Appendix B
Initial Corridor Assessment

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I-25 PEL: Colorado Springs Denver South Connection

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Prepared For:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

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Acronyms and Abbreviations

AADT	annual average daily traffic
AASHTO	American Association of State Highway and Transportation Officials
ATSF	Atchison, Topeka & Santa Fe Railroad
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CO	carbon monoxide
CPW	Colorado Parks and Wildlife
CRA	common resource area
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
ft	feet
GIS	geographic information system
ITS	intelligent transportation systems
mph	mile(s) per hour
MPO	metropolitan planning organizations
NEPA	National Environmental Policy Act
OTIS	Online Transportation Information System
PEL	planning and environmental linkages
PM_{10}	particulate matter of 10 microns or less
ROW	right-of-way
RTP	Regional Transportation Plan
SSD	stopping sight distance
TIP	Transportation Improvement Program
USGS	U.S. Geological Survey
WT/HP	weight to horsepower (ratio)

1.0 Introduction

This Initial Corridor Assessment summarizes data gathered to assess the existing conditions of approximately 33 miles of I-25 between the Town of Monument, Colorado, north of Colorado Springs, and the C-470/E470 interchange in the Denver South area. In general, the assessment of I-25 within the Study Area indicates that the horizontal and vertical geometry of the freeway system is in generally fair to good condition, with a few locations of poor conditions that are further described in this report.

The summary of findings along the I-25 corridor within the Study Area is presented below. A summary of the overall geometric ratings for the corridor is included in Appendix A.

1.1 Project Area

I-25 between Monument and C-470 provides the main travel link for residents, visitors, commuters, and military personnel between Colorado Springs and Denver. This vital link is the backbone for several communities, including Monument, Larkspur, Castle Rock, Castle Pines, and Lone Tree.

I-25 provides the central travel route between the state's two largest population centers, Denver and Colorado Springs, which also represent the primary trip destinations for corridor travelers. This trend is expected to continue as the primary travel demand is coming from the Colorado Springs area and El Paso County, which by 2040 is projected to be the state's most populous county (Colorado Department of Local Affairs, 2017).

The Study Area along the I-25 corridor is approximately 33 miles, beginning at Monument and ending at C-470/E-470 in the south Denver Metro area. A wide range of physical, geometric, and operational conditions exist along I-25. The need for or desirability of improvements is ultimately judged by the system's performance. Important measures of system performance include the frequency and severity of crashes and the speeds, density, and levels of service of traffic flow during peak travel periods.

1.2 Geometric Design

Appendix I contains plan sheets that provide a graphical summary of the geometric "health" of the existing I-25 mainline and interchanges. In general, the following ratings indicate how well the existing geometric elements meet current design criteria:

- Green bars indicate "Good" segments where the geometric element meets or exceeds design criteria.
- Yellow bars indicate "Fair" segments where the specific geometric element does not meet the design criteria but is within acceptable limits described in this document.
- Red bars indicate "Poor" segments where the geometric element does not meet design criteria and does not fall within the acceptable limits described in this document.

1.3 Traffic, Travel Forecasting, Safety, and Intelligent Transportation Systems Existing Corridor Conditions

An assessment of traffic operations, travel forecasting, recent traffic crash data, and intelligent transportation systems (ITS) along the I-25 corridor are summarized later in this document and in separate memos included in the appendixes. Results (where available) relating to traffic operational ratings and notable concentrations of crashes are shown in the plan sheets included in Appendix I.

1.4 Environmental Resources in the Project Area

An overview of environmental resources along the I-25 corridor, focusing on those resources identified to be important within the Study Area, is summarized later in this document. Resource specific technical memorandums are included in Appendix H. Identification and limits of environmental resources are also shown in the plan sheets included in Appendix I.

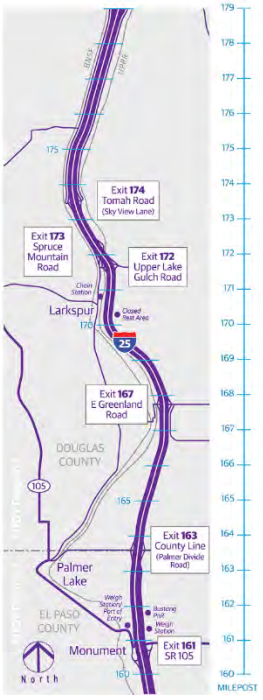
2.0 Objectives

This report documents the evaluation of existing conditions of I-25 through the Study Area. It is intended to provide reference for the planning and environmental linkages (PEL) study in documenting the purpose of corridor improvements and highlighting corridor transportation needs, including an assessment of infrastructure, safety, and travel reliability conditions. The data and report recommendations will also guide the next steps in the PEL study in evaluating and recommending improvement alternatives for the corridor. This report represents a snapshot of the existing condition and recognizes areas where further work is needed to assess and consider corridor needs. It is intended to be an overview rather than a comprehensive assessment of corridor infrastructure conditions, traffic and safety conditions, and environmental conditions. As the PEL study progresses, this overview report will be superseded by new data and analyses.

The I-25 corridor is divided into three segments as shown on Figure 1.

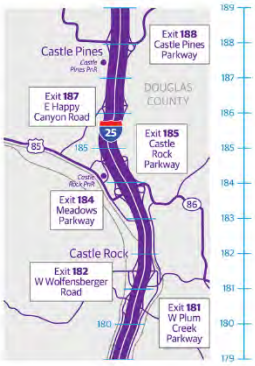
Segment 1
MP 161 to MP 179: The Gap

- Rural 4 lane
- Stable land use, large open space areas
- Steady climbing grades southbound (more than 1,000 feet elevation gain)
- Narrow shoulders
- Varied topography with hills, steep slopes, and vertically offset travel lanes (northbound is higher than southbound)
- 6 interchanges, mostly original (1960s)
- Existing (2015) Annual Average Daily Traffic: 64,000 to 68,000
- Percent of trucks: 5.8 to 6.6



Segment 2
MP 179 to MP 189: Castle Rock to Castle Pines

- Urban 6 lane
- Narrow shoulders
- Developed and growing communities
- 6 interchanges
- Existing (2015) Annual Average Daily Traffic: 99,000 to 121,000
- Percent of trucks: 5.1 to 5.5



Segment 3
MP 189 to 194: Denver South

- Urban 8 lane, recently widened
- Rapidly developing commercial and residential area
- 3 interchanges
- Existing (2015) Annual Average Daily Traffic: 126,000 to 178,000
- Percent of trucks: 4.8 to 7.2

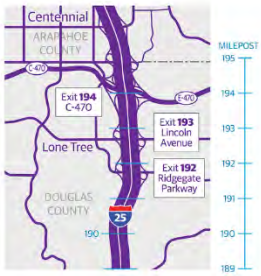


Figure 1. I-25 Corridor Segments

The assessment of existing I-25 conditions includes an inventory of the physical features within each segment. This inventory can then be used to develop short (early action) and long-term plans for this corridor, which not only correct existing geometrics and operational deficiencies, but can also accommodate future traffic requirements and reduce the severity of and potential for crashes.

2.1 Existing Conditions Study Process

The study process includes evaluating existing conditions of I-25 within the project area. The existing conditions of the roadway were evaluated against the current design standards to determine degree of deficiencies. Sufficiency and deficiency ratings for major structures were obtained from the Colorado Department of Transportation (CDOT) database to determine the condition of each major structure within the project area. Existing traffic data were obtained from CDOT to understand the magnitude of the volume of traffic along the corridor. Crash data were obtained from CDOT to determine where the

crashes occurred and the severity of the crashes. Environmental elements within the project area were identified.

2.2 Data Sources

The evaluations of the geometric elements were performed based on available as-built and design plans, supplemented by reference to Google Earth aerial photography. In addition, horizontal alignments, vertical alignments, and existing digital terrain models produced by CDOT were used to evaluate existing geometric conditions. CDOT-produced data resources included the following:

- Aerials from two sources. The first source is 2014 \\TOCAERIALS found in the CDOT computer network. The second source is the North El Paso Earth Explorer from the U.S. Geological Survey (USGS) library for aerials near Monument.
- Coordinates were set to NAD83 Colorado State Planes, Central Zone, US Foot using MicroStation / InRoads.
- Raw digital elevation models from the internet government sites at a USGS library for Colorado were used and stitched together to create an existing conditions digital terrain model. It should be noted that the USGS digital elevation models vary in precision, and the differences can be as much as 10-feet (ft.) contours.

For analysis of existing bridges along the corridor, staff bridge inspection reports and aerial imagery were used. Results of the analysis of existing bridges along the corridor are discussed later in this document.

For analysis of traffic, travel forecasting, safety, and ITS, existing conditions data were compiled from various available sources. No new data were collected as part of this initial assessment. Data sources included CDOT's Online Transportation Information System (OTIS), Cognos database query tool, Colorado Transportation Management Center, ITS management software, safety data, Bustang data, and others. Data were also obtained from cities, counties, metropolitan planning organizations (MPOs), as well as INRIX for travel time information.

2.3 Plan Sheets

All analyses are depicted graphically on plan sheets included under Appendix I. The sheets align all performance criteria with the corridor to enable a visual understanding and reference of potential relationships between features and performance. Each geometric element was evaluated using a simple 'Good,' "Fair,' or 'Poor' rating system discussed later in this document. The plan documents include separate sheets with ratings for the I-25 mainline and interchange ramps.

3.0 Geometric Design

The 2011 American Association of State Highway and Transportation Officials (AASHTO) *Policy on Geometric Design of Highways and Streets* and the 2005 CDOT *Roadway Design Guide* are the basis for the evaluation criteria. Alignment, cross section, and sight distance were evaluated in comparison with policies and guidelines for rural and urban freeways, as noted in the *Policy*. For the purposes of analysis, the quality of the geometry was evaluated using the design criteria as shown in Table 1a for the I-25 mainline and Table 1b for the ramps.

Table 1a. CDOT/AASHTO Standards Applied – Mainline

Design Element	Monument to Plum Creek MP 161 to MP 180.8	Plum Creek to Castle Rock Pkwy MP 180.8 to MP 185	Castle Rock Pkwy to C-470/E-470 MP 185 to MP 194
General			
Roadway Classification	Interstate - Rural	Interstate - Urban	Interstate - Urban
Access Control Classification	FW Interstate	FW Interstate	FW Interstate
Type of Terrain	Rolling	Rolling	Rolling
Design Speed	80	70	80
Minimum (MPH)	65	60	65
Desirable (MPH)	**80**	**70**	**80**
Posted Speed Limit Minimum (MPH)	65	60	65
Posted Speed Limit Maximum (MPH)	75	65	75
Design Vehicle	WB-67	WB-67	WB-67
Horizontal Alignment Criteria			
Curve Radius for Design Speed Minimum (Ft.)	3050'	2040'	3050'
Superelevation (e_{max})	6%	6%	6%
Cross-Slope	2%	2%	2%
Maximum Algebraic Difference at Crossover Line (%)	4 to 5	4 to 5	4 to 5
Clear Zone on Tangent - 6:1 Foreslope			
Minimum (Ft.)	30	30	30
Desirable (Ft.)	**34**	**34**	**34**
Clear Zone on Curve			
Minimum (Ft.)	36-45	36-45	36-45
Desirable (Ft.)	**40.8-51**	**40.8-51**	**40.8-51**
Flare Rates for Concrete Barrier (Right Side)	20:1 (Outside Shy Line) 30:1 (Inside Shy Line)	20:1 (Outside Shy Line) 30:1 (Inside Shy Line)	20:1 (Outside Shy Line) 30:1 (Inside Shy Line)
No. of Lanes in each direction	3	3	4
Lane Width (Ft.)	12'	12'	12'

Design Element	Monument to Plum Creek MP 161 to MP 180.8	Plum Creek to Castle Rock Pkwy MP 180.8 to MP 185	Castle Rock Pkwy to C-470/E-470 MP 185 to MP 194
Shoulder Widths (NOT including Type 7 Barrier Width)			
Left Inside (Ft.)	12'	12'	12'
Right Outside (Ft.)	12'	12'	12'
Vertical Alignment Criteria			
Maximum Grade - Down (Up)	4%	4%	4%
Minimum Grade	0.5%	0.5%	0.5%
Min. Vertical Grade Break without a Curve	0.20%	0.20%	0.20%
Min. Vertical Curve Length (Ft.)	300'	300'	300'
K-Value Ranges			
Crest VC (Min)	384	247	384
Sag VC (Min)	231	181	231
Sight Distances			
Min. Stopping Sight Distance (Ft.)			
Level	910	730'	910
3% (6%) Downgrade	965' (N/A)	771' (N/A)	965' (N/A)
3% (6%) Upgrade	859' (N/A)	690' (N/A)	859' (N/A)
Structure Clearance Criteria			
Highway Underpass Vertical (Ft.)	16.5'*	16.5'*	16.5'*
Overhead Wires (Ft.)	20.5'+	20.5'+	20.5'+
Rail Road Bridges (Highway over Rail)	23.5'	23.5'	23.5'
Rail Road Bridges (Rail Over Highway)	Railroad dictates clearance	Railroad dictates clearance	Railroad dictates clearance
Sign Structures and Pedestrian Overpasses (Ft.)	17.5'	17.5'	17.5'

Table 1b. CDOT/AASHTO Standards Applied – Ramps

Design Element	Monument to Plum Creek MP 161 to MP 180.8	Plum Creek to Castle Rock Pkwy MP 180.8 to MP 185	Castle Rock Pkwy to C-470/E-470 MP 185 to MP 194
General			
Roadway Classification	Interstate - Rural	Interstate - Urban	Interstate - Urban
Access Control Classification	FW Interstate	FW Interstate	FW Interstate
Type of Terrain	Rolling	Rolling	Rolling
Design Speed			
Minimum (MPH)	35 (approach to stop) 45 (ramp proper/middle)	35 (approach to stop) 45 (ramp proper/middle)	35 (approach to stop) 45 (ramp proper/middle)
Desirable (MPH)	**70**	**60**	**70**
Posted Speed Limit Minimum (MPH)	30	30	30
Posted Speed Limit Maximum (MPH)	70	60	70
Design Vehicle	WB-67	WB-67	WB-67
Horizontal Alignment Criteria			
Curve Radius for Design Speed Minimum (Ft.)	340’ – 2500’	340’ – 1660’	340’ – 2500’
Superelevation (e_{max})	6%	6%	6%
Cross-Slope	2%	2%	2%
Maximum Algebraic Difference at Crossover Line (%)	4 to 5	4 to 5	4 to 5
Clear Zone on Tangent - 6:1 Foreslope			
Minimum (Ft.)	30	30	30
Desirable (Ft.)	**34**	**34**	**34**
Clear Zone on Curve			
Minimum (Ft.)	30	30	30
Desirable (Ft.)	**34**	**34**	**34**
Flare Rates for Concrete Barrier (Right Side)	16:1 (Inside Shy Line) 10:1 (Outside Shy Line) for 35 MPH Design Speed	16:1 (Inside Shy Line) 10:1 (Outside Shy Line) for 35 MPH Design Speed	16:1 (Inside Shy Line) 10:1 (Outside Shy Line) for 35 MPH Design Speed
No. of Lanes in each direction	1 - 2	1 - 2	1 - 2
Lane Width (Ft.)	12' – 15’	12' – 15’	15’ (1-Lane) 12’ (2-Lane)

