I-25 CIMARRON INTERCHANGE
ENVIRONMENTAL ASSESSMENT REEVALUATION

ATTACHMENT 3

2014 Traffic Noise Analysis and Abatement Documentation

COLORADO
Department of Transportation

COLORADO
Department of Transportation
Division of Transportation Development

I-25 CIMARRON INTERCHANGE ENVIRONMENTAL ASSESSMENT RE-EVALUATION
Traffic Noise Addendum

September 29, 2014

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and

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INTRODUCTION

The March 2004 *I-25 Improvements through the Colorado Springs Urbanized Area Environmental Assessment* (I-25 EA) evaluated impacts for the widening of 26 miles of I-25 between South Academy Boulevard in Colorado Springs and State Highway 105 in Monument, together with reconstruction of various I-25 interchanges within this corridor as shown in Figure 1 from the I-25 EA. When the FONSI was signed in September 2004, there were insufficient funds to implement all of the improvements, a phased approach was developed. Page 2-10 of the I-25 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, then
(2) Six-laning in northern El Paso County, and finally
(3) Adding HOV [High-Occupancy Vehicle] lanes through central Colorado Springs and completing the six lanes widening south to south Academy Boulevard."

Figure 1. I-25 EA Project Limits

Considerable progress has been made in implementing the I-25 EA Proposed Action over time, including the following projects:

- 2007 - The first of these conceptual phases was completed in central Colorado Springs. The project, referred to as "COSMIX", 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).
- 2009 - The Baptist Road interchange (Exit 158) was reconstructed in a collaborative effort with the Baptist Road Rural Transportation Authority.
- 2012 - CDOT received funding to begin the second phase, which is to widen I-25 to six lanes in northern El Paso County between Woodmen Road (Exit 149) and SH 105 (Exit 160) including modifications to the

Northgate interchange. An EA re-evaluation was completed (2012) for this phase of I-25 and for the grading of a portion of the future North Powers Boulevard connection with I-25. This construction project is being delivered as a design/build project and expected to be completed by the end of 2014.

- 2014 – Funding was identified and an EA re-evaluation was completed to enable the Fillmore Street interchange to be reconstructed as a Diverging Diamond Interchange configuration, which differs from the configuration previously proposed by the I-25 EA (a Single Point Urban interchange). The project is currently in the bidding process.
- 2014 - CDOT, the City of Colorado Springs, and El Paso County allocated funds to reconstruct the I-25 Cimarron Interchange.

This re-evaluation is being completed to comply with the National Environmental Policy Act (pursuant to 23 CFR 771.129) as the I-25 Cimarron interchange project:

- Proceeds to the next major approval or action with changes such as laws, policies, guidelines, environmental setting impacts or mitigation,
- Shifts from a tight urban diamond to single point diamond interchange, and
- More than three years have elapsed since the Federal Highway Administration's (FHWA) approval of the FONSI [23 CFR 771.129(b)].

PROPOSED ACTION

A Revised Interchange Configuration

The I-25 Cimarron interchange in Colorado Springs, Colorado, as shown in Figure 2, is the connection between Interstate 25 and US Highway 24 West. The I-25 Cimarron interchange was built in 1959 and does not accommodate existing or projected traffic volumes nor does it meet current design criteria. Improvements to this interchange have been examined twice, first in the 2004 I-25 EA (FONSI September 2004) and then in the 2012 US 24 West EA (FONSI October 2014).

To meet traffic demand in the year 2025, the I-25 EA recommended that the Cimarron interchange be reconstructed in a Tight Urban Diamond Interchange (TUDI), having two consecutive traffic signals that would handle the eastern half and the western half of the interchange.

In 2012, CDOT and FHWA completed a separate EA for US Highway 24, between I-25 and Manitou Springs. To meet traffic demand in the year 2035, the US 24 West EA recommended the following for the I-25 Cimarron interchange:

Figure 2. I-25 Cimarron Interchange Area

> **"Build single-point diamond interchange (SPDI) with a loop ramp for eastbound-to-northbound travel at US 24 and I-25**. This interchange design replaces the tight diamond interchange identified in the *I-25 Improvements through the Colorado Springs Urbanized Area EA* (CDOT, 2004a). Since that EA was approved, traffic forecasts and future traffic operations have been revised by the Pikes Peak Area Council of Governments (PPACG), making a SPDI design more efficient operationally." [Chapter 2 – Alternatives, page 2-14, 1st bullet.]

