Record of Decision 4: Appendix C

Noise Technical Report

April 2017

EXPRESS LANES | NORTH I-25

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1 INTRODUCTION

The proposed project encompasses approximately 12 miles of Interstate 25 (I-25) from state highway (SH) 56 to SH 392, which spans through cities and towns including Fort Collins, Windsor, Loveland, and Johnstown located within Larimer and Weld Counties. The overall purpose of the updated noise analysis for I-25 is to conclude if noise levels at any receiver near proposed project improvements will exceed applicable impact thresholds from implementation of this phase of the project. This noise technical assessment and report supplements the technical report and information contained in the reports previously produced for the North I-25 Final Environmental Impact Statement (FEIS) (Colorado Department of Transportation (CDOT), 2011a) and considers changes in legislation, regulations, or guidance and existing conditions or future conditions. The technical assessment and report support the Record of Decision (ROD) 4, which will document the final agency decision for improvements to I-25 from SH 392 to SH 56.

1.1 Project Background

ROD4 documents the final agency decision for improvements to I-25 between SH 56 and SH 392. It is the final step in the National Environmental Policy Act (NEPA) process for this section of I-25, which started with a Notice of Intent to prepare an Environmental Impact Statement (EIS) in 2003. The purpose of the North I-25 project is to meet long-term travel needs between the Denver Metro Area and the rapidly growing population centers along the I-25 corridor north to the Fort Collins-Wellington area. To meet long-term travel needs, the project must improve safety, mobility, and accessibility, and provide modal alternatives and interrelationships.

1.2 Project Limits

The Selected Alternative discussed in this ROD4 consists of reconstruction and widening of I-25 between SH 56 and SH 392 (approximately 12 miles) to include addition of one buffer-separated express lane in each direction (for more information on the ROD4 Selected Alternative, see Chapter 2). These improvements are selected at this time because they support the full build-out of the FEIS Preferred Alternative.

Cross streets including Weld County Road (WCR) 46, SH 60, WCR 14, Larimer County Road (LCR) 16, SH 402, LCR 20, US Highway 34, Crossroads Boulevard, LCR 30 and SH 392 were included in the noise models. Frontage roads were included in the noise models near receptors to provide accurate terrain in noise levels. Cross streets were included to within the 500-foot line as seen in Appendix F maps. Per CDOT's *Noise Analysis and Abatement Guidelines* a 500-foot distance from the proposed edge of traveled lanes was used when modeling roadway elements.

2 RESOURCE DEFINITION

Noise generally is defined as unwanted or undesirable sound. It is emitted from many natural and man-made sources. Noise typically affects humans in three different ways: noise intensity or level, noise frequency, and noise variation with time. Noise intensity, or noise level, is determined by how sound pressure fluctuates. Since the range of sound pressure ratios varies greatly over many orders of magnitude, a base-10 logarithmic scale is used to express sound levels in dimensionless units of decibels (dB). The range of noise normally encountered can be expressed by values between 0 (threshold of hearing) and 120

dB on the dB scale. A 3-dB change in sound level generally represents a barely noticeable change in noise level, whereas a 10-dB change would be perceived as a doubling of loudness.

The frequency of noise is related to the tone or pitch of the sound and is expressed in terms of cycles per second, or Hertz. The human ear can detect a wide range of frequencies, from approximately 20 Hertz to 17,000 Hertz. Human hearing is most sensitive to frequencies between 1,000 Hertz and 6,000 Hertz. People generally are not as sensitive to lower-frequency sounds as they are to higher frequencies, and most people lose the ability to hear high frequency sounds as they age. To account for varying sensitivities, frequency sound levels are commonly adjusted, or "filtered," before being logarithmically added and reported as a single sound level. The A-weighting filter is commonly used when measuring noise to provide a value that represents human response. Noise levels measured using this system are called "A-weighted" levels, and are expressed as dBA.

Because noise fluctuates during the course of a day, it is common practice to use an equivalent sound level (Leq) that represents a steady sound level over a specified time period (typically 60 minutes). Leq(h) is the hourly equivalent noise level; the equivalent steady-state sound level that contains the same amount of acoustic energy as the time-varying sound level over a one-hour period.

3 METHODOLOGY

3.1 Changes in Legislation, Regulations, or Guidance

Since the publication of the FEIS in 2011, the noise guidance from both the Federal Highway Administration (FHWA) and CDOT have been updated. CDOT's *Noise Analysis and Abatement Guidelines* was revised in January 2015, and FHWA's revised *Highway Traffic Noise: Analysis and Abatement Guidance* was released in December 2011; the analysis in this report conforms to both.

3.2 Noise Abatement Criteria

CDOT has established noise levels at which noise abatement must be considered for various types of noise-sensitive sites. These noise levels are referred to as the Noise Abatement Criteria (NAC). As presented in Table 1, the NAC vary according to the land use activity category.

Noise abatement measures must be considered when either of the following is true:

- Predicted traffic noise levels meet or exceed the NAC.
- A substantial noise increase of at least 10 decibels (dBA) over existing conditions is predicted.

Table 1. CDOT Noise Abatement Criteria

Activity Category	Leq(h), dBA	Description of Land Use Activity Category
A	56 (Exterior)	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	66 (Exterior)	Residential.
C	66 (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 (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	71 (Exterior)	Hotels, motels, time-share resorts, vacation rental properties, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	—	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	—	Undeveloped lands that are not permitted for development.

Source: CDOT, 2015

3.3 Methodology

This report used the methodology described in a previous memo, *Traffic Noise Impact Assessment Methodology, Noise Technical Assessment – SH 392 to SH 56,* (September 2016). The memo outlines the methodology proposed to complete the noise technical assessment and report for the North I-25 project and has been used in the analysis described in this report. It followed the *Colorado Department of Transportation (CDOT) Noise Analysis and Abatement Guidelines* (2015).

4 EXISTING CONDITIONS

4.1 Identification of Noise-Sensitive Sites

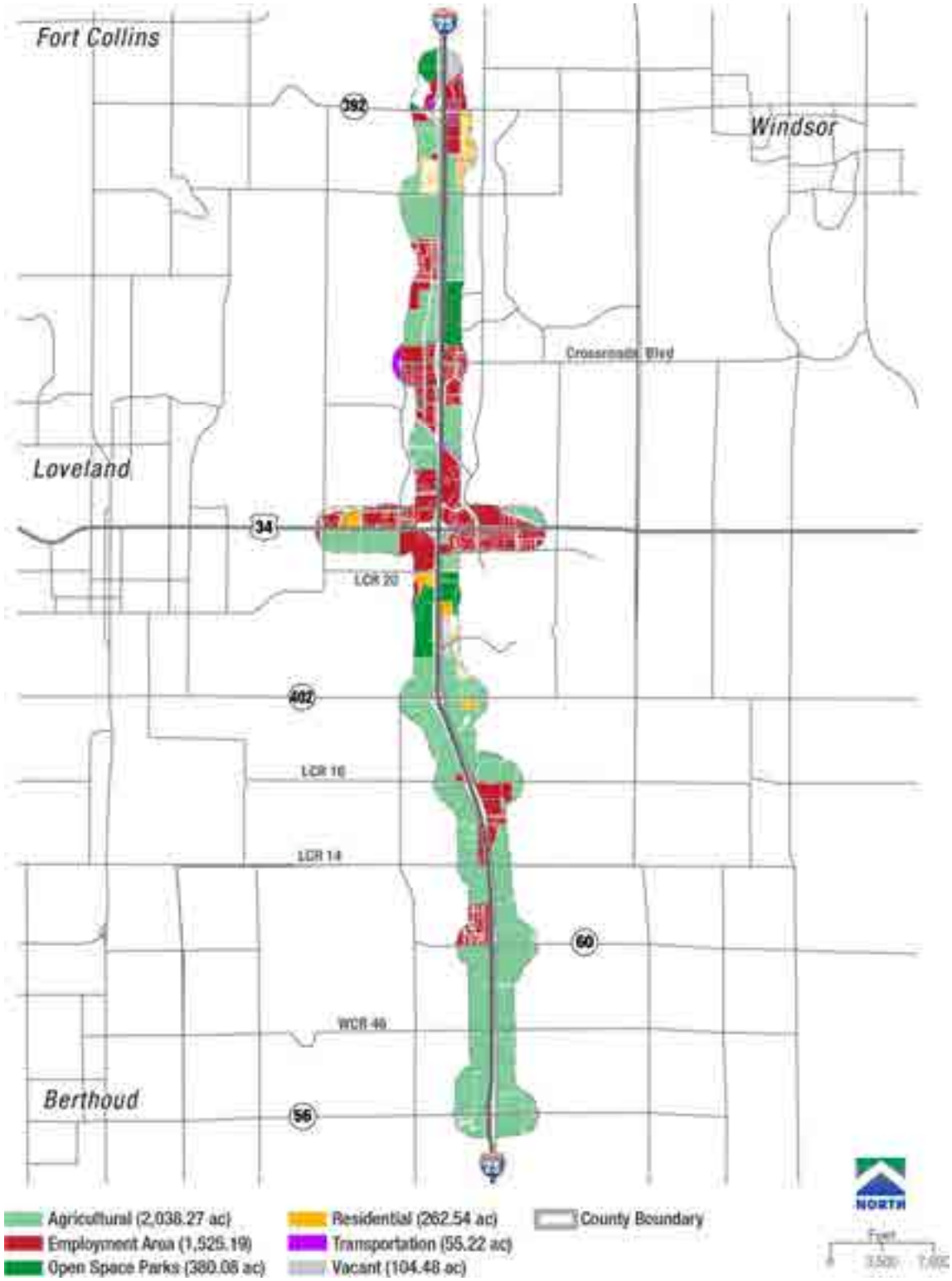
The project study area was reviewed to identify any new development or land use changes that have occurred since the prior noise technical report. Existing receptors were captured within the existing model run, and included in future no build and build model runs. Receptors within 500 feet of the edge of traveled lanes were considered. Previously identified receptors were reviewed and assigned their appropriate NAC based on the updated CDOT and FHWA guidance. New receptors were also assigned their appropriate NAC based on the current guidance.

In general, most of the sensitive sites in the I-25 corridor are residential development that has occurred adjacent to the highway ROW. These include the Mountain Range Shadows Subdivision north of E. LCR 30, a mobile home park at E. LCR 20, Thompson River Ranch Subdivision north of SH 402, Briarwood development just south of SH 402, and scattered individual residences along the length of the corridor. In addition, commercial enterprises with outdoor uses occur along I-25. No historic properties located along the corridor are expected to be affected by noise.

There is also a Category D facility, a radio station in an office complex on Crossroads Boulevard. This activity category includes the interior impact criteria for certain land use facilities. A desktop indoor analysis for this Category D receptor was performed because there are no potential exterior areas of frequent human use. The interior building noise level predictions were calculated by subtracting noise reduction factors from the predicted exterior levels for the building in question, based on structure and window type, as described in the *CDOT Noise Analysis and Abatement Guidelines* for interior noise evaluation. Per the guidelines for interior noise evaluation, a 25 dB noise reduction factor was applied to the light frame structure with storm windows. It should be noted that the predicted interior sound level for this receiver was below the NAC after the calculation was applied; thus, noise insulation as a means for mitigation will not be needed at this location.

In general, Category F facilities such as agricultural land are located north and south of Crossroads Boulevard, north of US 34 and north of WCR 14. There are large parcels of undeveloped land along I-25 that could be considered Category G uses, and could change use if redeveloped in the future. Neither Category F nor Category G uses were included in the impact analysis. Figure 1 shows the land uses along the project corridor including agricultural land (NAC F) and vacant parcels (NAC G).

Figure 1. Land Use Map



Source: Weld County, October 2016, Larimer County, October 2016
See Table 1 for NAC categories for land use.

4.2 Ambient Noise Measurements and TNM Model Validation

To characterize the existing noise environment and to validate the computer noise model (see Section 4.1.3, TNM Model Validation), field measurements were taken within the project area following procedures documented in FHWA's *Highway Traffic Noise: Analysis and Abatement Policy and Guidance* (FHWA, 2011). Noise measurements were collected September 8, 2016 from approximately 1 pm to 3:30 pm. Traffic noise measurements were collected via a Larson Davis 812 and a Larson Davis 712 Sound Level Meter. The meters were calibrated by Larson Davis certified laboratory in March 2016 (within one year prior to data collection), and the meter was calibrated in the field prior to and immediately after measurement collection. Table 2 lists the results of the noise measurements.

The noise measurements were taken at four locations within 500 feet of I-25. These sites were located in the vicinity of noise-sensitive sites, where safe access to monitoring sites existed, where representative sampling of free-flow traffic (traffic counts) could be obtained, and where roadway geometry remained relatively constant. Traffic counts were performed at the time of monitoring. Vehicle counts were separated into three categories: cars, medium trucks, and heavy trucks. Vehicle speeds were modeled based on posted speed limit, as actual travel speed readings were unable to be collected in the field.

Data collection efforts focused on noise sensitive receptors within NAC B land uses. No interior readings were taken while in the field. Additionally, the four monitoring locations were distributed throughout the corridor. Two locations were at the entrance to neighborhoods within (or at least partially within) 500 feet of I-25, another monitoring location was at an RV park and the fourth location was taken near a single residence near WCR 46 and I-25. Noise monitoring locations are shown on Figure 2. As shown in Table 2, measured noise levels approximately 180 feet to 450 feet from I-25 ranged from 60 dBA to 74 dBA.

In accordance with industry standards and accepted best practices, detailed noise models were created using the FHWA Traffic Noise Model (TNM) v.2.5. The noise models were validated to within acceptable tolerances of field-monitored traffic noise data. The results of the validation effort are listed in Table 2. The results show that the validation model predicted noise levels at all locations within ±3 decibels of the actual measurement as allowed by CDOT guidance. Successful validation of sites in different neighborhoods with different roadway geometry, traffic conditions, terrain lines, and shielding (buildings and other impediments to the propagation of noise) provided high confidence in the TNM model results and subsequent decisions made in the remaining portions of the noise study.

Table 2. Study area noise measurements and TNM model validation results

Measurement Site Number	Location Name	Description	Location from edge of I-25 (feet)	Noise Reading (dBA)	TNM Validation Result (dBA)	Difference
1	Roadside at WCR 46	WCR 46 and I-25	399	67	68	+1
2	Johnson's Corner Campground	Near Marketplace Drive and Frontage Road	184	71	74	+3
3	Thompson River Ranch Subdivision	Briarwood Lane and Frontage Road	449	61	64	+3
4	Mountain Range Shadows Subdivision	Peakview Drive and Frontage Road	192	74	76	+2

Figure 2. Noise-monitoring locations

5 EFFECTS ANALYSIS

The effects analysis presents the results of traffic noise impacts from implementation of project alternatives and discusses mitigation measures to minimize adverse effects. The effects assessment compares the No-Action and Build Alternatives to the existing conditions and to the NAC to determine whether impacts would occur at noise-sensitive receptors.

Modeled locations are shown in Appendix A, Data and TNM Modeling Results, of this technical report. Based on CDOT's Noise Analysis and Abatement Guidelines, 66 dBA was used as the approach noise level in the analysis of the existing conditions in the study area for Activity Categories B and C (see Table 1). Existing noise levels for each modeled location can be found in Appendix A, Data and TNM Modeling Results, of this technical report.

5.1 Modeling Methodology

The assessment of noise effects from traffic operations is based on a comparison of projected future noise exposure with existing conditions and with the NAC for noise-sensitive land use categories. The following subsections describe the methodologies followed for the noise effects analysis.

Due to the TNM software projecting a several-day long run time for results, both the ROD4 Selected Alternative and the FEIS Preferred Alternative were divided into northern and southern segments. This allowed for the noise level results to be obtained and analyzed in a more timely fashion. This segmentation was created just south of the US 34 and I-25 intersection in an area that did not have many modeled receivers. In the southern portion of the model where receivers were located, over 500 feet of roadway (well over four times the distance of the receiver in relation to its distance from the roadway in this instance) was left in the model to account for roadway noise.

Further, for the ROD4 Selected Alternative, the model for the north end was further segmented into four areas: SH 392, Mountain Range Shadows, Crossroads Boulevard and US 34. This was done due to the concentration of noise receivers within the Mountain Range Shadows neighborhood significantly affecting model run time. Again, in these areas where the model was segmented, the roadway remained in the model further beyond receiver location to account for roadway noise.

5.1.1 Noise Model

FHWA's TNM 2.5 was used for all traffic noise modeling. This software is required for all noise analysis per FHWA regulations (23 CFR §772). TNM calculates traffic noise levels based on input for the loudest hour traffic volumes, operating speeds, and surrounding environmental characteristics. This information then is used to determine which receptors would meet or exceed the established noise criteria or experience a substantial increase in noise levels over existing conditions.

Roadways and ramps that were modeled include I-25; segments of the frontage roads to the west and east of I-25 where present; and major intersecting streets, including SH 392, LCR 30, Crossroads Boulevard, US 34, LCR 20, SH 402, LCR16, WCR 14, SH 60, and WCR 46. Most major intersections span approximately 1,500 to 3,500 feet outward (east to west) from the intersecting point with I-25, with the exception of some shorter county roads that had a "T" intersection with the frontage roads where distance would have been captured westbound. No terrain lines were captured in the noise models.

5.1.2 Shielding

To remain consistent with the noise analysis performed in the FEIS buildings were modeled as barriers unless they were modeled as building rows. Building rows were used for neighborhood areas with consistently repeating structures. Barriers were used for commercial properties whose large structures act more like barriers than building rows with building percentages. To determine the percentage of noise blocked by the building row, the percentage of building lengths in the building row was used. The length of a building row includes the length of spaces between buildings through which noise could traverse. A lawn ground type was used for the noise models.

5.1.3 Placement of Receptors

The receptor location was placed where there was an apparent area of frequent outdoor human use. Each receptor placed represented one dwelling unit or area of frequent human use.

5.1.4 Traffic and Speed

In accordance with CDOT's guidelines and FHWA regulations (23 CFR 772.9 (d)), the loudest hour noise levels should be used to determine noise impacts. The loudest noise hour is typically the hour with the highest volume of traffic traveling at the fastest, congestion-free speeds. For roadway links that experience a Level of Service (LOS) rating of LOS D, LOS E, or LOS F during the peak hours of the day, the "loudest volume" as recommended in Exhibit 4 of the CDOT *Noise Analysis and Abatement Guidelines* was used, which is summarized in the "maximum vehicles per hour per lane" column of Table 3. Estimated vehicle speeds for all roadways within the project limits were divided into three categories that are consistent with CDOT's guidelines. For the I-25 noise analysis, one speed limit (75 miles per hour [mph]) was assumed for all of I-25, one speed limit was modeled for all ramps (50 mph), and one speed limit was modeled for all frontage roads, collector streets, and arterials (45 mph), depending on the number of lanes. Truck percentages for directional segments of I-25 and each on and off ramp were taken from the North Front Range Metropolitan Planning Organization (NFRMPO) travel demand model.

Traffic volumes modeled in TNM for each alternative were also generated from the NFRMPO travel demand model. Future traffic forecasts for the alternatives used the 2040 design year. While both AM peak and PM peak traffic volumes were generated using the NFRMPO models, PM peak traffic volumes were used because they represented a worst-case scenario for noise analysis.

The traffic information listed in Table 3 was input to the validated TNM noise models only where roadway segments on I-25 mainline experienced volumes above maximum traffic volumes for the worst noise hour to estimate existing noise levels and existing impacts at each noise-sensitive receptor within the project corridor. All other roadway segments used the actual traffic data, and is included in Appendix F.

Table 3. Maximum modeled traffic volumes for worst noise hour

Roadway Type	Facility Type (per CDOT Guidelines)	Speed[1] (mph)	Maximum Vehicles per Hour per Lane
Highway (I-25)	Freeway	75	1,600
Ramps	Non-freeway multiple lane	50	2,000
Multi-lane frontage roads, arterials, and collectors	Non-freeway multiple lane	45	2,100

[1]Speeds listed are used for all roadway segments in all noise models

Source: CDOT, 2015

Traffic volumes on local streets were included in the model where available, even though the low speeds of the roadways and the low traffic volumes do not contribute significantly to the overall noise level experienced by the surrounding noise-sensitive receptors. These volumes were derived from traffic modeling or from counts taken during noise measurements.

5.1.5 Input Data

Accurate vertical and horizontal data for roadways, receptors, and building rows were needed for noise modeling. There were no existing noise walls within the project corridor. MicroStation, geographic information systems (GIS), and field reviews were used to provide vertical/horizontal data for all features. These resources provided approximate elevations of the interstate, frontage roads, and receptors.

5.1.6 Number of Lanes in TNM Model

In cases where there are multiple lanes of travel, up to two lanes having the same traffic characteristics may be combined in the model as one lane of travel per direction. Currently, I-25 has two lanes in each direction. One lane was modeled to represent up to two lanes in TNM. TNM lanes were also used to model shoulders along I-25 to accurately model the full width of the surface pavement. For the ROD4 Selected Alternative, one TNM lane was used to model both general-purpose lanes for each direction. For the FEIS Preferred Alternative, two TNM lanes were used to model the three general-purpose lane (one representing a single general-purpose lane and another representing two general-purpose lanes). The managed lane in both scenarios was modeled as an additional TNM lane.

Two-lane ramps and frontage roads were modeled as one lane in TNM. The lane was modeled down the center of both lanes for a two-lane section or in the center of the lane for a one-lane section. For a two-lane cross street with one lane in each direction, the street was modeled down the center of both lanes in TNM. For cross streets with multiple lanes in each direction, each direction was modeled separately in TNM. Shoulders and turning lanes were modeled as necessary to accurately represent the full width of pavement on frontage roads and cross streets.

5.1.7 Future Modeling Year

As discussed in Section 2.3 above, future traffic forecasts for the alternatives used the 2040 design year, generated from the NFRMPO travel demand model.

5.1.8 Apartments/Hotels/Condos

Noise-sensitive structures with multiple floors having areas of frequent human outdoor use (such as balconies or patios) were not present within the study area. However, pool areas and playgrounds associated with these land uses were included in the analysis.

5.1.9 Rounding

Noise values were rounded to the nearest whole number when reporting existing and future noise volumes, per Section 3.6 of the CDOT *Noise Analysis and Abatement Guidelines*. For cost-benefit calculations, all values were calculated to one tenth of a decimal point, as reported in TNM.