Design Element	Monument to Plum Creek MP 161 to MP 180.8	Plum Creek to Castle Rock Pkwy MP 180.8 to MP 185	Castle Rock Pkwy to C-470/E-470 MP 185 to MP 194
Shoulder Widths (NOT including Type 7 Barrier Width)			
Left Inside (Ft.)	4’	4’	4’
Right Outside (Ft.)	8' des. (1-lane and 2-lane), 6' min. (1-lane)	8' des. (1-lane and 2-lane), 6' min. (1-lane)	8' des. (1-lane and 2-lane), 6' min. (1-lane)
Vertical Alignment Criteria			
Maximum Grade - Down (Up)	3%-4% (Downgrade) 3%-5% (Upgrade)	3%-4% (Downgrade) 3%-5% (Upgrade)	3%-4% (Downgrade) 3%-5% (Upgrade)
Minimum Grade	0.5%	0.5%	0.5%
Min. Vertical Grade Break without a Curve	0.20%	0.20%	0.20%
Min. Vertical Curve Length (Ft.)	150’ – 200’	150’ – 200’	150’ – 200’
K-Value Ranges			
Crest VC (Min)	29 - 247	29 - 151	29 - 247
Sag VC (Min)	49 - 181	49 - 136	49 - 181
Sight Distances			
Min. Stopping Sight Distance (Ft.)			
Level	250' – 645’	250' – 645’	250' – 645’
3% (6%)Downgrade	257' - 682'	257' - 682'	257' - 682'
3% (6%) Upgrade	237' - 612'	237' - 612'	237' - 612'
Structure Clearance Criteria			
Highway Underpass Vertical (Ft.)	16.5'*	16.5'*	16.5'*
Overhead Wires (Ft.)	20.5'+	20.5'+	20.5'+
Rail Road Bridges (Highway over Rail)	23.5'	23.5'	23.5'
Rail Road Bridges (Rail Over Highway)	Railroad dictates clearance	Railroad dictates clearance	Railroad dictates clearance
Sign Structures and Pedestrian Overpasses (Ft.)	17.5'	17.5'	17.5'

3.1 Horizontal Alignment

Mainline horizontal alignment ratings are based on the adherence of the horizontal alignment to current AASHTO (2011) and CDOT (2005) design guides, assuming a design speed of 80 miles per hour (mph) from Monument to Plum Creek Parkway and from Castle Rock Parkway to C-470/E-470, and 70 mph between Plum Creek Parkway and Castle Rock Parkway and an assumed maximum superelevation of 6 percent. Ratings were assigned using the control line geometry, which included independent alignments consisting of northbound and southbound I-25. Each direction was evaluated separately. For ramps, a single control line geometry was developed. The following ratings, which vary by design speed, apply:

Table 2. Evaluation Criteria for Horizontal Geometry for I-25 Mainline: DS = 80 mph

Good	Radius of Curve is > or = 3050 ft. [DS is 80 mph]
Fair	Radius of Curve is > or = 2040 ft. and < 3050 ft. [DS is 70 to 79 mph]
Poor	Radius of curve is < 2040 ft. [DS is < 70 mph]

DS = design speed
ft. = feet

Table 3. Evaluation Criteria for Horizontal Geometry for I-25 Mainline: DS = 70 mph

Good	Radius of Curve is > or = 2040 ft. [DS is 70 mph]
Fair	Radius of Curve is > or = 1330 ft. and < 2040 ft. [DS is 60 to 69 mph]
Poor	Radius of curve is < 1330 ft. [DS is < 60 mph]

Table 4. Evaluation Criteria for Horizontal Geometry for Ramps: DS = 35 mph (terminal); DS= 45 mph (Ramp Proper/middle); DS = 60 mph or 70 mph depending on the location on I 25 mainline with respect to the interchange (ramp gore)

Good	Radius of Curve reflects calculated speed > or = DS
Fair	Radius of Curve reflects calculated speed > or = DS less 10 mph
Poor	Radius of Curve reflects calculated speed < DS less 10 mph

3.2 Vertical Alignment

A comparison of mainline centerline grades with maximum recommended values per AASHTO and CDOT were evaluated. For evaluation purposes, the entire Study Area was considered rolling terrain.

Table 5. Evaluation Criteria for I-25 Mainline Vertical Grades

Good	< or = 4.0%
Fair	4.01% to 5.00%
Poor	> 5.00%

Table 6. Evaluation Criteria for Ramp Vertical Grades

Good	< or = 5.0% (upgrade); < or = 4.0% (downgrade)
Fair	5.01% to 6.00% (upgrade); 4.01% to 5.00% (downgrade)
Poor	> 6.00% (upgrade); > 5% (downgrade)

For the I-25 mainline, the operational effects of long and/or steep grades were investigated. The AASHTO Policy (2011) for combinations of grade and length of grade is based on avoiding designs that produce significant speed reductions by trucks with high weight to horsepower (WT/HP) ratios. The AASHTO Policy recommends the use of a 10-mph speed reduction for typical heavy trucks (WT/HP of 200) as a desirable maximum. The AASHTO Policy includes curves that combine length and grade to enable this analysis.

Table 7. Evaluation Criteria for Critical Length of Grade

Good	Speed reduction for a 200 WT/HP vehicle as given by grade and length < 10 mph
Fair	Speed reduction for a 200 WT/HP vehicle as given by grade and length 10 - 15 mph
Poor	Speed reduction for a 200 WT/HP vehicle as given by grade and length > 15 mph

The vertical alignment also includes sag and crest vertical curvature. Designs for these geometric features are based on the design requirements for stopping sight distance (SSD). Ratings for the quality of vertical curve design are thus included in the evaluation of SSD.

3.3 Stopping Sight Distance

AASHTO design values for SSD form the basis for these vertical curve criteria and ratings. Both vertical and horizontal SSD were reviewed for the I-25 mainline, while only vertical SSD was reviewed for ramps.

AASHTO SSD policy is based on an assumed eye height of 3.5 ft. and assumed object height of 2.0 ft. For the I-25 mainline, the minimum SSD for 80 mph design speed is 910 ft.; for 70 mph, the SSD is 730 ft. For ramps, the minimum SSD for 6 percent downgrade and 6 percent upgrade is 682 ft and 612 ft, respectively. The following criteria were established for SSD evaluations applied to crest vertical curvature.

3.3.1 Vertical Curves

Crest vertical curvature is described by the value K, which is the value of curve length divided by the algebraic difference in grades that are intersecting and requiring the vertical curve. Stated differently:

L (length of crest curve in ft.) = K*A

The AASHTO Policy (2011) provides values for K based on the design speed. Using these values, the criteria in Tables 8 through 10 apply to crest vertical curvature at 80 and 70 mph for I-25 mainline and 35 mph (ramp terminal) to 60 mph or 70 mph (ramp gore).

Table 8. Evaluation Criteria for Crest Vertical Curve SSD DS = 80 mph I-25 Mainline

Good	K > or = 384 (910 ft. of SSD)
Fair	K > or = 247 and < 384 (730 to 910 ft. of SSD)
Poor	K < 247 (< 730 ft. of SSD)

Table 9. Evaluation Criteria for Crest Vertical Curve SSD DS = 70 mph I-25 Mainline

Good	K > or = 247 (730 ft. of SSD)
Fair	K > or = 151 and < 247 (570 to 730 ft. of SSD)
Poor	K < 151 (< 570 ft. of SSD)

Table 10. Evaluation Criteria for Crest Vertical Curve SSD DS = 35 mph (ramp terminal) and DS = 60 mph or 70 mph depending on the location on I 25 mainline with respect to the interchange (ramp gore)

Good	K > or = 247 (gore); K > or = 29 (terminal)
Fair	K > or = 151 and < 247 (gore); K > or = 12 and < 29 (terminal)
Poor	K < 151 (gore); K < 12 (terminal)

When a vehicle traverses a sag vertical curve at night, the portion of highway visible ahead is dependent on the position of the headlights and the direction of the light beam. Sag vertical curvature is also described by the value K, which is the value of curve length divided by the algebraic difference in grades that are intersecting and requiring the vertical curve. Stated differently:

L (length of crest curve in ft.) = K*A

The AASHTO Policy (2011) provides values for K based on the design speed. Sag vertical curve SSD can be mitigated using roadside lighting. Using these values, the criteria in Tables 11 through 13 apply to sag vertical curvatures.

Table 11. Evaluation Criteria for Sag Vertical Curve SSD DS=80 mph for I-25 Mainline

Good	K > or = 231 (910 ft. of SSD)
Fair	K > or = 181 and < 231 (730 to 910 ft. of SSD) OR K < 181 (< 730 ft. of SSD) with adequate roadside lighting
Poor	K < 181 (< 730 ft. of SSD)

Table 12. Evaluation Criteria for Sag Vertical Curve SSD DS = 70 mph for I-25 Mainline

Good	K > or = 181 (730 ft. of SSD)
Fair	K > or = 136 and < 181 (570 to 730 ft. of SSD) OR K < 136 (< 570 ft. of SSD) with adequate roadside lighting
Poor	K < 136 (< 570 ft. of SSD)

Table 13. Evaluation Criteria for Crest Vertical Curve SSD DS = 35 mph (ramp terminal) and DS = 70 mph (ramp gore)

Good	K > or = 181 (gore); K > or = 49 (terminal)
Fair	K > or = 136 and < 181 (gore); K > or = 26 and < 49 (terminal)
Poor	K < 136 (gore); K < 26 (terminal)

3.3.2 Horizontal Curves

Horizontal sight restrictions that limit SSD are created by the combination of horizontal curvature and presence of an object in the inside of a curve blocking the driver's line of sight. For freeway mainline alignment, this object is typically associated with median barrier. The combination of the barrier and vertical alignment may create a sight obstruction. This is evaluated using design guidance from AASHTO (2011), which expresses the horizontal offset as measured from the middle of the lane (driver eye location) to the middle of the lane ahead, with the sight line tangential to the obstruction. The offset for any given design speed varies with the horizontal curvature. The available offset (which would include half the inside lane width and full shoulder width, if any) can be translated to an effective design speed (i.e., a speed associated with the sight distance provided).

Table 14. Effective Design Speed Given by Available Offset DS = 80 mph for I-25 Mainline

Good	> or = 80 mph
Fair	70 mph to 79 mph
Poor	< 70 mph

Table 15. Effective Design Speed Given by Available Offset DS = 70 mph for I-25 Mainline

Good	> or = 70 mph
Fair	60 mph to 69 mph
Poor	< 60 mph

3.4 Cross Section Elements

Design and as-built plans and Google Earth reviews, supplemented by field visits, were used to rate cross-section elements, including lane, shoulder, and median widths. Evaluation criteria are based on a combination of the following elements:

- Lane Widths
- Shoulder Widths (both left and right)

A composite rating was assigned to the cross section as noted in Table 16.

Table 16. Evaluation Criteria for Cross Sectional Elements

Condition	Element
Good (Each of features must meet criterion)	• Lane width of 12 ft. • Right shoulder width at least 12 ft. • Left shoulder width at least 12-ft.
Fair (Each of features must at least meet criterion)	• Lane width of 12 ft. • Right shoulder widths at least 10 ft. • Left shoulder width of 10 ft.
Poor (Rating assigned if any of the features has noted deficiency)	• Lane width less than 12 ft. • Right shoulder width less than 10 ft. • Left shoulder width is less than 10 ft.

A similar composite rating was assigned to the interchange ramps located within the Study Area. Table 17 shows the composite cross-section criteria for these ramps.

Table 17. Evaluation Criteria for Ramp Cross Sectional Elements

Condition	Element
Good (Each of features must meet criterion)	• 1-lane ramp width = 15’: 2-lane ramp width = 12 ft./lane • Right shoulder width at least 8 ft. • Left shoulder width at least 4 ft.
Fair	• Not applicable
Poor (Rating assigned if any of the features has noted deficiency)	• 1-lane ramp width < 15’: 2-lane ramp width < 12 ft./lane • Right shoulder width < 8 ft. • Left shoulder width < 4 ft.

The quality of the design of each ramp is based on two elements: the ramp taper angle in the vicinity of the point of physical merge or diverge and the length of acceleration or deceleration taper available to the driver. Recommended AASHTO design values form the basis for the criteria summarized in Tables 18 through 20 and Figures 2 and 3.

Table 18. Evaluation Criteria for Ramp Terminal Design

Condition	Exit Ramp	Entrance Ramp
Good	4° diverge or equivalent length for parallel lane design	50:1 taper* or greater
Fair	4° to 5° diverge or equivalent length for parallel lane design	40:1 to 50:1 taper*
Poor	Greater than 5° diverge	Less than 40:1 taper*

*Taper measured from physical merge or diverge to beginning of taper.