The proposed basic configuration, shown in Figure 3, meets the purpose and need for the interchange project, as defined in the 2004 I-25 EA. Because I-25 has already been reconstructed both north and south of the Cimarron interchange, based on the previously recommended TUDI configuration, there is very limited flexibility with regard to the footprint within the constrained project area, and thus the new SPDI design impacts vary only slightly from the previous design. This 2014 re-evaluation reports the changed impacts resulting from the current, proposed design.

Additional Requested Elements

CDOT intends to use the Design/Build approach for I-25 Cimarron interchange project delivery. The successful bidder for the construction project will also have extensive input into project final design. Additionally, as part of the bidding process, CDOT has identified the following Additional Requested Elements (AREs), which are included in the published Request for Proposals for the project and may or may not be included in the contractors bid / final design:

ARE No. 1 – Full Width I-25 Bridge: All the additional Work necessary to replace the existing I-25 Bridge over Cimarron and Fountain Creek (Str. # I-17-DG) with a full-width bridge structure that fully conforms to the ultimate I-25 lane and shoulder configuration. This ARE is fully consistent with the I-25 EA, as it provides today for the additional bridge structure that will be needed to accommodate the future High Occupancy Vehicle (HOV) lanes. Funding is not available at this time for the HOV lanes portion of the EA Proposed Action, but bridge reconstruction affords an opportunity to reduce future cost and traffic disruption by building the needed bridge structure now in conjunction with the interchange project.

ARE No. 2A – Widen US 24 Bridge over Fountain Creek and provide additional lanes to 8th Street: This ARE is consistent with the I-25 EA, as it provides operational benefits to the interchange with additional auxiliary lane lengths for both eastbound and westbound from I-25 southbound off-ramp to 8th Street, and provides additional eastbound left turn storage at the I-25 ramp intersection.

ARE No. 2B – Replace US 24 Bridge over Fountain Creek and provide additional lanes to 8th Street: This ARE is consistent with the I-25 EA, as it provides operational benefits to the interchange with additional auxiliary lane lengths for both eastbound and westbound from I-25 southbound off-ramp to 8th Street, and provides additional eastbound left turn storage at the I-25 ramp intersection. This ARE also provides roadway improvements to US 24 to conform to a 40 mph design speed west of I-25 and stream improvements to Fountain Creek under the new bridge.

ARE No. 3 – Provide additional trail and stream improvements along Fountain Creek: This ARE addresses stream improvements and trails which do not need additional environmental analysis in this re-evaluation because they were included in the US 24 West EA and FONSI signed October 2, 2014. Constructing the stream improvements as part of the design build project provides the opportunity for a more efficient and less disruption one-time completion of Fountain Creek restoration between the previous Gold Hill Mesa project to the west which ended at 8th Street and the Fountain Creek improvements that will be happening as part of the interchange complex at I-25.

ARE No. 4 – Provide Contractor defined additional requested elements: Contractor contractual commitments to provide additional Work that enhances operations on US 24 and at the I-25 and US 24 Interchange. This ARE provides the contractor flexibility to propose other design features or modifications, as long as they are within the environmental footprint of the I-25 EA and its re-evaluation or the US 24 EA that would be covered by this analysis. Any design modifications that increase environmental impacts beyond what has been considered and documented here would require additional environmental evaluation.

NOISE BACKGROUND AND TECHNICAL METHODOLOGY

FHWA requires that Traffic Noise Model software version 2.5 (TNM2.5) replace use of the previously endorsed noise modeling software, STAMINA2.0. The I-25 EA noise analyses were completed in STAMINA2.0. Because the modeling technology has changed, the I-25 EA future 2025 noise conditions generated by the STAMINA2.0 software were updated to the 2035 current planning year and were re-modeled using TNM2.5. The model input data include major roadways, roadway-specific traffic volumes of automobiles and light trucks, medium trucks, and heavy trucks representing the noisiest hour traffic capacity, noise-sensitive receptor locations, feature elevations, and terrain contours. All results are reported in hourly A-weighted decibels or dBA.

Regulatory Updates

The I-25 EA noise analyses were conducted utilizing CDOT Noise Analysis and Abatement Guidelines dated December 1, 2002 (CDOT, 2002). On March 25, 2013 FHWA approved the current revision of the CDOT Noise Analysis and Abatement Guidelines (CDOT, 2013) for implementation on new projects compliant with the latest 23 CFR 772 noise regulations. [A September 2, 2014 revision is currently pending FHWA approval.]

Because this is a re- evaluation of the original FONSI, an updated traffic impact noise study was completed using the latest compliant traffic noise model and rules. The purpose of this update is to provide disclosure of the noise conditions in the current planning horizon of 2035. Only traffic noise impacts to noise-sensitive receptors are provided. The 2004 study provided a generalized noise impact contours for the residential and park threshold of 66 dBA and commercial property threshold of 71 dBA. Under 2002 guidance, non-hotel/motel commercial properties were not considered for noise abatement.