5.1.9.1 Existing Conditions

Existing conditions are modeled to assess the noise levels that noise sensitive receptors currently experience. This analysis creates a baseline to compare the build alternatives to in order to determine if there will be significant increases in noise over existing levels. The model uses current roadway configuration with existing traffic data.

5.1.9.2 No-Action Alternative

No Action conditions are modeled to assess the noise levels that noise sensitive receptors experience in future years without the project improvements. This analysis creates a baseline to compare the build alternatives to in order to determine if increases in noise over existing levels are due exclusively to the highway project. The model uses current roadway configuration with future 2040 traffic data.

5.1.9.3 Build Alternatives

Two Build conditions are modeled to assess the noise levels that noise sensitive receptors experience. This analysis determines the noise impacts related to the highway project. The noise analysis modeled the FEIS Preferred Alternative with updated traffic, and the ROD4 Selected Alternative. These models use future roadway configurations with future 2040 traffic data.

5.2 Mitigation

The evaluation of effects is organized by sections and focuses on specific noise-sensitive NAC B, NAC C, NAC D and NAC E receptors. The noise-sensitive areas were analyzed for their existing noise levels, the 2040 No-Action noise levels, and for the 2040 noise levels for each of the Build Alternatives. Mitigation is only considered for areas that have impacted noise-sensitive receptors. Receptors are considered impacted if the noise level exceeds the NAC thresholds outlined in Table 1 or if the receptor experiences a substantial increase in noise (at least a 10 dBA increase over existing noise levels). While there are multiple options that can be used to mitigate noise impacts, the most common mitigation measure is the addition of noise walls, which were used in each mitigation analysis.

To determine whether noise walls may be both feasible and reasonable, the decibel decrease due to a noise wall must be compared to the scenario of building the highway without the noise wall, so both scenarios of “no wall” and “with a wall” were analyzed for each alternative that required construction or expansion of roadway capacity. A detailed description of how abatement is determined to be feasible and

reasonable will follow in Section 6.2.1. Impacts to residential, unique land use (such as a medical facility or amphitheater), and noise-sensitive commercial properties associated with each alternative were evaluated.

The discussions in the following subsections include figures that show the receptors modeled in TNM based on their NAC designation. Each modeled location represents one receptor and the figure summarizes whether the modeled noise levels are below their respective NAC criteria (shown in blue) or exceed the threshold (shown in orange). Tables showing the TNM predicted noise level for the loudest hour can be found in Appendix A for each alternative and each model run created.

Abatement measures considered include traffic system management techniques, alignment modifications, property acquisition, and noise walls.

5.2.1 Traffic system management

Traffic system management techniques that limit motor vehicle speeds and reduce traffic volumes can be used to abate traffic noise. Generally, it would take a speed reduction of at least 20 mph to achieve a readily perceptible (5 dBA) reduction of noise. However, I-25 will remain a major thoroughfare supporting intrastate and interstate commerce, and speed limits will not be reduced.

5.2.2 Alignment modifications

Alignment modification involves orienting and/or sighting the roadway at sufficient distances from the noise-sensitive areas in an effort to minimize traffic noise. Alignment modifications were not considered in the design of the I-25 corridor; thus, no alignment modifications are present within the future models.

5.2.3 Property acquisition

Property acquisition programs to provide noise buffer zones are not feasible due to the limited availability and high cost of vacant land in proximity to noise-sensitive sites. Further, federal dollars cannot be used to purchase developed property for noise mitigation purposes.

5.2.4 Noise walls

Noise walls reduce noise levels by blocking the sound path between a roadway and a noise-sensitive site. They are built only if they are found to be feasible and reasonable. CDOT has developed the Noise Abatement Determination Worksheet (Form 1209), included in Appendix B, to ensure consistent evaluation of noise abatement statewide.

For a noise wall to be recommended for inclusion or advancement in the project area, it must be both feasible and reasonable.

To be considered feasible, a noise wall must:

- Achieve at least a 5 dBA reduction for at least one impacted receptor by constructing a noise barrier
- Not reduce safety, such as reducing sight distance, or create a fatal flaw drainage, terrain or maintenance issue
- Be possible to construct with reliable and common engineering practices
- Be no more than 20 feet in height

CDOT has determined that for Colorado terrain and weather conditions, including common high-wind events, 20 feet is the maximum allowable noise wall height without compromising structural integrity under typical construction design specifications. If a wall does not meet the four criteria above, it cannot be considered feasible and further analysis of the noise wall is not necessary.

To be considered reasonable, noise mitigation must:

- Create an insertion loss (the difference in noise levels after mitigation and before mitigation) of 7 dBA or greater for at least one receptor
- Meet financial standards for cost effectiveness. A cost-benefit value of more than $6,800 per benefitted receptor, per decibel reduction, is considered unreasonable. A hypothetical example of this calculation is a 1,000-foot long, 10-foot high barrier that provides protection for a development of 16 homes. A 5 dBA benefit was experienced by six receptors, and a 7 dBA reduction was experienced by 10 receptors. The cost calculation for this would be as follows:
    - Barrier cost = 1,000-foot long x 10-foot high x $45 per square foot = $450,000 ($45 is a unit cost specified in CDOT guidance for computing the cost-benefit factor only and does not necessarily represent all of the costs that are incurred when constructing a noise wall)
    - dBA per benefitted receptors = (6 receptors x 5 dBA reduction) + (10 receptors x 7 dBA reduction) = 100 total dBA of reduction
    - Results in a cost-benefit index of $4,500 per decibel reduction per benefitted receptor, which would be considered economically reasonable
- Be wanted or chosen by the benefitted community. Benefitted receptors, defined as any property containing a noise-sensitive receptor that receives at least a 5 dBA reduction, participate in a Benefitted Receptor Preference Survey. The required survey will be deferred until the final design phase of the project. The benefitted receptor's desires will not be included in the reasonableness analysis in this report The survey is required prior to construction. Ultimately to meet all reasonability criteria, the benefitted receptor survey must be performed, and more than 50 percent of the responding owners and residents must support the construction of the noise wall.

If any of the reasonability requirements are not met, further analysis of the wall is not necessary. For example, if a wall does not benefit any receptors by at least 7 dBA, then the cost-benefit index will not be calculated due to the wall failing to meet reasonability criteria.

If a noise wall fails to meet all the feasibility and reasonability criteria, the wall cannot be recommended. If a single criterion for feasibility or reasonability is not met, further analysis for that particular noise mitigation is not necessary. If a wall does meet all the feasibility and reasonability requirements, it will be recommended pending completion of a benefitted receptor survey with more than 50 percent approval by owners and residents.

For this analysis, possible noise walls were analyzed from eight feet high to 20 feet high, going by one-foot increments in height. Feasibility and reasonability were analyzed at the maximum 20 foot height for the considered barrier. If the barrier at the maximum 20-foot height did not have at least one benefitted receiver meet at least a 7 dBA, then further analysis was not performed. If the barrier at the maximum height of 20 feet had at least one receiver meet the 7 dBA criteria, then the barrier was further optimized. This was done by adjusting each section of the barrier's height between 8 - 20 feet to optimize the number of receptors receiving a 5 dBA benefit while still meeting all feasibility and reasonability criteria.

5.3 Impacts

5.3.1 Existing Conditions Analysis

Existing conditions are modeled to assess the noise levels that noise sensitive receptors currently experience. This analysis creates a baseline to compare the build alternatives to in order to determine if there will be significant increases in noise over existing levels. The model uses current roadway configuration with existing traffic data.

As summarized in Table 4, there are 86 receptors where noise exceeds the NAC thresholds within the study area. These receptors are located either in the Mountain Range Shadows Subdivision just north of LCR 30 or in locations irregularly spaced north and south through the study area adjacent to I-25. The locations are shown on figures that can be found in Appendix C and in tables in Appendix A.

5.3.2 No-Action Alternative Analysis

No Action conditions are modeled to assess the noise levels that noise sensitive receptors experience in future years without the project improvements. This analysis creates a baseline to compare the build alternatives to in order to determine if increases in noise over existing levels are due exclusively to the highway project. The model uses current roadway configuration with future 2040 traffic data.

As summarized in Table 4, there are 99 receptors where noise exceeds the NAC thresholds within the study area. These receptors are located either in the Mountain Range Shadows Subdivision just north of LCR 30 or in locations irregularly spaced north and south through the study area adjacent to I-25. The locations are shown in tables in Appendix C.

5.3.3 Build Alternatives Analysis – ROD4 Selected Alternative

The ROD4 Selected Alternative was modeled to assess noise impacts with construction of the improvements described in Section 1. As summarized in Table 4, there are 157 receptors that have traffic noise impacts within the study area. These receptors are located either in the Mountain Range Shadows Subdivision just north of LCR 30 or in locations irregularly spaced north and south through the study area adjacent to I-25. Most of the impacts are due to noise levels exceeding the NAC. Two receptors are expected to experience substantial noise impacts in addition to exceeding the NAC, with noise levels increasing by 10 dB or more. They are the Colorado Christian University on Clydesdale Parkway (Receptor R240) and a residence located on LCR 16 (Receptor R303). Some receptors with very high existing noise levels would be acquired by the project. The locations are shown on figures that can be found within Appendix D.

5.3.4 Build Alternatives Analysis – FEIS Preferred Alternative

The FEIS Preferred Alternative was modeled to assess impacts in the future using updated 2040 traffic data. As summarized in Table 4, there are 160 receptors that have traffic noise impacts within the study area. These receptors are located either in the Mountain Range Shadows Subdivision just north of LCR 30 or in locations irregularly spaced north and south through the study area adjacent to I-25. Four receptors are expected to experience a substantial noise impact where noise levels increase by 10 dB or more. They are the Colorado Christian University on Clydesdate Parkway (Receptor R240), a residence located on LCR 16

(Receptor R303), an outdoor recreation area along US 34 (Receptor R256) and a restaurant on US 34 (Receptor R257). One receptor, receptor R257, is expected to experience a substantial noise impact, where noise levels increase by 10 dB or more, but is not expected to exceed the NAC. The three other receptors (R240, R303, R256) are expected to experience substantial noise impacts are also expected to exceed their NACs Some receptors with very high existing noise levels would be acquired by the project.

Table 4. Noise results and mitigation summary

Results	Existing	No-Action Alternative	Build Alternatives	
			ROD4 Selected Alternative	FEIS Preferred Alternative
Noise Impacts				
Number of Receptors that exceed NAC	86	99	157	160
Number of Receptors with Substantial Increase in Noise (≥10 dBA)	N/A	1	2	4
Leq(h) (dBA) Minimum	43	47	45	47
Leq(h) (dBA) Maximum	80	81	81	81
Mitigation Criteria				
Evaluated Wall Heights (ft)	N/A	N/A	8 to 20	8 to 20
Reasonable and Feasible Wall Heights (ft)			8 to 20	8 to 20

5.4 Proposed Mitigation

At impacted locations along the corridor that may benefit from noise mitigation, a feasible and reasonable analysis was conducted. All the proposed noise walls were modeled within the CDOT right of way. If a noise wall was found to be feasible and reasonable, then the barrier was optimized by perturbing barrier section heights to reduce cost while still providing the benefit to the maximum number of receivers. A detailed design of the recommended noise walls—including aesthetics, materials, and precise sighting—was not performed at this level but will be performed for the selected Preferred Alternative in the final design phase of the project.

Per CDOT guidelines, the maximum wall height considered to be feasible was 20 feet. CDOT has determined that for Colorado terrain and weather conditions, including common high wind events, 20 feet is the maximum allowable height without compromising structural integrity under typical construction design specifications. It is a general rule that the minimum height considered is eight feet, per the CDOT *Roadway Design Guide* (2011).

To mitigate the impacts of the build alternatives, 21 barriers were analyzed for reasonableness and feasibility. Of those, only one was found to be reasonable and feasible, meaning that it could provide adequate reduction in noise and meet the CDOT Cost Benefit Index. The barrier at Mountain Range Shadows Subdivision is recommended. Barrier 3 located between the frontage road and I-25 (shown on

Figure 3) meets feasible and reasonable criteria for a height of 20 feet. This barrier was further optimized to reduce cost, resulting in a barrier with heights ranging from 12 feet to 20 feet.

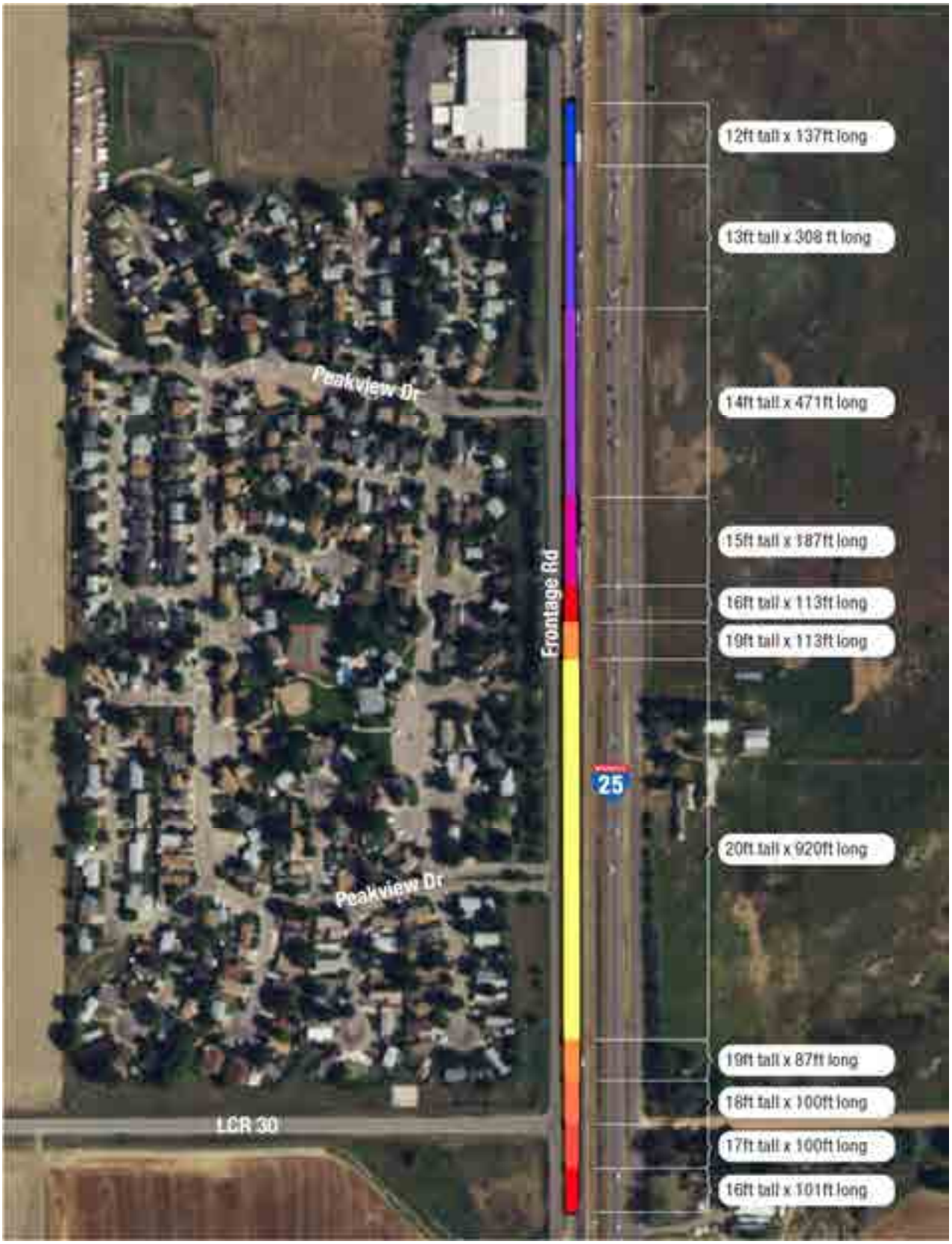
Table 5. Reasonable and feasible noise barriers

Barrier Name	Benefitted Receptors	Cost Benefit Index (approximate $ per receptor per decibel of reduction)	Location	Length (feet)	Height (feet)	Recommended
North Barrier 3	100	$3,430	Mountain Range Shadows Subdivision	2,638	12 to 20	Yes

Barriers 3 is recommended for the Mountain Range Shadows Subdivision. Barrier 3 is approximately 2,638 feet long and is 12 to 20 feet high. Barrier 3 would benefit 100 receivers (1 receiver at a 7+ dBA and 99 receivers at a 5+ dBA) at a cost-benefit of approximately $3,430 per receptor per decibel of reduction.

A Benefitted Receptor Preference Survey must be completed for the recommended noise barrier to identify if construction of the barrier is desired by the benefitted receptors. The noise wall will not be constructed if less than 50 percent of the benefitted receptors vote in favor of the wall. .

Figure 3. Optimized Noise Barrier



5.5 Construction Noise

Construction noise will present the potential for short-term impacts to those receptors located along the corridor and along designated construction access routes. It is anticipated that a portion of the construction will occur at night to minimize traffic disruption. Vibrations can occur from general construction equipment use near noise-sensitive receptors, particularly pile driving for substructure elements from compaction equipment. The primary source of construction noise is expected to be diesel-powered equipment, such as trucks and earth-moving equipment, and construction activities such as demolition hammers on trackhoes, rubble load outs, and tailgate and bucket bang. Pile driving and demolition are expected to be the loudest construction operations. Piles would be required at most major bridge installations. Bridge and road demolition also would be required at many locations.

This project will abide by the appropriate city codes as they pertain to construction noise. If noise levels during construction are expected to exceed the limits from the city codes, the contractor must obtain the necessary ordinance variance.

5.5.1 Construction Mitigation

Construction noise impacts to all noise-sensitive receptors will be presented to the public as part of the public involvement program that will occur after completion of the Record of Decision. Public suggestions regarding construction noise will be considered and implemented where appropriate. Prior to construction, all germane ordinance variations and permissions must be acquired. By contract agreement, each construction contractor will be required to submit a work plan outlining work schedules and intended mitigation measures prior to initiating construction. Construction noise mitigation measures can be found in the FHWA's *Highway Construction Noise Handbook* (2006). Heavy vibration construction activities that occur within approximately 50 feet of existing structures would require special care to prevent structural damage. Details of these provisions would be determined during final design and before construction begins.

The following best management practices (BMPs) will be required by the contractor, where determined to be feasible and reasonable:

- Construct permanent sound barriers prior to roadway construction, where possible from a construction staging standpoint
- Use noise blankets on equipment and quiet-use generators
- Minimize construction duration in residential areas as much as possible
- Minimize night-time activities in residential areas as much as possible
- Reroute truck traffic away from residential streets where possible
- Combine noisy operations to occur in the same time period
- Use alternative construction methods in sensitive areas, such as sonic or vibratory pile driving
- Conduct pile driving and other high-noise activities during day-time construction, where possible

Additional BMPs for consideration include:

- Avoid areas of work near noise-sensitive receptor locations, or minimize work in these areas where people or the environment are noise sensitive
- Eliminate slamming of truck beds, truck tailgates, and equipment buckets
- Idle equipment motors when the equipment is not in immediate use

- Minimize back-up distances for trucks and other equipment
- Schedule trucks appropriately to minimize long queuing lines
- Install noise shielding when in close proximity to residences

Contractors also should consider maintaining contact with the public through a 24-hour telephone contact line for questions and concerns and by providing schedules of planned construction activities.

For more information on construction noise issues, see FHWA's *Highway Construction Noise Handbook* (2006).

5.6 Local Agency Coordination

The land uses adjacent to I-25 are well established along the corridor. Local government officials can promote compatibility between land development and highways by ensuring that future NAC B and NAC C type development is restricted or limited within the project areas affected by traffic noise. Noise contours should be provided to local officials. A contour analysis was completed for vacant parcels (land that is currently NAC type G). The 71 dBA noise contour is approximately 295 feet from I-25, and the 66 dBA contour is approximately 545 feet from I-25.

Land use controls could be used to minimize future noise-sensitive development. Local planning officials should use noise contour information and development site plans to minimize the effects of traffic noise on proposed land uses that would be considered noise sensitive. This especially applies along areas of I-25 that could redevelop.

5.7 Statement of Likelihood

The final decision on the implementation of noise barriers constructed along I-25 will be made by CDOT during project final design, and after a survey of benefitted receptors. If during final design conditions substantially change that impact the implementation of likely barriers, then CDOT will solicit the viewpoints of those affected as part of the reevaluation of reasonableness. Only barriers determined to be both reasonable and feasible will be constructed. Barriers that are no longer reasonable and feasible will be removed from the project.

A barrier located east of the Mountain Range Shadows subdivision and west of I-25 travel lanes meets the feasible and reasonable criteria pending a benefited receptor survey. This barrier is approximately 2,638 feet in length and will vary from 12 feet to 20 feet in height. The final noise abatement decision will be made during the completion of the project's final design and the public involvement process.

6 REFERENCES

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Federal Highway Administration. (2011). Procedures for abatement of highway traffic noise and construction noise, 23 CFR § 772.

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National Environmental Policy Act of 1969, Pub. L. No. 91-190, 83 Stat. 852, 42 USC § 4321-4327.

U.S. Department of Transportation, Research and Innovative Technology Administration. (2006). Federal Highway Administration Highway Construction Noise Handbook. Cambridge, MA: Author.

