58.6 | 58.6 | 59.0 | +0.4 | No |
| R-35E | 435 E 78Th Dr; SF Residential | B/66 | 4 | 58.2 | 58.2 | 58.7 | +0.5 | No |
| R-36E | 7829 Patricia Dr; SF Residential | B/66 | 3 | 64.5 | 64.5 | 64.8 | +0.3 | No |
| R-37E | 7830 Patricia Dr; SF Residential | B/66 | 3 | 60.6 | 60.6 | 61.1 | +0.5 | No |
| R-38E | 7869 Patricia Dr; SF Residential | B/66 | 3 | 64.0 | 64.0 | 64.3 | +0.3 | No |
| R-39E | 7870 Patricia Dr; SF Residential | B/66 | 4 | 60.5 | 60.5 | 61.1 | +0.6 | No |
| R-40E | 7871 Grant St; SF Residential | B/66 | 5 | 59.2 | 59.2 | 59.7 | +0.5 | No |
| R-41E | 7909 Patricia Dr; SF Residential | B/66 | 3 | 63.3 | 63.3 | 63.6 | +0.3 | No |
| R-42E | 7920 Patricia Dr; SF Residential | B/66 | 3 | 60.2 | 60.2 | 60.9 | +0.7 | No |
| R-43E | 7939 Patricia Dr; SF Residential | B/66 | 3 | 62.7 | 62.7 | 63.1 | +0.4 | No |
| R-44E | 7941 Grant St; SF Residential | B/66 | 5 | 58.2 | 58.2 | 59.1 | +0.9 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-45E | 7950 Patricia Dr; SF Residential | B/66 | 3 | 59.7 | 59.7 | 60.7 | +1.0 | No |
| R-46E | 7969 Patricia Dr; SF Residential | B/66 | 4 | 62.2 | 62.3 | 62.9 | +0.7 | No |
| R-47E | 7971 Grant St; SF Residential | B/66 | 2 | 57.8 | 57.8 | 58.7 | +0.9 | No |
| R-48E | 7976 Patricia Dr; SF Residential | B/66 | 2 | 59.4 | 59.5 | 60.4 | +1.0 | No |
| R-49E | 501 E 80Th Ave; SF Residential | B/66 | 1 | 57.8 | 57.9 | 58.7 | +0.9 | No |
| R-50E | 8111 Grant St; SF Residential | B/66 | 2 | 61.6 | 61.7 | 62.5 | +0.9 | No |
| R-51E | 8112 Grant St; SF Residential | B/66 | 4 | 59.6 | 59.7 | 60.8 | +1.2 | No |
| R-52E | 330 E 82nd Dr; SF Residential | B/66 | 5 | 57.6 | 57.7 | 59.0 | +1.4 | No |
| R-53E | 8121 Grant St; SF Residential | B/66 | 2 | 60.9 | 61.0 | 62.2 | +1.3 | No |
| R-54E | 8141 Grant St; SF Residential | B/66 | 2 | 59.3 | 59.5 | 61.1 | +1.8 | No |
| R-55E | 8161 Grant St; SF Residential | B/66 | 2 | 59.0 | 59.1 | 60.7 | +1.7 | No |
| R-56E | 262 Grant Way; SF Residential | B/66 | 2 | 58.2 | 58.3 | 60.8 | +2.6 | No |
| R-57E | 261 Grant Way; SF Residential | B/66 | 2 | 58.2 | 58.3 | 60.2 | +2.0 | No |
| R-58E | 202 Grant Way; SF Residential | B/66 | 2 | 60.3 | 60.4 | 64.1 | +3.8 | No |
| R-59E | 194 Grant Way; SF Residential | B/66 | 2 | 62.3 | 62.4 | 70.8 | +8.5 | **Yes** |
| R-60E | 221 Grant Way; SF Residential | B/66 | 2 | 60.8 | 60.9 | 62.8 | +2.0 | No |
| R-61E | 191 Grant Way; SF Residential | B/66 | 2 | 62.7 | 62.8 | 65.4 | +2.7 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-62E | 500 E 84th Ave; Office Complex Outdoor Tables | E/71 | 1 | 56.2 | 56.2 | 58.9 | +2.7 | No |
| R-63E | 500 E 84th Ave; Office Complex Outdoor Tables | E/71 | 1 | 57.4 | 57.4 | 59.7 | +2.3 | No |
| R-64E | 500 E 84th Ave; Office Complex Outdoor Tables | E/71 | 1 | 58.5 | 58.6 | 60.1 | +1.6 | No |
| R-65E | Niver Creek Trailhead | C/66 | 1 | 66.3 | 66.6 | 68.9 | +2.6 | **Yes** |
| R-66E-G[2] | 101 E 88th Ave; Park 88 Apartment Balcony – Ground Floor | B/66 | 4 | 60.4 | 61.7 | 57.2 | -3.2 | No |
| R-66E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 64.2 | 65.2 | 60.7 | -3.5 | No |
| R-66E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 65.7 | 66.7 | 62.9 | -2.8 | No |
| R-67E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 66.3 | 66.7 | 72.5 | +6.2 | **Yes** |
| R-67E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 69.1 | 69.4 | 74.6 | +5.5 | **Yes** |
| R-68E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 44.9 | 45.2 | 46.6 | +1.7 | No |
| R-68E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 47.5 | 47.9 | 48.8 | +1.3 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-69E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 61.3 | 62.0 | 60.5 | -0.8 | No |
| R-69E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 64.2 | 64.8 | 63.0 | -1.2 | No |
| R-70E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 54.4 | 55.8 | 54.8 | +0.4 | No |
| R-70E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 56.1 | 57.4 | 56.5 | +0.4 | No |
| R-71E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 46.2 | 46.5 | 47.7 | +1.5 | No |
| R-71E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 47.5 | 47.7 | 49.2 | +1.7 | No |
| R-72E-G | 101 E 88th Ave; Park 88 Apartment Patio – Ground Floor | B/66 | 4 | 50.3 | 51.1 | 48.5 | -1.8 | No |
| R-72E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 54.2 | 54.8 | 49.8 | -4.4 | No |
| R-72E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 59.4 | 59.9 | 56.8 | -2.6 | No |
| R-73E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 51.8 | 52.0 | 56.7 | +4.9 | No |
| R-73E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 54.5 | 54.6 | 58.9 | +4.4 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-74E-G | 101 E 88th Ave; Park 88 Apartment Patio – Ground Floor | B/66 | 4 | 55.9 | 56.3 | 58.3 | +2.4 | No |
| R-74E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 59.2 | 59.6 | 61.9 | +2.7 | No |
| R-74E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 61.0 | 61.4 | 63.6 | +2.6 | No |
| R-75E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 54.6 | 55.1 | 58.0 | +3.4 | No |
| R-75E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 57.1 | 57.6 | 60.0 | +2.9 | No |
| R-76E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 66.6 | 66.8 | 77.2 | +10.6 | **Yes** |
| R-76E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 74.1 | 74.2 | 78.3 | +4.2 | **Yes** |
| R-77E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 54.8 | 54.9 | 60.4 | +5.6 | No |
| R-77E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 56.7 | 56.9 | 62.3 | +5.6 | No |
| R-78E | 101 E 88th Ave Pool; Park 88 Apartment Shared Outdoor Use – Pool | B/66 | 10 | 55.0 | 55.2 | 62.1 | +7.1 | No |
| R-79E | 101 E 88th Ave Shared Outdoor Use; Park 88 Apartment Shared Outdoor Use – Dog Park | B/66 | 1 | 63.1 | 63.3 | 74.4 | +11.3 | **Yes** |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-80E-1 | 101 E88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 57.4 | 57.7 | 64.4 | +7.0 | No |
| R-80E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 59.6 | 59.9 | 66.4 | +6.8 | **Yes** |
| R-81E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 54.5 | 54.6 | 60.0 | +5.5 | No |
| R-81E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 57.7 | 57.8 | 62.6 | +4.9 | No |
| R-82E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 52.2 | 52.4 | 56.8 | +4.6 | No |
| R-82E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 54.9 | 55.2 | 60.4 | +5.5 | No |
| R-83E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 67.5 | 67.8 | 77.7 | +10.2 | **Yes** |
| R-83E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 75.3 | 75.5 | 78.9 | +3.6 | **Yes** |
| R-84E | 101 E 88th Ave; Park 88 Apartment Shared Outdoor Use - Park | B/66 | 5 | 57.9 | 58.1 | 64.5 | +6.6 | No |
| R-85E-G | 101 E 88th Ave; Park 88 Apartment Patio – Ground Floor | B/66 | 4 | 57.9 | 58.1 | 63.0 | +5.1 | No |
| R-85E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 60.6 | 60.9 | 65.6 | +5.0 | No |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-85E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 62.6 | 62.8 | 66.8 | +4.2 | **Yes** |
| R-86E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 58.6 | 58.7 | 61.5 | +2.9 | No |
| R-86E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 61.4 | 61.5 | 63.6 | +2.2 | No |
| R-87E-G | 101 E 88th Ave; Park 88 Apartment Balcony – Ground Floor | B/66 | 4 | 61.8 | 62.0 | 72.1 | +10.3 | **Yes** |
| R-87E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 67.9 | 68.1 | 75.1 | +7.2 | **Yes** |
| R-87E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 72.1 | 72.3 | 76.0 | +3.9 | **Yes** |
| R-88E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | B/66 | 4 | 65.4 | 65.6 | 66.9 | +1.5 | **Yes** |
| R-88E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | B/66 | 4 | 67.5 | 67.7 | 68.8 | +1.3 | **Yes** |
| R-89E | 9191 Grant St; North Suburban Medical Center Hospital Picnic Tables | C/66 | 5 | 61.0 | 61.0 | 62.0 | +1.0 | No |
| R-90E | 9195 Grant St; HCA HealthONE Mountain Ridge Hospital Front Entrance | C/66 | 1 | 65.6 | 65.6 | 66.5 | +0.9 | **Yes** |
| R-91E | Civic Center Park Picnic Tables under Pergola | C/66 | 8 | 65.2 | 65.2 | 66.1 | +0.9 | **Yes** |
| R-92E | Trail Bench at Civic Center Park | C/66 | 1 | 65.7 | 65.7 | 66.7 | +1.0 | **Yes** |

| Receiver ID | Receiver Description | Activity Category/CDOT NAC (dBA) | Number of Receptors Represented By Receiver | Existing Condition (2024) $L_{eq}$ (dBA) | No Action (2050) $L_{eq}$ (dBA) | Proposed Action (2050) $L_{eq}$ (dBA) | Proposed Action Change From Existing (dBA) | Proposed Action Causes Impact? (Yes or No) |
|---|---|---|---|---|---|---|---|---|
| R-93E | Trail Bench at Civic Center Park | C/66 | 1 | 67.1 | 67.2 | 68.0 | +0.9 | **Yes** |
| R-94E | Trail Bench at Civic Center Park | C/66 | 1 | 73.3 | 73.4 | 74.3 | +1.0 | **Yes** |
| R-95E | Trail Bench at Civic Center Park | C/66 | 1 | 63.7 | 63.7 | 65.1 | +1.4 | No |
| R-96E | Trail Bench at Civic Center Park | C/66 | 1 | 69.9 | 69.7 | 72.3 | +2.4 | **Yes** |
| R-97E | Trail Bench at Civic Center Park | C/66 | 1 | 68.1 | 67.9 | 70.6 | +2.5 | **Yes** |
| R-98E | 10375 Logan St; Cemetery – South Formal Gathering Area | C/66 | 1 | 64.6 | 64.5 | 66.3 | +1.7 | **Yes** |
| R-99E | 10375 Logan St; Cemetery – North Formal Gathering Area | C/66 | 1 | 62.3 | 62.4 | 63.7 | +1.4 | No |
| R-100E | 10433 Lincoln Ct; SF Residential | B/66 | 4 | 60.0 | 60.1 | 61.9 | +1.9 | No |
| R-101E | 10473 Lincoln Ct; SF Residential | B/66 | 3 | 61.6 | 61.8 | 61.3 | -0.3 | No |

**Notes:**

1. Per Section 3.6.5 of the NAAG, this table modeled all existing walls (Walls 1-9) in the Existing and No Action conditions. The Proposed Action only modeled the existing barriers that would remain with the proposed roadway design (i.e., Walls 1-4, the unmodified section of Wall 5, and Walls 7-9). Wall 6 was not modeled in the Proposed Action because it would be entirely demolished as part of the project. See Tables 11A-11G for results with replacement barriers for impacted existing walls.
2. Receivers (R-66E-G through R-88E-2) were modeled at various heights in the same location to accurately represent the different story levels in the apartment complexes. Ground level receivers were marked with a "G" in the Receiver ID, first floor by "1," and second floor by "2."

## 5.1 Existing Conditions Summary

Under existing conditions (2024), modeled noise levels at 214 receivers range from 44.9 to 75.3 dBA. Figures 4A-J shows the locations of all modeled receivers. Table 9 shows the modeled noise level at each receiver. Existing conditions are not described as having noise impacts. If the project were not built, the project would not be responsible to mitigate noise via an abatement measure regardless of if existing condition noise levels exceeded NACs.

## 5.2 No Action Alternative Summary

Under the No Action Alternative (2050), modeled noise levels at 214 receivers range from 45.2 to 75.5 dBA. Figures 4A-J shows the locations of all modeled receivers. Table 9 shows the modeled noise level at each receiver. No Action Alternatives are not described as having noise impacts. If the project weren't built, the project would not be responsible to mitigate noise via an abatement measure regardless of if No Action Alternative noise levels exceeded NACs.

## 5.3 Proposed Action Summary

Under the Proposed Action (2050), modeled noise levels at 214 receivers range from 46.6 to 78.9 dBA. 35 receivers, representing 138 receptors, would exceed the NAC. Four receivers, representing 13 receptors, would experience a substantial noise increase of at least 10 db. Therefore, a total of 35 receivers, representing 138 receptors, would be impacted during the 2050 worst-hour noise period (see Figures 5A-K). Table 9 shows the modeled noise level at each receiver. These results were modeled solely with the existing barriers that would remain as part of the Proposed Action roadway design (i.e., Walls 1-4, the unmodified section of Wall 5, and Walls 7-9). Wall 6 was not modeled in the Proposed Action because it would be entirely demolished as part of the project. See Tables 11A-11G for results with replacement barriers for impacted existing walls.

## 5.4 Other Alternative Summary

This project does not have any other alternatives.

# 6 NOISE ABATEMENT EVALUATION

As described in Chapter 5, 138 receptors in the Noise Study Zone would be impacted by noise in (2050) under the Proposed Action. Therefore, abatement for the impacted receptors was evaluated in accordance with guidelines from The CDOT NAAG and FHWA's Guidelines. Although abatement was required to be evaluated, it is only recommended for inclusion in the project when determined to be both feasible and reasonable.

Abatement is feasible if it:

- Provides at least 5 dB of noise reduction for at least three impacted receptors
- Does not have any design and construction factors that are "fatal flaw" issues (e.g., safety, barrier height, topography, drainage, utilities, abatement maintenance, maintenance access to adjacent properties, and access to adjacent properties [i.e., arterial widening projects])

If abatement is not feasible, further evaluation is not needed. However, if it is feasible, reasonableness is evaluated. Abatement is reasonable if it:

- Meets the minimum noise reduction design goal of at least 7 dB for at least two benefited receptors
- The Cost Benefit ($/receptor) equals or is less than the Cost Benefit Index ($34,000/receptor)
- Has support from more than 50 percent of the potentially benefited receptors[2]

## 6.1 Noise Abatement Options Considered

Noise barriers (walls and, to a lesser extent, berms) are commonly used as noise abatement and must be evaluated when doing a mitigation analysis for impacted receptors, per 23 CFR 772.13(c)(1). Other mitigation measures may also be considered, including traffic management measures (e.g., traffic control devices and signing for prohibition of certain vehicle types, time-use restrictions for certain vehicle types, modified speed limits, and exclusive lane designations); alteration of horizontal and vertical alignments; and acquisition of real property or interests therein to serve as a buffer zone to preempt development which would be adversely impacted by traffic noise. However, these mitigation measures are generally not feasible and/or reasonable. For this project, noise walls were the only abatement evaluated.

## 6.2 Noise Abatement: Noise Insulation

The Noise Study Zone does not have any Activity Category D receptors that are not already represented as Activity Category C. Therefore, noise insulation was not considered as abatement for this project.

## 6.3 Noise Barrier Evaluation – Proposed Action

The Proposed Action has 11 impacted areas. Five of the impacted areas have fewer than three impacted receptors together that would benefit from a noise wall. In those instances, a noise wall was not analyzed, as it would not meet feasible and reasonable criteria. The following areas and associated impacted receivers were identified as impacted, but not needing to be analyzed for a noise wall; Figures 5A-J show the locations of each impacted receiver:

[2] Support determined through Benefited Receptor Preference Survey, which may be conducted after the NEPA process and is documented in a separate report.

- Trail crossing at Clear Creek Trail under I-25 near I-76: there are two impacted areas; one on either side of I-25 (R-1W west of I-25; R-1E east of I-25), each representing one receptor.
- Niver Creek trailhead east of I-25 and south of 88th Avenue (R-65E), representing one receptor.
- Niver Creek Trail trailhead by 88th Avenue (R-74W), representing one receptor.
- Medical facility entrance at HCA HealthONE Mountain Ridge Hospital; there is one impacted area (R-90E), representing one receptor.
- Olinger Cemetery has one impacted receiver (R-98E), representing one receptor.

One of the impacted areas occurred behind an existing barrier that will not be modified by the project (i.e., Wall 8). As shown in Table 11G, Wall 8 met the NRDG criteria to provide at least 7.0 dB of noise reduction for at least two receptors, and will therefore remain in place and not be considered as noise abatement.

Six proposed barriers were analyzed to address the rest of the impacted areas. Two of these barriers (PR-Wall 1 and PR-Wall 2) were proposed because their existing wall counterpart will be partially or fully demolished by the project, as described in Table 10A. PR-Wall 1 was not determined to be feasible and reasonable. As a result, it will be replaced with a new wall of the same dimensions as the existing wall. Per the NAAG, this rebuilt barrier is not considered to be a noise abatement action. PR-Wall 2, which would replace the existing Wall 6, was determined to be feasible and reasonable. However, it is also not considered to be a noise abatement action.

There are three areas on the corridor with three or more impacted receptors where there is not an existing noise wall in place. At these three sites, noise wall placement for each impacted area was considered in multiple locations. The location determined to be the best performer for each set of impacted receivers was optimized. PR-Wall 3, PR-Wall 4, and PR-Wall 5 were proposed as new noise abatement, as described in Table 10B. Out of these three proposed walls, only PR-Wall 5 was determined to be both feasible and reasonable. Additionally, due to the proposed replacement bridge and changes to the existing grading and striping on 88$^{th}$ Avenue, a new proposed wall, PR-Wall 6, was analyzed along 88$^{th}$ Avenue. This wall was determined not to be feasible or reasonable.

Figures 6A-6F show the best performing evaluated barrier location, as determined by modeling in TNM at various locations. Appendix D has six CDOT Noise Abatement Determination worksheets (CDOT Form 1209); one was completed for each impacted area. Of the six evaluated noise walls, two were found to be feasible and reasonable, as described in Tables 10A and 10B.

The existing walls that were not modified by the project are described in Table 10C. Since there were no impacted receivers beside these existing walls, no further evaluation was needed.