The differences between 2002 and 2013 noise abatement criteria are the subdividing of various land use categories, separating residential land use and the other special noise-sensitive land uses such as parks, schools and hospitals, from one category into two categories. Additionally, commercial land uses that were lumped inclusively into 2002 NAC category C, are now split into noise-sensitive land uses NAC E with a threshold of 71 dBA and non-noise sensitive land uses NAC F with no impact evaluation threshold. Remaining categories are generally the same, but identified with new NAC letter codes. The NAC threshold noise levels are shown with the corresponding category.

Figure 3. Project Map

Figure 4. Noise Abatement Criteria and Activity

2002 Noise Abatement Criteria

Activity Category	Leq	Description of Activity Category
A	56 (exterior)	Lands on which serenity & quiet are of extraordinary significance…
B	66 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	71 (exterior)	Developed lands, properties, or activities not included in Cat A or B above.
D	n/a	Undeveloped lands.
E	51 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums.

2013 Noise Abatement Criteria

Activity Category	Leq	Description of Activity Category
A	56 (exterior)	Lands on which serenity & quiet are of extraordinary significance…
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, offices, restaurants/bars, and other developed lands, properties or activities not included in A-D or F.
F	n/a	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, ship yards, utilities (water resources, water treatment, electrical), and warehousing.
G	n/a	Undeveloped lands that are not permitted for development.

Noise abatement evaluation of noise barriers or other approved measures still requires passing both a feasibility test of constructability issues and reasonableness test evaluating more socio-economic criteria. However, abatement measure evaluation of reasonableness has been changed from subjective 2002 criteria to required quantitative 2013 criteria.

The feasible and reasonable criteria taken from the 2002 Guidelines are:

2002 Feasibility - Each item must pass

1. Can a continuous noise barrier be constructed?
2. Can 5 dBA noise reductions be achieved by construction of a noise barrier?
3. Can a 5dBA noise reduction be achieved by insulation of the receiver? (Normally limited to public and non-profit)
4. Are there any fatal flaw safety or maintenance issues involving the proposed noise barrier?

2002 Reasonableness - Decision based qualitatively on summary of metrics

1. Build level decibel level. The future build condition noise level w/o noise barrier should be at least 66 dBA for majority of front row residential, school, hospital and recreational receivers for a reasonable project.

Metric: Very >70dBA; Reasonable 66-70dBA; Marginally 63-65.9dBA; Unreasonable <63dBA
When analyzing NAC C business/commercial, add 5dBA to levels shown above.

2. Build noise level is greater than existing. The future build noise levels w/o noise abatement should be at least 5 dBA above existing no-build noise levels for a reasonable project.

Metric: Very >10dBA; Reasonable 5-10dBA; Marginally 0--4.9dBA; Unreasonable- a decrease in noise level

3. Cost per impacted receiver per decibel. In consideration of each potential barrier, the cost indexed to $30 per SF, with less than $3750 per receiver per decibel reduction for a reasonable project.

Metric: Very <$3000; Reasonable $3000-3750; Marginally $3750-4000; Unreasonable >$4000
Count receivers getting 3 dBA or more reduction from the noise abatement

4. Impacted person's desire. At least 50% of impacted people both owners & renters, should want the proposed abatement measure for th project to be considered reasonable.

Metric: Very >75%; Reasonable 50-75%; Marginally 40-49.9%; Unreasonable <40%

5. Development type. The mixture of development types plays a major part in determining the reasonableness of noise mitigation. For a project to be considered reasonable, at least 75% of the development should consist of Category B receivers. See 2002 NAC categories.

Metric: Very >75%; Reasonable 50-70%; Marginally 25-49.9%; Unreasonable <25%

6. Development Existence. The length of time impacted receivers have been exposed to transportation related noise impacts. For a project to be considered reasonable, at least 75% of impacted commercial and residential receivers in a development should have been in existence for more than 15 years.

The above 1995 reasonableness criteria should be compared to the 2013 reasonableness criteria that are specified in 23 CFR 772.9 and adapted to CDOT Noise Analysis and Abatement Guidelines as follows:

2013 Feasibility - Each item must pass

1. Can a continuous noise barrier be constructed?
2. Can 5 dBA noise reductions be achieved by construction of a noise barrier?
3. Can a 5dBA noise reduction be achieved by insulation of the receiver? (Normally limited to public and non-profit)
4. Are there any fatal flaw safety, maintenance, environmental or critical habitat issues involving the proposed noise barrier?

