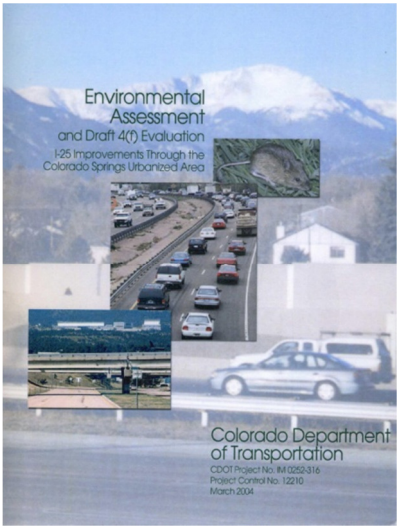
RE-EVALUATION, Mileposts 149 to 161

Interstate 25 Improvements through the Colorado Springs Area Environmental Assessment



TRAFFIC NOISE TECHNICAL MEMO

March 2012

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CDOT Region 2

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Introduction

The Colorado Department of Transportation (CDOT) has prepared this technical memorandum to update findings on the noise environment described in the original 2004 I-25 Environmental Assessment (EA) with regard to the portion of the Proposed Action between Woodmen Road (Exit 149) in Colorado Springs and State Highway 105 in Monument (Exit 161). The proposed action is to relieve existing traffic congestion and address project future congestion on I-25 within the Colorado Springs urbanized area.

The I-25 EA originally evaluated impacts for the widening of I-25 between South Academy Boulevard (Exit 135) and SH 105, together with reconstruction of various I-25 interchanges within this corridor. Page 2-10 of the EA stated that, "Consistent with projected traffic demand in the I-25 corridor, the conceptual phasing for the Proposed Action calls for:

(1) Initially six-laning through central Colorado Springs;

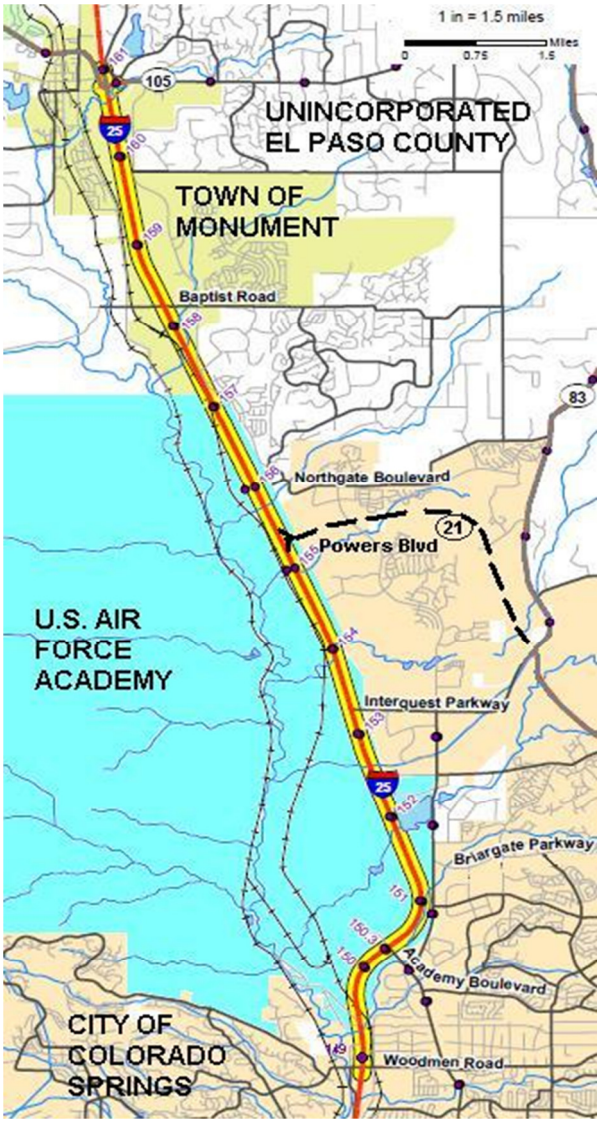
(2) Six-laning in northern El Paso County; and finally

(3) Adding HOV [High-Occupancy Vehicle] lanes through central Colorado Springs and widening to six lanes south to South Academy Boulevard."