**Table 10A Modified Existing Barrier Evaluation**

| **Proposed Barrier ID** | PR-Wall 1 | PR-Wall 2 |
|---|---|---|
| **Project Modifies Barrier?** | Yes | Yes |
| **Existing Barrier ID[1]** | Wall 5 | Wall 6 |
| **Barrier Location (general)** | Existing: East of I-25 NB, extending south of Grant St to north of Grant Way.<br>Proposed: About 268 ft of the existing wall will be demolished, specifically from 194 Grant Way to 180 Grant Way.<br>Around 194 Grant Way, PR-Wall 1 will be located 13 ft east of the existing location. Around 180 Grant way, PR-Wall 1 will be located about 4 ft east of the existing location.<br>The edges of PR-Wall 1 will overlap with the remaining existing edges of Wall 5. | Existing: East of I-25 NB, extending north of E 88th Ave to structure at 101 E 88th Ave H111<br>Proposed: In generally the same location as existing, except that the proposed northern limits of the wall will extend an extra 75 ft north of the existing northern limits. |
| **Barrier Location: Distance from Proposed Edge of Roadway (feet)** | Existing: The proposed edge of roadway overlaps with the section of existing wall that will be demolished.<br>Proposed: 3 ft | Existing: The proposed edge of roadway overlaps with the section of existing wall that will be demolished.<br>Proposed: The proposed wall will sit on top of the retaining wall located at the edge of shoulder |
| **Justification to Change Barrier Location** | The wall location was changed to accommodate the proposed roadway, which will be wider than the existing roadway. About 268 ft of the existing wall will be removed due to the proposed design. | The wall location was changed to accommodate the proposed roadway, which will be wider than the existing roadway. The entire existing wall will be removed due to the proposed design. |
| **Impacted Receiver IDs** | R-59E | Refer to Figure 6D |
| **Benefited Receiver IDs** | R-59E | Refer to Table 11B |
| **Figure #** | Figure 6B | Figure 6D |
| **Existing Barrier Reduces Noise ≥7.0 dB for ≥2 benefited receptors** | No | Yes |
| **Modeled Barrier: Fatal Flaw(s)?** | No | No |

| **Proposed Barrier ID** | PR-Wall 1 | PR-Wall 2 |
|---|---|---|
| **Modeled Barrier: Reduces Noise ≥5.0 dB for ≥3 impacted receptors** | No | Yes |
| **Modeled Barrier: Reduces Noise ≥7.0 dB for ≥2 benefited receptors** | Yes | Yes |
| **Existing Barrier Dimensions[2,3]** | 12 high x 918 long | 13 high x 1,240 long |
| **Modeled Barrier: Optimized Barrier Height & Length (feet)[3]** | 12 high x 311 long | 13 high x 1,300 long |
| **Modeled Barrier: Barrier Area[4] (square feet)** | 3,732 | 16,900 |
| **Modeled Barrier: Unit Cost** | $45/ft$^2$ | $45/ft$^2$ |
| **Modeled Barrier: Total Cost[5]** | $167,940 | $760,500 |
| **Modeled Barrier: No. Benefited Receptors** | 2 | 60 |
| **Modeled Barrier: Total Decibels of Benefit Provided** | 16.0 | 414.8 |
| **Modeled Barrier: Average Benefit (dB/receptor)** | 8.00 | 6.91 |
| **Modeled Barrier: Cost Benefit($/receptor)[5]** | $83,970 | $12,675 |
| **Design year Leq Range With Existing Abatement (dBA)** | 58.9 to 70.8 | 46.6 to 78.9 |
| **Design year Leq Range With Modeled Abatement (dBA)** | 58.4 to 64.2 | 44.0 to 70.9 |
| **Modeled Barrier: Feasible?** | No | Yes |
| **Modeled Barrier: Reasonable?** | No | Yes |

| **Proposed Barrier ID** | PR-Wall 1 | PR-Wall 2 |
|---|---|---|
| **Modeled Barrier: Recommended?[6]** | No – Project will partially demolish the existing noise wall. The modeled wall is not both feasible and reasonable. Therefore, a new noise wall will be constructed to replace the demolished portion of the wall, with the same dimensions as the existing wall but in a new location farther from the roadway. | **Yes** – Project will demolish the existing noise wall. The modeled wall is both feasible and reasonable and will be constructed |

**Notes:**

1. The information for all existing walls in this table refers to the area of the wall that will not be modified by the proposed action (i.e., the part of the existing wall that will remain after the proposed action).
2. Existing wall dimensions in this table may differ from Table 8 because the dimensions are based on the wall parts that will not be modified by the proposed action (i.e., the part of the existing wall that will remain after the proposed action).
3. The barrier heights and/or lengths listed in this table are rounded. Therefore, if they are used to calculate the barrier area, the resulting area may be slightly different than the reported barrier area due to round-off error.
4. The barrier areas listed in this table are rounded. Therefore, if they are used to calculate the total cost, the resulting cost may be slightly different than the reported cost due to round-off error.
5. The total cost listed in this table is rounded. Therefore, when used to calculate the cost benefit, the resulting cost benefit may be slightly different than the reported cost benefit due to round-off error.
6. Benefited receptor surveys are not used to determine reasonableness for existing barrier evaluations, including if the barrier will be modified. All existing barriers will either remain in place, be added unto, or demolished and rebuilt.

**Table 10B New Noise Barrier Evaluation**

| **Barrier ID** | PR-Wall 3 | PR-Wall 4 | PR-Wall 5 | PR-Wall 6 |
|---|---|---|---|---|
| **Barrier Location (general)** | East of I-25 NB and to the west of Croke Lake and Civic Center Park. | West of I-25 SB and south of 88th Ave. Beside the Pinnacle Athletic Complex at 8650 Conifer Rd. | In between I-25 SB and the Mapleton School complex; east of 7480 Broadway. | North of 88th Avenue and east of I-25 |
| **Barrier Location: Distance from Proposed Edge of Roadway (feet)** | 6 feet | 12 feet | 15 feet (northern end) to 4 feet (southern end) | 2 feet from edge of sidewalk |
| **Barrier Location Justification** | Multiple impacted receivers near this area. Noise wall was placed alongside the highway shoulder to optimize noise reduction at the source of the noise | Multiple impacted receivers near this area. Noise wall was placed alongside the highway shoulder to optimize noise reduction at the source of the noise | Multiple impacted receivers near this area. Noise wall was placed alongside the highway shoulder to optimize noise reduction at the source of the noise | The 88th Avenue bridge will be reconstructed over I-25 and 88th Avenue will be restriped. A wall was placed north of the sidewalk on 88th Avenue |
| **Impacted Receiver IDs** | R-91E, R-92E, R-93E, R-94E, R-96E, R-97E | R-73W | R-6W, R-7W, R-8W, R-9W, R-10W, R-11W | R-66E-2, R-67E-1, R-67E-2 |
| **Benefited Receiver IDs** | R-92E, R-93E, R-94E, R-96E | R-73W | R-5W, R-6W, R-7W, R-8W, R-9W, R-10W, R-11W | R-66E-G, R-66E-1, R-66E-2 |
| **Figure #** | Figure 6E | Figure 6C | Figure 6A | Figure 6F |
| **Fatal Flaw(s)?** | No | No | No | No |
| **Reduces Noise ≥5.0 dB for ≥3 impacted receptors** | Yes | Yes | Yes | Yes |
| **Reduces Noise ≥7.0 dB for ≥2 benefited receptors** | Yes | Yes | Yes | Yes |
| **Recommended Barrier Height & Length (feet)[1]** | 12 high x 1,202 long | 18 high x 1,250 long | 14 high x 660 long | 20 high x 1,194 long |
| **Barrier Area[2] (square feet)** | 14,424 | 22,500 | 9,240 | 23,880 |
| **Unit Cost** | $45/ft$^2$ | $45/ft$^2$ | $45/ft$^2$ | $45/ft$^2$ |

| **Barrier ID** | PR-Wall 3 | PR-Wall 4 | PR-Wall 5 | PR-Wall 6 |
|---|---|---|---|---|
| **Total Cost[3]** | $649,080 | $1,012,500 | $415,800 | $1,074,600 |
| **No. Benefited Receptors** | 4 | 10 | 53 | 12 |
| **Total Decibels of Benefit Provided** | 35.1 | 70.0 | 428.3 | 77.6 |
| **Average Benefit (dB/receptor)** | 7.02 | 7.00 | 8.08 | 6.47 |
| **Cost Benefit($/receptor)[3]** | $129,816 | $101,250 | $7,845 | $89,550 |
| **Design year Leq Range Without Abatement (dBA)** | 65.1 to 74.3 | 70.8[4] | 54.4 to 71.4 | 45.7 to 71.3 |
| **Design year Leq Range With Abatement (dBA)** | 61.4 to 65.1 | 63.8[4] | 52.9 to 63.9 | 45.1 to 70.2 |
| **Feasible?** | Yes | Yes | Yes | Yes |
| **Reasonable?** | No | No | Yes | No |
| **Recommended?** | No | No | **Yes** | No |

**Notes:**

1. The barrier heights and/or lengths listed in this table are rounded. Therefore, if they are used to calculate the barrier area, the resulting area may be slightly different than the reported barrier area due to round-off error.
2. The barrier areas listed in this table are rounded. Therefore, if they are used to calculate the total cost, the resulting cost may be slightly different than the reported cost due to round-off error.
3. The total cost listed in this table is rounded. Therefore, when used to calculate the cost benefit, the resulting cost benefit may be slightly different than the reported cost benefit due to round-off error.
4. Since the receptors were encapsulated by a single receiver, there was no Leq Range.

**Table 10C Existing Noise Barrier Evaluation**

| Existing Barrier ID | Wall 1 | Wall 2 | Wall 3 | Wall 4 | Wall 7 | Wall 8 | Wall 9 |
|---|---|---|---|---|---|---|---|
| Project Modifies Barrier? | No | No | No | No | No | No | No |
| Barrier Location (general) | East of I-25 NB, extending from E 76th Ave and running along Del Norte St | Split into two parts east of I-25 NB. The southern portion extends from 7615 Pennsylvania Ct to 7657 Logan St. The northern end extends from 7682 Logan St to 7735 Grant St. | East of I-25 NB, south of E 78th Dr and extending north along the mainline. | East of I-25 NB, south of Grant St. | East of the E 104th Ave on-ramp to I-25 NB | West of I-25 SB, extending south of 10190 Bannock St to Croke Lake. | West of I-25 SB, extending north of 8184 Sherman St to 7510 Sherman St |
| Barrier Location: Distance from Proposed Edge of Roadway (feet) | 9 ft | Southern Split Section:<br>26 – 158 ft<br>Northern Split Section:<br>158 – 185 ft | 30 ft (southern end) to 50 ft (northern end) | 36 ft | 12 ft (southern end) to 20 ft (northern end) | Northern end to 9900 Melody Dr: 18 – 25 ft<br>9900 Melody Dr to 9810 Melody Dr: 45 – 22 ft<br>9810 Melody Dr to southern end: 22 ft | Northern end to 8004 Sherman St: 20 – 44 ft<br>8004 Sherman St to 7876 Sherman St: 44 ft<br>7876 Sherman St to 7806 Sherman St: 36 ft<br>7806 Sherman St to 7654 Sherman St: 135 ft<br>7654 Sherman St to southern end: 30 ft |
| Justification to Change Barrier Location | Not Applicable – Location is not changing | Not Applicable – Location is not changing | Not Applicable – Location is not changing | Not Applicable – Location is not changing | Not Applicable – Location is not changing | Not Applicable – Location is not changing | Not Applicable – Location is not changing |
| Impacted Receiver IDs | None | None | None | None | None | R-80W | None |

| **Existing Barrier ID** | Wall 1 | Wall 2 | Wall 3 | Wall 4 | Wall 7 | Wall 8 | Wall 9 |
|---|---|---|---|---|---|---|---|
| **Benefited Receiver IDs** | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | R-79, R-80W, R-82W, R-85W, R-87W | Not Applicable |
| **Figure #** | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Figure 6G | Not Applicable |
| **Existing Barrier Reduces Noise ≥7.0 dB for ≥2 benefited receptors** | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Not Applicable | Yes | Not Applicable |
| **Modeled Barrier: Recommended?[1]** | No – Project does not modify the existing noise wall and receptors are not impacted with the existing noise wall, so a new noise wall was not modeled. The existing noise wall will remain in place. | No – Project does not modify the existing noise wall and receptors are not impacted with the existing noise wall, so a new noise wall was not modeled. The existing noise wall will remain in place. | No – Project does not modify the existing noise wall and receptors are not impacted with the existing noise wall, so a new noise wall was not modeled. The existing noise wall will remain in place. | No – Project does not modify the existing noise wall and receptors are not impacted with the existing noise wall, so a new noise wall was not modeled. The existing noise wall will remain in place. | No – Project does not modify the existing noise wall and receptors are not impacted with the existing noise wall, so a new noise wall was not modeled. The existing noise wall will remain in place. | No – Project does not modify the existing noise wall and the existing noise wall meets the NRDG, so a new noise wall did not need to be modeled. The existing noise wall will remain in place. | No – Project does not modify the existing noise wall and receptors are not impacted with the existing noise wall, so a new noise wall was not modeled. The existing noise wall will remain in place. |

**Notes:**

1. Benefited receptor surveys are not used to determine reasonableness for existing barrier evaluations, including if the barrier will be modified. All existing barriers will either remain in place, be added onto, or demolished and rebuilt.

**Table 11A Modeled Noise Levels With and Without Potential New Abatement (PR-Wall 1)**

| Receiver ID (Behind Abatement) | Receiver Description | Number of Receptors per Receiver | Are Receptors Benefited? (Yes or No) | Proposed Action (2050) $L_{eq}$ Without Abatement (dBA) | Proposed Action (2050) $L_{eq}$ With Abatement (dBA) | Proposed Action (2050) Insertion Loss (dB) |
|---|---|---|---|---|---|---|
| R-50E | 8111 Grant St; SF Residential | 2 | No | 62.5 | 62.4 | 0.1 |
| R-51E | 8112 Grant St; SF Residential | 4 | No | 60.8 | 60.5 | 0.3 |
| R-52E | 330 E 82nd Dr; SF Residential | 5 | No | 59.0 | 58.5 | 0.5 |
| R-53E | 8121 Grant St; SF Residential | 2 | No | 62.2 | 61.7 | 0.5 |
| R-54E | 8141 Grant St; SF Residential | 2 | No | 61.1 | 60.3 | 0.8 |
| R-55E | 8161 Grant St; SF Residential | 2 | No | 60.7 | 59.9 | 0.8 |
| R-56E | 262 Grant Way; SF Residential | 2 | No | 60.8 | 59.1 | 1.7 |
| R-57E | 261 Grant Way; SF Residential | 2 | No | 60.2 | 59.2 | 1.0 |
| R-58E | 202 Grant Way; SF Residential | 2 | No | 64.1 | 61.1 | 3.0 |
| R-59E | 194 Grant Way; SF Residential | 2 | **Yes** | 70.8 | 62.8 | 8.0 |
| R-60E | 221 Grant Way; SF Residential | 2 | No | 62.8 | 61.7 | 1.1 |
| R-61E | 191 Grant Way; SF Residential | 2 | No | 65.4 | 64.2 | 1.2 |
| R-62E | 500 E 84th Ave; Office Complex Outdoor Tables | 1 | No | 58.9 | 58.4 | 0.5 |
| R-63E | 500 E 84th Ave; Office Complex Outdoor Tables | 1 | No | 59.7 | 59.3 | 0.4 |
| R-64E | 500 E 84th Ave; Office Complex Outdoor Tables | 1 | No | 60.1 | 59.9 | 0.2 |

**Table 11B Modeled Noise Levels With and Without Potential New Abatement (PR-Wall 2)**

| Receiver ID (Behind Abatement) | Receiver Description | Number of Receptors per Receiver | Are Receptors Benefited? (Yes or No) | Proposed Action (2050) $L_{eq}$ Without Abatement (dBA) | Proposed Action (2050) $L_{eq}$ With Abatement (dBA) | Proposed Action (2050) Insertion Loss (dB) |
|---|---|---|---|---|---|---|
| R-66E-G | 101 E 88th Ave; Park 88 Apartment Balcony – Ground Floor | 4 | No | 57.2 | 55.7 | 1.5 |
| R-66E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 60.7 | 58.2 | 2.5 |
| R-66E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 62.9 | 61.0 | 1.9 |
| R-67E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | **Yes** | 72.5 | 65.8 | 6.7 |
| R-67E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 74.6 | 70.5 | 4.1 |
| R-68E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 46.6 | 45.0 | 1.6 |
| R-68E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 48.8 | 47.7 | 1.1 |
| R-69E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 60.5 | 57.6 | 2.9 |
| R-69E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 63.0 | 59.6 | 3.4 |
| R-70E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 54.8 | 52.8 | 2.0 |
| R-70E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 56.5 | 54.6 | 1.9 |
| R-71E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 47.7 | 46.4 | 1.3 |
| R-71E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 49.2 | 48.3 | 0.9 |
| R-72E-G | 101 E 88th Ave; Park 88 Apartment Patio – Ground Floor | 4 | No | 48.5 | 47.8 | 0.7 |
| R-72E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 49.8 | 49.2 | 0.6 |
| R-72E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 56.8 | 56.2 | 0.6 |
| R-73E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 56.7 | 52.6 | 4.1 |
| R-73E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 58.9 | 55.6 | 3.3 |
| R-74E-G | 101 E 88th Ave; Park 88 Apartment Patio – Ground Floor | 4 | No | 58.3 | 53.4 | 4.9 |

| Receiver ID (Behind Abatement) | Receiver Description | Number of Receptors per Receiver | Are Receptors Benefited? (Yes or No) | Proposed Action (2050) $L_{eq}$ Without Abatement (dBA) | Proposed Action (2050) $L_{eq}$ With Abatement (dBA) | Proposed Action (2050) Insertion Loss (dB) |
|---|---|---|---|---|---|---|
| R-74E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | **Yes** | 61.9 | 55.5 | 6.4 |
| R-74E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | **Yes** | 63.6 | 58.0 | 5.6 |
| R-75E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 58.0 | 54.1 | 3.9 |
| R-75E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 60.0 | 57.5 | 2.5 |
| R-76E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | **Yes** | 77.2 | 68.0 | 9.2 |
| R-76E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 78.3 | 74.9 | 3.4 |
| R-77E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | **Yes** | 60.4 | 55.1 | 5.3 |
| R-77E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 62.3 | 57.4 | 4.9 |
| R-78E | 101 E 88th Ave Pool; Park 88 Apartment Shared Outdoor Use – Pool | 10 | **Yes** | 62.1 | 55.7 | 6.4 |
| R-79E | 101 E 88th Ave Shared Outdoor Use; Park 88 Apartment Shared Outdoor Use – Dog Park | 1 | **Yes** | 74.4 | 63.8 | 10.6 |
| R-80E-1 | 101 E88th Ave; Park 88 Apartment Balcony – First Floor | 4 | **Yes** | 64.4 | 58.0 | 6.4 |
| R-80E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | **Yes** | 66.4 | 60.7 | 5.7 |
| R-81E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 60.0 | 55.6 | 4.4 |
| R-81E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 62.6 | 58.8 | 3.8 |
| R-82E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 56.8 | 53.1 | 3.7 |
| R-82E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 60.4 | 56.0 | 4.4 |
| R-83E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | **Yes** | 77.7 | 66.8 | 10.9 |
| R-83E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 78.9 | 75.1 | 3.8 |

| Receiver ID (Behind Abatement) | Receiver Description | Number of Receptors per Receiver | Are Receptors Benefited? (Yes or No) | Proposed Action (2050) $L_{eq}$ Without Abatement (dBA) | Proposed Action (2050) $L_{eq}$ With Abatement (dBA) | Proposed Action (2050) Insertion Loss (dB) |
|---|---|---|---|---|---|---|
| R-84E | 101 E 88th Ave; Park 88 Apartment Shared Outdoor Use - Park | 5 | **Yes** | 64.5 | 58.7 | 5.8 |
| R-85E-G | 101 E 88th Ave; Park 88 Apartment Patio – Ground Floor | 4 | **Yes** | 63.0 | 58.0 | 5.0 |
| R-85E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 65.6 | 61.3 | 4.3 |
| R-85E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 66.8 | 62.7 | 4.1 |
| R-86E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 61.5 | 61.2 | 0.3 |
| R-86E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 63.6 | 63.5 | 0.1 |
| R-87E-G | 101 E 88th Ave; Park 88 Apartment Balcony – Ground Floor | 4 | **Yes** | 72.1 | 62.4 | 9.7 |
| R-87E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | **Yes** | 75.1 | 68.2 | 6.9 |
| R-87E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 76.0 | 72.8 | 3.2 |
| R-88E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 66.9 | 65.5 | 1.4 |
| R-88E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 68.8 | 67.6 | 1.2 |

**Table 11C Modeled Noise Levels With and Without Potential New Abatement (PR-Wall 3)**

| Receiver ID (Behind Abatement) | Receiver Description | Number of Receptors per Receiver | Are Receptors Benefited? (Yes or No) | Proposed Action (2050) $L_{eq}$ Without Abatement (dBA) | Proposed Action (2050) $L_{eq}$ With Abatement (dBA) | Proposed Action (2050) Insertion Loss (dB) |
|---|---|---|---|---|---|---|
| R-91E | Civic Center Park Picnic Tables under Pergola | 8 | No | 66.1 | 63.9 | 2.2 |
| R-92E | Trail Bench at Civic Center Park | 1 | **Yes** | 66.7 | 61.6 | 5.1 |
| R-93E | Trail Bench at Civic Center Park | 1 | **Yes** | 68.0 | 62.8 | 5.2 |
| R-94E | Trail Bench at Civic Center Park | 1 | **Yes** | 74.3 | 65.1 | 9.2 |
| R-95E | Trail Bench at Civic Center Park | 1 | No | 65.1 | 61.4 | 3.7 |
| R-96E | Trail Bench at Civic Center Park | 1 | **Yes** | 72.3 | 63.0 | 9.3 |
| R-97E | Trail Bench at Civic Center Park | 1 | **Yes** | 70.6 | 64.3 | 6.3 |