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APPENDIX A. DATA AND TNM MODELING RESULTS

											Results (dBA)											
												Existing		2040 No Build			2040 2GP + 1 TEL			2040 3 GP + 1 TEL		
TNM Receiver Name	Description	TNM Seq. #	NAC Category	NAC dBA	Take?	North of South?	X	Y	Z	Receptors Modeled	Existing	Existing Impacts	Difference NBto Existing	No Walls	No Build Impacts	Difference 2+1 to Existing	No Walls	2+1 Impacts	Difference 3+1 to Existing	No Walls	3+1 Impacts
R1 7301FR	Colorado Mountain RV	353	F	NA		North	188397.00	271340.41	4858.00	1	73.1		1	74.1		-8.4	64.7		-2.5	70.6	
R2 7499WGD	Home State Bank	354	E	71		North	189168.56	269765.50	4896.00	1	63.1		4.5	67.6		2.3	65.4		7.3	70.4	
R3 7601WGD	Arby's	355	E	71		North	189367.61	269438.72	4909.00	1	65.9		3.6	69.5		-3.7	62.2		1.6	67.5	
R4 4650RVC	Civeo (Corp. Office)	356	E	71		North	189204.22	269444.66	4910.00	1	64.9		3.6	68.5		-1.7	63.2		4.3	69.2	
R5 4630RVC	Pueblo Viejo (Restaurant)	357	E	71		North	188850.70	268972.31	4911.00	1	74.2	1	1.1	75.3	1	6.7	80.9	1	6.4	80.6	1
R6 7645WGD	merican Lodge & Suites (hot	358	E	71		North	189195.30	269064.41	4914.00	1	63.8		2.5	66.3		1.6	65.4		2.6	66.4	
R7 7795FR	U-hual Dealer	359	F	NA		North	188313.00	268871.31	4894.00	1	70		1.3	71.3		-2.4	67.6		-1.4	68.6	
R8 7801FR	Horse Trainer	360	C	66		North	188244.67	268360.34	4904.00	1	69.2	1	0.8	70	1	-3.9	65.3		-1.6	67.6	1
R9 8101FR	Parkway Products LLC	361	F	NA		North	188453.81	266818.56	4936.00	1	78.1		0.6	78.7		-0.9	77.2		-2	76.1	
R10 8108MRD	Resident	362	B	66		North	188352.91	266502.28	4937.00	1	72	1	0.7	72.7	1	1.5	73.5	1	0.1	72.1	1
R11 8112MRD	Resident	363	B	66		North	188388.83	266472.34	4937.00	1	74	1	0.7	74.7	1	0.5	74.5	1	-1.3	72.7	1
R12 8116MRD	Resident	364	B	66		North	188398.41	266380.06	4937.00	1	74.6	1	0.7	75.3	1	-0.1	74.5	1	-2	72.6	1
R13 8120MRD	Resident	365	B	66		North	188400.81	266322.50	4937.00	1	74.7	1	0.7	75.4	1	-0.8	73.9	1	-2.4	72.3	1
R14 8200MRD	Resident	366	B	66		North	188393.03	266278.13	4937.00	1	74.3	1	0.7	75	1	-1	73.3	1	-2.4	71.9	1
R15 8204MRD	Resident	367	B	66		North	188395.42	266227.75	4937.00	1	74.4	1	0.7	75.1	1	-1.9	72.5	1	-3.3	71.1	1
R16 8208MRD	Resident	368	B	66		North	188380.45	266175.66	4937.00	1	73.5	1	0.7	74.2	1	-2.1	71.4	1	-2.8	70.7	1
R17 8212MRD	Resident	369	B	66		North	188353.50	266119.88	4938.00	1	72.4	1	0.6	73	1	-0.4	72	1	-0.7	71.7	1
R18 8216MRD	Resident	370	B	66		North	188336.14	266067.78	4938.00	1	71.6	1	0.7	72.3	1	-0.8	70.8	1	-0.3	71.3	1
R19 8217MRD	Resident	371	B	66		North	188210.03	266054.03	4937.00	1	67	1	0.8	67.8	1	1.6	68.6	1	2	69	1
R20 8213MRD	Resident	372	B	66		North	188233.39	266111.50	4937.00	1	67.6	1	0.7	68.3	1	1.7	69.3	1	1.6	69.2	1
R21 8209MRD	Resident	373	B	66		North	188247.75	266155.81	4937.00	1	67.9	1	0.7	68.6	1	2	69.9	1	1.8	69.7	1
R22 8205MRD	Resident	374	B	66		North	188262.72	266230.66	4937.00	1	68.4	1	0.7	69.1	1	2.1	70.5	1	1.7	70.1	1
R23 8201MRD	Resident	375	B	66		North	188266.92	266277.38	4936.00	1	68.3	1	0.7	69	1	1.9	70.2	1	1.2	69.5	1
R24 8121MRD	Resident	376	B	66		North	188265.13	266344.59	4936.00	1	68.3	1	0.8	69.1	1	2.1	70.4	1	1.1	69.4	1
R25 8117MRD	Resident	377	B	66		North	188244.77	266387.69	4936.00	1	67.7	1	0.8	68.5	1	2.8	70.5	1	1.5	69.2	1
R26 8113MRD	Resident	378	B	66		North	188247.16	266438.00	4935.00	1	67.7	1	0.7	68.4	1	2.1	69.8	1	1	68.7	1
R27 8109MRD	Resident	379	B	66		North	188271.70	266508.19	4936.00	1	68.7	1	0.8	69.5	1	2.4	71.1	1	1.3	70	1
R28 8108HC	Resident	380	B	66		North	188084.75	266508.19	4936.00	1	64.6		0.7	65.3		3.2	67.8	1	2.4	67	1
R29 8112HC	Resident	381	B	66		North	188145.83	266453.13	4937.00	1	65		0.8	65.8	1	3.9	68.9	1	3.6	68.6	1
R30 8116HC	Resident	382	B	66		North	188143.44	266387.84	4937.00	1	64.6		0.8	65.4		4.3	68.9	1	3.9	68.5	1
R31 8120HC	Resident	383	B	66		North	188142.23	266328.56	4937.00	1	64.3		0.8	65.1		4.6	68.9	1	4.1	68.4	1
R32 8200HC	Resident	384	B	66		North	188142.83	266282.91	4937.00	1	64.3		0.8	65.1		4.6	68.9	1	4	68.3	1
R33 8204HC	Resident	385	B	66		North	188141.05	266234.41	4937.00	1	64.2		0.8	65		4.6	68.8	1	4.1	68.3	1
R34 8208HC	Resident	386	B	66		North	188138.05	266185.31	4937.00	1	64.2		0.8	65		4.3	68.5	1	3.9	68.1	1
R35 8212HC	Resident	387	B	66		North	188129.06	266133.22	4937.00	1	64.4		0.8	65.2		3.4	67.8	1	3.7	68.1	1
R36 8216HC	Resident	388	B	66		North	188129.06	266079.78	4937.00	1	64.7		0.8	65.5	1	2.9	67.6	1	3.2	67.9	1
R37 8213HC	Resident	389	B	66		North	188011.34	266102.53	4937.00	1	62.5		0.7	63.2		4.4	66.9	1	3.6	66.1	1
R38 8209HC	Resident	390	B	66		North	188010.73	266172.56	4937.00	1	62.1		0.8	62.9		4.9	67	1	4.1	66.2	1
R39 8205HC	Resident	391	B	66		North	188012.53	266221.16	4937.00	1	62		0.8	62.8		5	67	1	4.4	66.4	1
R40 8201HC	Resident	392	B	66		North	188012.53	266272.06	4937.00	1	62.1		0.8	62.9		4.7	66.8	1	4.3	66.4	1
R41 8121HC	Resident	393	B	66		North	188010.73	266320.56	4937.00	1	62.2		0.8	63		4.6	66.8	1	4.2	66.4	1
R42 8117HC	Resident	394	B	66		North	187989.19	266366.66	4937.00	1	62.4		0.7	63.1		4	66.4	1	3.9	66.3	1
R43 8113HC	Resident	395	B	66		North	187985.59	266428.50	4937.00	1	62.6		0.8	63.4		3.6	66.2	1	3.9	66.5	1
R44 8109HC	Resident	396	B	66		North	188001.16	266506.94	4936.00	1	63.6		0.7	64.3		2.7	66.3	1	2.6	66.2	1
R45 8112OC	Resident	397	B	66		North	187845.70	266491.34	4937.00	1	61.1		0.8	61.9		3.6	64.7		3.4	64.5	
R46 8116OC	Resident	398	B	66		North	187888.83	266412.31	4937.00	1	60.7		0.8	61.5		4.2	64.9		4.4	65.1	
R47 8120OC	Resident	399	B	66		North	187896.61	266354.84	4937.00	1	60.2		0.8	61		4.7	64.9		4.8	65	
R48 8200OC	Resident	400	B	66		North	187918.77	266284.09	4937.00	1	59.9		0.8	60.7		5.3	65.2		5.3	65.2	
R49 8204OC	Resident	401	B	66		North	187919.95	266237.41	4937.00	1	59.8		0.8	60.6		5.3	65.1		5.3	65.1	
R50 8208OC	Resident	402	B	66		North	187913.97	266186.44	4937.00	1	59.9		0.8	60.7		5.5	65.4		5.2	65.1	
R51 8212OC	Resident	403	B	66		North	187912.77	266109.19	4937.00	1	60.8		0.7	61.5		4.8	65.6	1	4.1	64.9	
R52 8209OC	Resident	404	B	66		North	187803.20	266135.53	4937.00	1	59.1		0.7	59.8		4.9	64		4.7	63.8	
R53 8205OC	Resident	405	B	66		North	187794.81	266209.78	4937.00	1	58.3		0.7	59		5.3	63.6		5.6	63.9	
R54 8201OC	Resident	406	B	66		North	187799.61	266267.25	4937.00	1	58.1		0.8	58.9		5.7	63.8		5.9	64	
R55 8121OC	Resident	407	B	66		North	187772.06	266332.09	4937.00	1	58.4		0.8	59.2		5.3	63.7		5.4	63.8	
R56 8117OC	Resident	408	B	66		North	187737.33	266360.81	4937.00	1	58.4		0.8	59.2		5	63.4		5.2	63.6	
R57 8113OC	Resident	409	B	66		North	187715.78	266412.31	4937.00	1	58.3		0.8	59.1		4.9	63.2		5.1	63.4	
R58 8109OC	Resident	410	B	66		North	187710.39	266489.56	4937.00	1	59.1		0.8	59.9		4.1	63.2		4.3	63.4	

											Results (dBA)										
											Existing		2040 No Build			2040 2GP + 1 TEL			2040 3 GP + 1 TEL		
TNM Receiver Name	Description	TNM Seq. #	NAC Category	NAC dBA	Take?	North of South?	X	Y	Z	Receptors Modeled	Existing	Existing Impacts	Difference NBto Existing	No Walls	No Build Impacts	Difference 2+1 to Existing	No Walls	2+1 Impacts	Difference 3+1 to Existing	No Walls	3+1 Impacts
R59 8108OC	Resident	411	B	66		North	187797.20	266505.72	4937.00	1	60.4		0.7	61.1		3.8	64.2		3.6	64	
R60 8220MRD	Resident	412	B	66		North	188274.00	265950.16	4939.00	1	68.9	1	0.7	69.6	1	1	69.9	1	0.9	69.8	1
R61 8224MRD	Resident	413	B	66		North	188334.06	265940.38	4939.00	1	71.4	1	0.7	72.1	1	-0.8	70.6	1	-0.2	71.2	1
R62 8228MRD	Resident	414	B	66		North	188395.11	265871.03	4940.00	1	74.8	1	0.6	75.4	1	-2.6	72.2	1	-3	71.8	1
R63 8300MRD	Resident	415	B	66		North	188405.36	265805.94	4940.00	1	75.2	1	0.7	75.9	1	-3.6	71.6	1	-4	71.2	1
R64 8304MRD	Resident	416	B	66		North	188397.55	265750.75	4940.00	1	74.6	1	0.7	75.3	1	-3.6	71	1	-3.9	70.7	1
R65 8306MRD	Resident	417	B	66		North	188335.53	265713.97	4941.00	1	71.3	1	0.6	71.9	1	-1.1	70.2	1	-0.5	70.8	1
R66 8312MRD	Resident	418	B	66		North	188244.70	265777.97	4940.00	1	67.7	1	0.8	68.5	1	1.5	69.2	1	1.5	69.2	1
R67 8320MRD	Resident	419	B	66		North	188340.42	265666.97	4942.00	1	71.6	1	0.7	72.3	1	-1.4	70.2	1	-0.7	70.9	1
R68 8324MRD	Resident	420	B	66		North	188388.28	265634.25	4942.00	1	74.2	1	0.6	74.8	1	-3.4	70.8	1	-2.7	71.5	1
R69 8328MRD	Resident	421	B	66		North	188405.86	265569.78	4942.00	1	74.9	1	0.6	75.5	1	-4	70.9	1	-3.6	71.3	1
R70 8332MRD	Resident	422	B	66		North	188382.41	265470.44	4942.00	1	73.3	1	0.7	74	1	-3.1	70.2	1	-3	70.3	1
R71 8336MRD	Resident	423	B	66		North	188341.39	265448.47	4942.00	1	71.3	1	0.6	71.9	1	-2.2	69.1	1	-1.8	69.5	1
R72 8340MRD	Resident	424	B	66		North	188226.34	265441.63	4943.00	1	66.4	1	0.8	67.2	1	2.1	68.5	1	2.3	68.7	1
R73 8400MRD	Resident	425	B	66		North	188238.84	265343.38	4943.00	1	66.9	1	0.8	67.7	1	1.4	68.3	1	1.3	68.2	1
R74 8402MRD	Resident	426	B	66		North	188319.42	265412.25	4943.00	1	69.9	1	0.7	70.6	1	-0.6	69.3	1	-0.2	69.7	1
R75 8404MRD	Resident	427	B	66		North	188400.97	265393.19	4943.00	1	74.2	1	0.7	74.9	1	-3.4	70.8	1	-3.3	70.9	1
R76 8406MRD	Resident	428	B	66		North	188401.45	265353.16	4943.00	1	74	1	0.7	74.7	1	-3.3	70.7	1	-3.4	70.6	1
R77 8408MRD	Resident	429	B	66		North	188406.83	265286.03	4944.00	1	74.2	1	0.7	74.9	1	-3.3	70.9	1	-3.3	70.9	1
R78 8410MRD	Resident	430	B	66		North	188375.09	265240.13	4944.00	1	72.5	1	0.7	73.2	1	-2.4	70.1	1	-2.3	70.2	1
R79 8412MRD	Resident	431	B	66		North	188343.83	265186.91	4945.00	1	70.9	1	0.7	71.6	1	-1	69.9	1	-0.8	70.1	1
R80 8414MRD	Resident	432	B	66		North	188276.94	265195.47	4944.00	1	67.5	1	0.8	68.3	1	1.1	68.6	1	1.1	68.6	1
R81 8416MRD	Resident	433	B	66		North	188265.22	265087.06	4945.00	1	67.7	1	0.8	68.5	1	1.2	68.9	1	1.1	68.8	1
R82 8420MRD	Resident	434	B	66		North	188382.41	265154.94	4945.00	1	72.8	1	0.7	73.5	1	-2.3	70.5	1	-2.3	70.5	1
R83 8422RD	Resident	435	B	66		North	188424.41	265084.47	4946.00	1	74.9	1	0.7	75.6	1	-3.2	71.7	1	-3.1	71.8	1
R84 8424MRD	Resident	436	B	66		North	188430.77	265026.38	4946.00	1	74.9	1	0.7	75.6	1	-2.8	72.1	1	-3.3	71.6	1
R85 8426MRD	Resident	437	B	66		North	188420.50	264958.97	4947.00	1	74.6	1	0.7	75.3	1	-2.6	72	1	-2.8	71.8	1
R86 8430MRD	Resident	438	B	66		North	188306.23	264957.50	4947.00	1	69.4	1	0.8	70.2	1	1.5	70.9	1	0.9	70.3	1
R87 8421MRD	Resident	439	B	66		North	188180.44	264876.31	4946.00	1	65.9	1	0.8	66.7	1	2.5	68.4	1	1.7	67.6	1
R88 8415MRD	Resident	440	B	66		North	188109.14	264967.63	4946.00	1	64.7		0.8	65.5	1	2.7	67.4	1	2.2	66.9	1
R89 8413MRD	Resident	441	B	66		North	188130.63	265037.47	4946.00	1	65.1		0.8	65.9	1	2.7	67.8	1	2.4	67.5	1
R90 8411MRD	Resident	442	B	66		North	188170.19	265062.84	4946.00	1	65.8	1	0.8	66.6	1	2.6	68.4	1	2.4	68.2	1
R91 Playground	Playground	443	C	66		North	187960.11	265252.63	4943.00	1	61.2		0.7	61.9		3.7	64.9		3.8	65	
R92 Tennis Courts	Tennis Court	444	C	66		North	187945.94	265408.06	4943.00	1	59.9		0.8	60.7		5.6	65.5	1	5.5	65.4	
R93 Pool	Pool	445	C	66		North	188037.75	265375.81	4943.00	1	58.7		0.8	59.5		7.6	66.3	1	7.6	66.3	1
R94 Rec Center	Rec Center	446	C	66		North	188103.67	265292.31	4943.00	1	64.6		0.8	65.4		2.3	66.9	1	2.1	66.7	1
R95 8333MRD	Resident	447	B	66		North	188170.88	265478.59	4942.00	1	65.8	1	0.8	66.6	1	1.7	67.5	1	2.2	68	1
R96 8329MRD	Resident	448	B	66		North	188170.38	265524.56	4942.00	1	65.9	1	0.8	66.7	1	2	67.9	1	2.3	68.2	1
R97 8325MRD	Resident	449	B	66		North	188168.92	265590.00	4942.00	1	66	1	0.8	66.8	1	1.9	67.9	1	2.5	68.5	1
R98 8321MRD	Resident	450	B	66		North	188168.92	265625.72	4941.00	1	65.9	1	0.8	66.7	1	1.9	67.8	1	2.1	68	1
R99 8317MRD	Resident	451	B	66		North	188170.88	265703.44	4940.00	1	66.1	1	0.8	66.9	1	1.6	67.7	1	1.8	67.9	1
R100 4433JC	Resident	452	B	66		North	188171.36	265788.56	4939.00	1	66.1	1	0.8	66.9	1	1.5	67.6	1	2.1	68.2	1
R101 4429JC	Resident	453	B	66		North	188097.33	265796.38	4938.00	1	64.4		0.8	65.2		1.9	66.3	1	2.1	66.5	1
R102 4425JC	Resident	454	B	66		North	188053.58	265805.22	4938.00	1	63.6		0.8	64.4		2.3	65.9	1	2.4	66	1
R103 4421JC	Resident	455	B	66		North	187998.39	265813.03	4938.00	1	62.7		0.7	63.4		2.7	65.4		2.6	65.3	
R104 4417JC	Resident	456	B	66		North	187947.61	265821.84	4938.00	1	62		0.7	62.7		2.6	64.6		2.7	64.7	
R105 4413JC	Resident	457	B	66		North	187889.98	265826.22	4938.00	1	61.4		0.7	62.1		2.7	64.1		2.8	64.2	
R106 4409JC	Resident	458	B	66		North	187858.73	265838.44	4938.00	1	61		0.7	61.7		3.1	64.1		3	64	
R107 4405JC	Resident	459	B	66		North	187847.98	265866.28	4938.00	1	61		0.7	61.7		3.4	64.4		3	64	
R108 4408JC	Resident	460	B	66		North	187848.47	265914.13	4938.00	1	60.9		0.7	61.6		3.6	64.5		3.3	64.2	
R109 4412JC	Resident	461	B	66		North	187873.38	265935.69	4938.00	1	61.2		0.7	61.9		3.6	64.8		3.2	64.4	
R110 4416JC	Resident	462	B	66		North	187930.52	265930.81	4938.00	1	62.1		0.7	62.8		3.4	65.5	1	2.8	64.9	
R111 4420JC	Resident	463	B	66		North	188002.78	265929.34	4938.00	1	62.6		0.7	63.3		2.9	65.5	1	3	65.6	1
R112 4420JC	Resident	464	B	66		North	188026.52	265857.06	4938.00	1	63		0.8	63.8		2.8	65.8	1	2.8	65.8	1
R113 4428JC	Resident	465	B	66		North	188113.94	265848.78	4938.00	1	64.8		0.7	65.5	1	2	66.8	1	2.3	67.1	1
R114 4432JC	Resident	466	B	66		North	188170.88	265844.88	4938.00	1	66	1	0.8	66.8	1	1.3	67.3	1	2	68	1
R115 8204PVD	Resident	467	B	66		North	188188.25	265954.88	4937.00	1	66.6	1	0.8	67.4	1	1	67.6	1	1.6	68.2	1
R116 8208PVD	Resident	468	B	66		North	188078.28	266002.81	4937.00	1	64.4		0.7	65.1		2	66.4	1	2.3	66.7	1