The first of these conceptual phases was undertaken in central Colorado Springs, completed in 2007. The so-called COSMIX project resulted in 12 miles of six-lane freeway, between South Circle Drive (Exit 138) and North Academy Boulevard (Exit 150). It included major reconstruction at several interchanges, notably not including the Cimarron Street interchange (Exit 141) or the Fillmore Street interchange (Exit 145). Additional funding will be needed to complete Phase 1.

For the year 2012, CDOT has received funding to begin the second phase, meaning to widen I-25 to six lanes in northern El Paso County, within the area shown in Figure 1. The EA calls for eventually widening I-25 all the way to SH105. Total funding for this project is yet to be determined. Currently enough is available to widen I-25 from Woodmen Rd to Interquest (Exit 153). Nevertheless, to be prepared for possible additional funding being available to complete the widening to SH 105 with this project or available in the near future, CDOT's current EA re-

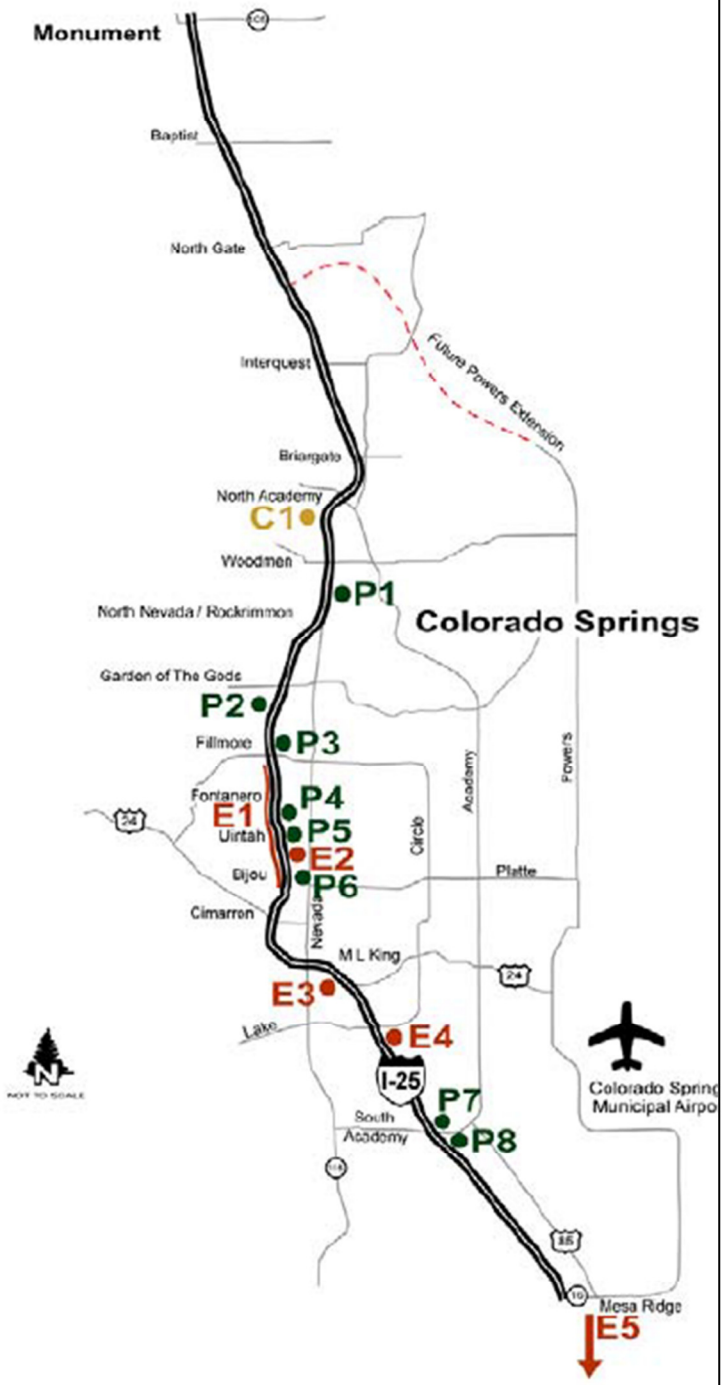
Figure 1. I-25 EA Re-evaluation Project Vicinity



evaluation effort is covering all Phase 2 improvements. Therefore, the study area for this re-evaluation extends northward all the way to Monument.