° = degree

Table 19. Evaluation Criteria for Length of Deceleration Lanes and Tapers for Exits

Condition	Exit Ramp
Good	Deceleration length is provided in accordance with criteria per AASHTO Policy (2011) (Figure 2)
Fair	Not applicable
Poor	Adequate deceleration length is not provided

U.S. Customary										
Deceleration Length, L (ft) for Design Speed of Exit Curve V' (mph)										
Highway Design Speed, V (mph)	Speed Reached, V_a (mph)	Stop Condition	15	20	25	30	35	40	45	50
		For Average Running Speed on Exit Curve, V'_a (mph)								
		0	14	18	22	26	30	36	40	44
30	28	235	200	170	140	—	—	—	—	—
35	32	280	250	210	185	150	—	—	—	—
40	36	320	295	265	235	185	155	—	—	—
45	40	385	350	325	295	250	220	—	—	—
50	44	435	405	385	355	315	285	225	175	—
55	48	480	455	440	410	380	350	285	235	—
60	52	530	500	480	460	430	405	350	300	240
65	55	570	540	520	500	470	440	390	340	280
70	58	615	590	570	550	520	490	440	390	340
75	61	660	635	620	600	575	535	490	440	390

V = design speed of highway (mph)

V_a = average running speed on highway (mph)

V' = design speed of exit curve (mph)

V'_a = average running speed on exit curve (mph)

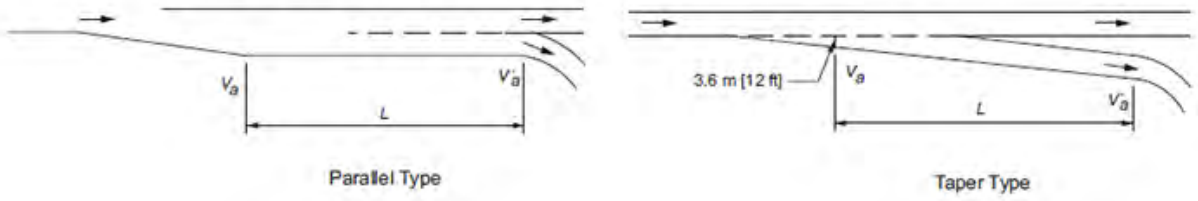


Figure 2. Deceleration Length Criteria

Table 20. Evaluation Criteria for Length of Acceleration Lanes and Tapers for Entrances

Condition	Exit Ramp
Good	Acceleration length is provided in accordance with criteria per AASHTO Policy (2011) (Figure 3)
Fair	Not applicable
Poor	Adequate acceleration length is not provided

U.S. Customary										
Acceleration Length, L (ft) for Entrance Curve Design Speed (mph)										
Highway		Stop Condition	15	20	25	30	35	40	45	50
Design Speed, V (mph)	Speed Reached, V_a (mph)	and Initial Speed, V'_a (mph)								
		0	14	18	22	26	30	36	40	44
30	23	180	140	—	—	—	—	—	—	—
35	27	280	220	160	—	—	—	—	—	—
40	31	360	300	270	210	120	—	—	—	—
45	35	560	490	440	380	280	160	—	—	—
50	39	720	660	610	550	450	350	130	—	—
55	43	960	900	810	780	670	550	320	150	—
60	47	1200	1140	1100	1020	910	800	550	420	180
65	50	1410	1350	1310	1220	1120	1000	770	600	370
70	53	1620	1560	1520	1420	1350	1230	1000	820	580
75	55	1790	1730	1630	1580	1510	1420	1160	1040	780

Note: Uniform 50:1 to 70:1 tapers are recommended where lengths of acceleration lanes exceed 1,300 ft.

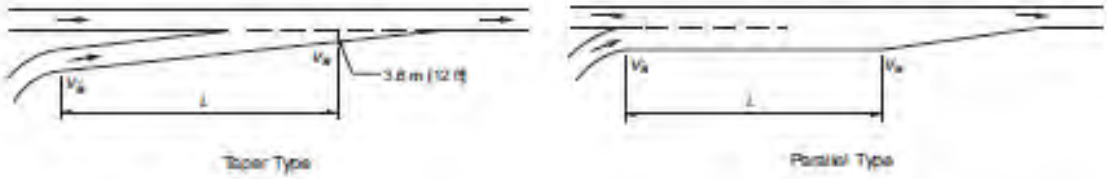


Figure 3. Acceleration Length Criteria

4.0 Systems Operational Features

The following operational features, discussed in the AASHTO Policy (2011), are considered essential to the design of urban freeways. Recent research has established links between these features and safety performance.

4.1 Lane and Route Continuity

The term "continuity" refers to the desirable characteristic of providing a certain minimum number of continuous through-lanes along a marked interstate route. In all cases, at least two lanes should be provided. On higher-volume freeways, three or four continuous lanes may be necessary. Continuity implies that drivers following the route and using those lanes need not change lanes or exit to remain on the route.

The existing system was reviewed to establish the effective number of basic lanes and auxiliary lanes, which was then used to confirm or note the presence of lane continuity at each diverge point.

Table 21. Evaluation Criteria for Lane and Route Continuity

Good	Section has lane/route continuity
Fair	Not applicable
Poor	Section lacks lane/route continuity

4.2 Lane Balance at Exits and Entrances

Provision for lane balance recognizes the need to facilitate access / egress to the freeway while minimizing disruption to through traffic by creating unnecessary lane changing. Figure 4 illustrates the principle of lane balance. Evaluation criteria are summarized in Table 22.

Table 22. Evaluation Criteria for Lane Balance

Good	Ramp exits and entrances are designed in accordance with lane balance criteria per AASHTO Policy (2011) (Figure 4)
Fair	Not applicable
Poor	Lane balance criteria are not met by existing ramp terminal design

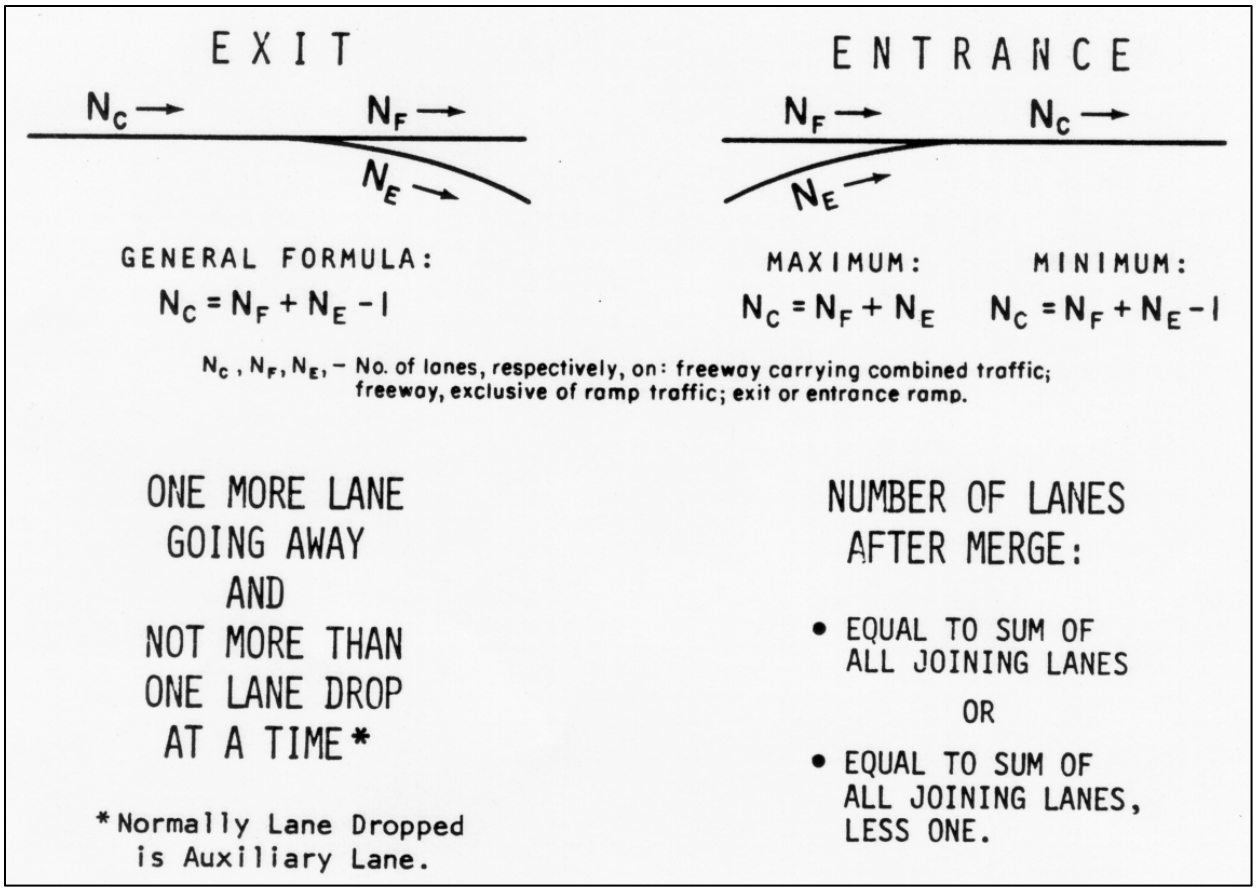


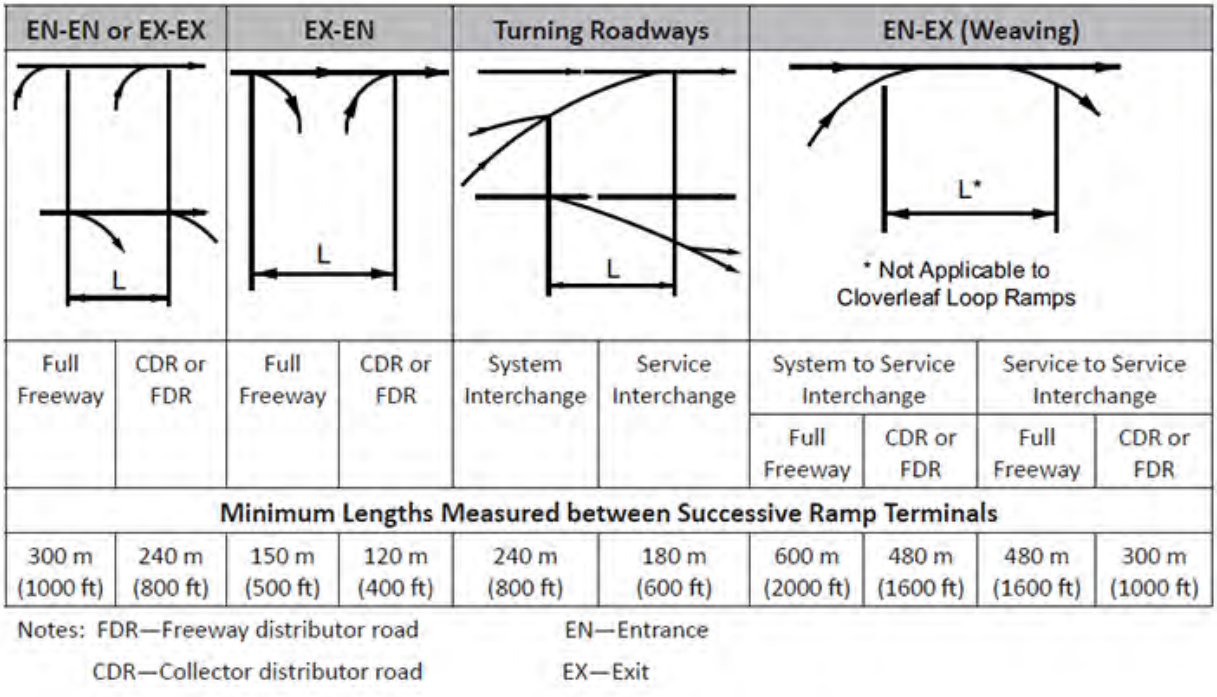
Figure 4. Definition of Lane Balance

4.3 Spacing and Sequencing of Ramps

The proximity of successive exit and entrance ramps can reduce operational efficiencies which reduces capacity and increases the potential for conflict between vehicles. Criteria for the spacing of exits and entrances are summarized on Figure 5. Note that the AASHTO Policy (2011) cites only absolute minimum values. Adequate and even desirable ramp spacing provides much better operational quality. In evaluating the existing freeway system, the criteria in Table 23 were applied.

Table 23. Evaluation Criteria for Ramp Sequencing/Ramp Spacing Distances

Good	Spacing meets or exceeds criteria on Figure 5
Fair	Not applicable
Poor	Spacing is less than absolute minimum



EN-EN or EX-EX		EX-EN		Turning Roadways		EN-EX (Weaving)			
Full Freeway	CDR or FDR	Full Freeway	CDR or FDR	System Interchange	Service Interchange	System to Service Interchange		Service to Service Interchange	
						Full Freeway	CDR or FDR	Full Freeway	CDR or FDR
Minimum Lengths Measured between Successive Ramp Terminals									
300 m (1000 ft)	240 m (800 ft)	150 m (500 ft)	120 m (400 ft)	240 m (800 ft)	180 m (600 ft)	600 m (2000 ft)	480 m (1600 ft)	480 m (1600 ft)	300 m (1000 ft)

Notes: FDR—Freeway distributor road
CDR—Collector distributor road
EN—Entrance
EX—Exit

Figure 5. Ramp Spacing Criteria

The Highway Capacity Manual (Transportation Research Board, 2016) illustrates that the operational impacts of ramp-freeway junctions are localized within a defined ramp influence area. For most ramps, this area includes the ramp and the outer two lanes of the mainline. Because of this influence on operations, for this analysis, “parclo” interchanges with successive on-ramps are treated as separate entrance locations, regardless of the ramp type (parallel or taper).

5.0 Existing Structure Analysis

Figure 6 includes the sufficiency ratings and deficiency ratings for each of the structures along the corridor.