											Results (dBA)											
												Existing		2040 No Build			2040 2GP + 1 TEL			2040 3 GP + 1 TEL		
TNM Receiver Name	Description	TNM Seq. #	NAC Category	NAC dBA	Take?	North of South?	X	Y	Z	Receptors Modeled	Existing	Existing Impacts	Difference NBto Existing	No Walls	No Build Impacts	Difference 2+1 to Existing	No Walls	2+1 Impacts	Difference 3+1 to Existing	No Walls	3+1 Impacts
R117 8212PVD	Resident	469	B	66		North	188034.33	266014.53	4937.00	1	63.3		0.8	64.1		2.8	66.1	1	2.8	66.1	1
R118 8216PVD	Resident	470	B	66		North	188002.59	266022.34	4937.00	1	62.8		0.8	63.6		2.8	65.6	1	2.9	65.7	1
R119 Playground	Playground	471	C	66		North	187845.25	266040.41	4937.00	1	60.7		0.7	61.4		3.9	64.6		3.3	64	
R120 8232PVD	Resident	472	B	66		North	187784.20	265998.41	4936.00	1	59.5		0.7	60.2		3.8	63.3		3.5	63	
R121 8236PVD	Resident	473	B	66		North	187766.63	265947.13	4936.00	1	58.7		0.7	59.4		4.2	62.9		4	62.7	
R122 8240PVD	Resident	474	B	66		North	187765.66	265896.22	4936.00	1	58.5		0.7	59.2		4.3	62.8		3.9	62.4	
R123 8244PVD	Resident	475	B	66		North	187765.66	265847.88	4936.00	1	58.3		0.7	59		4.4	62.7		4	62.3	
R124 8304PVD	Resident	476	B	66		North	187765.17	265809.78	4936.00	1	58.4		0.6	59		4.3	62.7		3.9	62.3	
R125 4400FTC	Resident	477	B	66		North	187738.02	265764.78	4936.00	1	58.1		0.7	58.8		4.3	62.4		3.9	62	
R126 4404FTC	Resident	478	B	66		North	187780.98	265760.38	4936.00	1	58.5		0.7	59.2		4.2	62.7		3.8	62.3	
R127 4408FTC	Resident	479	B	66		North	187839.69	265749.16	4937.00	1	59.7		0.7	60.4		3.6	63.3		3.5	63.2	
R128 4412FTC	Resident	480	B	66		North	187891.45	265738.88	4937.00	1	60.3		0.7	61		3.5	63.8		3.4	63.7	
R129 4416FTC	Resident	481	B	66		North	187944.67	265734.00	4937.00	1	61.1		0.7	61.8		3.4	64.5		3	64.1	
R130 4420FTC	Resident	482	B	66		North	187993.52	265727.66	4937.00	1	62.1		0.6	62.7		2.5	64.6		2.4	64.5	
R131 4424FTC	Resident	483	B	66		North	188060.70	265714.47	4938.00	1	63.4		0.7	64.1		2.1	65.5	1	2.2	65.6	1
R132 4428FTC	Resident	484	B	66		North	188082.48	265670.44	4939.00	1	63.6		0.7	64.3		2.3	65.9	1	2.1	65.7	1
R133 4429FTC	Resident	485	B	66		North	188084.34	265566.84	4940.00	1	62.9		0.8	63.7		2.8	65.7	1	2.9	65.8	1
R134 4425FTC	Resident	486	B	66		North	188061.39	265524.78	4940.00	1	62.9		0.8	63.7		2.6	65.5	1	2.6	65.5	1
R135 4421FTC	Resident	487	B	66		North	187970.56	265491.09	4941.00	1	61.2		0.7	61.9		4.2	65.4		4	65.2	
R136 4417FTC	Resident	488	B	66		North	187903.36	265524.78	4941.00	1	59.6		0.7	60.3		4.9	64.5		5.2	64.8	
R137 4413FTC	Resident	489	B	66		North	187862.83	265543.81	4940.00	1	58.8		0.7	59.5		5.4	64.2		5.2	64	
R138 4409FTC	Resident	490	B	66		North	187838.42	265628.31	4940.00	1	59.4		0.7	60.1		4.8	64.2		4.9	64.3	
R139 4405FTC	Resident	491	B	66		North	187794.47	265646.38	4940.00	1	58.9		0.7	59.6		4.9	63.8		5.2	64.1	
R140 4401FTC	Resident	492	B	66		North	187710.95	265649.31	4940.00	1	57.9		0.7	58.6		5.2	63.1		5.3	63.2	
R141 8324PVD	Resident	493	B	66		North	187738.02	265553.53	4940.00	1	57.4		0.7	58.1		5.5	62.9		5.6	63	
R142 8328PVD	Resident	494	B	66		North	187812.25	265536.44	4940.00	1	58.4		0.7	59.1		5.3	63.7		5.2	63.6	
R143 8332PVD	Resident	495	B	66		North	187845.73	265473.84	4941.00	1	59		0.8	59.8		4.9	63.9		5.2	64.2	
R144 8336PVD	Resident	496	B	66		North	187845.73	265367.25	4942.00	1	59.3		0.7	60		4.7	64		4.7	64	
R145 8340PVD	Resident	497	B	66		North	187796.13	265340.38	4942.00	1	59		0.7	59.7		4.5	63.5		4.5	63.5	
R146 8344PVD	Resident	498	B	66		North	187734.59	265340.38	4941.00	1	57.9		0.7	58.6		4.7	62.6		4.6	62.5	
R147 8400PVD	Resident	499	B	66		North	187745.34	265290.50	4941.00	1	58.4		0.7	59.1		4.4	62.8		4.1	62.5	
R148 8404PVD	Resident	500	B	66		North	187801.50	265283.19	4942.00	1	59.3		0.7	60		4	63.3		3.9	63.2	
R149 8406PVD	Resident	501	B	66		North	187807.36	265177.06	4942.00	1	59.1		0.7	59.8		4.1	63.2		3.7	62.8	
R150 8408 PVD	Resident	502	B	66		North	187778.55	265094.38	4941.00	1	57.8		0.7	58.5		4.8	62.6		4.3	62.1	
R151 8412 PVD	Resident	503	B	66		North	187683.81	265093.41	4941.00	1	56.4		0.7	57.1		5.8	62.2		5.2	61.6	
R152 8416PVD	Resident	504	B	66		North	187802.97	265017.56	4941.00	1	57.7		0.8	58.5		5	62.7		4.4	62.1	
R153 8420PVD	Resident	505	B	66		North	187807.84	264935.47	4941.00	1	57.8		0.8	58.6		4.9	62.7		4.1	61.9	
R154 8425PVD	Resident	506	B	66		North	187795.44	264830.31	4941.00	1	58.4		0.7	59.1		3.7	62.1		3.1	61.5	
R155 8421CC	Resident	507	B	66		North	187913.63	264844.97	4942.00	1	61.6		0.7	62.3		1.9	63.5		1.5	63.1	
R156 8415CC	Resident	508	B	66		North	187914.11	264940.69	4943.00	1	61.2		0.8	62		2.9	64.1		2.3	63.5	
R157 8413CC	Resident	509	B	66		North	187903.36	265003.28	4943.00	1	60.8		0.7	61.5		3.3	64.1		2.8	63.6	
R158 8409CC	Resident	510	B	66		North	187881.88	265080.09	4943.00	1	60.7		0.7	61.4		3.3	64		2.8	63.5	
R159 8407CC	Resident	511	B	66		North	187906.78	265116.22	4943.00	1	61		0.7	61.7		3.3	64.3		2.8	63.8	
R160 8405CC	Resident	512	B	66		North	187974.17	265190.44	4944.00	1	62.6		0.7	63.3		2.7	65.3		2.8	65.4	
R161 8406CC	Resident	513	B	66		North	188031.89	265158.78	4945.00	1	63.8		0.8	64.6		2.7	66.5	1	2.7	66.5	1
R162 8410CC	Resident	514	B	66		North	188055.81	265101.50	4945.00	1	63.7		0.8	64.5		2.7	66.4	1	2.4	66.1	1
R163 8414CC	Resident	515	B	66		North	188025.83	264950.47	4945.00	1	62.8		0.8	63.6		3.2	66	1	2.6	65.4	
R164 8420CC	Resident	516	B	66		North	188002.11	264897.56	4945.00	1	62.8		0.7	63.5		2.8	65.6	1	2.3	65.1	
R165 8516PVD	Resident	517	B	66		North	188112.95	264860.47	4946.00	1	64.4		0.8	65.2		3	67.4	1	2.3	66.7	1
R166 8500MRD	Resident	518	B	66		North	188354.09	264740.19	4950.00	1	71.5	1	0.7	72.2	1	1.8	73.3	1	1.3	72.8	1
R167 8504MRD	Resident	519	B	66		North	188379.97	264689.41	4950.00	1	72.7	1	0.7	73.4	1	1.3	74	1	0.4	73.1	1
R168 8506MRD	Resident	520	B	66		North	188374.59	264663.84	4950.00	1	72.3	1	0.7	73	1	1.5	73.8	1	0.5	72.8	1
R169 8508MRD	Resident	521	B	66		North	188382.91	264623.31	4950.00	1	72.4	1	0.8	73.2	1	1.6	74	1	0.2	72.6	1
R170 8510MRD	Resident	522	B	66		North	188384.86	264581.31	4950.00	1	72.4	1	0.7	73.1	1	1.6	74	1	-0.1	72.3	1
R171 8512MRD	Resident	523	B	66		North	188370.69	264537.88	4950.00	1	71.5	1	0.8	72.3	1	2.2	73.7	1	0.5	72	1
R172 8516MRD	Resident	524	B	66		North	188385.34	264447.22	4950.00	1	71.5	1	0.8	72.3	1	2.5	74	1	0.7	72.2	1
R173 8518MRD	Resident	525	B	66		North	188371.19	264369.59	4951.00	1	70.3	1	0.8	71.1	1	4.1	74.4	1	1.6	71.9	1
R174 8519MRD	Resident	526	B	66		North	188265.13	264415.50	4950.00	1	67.1	1	0.8	67.9	1	4.4	71.5	1	2.8	69.9	1

											Results (dBA)											
												Existing		2040 No Build			2040 2GP + 1 TEL			2040 3 GP + 1 TEL		
	TNM Receiver Name	Description	TNM Seq. #	NAC Category	NAC dBA	Take?	North of South?	X	Y	Z	Receptors Modeled	Existing	Existing Impacts	Difference NBto Existing	No Walls	No Build Impacts	Difference 2+1 to Existing	No Walls	2+1 Impacts	Difference 3+1 to Existing	No Walls	3+1 Impacts
	R175 8515MRD	Resident	527	B	66		North	188173.80	264410.13	4950.00	1	65.3		0.8	66.1	1	4.4	69.7	1	3.1	68.4	1
	R176 8513MRD	Resident	528	B	66		North	188223.61	264480.94	4950.00	1	67.1	1	0.7	67.8	1	3.6	70.7	1	2.6	69.7	1
	R177 8511MRD	Resident	529	B	66		North	188232.89	264531.88	4951.00	1	67.7	1	0.8	68.5	1	3.5	71.2	1	2.8	70.5	1
	R178 8509MRD	Resident	530	B	66		North	188236.31	264565.56	4950.00	1	67.7	1	0.8	68.5	1	3.3	71	1	2.6	70.3	1
	R179 8507MRD	Resident	531	B	66		North	188248.03	264642.31	4948.00	1	67.2	1	0.8	68	1	3.1	70.3	1	1.9	69.1	1
	R180 8505MRD	Resident	532	B	66		North	188238.27	264690.22	4948.00	1	67.3	1	0.8	68.1	1	2.8	70.1	1	1.7	69	1
	R181 8503MRD	Resident	533	B	66		North	188228.50	264746.53	4948.00	1	67.1	1	0.8	67.9	1	2.7	69.8	1	2.1	69.2	1
	R182 8501MRD	Resident	534	B	66		North	188215.80	264781.19	4948.00	1	66.6	1	0.8	67.4	1	3.2	69.8	1	2.4	69	1
	R183 8500AC	Resident	535	B	66		North	188096.84	264772.91	4948.00	1	64.3		0.8	65.1		3.8	68.1	1	3	67.3	1
	R184 8502AC	Resident	536	B	66		North	188095.86	264724.56	4948.00	1	64.1		0.8	64.9		4	68.1	1	3.1	67.2	1
	R185 8504AC	Resident	537	B	66		North	188087.08	264666.78	4948.00	1	63.8		0.8	64.6		4.2	68	1	3.2	67	1
	R186 8506AC	Resident	538	B	66		North	188101.72	264623.31	4948.00	1	63.9		0.8	64.7		4.3	68.2	1	3.2	67.1	1
	R187 8505AC	Resident	539	B	66		North	188088.05	264555.31	4949.00	1	61.8		0.8	62.6		6.5	68.3	1	5.2	67	1
	R188 8510AC	Resident	540	B	66		North	188134.44	264505.00	4950.00	1	64.4		0.8	65.2		4.9	69.3	1	3.7	68.1	1
	R189 8514AC	Resident	541	B	66		North	188134.44	264390.09	4950.00	1	64.3		0.8	65.1		4.9	69.2	1	3.1	67.4	1
	R190 8516AC	Resident	542	B	66		North	188080.23	264375.94	4950.00	1	63.4		0.8	64.2		5.1	68.5	1	2.8	66.2	1
	R191 8515AC	Resident	543	B	66		North	187981.80	264441.38	4950.00	1	61.8		0.7	62.5		5.4	67.2	1	3.6	65.4	
	R192 8511AC	Resident	544	B	66		North	187976.91	264483.84	4949.00	1	61.5		0.8	62.3		5.2	66.7	1	3.6	65.1	
	R193 8509AC	Resident	545	B	66		North	187998.88	264535.22	4949.00	1	61.7		0.8	62.5		5.4	67.1	1	4.1	65.8	1
	R194 8507AC	Resident	546	B	66		North	187997.42	264585.09	4948.00	1	61.4		0.8	62.2		5.2	66.6	1	4.2	65.6	1
	R195 8505AC	Resident	547	B	66		North	187998.88	264630.03	4948.00	1	61.5		0.8	62.3		5.2	66.7	1	4.2	65.7	1
	R196 8503AC	Resident	548	B	66		North	188002.30	264693.66	4948.00	1	61.7		0.8	62.5		5	66.7	1	4.2	65.9	1
	R197 8501AC	Resident	549	B	66		North	188001.81	264746.38	4948.00	1	62.3		0.8	63.1		4.5	66.8	1	3.6	65.9	1
	R198 8500SC	Resident	550	B	66		North	187882.66	264765.91	4948.00	1	61.1		0.7	61.8		4.4	65.5	1	3.5	64.6	
	R199 8502SC	Resident	551	B	66		North	187899.95	264689.19	4948.00	1	59.8		0.8	60.6		5.7	65.5	1	4.6	64.4	
	R200 8504SC	Resident	552	B	66		North	187896.05	264649.13	4948.00	1	59.6		0.8	60.4		5.9	65.5	1	4.6	64.2	
	R201 8506SC	Resident	553	B	66		North	187888.72	264601.69	4948.00	1	59.5		0.7	60.2		5.7	65.2		4.5	64	
	R202 8508SC	Resident	554	B	66		North	187881.39	264546.50	4949.00	1	59.8		0.8	60.6		5.7	65.5	1	4.4	64.2	
	R203 8510SC	Resident	555	B	66		North	187885.78	264499.50	4950.00	1	60.2		0.8	61		5.6	65.8	1	4.3	64.5	
	R204 8512SC	Resident	556	B	66		North	187868.69	264414.94	4950.00	1	59.9		0.8	60.7		5.8	65.7	1	3.4	63.3	
	R247 5929SPD	PF Changs	557	E	71		North	189200.70	245016.09	4946.00	1	58.4		0.7	59.1		3.7	62.1		4.5	62.9	
	R206 8516SC	Resident	558	B	66		North	187742.13	264440.31	4950.00	1	58.4		0.8	59.2		5.8	64.2		3.8	62.2	
	R215 8606FR	**Resident**	**559**	**B**	**66**	**Take**	North	**188804.70**	**264131.91**	**4953.00**	**1**	**72.9**			**74**			**Take**			**Take**	
	R208 8511SC	Resident	560	B	66		North	187704.52	264480.94	4949.00	1	58.1		0.7	58.8		5.3	63.4		3.6	61.7	
	R209 8509SC	Resident	561	B	66		North	187727.27	264538.69	4949.00	1	58		0.7	58.7		5.8	63.8		4.3	62.3	
	R210 8507SC	Resident	562	B	66		North	187754.13	264559.69	4949.00	1	57.8		0.8	58.6		6.3	64.1		4.8	62.6	
	R211 8505SC	Resident	563	B	66		North	187769.77	264612.94	4949.00	1	57.9		0.8	58.7		6.4	64.3		5.1	63	
	R212 8501SC	Resident	564	B	66		North	187790.27	264726.84	4949.00	1	59		0.8	59.8		5.4	64.4		4.9	63.9	
	R213 8420FRa	**Resident**	**565**	**B**	**66**	**Take**	North	**188735.89**	**265192.81**	**4949.00**	**1**	**79.9**			**80.9**			**Take**			**Take**	
	R214 8420FRb	**Resident**	**566**	**B**	**66**	**Take**	North	**188782.03**	**264318.53**	**4953.00**	**1**	**75.6**			**76.6**			**Take**			**Take**	
	R205 8514SC	Resident	567	B	66		North	187851.81	264383.41	4950.00	1	59.9		0.7	60.6		5.9	65.8	1	3.1	63	
	R216 6002BD	Office Furniture (retail)	568	F	NA		North	188437.92	260266.92	5023.00	1	71.6		1.6	73.2		0.9	72.5		-3.6	68	
	R217 5850BD	Window Serive (retail)	569	F	NA		North	188442.86	260096.69	5030.00	1	72.3		1.6	73.9		2.5	74.8		-4	68.3	
	R218 5848BD	Office building	570	E	71		North	188429.69	259954.95	5030.00	1	70.7	1	1.4	72.1	1	1.8	72.5	1	-2.9	67.8	
	R219 5814BD	retail facility	571	F	NA		North	188324.20	259654.53	5042.00	1	66.5		0.9	67.4		3.6	70.1		-1.9	64.6	
	R220 5726BD	Truck Accessories (retail)	572	F	NA		North	188250.70	259084.05	5050.00	1	65.5		0.9	66.4		2.8	68.3		-1.7	63.8	
	R221 5605GD	BW Container (manufacturer	573	F	NA		North	188018.97	258689.20	5053.00	1	61.8		0.9	62.7		2.7	64.5		-0.1	61.7	
	R222 County Fairgrounds	County Fairgrounds	574	C	66		North	189667.08	256688.63	5076.00	1	54.5		0.8	55.3		3.8	58.3		3.4	57.9	
	R223 5280Arena Cir	Budweiser Events Center	575	C	66		North	189189.13	256751.27	5078.00	1	64.6		0.6	65.2		3.3	67.9	1	2.9	67.5	1
	R224 Fairground Bldg	Fairground Building	576	C	66		North	189508.86	256314.52	5074.00	1	58		0.7	58.7		3.3	61.3		4.1	62.1	
	R225 Fairground Offices	Fairground Offices	577	E	71		North	190120.64	256258.70	5074.00	1	51.8		1	52.8		3.1	54.9		3.4	55.2	
	R226 Hotel - ES	Embassy Suites	578	E	71		North	188962.34	255388.03	5068.00	1	67		0.4	67.4		4.4	71.4	1	3.4	70.4	
	R207 8513SC	Resident	579	B	66		North	187644.50	264403.81	4949.00	1	56.5		0.8	57.3		6.5	63		4.2	60.7	
	R228 Amphitheater	hunder Mountain Amphitheat	580	C	66		North	188169.28	254505.11	5066.00	1	70.2	1	0.6	70.8	1	3.4	73.6	1	3.7	73.9	1
	R229 Picnic area	Picnic Area	581	C	66		North	187974.80	254192.91	5060.00	1	67.3	1	1.1	68.4	1	2.6	69.9	1	2.7	70	1
Reduction:	R230 4230 Rest. Patio	Hooters	582	C	66		North	188004.47	253967.13	5058.00	1	64		4.6	68.6	1	4.6	68.6	1	5.8	69.8	1
25	R231 4270 Radio Stn	107.9 Radio	583	D	51		North	187722.31	253950.64	5046.00	1	42.9		3.8	46.7		2.4	45.3		4.3	47.2	
	R232 5910CRB	BMW Center	584	F	NA		North	188007.44	253581.00	5050.00	1	68.6		2.8	71.4		2.2	70.8		2.8	71.4	