The I-25 EA included a new connection with Powers Boulevard (now State Highway 21), following SH 21 eastward to just past the Powers Boulevard/Voyager Boulevard interchange. The design and analysis of this connection in the I-25 EA superseded what was proposed earlier in the North Powers Boulevard EA that was approved in 1999. The current EA re-evaluation also includes this portion of Powers Boulevard from I-25 to just east of Voyager Parkway.

Figure 2. Existing, Committed and Proposed I-25 Noise Walls Identified in the 2004 EA



Summary of the 2004 EA Traffic Noise Impacts and Mitigation

The EA determined that the Proposed Action would increase traffic noise along I-25 both by accommodating more traffic and due to geometric changes to the roadway. In addition to long-term noise impacts from traffic, there would be short-term impacts generated by construction activity. The EA recommended construction of eight new noise walls in addition to one already committed wall and five existing walls along the I-25 corridor. These are indicated in Figure 2 by the letters E (Existing), C (Committed) and P (Proposed). As of April 2012, all of the identified noise barriers have been constructed except for those located at sites P7 and P8.

Changes to the Project that Would Affect Traffic Noise

Based on the current design, CDOT has not proposed to change the project in any way that would affect the noise environment differently from what was described in the EA.

Changes in Analysis Data, Analysis Methods or Applicable Regulations

Since the I-25 Proposed Action was analyzed in 2002 and the EA was approved in 2004, the following changes affecting traffic noise have occurred:

- A new FHWA-mandated noise model called TNM is now in use. TNM version 2.5 is the most recent software update.
- Federal regulations and Colorado noise abatement guidelines in effect when the EA was prepared have been superseded with newer versions.

Updated Noise Analysis

An updated noise analysis using TNM 2.5 modeling software was prepared in 2012 for EA re-evaluation area, between Woodmen Road (Exit 149) and SH 105 in Monument (Exit 161). The analysis concludes that there are no receptors in the re-evaluation area where noise mitigation would be recommended for the Proposed Action. Please see the appendix to this memorandum for complete details.

Summary of Previously and Currently Identified Traffic Noise Impacts and Mitigation

EA 2004 – No-Action Alternative	EA 2004 – Impacts of Proposed Action	EA 2004 – Mitigation	2012 – What has changed	Re-evaluation 2012 – No Action	Re-evaluation 2012 – Impacts of Proposed Action	Re-evaluation 2012 - Mitigation
Noise is expected to increase along the corridor by 3 decibels or less due to existing and predicted traffic congestion.	Properties that would approach, equal, or exceed FHWA noise abatement criteria include 10 residential areas, 3 parks, and 17 hotels along the I-25 corridor.	Mitigation was found to be both feasible and reasonable at a total of 8 locations. Collectively, they will protect 270 residences, plus several features of Monument Valley Park with construction of one earthen berm and seven new noise barriers ranging from 8 feet to 20 feet high and approximately 1/8- to ½-mile in length.	The COSMIX project, which widened I-25 through central Colorado Springs, included construction of six of the eight noise walls recommended in the EA. The remaining two are located near South Academy Boulevard (Exit 135). A new FHWA-mandated noise model called TNM is now in use. Federal and Colorado noise abatement guidelines in effect when the EA was prepared have been superseded with newer versions. Additional development has occurred along I-25 since the EA was prepared. While some of these may be new noise receptors, by regulation and CDOT guidelines, they would not receive noise mitigation.	With continued regional growth, I-25 traffic would increase under the No-Action Alternative, but not as much as under the Proposed Action. However, no noise mitigation would be provided.	Updated noise modeling has been conducted for the northern El Paso County re-evaluation area using the TNM model and following the new Federal and Colorado guidelines. The new (2007) Tri-Lakes YMCA soccer field 175 feet from the freeway experiences high traffic noise that would increase with the Proposed Action, but no mitigation is recommended, per regulation and CDOT guidelines.	Due to lack of impacted receptors, no noise mitigation is recommended in the re-evaluation area. Two previously recommended walls near Exit 135 (P7, P8) will be re-modeled in the future when CDOT implements the southernmost section of the I-25 Proposed Action.
	During construction, the Proposed Action would generate noise from diesel-powered earth moving equipment such as dump trucks and bulldozers, back-up alarms on certain equipment, compressors, and pile drivers (near bridge abutments and retaining walls, if necessary).	To the extent feasible, construction noise impacts, while temporary, will be mitigated by limiting work to daylight hours and requiring the contractor to use well-maintained equipment (particularly with respect to mufflers).	Construction practices, technologies and regulations regarding noise are largely unchanged.	No changes to EA-identified construction-related noise impacts.	No changes to EA-identified construction-related noise impacts.	No changes to EA-identified construction-related noise mitigation.