5.1 Sufficiency Rating Explanation

- Sufficiency rating of 80 or less - eligible for rehabilitation
- Sufficiency rating of less than 50 - eligible for replacement

5.2 Deficiency Rating Explanation

- FO = Functionally Obsolete
- ND = Not Deficient
- NE = Not Eligible
- SD = Structurally Deficient
- NA = Not Applicable

	MP	Structure Number	Sufficiency Rating	Deficiency	Feature Intersected	Facility Carried	Year Built	Ratings: Inventory Rating
					6	7	27	66
1	160.800	H-17-CA	65	ND	UNNAMED DRAINAGE	I-25 ML	1958	36
2	160.751	H-17-BB	97	NE	DIRTY WOMAN CREEK	I-25 ML	2004	48
3	160.763	H-17-CZ	86	ND	I-25 ML	SH 105 ML	2004	51.9
4	163.321	H-17-CF	66	NE	I-25 ML	COUNTY ROAD 404	1964	34.1
5	167.259	H-17-CP	70	NE	EAST PLUM CREEK	I-25 ML	1978	36
6	171.783	H-17-CH	77.1	SD	COUNTY ROAD	I-25 ML NBND	1964	30.97
7	171.784	H-17-CI	77.1	SD	COUNTY ROAD	I-25 ML SBND	1964	30.97
8	171.981	H-17-CQ	93.4	ND	UPRR	I-25 ML	1980	34.9
9	172.179	H-17-AH	83.3	ND	EAST PLUM CREEK	I-25 ML	1950	24.2
10	172.307	H-17-CG	73	FO	I-25 ML	COUNTY ROAD	1964	29.9
11	173.791	G-17-AJ	79.7	FO	I-25 ML	TOMAH ROAD	1965	29.1
12	180.813	G-17-DZ	96.6	ND	PLUM CREEK PARKWAY	I-25 ML SBND	2010	64.1
13	180.769	G-17-EA	96.6	ND	PLUM CREEK PARKWAY	I-25 ML NBND	2010	73.4
14	181.195	G-17-DX	94.8	ND	EAST PLUM CREEK	I-25 ML NBND	2010	32.52
15	181.196	G-17-DY	94.8	ND	EAST PLUM CREEK	I-25 ML SBND	2010	32.5
16	181.517	G-17-DA	78.5	FO	I-25 ML & RAMP; PLUM CREEK	5TH ST.	2001	39.79
17	181.851	G-17-BI	88	ND	PLUM CREEK	I-25 ML	2003	31.75
18	181.853	G-17-BH	95.6	ND	I-25 ML	WOLFENSBERGER RD	2002	42.33
19	182.217	G-17-CS	-2	NA	I-25 ML	UPRR	2005	0
20	182.374	G-17-AC	55.9	SD	I-25 ML	COUNTY ROAD 107	1964	36.05
21	183.296	G-17-BG	73.4	FO	I-25 ML	SANTA FE DRIVE	2002	17.7
22	184.212	G-17-AM	98	ND	I-25 ML	SH 86B ML	1999	45
Castle Rock Pkwy (Not available)								
23	186.935	G-17-AG	61.7	SD	I-25 ML	HAPPY CANYON ROAD	1965	38.03
24	188.486	G-17-CT	68.6	FO	I-25 ML	CASTLE PINES PRKWY	2005	0
25	189.719	G-17-T	80	ND	SURREY RIDGE ROAD	I-25 ML	1999	47.07
26	191.086	F-17-CR	93.3	ND	HAPPY CANYON CREEK	I-25 ML	1999	49.05
27	192.000	F-17-PT	93.1	ND	RIDGEGATE PKWY	I-25 ML	2008	37.59
28	192.990	F-17-JM	98	ND	I-25 ML	LINCOLN AVE	1990	43
29	193.689	F-17-WJ	-2	ND	I-25	PEDESTRIAN BRIDGE	2006	0

Figure 6. Structure Sufficiency Rating Summary

6.0 Traffic, Travel Forecasting, Safety, and Intelligent Transportation Systems Existing Corridor Conditions

6.1 Traffic

6.1.1 Data

Historical annual average daily traffic (AADT) counts for several locations along I-25, SH 83, and SH 105A were obtained from CDOT. Traffic data for the parallel highways were compiled to understand the magnitude of traffic on these routes particularly because they are known alternate routes to I-25. The 2016 existing daily traffic volumes on I-25 in the Study Area are shown on Figure 7 and range from 64,000 to 178,000 cars per day, with the highest volumes on the north end of the corridor. CDOT maintains two automatic traffic recorders in the corridor. One is located south of Plum Creek Parkway and the other is south of Lincoln Avenue. CDOT has also recently completed studies and pilot projects in the corridor that included collection of targeted traffic counts. Some hourly, bi-directional counts were provided by the Pikes Peak Area Council of Governments. As compiled, the available traffic data is incomplete and not adequate for conducting a thorough existing traffic operations assessment. A comprehensive data collection effort is recommended to support the evaluation of existing conditions and traffic model calibration. The complete summary of available traffic data is presented in Appendix B.

6.1.2 Traffic Operations

With a more complete traffic data set, a comprehensive assessment of corridor traffic operations is planned to refine the understanding of corridor operations. This report presents operational trends and characteristics based on available data. Although not all typical analyses (e.g., AM and PM peak hour conditions and levels of service for mainline, ramps, parallel routes) could be conducted because of incomplete traffic data, the volume-to-capacity ratio on mainline I-25 was calculated at locations with hourly counts and estimated at locations with daily counts by assuming the peak hour proportion of the daily counts and the peak hour directional factor. Results of the analysis were inconclusive because the calculated volume-to-capacity ratios did not reflect the known corridor conditions. Drivers regularly experience congestion, delay, and turbulence in the traffic stream on I-25 between Denver and Colorado Springs, and this analysis did not reflect these conditions.

6.1.3 Travel Time Reliability

Because the traditional traffic operational assessment underrepresented corridor congestion, the study team investigated alternate data sources that may better represent known corridor conditions. To provide additional context for congestion and to understand changing traffic conditions, an assessment of travel time reliability was completed. Travel times on I-25, both northbound and southbound, were obtained from INRIX, which collects roadway speeds from over 250 million real-time anonymous cell phones worldwide. Raw point-to-point travel times between exits were compiled from the INRIX database in 15-minute time periods over 2015 and 2016. CDOT has completed an assessment of INRIX travel time data and has validated its reliability.

Figure 7. 2016 Average Annual Daily Traffic Volumes and Truck Percentages

For travel time purposes, the corridor was divided into two segments: the southern segment from Baptist Road to US 85 and the northern segment from US 85 to C-470. As presented in Table 24, a color gradient from green to red was used to display the Good, Fair, and Poor travel times as compared to free-flow travel time. For purposes of this analysis, the free-flow speed is assumed to be equal to the posted speed limit. The data was plotted on three-dimensional graphs, with the X-axis representing the day of the year, the Y-axis representing the time of day, and the Z-axis representing the calculated travel time. An example of these graphs is shown on Figure 8; a complete summary of the travel time reliability analysis is included in Appendix C.

Table 24. Travel Time Thresholds

Threshold	Compared to Free Flow Travel Time (minutes)	Southern Segment Travel Time (minutes)	Northern Segment Travel Time (minutes)
Free-flow	1.0	21	9
Good	< 1.4x	<29	<12.5
Fair	1.4x to 2.0x	29 to 42	12.5 to 18
Poor	>2.0x	>42	>18

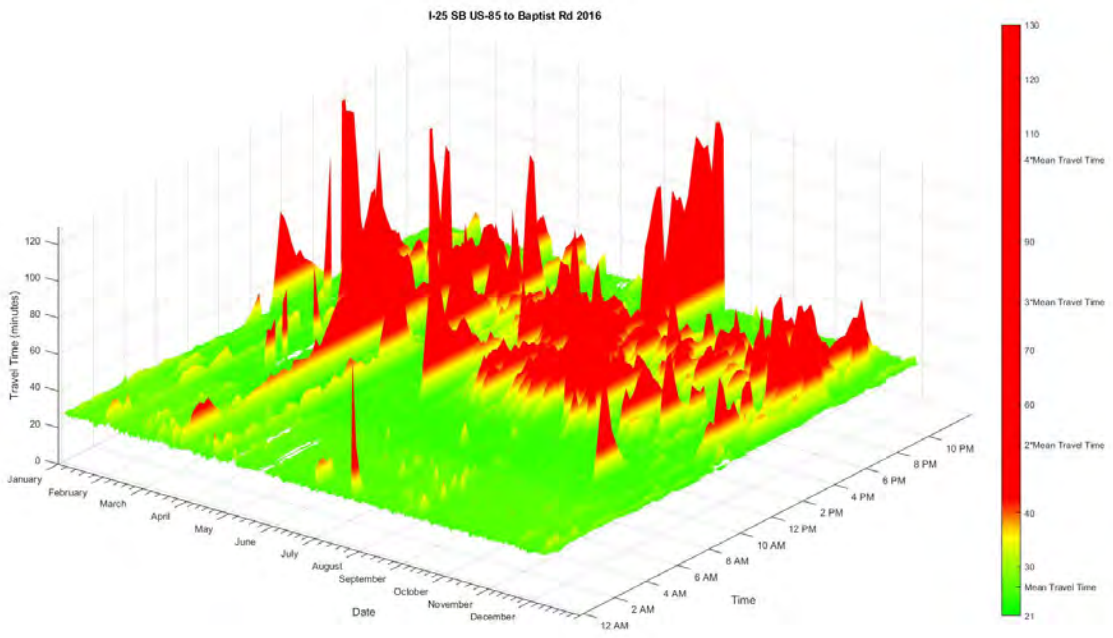


Figure 8. Southern Segment Southbound All Days in 2016 (Example)

The travel time days considered Poor were evaluated in more detail to determine the number of days with delay caused by crashes, police action, weather, special events, regularly occurring congestion, or other incidents.

For the southern segment, the Poor travel time periods were northbound weekends during summer and fall afternoons as well as southbound weekday evenings. From 2015 to 2016, there was a 7 percent increase in the total number of days with Fair or Poor travel times and congestion-related increases in travel time grew by 20 percent. The increased travel times as a result of incidents predominantly occurred on weekends. Table 25 indicates the causal factors evaluation for the southern segment. Because of limitations with data availability, the number of days analyzed in 2016 is fewer than in 2015.

The number of weather-related events decreased in 2016 as compared to 2015 because of more favorable climactic conditions.

Table 25. Causal Factors: Southern Segment

	Number of Days		Percentage of Days	
Event Type	**2015**	**2016**	**2015**	**2016**
Incidents	106	96	29%	28%
Weather	17	10	5%	3%
Special Events	12	25	3%	7%
Congestion	108	130	30%	38%
Uncongested	122	83	33%	24%
Total Days Analyzed	**365**	**344**	**100%**	**100%**

For the northern segment, the Poor travel time periods were northbound AM weekday peaks and southbound PM weekday peaks. From 2015 to 2016, there was an 18 percent decrease in the total number of days with Fair or Poor travel times and a 16 percent decrease in the number of congested days. Both of these decreases can be primarily attributed to the completion of the I-25 Lane Balance Project. Table 26 indicates the causal factors evaluation for the northern segment. The number of days with Poor travel times was likely higher in 2015 than in 2016 because of the construction activities associated with the lane balance project and the less favorable weather conditions.

Table 26. Causal Factors: Northern Segment

	Number of Days		Percentage of Days	
Event Type	**2015**	**2016**	**2015**	**2016**
Incidents	111	91	30%	25%
Weather	11	1	3%	1%
Special Events	37	36	10%	10%
Congestion	153	128	42%	35%
Uncongested	53	107	15%	29%
Total Days Analyzed	**365**	**363**	**100%**	**100%**

6.1.4 Transit

CDOT provides regional bus service on this section of I-25 from Colorado Springs to Denver. CDOT's "Bustang" service consists of 7 daily roundtrip buses with one stop location in the study corridor at the Monument Park-n-Ride near Woodmoor Drive and I-25 (Exit 161). Additional stop locations, such as Castle Rock, are under consideration.

Regional Transportation District's light rail service will be provided in the northern section of the corridor beginning in 2019. Construction is in process for Regional Transportation District's extension of the Southeast Rail Line to Castle Pines Parkway. The line will provide three new stations: Skyridge Station, Lone Tree Town Center Station, and RidgeGate Parkway Station.

CDOT maintains a Park-n-Ride in the southeast quadrant of the Castle Pines Parkway interchange with I-25. This lot provides ride-sharing opportunities.

CDOT's transit and rail division is currently completing their Interregional Connectivity Study to examine high-speed technologies, alignments, funding, and ridership for rail transit service extending from Fort Collins to Pueblo including Denver and Colorado Springs. The Division of Transit and Rail is also considering a more near-term option of leveraging existing freight rail corridors for commuter rail.

6.1.5 Alternate Routes, Frontage Roads, and Rail Crossings

Incident management on I-25 is challenging because of limited alternate routes and discontinuous frontage roads, as shown on Figure 9. This is particularly true when vehicles are diverted off I-25 at the Greenland interchange where the detour route along Noe Road and Spruce Mountain includes dirt roads and a passive railroad crossing without an active warning device, such as flashing lights. Dynamic message signs between Monument and Castle Rock do not provide adequate coverage for drivers to get the necessary information in a timely fashion to make informed travel decisions. When drivers do divert to local roads to avoid delays or incidents on I-25, they often travel circuitously through local communities on roads not designed for highway volumes or vehicles that might include heavy trucks. Plan sheets in Appendix D show the adjacent alternate routes, frontage roads, and pavement surface as well as railroad crossings, active or passive control, and train frequency.

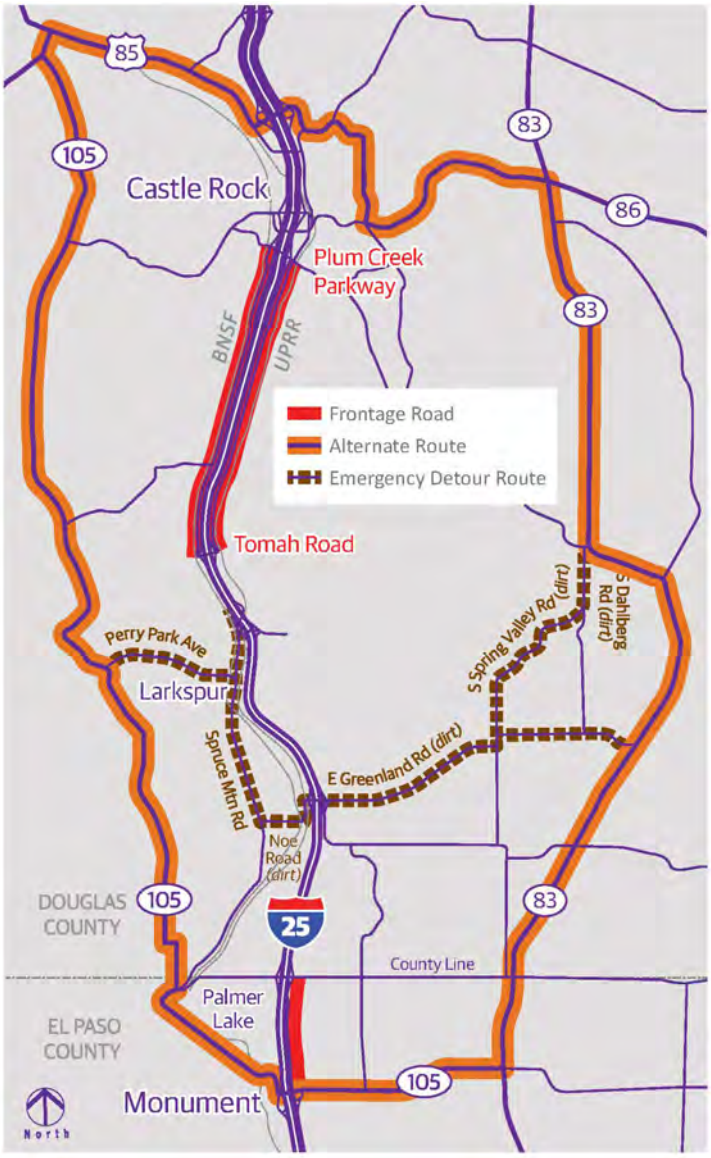


Figure 9. Existing Alternate Routes and Frontage Roads

6.2 Travel Forecasting

The corridor spans the edges of Colorado's two largest MPO planning areas: the Denver Regional Council of Governments and the Pikes Peak Area Council of Governments. Each MPO maintains a travel demand model used to forecast future travel conditions and to aid in regional planning. Since neither model encompasses the entire study corridor, combining the two models will be necessary. Through close coordination with both MPOs as well as various project stakeholders from CDOT and the Federal Highway Administration (FHWA), the following approach was developed for corridor travel forecasting. Based on the current available tools and understanding of how the travel modeling results will be used, a macroscopic travel demand model based on the Denver Regional Council of Governments FOCUS II model with modifications was proposed as the main tool for analysis. This will be supplemented by an interregional trip distribution model and a microsimulation model to provide more detailed analysis of some alternatives. The details of the development of these models are described in Appendix E. Historical traffic growth suggests that I-25 traffic will likely increase substantially in the next 20 years, further degrading corridor travel conditions. The extent and impacts of this growth will be determined using the refined travel forecasting model.