											Results (dBA)											
												Existing		2040 No Build			2040 2GP + 1 TEL			2040 3 GP + 1 TEL		
TNM Receiver Name	Description	TNM Seq. #	NAC Category	NAC dBA	Take?	North of South?	X	Y	Z	Receptors Modeled	Existing	Existing Impacts	Difference NBto Existing	No Walls	No Build Impacts	Difference 2+1 to Existing	No Walls	2+1 Impacts	Difference 3+1 to Existing	No Walls	3+1 Impacts
R233 Hotel -CWS	Holiday Inn Express	585	C	66		North	189248.45	253501.41	5046.00	1	64.4		2.6	67	1	2.8	67.2	1	4.2	68.6	1
R234 Hotel -HIE	Candlewood Suites	586	C	66		North	189594.56	253608.53	5046.00	1	63.8		4.6	68.4	1	-1.3	62.5		4.3	68.1	1
R235 4040BD	Mercedes Benz	587	F	NA		North	188090.83	252916.80	5046.00	1	67.1		0.6	67.7		3.6	70.7		3.4	70.5	
R236 3930BD	Davidson Chevrolet	588	F	NA		North	188308.38	252503.13	5045.00	1	73.4		0.4	73.8		4.4	77.8		4.4	77.8	
R237 3915PD	Woodspring Suites	589	C	66		North	188859.84	252532.56	5047.00	1	67.4	1	0.5	67.9	1	8	75.4	1	8.1	75.5	1
R238 3870BD	Crossroads Hyundai	590	F	NA		North	187991.28	252072.27	5032.00	1	63.3		0.7	64		5	68.3		5.1	68.4	
R239 3675CDP	Tri City Cycle	591	F	NA		North	188749.41	251974.78	5035.00	1	69		0.4	69.4		9.1	78.1		8.5	77.5	
R240 3553CDP	Colorado Christian University	592	C	66		North	188693.70	251359.09	5025.00	1	68.3	1	0.6	68.9	1	10.4	78.7	1	11.3	79.6	1
R241 3800CDP	CarMax Dealership	593	F	NA		North	188125.44	251642.58	5025.00	1	66.5		0.6	67.1		3.6	70.1		4.5	71	
R242 6085SPD	Metropolitan Theaters	594	C	66		North	188957.91	247972.42	4980.00	1	61.9		0.5	62.4		2.3	64.2		1.3	63.2	
R243 6015SPD	On the Border	595	E	71		North	188742.83	247178.86	4963.00	1	64		0.8	64.8		-1.5	62.5		3.1	67.1	
R244 6005SPD	Red Robin	596	E	71		North	188816.98	247075.03	4961.00	1	61.8		0.8	62.6		0	61.8		4.3	66.1	
R245 6025SPD	Rock Bottom	597	E	71		North	189190.27	247250.98	4960.00	1	49.1		0.8	49.9		3.3	52.4		3.6	52.7	
R246 5897SPD	Retail	598	F	NA		North	189128.48	247145.23	4960.00	1	59.4		0.5	59.9		0.4	59.8		1.8	61.2	
R251 5800MB	**Cracker Barrel**	**599**	**E**	**71**	**Take**	North	**188221.75**	**244394.75**	**4942.00**	**1**	**71.8**			**72.4**			**Take**			**Take**	
R248 2500RMA	Medical Center	600	C	66		North	187532.11	246657.78	4965.00	1	61.5		0.5	62		0.5	62		-0.2	61.3	
R249 5745MB	Retail	601	F	NA		North	188261.88	245251.61	4952.00	1	74.5		1	75.5		-2	72.5		-1.8	72.7	
R250 5833MB	Retail	602	F	NA		North	188270.30	244799.72	4946.00	1	75.3		1	76.3							
R255 5500SCS Hampton	Hampton Inn	603	E	71		North	187172.13	243854.69	4936.00	1	57.5		1.9	59.4		1.4	58.9		1.8	59.3	
R252 5732MB	Retail	604	F	NA		North	187877.34	244330.98	4940.00	1	63.2		0.7	63.9		-0.2	63		-3	60.2	
R253 5704MB	Retail	605	F	NA		North	187922.25	243971.72	4936.00	1	63.2		0.6	63.8		1.8	65		-3.4	59.8	
R254 5688MB	Retail	606	F	NA		North	187591.05	243963.30	4936.00	1	57.4		0.7	58.1		-1	56.4		-1.9	55.5	
R256 Outdoor Rec	Pond	607	C	66		North	186270.84	243476.50	4936.00	1	53.5		1.5	55		0.7	54.2		16	69.5	1
R257 Restaur.	IHOP	608	E	71		North	186952.98	243455.30	4936.00	1	59.3		2.1	61.4		3.1	62.4		10.2	69.5	
R258 5464 US 34	Resident	609	B	66		North	187090.83	243123.06	4936.00	1	63.2		2.5	65.7	1	2.1	65.3		4.6	67.8	1
R296 6163 ECR 18	Resident	610	B	66		South	189835.92	233186.23	4943.00	1	58.4		0.7	59.1		3.7	62.1		5.6	64	
R259 5542US34 BW Hotel	Best Western	611	E	71		North	187650.69	243022.17	4930.00	1	65.8		3.3	69.1		-2.8	63		0.9	66.7	
R307 6505 ECR 16	**Resident**	**612**	**B**	**66**	**Take**	**South**	**191411.95**	**227476.38**	**4954.00**	**1**	**53.6**			**62.5**			**Take**			**Take**	
R261 0FR	Resident	613	B	66		South	188587.45	241145.33	4909.00	1	71.2	1	0.4	71.6	1	3	74.2	1	1.6	72.8	1
R262 5668CR20	Resident	614	B	66		South	187972.77	240463.28	4907.00	1	70.7	1	1.6	72.3	1	4	74.7	1	0.3	71	1
R263 Putt Putt	Putt putt	615	C	66		South	188733.41	240491.36	4907.00	1	63.7		0.5	64.2		5.8	69.5	1	3.7	67.4	1
R264 Pool	Pool	616	C	66		South	188887.78	240409.95	4908.00	1	60.3		0.5	60.8		6.5	66.8	1	4.6	64.9	
R265 Camp site	Campground	617	C	66		South	188713.77	240297.69	4908.00	1	64.3		0.4	64.7		8.4	72.7	1	7	71.3	1
R266 260FR	Resident	618	B	66		South	189202.78	238459.27	4853.00	1	59.8		0.4	60.2		4.3	64.1		5.7	65.5	1
R267 5331CWL	Resident	619	B	66		South	189200.16	237882.41	4859.00	1	61		0.5	61.5		3.6	64.6		5.9	66.9	1
R268 5325CWL	Resident	620	B	66		South	189297.66	237879.19	4859.00	1	60.3		0.5	60.8		3.2	63.5		5.5	65.8	1
R269 3943AWL	Resident	621	B	66		South	189305.16	237791.88	4859.00	1	60.2		0.5	60.7		3.2	63.4		5.4	65.6	1
R270 3937AWL	Resident	622	B	66		South	189304.63	237743.66	4859.00	1	60.3		0.4	60.7		3.1	63.4		5.4	65.7	1
R271 3931AWL	Resident	623	B	66		South	189306.22	237692.59	4859.00	1	60.2		0.5	60.7		3.2	63.4		5.5	65.7	1
R272 3925AWL	Resident	624	B	66		South	189309.44	237644.91	4859.00	1	60.2		0.5	60.7		3.1	63.3		5.5	65.7	1
R273 3919AWL	Resident	625	B	66		South	189307.83	237604.55	4859.00	1	60.2		0.5	60.7		3.1	63.3		5.5	65.7	1
R274 3919AWL	Resident	626	B	66		South	189308.91	237561.16	4859.00	1	60.2		0.5	60.7		3.1	63.3		5.5	65.7	1
R275 3907AWL	Resident	627	B	66		South	189307.83	237513.30	4859.00	1	60.2		0.5	60.7		3.1	63.3		5.5	65.7	1
R276 3901AWL	Resident	628	B	66		South	189309.97	237464.56	4859.00	1	60.2		0.4	60.6		2.9	63.1		5.5	65.7	1
R277 3861AWL	Resident	629	B	66		South	189308.38	237430.63	4859.00	1	60.2		0.4	60.6		3	63.2		5.6	65.8	1
R278 3855AWL	Resident	630	B	66		South	189308.38	237355.63	4859.00	1	60.1		0.5	60.6		3	63.1		5.7	65.8	1
R279 3837AWL	Resident	631	B	66		South	189314.80	237225.19	4858.00	1	59.9		0.5	60.4		3.1	63		5.7	65.6	1
R280 3837AWL	Resident	632	B	66		South	189315.33	237173.75	4858.00	1	59.9		0.5	60.4		2.9	62.8		5.6	65.5	1
R281 3825AWL	Resident	633	B	66		South	189314.27	237131.78	4858.00	1	59.9		0.5	60.4		2.9	62.8		5.6	65.5	1
R282 3819AWL	Resident	634	B	66		South	189313.72	237085.72	4858.00	1	59.9		0.5	60.4		2.7	62.6		5.5	65.4	
R283 3813AWL	Resident	635	B	66		South	189316.41	237040.00	4858.00	1	59.9		0.5	60.4		2.5	62.4		5.4	65.3	
R284 3807AWL	Resident	636	B	66		South	189316.41	236995.55	4858.00	1	59.8		0.5	60.3		2.8	62.6		5.4	65.2	
R285 3801AWL	Resident	637	B	66		South	189313.72	236948.75	4858.00	1	59.7		0.5	60.2		2.8	62.5		5.6	65.3	
R286 3761AWL	Resident	638	B	66		South	189316.41	236907.50	4858.00	1	59.6		0.5	60.1		2.7	62.3		5.4	65	
R287 3755AWL	Resident	639	B	66		South	189320.16	236829.11	4858.00	1	59.8		0.4	60.2		2.4	62.2		5	64.8	
R288 5318AWL	Resident	640	B	66		South	189353.91	236749.83	4858.00	1	59.8		0.5	60.3		2	61.8		4.4	64.2	
R289 5324RWL	Resident	641	B	66		South	189308.91	236746.08	4858.00	1	60.4		0.4	60.8		1.7	62.1		4.3	64.7	
R290 Playground	Playground	642	C	66		South	189224.80	236614.91	4858.00	1	60.7		0.5	61.2		2.1	62.8		4.6	65.3	

											Results (dBA)											
												Existing		2040 No Build			2040 2GP + 1 TEL			2040 3 GP + 1 TEL		
TNM Receiver Name	Description	TNM Seq. #	NAC Category	NAC dBA	Take?	North of South?	X	Y	Z	Receptors Modeled	Existing	Existing Impacts	Difference NBto Existing	No Walls	No Build Impacts	Difference 2+1 to Existing	No Walls	2+1 Impacts	Difference 3+1 to Existing	No Walls	3+1 Impacts
R291 Pavillion	Pavillon	643	C	66		South	189267.13	236443.84	4858.00	1	59.8		0.5	60.3		2.4	62.2		4.5	64.3	
R292 1016FR	**Resident**	**644**	**B**	**66**	**Take**	**South**	**188613.16**	**234105.39**	**4945.00**	**1**	**76**			**76.3**			**Take**			**Take**	
R293 1106FR	**Resident**	**645**	**B**	**66**	**Take**	**South**	**188629.42**	**233914.20**	**4940.00**	**1**	**74.8**			**75.1**			**Take**			**Take**	
R294 5531HWY402a	Resident	646	B	66		South	187543.30	232897.23	4967.00	1	65.5	1	1.2	66.7	1	-0.9	64.6		-0.6	64.9	
R295 5531HWY402b	Resident	647	B	66		South	187575.84	232783.34	4967.00	1	70.3	1	1.4	71.7	1	-0.6	69.7	1	0.8	71.1	1
R297 6231 ECR 18	Resident	648	B	66		South	190270.66	233000.67	4942.00	1	55.8		0.8	56.6		5.1	60.9		7.1	62.9	
R298 6333 ECR 18	Resident	649	B	66		South	190493.31	232958.27	4941.00	1	54.6		0.8	55.4		6.1	60.7		6.8	61.4	
R299 6342 ECR 18	Resident	650	B	66		South	190657.67	232406.89	4941.00	1	53.8		0.9	54.7		5.5	59.3		5.3	59.1	
R300 6330 ECR 18	Resident	651	B	66		South	190419.09	232332.67	4942.00	1	54.8		0.9	55.7		4.7	59.5		5.7	60.5	
R301 6228 ECR 18	Resident	652	B	66		South	190148.72	232353.88	4943.00	1	56.6		0.9	57.5		4.5	61.1		6.2	62.8	
R260 4901 THOMPSON PKWY	Kaiser Medical Offices	653	C	66		North	190157.36	243149.78	4944.00	1	57.1		2	59.1		9.4	66.5	1	8.6	65.7	1
R302 6127ECR16a	Resident	654	B	66		South	189727.75	227613.19	5010.00	1	62		4.8	66.8	1	1.6	63.6		2.8	64.8	
R303 6127ECR16b	Resident	655	B	66		South	189719.61	227483.02	5010.00	1	62.7		12.4	75.1	1	11.1	73.8	1	11.6	74.3	1
R304 6163ECR16	Land Surveyor	656	E	71		South	189906.73	227568.44	5008.00	1	65.8		4.5	70.3		-1.1	64.7		-0.3	65.5	
R305 2716FR MOTEL	Budget Host	657	E	71		South	190732.52	227787.34	5003.00	1	75.3	1	1.3	76.6	1	-1.3	74	1	-5.4	69.9	
R306 6505ECR16 CHAPEL	**Chapel**	**658**	**C**	**66**	**Take**	**South**	**191216.95**	**227465.42**	**4999.00**	**1**	**65.4**			**79.4**			**Take**			**Take**	
R308 4777 MPD	RV dealer	660	F	NA		South	191798.28	225934.95	5003.00	1	63.1		1.3	64.4		3.8	66.9		2.3	65.4	
R309 3415CR5	Resident	661	B	66		South	191163.70	225081.75	5008.00	1	68.5	1	4.2	72.7	1	-1.5	67	1	1	69.5	1
R310 6499QVC	Resident	662	B	66		South	190935.91	224662.75	5006.00	1	60.8		3	63.8		1.7	62.5		3	63.8	
R311 3550CR5	Murdock Trailer Sales	663	F	NA		South	191363.03	224691.23	5014.00	1	74.7		1.5	76.2		5.2	79.9		0.5	75.2	
R312 3643CR5	Resident	664	B	66		South	191070.14	224251.91	5006.00	1	59.6		5.2	64.8		2.5	62.1		2.5	62.1	
R314 POOL	Pool	665	C	66		South	192160.33	224076.98	5014.00	1	64.8		1.2	66	1	1.4	66.2	1	2.7	67.5	1
R315 3814 CR5	Northstar Homes INC	666	E	71		South	191570.48	223558.09	5024.00	1	74.4	1	1.4	75.8	1	5.9	80.3	1	1.5	75.9	1
R316 3815 CR5	Resident	667	B	66		South	191106.75	223562.16	5015.00	1	58.8		6.1	64.9		4.1	62.9		4.4	63.2	
R317 3952 FRONTAGE	Colorado Boat Center	668	F	NA		South	191969.14	223106.56	5033.00	1	75.6		0.8	76.4		0.3	75.9		1.4	77	
R318 6545 HWY 60	fencing supplier	669	F	NA		South	191509.47	222376.14	5025.00	1	64.8		1.7	66.5		2.3	67.1		2.5	67.3	
R319 6503 HWY 60	Resident	670	B	66		South	191350.83	222266.31	5020.00	1	62.4		2.6	65		2.5	64.9		2.7	65.1	
R320 22764 FRONTAGE	Resident	671	B	66		South	192335.25	215968.59	5025.00	1	73.7	1	0.1	73.8	1						
R227 4250BD	Power Administration	672	E	71		North	187289.64	254605.22	5060.00	1	60.8		1.6	62.4		2.6	63.4		4.5	65.3	
R321 Fishing Area	Fishing Area	673	C	66		South	187387.67	237881.22	4856.00	1	58.1		0.6	58.7		3.5	61.6		3.2	61.3	
R313 3618 RV PARK	RV Park	675	E	71		South	191986.55	224363.14	5014.00	1	67.8		1.1	68.9		1.4	69.2		2.5	70.3	

APPENDIX B. CDOT NOISE ABATEMENT FORMS

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; SH 392 North Barrier 1

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ■ YES ❒ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

200 ft of noise walls, 8-ft tall, provides a 7-dBA benefit to one receiver with a Cost Benefit Index of $10,600

E. STATEMENT OF LIKELIHOOD:

1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A 8-ft wall height did provide sufficient reduction to be feasible and reasonable.

Completed by: Allie Apley Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; S of SH 392, Mountain Range Shadows North Barrier 3

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ■ YES ❒ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

2,640 ft of noise wall at 20-ft tall does have at least one receptor at 7dBA and does meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; Crossroads North Barrier 5

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

820 ft of noise wall at 20-ft tall does not provide a 5-dBA benefit to any receptor.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ❒ YES ■ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; Crossroads North Barrier 6

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

710 ft noise walls at 18-ft tall does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 18-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; Crossroads North Barrier 7

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

1100 ft of noise wall that is 20-ft tall does not provide a 5-dBA benefit to any receptor.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ❒ YES ■ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; Crossroads North Barrier 9

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

1220 ft of noise wall that is 20-ft tall does not provide a 5-dBA benefit to any receptor.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ❒ YES ■ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; Crossroads North Barrier 11

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

970 ft of noise wall at 8 to 11-ft tall does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 8 to 11-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: _____

Project Name & Location: _____

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ■ YES ❒ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ■ YES ❒ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

Completed by: Allie Apley Date: _____

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 20

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

470 ft of noise wall at 20-ft tall does not provide a 5-dBA benefit for any receiver.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ■ YES ❒ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 20 South Barrier 1c

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

235 ft of noise wall at 10 to 11-ft tall provided 7-dBA benefit for one receiver, but does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall of 10 to 11-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 20 South Barrier 2

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

510 ft of noise wall at 20-ft tall does not provide 5-dBA benefit to any receiver.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 16 South Barrier 8ab

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

570 ft of noise wall at 20-ft tall does not provide 5-dBA benefit to any receiver.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 16 South Barrier 4

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

240 ft of noise wall at 20-ft tall does not provide 5-dBA benefit to any receiver.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ❒ YES ■ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 14 South Barrier 5

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

370 ft of noise wall that is 8-ft tall provides 7-dBA benefit to one receiver, but does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 8-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; CR 14 South Barrier 6ab

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

940 ft of noise wall at 20-ft tall provides 5-dBA benefit to one receiver, but does not provide 7-dBA benefit or meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 14 South Barrier 7

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

250-ft of noise wall that is 8-ft tall does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 8-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 20 South Barrier 8 ab

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

115 ft of noise wall at 11-ft tall provides a 7-dBA benefit for one receiver, but does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall at 11-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 14 South Barrier 10

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

180 ft of noise wall at 8-ft tall does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 8-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; SH 392 North Barrier 1

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ■ YES ❒ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

200 ft of noise walls, 8-ft to 20-ft tall, provides a 7-dBA benefit to one receiver with a Cost Benefit Index of $9,300

E. STATEMENT OF LIKELIHOOD:

1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A 8-ft to 20- ft wall height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Allie Apley Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; SH 392 North Barrier 2

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

730 ft of noise wall at 20-ft tall does not provide a 5-dBA benefit to any receivers.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ❒ YES ■ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A wall 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; Crossroads North Barrier 5

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

820 ft of noise wall at 20-ft tall did not provide a 5-dBA benefit to any receptor.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ❒ YES ■ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A wall at a height of 20- ft did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; Crossroads North Barrier 7

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

1100 ft of noise wall at 20-ft tall does not provide a 5-dBA benefit to any receptor.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ❒ YES ■ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that was 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; Crossroads North Barrier 9

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

1220 ft of noise wall at 20-ft tall does not provide a 5-dBA benefit to any receptor.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ❒ YES ■ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall at 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; Crossroads North Barrier 11

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

860 ft of noise wall between 12 to 14-ft tall does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 12 to 14- ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; US 34 North Barrier 13

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ■ YES ❒ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

200 ft of noise walls, 14- to 16-ft tall, benefits one receptor by 7 dBA with Cost Benefit of $17,810

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A 8-ft to 20-ft wall height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Allie Apley Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; US 34 North Barrier 15

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

520 ft of noise wall at 9-ft tall does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall at 9-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; US 34 North Barrier 16

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

590 ft of noise wall at 11-12 feet tall does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 11-12 feet in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 2+1 Alt; CR 20 South Barrier 1ab

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

620 ft of noise wall at 20-ft tall doe snot provide a 5-dBA benefit for any receiver.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ❒ YES ■ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; CR 20 South Barrier 1c

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

120 ft of noise wall at 13-ft tall provided 7-dBA benefit for one receiver, but does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 13-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; CR 20 South Barrier 2

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

590 ft of noise wall at 20-ft tall does not provide 5-dBA benefit to any receiver.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A 20-ft tall noise wall did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; SH 402 South Barrier 3

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

820 ft of noise wall at 20-ft tall does not provide 5-dBA benefit to any receiver.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; CR 14 South Barrier 5

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

485 ft of noise wall between 13 to 17-ft tall provides 7-dBA benefit to one receiver, but does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall between 13 to 17-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; Crossroads North Barrier 6 a and b

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

940 ft of noise wall at 20-ft tall does not meet Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; CR 14 South Barrier 7

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

380 ft of noise wall at 14-ft tall does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall at 14-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; CR 20 South Barrier 8a and 8b

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

115 ft of noise wall at 13-ft tall provides a 7-dBA benefit for one receiver, but does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 13-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; CR 14 South Barrier 10

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ■ YES ❒ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ■ YES ❒ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

180 ft of noise wall at 8-ft tall does not meet the Cost Benefit Index.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 14-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

COLORADO DEPARTMENT OF TRANSPORTATION
NOISE ABATEMENT DETERMINATION WORKSHEET

Instructions: To complete this form refer to CDOT Noise Analysis Guidelines

STIP # _____ Date of Analysis: November 2016

Project Name & Location: I-25 ROD 4; 3+1 Alt; CR 20 South Barrier 11 abc

A. FEASIBILITY:
1. Can a 5dBA noise reduction be achieved by constructing a noise barrier or berm?
   ❒ YES ■ NO
2. Are there any fatal flaw drainage, terrain, safety, or maintenance issues involving the proposed noise barrier or berm?
   ❒ YES ■ NO
3. Can a noise barrier or berm less than 20 feet tall be constructed?
   ❒ YES ■ NO

B. REASONABLENESS:
1. Has the Design goal of 7 dBA noise reduction for abatement measure been met for at least one impacted receptor?
   ❒ YES ■ NO
2. Is the Cost Benefit Index below $6800 per receptor per dBA?
   ❒ YES ■ NO
3. Are more than 50% of benefited resident/owners in favor of the recommended noise abatement measure?
   ❒ YES ❒ NO

C. INSULATION CONSIDERATION:
1. Are normal noise abatement measures physically infeasible or economically unreasonable?
   ■ YES ❒ NO
   If the answer to 1 is YES, then:
2. a. Does this project have noise impacts to NAC Activity Category D?
      ❒ YES ■ NO
   b. If yes, is it reasonable and feasible to provide insulation for these buildings?
      ❒ YES ❒ NO

D. ADDITIONAL CONSIDERATIONS:

1600 ft of noise wall at 20-ft tall does not provide 5-dBA benefit to any receiver.

E. STATEMENT OF LIKELIHOOD:
1. Are noise mitigation measures feasible?
   ■ YES ❒ NO
2. Are noise mitigation measures reasonable?
   ❒ YES ■ NO
3. Is insulation of buildings both feasible and reasonable?
   ❒ YES ■ NO
4. Shall noise abatement measures be provided?
   ❒ YES ■ NO

F. ABATEMENT DECISION DESCRIPTION AND JUSTIFICATION:

A noise wall that is 20-ft in height did not provide sufficient reduction to be feasible and reasonable.