APPENDIX – TRAFFIC NOISE ANALYSIS

Introduction

The Colorado Department Transportation (CDOT) prepared the original I-25 Improvements through the Colorado Springs Urbanized Area Environmental Assessment (I-25 EA) to disclose the environmental impacts of future widening of I-25between South Academy Boulevard to State Highway (SH) 105 in Monument. This noise technical memorandum was developed to validate the predicted noise environmental described within the original I-25 EA and identify areas of new impacts along I-25 in the Woodmen Road to SH 105 in Monument segment. Additionally, noise analyses were carried forward to year 2035 to be consistent with current planning year assumptions.

This memo presents an analysis that was performed as part of the re-evaluation to analyze existing and future traffic noise levels along the Woodmen Road to SH 105 roadway segment. Noise impacts to residential developments built after the date of public knowledge of the original I-25 EA are evaluated in this memo, however; noise abatement for any impacts to these receptors will not be considered. Noise impacts to receptors existing or permitted at the date of public knowledge of the original EA will be considered for noise abatement measures as a result of this investigation.

Noise Analysis Methodology

The overall purpose of the following noise analysis is to conclude whether noise levels at any receivers within a likely traffic noise impact zone of the completed roadway may exceed applicable impact thresholds. A new noise analysis, modeled with TNM2.5, examined roads that would be changed or newly built by the current project. This re-evaluation was conducted under CDOT's Noise Analysis and Abatement Guidelines dated June 16, 2011 which implement 23CFR772. These guidelines establish noise abatement criteria, design and cost requirements for noise mitigation. Traffic noise impacts occur when noise levels, for different categories of land uses and activities, meet or exceed the CDOT Noise Abatement Criteria (NAC) shown in Table A-1.

TABLE A-1. CDOT Noise Abatement Criteria

Activity Category	Activity Leq(h)*	Evaluation Location	Activity Description
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 its intended purpose.
B[1]	66	Exterior	Residential
C[1]	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, recreation 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[1]	71	NA	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	NA	NA	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	NA	NA	Undeveloped lands that are not permitted for development.

1 Includes undeveloped lands permitted for this activity category.
* Hourly A-weighted sound level in dB(A), reflecting a 1-dB(A) approach value below 23CFR772 values.

Validation

The noise analysis validation was based on the original 2003 field measurements, traffic conditions, roadway alignments, receptor locations and terrain features. During the field measurement, the number of automobiles, medium trucks, heavy trucks, buses and motorcycles that passed on I-25 and adjacent facilities were documented. Average speeds were determined by driving in the flow of traffic and radar speed detection. Using the inputs noted above, noise levels were predicted at each field measurement location. The measured and predicted noise levels are compared in Table A-2.

TABLE A-2. Model Validation Results, Leq(h) in dB(A)

Location	2003 Field Measurement	2004 I-25 EA		2012 Re-evaluation	
		Predicted Level	Difference	Predicted Level	Difference
M1	61	63	2.0	62.1	1.1
M2	55	58	3.0	54.5	-0.5
M3	53	54	1.0	51.4	-1.6
M4	53	55	2.0	51.0	-2.0
M5	53	55	2.0	51.1	-1.9

The model is considered validated when the measured and predicted results are within ± 3 dB(A), which suggests the model is accurately predicting the existing noise environment.