6.3 Safety

CDOT provided crash data for the years 2011 through 2015 between mile posts 160 and 194 in an Excel spreadsheet. These data were queried to assess a variety of characteristics including severity, location, type, contributing factors, and circumstances such as time of day and weather conditions. A total of 4,710 crashes were reported during this 5-year period. Of this total, 27 percent resulted in injuries and less than 1 percent resulted in fatalities. As Figure 10 shows, the most common crash type was rear-end, followed by fixed-object and sideswipe same direction.

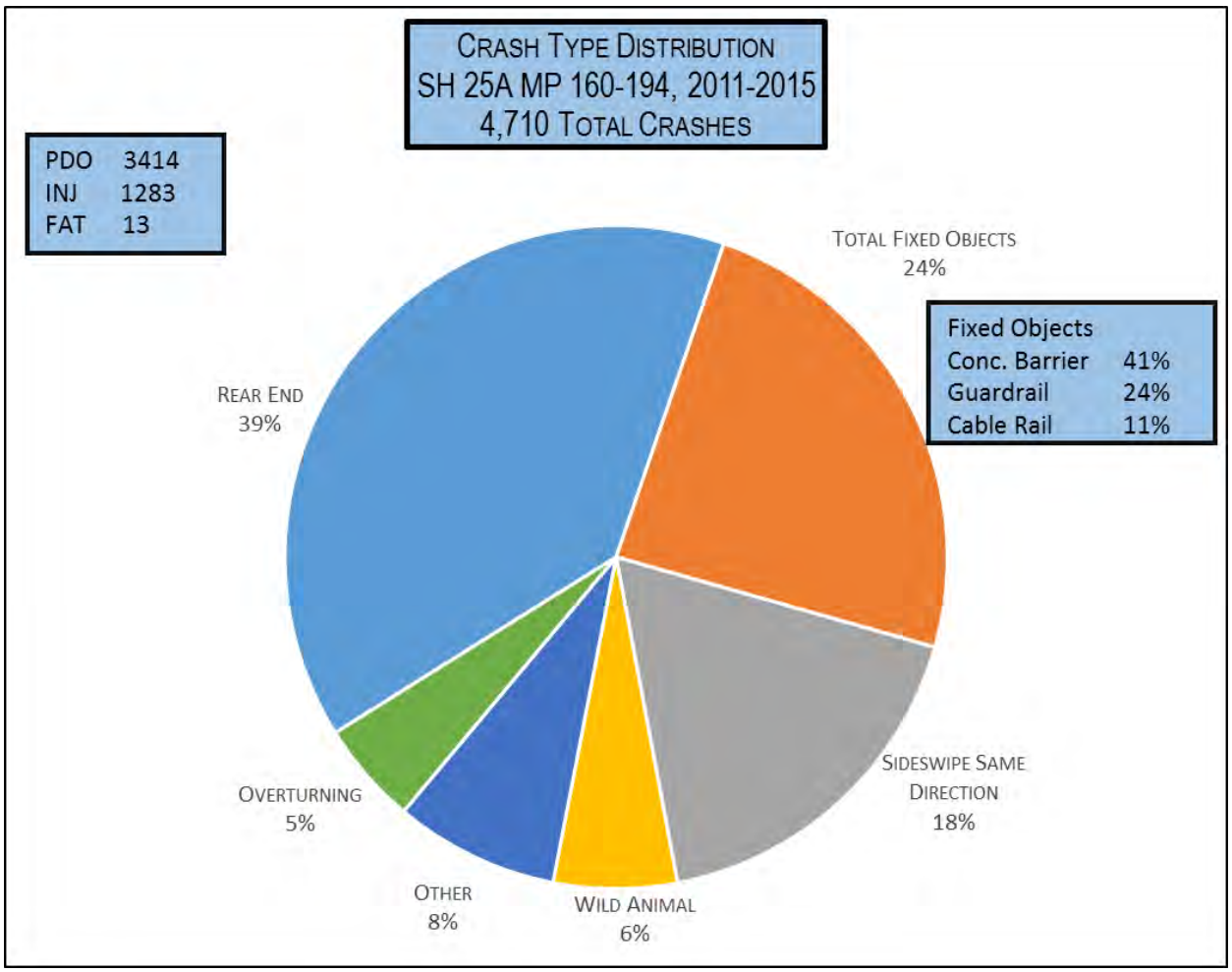


Figure 10. Crash Distribution by Type

Rear-end and sideswipe same direction crashes can be indicative of turbulence in the traffic stream because of volume demand, transitions between 2- and 3-lane sections, interchange influence areas, speed limit changes, and topography (such as slower moving vehicles on steep grades). Although they accounted for the majority of the crashes, multiple-vehicle crashes occurred in a lower proportion than expected when compared to similar facilities statewide. Thus, single-vehicle crashes occurred in a higher proportion than expected. The turbulence could have contributed to these types of crashes if drivers departed the travelway as they attempted to avoid rear-end or sideswipe collisions. The most commonly struck objects in this corridor were concrete barrier, guardrail, and cable rail, all of which are adjacent to the narrow shoulders throughout most of the corridor.

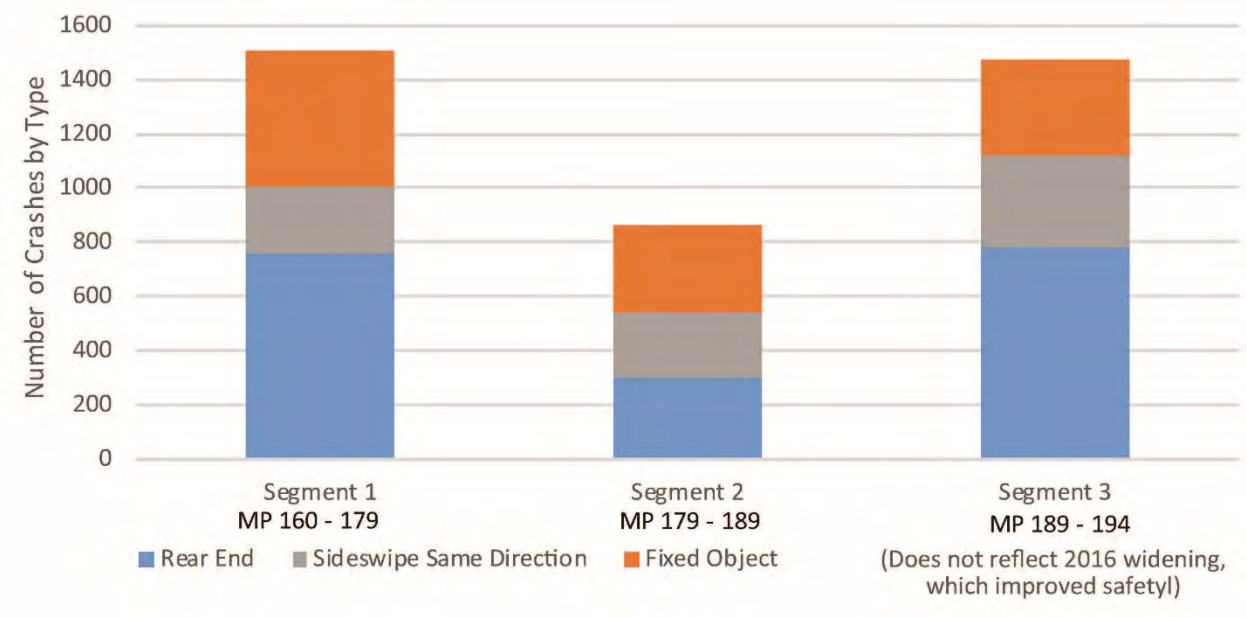


Figure 11. Rear End, Sideswipe Same Direction, and Fixed Object Crashes by Location (2011-2015)

As Figure 12 shows, the highest proportions of crashes occurred during the hours of 7 to 8 AM and 3 to 4 PM. Saturday was the most common day for crashes, followed by Fridays. Although the distribution among the months is fairly even for most of the year (particularly in the second half of the year), Figure 13 shows the highest proportions of crashes occur in the months of June-July-August. The highest volume months have been June-July-August for the last several years dating back to 1999, so there is a relationship between exposure and crash frequency in this corridor.

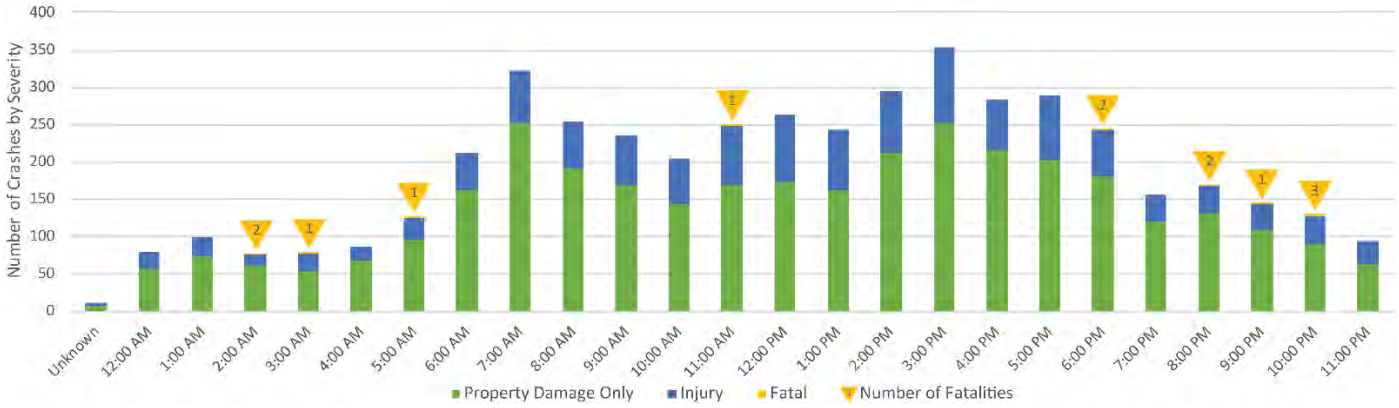


Figure 12. Crash Severity by Time of Day (2011-2015)

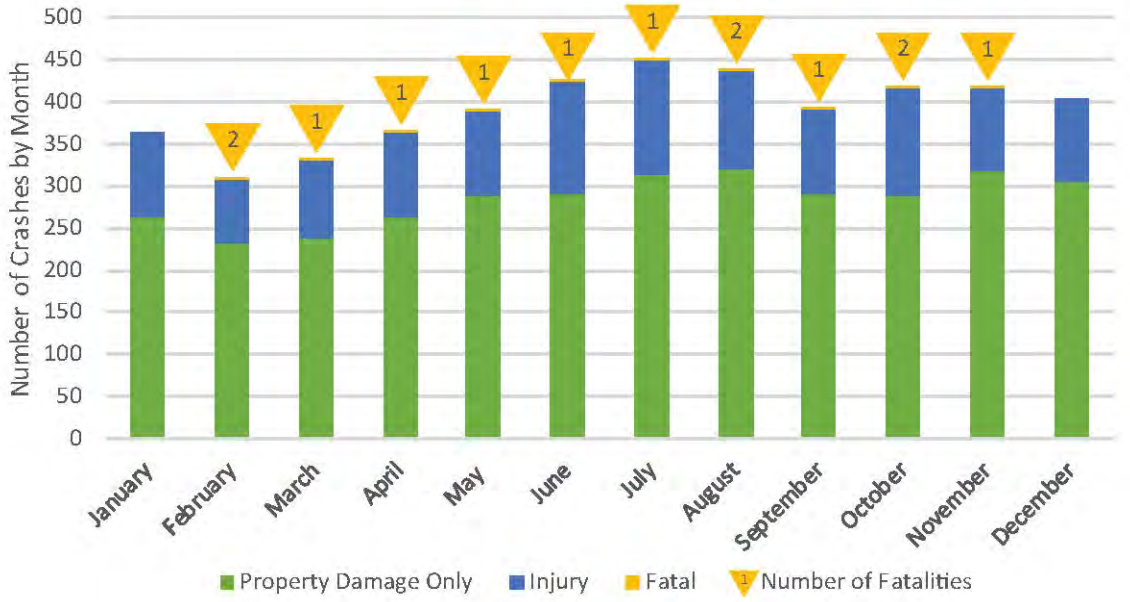


Figure 13. Crash Distribution by Month (2011-2015)

Crashes occurred more often than expected during weather events and when roadway surfaces were wet or snowy. This could result from driving too fast for conditions. Likewise, reduced traction on the roadway surface can lead to drivers losing control, resulting in collisions or departing the travelway. About one-third of the crashes occurred in low-light conditions.