Completed by: Amanda von Oldenburg Date: December 13, 2016

APPENDIX C. RECEIVER LOCATIONS AND EXISTING IMPACT MAPS

Existing Conditions

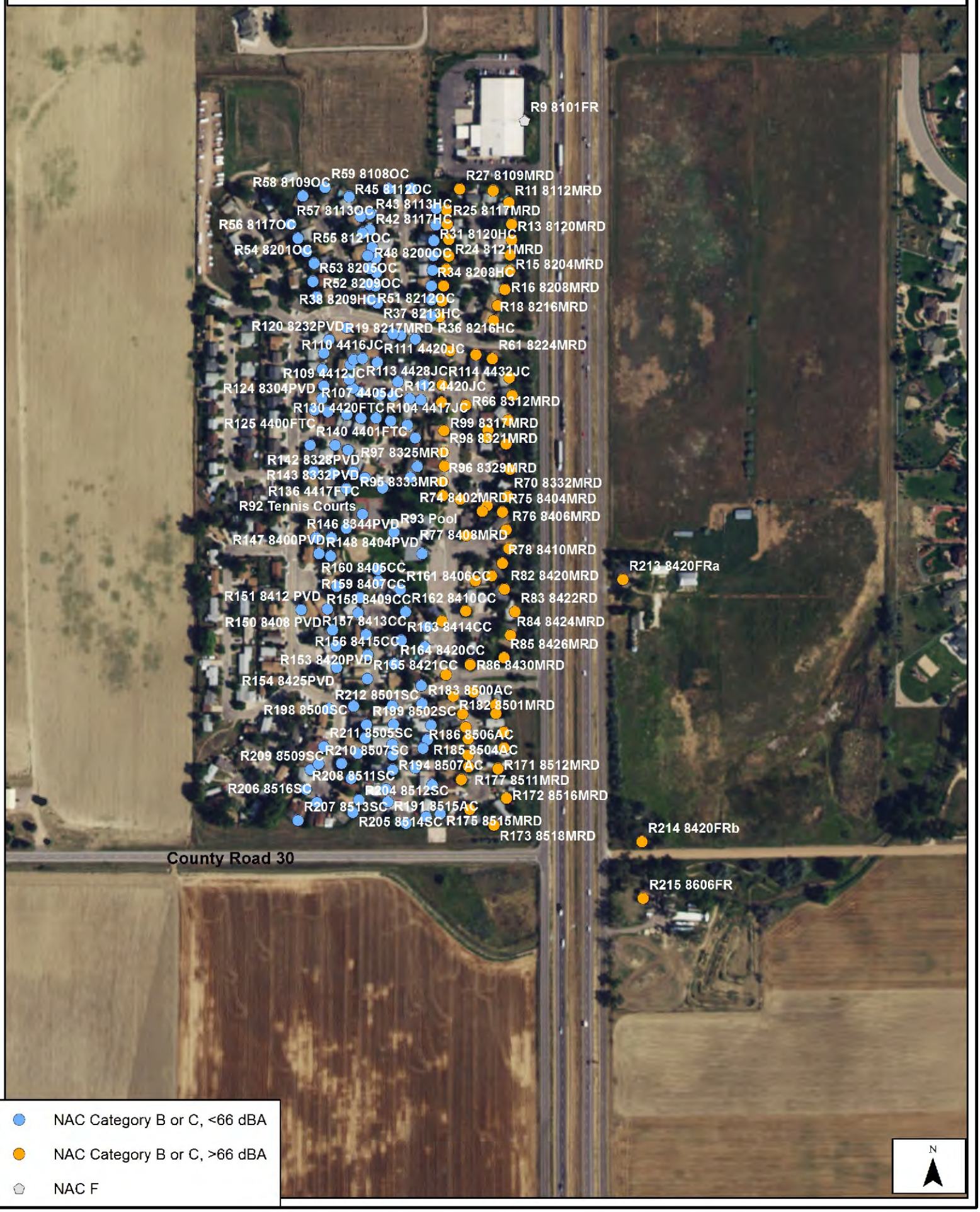
Figure 1 of 9

Date: 2/2/2017

Existing Conditions

Figure 2 of 9

Date: 2/2/2017



Existing Conditions

Figure 3 of 9

Date: 2/2/2017

Existing Conditions

Figure 4 of 9

Date: 2/2/2017

Existing Conditions

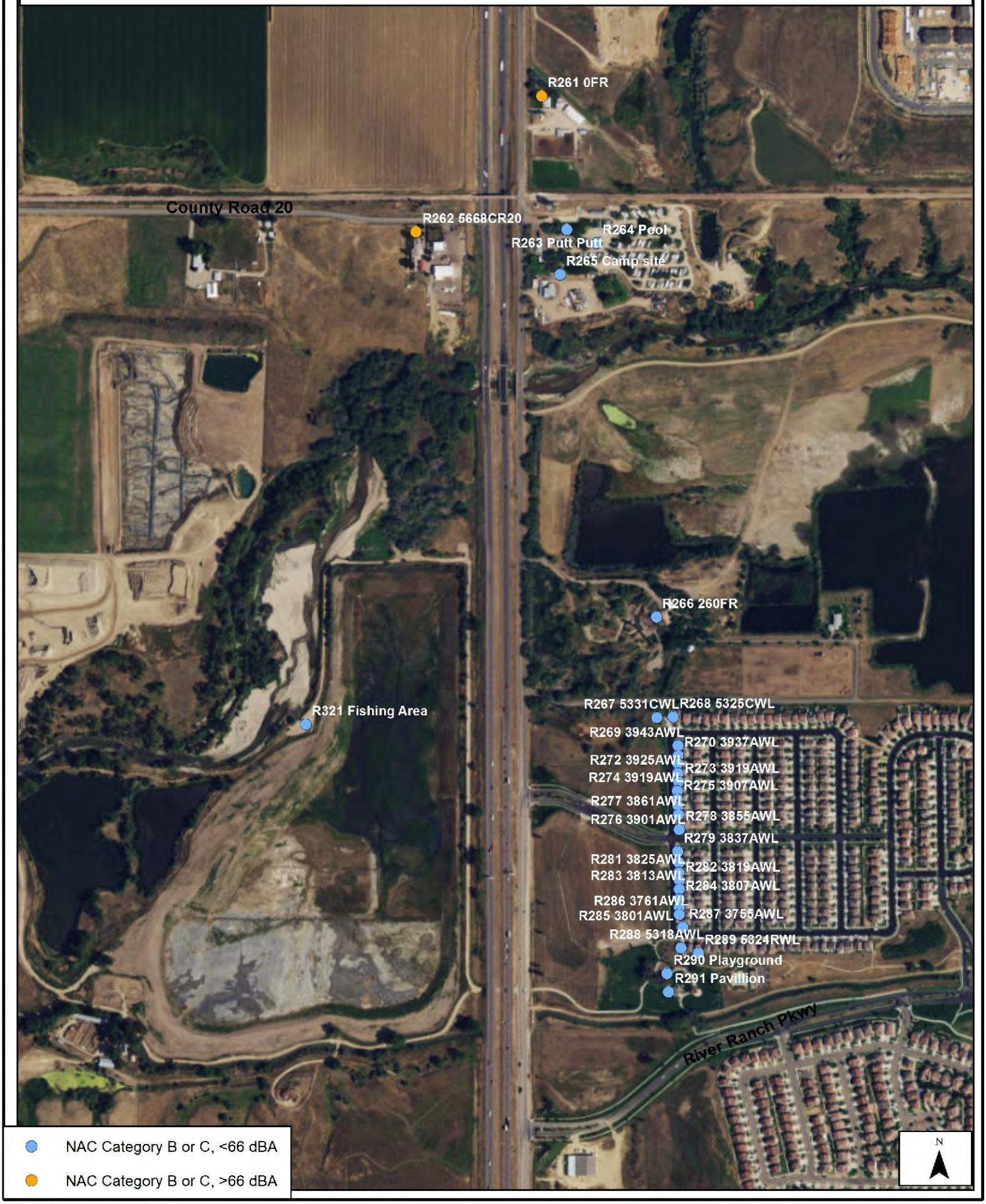
Figure 5 of 9

Date: 2/2/2017

Date: 2/2/2017

Existing Conditions

Figure 6 of 9



Existing Conditions

Figure 7 of 9

Date: 2/2/2017

Existing Conditions

Figure 8 of 9

Date: 2/2/2017

Existing Conditions

Date: 2/2/2017

Figure 9 of 9

APPENDIX D. ROD4 SELECTED ALTERNATIVE IMPACTS AND BARRIER LOCATIONS

ROD 4 Selected Alternative - County Road 32

Figure 1 of 9

Date: 12/13/2016

ROD 4 Selected Alternative - County Road 30

Figure 2 of 9

Date: 12/14/2016

ROD 4 Selected Alternative - North of Crossroads

Figure 3 of 9

Date: 12/13/2016

ROD 4 Selected Alternative - Crossroads

Figure 4 of 9

Date: 12/13/2016

ROD 4 Selected Alternative - US 34

Figure 5 of 9

Date: 12/13/2016

ROD 4 Selected Alternative - County Road 20

Figure 6 of 9

Date: 12/13/2016

ROD 4 Selected Alternative - SH 402

Figure 7 of 9

Date: 12/13/2016

ROD 4 Selected Alternative - County Road 14 to 16

Figure 8 of 9

Date: 12/13/2016

ROD 4 Selected Alternative - SH 60

Figure 9 of 9

Date: 12/13/2016

APPENDIX E. FIELD NOTES AND NOISE MEASUREMENTS

CR 46 Location #1 PESS Location #4 1PM

EQUIPMENT: METER Larson Davis 812 SLM CALIBRATOR ____ 10 minutes

CALIBRATION: START ____ DB END ____ DB

RESPONSE: __ FAST __ SLOW X A-WEIGHTING __ BATTERY CHECK

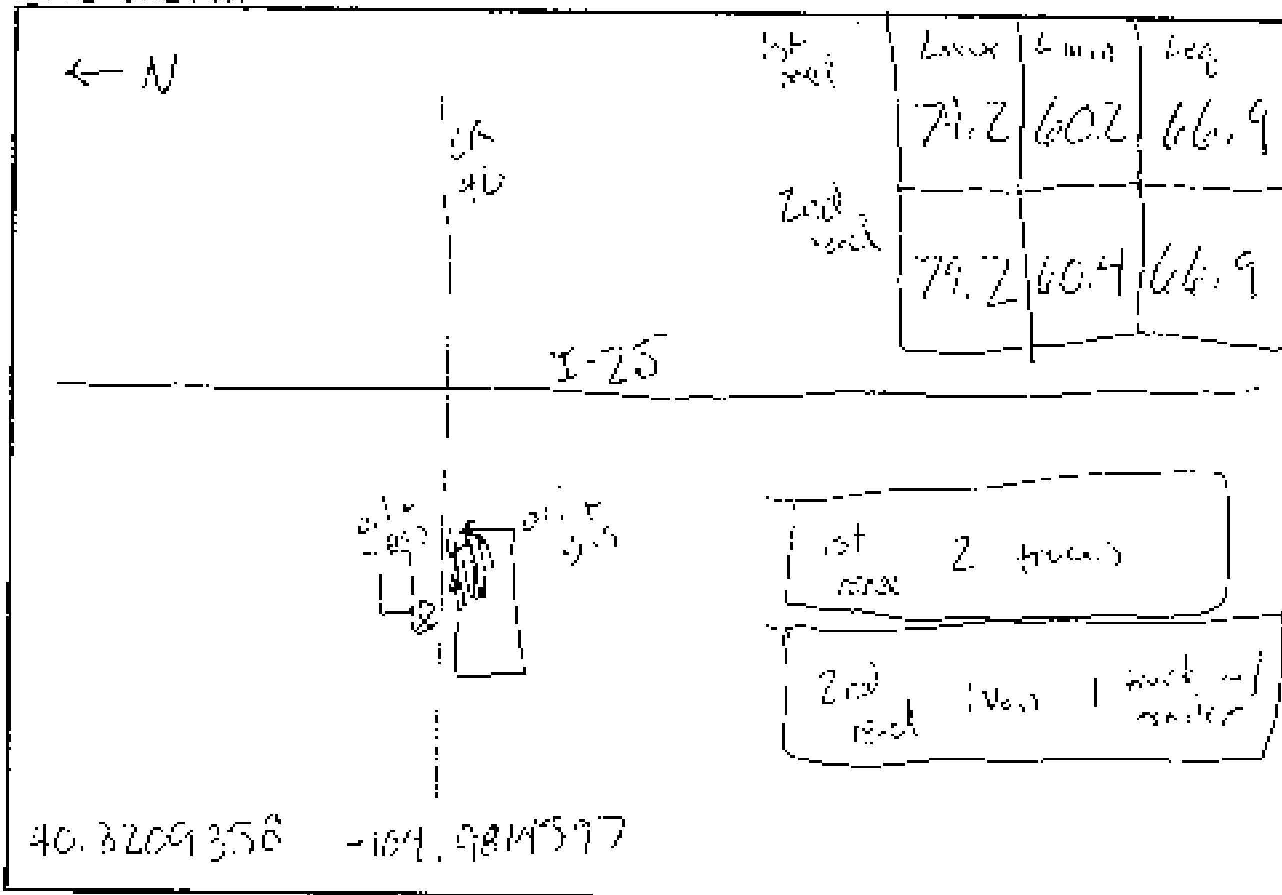
WEATHER DATA 80° Sunny No Clouds 10 MPH Wind

TRAFFIC DATA			
ROAD	46 WB	46 EB	
AUTOS	2 trucks		
MED. TRKS.			
HVY. TRKS.			
DURATION	10 min	10 min	

CRITERION: ± 3DB

NUMBER OF SAMPLES	UPPER LIMIT	L10	LOWER LIMIT
50	1ST	5TH	10TH
100	6TH	10TH	17TH
150	8TH	15TH	23RD
200	12TH	20TH	29TH

SITE SKETCH



	Lmax	Lmin	Leq
1st read	79.2	60.2	66.9
2nd read	79.2	60.4	66.9

BACKGROUND NOISE Slight noise from oil & gas (idling vehicle)

MAJOR SOURCES Highway

UNUSUAL EVENTS ____

OTHER NOTES ____

Johnson's Corner RV

Location #2

FEIS Location #3

EQUIPMENT: METER Larson Davis [illegible] CALIBRATOR ______

CALIBRATION: START ______ DB END ______ DB

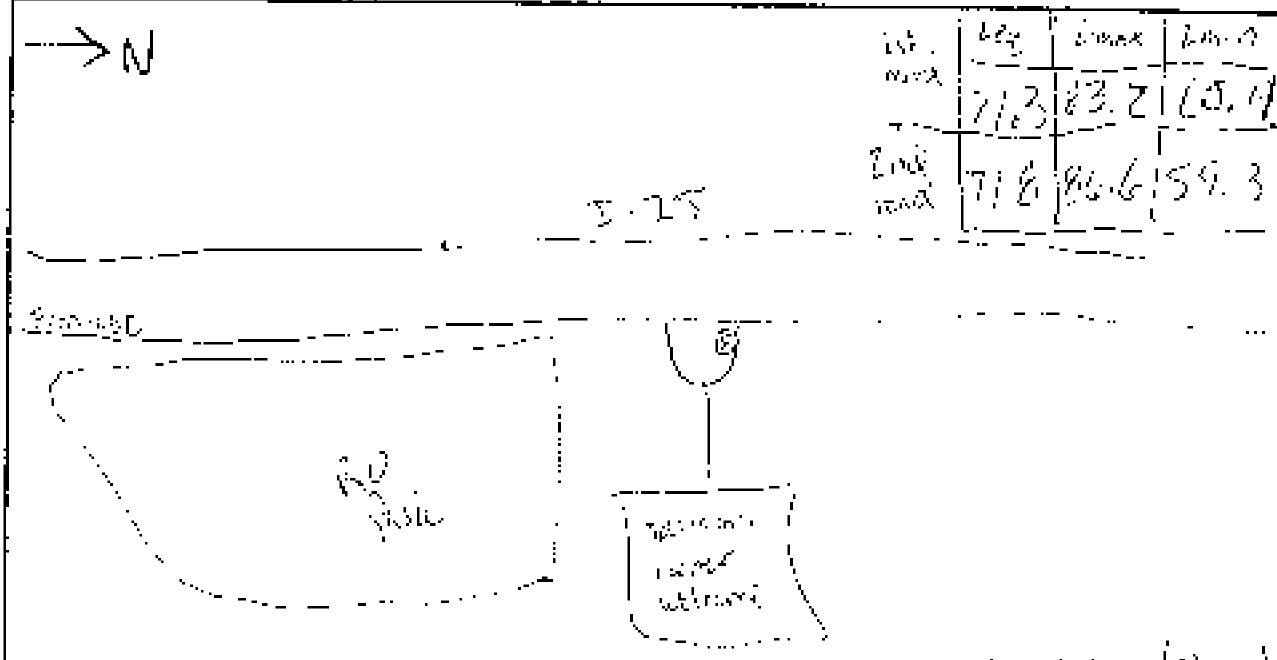
RESPONSE: ___ FAST ___ SLOW X A-WEIGHTING ___ BATTERY CHECK

WEATHER DATA [illegible] Sunny No Clouds 10 MPH Wind

TRAFFIC DATA			
ROAD	Frontage	Frontage	
AUTOS	[illegible]	[illegible]	
MED. TRKS.	IIII	III	
HVY. TRKS.	𝍸 II	III	
DURATION	10 min	10 min	

CRITERION: ± 3DB			
NUMBER OF SAMPLES	UPPER LIMIT	L10	LOWER LIMIT
50	1ST	5TH	10TH
100	5TH	10TH	17TH
150	8TH	15TH	23RD
200	12TH	20TH	28TH

SITE SKETCH



	Leq	Lmax	Lmin
1st meas	71.3	83.2	60.4
2nd meas	71.6	86.6	59.3

	Auto	Med	Hvy	Cycle
1st meas	40	4	6	
2nd meas	32	3	3	1

40.3560938 -104.9814255

BACKGROUND NOISE Construction Lift (beeping + movement) slight [illegible] [illegible] [illegible]

MAJOR SOURCES Highway

UNUSUAL EVENTS ______

OTHER NOTES ______

Tongue River Ranch

Location #2

FEIS location #6A

EQUIPMENT: METER Larson Davis CALIBRATOR _____

CALIBRATION: START _____ DB END _____ DB

RESPONSE: ___FAST ___ SLOW X A-WEIGHTING ___BATTERY CHECK

WEATHER DATA 87° Sunny No Clouds 10 KPH Wind

TRAFFIC DATA			
ROAD	Nearside Lane	Farside Lane	
AUTOS	[illegible]	[illegible]	
MED. TRKS.			
HVY. TRKS.			
DURATION	10 min	10 min	

CRITERION: ± 3DB			
NUMBER OF SAMPLES	UPPER LIMIT	L10	LOWER LIMIT
50	18Y	8TH	10TH
100	6TH	10TH	17TH
150	0TH	13TH	23RD
200	12TH	20TH	29TH

SITE SKETCH

→ N

	Leq	Lmax	Lmin
1st read	61.3	72.7	56.6
2nd read	60.0	74.2	51.5

2-25

Farside Lane

℄

Nearside Lane

40.30|2401, -104.99 Ingle Subdivision

	Autos	Cycle Mot.
1st read	19	1
2nd read	16	1

BACKGROUND NOISE None

MAJOR SOURCES Highway

UNUSUAL EVENTS _____

OTHER NOTES Inaudible wind in Rural location

Mountain Range Shadows Location #4 3:05

FEJS Location #2 3:15

EQUIPMENT: METER Larson Davis 812 SLM CALIBRATOR _____

CALIBRATION: START _____ DB END _____ DB

RESPONSE: ___ FAST ___ SLOW X A-WEIGHTING ___ BATTERY CHECK

WEATHER DATA 87° Sunny No Clouds 10 MPH S.nd

TRAFFIC DATA			
ROAD	Peakview	Peakview	
AUTOS	11	4HH	
MED. TRKS.			
HVY. TRKS.	11		
DURATION	10 min		

CRITERION: ± 3DB			
NUMBER OF SAMPLES	UPPER LIMIT	L10	LOWER LIMIT
50	1ST	5TH	10TH
100	5TH	10TH	17TH
150	9TH	15TH	23RD
200	12TH	20TH	29TH

SITE SKETCH

40.466353, -104992850

← N

	Leq	Lmax	Lmin
1st read	74.4	89.0	68.9
2nd read	73.1	79.5	68.7

I-25

Frontage

Peakview Dr

Peak View Dr.

1st	Auto	Med	Hvy	Cycle
	2		2	
2nd	5			

Frontage road

	Auto	Med	Hvy	Cycle
1st	7	5	10	
2nd	46	2	4	

BACKGROUND NOISE _____

MAJOR SOURCES Highway

UNUSUAL EVENTS 2 School bus (1st read) went right next to monitor

OTHER NOTES Talk/walking

							Traffic Data		
FID	Shape *	Id	FEISLocati	Location	Traffic Count Road	Reading	Autos	Med Truck	Hvy Truck	Cycle
0	Point	1	4	CR 46	CR 46	1	2			
0	Point	1	4	CR 46	CR 46	2	2			
1	Point	2	3	Johnson's Corner Campground	Frontage Road	1	40	4	6	
1	Point	2	3	Johnson's Corner Campground	Frontage Road	2	32	3	3	1
2	Point	3	N/A	Thompson River Ranch	Briarwood Lane	1	19			1
2	Point	3	N/A	Thompson River Ranch	Briarwood Lane	2	16	1		
3	Point	4	2	Mountain Range Shadows	Frontage Road	1	117	5	10	
3	Point	4	2	Mountain Range Shadows	Frontage Road	2	96	2	4	

APPENDIX F. TRAFFIC DATA

	2040 2+1 Adjusted																							
	SB GP Lanes						SB TEL						NB GP Lanes						NB TEL					
	AM			PM			AM			PM			AM			PM			AM			PM		
South of Interchange	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of
SH 392	960	1,210	4,430	1,240	2,140	6,530	470	110	720	1,450	1,540	2,140	520	1,180	4,720	2,020	2,120	3,640		40	1,600		160	1,820
Crossroads Blvd.	1,750	1,350	4,030	1,130	1,220	6,620	100	210	830	170	330	2,300	1,150	880	4,990	970	1,400	3,210		200	1,400		400	1,420
US 34	1,470	1,970	4,530	1,330	2,820	8,110	340		490	340		1,960	1,490	1,030	5,450	1,290	1,160	3,340		320	1,080		460	960
n/s to EB		640			920									280			560			90			130	
n/s to WB		1,330			1,900									750			600			230			330	
SH 402	430	590	4,690	2,530	1,910	7,490	60		430	310	30	1,680	860	1,070	5,240	1,660	1,060	3,940		190	890		160	800
CR 16	390		4,300	330		7,160			430			1,680	160		5,400	490		4,430			890			800
SH 60	410	1,070	4,960	960	1,550	7,750	50		380	350		1,330	870	710	5,560	1,020	1,100	4,350		390	500		270	530