2013 Reasonableness -All 3 criteria must be collectively met

1. Design goal noise reduction of at least 7 dBA must be achieved at a minimum of one receptor affected by abatement measure.

2. Cost benefit index must be below of $6800 per receiver per decibel reduced. Use $45SF unit cost in formulation and only benefited receptors achieving 5 or more dBA reduction from abatement measure.

3. Benefited receptor preference. Simple majority of surveyed benefited receptors (owners & renters).

NOISE IMPACTS AND MITIGATION

At the time of the I-25 EA study noise levels in this area ranged from 61 to 72 dBA. Front row commercial receptors located within 100 feet of the interstate typically experience noise levels in the low 70 decibels. Residential areas located more than 900-1040 feet west of the interstate on South 7th Street were expected to experience the noise levels below the NAC B in the low 60 decibels. The 2025 traffic noise levels were predicted using STAMINA 2.0 modeling software, and in this area were delineated by contours of 66 dBA and 71 dBA for 2025 NAC B and C, respectively. These are shown in Figure 5 taken from the I-25 EA technical noise report (CDOT, 2003).

A TNM 2.5 model was created to update traffic noise levels for the current planning horizon of 2035 using noisiest hour maximum traffic volumes from Table 4 of the 2013 Noise Analysis and Abatement Guidelines (CDOT, 2013). Additionally, model inputs included planned engineering design roadways and ramps, noise-sensitive receptor locations, terrain lines, and elevation data. Barriers and/or building rows were used to define shielding from large buildings and consistent rows of buildings where appropriate. Future noise levels ranged from 62 dBA to 74 dBA. The noise level results for 2035 are tabulated in Figure 6 and receptor locations shown in Figure 7.