While the initial traffic safety assessment was conducted in adherence with CDOT Safety Engineering and Analysis Group philosophies and served the purpose of documenting existing conditions in the corridor within the study schedule, the analysis did not include all of the components of the typical methodology followed by CDOT to produce a *Safety Assessment Report* (SAR). Therefore, these crash data records will be further analyzed and a SAR produced by Muller Engineering Company. The SAR is anticipated to be completed in spring 2017. Once completed, this document will serve as the safety reference document for the remainder of the PEL study and subsequent National Environmental Policy Act (NEPA) and preliminary design processes.

The complete safety assessment of existing conditions is contained in Appendix F.

6.4 Intelligent Transportation Systems

The existing ITS infrastructure inventory was assembled from two CDOT systems (Cognos & Colorado Transportation Management Center). This was supplemented by site visits, plan reviews, and discussions with CDOT staff. The ITS infrastructure comprises four major categories:

1. Surveillance – Closed-circuit television cameras
2. Detection – Travel time indicators, microwave vehicle radar detectors, and Doppler speed sensors
3. Messaging – Variable message signs, travel time signs, and dynamic chain law signs
4. Miscellaneous – Roadway weather information stations and weigh-in-motion systems

The existing devices are shown on the corridor health report contained in Appendix G and summarized in Table 27. A preliminary assessment of the existing ITS infrastructure suggests there is opportunity to expand and enhance the system to improve traveler information, aid incident response, and better leverage existing and emerging technologies.

Table 27. Existing ITS Devices

ITS Device	Southbound Device Count	Northbound Device Count
Closed-circuit television cameras	14	16
Travel time indicators	12	13
Microwave vehicle radar detectors	2	3
Doppler speed sensors	9	13
Variable message signs	4	4
Travel time signs	2	1
Dynamic chain law signs	1	0
Roadway weather information stations	4	2
Weigh-in-motion systems	1	1
Fiber optic communications system	Entire length of corridor	Entire length of corridor
Communication system nodes	2	2

7.0 Summary of Environmental Resources in the Study Area

The corridor is characterized by its contrasting developed and undeveloped settings, bookended by the state's two largest urban areas. Through Segment 1, scenic vistas, expansive open space, and small communities dominate the landscape. As Segment 1 ends near the southern limits of Castle Rock, the Douglas County open space areas transition into mixed residential and commercial areas through Castle Rock. Plum Creek and Carpenter Creek are the major drainage features through the area, paralleling the I-25 corridor through much of Segments 1 and 2. North of Castle Rock, as Segment 2 ends and Segment 3 begins, the corridor transitions into predominantly low-density residential and commercial areas.

Throughout all three project segments, the Study Area is rich in natural resources and recreational amenities. Streams and wetlands meander along and under the highway and provide riparian habitat for protected wildlife species. The following resource areas were identified as important to the environmental context of the corridor:

- Air Quality
- Aquatic Resources
- Environmental Justice
- Farmland Resources
- Floodplain Resources
- Hazardous Materials/Waste Sites
- Historic Resources
- Land Use
- Noise
- Recreational and Section 4(f)/6(f) Resources
- Threatened and Endangered Species
- Visual Resources
- Water Quality
- Wildlife Movement

Environmental Resource Memorandums are included in Appendix H. Archaeological and paleontological resources should be evaluated during subsequent NEPA phases of analysis. While no right-of-way (ROW) survey was available, Douglas County and El Paso County parcel boundary data was used to establish an approximate ROW boundary.

Bicyclists and pedestrians are not accommodated on I-25. Additionally, there are no existing continuous trails extending through all three project segments. Pedestrian and bicycle movement is facilitated within the project segments via the local trail networks. The recreational resources section discusses the existing and proposed trails in the project area.

The purpose of this section is to identify major environmental constraints that could influence future project development. Characterization of environmental conditions in the corridor provides a baseline for future evaluation, but does not include a detailed impact assessment. This assessment is also intended to identify the presence of high quality or sensitive resources that may affect the way future projects move through the NEPA and permitting processes.

7.1 Air Quality

7.1.1 Methodology for Air Quality Overview

The air quality overview involved review of the regional air quality conditions and conformity status for criteria pollutants. Relevant activities included the review of current attainment status of criteria pollutants gathered from the Colorado Department of Public Health and Environment (CDPHE). CDOT's OTIS collects traffic data including current and projected AADT, including truck counts. OTIS was used to derive AADT identified in the Study Area.

7.1.2 Air Quality Conditions in the Study Area

Currently, all areas in Colorado are in attainment for all National Ambient Air Quality Standards pollutants except for ground-level ozone. The Douglas County portion of the Study Area is within the Denver Metropolitan Area and North Front Range ozone nonattainment area. The Douglas County portion of the Study Area is also located within the Denver Metropolitan maintenance area for particulate matter of 10 microns (PM_{10}) and carbon monoxide (CO), and the Denver-Boulder maintenance area for CO. The El Paso County portion of the Study Area is within the Colorado Springs attainment/maintenance area for CO.

The Transportation Conformity Rule, promulgated through the Clean Air Act legislation, is a mechanism through which transportation projects are considered for air quality impacts in nonattainment and maintenance areas (40 Code of Federal Regulations Parts 51.390 and 93). The conformity process has two levels—regional air quality conformity and project-level conformity. The regional conformity analysis is conducted for the long-range Regional Transportation Plan (RTP) and the Transportation Improvement Program (TIP). For the purposes of transportation conformity, non-attainment and maintenance areas are treated the same. In addition to the transportation conformity demonstration requirements, CDOT requires an assessment of Mobile Source Air Toxics, Greenhouse Gases, and a non-conformity assessment of criteria pollutants.

7.1.3 Context for Alternatives Development and Selection

The Study Area falls within the jurisdiction of two separate regional planning agencies—the Denver Regional Council of Governments and the Pikes Peak Area Council of Governments. To comply with regional air quality conformity requirements, the project must be included in the respective RTP and TIP for both planning agencies. Project-level conformity applies to transportation projects in air quality nonattainment and maintenance areas. It requires a review and possibly quantitative hotspot analyses of CO and PM_{10} emissions. To pass project-level conformity, the project must be included in a conforming RTP and TIP, and the project cannot create new, increase the frequency of, or exacerbate the severity of air quality violations of the National Ambient Air Quality Standards.

7.2 Aquatic Resources

7.2.1 Methodology for Aquatic Resources Review

Aquatic resources include wetlands and waters of the United States. Within the PEL project limits, the Aquatic Resources Study Area was determined by placing the CDOT ROW over current aerial photographs and including a 50-ft. buffer. Aquatic Resources Study Area maps were created with geographic information system (GIS) software. Initial assessment research included a review of state and federal resource databases. Aquatic resources identified during the initial assessment have been classified using the Cowardin classification system. Wetlands and surface waters are classified consistent with their physical and biological characteristics.

7.2.2 Aquatic Resources Conditions in the Study Area

The Aquatic Resources Study Area is predominantly located within the common resource area (CRA) known as the Southern Rocky Mountain Foothills, with the southern project limits in the Southern Rocky Mountains – High Mountains and Valleys CRA. The Southern Rocky Mountain Foothills CRA is the transition zone between the Great Plains and the Southern Rocky Mountains. The Aquatic Resources Study Area is characterized as having a wide temperature range.

The Aquatic Resources Study Area supports five broad vegetative communities: Landscape, Woodland, Farmland, Wetland/Riparian, and Disturbed/Barren. To support these diverse vegetation types, more

than 30 different soil types are present crossing three watersheds: Fountain, Upper South Platte, and Middle South Platte – Cherry Creek. The final receiving waters for the Aquatic Resources Study Area includes Fountain Creek, Cherry Creek, and the South Platte River. Approximately 40 aquatic resources, consisting mainly of wetlands, have been identified in the Aquatic Resources Study Area. In addition, 65 linear surface water features and two ponds have been identified.

7.2.3 Context for Alternatives Development and Selection

Aquatic resources constitute a core component of the habitat of many plant and animal species. They are also interrelated with other import resource considerations, such as floodplain functionality and water quality. Because of their widespread importance, and because of CDOT's commitment to environmental stewardship and legal compliance, I-25 alternatives must identify their potential impacts to aquatic resources.

7.3 Environmental Justice

7.3.1 Methodology for Environmental Justice Review

While I-25 serves in the movement of people on a local, regional, and national scale, the Study Area was concentrated in the two counties where physical improvements would be constructed. Douglas County and El Paso County block groups within or intersecting a 2-mile buffer from the project centerline were selected to be analyzed for the presence of minority, low-income, and limited English proficiency (LEP) populations.

7.3.2 Environmental Justice Populations in the Study Area

Minority, low-income, and LEP populations have been identified in all three project segments within the Study Area. Minority and low-income populations were only identified in the Douglas County portion of the Study Area and are primarily located in the urbanized areas within Castle Rock, Castle Pines, and Lone Tree. LEP populations were identified within both Douglas and El Paso Counties. In El Paso County, the LEP population is located immediately south of the county line, west of I-25 in the Palmer Lake neighborhood. In Douglas County, the LEP population areas reflect the same general urban areas as the minority and low-income populations.

7.3.3 Context for Alternatives Development and Selection

Environmental Justice, a component of Title VI, is a public policy goal of promoting the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Alternatives should be evaluated for their potential to result in high or adverse impacts to Environmental Justice populations. In addition, targeted outreach and engagement should be considered during subsequent project phases to ensure any Environmental Justice populations in the project area have been involved as stakeholders in the project through the NEPA process.

7.4 Farmland Resources

7.4.1 Methodology for Farmland Resources Review

Within the PEL project limits, the Farmland Resources Study Area was determined by placing the CDOT ROW over current aerial photographs and including a 50-ft. buffer. Farmland Resources Study Area maps were created with GIS software. Initial assessment research databases include The Farmland Protection Policy Act, Natural Resources Conservation Service soil survey maps, and the Northwest Corridor Transportation and Environmental Planning Study.

7.4.2 Farmland Resources Conditions in the Study Area

Prime, unique, or farmlands of statewide importance are present within the Farmland Resources Study Area, concentrated along Plum Creek through Castle Rock in Segment 2 and south of Larkspur in Segment 1. For those areas located within the existing CDOT ROW, farmland resources are considered to be previously converted to a transportation use and therefore do not actually represent existing prime, unique, or other important farmland resources. For those areas within the 50-ft. CDOT ROW buffer, identified farmland resources will warrant further consideration if determined through review of aerial imagery to not have already been developed.

7.4.3 Context for Alternatives Development and Selection

Farmlands are a valuable economic and cultural resource that is protected by the Farmland Protection Policy Act, which requires federal agencies to consider the adverse effects their programs may have on the preservation of farmland review alternatives that could lessen adverse effects and ensure that their programs are compatible with private, local, and state programs and policies to protect farmland. I-25 alternatives will identify the amount of farmland potentially converted and conduct consultation with the Natural Resources Conservation Service as needed. Identifying and protecting farmlands ensures compliance with CDOT's stewardship responsibilities to construct the statewide transportation system in an environmentally responsible manner.

7.5 Floodplain Resources

7.5.1 Methodology for Floodplain Resources Review

Two primary sets of data were used to identify 100-year floodplains and floodways. The Federal Emergency Management Agency (FEMA) digital GIS data were used to identify floodplains and floodways in Douglas County. El Paso County FEMA data are not available in GIS or digital format; therefore, FEMA hard copy Flood Insurance Rate Maps Map Panels were obtained for the corridor and used to identify areas of floodplains and floodways within El Paso County.

7.5.2 Floodplain Resources Conditions in the Study Area

Floodplains are present in numerous locations along the Study Area. Specifically, the I-25 corridor crosses 100-year floodplains associated with the Cottonwood Creek, Happy Canyon Creek, Hangman's Gulch, East Plum Creek, Carpenter Creek, and Crystal Creek, along with numerous unnamed tributaries. There are two regulatory floodways in the Floodplain Resources Study Area; one associated with East Plum Creek and another associated with Crystal Creek.

7.5.3 Context for Alternatives Development and Selection

Construction within a floodplain or floodway has the potential to change or impede the function of the floodplain and result in new or increased flooding risk to facilities within and adjacent to the area. I-25 alternatives will need to identify potential changes to floodplains in the Study Area, and consider whether alternatives are compatible with state, federal, and local floodplain regulations. If development within the floodplain or floodway is anticipated, the alternative must be evaluated for its regulatory compliance and severity of impact on the surrounding floodplain and floodway. Depending on the severity of impact, additional regulatory compliance in the form of a Conditional Letter of Map Amendment and Letter of Map Amendment may be required.

7.6 Hazardous Materials/Waste Sites

7.6.1 Methodology for Hazardous Materials/Waste Sites Review

An environmental records search, including federal and state environmental resources, was conducted for the Study Area using readily available data. The record search includes facilities within 0.25 mile of the I-25 centerline within the Hazardous Materials/Waste Sites Conditions Study Area from the following databases:

- Leaking underground storage tank facilities
- U.S. Environmental Protection Agency Brownfields
- Resource Conservation and Recovery Act generators
- Superfund and National Priority List sites
- Tri-County Landfills

7.6.2 Hazardous Materials/Waste Sites Conditions in the Study Area

The Hazardous Materials/Waste Sites Conditions Study Area is developed with a mix of commercial, residential, community, and industrial developments. The northern portion of the Study Area, including the cities of Lone Tree and Castle Pines consists primarily of residential and retail development with few hazardous material facilities. The central portion of the Study Area, specifically within the Town of Castle Rock, includes the highest density of development and the majority of the hazardous material facilities. Several facilities are also located in the southern portion of the Study Area within the Town of Monument. The majority of the hazardous material facilities are located in Segment 1 and Segment 2 of the Study Area, particularly within the urban centers of Castle Rock and the Monument.

7.6.3 Context for Alternatives Development and Selection

Encountering contaminated groundwater or soils may have significant implications for project cost, schedule, mitigation requirements, worker safety, and other important elements of a proposed alternative. Alternatives that are likely to impact contaminated soils or groundwater must be evaluated for their feasibility with an understanding of the constraints associated with encountering hazardous materials. Because of these risks, avoiding areas of known or suspected contamination is preferred. I-25 alternatives will need to consider their potential for encountering hazardous materials.

7.7 Historic Resources

7.7.1 Methodology for Historic Resources Review

This preliminary evaluation is intended to provide a summary of existing conditions regarding the presence and potential for historic resources occurring in the Study Area. The Historic Resources Study Area was defined by creating a 50-ft. buffer on the ROW through the study corridor to accommodate consideration of resources adjacent to the corridor. The Historic Resources Study Area represents the area being reviewed for historic resources as presented in this assessment. A comparison of COMPASS records and assessor data was used to identify historic resources in the study area.