Cross Street	Intersection	Alternative	2040 AM Peak								2040 PM Peak							
			NB		SB		EB		WB		NB		SB		EB		WB	
			App	Dep	App	Dep	App	Dep	App	Dep	App	Dep	App	Dep	App	Dep	App	Dep
SH392	West Frontage Road	2040 No Build	600	735	785	460	1245	1840	1815	1410	740	1125	1125	775	2385	2745	1885	1490
		2040 2GP + 1TEL	600	765	785	460	1390	1995	1920	1475	740	1225	1155	805	2960	3260	2725	2290
		2040 3GP + 1TEL	600	695	730	480	1615	2160	1755	1365	740	1120	1030	820	4215	4435	3095	2705
	SB Ramp	Existing			430	650	915	690	890	900			550	450	1130	1170	1120	1175
		2040 No Build			940	670	1840	1820	1525	1815			1220	2100	2745	2535	2555	1885
		2040 2GP + 1TEL			1430	1320	1995	1815	1630	1920			2690	3680	3260	2760	3215	2725
		2040 3GP + 1TEL			1460	1370	2160	1880	1385	1755			2740	3750	4435	3975	3645	3095
	NB Ramp	Existing	460	520			690	765	1025	890	690	500			1170	1190	960	1120
		2040 No Build	510	1200			1820	1695	2090	1525	770	2240			2535	1885	3375	2555
		2040 2GP + 1TEL	520	1220			1815	1735	2250	1630	2020	2280			2760	2360	3075	3215
		2040 3GP + 1TEL	520	1370			1880	1690	2045	1385	2060	3730			3975	2860	4200	3645
	East Frontage Road	2040 No Build	580	580	580	665	1695	1650	2130	2090	750	750	750	1135	1885	1700	3575	3375
		2040 2GP + 1TEL	580	580	580	505	1735	1835	2275	2250	755	755	755	995	2360	2215	3170	3075
		2040 3GP + 1TEL	585	585	585	485	1690	1780	2035	2045	765	765	765	940	2860	2755	4270	4200
Crossroads	SB Ramp	Existing			470	340	300	420	760	770			360	500	840	890	740	540
		2040 No Build			1420	710	1345	1530	2405	2930			1110	1090	3550	3455	2300	2415
		2040 2GP + 1TEL			1850	1560	1535	1580	2620	2865			1300	1550	3675	3540	2420	2305
		2040 3GP + 1TEL			1870	1590	1370	1585	2615	2680			1450	1960	3755	3535	2525	2235
	NB Ramp	Existing	450	250			420	575	710	755	360	590			890	830	905	735
		2040 No Build	1130	880			1530	1575	2200	2405	750	1320			3455	2865	2280	2300
		2040 2GP + 1TEL	1150	1080			1580	1540	2510	2620	970	1800			3540	2825	2535	2420
		2040 3GP + 1TEL	1170	1080			1585	1685	2625	2615	990	1840			3535	2850	2690	2525
US 34 Interchange	Rocky Mountain/ US 34	Existing			340		1725	1860	1870	1325			1155		1845	2600	2410	2125
		2040 No Build	775	1065	500	485	3190	3660	2620	1875	590	1235	1605	645	3240	4400	4205	3360
		2040 2GP + 1TEL	855	1145	535	540	3855	4275	3190	2475	705	1370	1665	705	2400	3700	4995	3990
		2040 3GP + 1TEL	870	1190	585	550	4015	4510	3365	2585	580	1160	1560	720	2670	3775	4275	3430
	Park N Ride/US 34	Existing	90	40			1860	1845	1900	1870	95	135			2600	2595	2500	2410
		2040 No Build					3660	3660	2620	2620					4400	4400	4205	4205
		2040 2GP + 1TEL					4275	4275	3190	3190					3700	3700	4995	4995
		2040 3GP + 1TEL					4510	4510	3365	3365					3775	3775	4275	4275
	SB Ramp	Existing			1140	440	1845	2055	1900	1900			1170	780	2595	2455	2475	2500
		2040 No Build			1430	1,910	3660	3850	3290	2620			1220	2,690	4400	4240	5515	4205
		2040 2GP + 1TEL			1810	1,970	4275	4670	3745	3190			1670	2,820	3700	4510	5465	4995
		2040 3GP + 1TEL			1850	2,010	4510	4860	3875	3365			2280	2,880	3775	4085	5185	4275
	NB Ramp	Existing	940	580			2055	2165	2050	1900	1060	870			2455	2585	2845	2475
		2040 No Build	1460	1,010			3850	4150	3140	3290	1100	1,320			4240	4160	5655	5515
		2040 2GP + 1TEL	1490	1,350			4670	4880	3815	3745	1290	1,620			4510	4370	5655	5465
		2040 3GP + 1TEL	1520	1,380			4860	5065	3940	3875	1310	1,760			4085	3945	5495	5185
	Centera Pkwy/US 34	Existing	300	345	170	250	2165	1950	1960	2050	355	585	825	300	2585	2290	2255	2845
		2040 No Build	1885	635	1400	925	4150	4530	1795	3140	1785	1925	1285	1365	4160	2810	4525	5655
		2040 2GP + 1TEL	1935	685	1440	1045	4880	5110	2400	3815	1845	2005	1330	1420	4370	2935	4470	5655
		2040 3GP + 1TEL	1715	620	1220	955	5065	5215	2730	3940	1690	1870	1115	1340	3945	2545	4500	5495
SH402	SB Ramp	Existing			400	660	1240	1075	1215	1120			630	590	1150	1140	1405	1455
		2040 No Build			440	900	1915	1495	1615	1575			1630	880	1630	1745	2015	2650
		2040 2GP + 1TEL			490	590	2135	2050	1660	1645			2840	1940	1620	1780	1800	2540
		2040 3GP + 1TEL			500	1230	2360	1605	2435	2460			2880	1950	1615	1785	1890	2650
	NB Ramp	Existing	510	810			1075	910	1350	1215	710	660			1140	1180	1400	1405
		2040 No Build	420	800			1495	1150	1650	1615	1630	790			1745	1995	1425	2015
		2040 2GP + 1TEL	860	1260			2050	1820	1830	1660	1660	1220			1780	1935	1515	1800
		2040 3GP + 1TEL	900	1260			1605	930	2120	2435	2010	1240			1785	2085	1420	1890
	East Frontage	2040 No Build	385	640	685	195	1150	930	1195	1650	550	990	735	330	1995	1485	950	1425
		2040 2GP + 1TEL	535	630	675	190	1820	1680	1300	1830	555	1000	745	335	1935	1425	1040	1515
		2040 3GP + 1TEL	530	630	670	190	930	785	1595	2120	585	1060	785	355	2085	1540	920	1420
CR 16 Interchange	SB Ramp	2040 No Build			380		400	695	620	705			510		445	550	1010	1055
		2040 2GP + 1TEL			390		405	720	630	705			330		310	410	1470	1530
		2040 3GP + 1TEL			400		270	590	825	905			340		290	425	1275	1300
	East Frontage and NB Off	2040 No Build	125	260	410	425	150				665	1075	330	370	450			
		2040 2GP + 1TEL	115	265	265	275	160				485	960	145	160	490			
		2040 3GP + 1TEL	95	250	190	195	160				300	1180	60	70	890			
	CR 16 & East Frontage	2040 No Build	260	90	775	410	695	1270	660	620	1075	1020	625	330	550	1205	1315	1010
		2040 2GP + 1TEL	265	175	660	165	720	1350	675	630	960	565	485	145	410	1145	1470	1470
		2040 3GP + 1TEL	250	20	545	190	590	1125	765	815	1180	430	365	60	425	1645	1440	1275
	West Frontage Road	2040 No Build	575			595	740	350	470	840	575			515	685	405	785	1125
		2040 2GP + 1TEL	575			510	685	345	460	865	575			410	635	425	815	1190
		2040 3GP + 1TEL	575			100	275	210	605	1145	575			15	215	255	605	1125
SH60 Interchange	SB Ramp	Existing			130	430	40	125	470	85			130	180	120	210	225	80
		2040 No Build			400	890	890	1230	1275	445			770	930	900	1010	890	620
		2040 2GP + 1TEL			460	1070	925	1180	1540	675			1310	1550	975	1235	1175	675
		2040 3GP + 1TEL			590	1090	745	785	2440	1900			1490	2170	1180	1475	1870	895
	NB Ramp	Existing	140	300			125	230	730	470	320	180			210	490	370	225
		2040 No Build	850	1080			1230	1950	2225	1275	1000	1560			1010	1290	1730	890
		2040 2GP + 1TEL	870	1100			1180	1720	2310	1540	1020	1370			1235	1635	1925	1175
		2040 3GP + 1TEL	870	1100			785	935	2820	2440	1020	1400			1475	1915	2690	1870

South of Interchange	2012 Large Trucks %																	
	SB GP Lanes									NB GP Lanes								
	AM			PM			Daily			AM			PM			Daily		
	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of
North Limits																		
SH 1																		
Mountain Vista																		
SH 14	2%	2%	8%	3%	2%	8%	2%	2%	3%	2%	6%	8%	2%	2%	8%	2%	2%	3%
Prospect	13%	5%	7%	17%	4%	8%	3%	2%	2%	4%	9%	7%	4%	6%	7%	2%	3%	2%
Harmony	1%	3%	7%	2%	3%	7%	2%	3%	3%	3%	2%	7%	3%	1%	7%	3%	2%	3%
SH 392	6%	1%	6%	4%	1%	7%	2%	2%	2%	3%	4%	6%	3%	5%	7%	2%	2%	3%
Crossroads Blvd.	1%	4%	6%	1%	3%	7%	2%	3%	3%	2%	2%	6%	3%	1%	7%	3%	2%	3%
US 34	3%	6%	6%	4%	6%	8%	2%	2%	3%	5%	3%	7%	7%	4%	7%	2%	2%	3%
SH 402	5%	2%	6%	2%	1%	7%	2%	3%	3%	2%	2%	6%	2%	3%	8%	3%	2%	3%
CR 16	0%		6%	0%		7%	3%		3%	1%		6%	0%		7%	3%		3%
SH 60	2%	2%	6%	1%	2%	7%	2%	2%	3%	3%	1%	6%	2%	1%	7%	1%	3%	3%

South of Interchange	2012 Small Trucks %																	
	SB GP Lanes									NB GP Lanes								
	AM			PM			Daily			AM			PM			Daily		
	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of
North Limits																		
SH 1																		
Mountain Vista																		
SH 14	2%	3%	3%	2%	2%	2%	4%	2%	10%	2%	3%	3%	2%	2%	2%	2%	5%	9%
Prospect	2%	2%	3%	3%	2%	2%	22%	5%	8%	2%	4%	3%	2%	2%	2%	4%	11%	8%
Harmony	2%	3%	3%	2%	3%	2%	2%	3%	8%	3%	2%	3%	2%	2%	2%	3%	2%	8%
SH 392	2%	1%	3%	2%	2%	2%	5%	2%	7%	2%	2%	2%	1%	2%	2%	3%	5%	7%
Crossroads Blvd.	2%	4%	3%	2%	2%	2%	2%	4%	7%	3%	4%	2%	3%	2%	2%	4%	2%	8%
US 34	2%	2%	2%	2%	1%	2%	3%	7%	9%	2%	2%	3%	2%	2%	2%	8%	3%	8%
SH 402	3%	2%	3%	2%	2%	2%	3%	3%	8%	2%	2%	2%	2%	2%	2%	2%	3%	8%
CR 16	2%		2%	2%		2%	0%		8%	2%		3%	2%		2%	1%		8%
SH 60	3%	1%	2%	2%	2%	2%	2%	2%	8%	2%	2%	2%	1%	3%	2%	3%	2%	8%

"South of" Column = Mainline Truck Percentages

I-25 Truck Percentages from NFRMPO Model

	2040 NB Large Trucks %																	
	SB GP Lanes									NB GP Lanes								
	AM			PM			Daily			AM			PM			Daily		
South of Interchange	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of
North Limits																		
SH 1																		
Mountain Vista																		
SH 14	3%	2%	9%	3%	2%	11%	3%	2%	3%	2%	6%	10%	2%	3%	11%	2%	3%	3%
Prospect	5%	3%	8%	4%	3%	10%	2%	2%	3%	3%	6%	9%	3%	6%	10%	2%	2%	3%
Harmony	2%	4%	9%	2%	3%	11%	2%	2%	3%	4%	2%	9%	3%	1%	11%	2%	1%	3%
SH 392	3%	6%	8%	2%	8%	9%	2%	2%	2%	8%	3%	8%	10%	2%	9%	2%	2%	2%
Crossroads Blvd.	3%	7%	9%	3%	5%	10%	2%	3%	3%	5%	3%	8%	5%	2%	10%	3%	2%	3%
US 34	4%	11%	8%	6%	5%	11%	2%	2%	3%	8%	7%	11%	8%	4%	9%	2%	2%	3%
SH 402	3%	2%	10%	2%	4%	10%	2%	3%	3%	3%	2%	9%	3%	2%	12%	3%	1%	3%
CR 16	1%	#N/A	9%	0%	#N/A	11%	1%	#N/A	3%	1%	#N/A	10%	0%	#N/A	11%	2%	#N/A	3%
SH 60	2%	1%	9%	1%	1%	11%	1%	2%	3%	1%	1%	8%	1%	1%	10%	2%	1%	3%

	2040 NB Small Trucks %																	
	SB GP Lanes									NB GP Lanes								
	AM			PM			Daily			AM			PM			Daily		
South of Interchange	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of
North Limits																		
SH 1																		
Mountain Vista																		
SH 14	2%	2%	3%	3%	2%	3%	5%	2%	11%	2%	6%	3%	2%	2%	3%	2%	6%	11%
Prospect	2%	2%	3%	2%	1%	3%	7%	3%	10%	2%	2%	3%	1%	2%	3%	3%	7%	10%
Harmony	2%	3%	4%	1%	1%	3%	2%	4%	11%	2%	2%	3%	1%	1%	3%	4%	2%	11%
SH 392	2%	2%	2%	2%	2%	2%	3%	7%	9%	2%	2%	3%	2%	1%	2%	8%	3%	9%
Crossroads Blvd.	2%	6%	3%	2%	2%	2%	3%	7%	10%	2%	3%	2%	4%	2%	2%	6%	3%	10%
US 34	3%	3%	2%	2%	1%	2%	5%	10%	11%	2%	2%	4%	2%	2%	2%	13%	6%	11%
SH 402	2%	2%	3%	1%	2%	2%	2%	3%	11%	2%	1%	2%	2%	1%	3%	4%	3%	12%
CR 16	2%	#N/A	2%	0%	#N/A	3%	1%	#N/A	11%	2%	#N/A	4%	2%	#N/A	2%	1%	#N/A	12%
SH 60	2%	2%	3%	0%	2%	3%	2%	2%	11%	2%	0%	3%	1%	1%	3%	2%	2%	11%

"South of" Column = Mainline Truck Percentages

I-25 Truck Percentages from NFRMPO Model

	2040 2GP+1EL Large Trucks %																	
	SB GP Lanes									NB GP Lanes								
	AM			PM			Daily			AM			PM			Daily		
South of Interchange	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of
North Limits																		
SH 1																		
Mountain Vista																		
SH 14	3%	2%	9%	4%	2%	10%	3%	2%	3%	2%	6%	9%	2%	3%	10%	2%	3%	3%
Prospect	5%	3%	8%	5%	3%	9%	2%	2%	3%	3%	7%	8%	3%	6%	9%	2%	2%	3%
Harmony	2%	4%	9%	2%	3%	10%	1%	2%	3%	3%	2%	9%	3%	1%	10%	2%	1%	3%
SH 392	3%	4%	9%	3%	4%	10%	2%	2%	3%	4%	3%	9%	4%	3%	10%	2%	2%	3%
Crossroads Blvd.	3%	6%	10%	3%	3%	11%	2%	3%	4%	4%	4%	8%	5%	2%	11%	3%	2%	3%
US 34	3%	10%	9%	4%	5%	12%	2%	2%	3%	8%	5%	12%	8%	3%	10%	2%	2%	3%
SH 402	3%	2%	10%	2%	4%	11%	1%	3%	4%	3%	2%	9%	3%	2%	13%	3%	1%	4%
CR 16	1%	#N/A	9%	0%	#N/A	11%	2%	#N/A	4%	2%	#N/A	11%	0%	#N/A	12%	2%	#N/A	4%
SH 60	2%	1%	9%	1%	2%	12%	1%	2%	4%	2%	1%	9%	1%	1%	10%	2%	1%	4%

	2040 2GP+1EL Small Trucks %																	
	SB GP Lanes									NB GP Lanes								
	AM			PM			Daily			AM			PM			Daily		
South of Interchange	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of
North Limits																		
SH 1																		
Mountain Vista																		
SH 14	2%	2%	3%	3%	2%	3%	5%	2%	11%	2%	5%	3%	2%	2%	3%	2%	6%	11%
Prospect	2%	2%	3%	2%	1%	3%	7%	3%	10%	2%	2%	3%	1%	2%	3%	3%	7%	10%
Harmony	2%	3%	4%	1%	1%	3%	2%	4%	10%	1%	2%	3%	1%	1%	3%	4%	2%	10%
SH 392	2%	2%	3%	1%	2%	3%	4%	4%	10%	3%	2%	3%	2%	1%	3%	5%	4%	10%
Crossroads Blvd.	2%	5%	4%	3%	2%	3%	3%	5%	11%	2%	3%	3%	4%	2%	3%	6%	3%	11%
US 34	2%	3%	2%	2%	1%	3%	4%	9%	12%	2%	2%	4%	2%	2%	2%	12%	4%	12%
SH 402	2%	2%	4%	1%	2%	3%	2%	3%	12%	3%	1%	3%	2%	1%	3%	3%	2%	13%
CR 16	2%	#N/A	3%	1%	#N/A	3%	1%	#N/A	12%	1%	#N/A	4%	2%	#N/A	3%	1%	#N/A	13%
SH 60	3%	2%	3%	0%	2%	3%	1%	2%	12%	2%	0%	3%	1%	1%	3%	2%	1%	11%

"South of" Column = Mainline Truck Percentages

I-25 Truck Percentages from NFRMPO Model

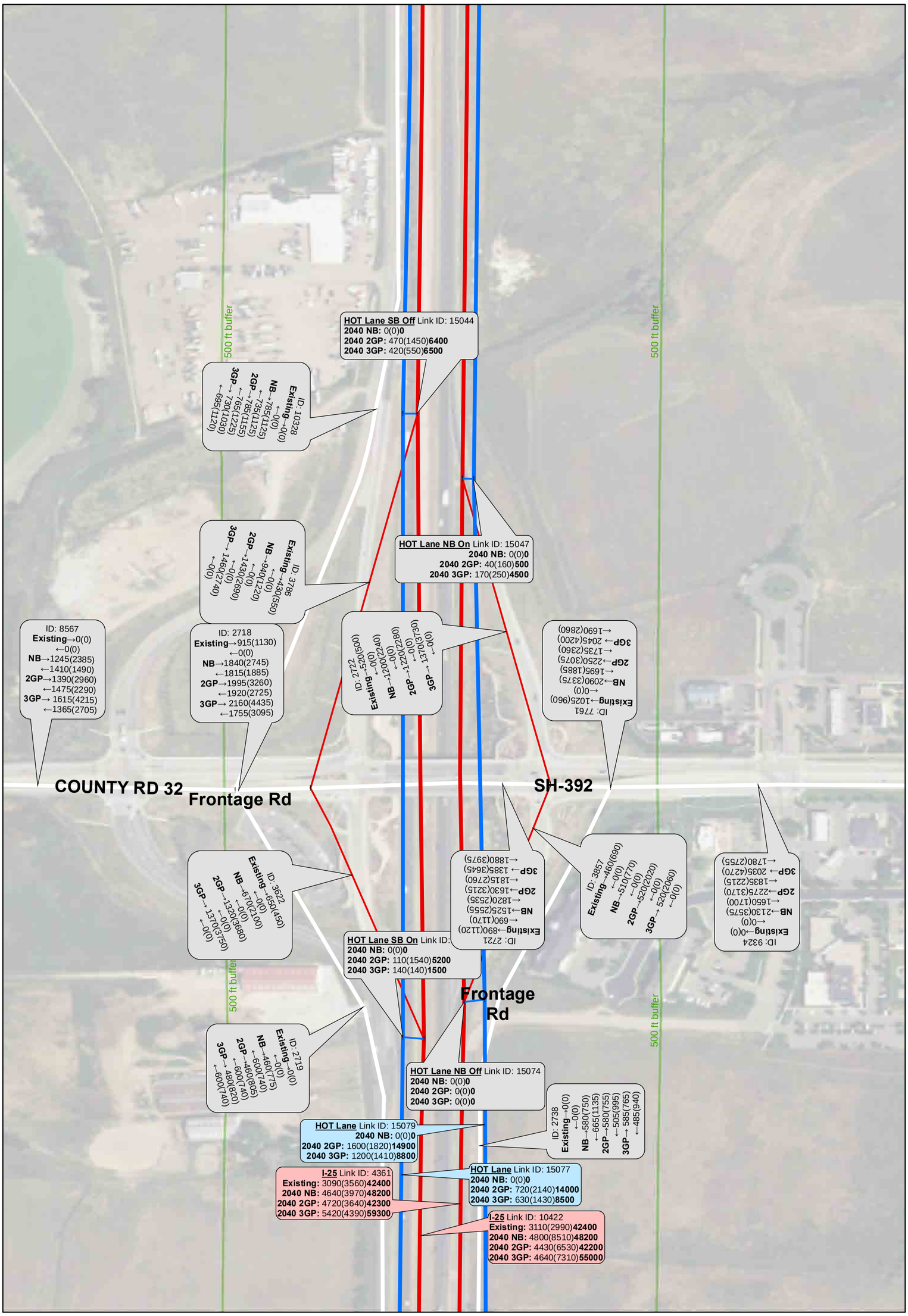
	2040 3GP+1EL Large Trucks %																	
	SB GP Lanes									NB GP Lanes								
	AM			PM			Daily			AM			PM			Daily		
South of Interchange	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of
North Limits																		
SH 1																		
Mountain Vista																		
SH 14	3%	2%	8%	4%	2%	9%	3%	2%	3%	2%	7%	8%	2%	3%	9%	2%	3%	3%
Prospect	6%	3%	7%	16%	2%	8%	1%	2%	3%	2%	14%	7%	2%	24%	7%	2%	2%	3%
Harmony	2%	3%	8%	2%	3%	8%	2%	2%	3%	3%	2%	7%	3%	1%	8%	2%	2%	3%
SH 392	3%	4%	7%	3%	3%	8%	2%	2%	3%	3%	3%	7%	4%	3%	7%	2%	2%	3%
Crossroads Blvd.	2%	5%	8%	3%	3%	7%	2%	3%	3%	3%	4%	6%	4%	2%	8%	3%	2%	3%
US 34	3%	6%	7%	3%	4%	9%	2%	2%	3%	7%	4%	10%	7%	2%	7%	2%	2%	3%
SH 402	3%	1%	8%	1%	2%	7%	1%	3%	3%	2%	1%	7%	2%	2%	10%	3%	1%	3%
CR 16	1%	#N/A	6%	0%	#N/A	8%	2%	#N/A	3%	0%	#N/A	9%	0%	#N/A	8%	3%	#N/A	3%
SH 60	1%	1%	8%	1%	2%	9%	1%	2%	3%	2%	1%	7%	1%	1%	8%	1%	1%	3%