Figure 5. I-25 EA Noise Impact Contours

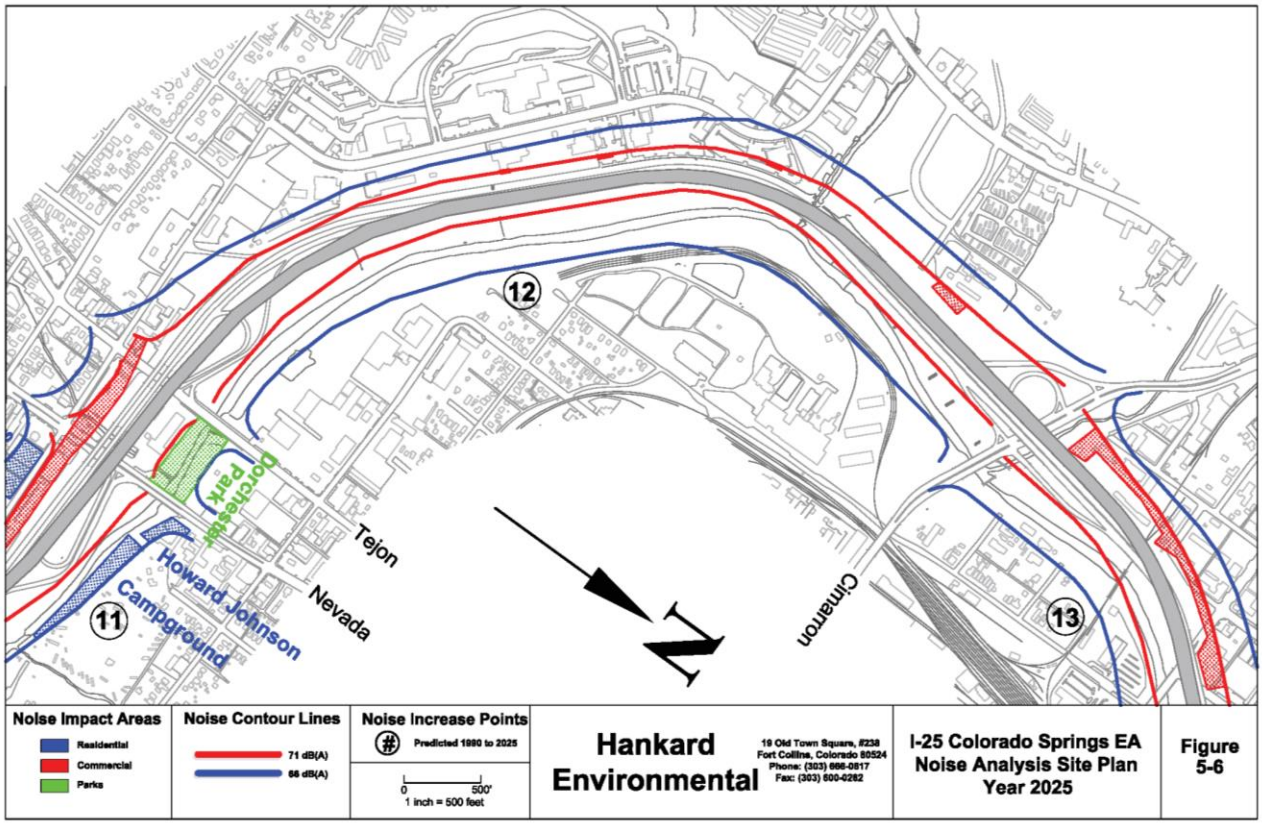
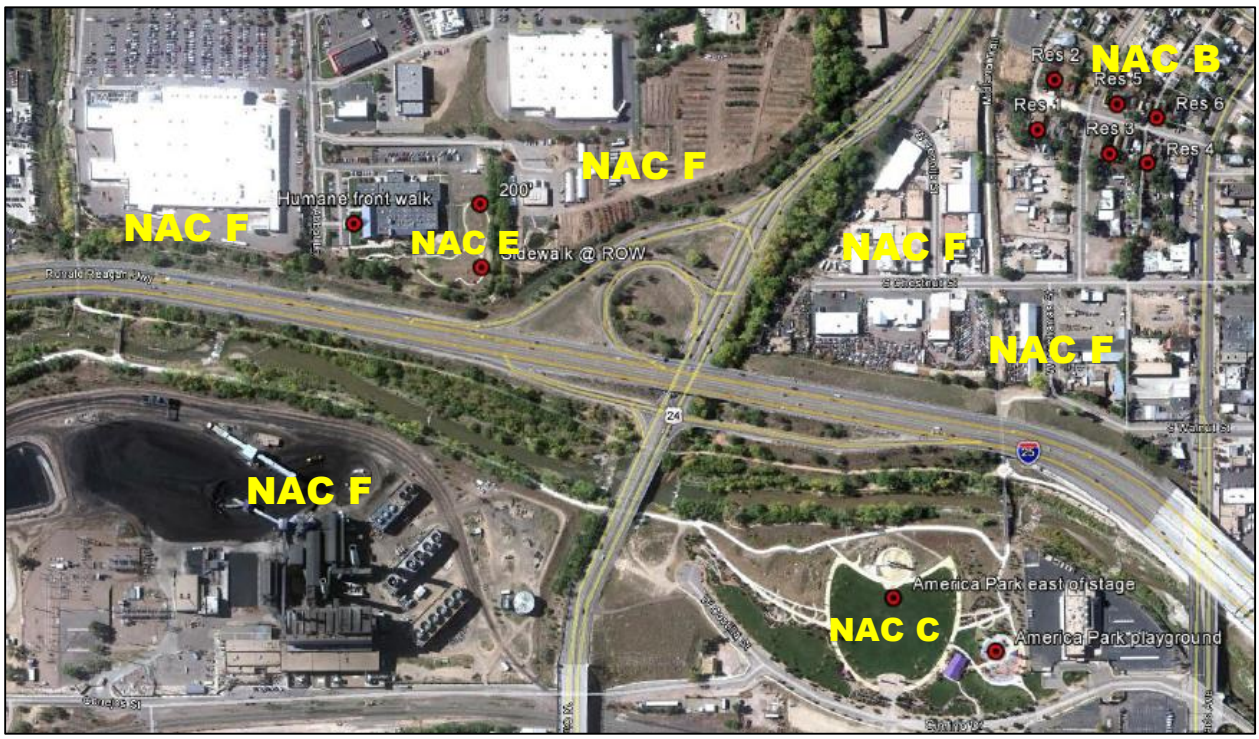


Figure 6. Traffic Noise Impact Analysis Results

Receptor Location	Dwelling Units	2013 NAC	Noise Level (dBA)
America the Beautiful Park east of stage	1	C	62
America the Beautiful Park playground area	1	C	62
Resident 1	1	B	65
Resident 2	1	B	63
Resident 3	1	B	63
Resident 4	1	B	63
Resident 5	1	B	62
Resident 6	1	B	62
Humane Society entrance area	1	E	**74**
Humane Society walk area at ROW	1	E	**71**
Humane Society walk area at 100'	1	E	69
Humane Society walk area at 200' (top of loop)	1	E	67

Figure 7. Location of Noise Receptors and NAC Categories



The noise impacts identified by contouring in the I-25 EA are similar to TNM 2.5 modeling results. Noise levels at frontage land uses identified as noise-sensitive NAC C (America the Beautiful Park and playground) with an impact threshold of 66 dBA and NAC E businesses (Humane Society outdoor uses) with an impact threshold of 71 dBA are shown in Figures 6 and 7. Other commercial frontage properties are either right-of-way acquisitions or are categorized as non-noise sensitive NAC F where impacts are not applicable. Only the outdoor use areas of the Humane Society facility are impacted by this project.