Historic resources are considered under two Acts on transportation projects: Section 106 of the National Historic Preservation Act of 1966 and Section 4(f) of the Department of Transportation Act of 1966. CDOT is required to implement the Section 106 process in accordance with the 2014 Programmatic Agreement among CDOT, FHWA, and the Advisory Council on Historic Preservation.

7.7.2 Historic Resources in the Study Area

The Study Area consists primarily of the I-25 corridor. A comparison of COMPASS records and assessor data indicates the presence of historic and potentially historic resources throughout the project corridor, with higher concentrations around the Castle Rock near the center of the project area. Appendix H provides the results of the COMPASS database search conducted on November 17, 2016, January 4, 2017, and March 3, 2017.

A total of 112 built environment resources were indicated in the COMPASS search; a total of 10 are located in PEL Segment 1—The Gap, 96 are located in PEL Segment 2—Castle Rock to Castle Pines, and 6 are located in PEL Segment 3—Denver South. One resource, segment 5DA.922.4 of the Atchison, Topeka & Santa Fe Railroad (ATSF), is located in both PEL Segments 1 and 2. Buildings are the most common resource type within the Study Area, primarily represented by houses; however commercial buildings, churches, and schools are included. Structures are also represented, including bridges and linear resources. A linear resource is a resource with a length significantly longer than its width, and includes roads, railroads, and irrigation ditches. One irrigation ditch was identified in the corridor; the Arapahoe Ditch, which intersects I-25 just north of RidgeGate Parkway. Railroad resources are the most common within this corridor, namely the grades of the former ATSF and Denver and Rio Grande Western Railroad. The historic ATSF line is currently owned by the Burlington Northern Santa Fe Railroad, and the historic Denver and Rio Grande Western Railroad is currently owned by the Union Pacific. These rail lines generally follow the I-25 corridor from the southern project limits to the Castle Rock area, where the rail lines turn west and follow the US 85 corridor. Not all segments of these lines within the Study Area have been surveyed. However, the surveyed segments have been determined to support the overall eligibility of the linear resources. Roads and highways have the potential to be considered eligible for inclusion on the National Register of Historic Places. As a part of the interstate highway system, I-25 is exempt from consideration as a historic resource under the Advisory Council on Historic Preservation Exemption Regarding Historic Preservation Review Process for Effects to the Interstate Highway System (2005). Bridges identified through the COMPASS search have been determined ineligible for inclusion on the National Register of Historic Places, primarily through the 2002 CDOT Historic Bridge Inventory. Additional bridges may be present in the Study Area. It is likely that bridges constructed in 1968 or before have been previously surveyed through the 2014 CDOT Historic Bridge Inventory update, which inventoried CDOT-owned bridges constructed through 1968. Results of this inventory have not been fully integrated into the COMPASS system. Bridges constructed between 1968 and 1972 may require survey once the project moves into a NEPA phase.

7.7.3 Context for Alternatives Development and Selection

The preliminary historic resources review has identified historic resources in the Study Area, concentrations of which are located within and adjacent to the existing urban areas. State and federal law requires the evaluation of historic properties, and the potential for adverse effects to those properties, which may result from an I-25 alternative. All potential historic properties within an alternative's area of potential effects must be considered when assessing project effects. Local jurisdictions may also have their own ordinances and regulations that must be followed.

7.8 Land Use

7.8.1 Methodology for Land Use Review

The Land Use Study Area limits were expanded north to Denver and south to Colorado Springs to assist in understanding potential indirect effects these major urban centers may have on the immediate area of physical improvements being considered. To obtain a comprehensive picture of land uses along I-25 in the Study Area, comprehensive plans—or equivalent plans where available—were supplemented with

GIS data from the county and municipal levels. The GIS data gathered includes zoning, parks and open space, annexation (both past and proposed), parcel data, and other pertinent land use information. The project entered into a GIS use agreement with El Paso County and used the El Paso County parcel data for the respective area discussions. Douglas County parcel data is publicly available and no agreement was needed.

7.8.2 Land Uses within the Study Area

The Land Use Study Area is bookended by Colorado Springs and Denver, the two largest metropolitan areas in the state. Denver and Colorado Springs are the major trip generators along I-25, with roughly half of the trips through Segments 1, 2, and 3, continuing to either destination. As the Front Range population continues to surge, the majority of municipal areas in this stretch of the I-25 corridor have experienced rapid population growth and economic development. The larger metropolitan areas south of Denver (i.e., Lone Tree, Castle Pines, and Castle Rock) are anticipated to at least double in population in the next two decades. South of Castle Rock, the dominant land use switches from single family residential and commercial to the vast, preserved open spaces of Unincorporated Douglas County.

Approximately 32.5 of the 35 miles of I-25 within Segments 1 through 3 are located in Douglas County. Douglas County has been the driving force behind the acquisition and protection of continuous open space, which extends south to the El Paso County line both east and west of I-25. The majority of these open spaces are open to the public and are primarily used for recreation.

At the El Paso County line, the predominant land use switches back to single family residential and commercial. This use pattern extends into north Colorado Springs, where, similar to Denver, the I-25 corridor becomes a fully built-out mix of commercial, industrial, and high density residential. In essence, land use within the Study Area can be categorized as a bell curve; the crown representing Douglas County open space, then tapering away north and south into single family residential, and finally ending in the highly developed metropolitan areas of Denver and Colorado Springs.

7.8.3 Context for Alternatives Development and Selection

Existing and future land use is a core consideration to the communities within the Project Area. Although there are no state or federal regulations specific to land use, I-25 alternatives will be evaluated for their compliance with local land use plans, master plans, and other overarching community guidance documents.

7.9 Noise

7.9.1 Methodology for Noise Resources Review

Noise is defined as any unwanted sound. As mobility increases, transportation can be a key source of noise across transportation modes. A noise-sensitive site is any property (owner occupied, rented, or leased) where frequent, exterior human use occurs and where a lowered noise level would be of benefit. CDOT has established the noise level at which a noise abatement must be considered. Known as noise abatement criteria, these criteria vary according to a property's land use category. A traffic noise impact occurs when the projected traffic noise levels meet or exceed the noise abatement criteria levels, or when projected noise levels substantially exceed existing noise conditions.

The Noise Study Area is defined as the area contained within a 500-ft. distance in all directions throughout the length of the Study Area. Where appropriate, the 500-ft. distance has been expanded to assure that noise levels have been adequately addressed outside the study corridor. Both 66 dBA and 71 dBA existing condition noise contours were developed for the PEL corridor by using a straight-line noise model with standard 12-ft. lanes and shoulders. To reflect the existing I-25 cross sections through each corridor Segment, four lane (Segment 1), six-lane (Segment 2), and eight-lane (Segment 3) section contours were

developed. Existing posted speeds were matched to the appropriate Segment (75 mph for Segments 1 and 3; 65 mph for Segment 2). Noise contours are identified in the Noise Technical Memorandum in Appendix H.

7.9.2 Noise Conditions in the Study Area

Within the Noise Study Area, there is one noise mitigation feature located in Castle Pines and one located in Castle Rock. The Castle Pines noise mitigation feature consists of a concrete wall transitioning into an earthen berm. The Castle Rock noise mitigation feature consists of a concrete noise wall. In both locations, the noise mitigation features separate I-25 from adjacent residential development. Noise-sensitive land uses have been identified with the Study Area and are strongly correlated with metropolitan development adjacent to I-25.

7.9.3 Context for Alternatives Development and Selection

Increases in noise levels to adjacent noise-sensitive properties is an important consideration when considering alternatives. Unwanted noise can affect the use and enjoyment of nearby lands. I-25 alternatives will be evaluated for their potential to adversely affect nearby sensitive properties. While the project is not required to select the alternative that increases noise levels the least, or not at all, alternatives must comply with federal and state regulation under 23 Code of Federal Regulations 772.

7.10 Recreational and Section 4(f)/6(f) Resources

7.10.1 Methodology for Recreational and Section 4(f)/6(f) Resources Review

Within the PEL project limits, the Recreational and Section 4(f) Resources Study Area was determined by placing the CDOT ROW over current aerial photographs and including a 50-ft. buffer. Recreational and Section 4(f) Resources Study Area maps were created with GIS software. Initial assessment research included a desktop survey of the corridor, which combined information contained in the various comprehensive, land use, open space, trail, bicycle and pedestrian, and other plans with GIS and parcel information provided by municipalities and counties. For each of the adjacent recreational resources, public ownership and accessibility was assessed. Historic 4(f) resources are assessed separately in the Historic Resources section.

7.10.2 Methodology for Section 4(f)/6(f) Resources Conditions in the Study Area

Recreational resources within the Study Area were divided into three categories: (1) easements/ fee title, (2) open space, and (3) trails and parks. Section 6(f) funding has been used to acquire open space in the Study Area. While recreational resources are located in all three project segments, they are concentrated adjacent to I-25 in Segment 1. Segment 1 is unique because of the large open space acquisitions made by Douglas County over the past two decades. The Douglas County open spaces, the majority of which are available for public use, represent a hotbed of numerous recreational uses extending to the El Paso County line, south of Castle Rock and south of Larkspur.

Representing the main recreational artery in the Study Area, the Front Range Trail will extend over 800 miles from Wyoming to New Mexico once complete. Existing and planned sections of the Front Range Trail are present within all three project segments, providing numerous trailhead connections to local trails extending into the open spaces and municipal areas in the corridor. The Front Range Trail closely follows Plum Creek and its tributaries through the Study Area.

7.10.3 Context for Alternatives Development and Selection

Recreational properties serve as important land use functions within the Study Area. For those areas considered 4(f) resources, avoiding any use of the property is always preferred. When avoiding impacts

is not prudent or feasible, the alternative should minimize its use of the property. In accordance with the Department of Transportation Action of 1966, use of a 4(f) property requires concurrence from the official with jurisdiction in addition to other criteria. Early coordination with the official with jurisdiction is a critical part of alternatives development when impacts to 4(f) and 6(f) resources are anticipated. The I-25 alternatives will be evaluated and compared for their direct and indirect impacts to recreational, 4(f), and 6(f) properties.

7.11 Threatened and Endangered Species

7.11.1 Methodology for Threatened and Endangered Species Review

A desktop review of readily available data for threatened and endangered species was completed. As part of this review, a list of federally and state-listed species with the potential to occur in the Study Area or be impacted by activities taking place in the Study Area was compiled by reviewing the following:

- The U.S. Fish and Wildlife Service Online Information, Planning, and Conservation decision support system
- Colorado Parks and Wildlife (CPW) Threatened and Endangered List
- Colorado Natural Heritage Program Tracking List

Preliminary desktop assessments of existing habitat characteristics in the vicinity of the Study Area and habitat requirements for listed species were also completed by examining ecoregion descriptions, local area planning documents, and species data available from CPW.

7.11.2 Threatened and Endangered Species Conditions in the Study Area

Land use in the Study Area has been historically composed of large ranching operations; however, recent rapid urban development has occurred in Colorado Springs, Denver, and the municipalities in between, eliminating habitat for a wide range of plant and animal species in the area. The remaining contiguous open spaces in the Study Area are located in Unincorporated Douglas County south of Castle Rock, where the county has established preservation easements aimed at preserving wildlife habitat and improving the permeability of the I-25 corridor for large and mid-sized animals.

The desktop review identified 10 federal and 10 state-listed species with the potential to occur within or downstream of the Study Area (see Appendix H). One of these species, the Preble's meadow jumping mouse, is listed at both the federal and state levels. In addition to the federal and state-listed species, suitable habitat for migratory birds is present throughout the Study Area.

7.11.3 Context for Alternatives Development and Selection

Threatened and endangered species are protected at the federal level under The Endangered Species Act and at the state level under Colorado's Non-game and Endangered Species Conservation regulations. These regulations prohibit the unauthorized take of threatened and endangered species. Unauthorized takes are subject to criminal and civil penalties. The Endangered Species Act also prohibits the authorization of projects that jeopardize the continued existence of listed species or adversely modify designated critical habitat. The United States Fish and Wildlife Service must be consulted when determining if a selected alternative will have no effect, or may affect, sensitive resources. Alternatives that are likely to adversely affect threatened and endangered species require offsetting mitigation.

Beyond the legislative requirements, threatened and endangered species—and their habitats—are ecologically important to the ecosystems in the Study Area. Impacts to this resource must be carefully considered when evaluating and selecting alternatives.

7.12 Water Quality

7.12.1 Methodology for Water Quality Review

This memorandum summarizes water quality and water resources within the Study Area. Water-related resources generally include lakes, ponds, rivers, draws, ditches, and irrigation canals. An assessment of the Study Area was conducted using available data of water-related resources. The following data sources were used for this task:

- Streams from the USGS National Hydrology Dataset (USGS, 2016)
- FEMA floodplain maps
- Current available aerial photography (e.g., Bing Maps and Google Earth)
- CDPHE List of Impaired Waters (CDPHE, 2016a; 2016b)

7.12.2 Water Quality Conditions in the Study Area

Numerous drainages occur within the Study Area. The Study Area crosses 51 waterways, including six creeks (Dirty Woman Creek, Crystal Creek, Carpenter Creek, East Plum Creek, Happy Canyon Creek, and Cottonwood Creek,), three gulches (Sellars Gulch, Hangman's Gulch, and Newlin Gulch), one ditch (the Arapahoe Canal), and numerous unnamed tributaries. Of the 50 water crossings, 49 are within the South Platte River Basin and only one, Crystal Creek, is located within the Upper Arkansas River Basin. Five waterways are currently listed on the CDPHE 303(d) list of impaired streams. These include East Plum Creek and its tributary Hangman's Gulch, as well as Carpenter Creek and two of its tributaries.

7.12.3 Context for Alternatives Development and Selection

CDOT requires that any new significant highway construction or reconstruction include permanent features for the protection of water quality. Regardless of the alternative, installing and maintaining permanent water quality features is a requisite for consideration. I-25 alternatives may present significantly different water quality construction and maintenance costs. Additionally, alternatives could include opportunities to partner with local jurisdictions and provide water quality on a more regional scale, an approach encouraged to maximize the efficacy of the water quality protections.