	2040 3GP+1EL Small Trucks %																	
	SB GP Lanes									NB GP Lanes								
	AM			PM			Daily			AM			PM			Daily		
South of Interchange	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of	Off	On	South of
North Limits																		
SH 1																		
Mountain Vista																		
SH 14	2%	2%	3%	3%	2%	3%	5%	2%	10%	2%	5%	3%	2%	2%	3%	2%	6%	10%
Prospect	2%	3%	3%	1%	2%	3%	10%	3%	9%	2%	3%	3%	2%	0%	3%	3%	9%	8%
Harmony	2%	3%	3%	1%	2%	3%	2%	4%	9%	2%	2%	3%	2%	1%	3%	4%	2%	9%
SH 392	2%	2%	3%	2%	2%	3%	4%	4%	8%	2%	2%	3%	2%	2%	2%	4%	4%	8%
Crossroads Blvd.	2%	5%	4%	3%	2%	2%	3%	4%	8%	2%	3%	2%	3%	2%	3%	5%	3%	8%
US 34	2%	3%	2%	2%	1%	3%	3%	7%	10%	2%	2%	4%	2%	2%	2%	10%	3%	9%
SH 402	2%	2%	4%	0%	2%	2%	2%	2%	9%	3%	1%	3%	2%	1%	3%	2%	2%	10%
CR 16	2%	#N/A	3%	1%	#N/A	3%	1%	#N/A	9%	3%	#N/A	4%	2%	#N/A	2%	0%	#N/A	10%
SH 60	2%	1%	3%	0%	2%	3%	1%	2%	10%	2%	0%	3%	1%	1%	3%	2%	1%	9%

"South of" Column = Mainline Truck Percentages

I-25 Truck Percentages from NFRMPO Model

I-25 - Existing and Adjusted 2040 (NB, 2GP+1, 3GP+1)



Source: NFRMPO, AECOM

Saved: 10/11/2016

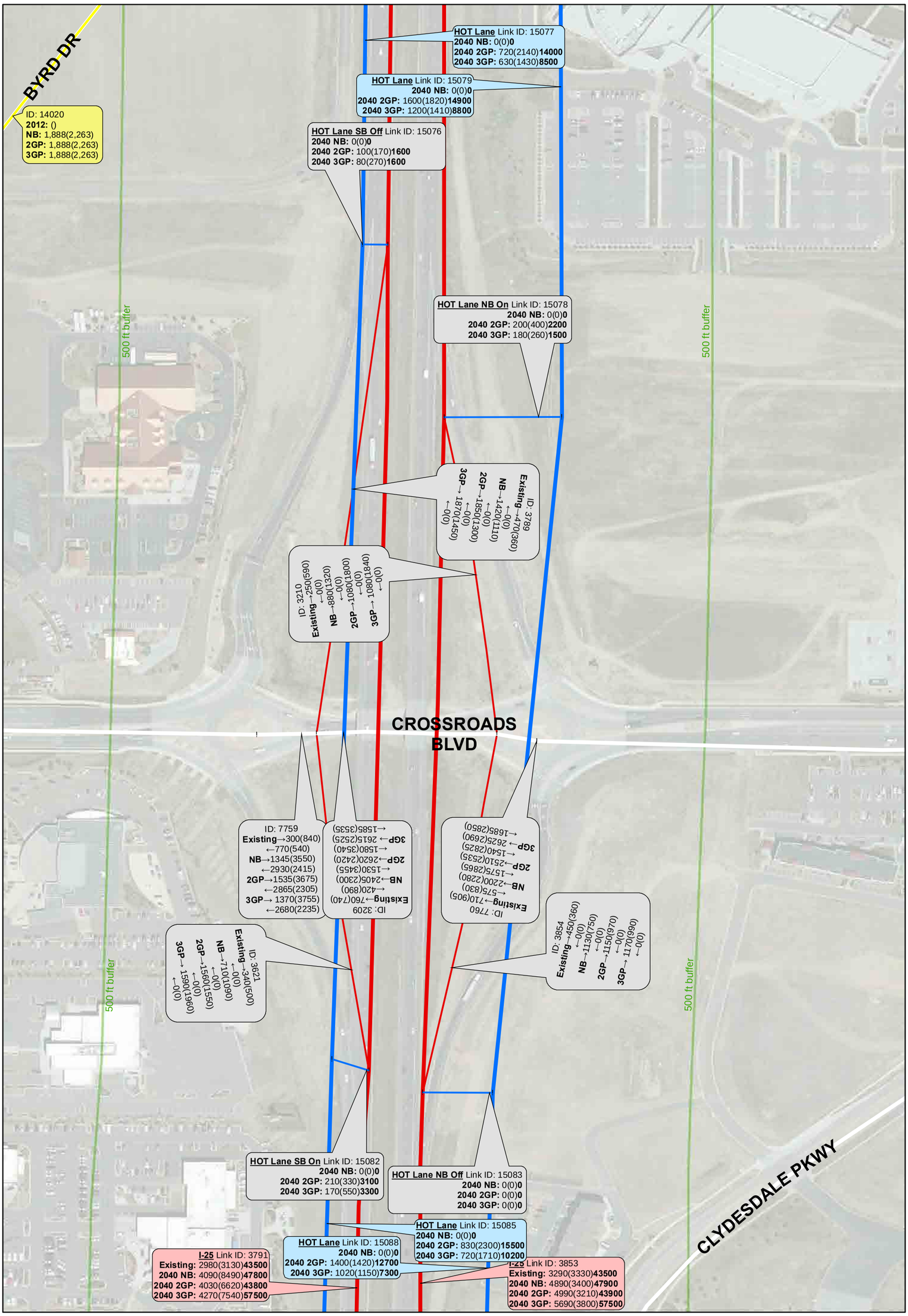
0 0.075 0.15 Miles

AM(PM)**Daily**

Legend

- NCHRP Vol from NFRMPO
- Other Roads
- HOT Lane
- HOT Lane Ramp
- I-25
- I-25 Ramp

I-25 - Existing and Adjusted 2040 (NB, 2GP+1, 3GP+1)



Source: NFRMPO, AECOM

Saved: 10/11/2016

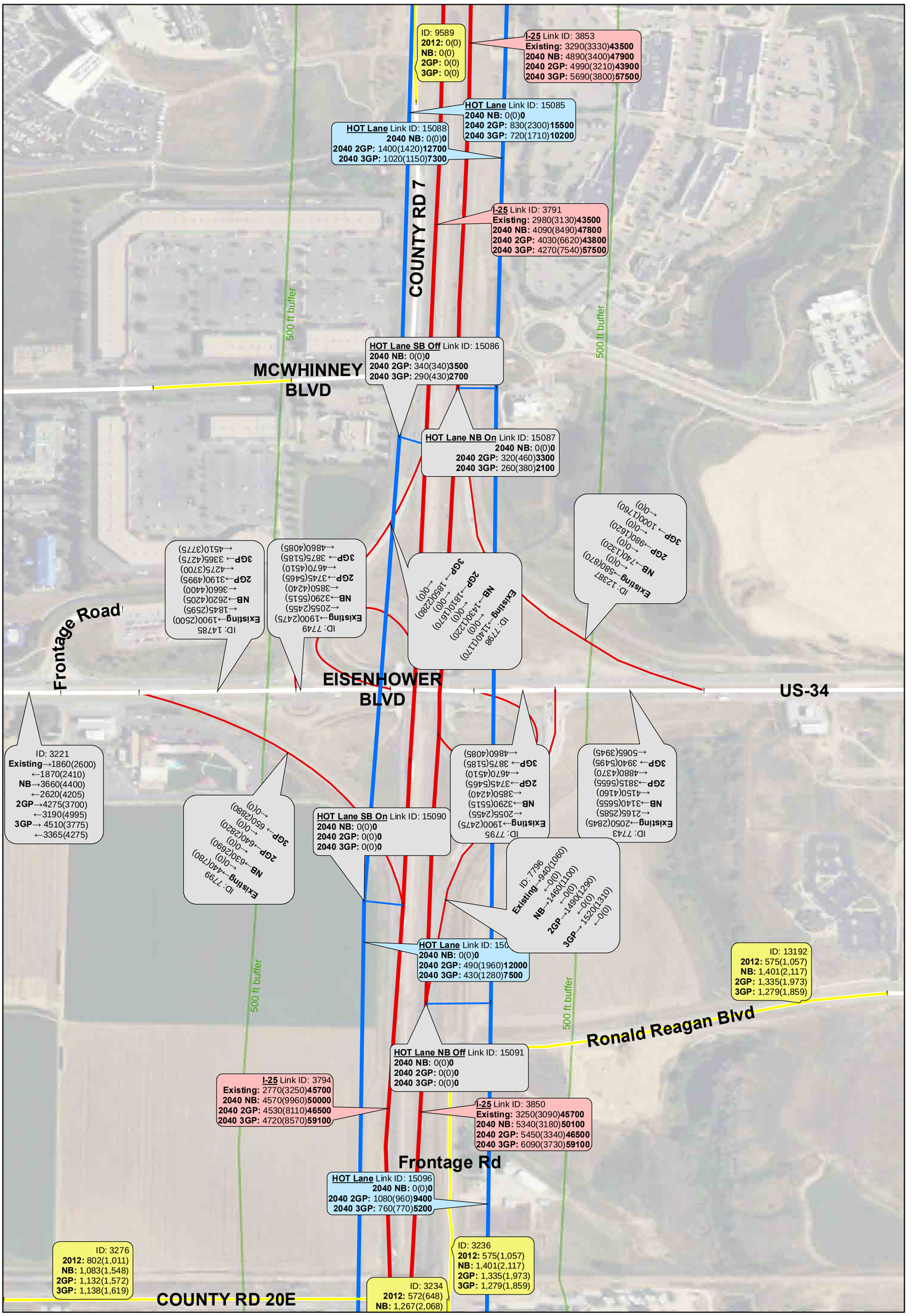
0 0.05 0.1 Miles

AM(PM)**Daily**

Legend

- NCHRP Vol from NFRMPO
- Other Roads
- HOT Lane
- HOT Lane Ramp
- I-25
- I-25 Ramp

I-25 - Existing and Adjusted 2040 (NB, 2GP+1, 3GP+1)



Source: NFRMPO, AECOM

Saved: 10/11/2016

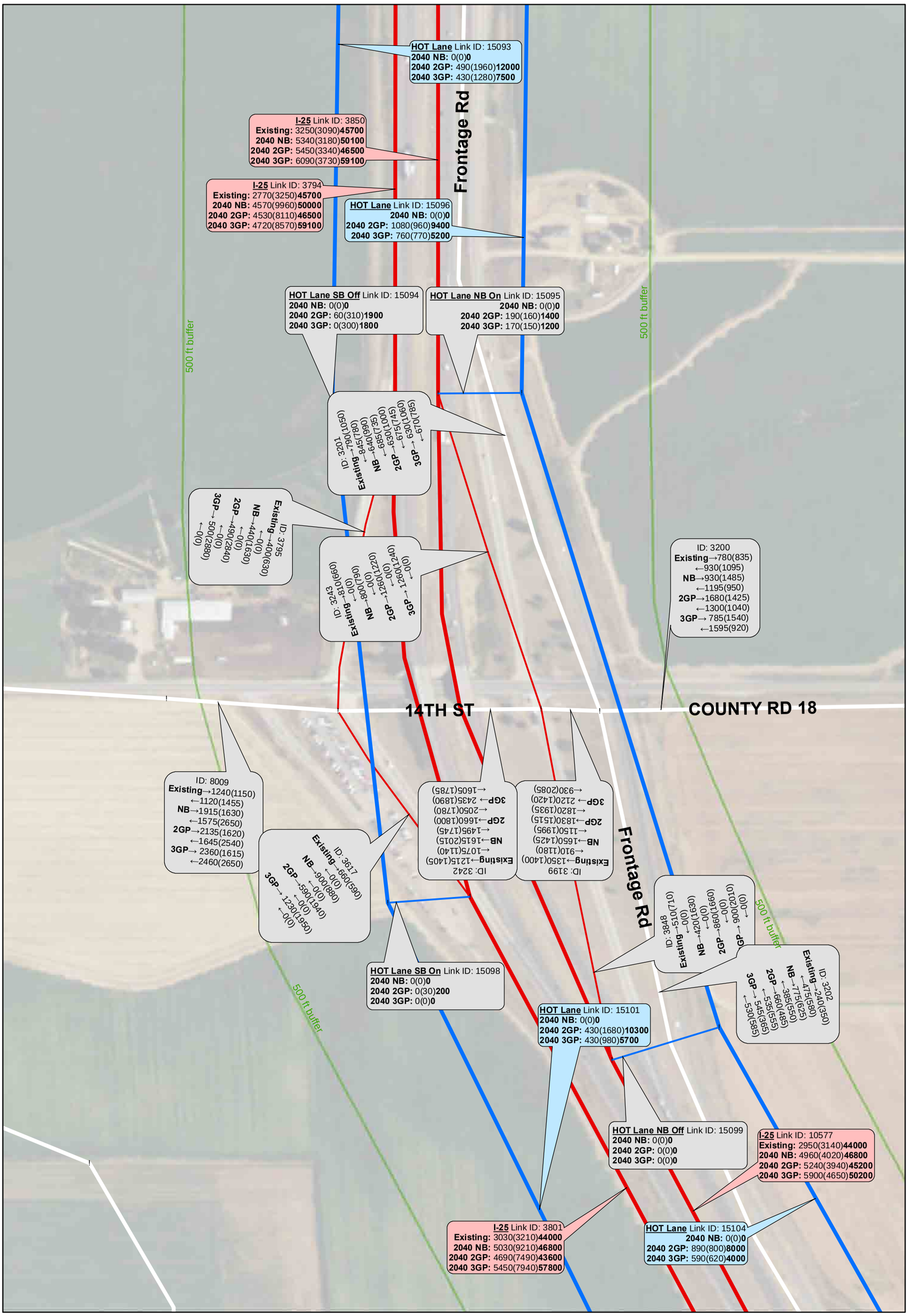
0 0.1 0.2 Miles

AM(PM)**Daily**

Legend

- NCHRP Vol from NFRMPO
- Other Roads
- HOT Lane
- HOT Lane Ramp
- I-25
- I-25 Ramp

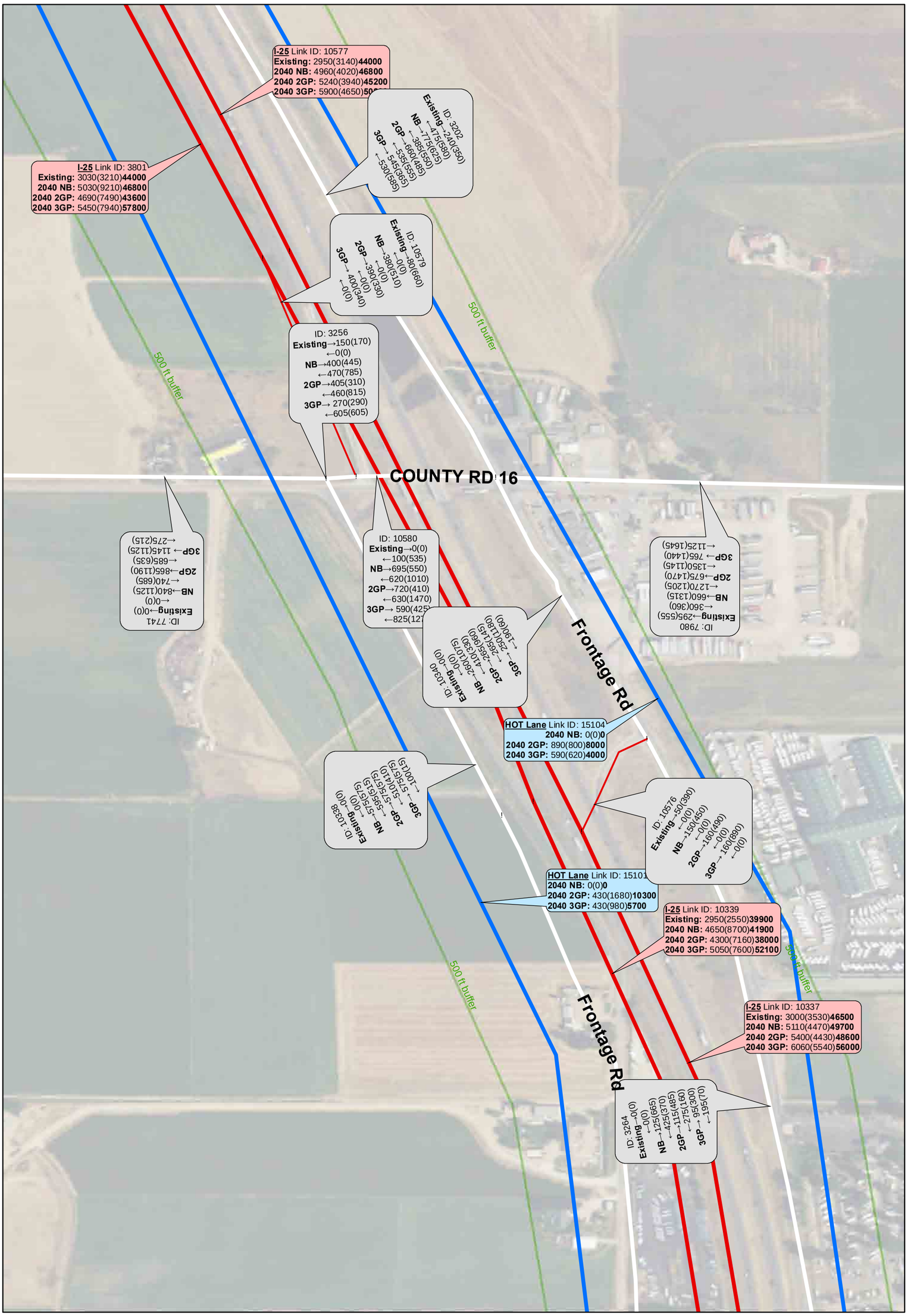
I-25 - Existing and Adjusted 2040 (NB, 2GP+1, 3GP+1)



Source: NFRMPO, AECOM

Saved: 10/11/2016

I-25 - Existing and Adjusted 2040 (NB, 2GP+1, 3GP+1)



Page 8 of 9
Source: NFRMPO, AECOM

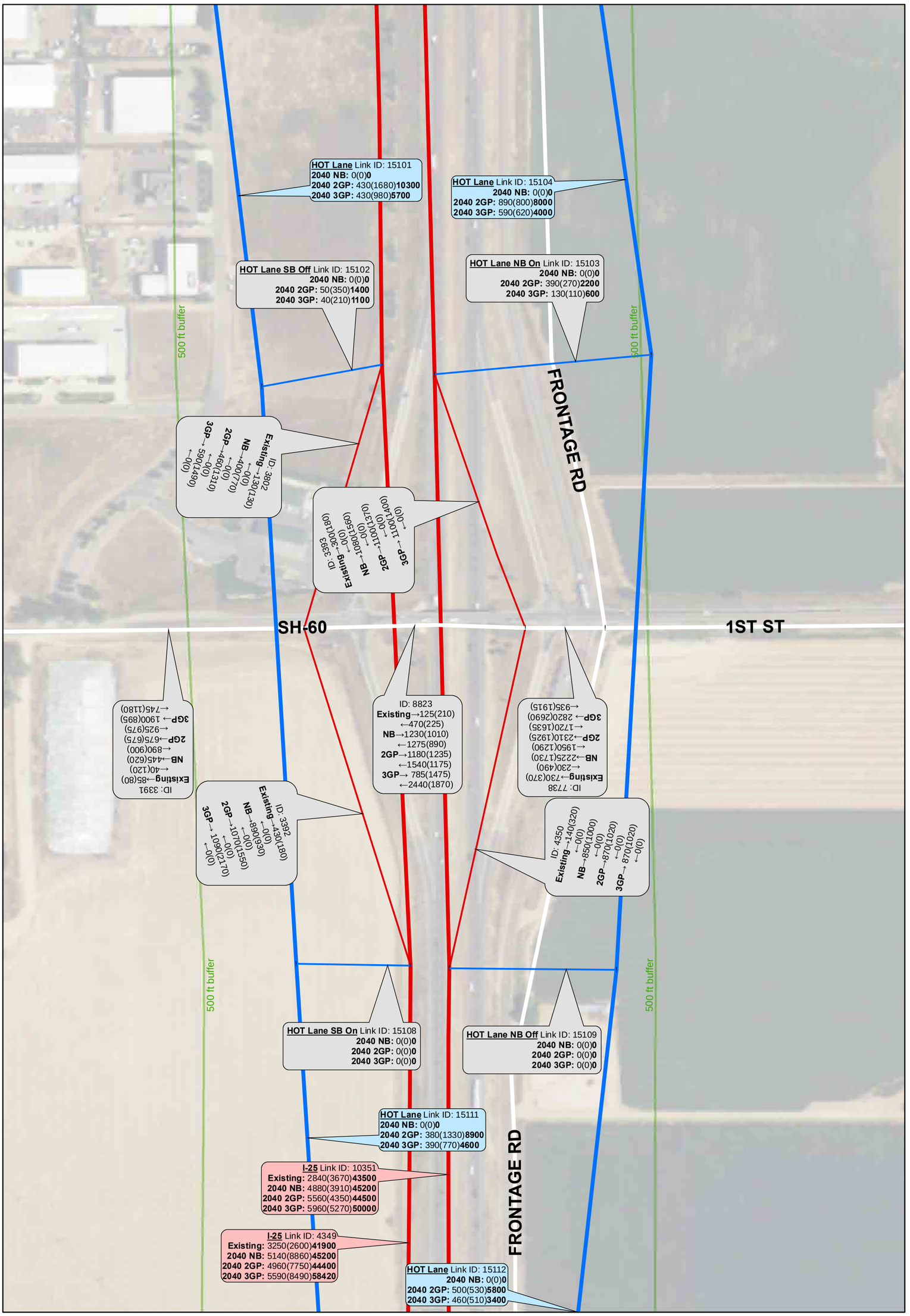
Saved: 10/11/2016

0 0.1 0.2 Miles

AM(PM)**Daily**

Legend
- NCHRP Vol from NFRMPO
- Other Roads
- HOT Lane
- HOT Lane Ramp
- I-25
- I-25 Ramp

I-25 - Existing and Adjusted 2040 (NB, 2GP+1, 3GP+1)



Source: NFRMPO, AECOM

Saved: 10/11/2016

0 0.075 0.15 Miles

AM(PM)**Daily**

Legend

- NCHRP Vol from NFRMPO
- Other Roads
- HOT Lane
- HOT Lane Ramp
- I-25
- I-25 Ramp