Receptors

The original I-25 EA identified one area of sensitive receptors, Chaparral Hills subdivision, located north of the North Academy Exit 150. The New Santa Fe recreational trail also parallels I-25 through the northern portion of this project area. Modeling of the trail was performed for its closest approach to I-25, considered to be its potentially noisiest section.

Between 2004 and 2012, several subdivisions have been constructed along the I-25 corridor but all are 600 feet or greater from the edge of the pavement on I-25. Also, the Tri-Lakes YMCA in Monument was developed adjacent to I-25 with outdoor soccer fields roughly 175 feet from the edge of pavement. All of these new receptors were developed after approval of the I-25 EA FONSI, with full public knowledge of the proposed improvements. Figure A-1 shows the general location of the receptors examined in this analysis with regard to the 12-mile re-evaluation corridor. Figures A-2 through A-5 show each receptor area in greater detail. These locations are:

- north of Baptist Road (Exit 158)
- south of Baptist Road (Exit 158)
- north of Northgate Road (Exit 156)
- in the vicinity of the Northgate Road (Exit 156)

Traffic

The Existing 2012, No-Action 2035 and Proposed 2035 environments were modeled for their worst noise hour conditions. The worst hour for noise is when the highest volume of traffic can travel at the highest free flow speed for the particular roadway. Using the Highway Capacity Manual (2000) and TNM, CDOT has developed maximum traffic volumes per lane at various posted speed limits on specific roadway types to simulate free flow conditions and produce the loudest noise. This analysis uses these maximum freeway flow rates for the posted speeds on the I-25 mainline only. Traffic volumes for Struthers Road were developed using the PPACG regional model. The traffic volumes per lane per hour used for this analysis are shown in Table A-3.

TABLE A-3. Traffic Data

Facility	Posted Speed Limit (mph)	Traffic Volumes (vehicles/lane/hour)		
		Existing 2012	No-Action 2035	Proposed 2035
I-25	75	1600	1600	1600
Struthers	45	135	135	135