Early Action Project Mitigation

Noise barriers 16- to 20-foot tall are present along the southbound right-of-way from just south of Fillmore Street to the north flank of the Bijou Interchange to mitigate noise levels to residential neighborhoods flanking I-25. These walls were constructed between 1998 and 2000, as a part of an early action project prior to the I-25 EA. The Fillmore to Bijou noise impacts were based on older studies, but a post-construction noise report summarized the noise environment in this area: *Bijou to Fillmore Noise Wall Study, Final Report* June 2002.

I-25 EA Mitigation

The 2025 impact contours generated as a part of the I-25 EA indicated a need for noise abatement in the vicinity of the Cimarron Interchange at America the Beautiful Park (see Figure 5). The City was not in favor of a noise barrier along the northbound I-25 shoulder at America the Beautiful Park, formerly named Confluence Park in order to preserve the Pikes Peak view shed from the park and secondarily, to be visible from the interstate. The final confirmation letter stating the City of Colorado Springs desire not to receive abatement treatment for the park is attached as Appendix A.

Other than the park, the impact contours from the I-25 EA indicated that only NAC C business/commercial properties would be impacted by future noise levels in the Cimarron Interchange area and that mitigation was not evaluated due to commercial nature of the properties. Local land use maps illustrating current and planned land use in the immediate area around the Cimarron Interchange are included in Appendix B.

2014 Update

Confirmation has been received from the City of Colorado Springs that no noise mitigation is desired for the America the Beautiful Park and Midland Trail, per recommendations included in the I-25 EA.

Impacts to Humane Society outdoor use areas are similar to those identified in the I-25 EA, with noise levels ranging between 69-74 dBA. A pet memorial and cemetery area will be part of a right-of-way acquisition. Remaining pet-walking trail congregating areas will be impacted. Encroachment of highway right-of-way for future US24 and I-25 ramps will bring the active ramp travel lanes within 90 feet of the animal shelter building and will permanently remove approximately 30 percent of the existing pet-walking trails.

Because no abatement was recommended for this area in the I-25 EA and the FONSI date of public knowledge of December 2004 has passed, no additional abatement analysis has been conducted for this re-evaluation.

Appendix A
America the Beautiful Park Mitigation Preference Letter

PARKS, RECREATION & CULTURAL SERVICES

CITY OF COLORADO SPRINGS

May 14, 2014

Lesley Mace
Project Manager
Colorado Department of Transportation
1480 Quail Lake Loop
Colorado Springs, CO 80906

RE: The City of Colorado Springs Parks and Recreation Advisory Board
I-25 / Cimarron Street (US 24) Interchange Design-Build Project

Thank you for the opportunity over the past several months to review and provide comment on the Midland Trail Relocation and the noise impact along America the Beautiful Park (previously known as Confluence Park). As you are aware, we took your findings through a three-step process: an internal review by Parks, Recreation and Cultural Services staff members, a public presentation of the information to the Parks and Recreation Advisory Board on March 14, 2014, and a second presentation for action to the Parks and Recreation Advisory Board on April 10, 2014. We are pleased that there was close consensus between both staff and the Board on the following key issues:

Midland Trail Realignment:
As part of the I-25 Environmental Assessment, previous action was taken by the Parks Advisory Board on December 12, 2002 regarding the realignment of the Midland Trail. The Board approved the relocation of the trail from its current location to the north bank of Fountain Creek. This will close the Midland Trail connection under the interstate. The Colorado Department of Transportation is proposing to make these changes as part of the I-25 / Cimarron Street (US 24) Interchange Design-Build Project.

Because portions of the Midland Trail were constructed using funds allocated by the Land and Water Conservation Fund Act of 1965, the impacts to the trail require CDOT to conduct a "Section 6(f)" evaluation for realignment and reconstruction. Section 6(f) requires that any permanent impact to an encumbered property be mitigated at least on a one to one basis with similar quality and value. CDOT will assure that there is an equal value exchange for the Section 6(f) property acquired. Such exchange will be valued according to the requirements of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 for both the property acquired and for any properties used as a part of the payment. Appraisals are conducted as part of CDOT's right-of-way process.

In addition to the trail relocation, CDOT will construct a pedestrian bridge across Monument Creek to complete the trail system. The proposed bridge will be a standard continental pedestrian bridge structure. The City of Colorado Springs has agreed to and will be responsible to maintain the relocated Midland Trail as a Section 6(f) encumbered property in perpetuity.