**Table 11D Modeled Noise Levels With and Without Potential New Abatement (PR-Wall 4)**

| Receiver ID (Behind Abatement) | Receiver Description | Number of Receptors per Receiver | Are Receptors Benefited? (Yes or No) | Proposed Action (2050) $L_{eq}$ Without Abatement (dBA) | Proposed Action (2050) $L_{eq}$ With Abatement (dBA) | Proposed Action (2050) Insertion Loss (dB) |
|---|---|---|---|---|---|---|
| R-73W | 8650 Conifer Rd; Soccer/Football Field | 10 | **Yes** | 70.8 | 63.8 | 7.0 |

**Table 11E Modeled Noise Levels With and Without Potential New Abatement (PR-Wall 5)**

| Receiver ID (Behind Abatement) | Receiver Description | Number of Receptors per Receiver | Are Receptors Benefited? (Yes or No) | Proposed Action (2050) $L_{eq}$ Without Abatement (dBA) | Proposed Action (2050) $L_{eq}$ With Abatement (dBA) | Proposed Action (2050) Insertion Loss (dB) |
|---|---|---|---|---|---|---|
| R-2W | 7350 N Broadway; Mapleton Public School Sports Field | 10 | No | 60.8 | 59.8 | 1.0 |
| R-3W | 7480 Broadway; Mapleton Public School Basketball Court | 10 | No | 60.9 | 60.2 | 0.7 |
| R-4W | 7840 Broadway; Mapleton Public School Entrance | 10 | No | 54.4 | 53.4 | 1.0 |
| R-5W | 7840 Broadway; Mapleton Public School Gaga Ball Area/Playground | 4 | **Yes** | 62.5 | 54.5 | 8.0 |
| R-6W | 7840 Broadway; Mapleton Public School Basketball Court | 10 | **Yes** | 66 | 57 | 9.0 |
| R-7W | 7840 Broadway; Mapleton Public School Basketball Court | 10 | **Yes** | 69.2 | 61.3 | 7.9 |
| R-8W | 7840 Broadway; Mapleton Public School Four Square Area | 10 | **Yes** | 71.4 | 63.9 | 7.5 |
| R-9W | 7840 Broadway; Mapleton Public School Tetherball Area | 6 | **Yes** | 66.2 | 57.3 | 8.9 |
| R-10W | 7840 Broadway; Mapleton Public School Basketball Court | 10 | **Yes** | 70.8 | 63.1 | 7.7 |
| R-11W | 7840 Broadway; Mapleton Public School Outdoor Picnic Tables | 3 | **Yes** | 67.1 | 59.8 | 7.3 |
| R-12W | 7840 Broadway; Mapleton Public School Entrance | 10 | No | 57.4 | 52.9 | 4.5 |

**Table 11F Modeled Noise Levels With and Without Potential New Abatement (PR-Wall 6)**

| Receiver ID (Behind Abatement) | Receiver Description | Number of Receptors per Receiver | Are Receptors Benefited? (Yes or No) | Proposed Action (2050) $L_{eq}$ Without Abatement (dBA) | Proposed Action (2050) $L_{eq}$ With Abatement (dBA) | Proposed Action (2050) Insertion Loss (dB) |
|---|---|---|---|---|---|---|
| R-66E-G | 101 E 88th Ave; Park 88 Apartment Balcony – Ground Floor | 4 | **Yes** | 62.8 | 55.6 | 7.2 |
| R-66E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | **Yes** | 64.7 | 58 | 6.7 |
| R-66E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | **Yes** | 66.4 | 60.9 | 5.5 |
| R-67E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 66.7 | 65.4 | 1.3 |
| R-67E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 71.3 | 70.2 | 1.1 |
| R-68E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 45.7 | 45.1 | 0.6 |
| R-68E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 48.4 | 47.8 | 0.6 |
| R-69E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 61.9 | 57.7 | 4.2 |
| R-69E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 63.9 | 59.8 | 4.1 |
| R-70E-1 | 101 E 88th Ave; Park 88 Apartment Balcony – First Floor | 4 | No | 56.7 | 52.8 | 3.9 |
| R-70E-2 | 101 E 88th Ave; Park 88 Apartment Balcony – Second Floor | 4 | No | 57.8 | 54.6 | 3.2 |

**Table 11G Modeled Noise Levels for Existing Wall 8**

| Receiver ID (Behind Abatement) | Receiver Description | Number of Receptors per Receiver | Are Receptors Benefited? (Yes or No) | Proposed Action (2050) $L_{eq}$ Without Abatement (dBA) | Proposed Action (2050) $L_{eq}$ With Abatement (dBA) | Proposed Action (2050) Insertion Loss (dB) |
|---|---|---|---|---|---|---|
| R-77W | 9830 Melody Dr; SF Residential | 6 | No | 69.3 | 65.2 | 4.1 |
| R-78W | 9841 Melody Dr; SF Residential | 6 | No | 62.9 | 60.2 | 2.7 |
| R-79W | 9860 Melody Dr; SF Residential | 6 | Yes | 70.7 | 65 | 5.7 |
| R-80W | 9960 Melody Dr; SF Residential | 6 | Yes | 76.6 | 67.1 | 9.5 |
| R-81W | 9971 Melody Dr; SF Residential | 6 | No | 67.2 | 62.6 | 4.6 |
| R-82W | 10020 Brigitte Dr; SF Residential | 6 | Yes | 75.1 | 65.4 | 9.7 |
| R-83W | 10011 Brigitte Dr; SF Residential | 6 | No | 67.5 | 63.7 | 3.8 |
| R-84W | 10030 Melody Dr; SF Residential | 6 | No | 63.9 | 61.1 | 2.8 |
| R-85W | 242 Brigitte Dr; SF Residential | 6 | Yes | 67.3 | 62 | 5.3 |
| R-86W | 302 Brigitte Dr; SF Residential | 6 | No | 64.2 | 60.8 | 3.4 |
| R-87W | 10070 Brigitte Dr; SF Residential | 6 | Yes | 74.4 | 64.9 | 9.5 |
| R-88W | 243 Brigitte Dr; SF Residential | 6 | No | 67.1 | 63.5 | 3.6 |

# 7 STATEMENT OF LIKELIHOOD

The noise abatement evaluation for the Proposed Action is described in Chapter 6. Thirty-five receivers, representing 138 receptors, were determined to be impacted by traffic noise in (2050) for the Proposed Action.

Noise abatement was determined to be feasible and reasonable in one location. Therefore, the following noise wall is recommended to be constructed:

- PR-Wall 5: Located between I-25 SB and the Mapleton School complex, specifically east of 7480 Broadway Street.
    - 14 feet high x 660 feet long; Cost benefit of $7,845/receptor; evaluated for impacted receivers R-2W and R-12W, as shown using Figure 6A.
    - This noise wall does not replace an existing wall; it is a new form of abatement.

Noise abatement at one location with an existing wall (PR-Wall 1, Grant Way cul-de-sac) was determined not to be feasible and/or reasonable, as described in Section 6.3 and Table 10A. Because PR-Wall 1 was determined to not be reasonable for construction, it must be replaced by a new wall with the minimum dimensions as the portions of the existing wall that will be removed (12 ft in height and 268 ft in length). Therefore, this wall is considered a replacement wall and not a noise abatement action.

Noise abatement at one location (PR-Wall 2, replacing existing Wall 6 at Park 88 apartment complex) was determined to be both feasible and reasonable. The existing wall at this location will be replaced by a new wall with the dimensions of 13 feet high by 1,300 feet long. This wall is considered a replacement wall and not a noise abatement action.

Noise abatement at three locations with no existing walls (PR-Wall 3, PR-Wall 4, and PR-Wall 6) was determined not to be feasible and/or reasonable, as described in Section 6.2 and Table 10B.

Seven existing walls will not be modified by the project: Wall 1, Wall 2, Wall 3, Wall 4, Wall 7, Wall 8, and Wall 9.

Note the following:

- The final noise abatement decision will be made during the project's final design. Feasibility and reasonableness determinations for this project may change if there are changes in final design after approval of the NEPA documentation.
- A Benefited Receptor Preference Survey will be conducted at each new[3] recommended barrier at the time of final design of the construction project. Abatement will not be built if the Benefited Receptor Preference Survey results in 50 percent or less support for the abatement.
- Information for construction contractors as identified in Section 9.8 of the NAAG will be included in all plan sets and/or specifications and clearly documented in the Bid Package.

[3] Benefited receptor surveys are not used to determine reasonableness for existing barrier evaluations, including if the barrier will be modified. All existing barriers will either remain in place, be added onto, or demolished and rebuilt. Surveys will only be used for areas that do not currently have an existing noise wall but for which a noise wall is recommended.

# 8 CONSTRUCTION NOISE

This chapter describes construction noise implications, construction noise mitigation strategies, and whether the project is in an area that is subject to local noise ordinances.

## 8.1 Construction Noise Implications

Properties adjoining project construction may be exposed to noise caused by construction activities of the Proposed Action. Examples of construction equipment noise are shown in Table 12. Construction noise differs from traffic noise in several ways:

- Construction noise lasts only for the duration of construction, with most construction activities in noise-sensitive areas being conducted during hours that are least disturbing to most nearby residents, when feasible.
- Construction activities generally are short term and, depending on the nature of the construction operations, last from seconds (e.g., a truck passing a receptor) to months (e.g., bridge construction).
- Construction equipment noise is intermittent and depends on the type of operation, location, and function of the equipment, as well as the equipment usage cycle.
- As opposed to operational traffic noise, construction noise is not analyzed; there are no FHWA or CDOT construction NACs. However, construction noise is subject to relevant local regulations and ordinances (see Section 8.3).

**Table 12 Typical Construction Equipment Noise**

| Equipment | Maximum Noise Level (dBA at 50 feet)[1] |
|---|---|
| Scraper | 89 |
| Dozer (Bulldozer) | 85 |
| Truck (Heavy Truck) | 88[2] |
| Pickup Truck | 55 |
| Concrete Pump Truck | 82 |
| Backhoe | 80 |
| Pneumatic Tools | 85 |

**Notes:**

1. Noise levels are from Table 9.1 of FHWA's 2006 Construction Noise Handbook (FHWA, 2006), unless otherwise noted.
2. This noise level is from Table 9.9 of FHWA's 2006 Construction Noise Handbook (FHWA, 2006), which is taken from Chapter 12 of the FTA Transit Noise and Vibration Guidance Handbook.

## 8.2 Construction Noise Mitigation Strategies

To minimize construction noise levels, typical best management practices will be incorporated into construction contracts, plans, and specifications where it is appropriate to do so. The determination of practices weighs the benefits achieved and the overall adverse social, economic, and environmental effects and costs of abatement measures. These may include:

- Notify neighbors in advance when construction noise may occur.
- Keep noisy activities as far from sensitive receptors as possible.
- Keep exhaust systems on equipment in good working order. It should be subject to inspection by the construction project manager to ensure maintenance is being conducted.
- Use properly designed engine enclosures and intake silencers, if appropriate.
- Place stationary equipment as far from sensitive receptors as possible.
- Perform construction activities in noise sensitive areas during hours that are least disturbing to nearby residents, generally daytime hours, as feasible
- Locate haul roads so that they are as least disruptive as possible
- Provide mechanisms for complaints

## 8.3 Local Noise Ordinances

The project is in Adams County, Thornton City, and Northglenn City. While Adams County does not have a local noise ordinance, ordinances for Thornton City and Northglenn City exist.

The **Thornton Noise Disturbance Ordinance** (Section 38-441) prohibits construction activities between the hours of 9:00 p.m. and 6:00 a.m., unless within an industrial district and/or given authorization and located at least 400 feet from an occupied dwelling unit. Construction activities from 6:00 a.m. and 9:00 p.m. must comply with the sound pressure level limits given in Table 13 below.

**Table 13 City of Thornton's Sound Pressure Level Limits [1]**

| District | db(A) During the Day, 7:00 a.m. to 7:00 p.m. | db(A) During the Night, 7:00 p.m. to 7:00 a.m. |
|---|---|---|
| All Residential Districts | 55 | 50 |
| Nonresidential Districts Except Industrial | 60 | 55 |
| Industrial Districts | 80 | 75 |

**Notes:**

1. This table was taken from Section 38-441, subsection (c), Table A of the **Thornton Noise Disturbance Ordinance.**

The **Noise Control Ordinance of Northglenn** (Section 9-13-4) prohibits construction activity from 7:00 p.m. and 7:00 a.m., unless the work is authorized by the City Manager in accordance with Section 9-13-7(f) of the same article. The ordinance does not provide specific noise limits on construction from 7:00 a.m. to 7:00 p.m.

In addition, the Colorado Noise Statute 25-12-103 applies. This means that noise at 25 feet from the project boundary may not exceed 80 dBA from 7:00 a.m. until 7:00 p.m. and 75 dBA from 7:00 p.m. until 7:00 a.m.

As of the time of this writing, the information provided by local ordinances is up to date. However, local ordinances should be reviewed prior to construction to confirm any potential changes. The ordinances and statute all apply. Depending on the construction schedule, there may be instances when one or both local ordinance and/or the State statute conflict. In those situations, the more stringent requirement applies.

# 9 INFORMATION FOR LOCAL OFFICIALS

This project's Noise Study Zone includes land that is unpermitted and undeveloped (i.e., Activity Category G) (see Figures 2A-C). Therefore, 23 CFR 772.17 is applicable and noise related information needs to be provided to local officials to support local land use planning decisions and future development, as described in Section 6.3 of the NAAG.

Contour lines represent distances from the edge of the nearest travel lane of the highway improvement to where the design year (2050) noise levels reach the Activity Category B and C NAC (66 dBA) and Activity Category E's NAC (71 dBA). These were developed for Activity Category G land within the Noise Study Zone and are shown on Figures 7A-C.

Distances to the Activity Category B and C NAC (66 dBA) and Activity Category E's NAC (71 dBA) were developed for the Noise Study Zone and are shown in Table 13.

**Table 14 Distances to the Activity Category B, C, and E NAC**

| Location Description | Distance from Nearest Proposed Roadway NAC B & C: (66 dBA) | Distance from Nearest Proposed Roadway NAC E: (71 dBA) |
|---|---|---|
| Undeveloped parcel north of the Sherman St neighborhood and south of 8250 Sherman St; platted as Falk Industrial Tract.[1] (Figure 7A). | 165-175 ft | 110-140 ft |
| Undeveloped parcel east of I-25 with access via Russell Boulevard; platted as Horizon Place No 1 (Figure 7B) | 385 ft | 195 ft |
| Undeveloped parcel northeast of 664 W Thornton Pkwy; platted as Brittany Place Metropolitan District (left side of Figure 7C) | 225 ft (south end, from proposed mainline)<br>50 ft (north end, from ramp) | Less than 50 ft from the nearest proposed roadway |
| Undeveloped parcel north of 9351 Grant St; platted as BCMT LTD UND (right side of Figure 7C) | 100 ft | Less than 50 ft from the nearest proposed roadway |

**Notes:**

1. This parcel is protected approximately halfway by an existing noise wall. The noise wall will allow for noise levels of less than 66 dBA behind the wall.

Distances may vary somewhat over the corridor due to topography and changing road alignments. Properties developed in those areas would not be compatible with Activity Category B or C (66 dBA) or Activity Category E (71 dBA) uses, respectively.

Each state highway agency is required to identify when the public is officially notified of a proposed highway project location. The CDOT NAAG defines the Date of Public Knowledge as the date on which the final environmental project document is approved (i.e., signed Categorical Exclusion Form 128, Finding of No Significant Impact, or Record of Decision). After this date, CDOT and FHWA will be responsible for analyzing and documenting existing condition and design year noise levels for these lands as part of Type I noise analyses, but will not be required to provide noise abatement for development on these lands if it was permitted after the Date of Public Knowledge. In addition, these areas would not be eligible for Federal-aid participation for Type II projects, if funding to the Type II program were to be reinstated in Colorado. Colorado

does not currently have a Type II program. Decisions concerning such noise abatement are left to local government agencies and private developers.

Noise compatible planning concepts should be considered by local agencies. Examples are available in the following documents. Additional material and technical support are available from CDOT, upon request.

- **The Audible Landscape: A Manual for Highway Noise and Land Use** (Urban Systems Research and Engineering, Inc.; 1974),
- **Guidelines for Considering Noise in Land Use Planning and Control** (Federal Interagency Committee on Urban Noise; 1980), and
- **Entering the Quiet Zone: Noise Compatible Land Use Planning** (FHWA brochure; 2002).

# 10 IMPACTS AND MITIGATION COMMITMENTS

Because this project is an EA, the following table that describes impacts on noise resources and mitigation commitments for noise resources is being provided. Information from this table is generally copied into the NEPA document table, which lists impacts and mitigation commitments for all resources.

**Table 15 Summary of Impacts and Mitigation Table for NEPA Documents**

| Impact | Location | Mitigation Commitment | Responsible Branch | Mitigation Timing / Phase |
|---|---|---|---|---|
| Traffic causing exceedances of the NAC | By the Mapleton School complex located at 7480 Broadway Street | A noise wall will be built by the Mapleton School complex located at 7480 Broadway Street, contingent on a majority "yes" vote via a Benefited Receptor Preference Survey of benefited receptors. This vote happens after the project Engineer completes the design for the noise wall during final project design. | CDOT Engineering and Environmental | Final Design & Construction |
| New highway footprint impacts existing noise wall location, requiring demolition | By Park 88 Apartments | A noise wall will be constructed in a new location between the Park 88 apartments located at 101 E 88th Avenue and I-25. During Final Design, the Engineer will complete the noise wall design. | CDOT Engineering and Environmental | Final Design & Construction |
| New highway footprint impacts existing noise wall location, requiring demolition | By Grant Way cul-de-sac | A new noise wall will be constructed that has the same dimensions as the demolished barrier but in a new location by 180 and 194 Grant Way. During Final Design, the Engineer will complete the noise wall design. | CDOT Engineering | Final Design & Construction |
| Construction noise impacts at adjacent properties | Adams County, City of Thornton, and City of Northglenn | The Contractor shall follow local noise ordinances and Colorado noise Statute 25.12.103. The Contractor shall also apply for variances when necessary. | CDOT Engineering and Contractor | Construction |

| Impact | Location | Mitigation Commitment | Responsible Branch | Mitigation Timing / Phase |
|---|---|---|---|---|
| Construction noise impacts at adjacent properties | Within Project limits | The Contractor shall:<br>Notify neighbors in advance when construction noise may occur, in accordance with the public information plan that will be developed.<br>Keep noisy activities as far from sensitive receptors as possible. Coordinate with Project Engineer.<br>Keep exhaust systems on equipment in good working order. It should be subject to inspection by the construction project manager to ensure maintenance is being conducted.<br>Use properly designed engine enclosures and intake silencers, if appropriate.<br>Place stationary equipment as far from sensitive receptors as possible. Coordinate with Project Engineer.<br>Perform construction activities in noise sensitive areas during hours that are least disturbing to nearby residents, generally daytime hours, as feasible.<br>Locate haul roads so that they are as minimally disruptive as possible. Coordinate with Project Engineer.<br>Provide a mechanism for complaints. Mechanisms will be determined during final design and may include a project hotline number or other mechanisms | CDOT Engineering and Public Involvement, and Contractor | Construction |
| Noise and visual disturbance for residents | Grant Way cul-de-sac and Park 88 Apartments | Install temporary noise walls until the permanent replacement walls are constructed if existing noise walls will not be replaced within six months of demolition. | CDOT Engineering, Contractor | Construction |

| Impact | Location | Mitigation Commitment | Responsible Branch | Mitigation Timing / Phase |
|---|---|---|---|---|
| Temporary increase in noise from construction activities during periods where existing noise walls have been removed and replacement walls have not yet been installed | Grant Way cul-de-sac and Park 88 Apartments | At the Grant Way cul de sac and Park 88 apartment complex, during periods where existing noise walls have been removed and permanent replacement walls have not yet been installed, the Contractor shall notify potentially affected residents in advance of planned noise heavy construction activities and night work in the area, and offer hotel vouchers, as needed, in accordance with the project public information plan. | CDOT Engineering, Environmental, and Public Involvement | Construction |

# 11 SOURCES AND REFERENCES

AtkinsRéalis. 2025. **I-25 (US 36 to 104th Avenue) Draft Traffic and Safety Technical Report, November.**

CDOT. 2020. **Noise Analysis and Abatement Guidelines**, September.

City of Northglenn. 2015. **Noise Control Ordinance of the City of Northglenn**, Section 9-13-4.

City of Thornton. 2025. **CODE of the City of THORNTON, COLORADO**. **Noise disturbances prohibited**, Section 38-441, February.

FHWA. 2006. **Construction Noise Handbook**, August.