FIGURE A-1. Location of Noise Receptors Analyzed in the I-25 Re-evaluation Area

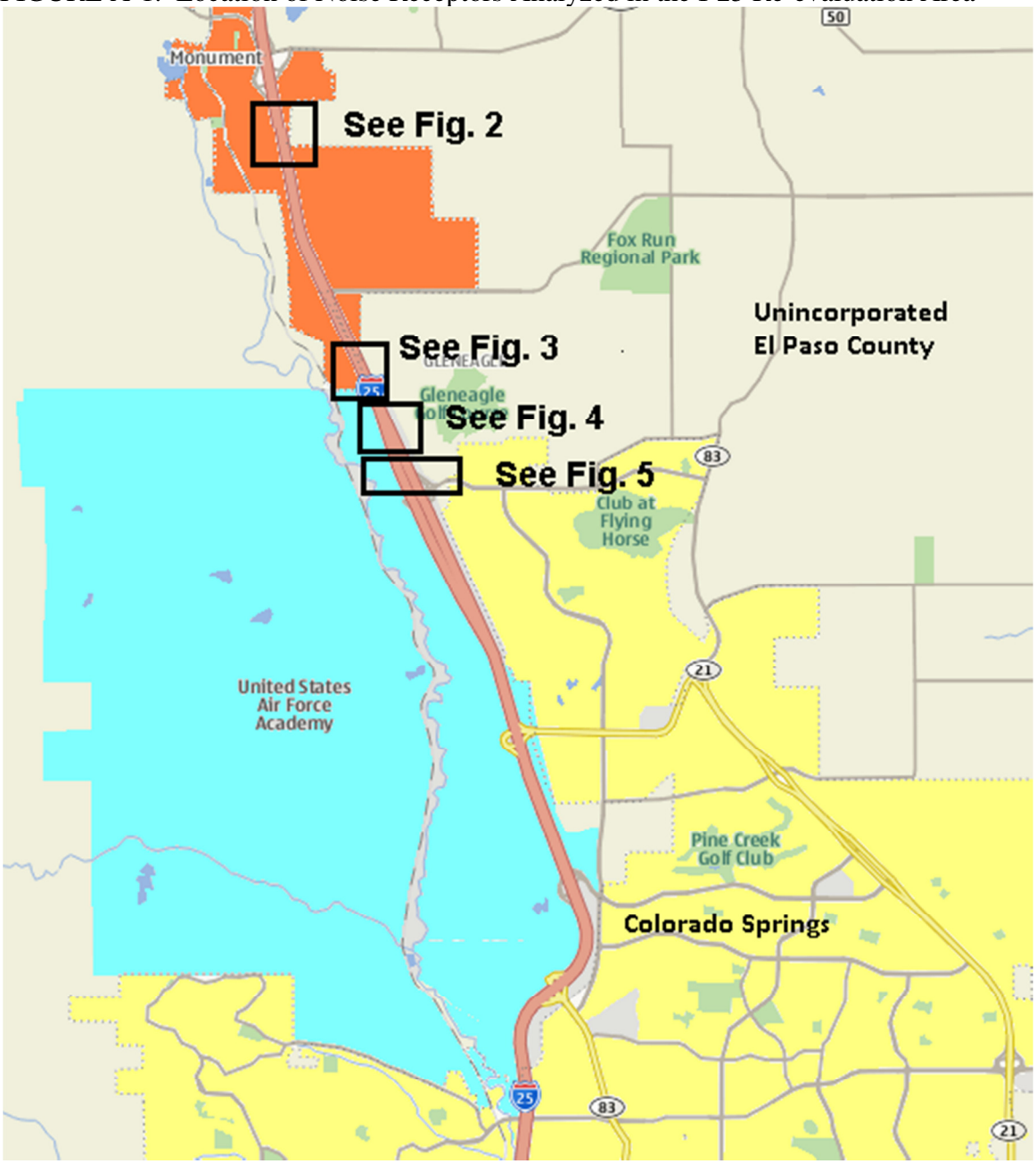


FIGURE A-2. Receptors North of Baptist Road (Exit 158):

FIGURE A-3. Receptors South of Baptist Road (Exit 158)

FIGURE A-4. Receptors North of Northgate Road (Exit 156)

FIGURE A-5. Receptors in the vicinity of the Northgate Road (Exit 156)

Current Noise Levels

Current noise levels at receptors along I-25 are less than the NAC for residential criteria of 66 dBA, except for the soccer field at the YMCA which is impacted.

Future Noise Levels

Noise levels for the No-Action (2035) and Proposed (2035) are shown in Table A-4. The 2035 noise environment does not have any new impacts beyond the Monument YMCA soccer field which was developed around 2007, after approval of the 2004 I-25 EA and FONSI. All other receptors are below the NAC criteria of 66 dBA.

Summary/Recommendations

The initial study conducted with STAMINA2.0 software indicated no impacted receptors for this study area. The results of this new analysis for the re-evaluation of the I-25 EA confirm those results for the receptors known at that time and show that future 2035 noise levels will result in one new impacted receptor at the Monument YMCA soccer field. However, because this receptor was built well after the date of public knowledge of the I-25 EA, no abatement will be considered by FHWA or CDOT for this site.