Noise:
As part of the I-25 Environmental Assessment, previous action has been taken by the Parks Advisory Board on December 12, 2003 regarding the noise impact from the proposed interchange improvements. The current Parks Advisory Board,

as reflected in their formal vote, concurred with the previous Board's action that the visual quality, views into and out of America the Beautiful Park (previously known as Confluence Park), were of much higher importance than noise mitigation. The Parks Advisory Board acknowledges that CDOT will not construct a noise mitigation wall in this location. However, the Parks Advisory Board does request a solid guard rail along I-25 to obscure the lower half of cars passing the park and possibly soften tire noise.

CDOT will continue to integrate Parks, Recreation and Cultural Services staff members in the interchange design reviews to ensure compatibility of the Interchange improvements with the America the Beautiful Park and Trail network. We are excited about the collaborative process that has transpired to date and recognize the enhancements this project will provide to our community.

If any changes occur as part of the design build process, CDOT will present the changes to the Parks Board for consideration and approval.

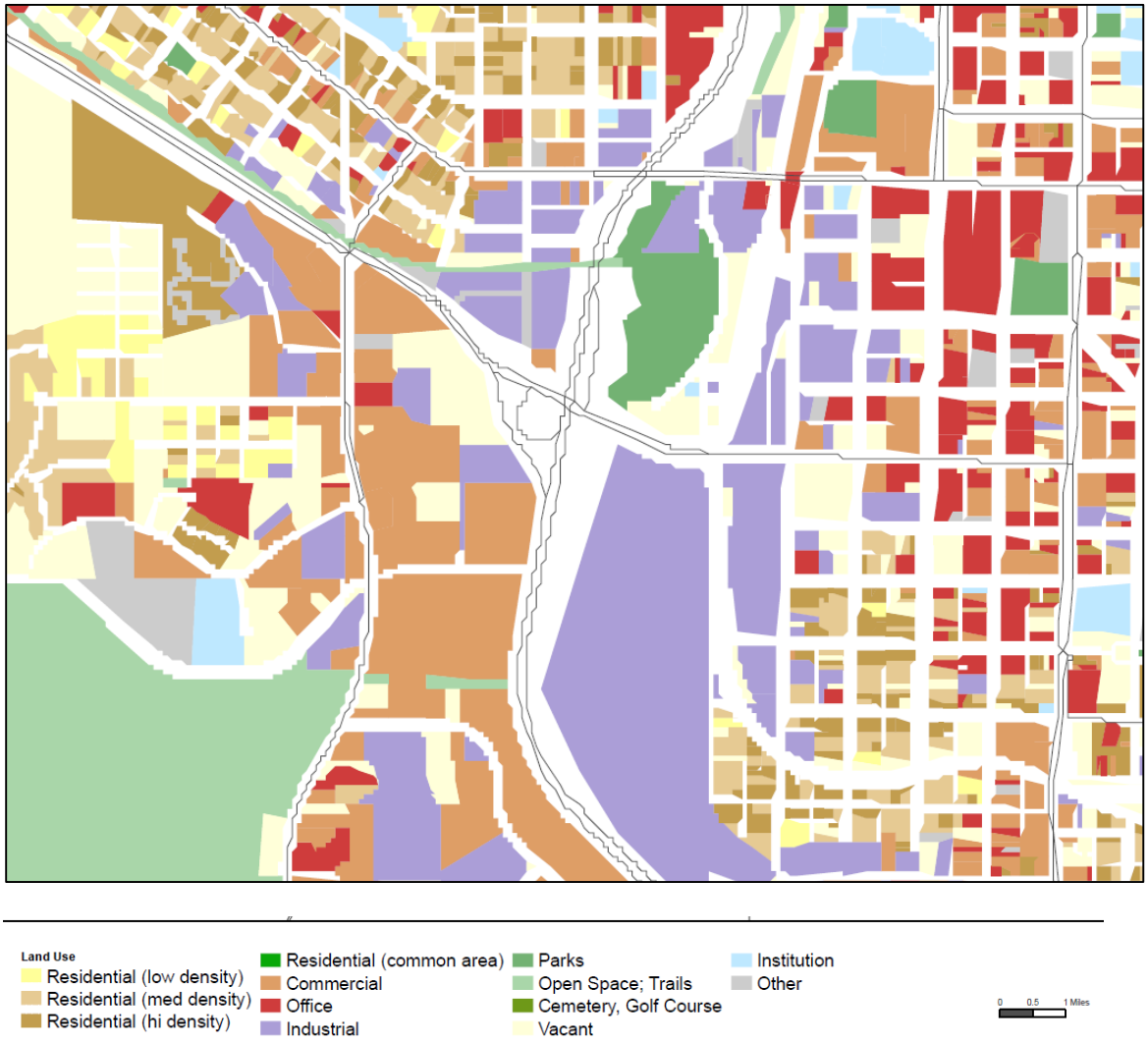
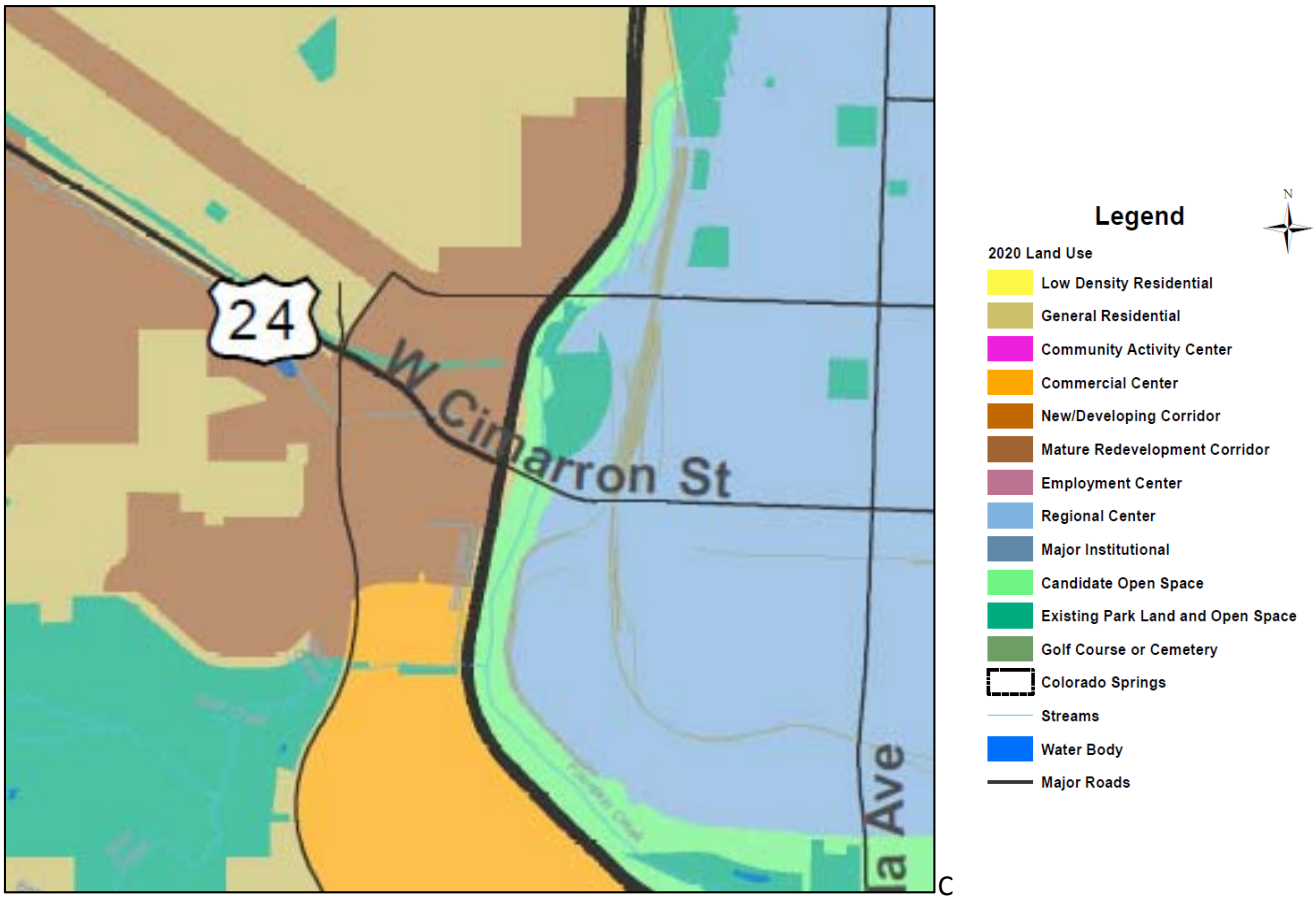
If you have any additional questions or need additional information, please do not hesitate to contact me at 719.385.6501.

Sincerely,

Karen Palus
Director

Appendix B
Area Land Use

2014 Land Use Map for Cimarron Interchange Vicinity



2020 Planned Land Use Map for Cimarron Interchange Vicinity