FHWA. 2010. **Procedures for Abatement of Highway Traffic Noise and Construction Noise, 23 C.F.R. § 772**.

FHWA. 2011. **Highway Traffic Noise: Analysis and Abatement Guidance**, December.

FHWA. 2018. **Noise Measurement Handbook**, FHWA-HEP-18-065, June.

State of Colorado. 2025. **Colorado Revised Statutes. Maximum Permissible Noise Levels, Section 25-12-103**.

**Figure 1 I-25 (US 36 to 104th Avenue) Project Vicinity**

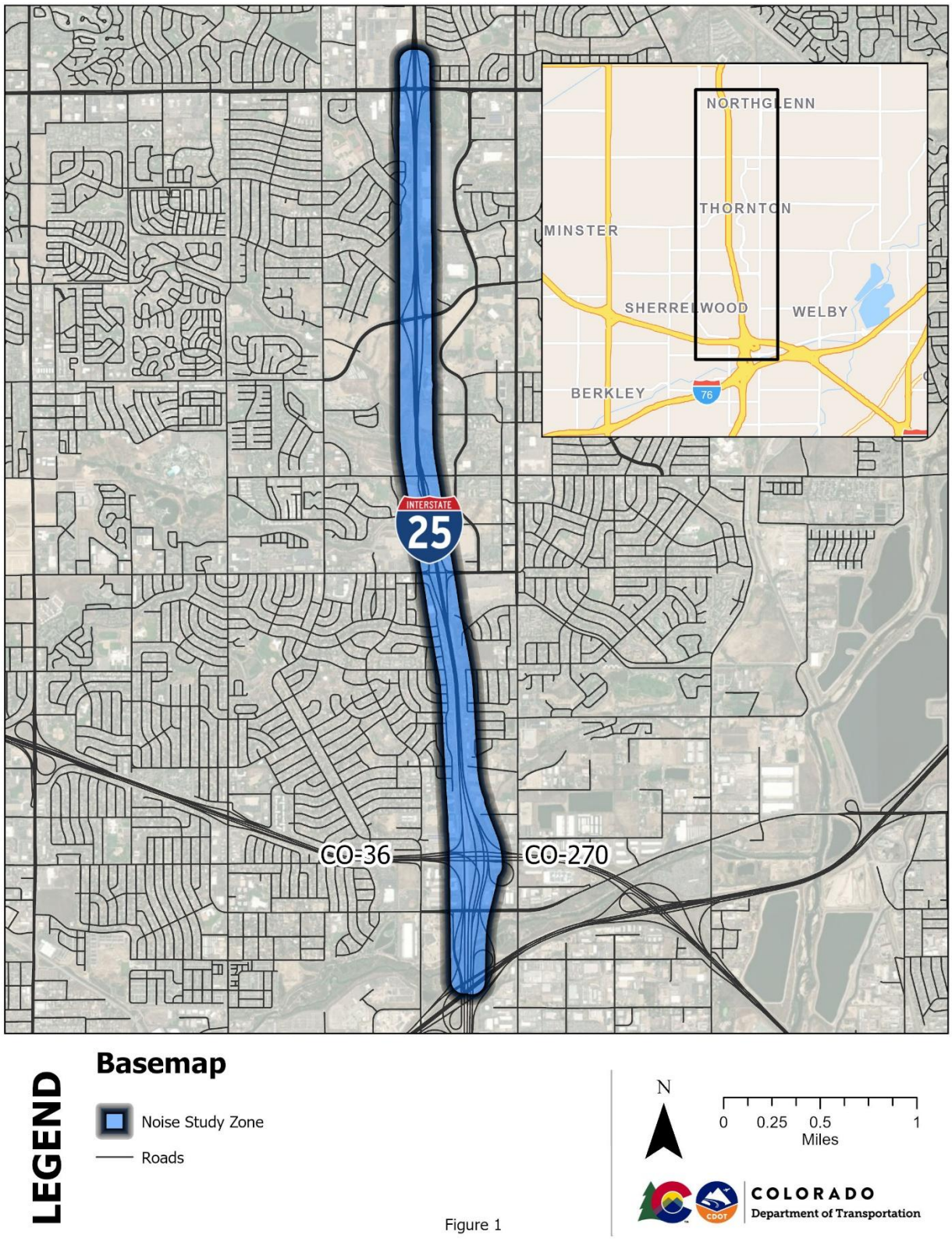



Figure 1

**Figure 2A Noise Study Zone, Activity Categories, and Noise Measurement Locations**

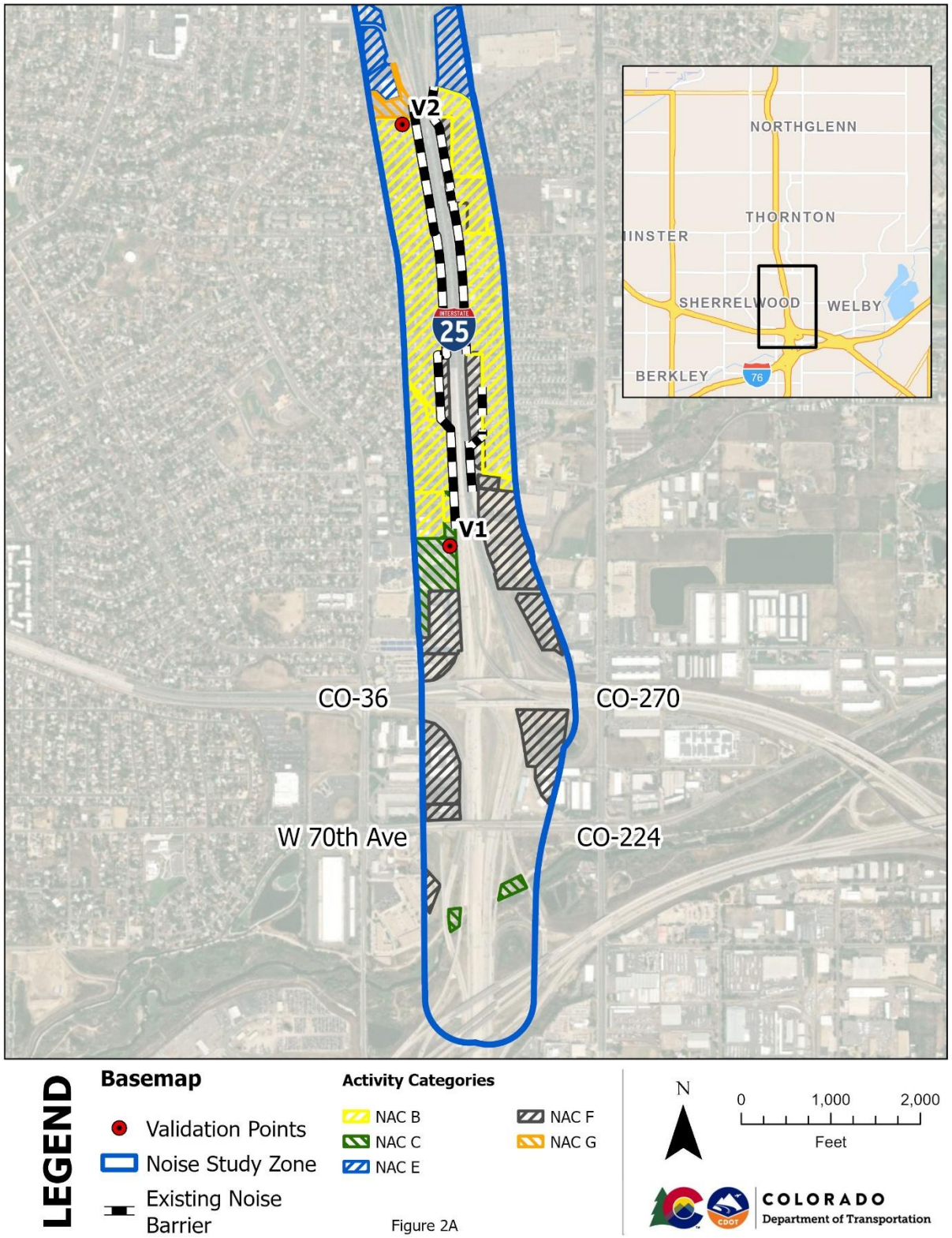



Figure 2A

**Figure 2B Noise Study Zone, Activity Categories, and Noise Measurement Locations**

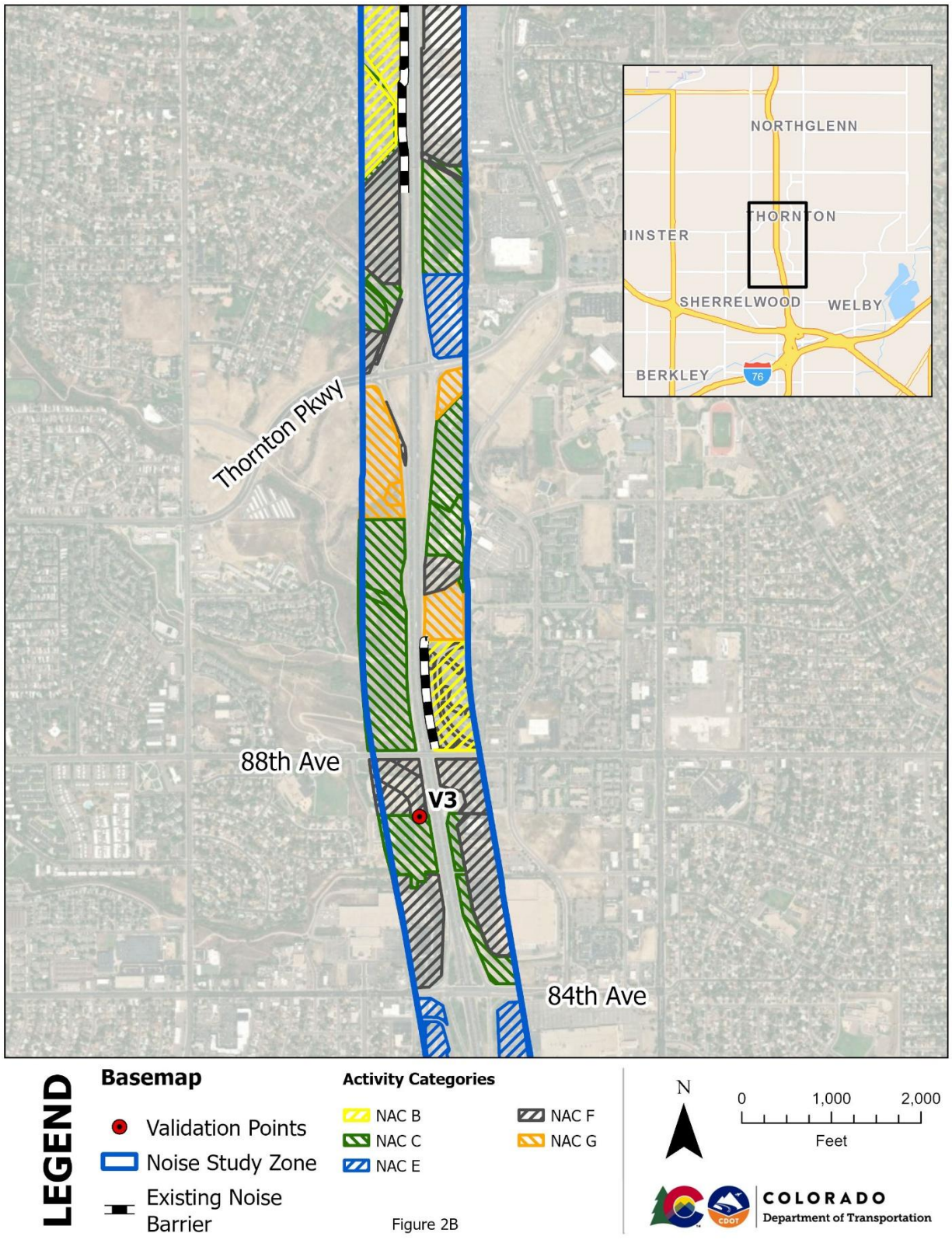



Figure 2B

**Figure 2C Noise Study Zone, Activity Categories, and Noise Measurement Locations**

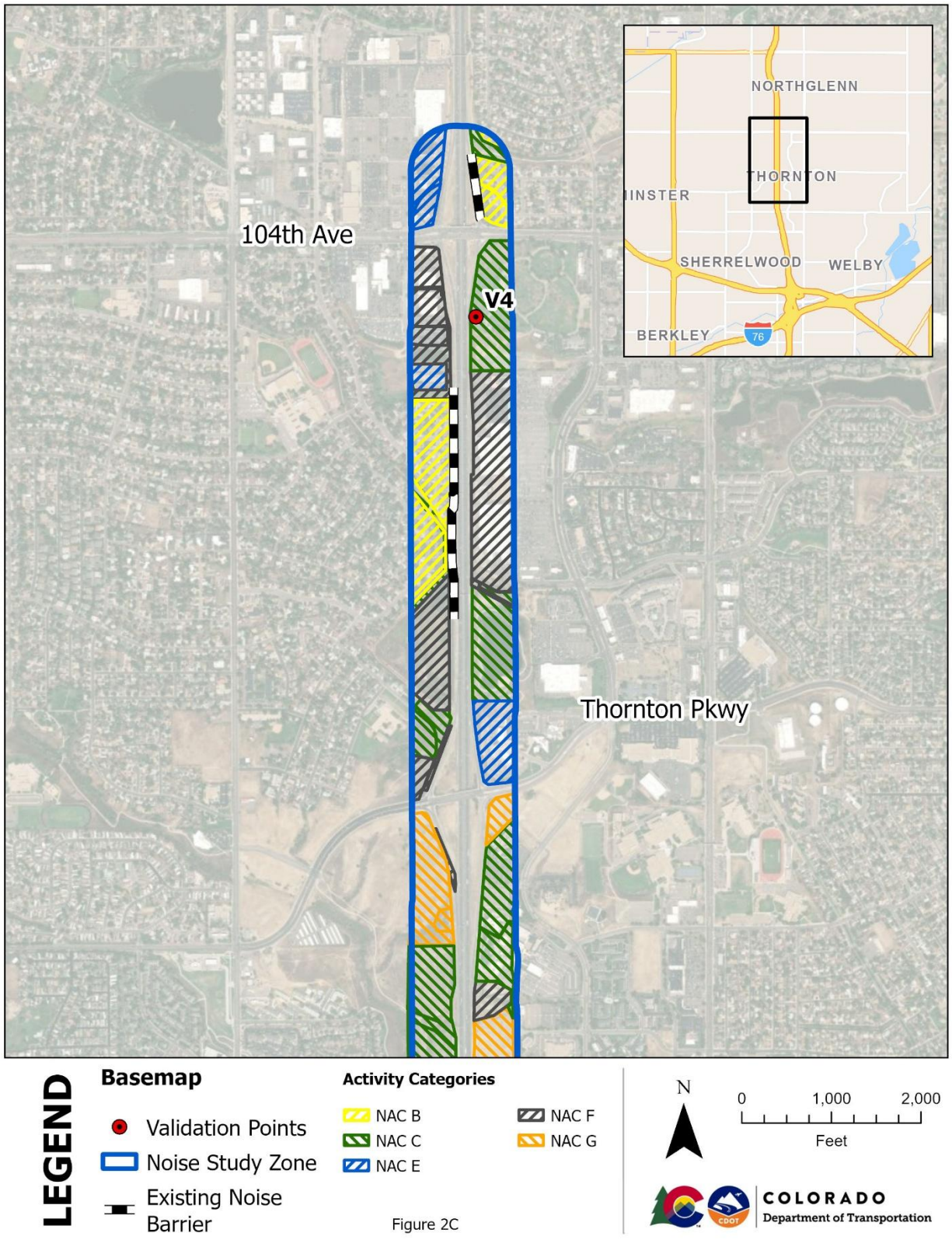



Figure 2C