TABLE A-4 Receptor Noise Levels

Original Receptors						
General Area	Receptor Identification	Existing (2012) (dBA)	No-Action (2035) (dBA)	Proposed (2035) (dBA)	Change 2012 to 2035(dBA)	Noise Impact
Chaparral Hills	S2M1	58.0	58.0	60.0	2.0	No
	S2M2	53.0	53.0	54.6	1.6	No
	S2M3	47.9	47.9	50.0	2.1	No
	S2M4	49.6	49.6	51.3	1.7	No
	S2M5	50.9	50.9	54.0	3.1	No
New Representative Receptors						
General Area	Receptor Identification	Existing (2012) (dBA)	No-Action (2035) (dBA)	Proposed (2035) (dBA)	Change 2012 to 2035(dBA)	Noise Impact
Valley Ridge, Peak View Ridge, Santa Fe Trails, Village at Monument, Trail Ends	MON1	45.3	45.3	50.7	5.4	No
	MON2	45.5	45.5	50.9	5.4	No
	MON3	46.2	46.2	51.5	5.3	No
	MON4	46.0	46.0	51.5	5.5	No
	MON5	47.5	47.5	51.9	4.4	No
	MON6	48.8	48.8	52.0	3.2	No
	MON7	49.8	49.8	52.3	2.5	No
	MON8	49.8	49.8	53.1	3.3	No
	MON9	50.4	50.4	53.5	3.1	No
	MON10	51.1	51.1	54.1	3.0	No
	MON11	51.6	51.6	54.9	3.3	No
	MON12	52.4	52.4	55.7	3.3	No
	MON13	52.4	52.4	55.8	3.4	No
	MON14	53.1	53.1	56.5	3.4	No
	MON15	53.6	53.6	56.8	3.2	No
	MON16	55.0	55.0	58.0	3.0	No
	MON17	56.1	56.1	58.5	2.4	No
	MON18	56.7	56.7	59.3	2.6	No
	MON19	56.7	56.7	59.4	2.7	No
Struthers Ranch	NS1	57.2	57.2	60.5	3.3	No
	NS2	57.6	57.6	60.9	3.3	No
	NS3	58.0	58.0	61.4	3.4	No
	NS4	58.6	58.6	61.9	3.3	No
	NS5	59.3	59.3	62.9	3.6	No
	NS6	59.3	59.3	63.0	3.7	No
	NS7	58.9	58.9	62.6	3.7	No
	NS8	60.5	60.5	63.7	3.2	No
	NS9	55.5	55.5	58.8	3.3	No
	NS10	55.9	55.9	59.2	3.3	No
	NS11	56.4	56.4	59.7	3.3	No
	NS12	57.2	57.2	60.5	3.3	No
	NS13	57.0	57.0	60.5	3.5	No
	NS14	57.6	57.6	61.0	3.4	No
	NS15	62.1	62.1	64.4	2.3	No

TABLE A-4 Receptor Noise Levels (continued)

General Area	Receptor Identification	Existing (2012) (dBA)	No-Action (2035) (dBA)	Proposed (2035) (dBA)	Change 2012 to 2035(dBA)	Noise Impact
Falcons Nest	NS16	58.9	58.9	63.0	4.1	No
	NS17	58.8	58.8	62.8	4.0	No
	NS18	58.7	58.7	62.7	4.0	No
	NS19	58.5	58.5	62.6	4.1	No
	NS20	58.5	58.5	62.5	4.0	No
	NS21	58.2	58.2	62.2	4.0	No
	NS22	57.9	57.9	61.8	3.9	No
	NS23	57.7	57.7	61.7	4.0	No
	NS24	56.5	56.5	60.2	3.7	No
	NS25	56.0	56.0	59.6	3.6	No
	NS26	54.9	54.9	58.3	3.4	No
	NS27	56.4	56.4	60.0	3.6	No
	NS28	56.2	56.2	60.1	3.9	No
	NS29	56.1	56.1	59.9	3.8	No
	NS30	55.8	55.8	59.7	3.9	No
	NS31	55.6	55.6	59.5	3.9	No
	NS32	55.3	55.3	58.9	3.6	No
	NS33	54.7	54.7	58.3	3.6	No
	NS34	54.4	54.4	57.9	3.5	No
	NS35	54.4	54.4	57.9	3.5	No
	NS36	54.4	54.4	57.8	3.4	No
	NS37	53.8	53.8	56.8	3.0	No
	NS38	53.8	53.8	56.8	3.0	No
Paradise Villas	NS39	58.5	58.5	59.0	0.5	No
	NS40	59.1	59.1	59.6	0.5	No
	NS41	60.1	60.1	60.6	0.5	No
	NS42	59.2	59.2	59.7	0.5	No
	NS43	56.2	56.2	57.4	1.2	No
	NS44	54.6	54.6	56.2	1.6	No
	NS45	59.3	59.3	59.5	0.2	No
Ridge Point	NS46	60.1	60.1	60.4	0.3	No
	NS47	60.0	60.0	60.4	0.4	No
	NS48	57.2	57.2	58.0	0.8	No
	NS49	57.3	57.3	57.4	0.1	No
	NS50	54.9	54.9	55.5	0.6	No
Misc	Mining	51.7	51.7	53.7	2.0	No
	Santa Fe Trail	62.7	62.7	63.6	0.9	No
	YMCA soccer	69.0	69.0	72.8	3.8	Yes