**Figure 3A TNM Model Objects for Design Year (2050) Proposed Action**

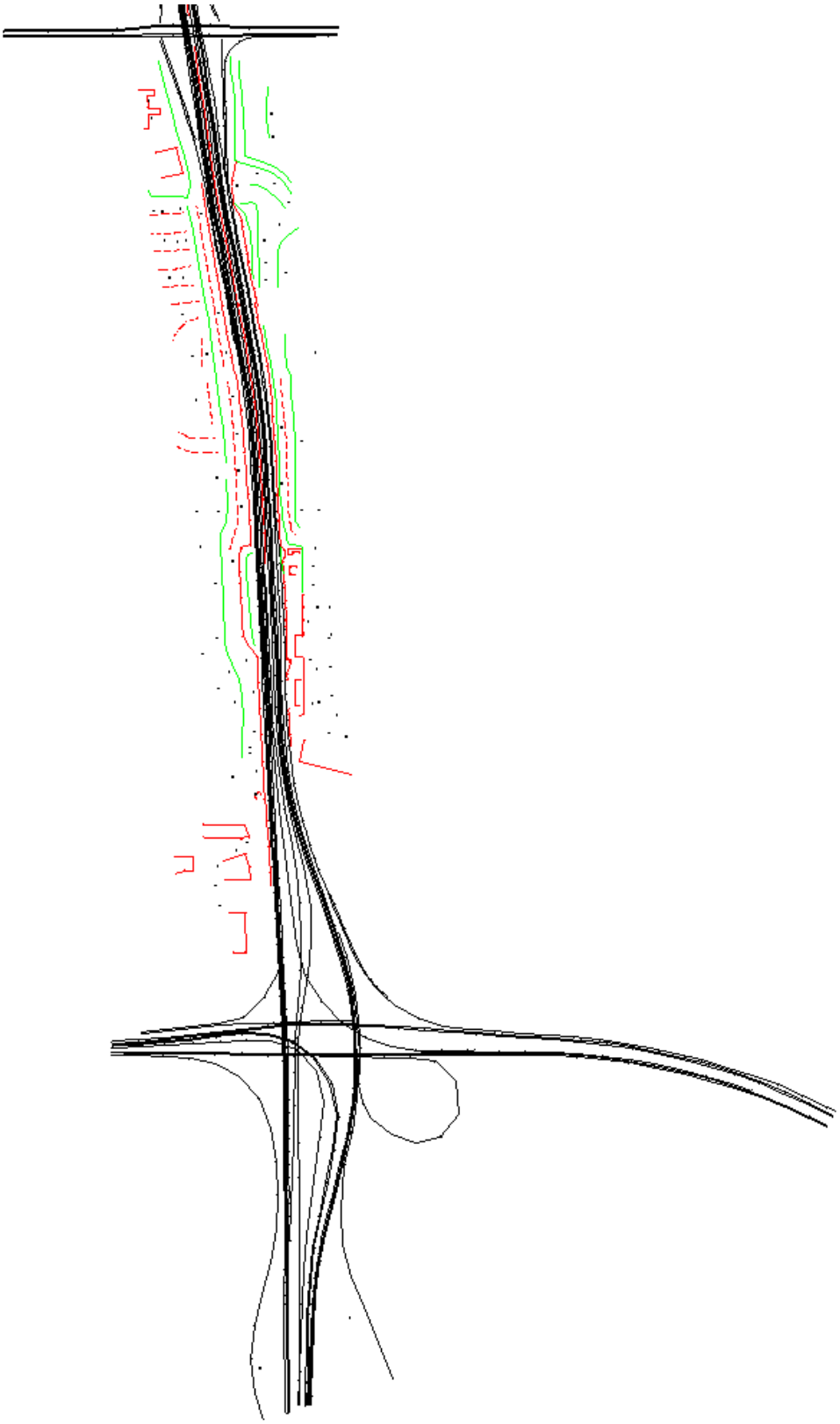


**Figure 3B TNM Model Objects for Design Year (2050) Proposed Action**

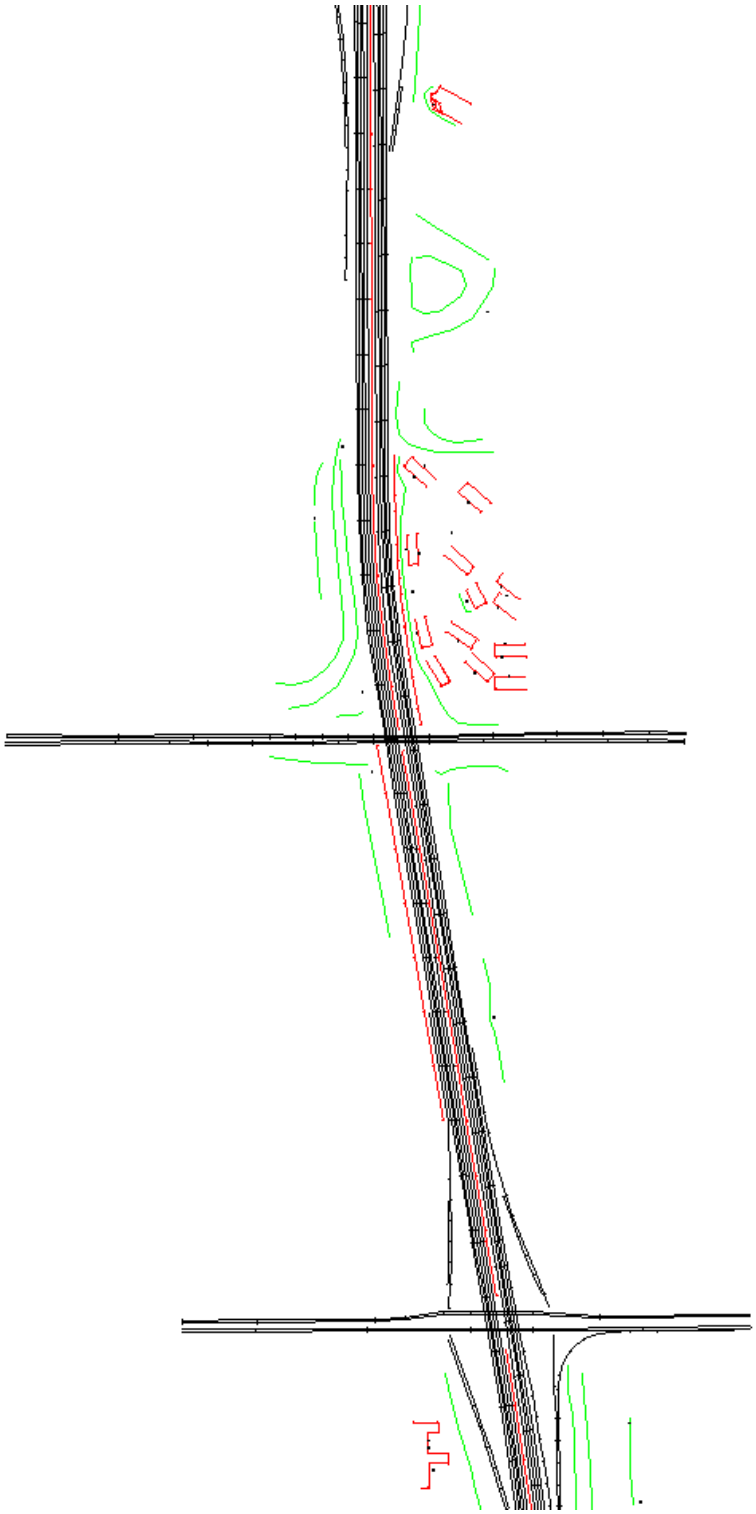


**Figure 3C TNM Model Objects for Design Year (2050) Proposed Action**

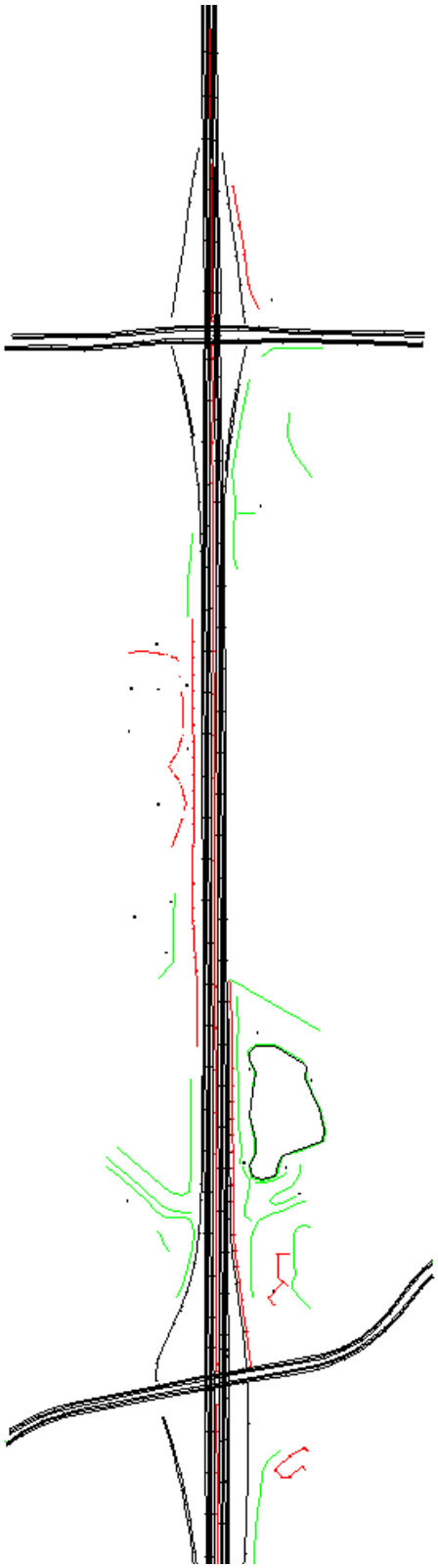


**Figure 4 Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**

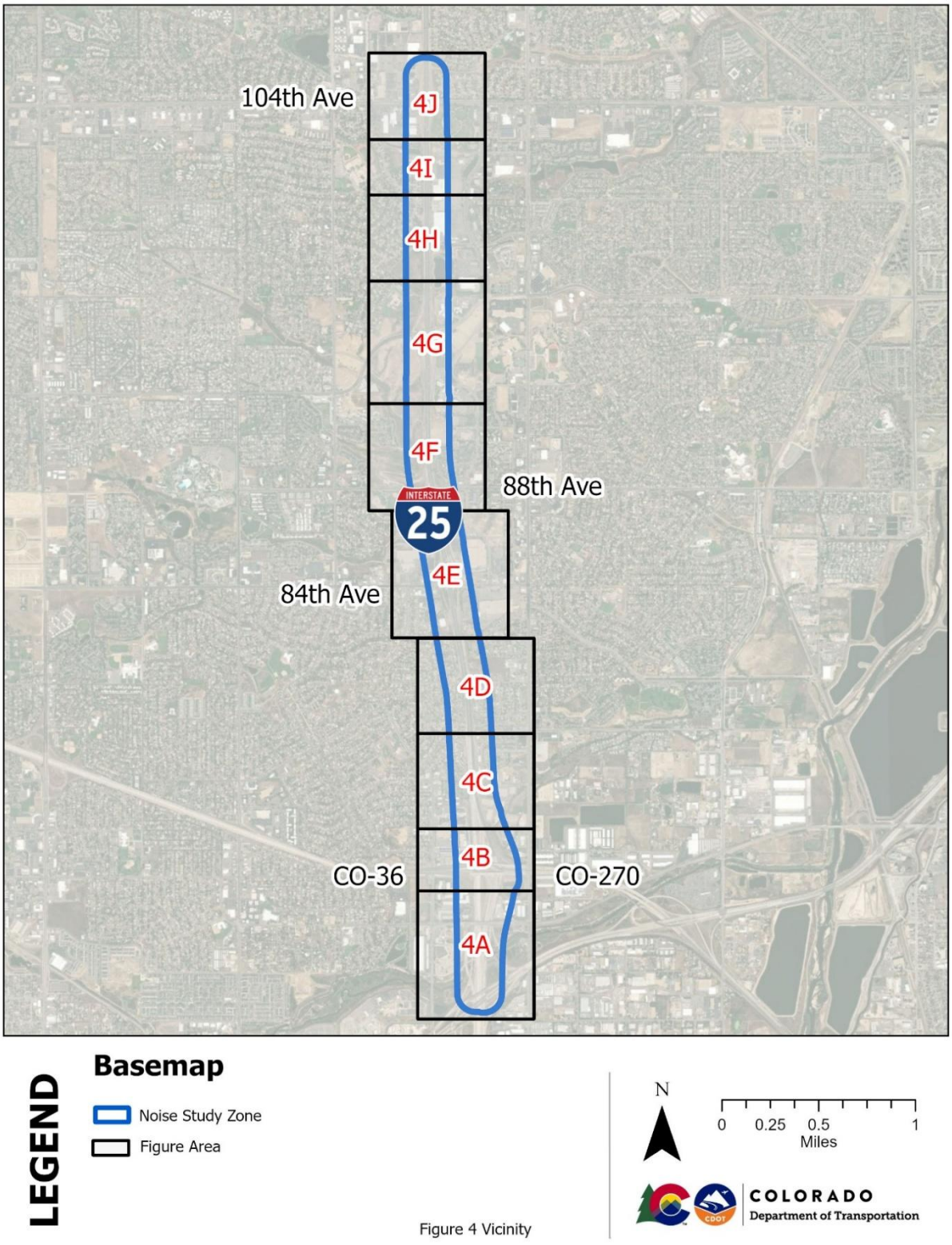



Figure 4 Vicinity

**Figure 4A Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**




Figure 4A

**Figure 4B Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**

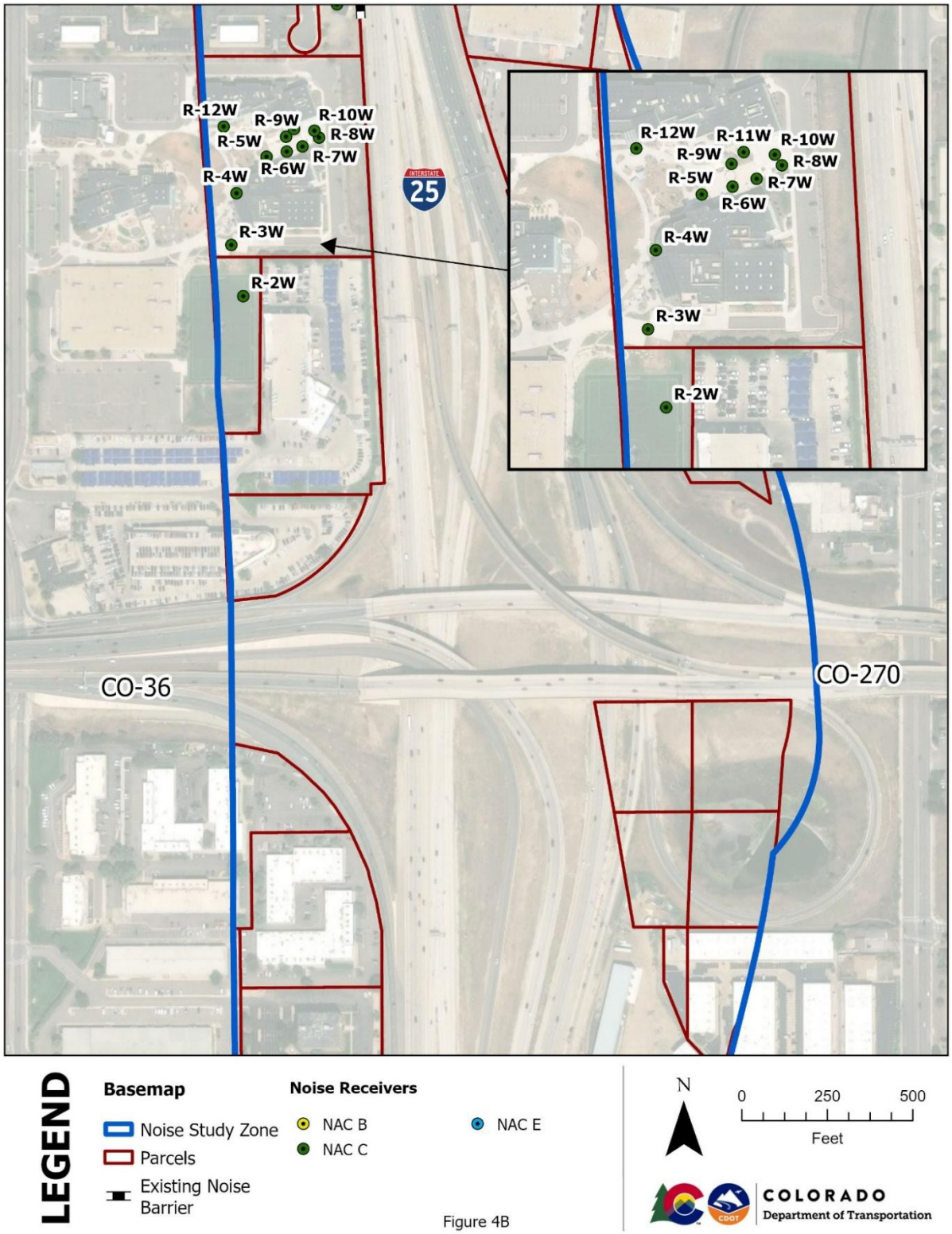



Figure 4B

**Figure 4C Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**

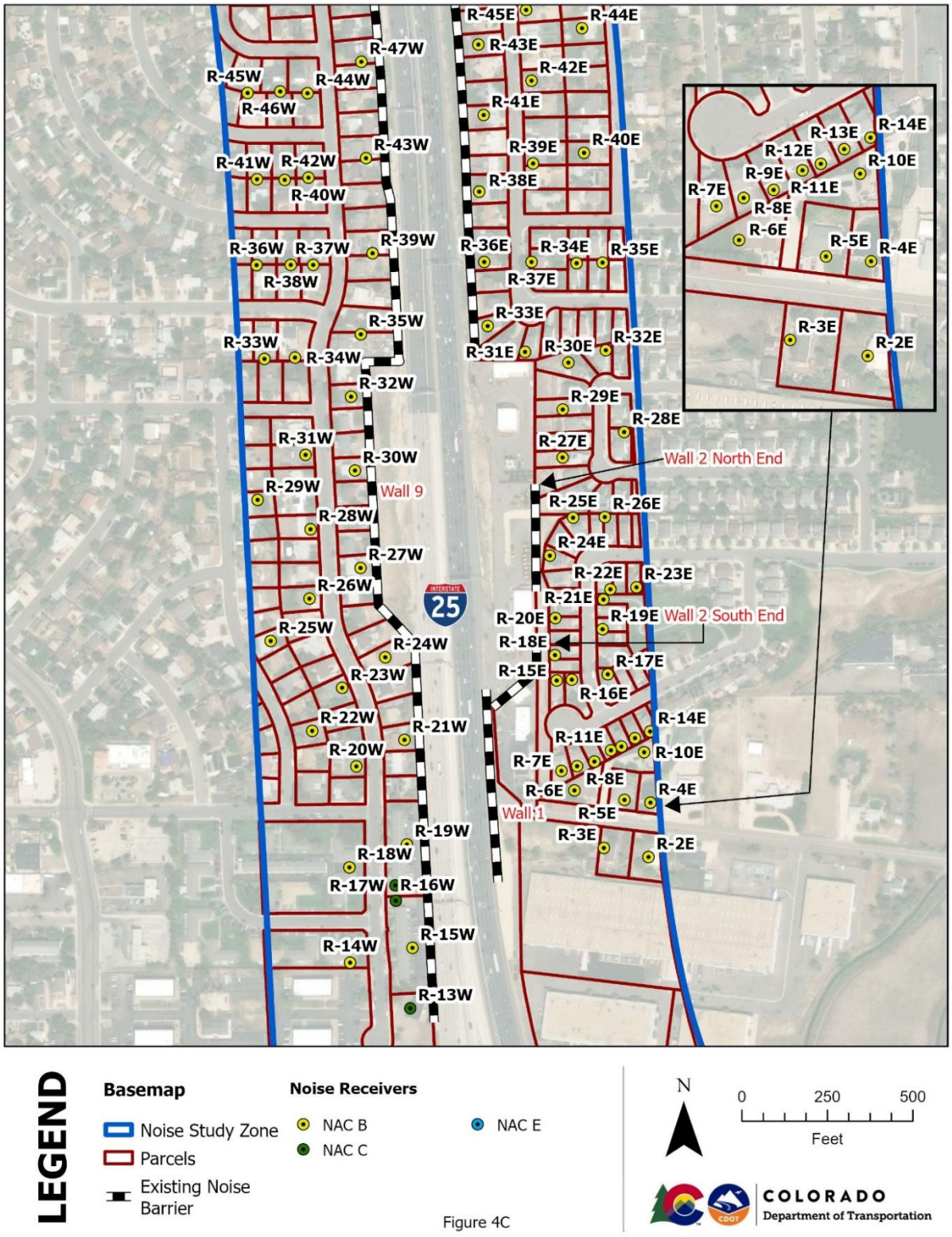



Figure 4C

**Figure 4D Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**

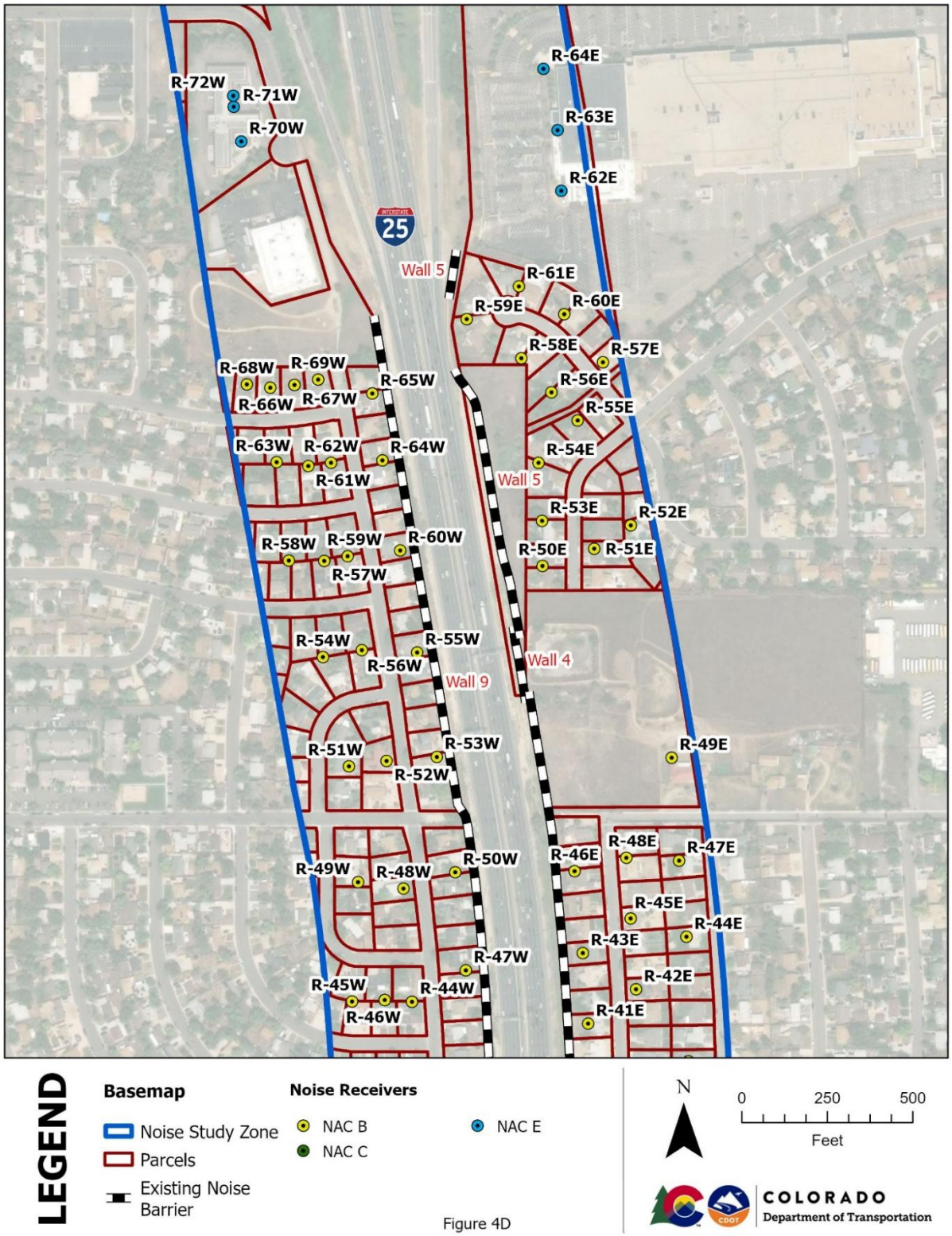



Figure 4D

**Figure 4E Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**

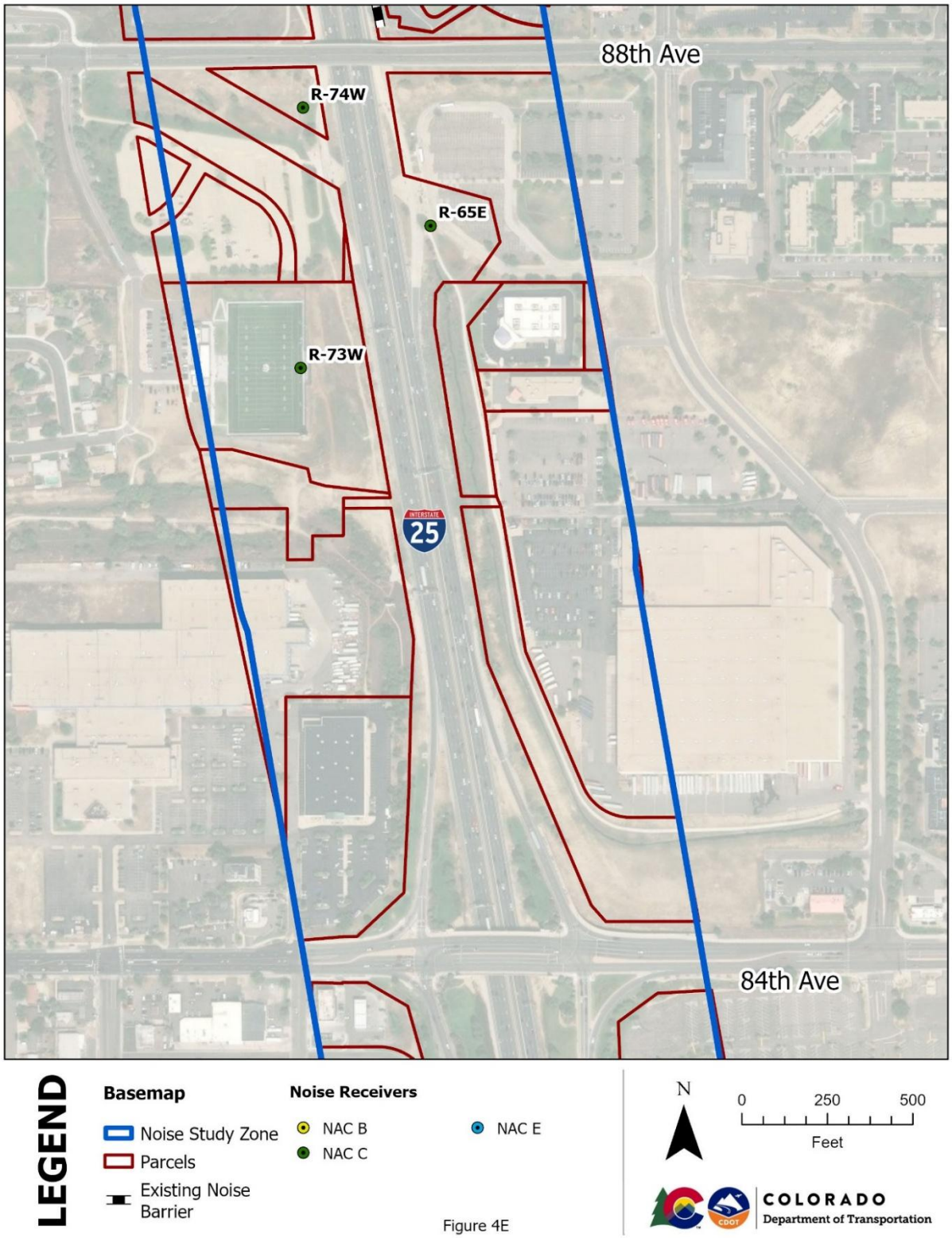



Figure 4E

**Figure 4F Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**

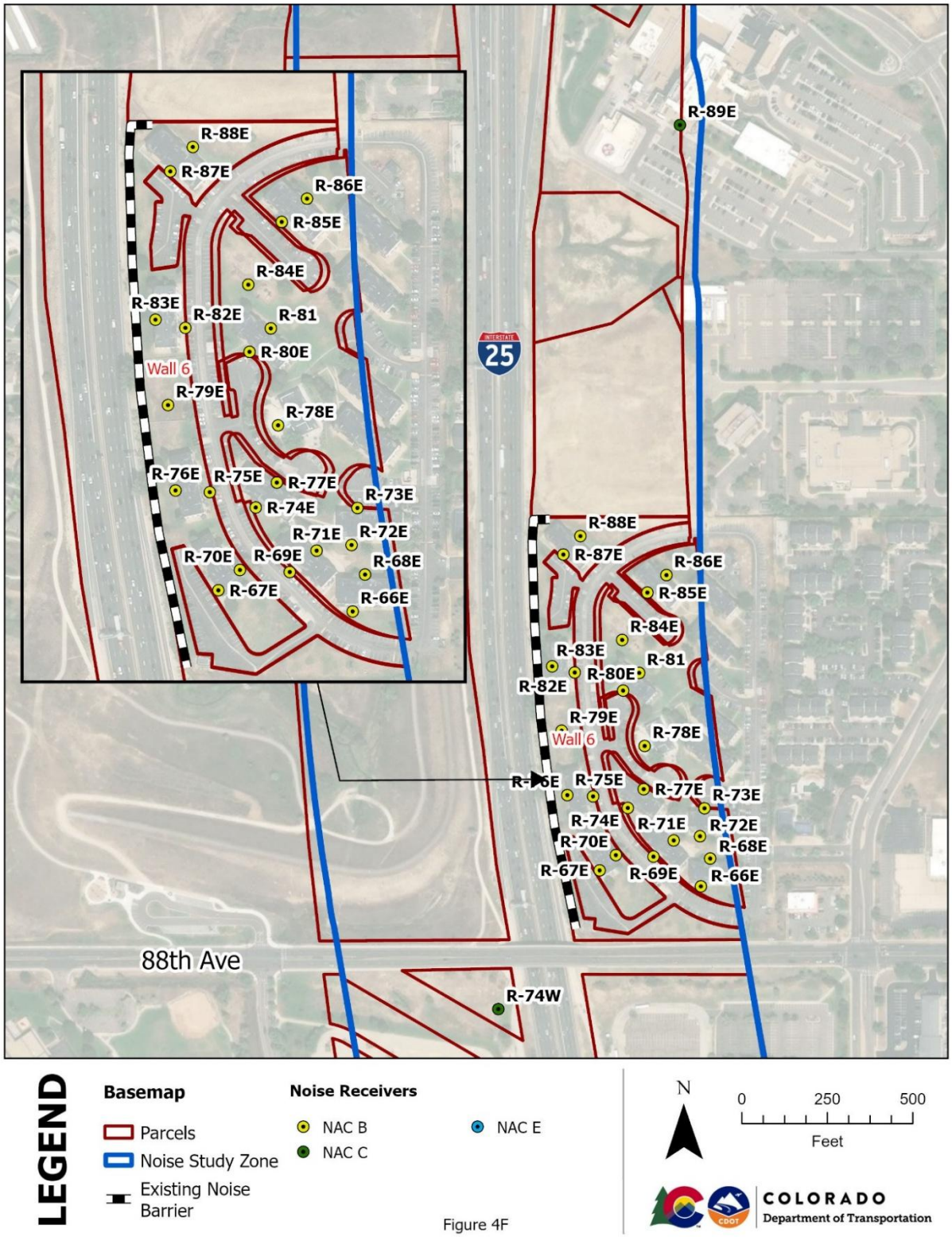



Figure 4F

**Figure 4G Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**



**Figure 4H Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**

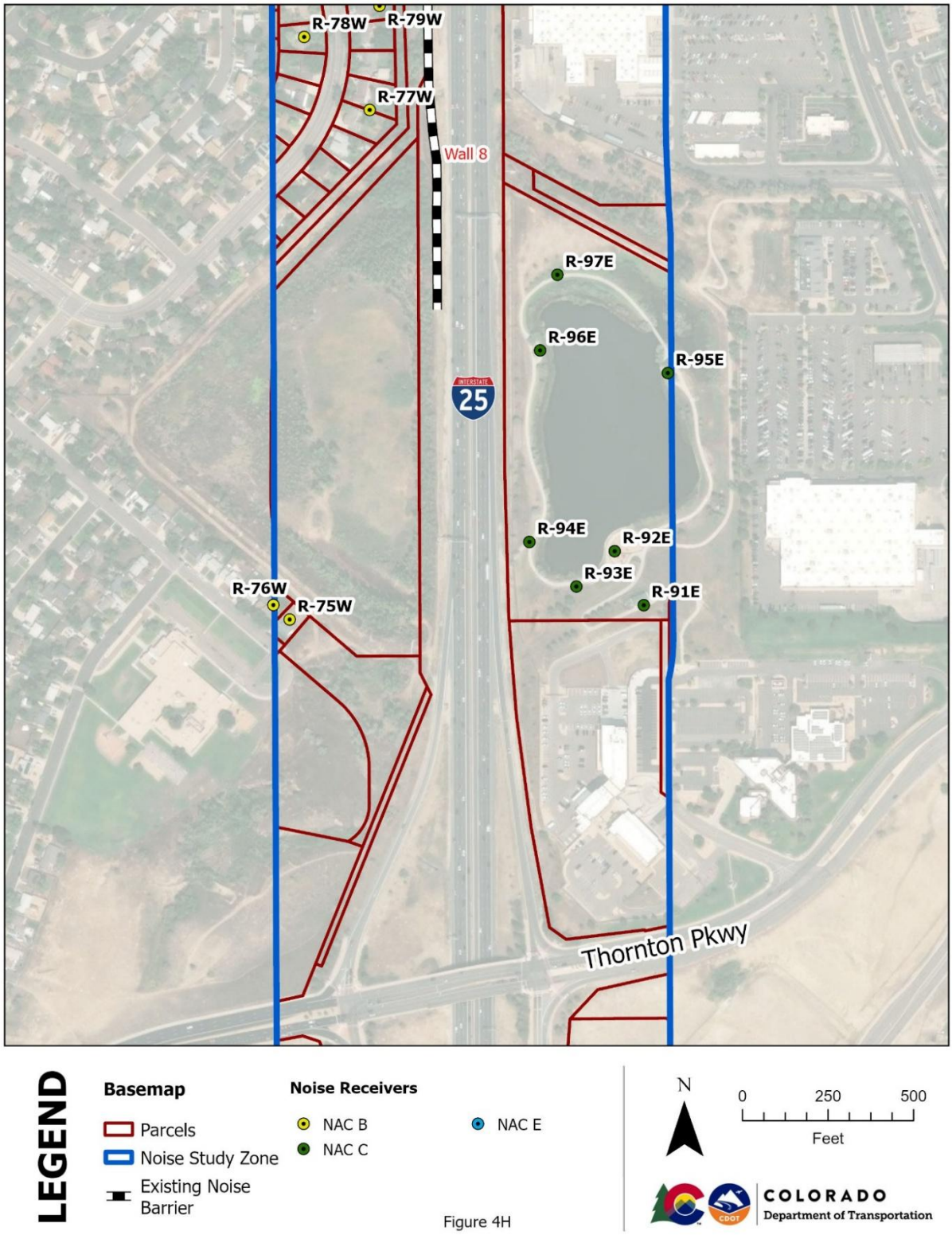



Figure 4H

**Figure 4I Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**

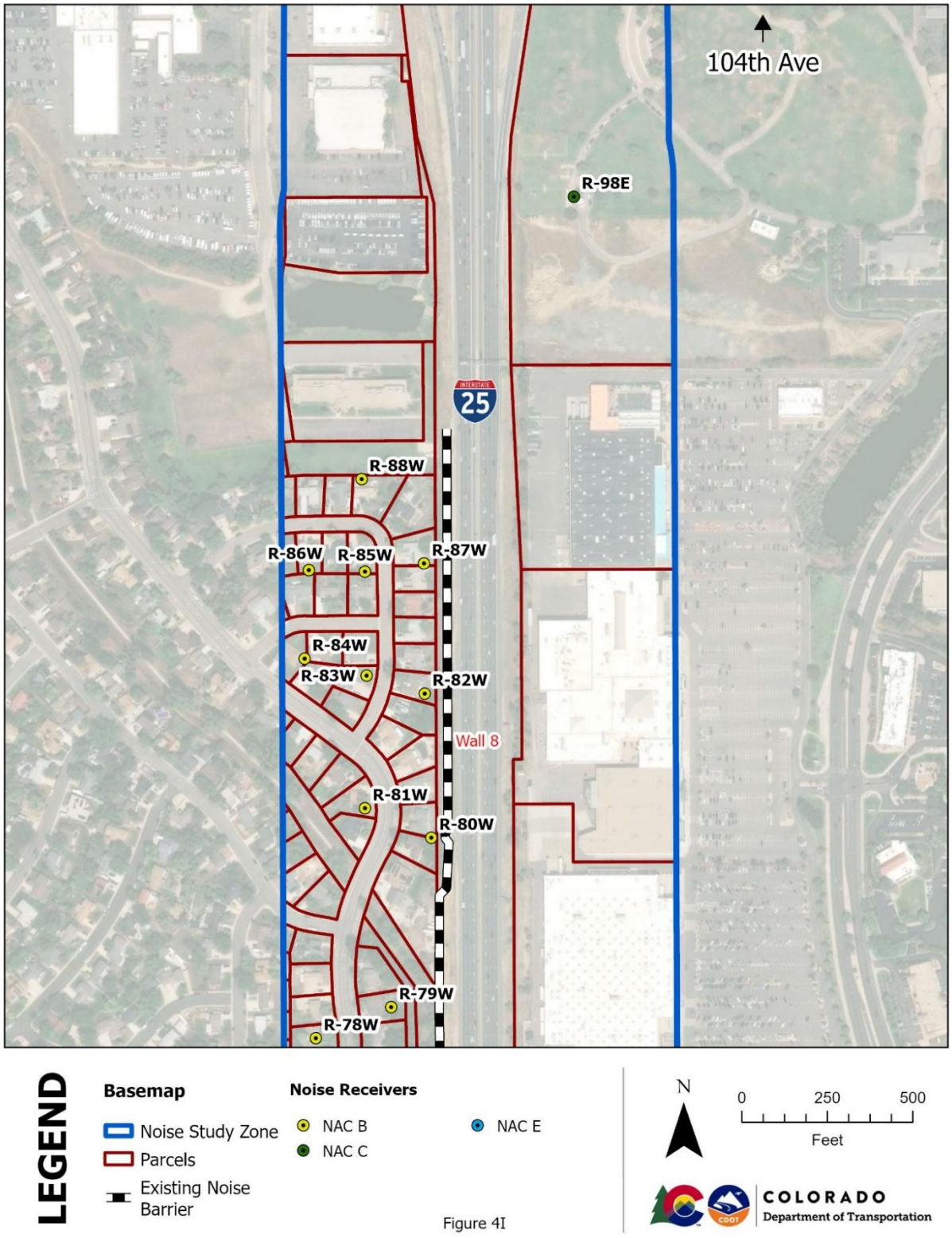



Figure 4I

**Figure 4J Roadways and Receiver Locations for Existing Condition (2024) and Design Year (2050) No Action Alternative**

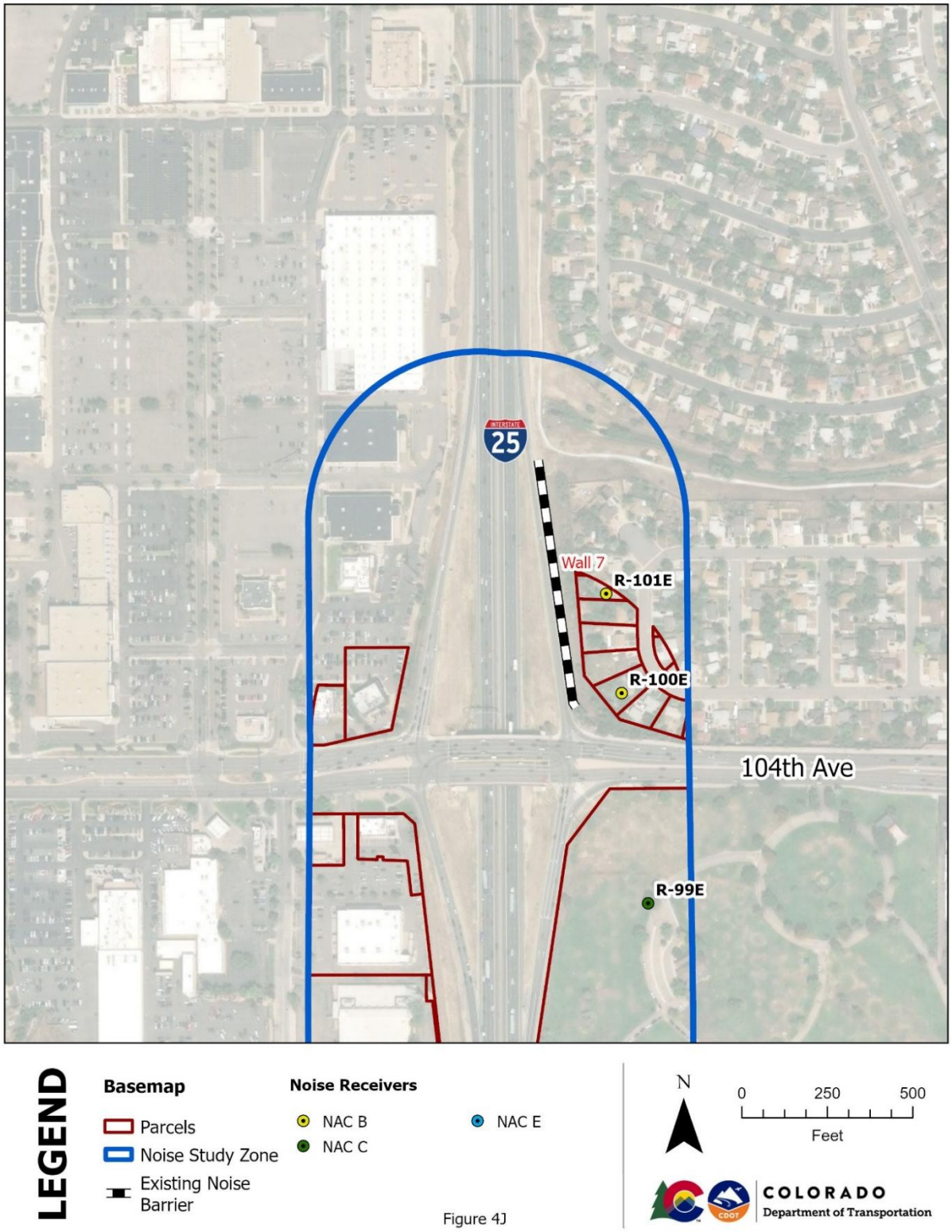



Figure 4J

**Figure 5A Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)[1]**

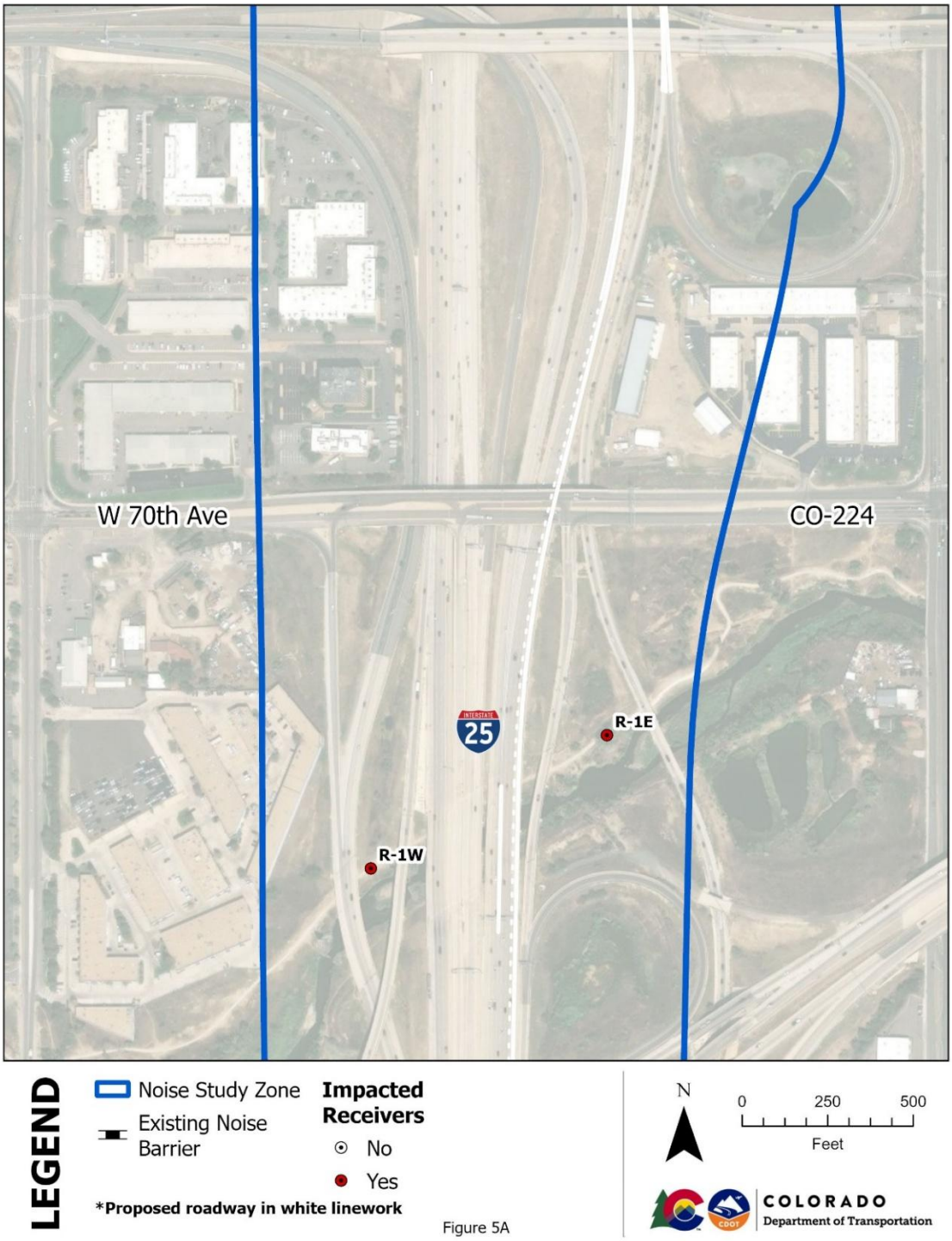



Figure 5A

**Notes:**

1. Figures 5A-5K display the existing noise barriers that will remain after the project (i.e., any modified parts of existing barriers are not included in these diagrams).

**Figure 5B Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)**




Figure 5B

**Figure 5C Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)**

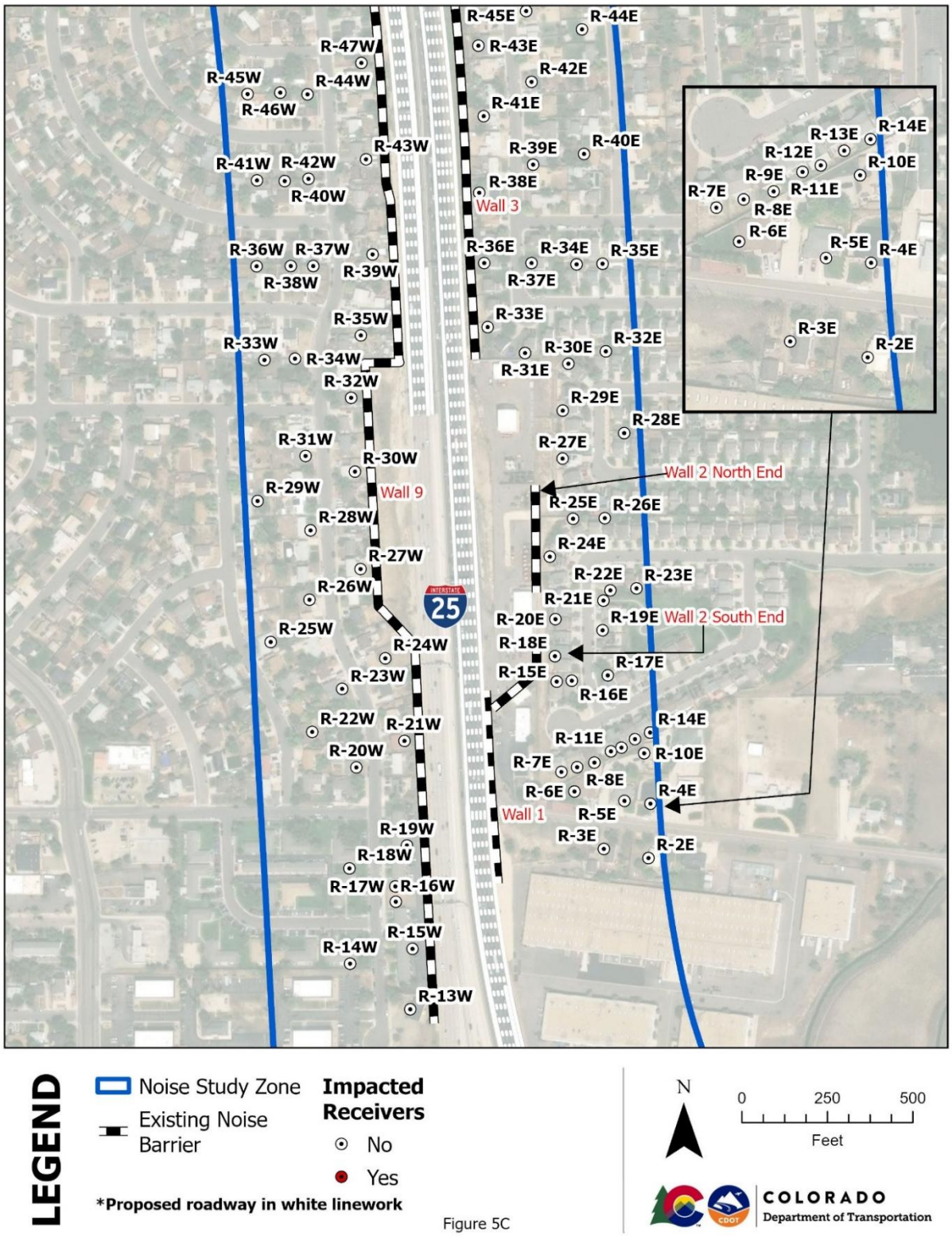



Figure 5C

**Figure 5D Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)**

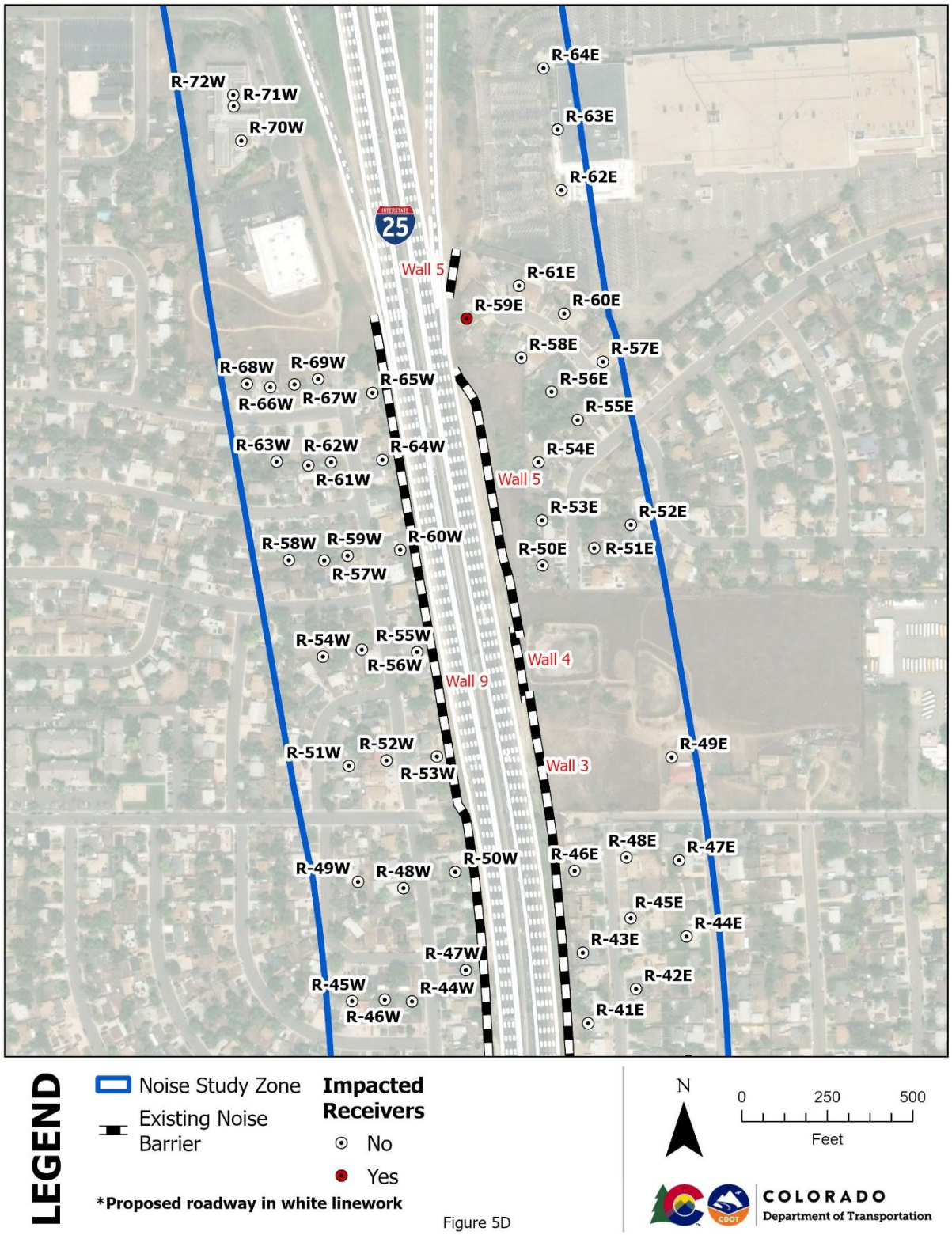



Figure 5D

**Figure 5E Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)**




Figure 5E

**Figure 5F Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)**

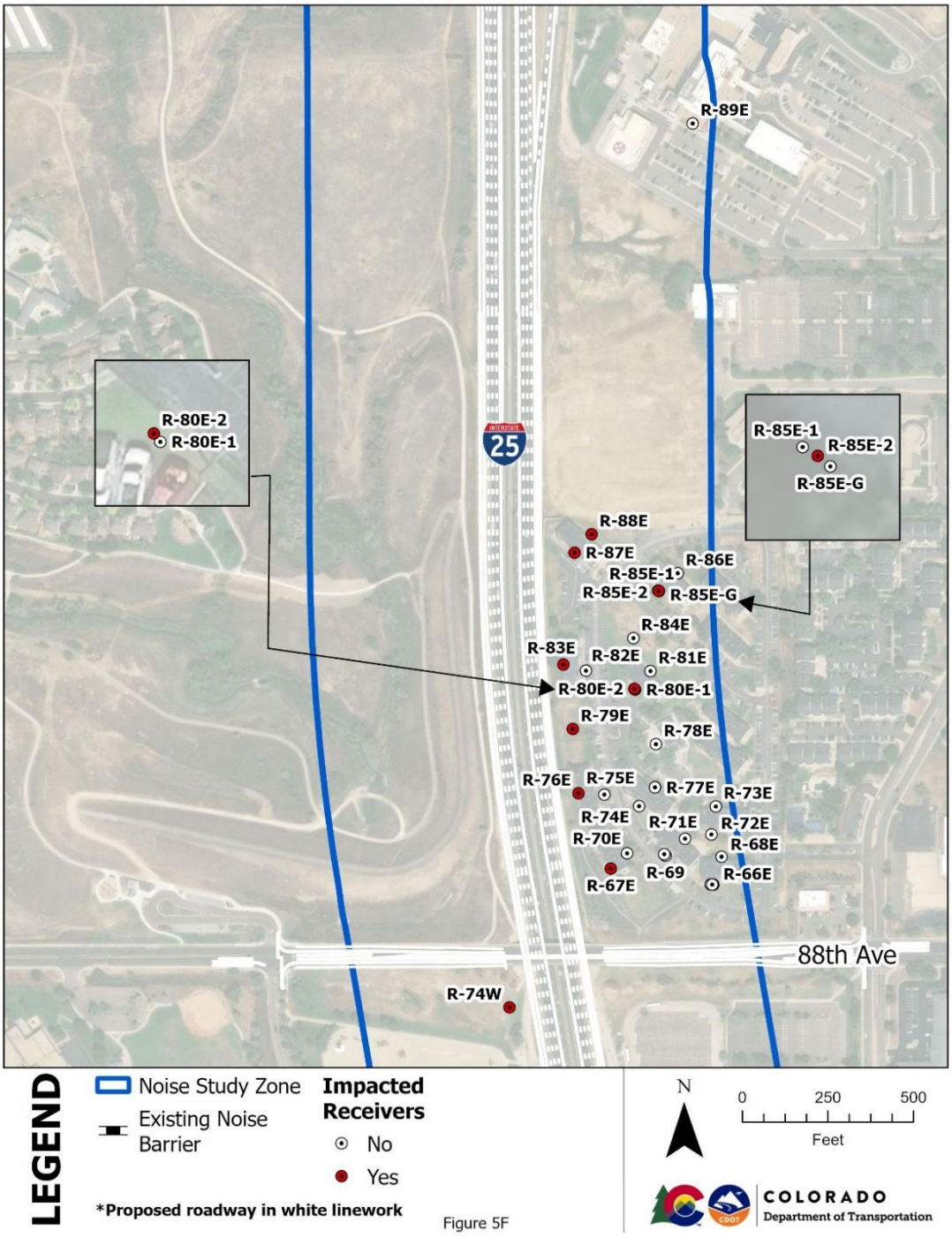



Figure 5F

**Notes:**

1. Receivers (R-66E-G through R-88E-2) were modeled at various heights in the same location to accurately represent the different story levels in the apartment complexes. If different story levels for the same location were impacted, the receivers were separated: ground level receivers were marked with a "G" in the receiver ID, first floor by "1," and second floor by "2." If all story levels for a receiver were impacted (or not impacted), the receiver was not separated based on story level.

**Figure 5G Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)**




Figure 5G

**Figure 5H Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)**

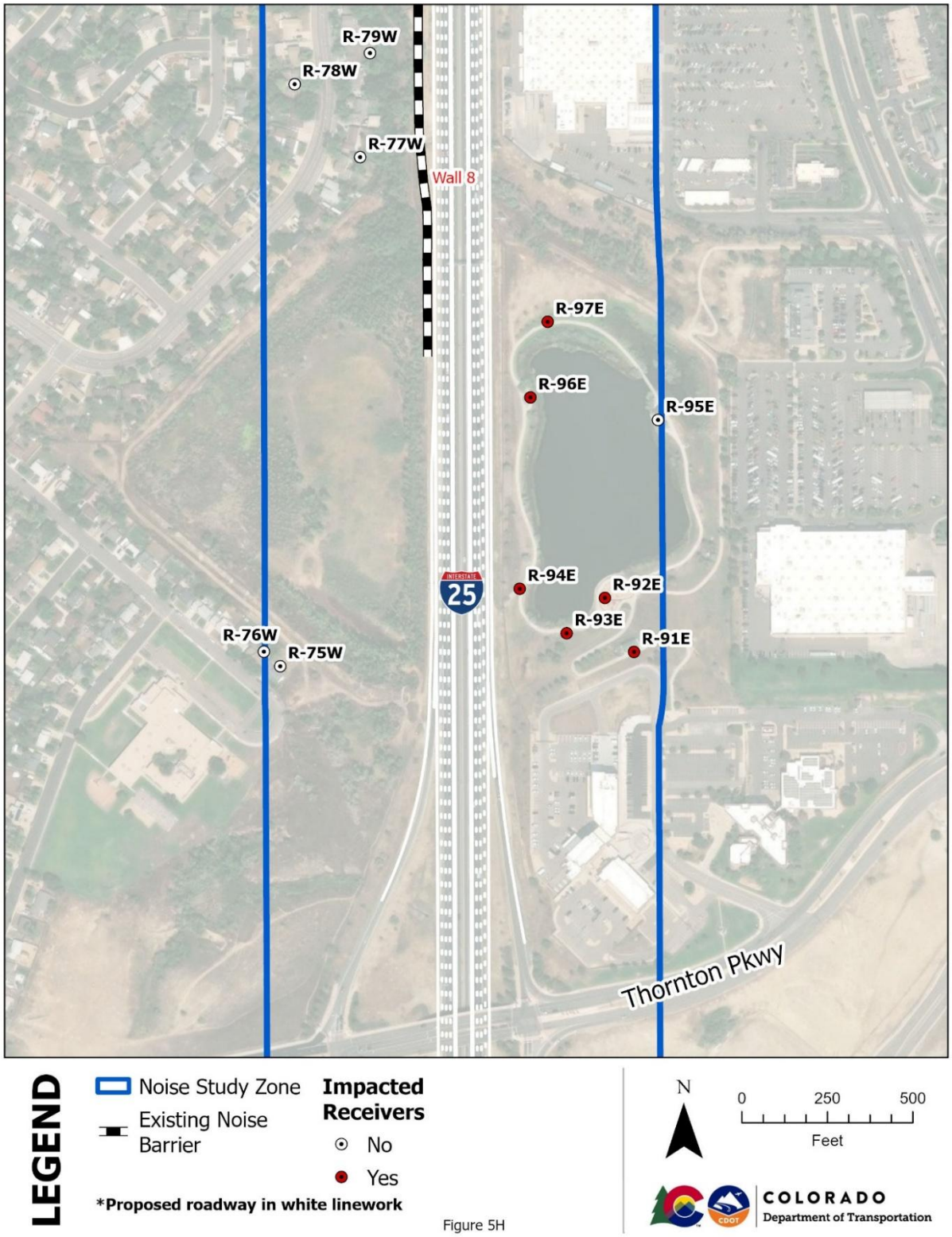



Figure 5H

**Figure 5I Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)**




Figure 5I

**Figure 5J Roadways and Receiver Noise Levels for Design Year (2050) Proposed (Impacts Identified)**




Figure 5J

**Figure 6A Evaluated Noise Barrier Locations – PR-Wall 5**

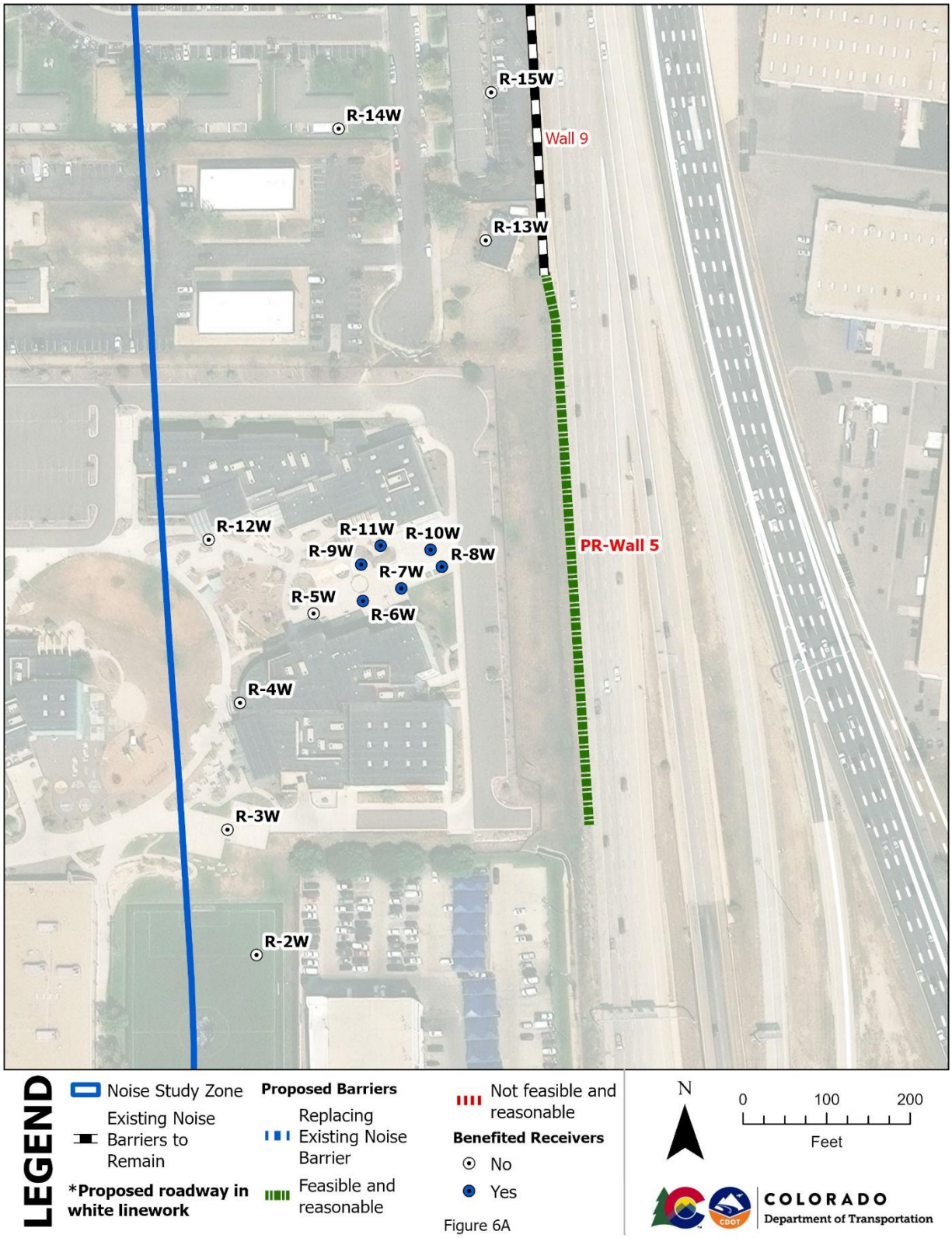



Figure 6A

**Figure 6B Evaluated Noise Barrier Locations – PR-Wall 1**

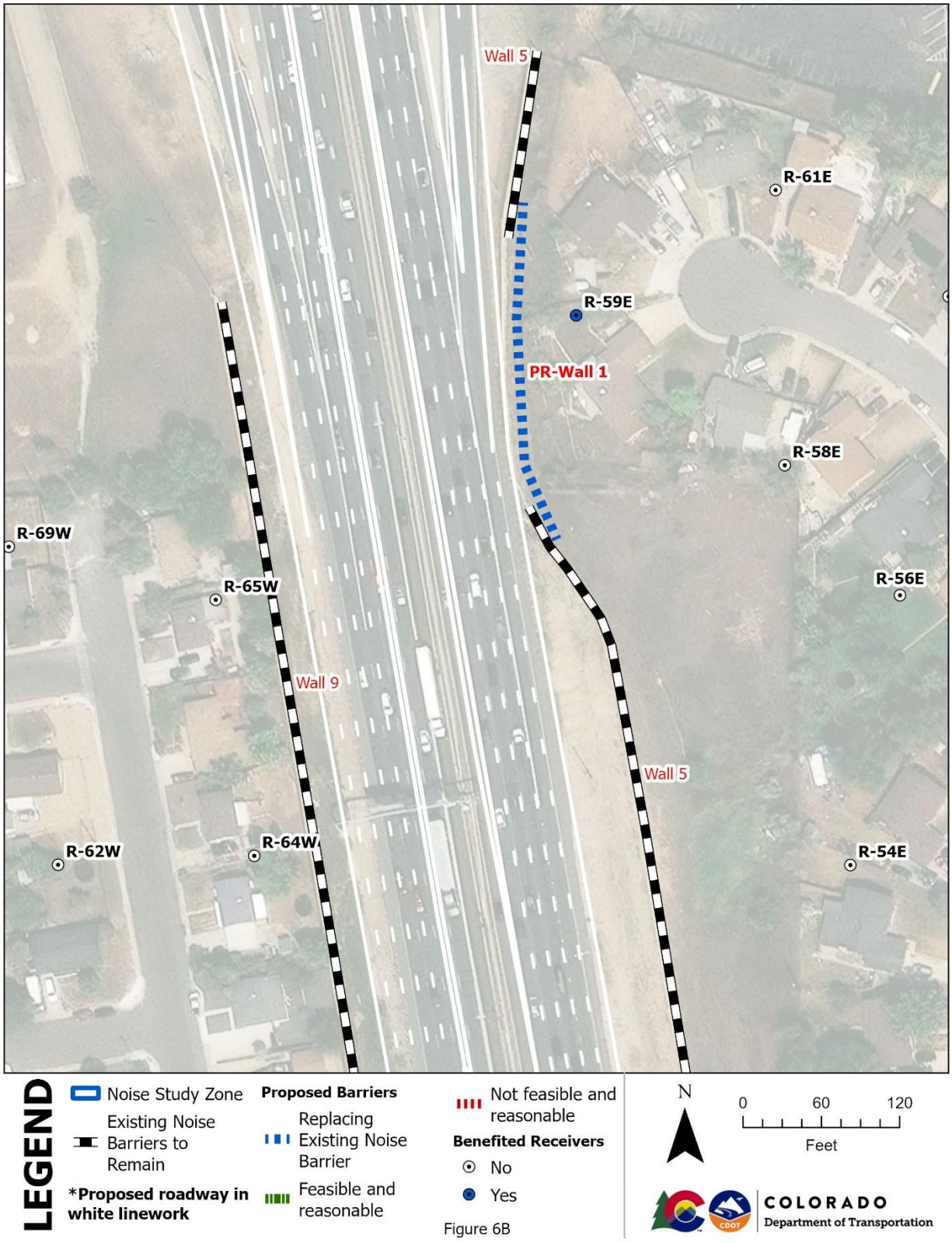



Figure 6B

**Figure 6C Evaluated Noise Barrier Locations – PR-Wall 4**



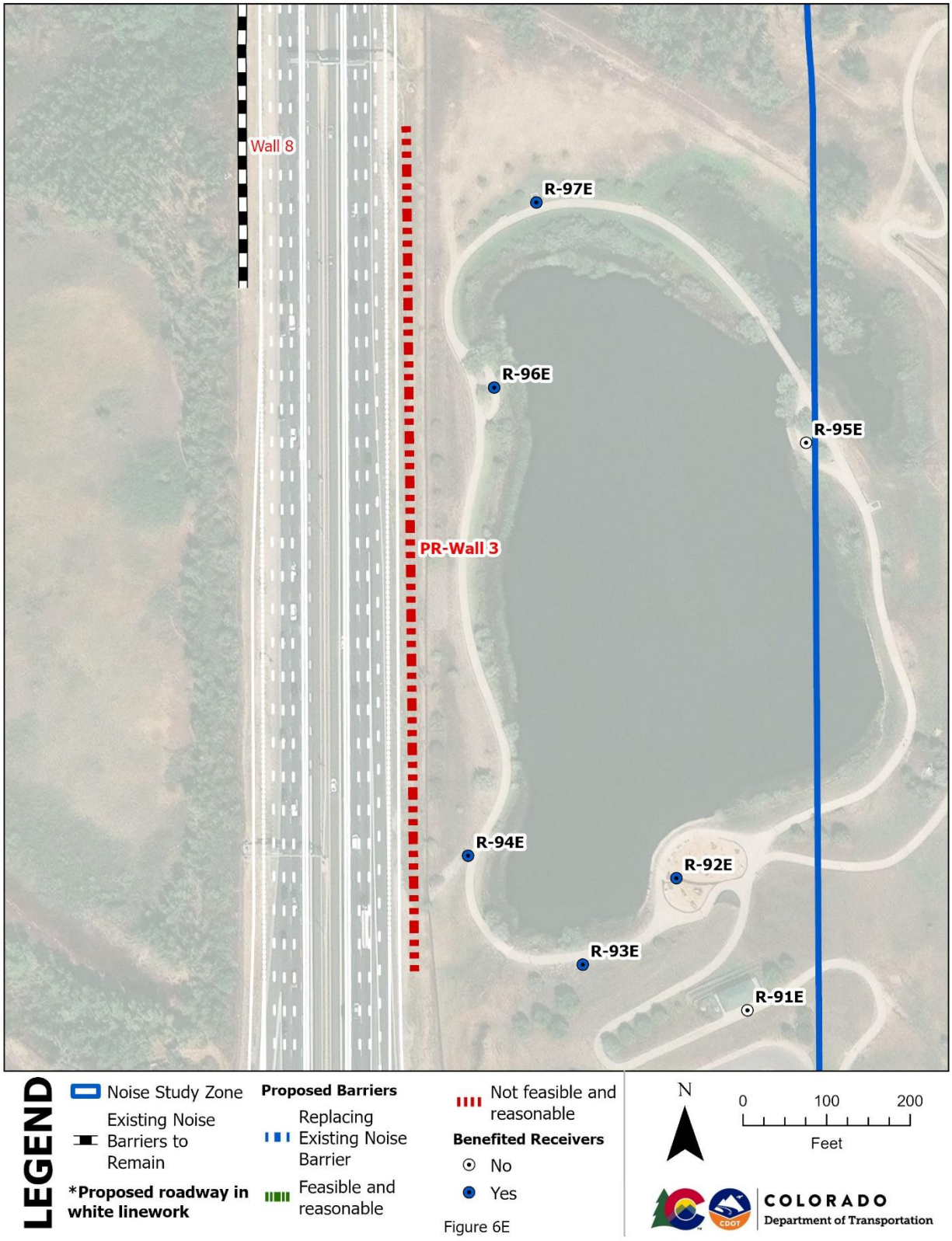
**Figure 6D Evaluated Noise Barrier Locations – PR-Wall 2**




**Notes:**

1. Receivers (R-66E-G through R-88E-2) were modeled at various heights in the same location to accurately represent the different story levels in the apartment complexes. If different story levels for the same location were impacted, the receivers were separated: ground level receivers were marked with a "G" in the receiver ID, first floor by "1," and second floor by "2." If all story levels for a receiver were impacted (or not impacted), the receiver was not separated based on story level.

**Figure 6E Evaluated Noise Barrier Locations – PR-Wall 3**



## Figure 6F Evaluated Noise Barrier Locations – PR-Wall 6




Figure 6F

**Notes:**

1. Receivers (R-66E-G through R-88E-2) were modeled at various heights in the same location to accurately represent the different story levels in the apartment complexes. If different story levels for the same location were impacted, the receivers were separated: ground level receivers were marked with a "G" in the receiver ID, first floor by "1," and second floor by "2." If all story levels for a receiver were impacted (or not impacted), the receiver was not separated based on story level.

## Figure 6G Evaluated Noise Barrier Locations – Wall 8

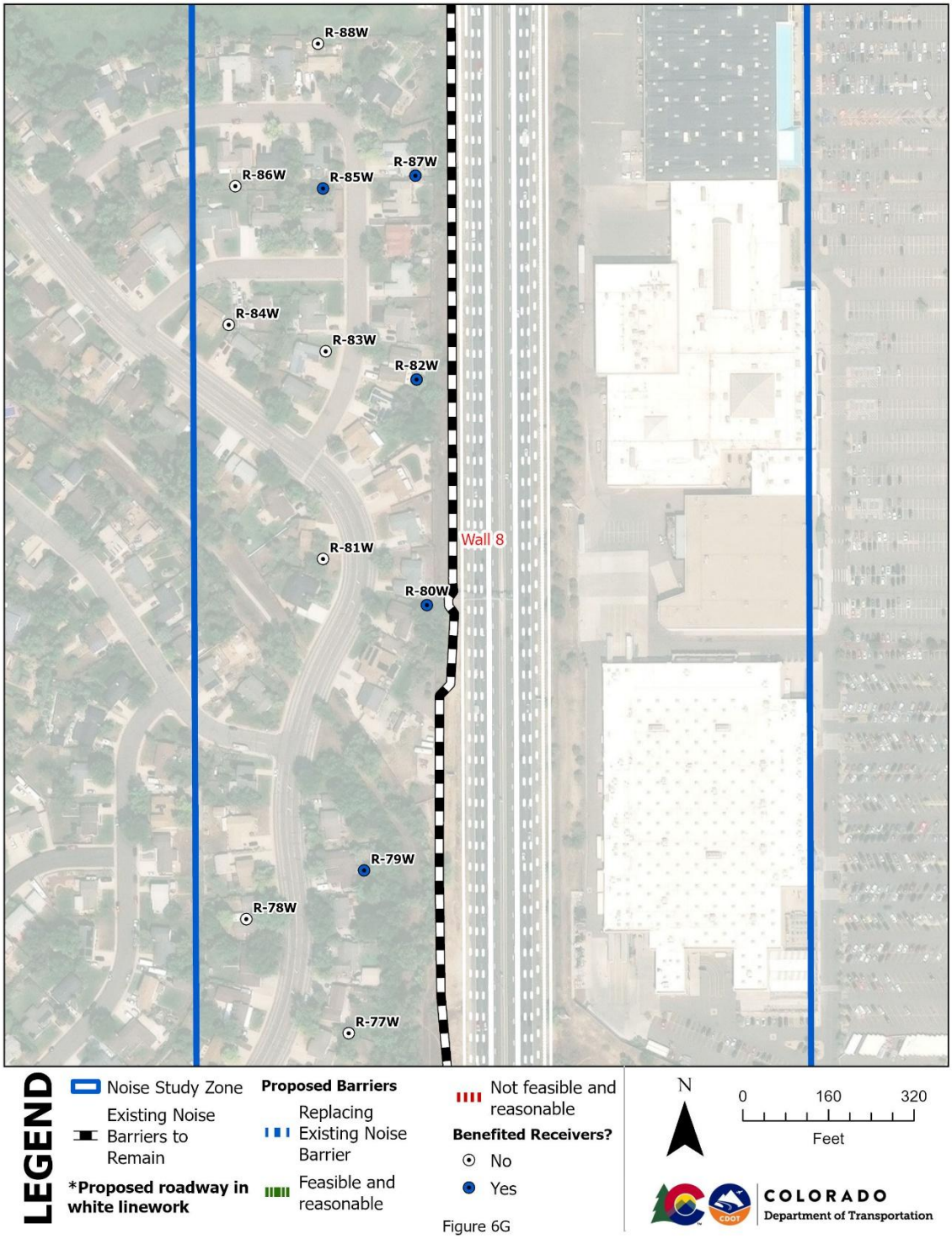



Figure 6G

**Notes:**

1. Existing Wall 8 was modeled because it had an impacted receiver (R-80W). Based on the amount of benefit it provides, Wall 8 meet the NRDG criteria and will remain.

**Figure 7A Design Year (2050) Proposed Action NAC Activity Category G Noise Level Contours**

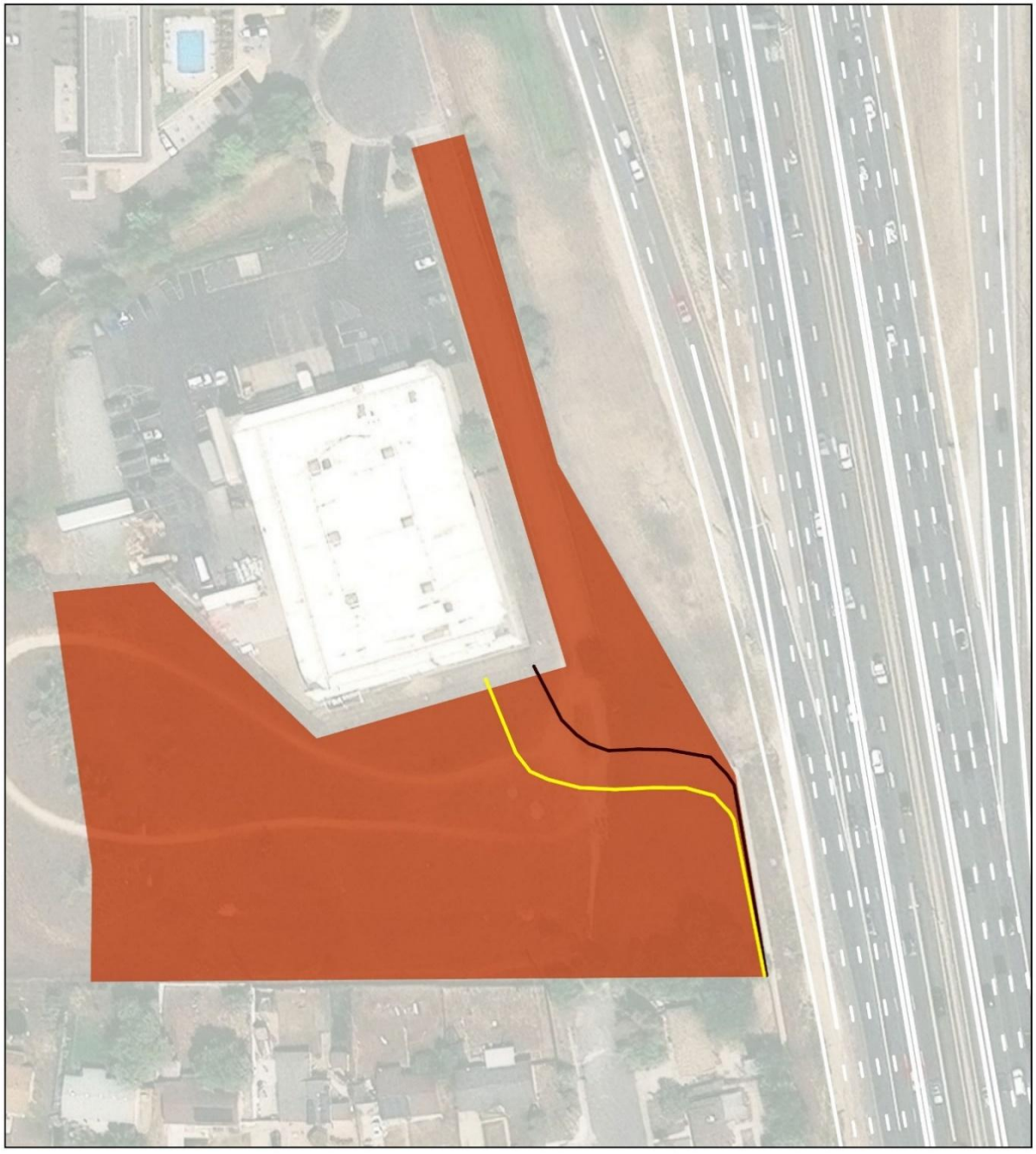


**Figure 7B Design Year (2050) Proposed Action NAC Activity Category G Noise Level Contours**

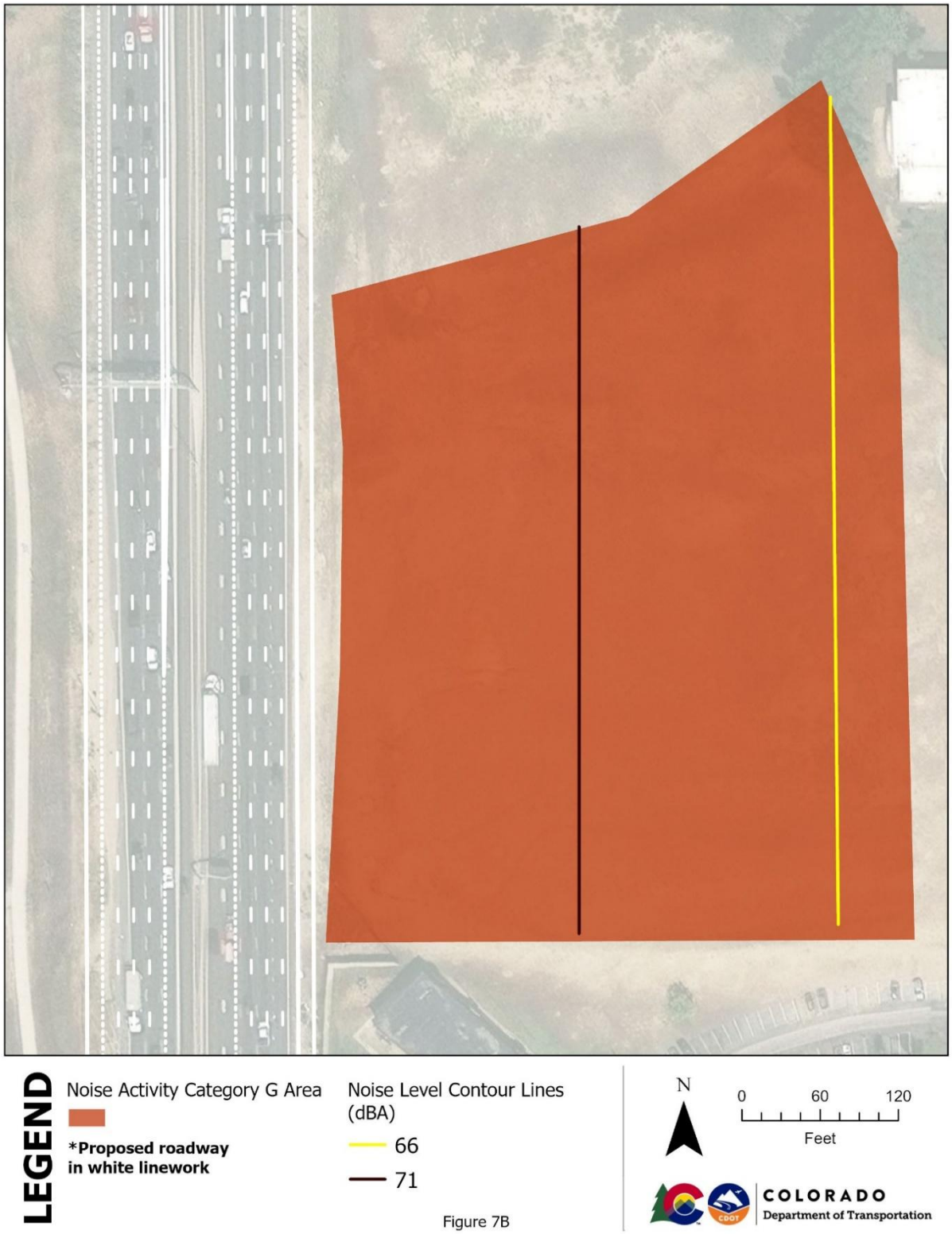


**Figure 7C Design Year (2050) Proposed Action NAC Activity Category G Noise Level Contours**