7.13 Wildlife Movement

7.13.1 Methodology for Wildlife Movement Review

Wildlife conflict data from CPW, CDOT, and the Colorado State Patrol were collected and analyzed to establish movement patterns and conflict hot spots in the Study Area. A joint CDOT/FHWA 2006 wildlife linkage assessment for the area was obtained to compare previous crossing recommendations with current corridor conditions. The vehicle-wildlife conflict data and linkages report was supplemented with input from CPW wildlife and game managers, who have intimate knowledge of wildlife movements through the Study Area. The I-25 South PEL project team has partnered with CPW to create a Wildlife Movement Task Force to ensure wildlife movement existing conditions are adequately described and recommendations are captured.

7.13.2 Wildlife Movements in the Study Area

Vehicle-wildlife conflicts occur throughout Segment 1, 2, and 3, but are significantly more concentrated in Segment 1. The major cause of the Segment 1 conflict concentration is the movement of resident elk and deer populations in the Douglas County open spaces, which line both sides of I-25. Wildlife conflicts increase during migration season and tend to occur in low-lighting conditions. Wildlife conflicts appear to decrease somewhat in areas closer to cities (where traffic levels are greatest) and at times of the day

when traffic flows are the highest (CDOT, 2016; Colorado State Patrol, 2016). Specific wildlife conflict data within the Study Area are included in the Wildlife Movement Resource Memo.

7.13.3 Context for Alternatives Development and Selection

The presence of interconnected, protected lands allows for the movement of wildlife in the vicinity of the Study Area. Currently, there are no formal wildlife crossings, and the existing potential wildlife crossings (e.g., underpasses and overpasses) are generally not sufficiently open to accommodate large mammal movement, which results in mortality of wildlife when animals attempt to cross the roadway. Railroads and frontage roads that parallel the Study Area present additional constraints to wildlife movement through this area.

Wildlife movement is a unique area of environmental analysis to this study because it factors directly into both environmental stewardship and vehicle safety concerns. Alternatives will be evaluated on their ability to facilitate the safe movement of wildlife across I-25 and reducing the potential for vehicle-wildlife conflicts. The number, type, cost, feasibility, and function of wildlife crossings will be used to differentiate alternatives.

7.14 Visual Resources

7.14.1 Activities to Support Visual Resources Review

The public nature and high visibility of transportation projects necessitates that potential negative and positive impacts from proposed transportation projects be adequately assessed and considered. Community acceptance of a proposed project is frequently influenced by the extent of the project's visual impacts. Anticipating and responding appropriately to these impacts avoids unnecessary delay in delivering needed transportation improvements.

7.15 Visual Resources in the Study Area

Visual impacts caused by a highway project are seen both by people traveling on the road and by neighbors adjacent to it. The remarkable views from Segment 1 of I-25, between Monument and Castle Rock, are accentuated by the significant conservation easements and open space lands. This area is rich in natural resources and recreational amenities. Streams and wetlands meander along and under the highway and provide riparian habitat for protected wildlife species. Segments 2 and 3 are more urban in nature, where the surrounding land use is dominated by development. An inventory of visual settings in the corridor is included in the Visual Resources Technical Memorandum included in Appendix H.

7.15.1 Context for Alternatives Development and Selection

The visual setting of the Study Area is an important aspect to the corridor's context. The pattern of rural and urban settings through the Study Area is unlike any other segment of I-25 in Colorado. For the communities along I-25 in the area, the sense of place, and character, is strongly associated with the viewsheds both toward and from the interstate. I-25 alternatives will be evaluated and compared based on impact to the visual setting of the corridor.

8.0 Summary of Public and Agency Input

8.1 Overview

At the onset of the study, the team developed an Agency Coordination and Public Outreach Plan to guide the outreach process and ensure broad-reaching representation and coordination on Project Team membership and communications protocol, team chartering and stakeholder involvement.

The project launched with the implementation of a corridor-specific Elected Officials Tour on Friday, October 7, 2016. Elected officials boarded the Bustang tour bus at the CH2M Campus, and project team members provided a documented overview of the corridor, highlighting key projects, growth patterns, environmental and wildlife interests and congestion observations.

Project overview materials and timeline, Study Area mapping, a Frequently Asked Questions sheet, and a public comment submission form were made available on the project website at the onset of the project. The website, hosted by CDOT, is updated on a regular basis to reflect the ongoing progress of the project, and comments or questions received through the site are addressed by the project team and documented.

8.2 Project Teams

Three primary project teams were established to guide the project.

- The Project Management Team includes CDOT and consultant team staff, and it meets monthly to oversee the management of the study.
- The Technical Working Group provides technical input and guidance to the project and includes key CDOT Traffic Engineering staff and corridor jurisdictional representatives from various related departments. The Technical Working Group was originally scheduled to meet at key milestones but has transitioned to monthly meetings.
- The Steering Committee consists of elected officials at the state and local levels. This group reviews the PEL analyses and recommendations to prioritize, plan, and implement corridor improvements. The Steering Committee was also scheduled to meet at key milestones but transitioned to a monthly meeting schedule.

After the chartering process with the project teams, it was decided that another group would be added to increase stakeholder representation throughout the corridor.

- The Stakeholder Committee includes representatives in the Study Area who are seeking more active involvement beyond the public meetings. Representatives include chambers of commerce, business associations, developers, local businesses, media representatives, Homeowner Associations, environmental groups, development companies, local law enforcement, and others.

8.3 Stakeholder Meetings and Interviews

During the first phase of the project, stakeholders in the Study Area who have an investment in the outcome of this study were selected for individual and focus group interviews so that the project team could identify key corridor concerns, interests, goals, and desired outcomes for the PEL Study.

Stakeholder interviews were held with Representative Paul Lundeen, Representative Terri Carver, CDOT Transportation Commissioner Rocky Scott, and Castle Rock Development Council Lead Frank Gray. Two specific interviews were filmed so that they could be shared with a broader audience. Those interviews included Cheryl Mathews, the Director of Douglas County Open Space, and Dirk Draper, President Colorado Springs Regional Business Alliance (Draper video: https://youtu.be/ZzQzbIcVTDc; Mathews video: https://youtu.be/ZSpp-mpGMJg).

A subsequent stakeholder focus group meeting was held with business and development representatives from the Castle Rock area.

In addition to stakeholder interviews and focus group meetings, a stakeholder committee was organized and meetings were held on both ends of the corridor before the first round of public meetings.

- Stakeholder Meeting #1 – January 24, 2017 - Colorado Springs, East Library Community Meeting Room
- Stakeholder Meeting #2 – January 26, 2017 – Douglas County Fairgrounds, Castle Rock, Kirk Hall

Generally, attendees were appreciative of the accelerated project timeframe and interested in a range of concerns regarding congestion and reliability, personal safety on the corridor, utilization of the frontage roads, alternate routes including SH 105 and SH 83, growing pressure on SH 85, and the need for consistent communication with the public during the process and during construction.

8.4 Public Meetings

The first round of public meetings were held in January 2017 at locations on either end of the corridor.

- Public Meeting #1 – January 24, 2017 –Pikes Peak Library, Colorado Springs
- Public Meeting #2 – January 26, 2017 – Douglas County Fairgrounds, Castle Rock

The public meetings were well attended, with about 220 attendees in Colorado Springs and 150 in Castle Rock. Numerous local and state elected officials turned out to support the process and share their interests with citizens. The meetings clarified the commitments made by CDOT and stakeholders to develop an early action project in The Gap and deliver this project within 5 years. The meetings provided an opportunity for interested members of the public to share their thoughts on the future of the corridor. The project team gathered community input on issues and concerns related to their experiences with the corridor and expectations for the future. A live questionnaire was made available at computers at the meetings; via the project website and approximately 75 questionnaire responses were collected.

8.5 Key Issues of Concern

Numerous comments were collected at the public meetings, and attendees had the opportunity to speak with team representatives in all areas of work. The results of the public questionnaire highlighted the following general concerns:

- 92.4 percent of respondents found the 2-lane Gap segment to present the most problems in the corridor
- 35.9 percent of respondents felt the Lone Tree and RidgeGate segment of the corridor presented the second most problems in the corridor
- The top three concerns with travel in the corridor were congestion, personal safety, and unreliable or unpredictable travel times

Other comments and discussions revealed the following primary concerns by attendees:

- PEL Process
  - There was a high level of support for the accelerated schedule
  - Transit/rail should be included in the PEL process as an alternative travel mode
- Engineering and Infrastructure
  - Consider a minimum speed lane along the corridor
  - Create breaks in the barrier
  - Develop alternate routes adjacent to the corridor to minimize cut-through traffic in neighborhoods
- Reliability and Mobility
  - Add an additional lane but do not toll
  - Minimize high speeds that contribute to crashes within the corridor
  - Maintain roadway operations during construction
- Safety
  - Include a truck-climbing lane
  - Develop the space and operations to move crashes out of traffic and travel lanes
- Environmental
  - Be cognizant and protective of wildlife crossings
  - Minimize traffic diversion from the corridor to other corridors such as SH 83
  - Consider environmental assets when looking at ROW needs
- Funding and Financing
  - Most popular potential funding source was the motor fuel tax

8.6 Recommendations

The public meetings were well-attended, and there was a considerable interest on the part of the public to continue to hold such meetings and spend time keeping residents up to speed in person.

The stakeholder committee attendance was smaller than anticipated, and it may be better to reach out to smaller focus groups in multiple locations along the corridor. At a minimum, stakeholder committee meetings should be held several weeks before the public meetings to better inform the process.

9.0 References

Advisory Council on Historic Preservation. 2005. *Historic Preservation Exemption Regarding Historic Preservation Review Process for Effects to the Interstate Highway System*. https://www.achp.gov/digital-library-section-106-landing/exemption-regarding-historic-preservation-review-process. March 10.

American Association of State Highway and Transportation Officials (AASHTO). 2011. *Policy on Geometric Design of Highways and Streets.*

Colorado Department of Local Affairs. 2017. *2040 Colorado Population Estimates by County*. https://data.colorado.gov/Demographics/Total-Population-by-County-by-Year/9dd2-kw29. Accessed June 21, 2017.

Colorado Department of Public Health and Environment (CDPHE). 2016a. Regulation #93, Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation List. Adopted March 17, 2004, Amended November 30, 2016

—. 2016b. Interstate 25 History. https://www.codot.gov/about/CDOTHistory/50th-anniversary/interstate-25. Accessed Nov 2, 2016.

—. 2016c. "Wildlife on the Move!" Colorado Department of transportation. Available online at: https://www.codot.gov/programs/environmental/wildlife/wildlifeonthemove. Accessed 11/30/2016.

Colorado Department of Transportation (CDOT). 2002. *Historic Bridge Inventory*.

—. 2005. *Roadway Design Guide.*

—. 2013. *Historic Bridge Inventor Update.*

—. 2016. "Wildlife Conflict Data." Roadkill data for 2005-2016 provided by CDOT Maintenance for I-25 mile posts 160-195.

Colorado State Patrol. 2016. "Animal Vehicle Collision Data." CSP data for 2011-2015 provided by CDOT for I-25 mile posts 160-194.

Federal Emergency Management Agency (FEMA). 2016. FEMA GIS Data for Douglas County, Colorado

United States Geological Survey (USGS). 2016. National Hydrology Dataset. Available at: http://nhd.usgs.gov/.

Appendix A
Corridor Overall Geometric Rating Summary

Corridor Overall Geometric Ratings Summary - Appendix A

Mile Post 161 - 194

Horizontal Alignment

Rating	Description	Begin MP	End MP	Direction
Good	Radius of Curve is > or = 2040 ft. [Design Speed is 70 mph]	162.32	168.60	B
		168.86	169.92	B
		170.37	171.56	B
		171.96	174.33	B
		174.33	174.45	SB
		174.45	175.20	B
		175.20	175.36	NB
		175.36	185.30	B
		185.64	186.18	B
		186.44	191.55	B
		191.78	193.86	B
Fair	Radius of Curve is > or = 1330 ft; and < 2040 ft. [Design Speed is 60 to 69 mph]	168.60	168.86	B
		169.92	170.37	B
		171.56	171.96	B
		174.33	174.45	NB
		175.20	175.36	SB
		185.30	185.64	B
		186.18	186.44	B
		191.55	191.78	B
Poor	Radius of Curve is < 1330 ft. [Design Speed is < 60 mph]	--	--	--

Vertical Alignment

Rating	Description	Begin MP	End MP	Direction
Good	< or = 4.0%	161.26	191.93	B
		162.74	163.71	B
		164.00	170.78	B
		171.00	185.38	B
		186.05	187.97	B
		188.17	189.44	B
		190.01	193.88	B
Fair	4.01% to 5.00%	161.93	162.74	B
		185.38	186.05	B
Poor	> 5.00%	163.71	164.00	B
		170.78	171.00	B
		187.97	188.17	B
		189.44	190.01	B

Critical Length of Grade

Rating	Description	Begin MP	End MP	Direction
Good	< 10 mph	161.07	164.68	B
		166.07	194.96	B
Fair	10 - 15 mph	--	--	--
Poor	> 15 mph	164.68	166.07	B

Corridor Overall Geometric Ratings Summary - Appendix A

Mile Post 161 - 194

Vertical Curve Stopping Sight Distance

Rating	Description	Type	Begin MP	End MP	Direction
Good	K_{CREST} > or = 247 (730 ft. of SSD) K_{SAG} > or = 181 (730 ft. of SSD)		161.26	162.74	B
			163.24	163.71	B
			164.00	170.40	B
			171.49	177.98	B
			178.18	180.15	B
			180.76	183.54	B
			184.01	185.11	B
			185.38	185.55	B
			186.05	187.29	B
			187.82	187.97	B
			188.59	189.44	B
			190.01	190.27	B
			192.71	193.33	B
			193.66	193.88	B
Fair	K_{CREST} > or = 151 and < 247 (570 to 730 ft. of SSD) K_{SAG} > or = 136 and < 181 (570 to 730 ft. of SSD) OR K_{SAG} < 136 (< 570 ft. of SSD) with adequate roadside lighting		162.74	163.24	B
			163.71	164.00	B
			170.40	170.63	B
			171.00	171.49	B
			180.15	180.76	B
			183.54	183.66	B
			183.77	184.01	B
			185.11	185.38	B
			190.27	192.71	B
			193.33	193.66	B
Poor	K_{CREST} < 151 (< 570 ft. of SSD) K_{SAG} < 136 (< 570 ft. of SSD)		170.63	171.00	B
			177.98	178.18	B
			183.66	183.77	B
			185.55	186.05	B
			187.29	187.82	B
			187.97	188.59	B
			189.44	190.01	B

Corridor Overall Geometric Ratings Summary - Appendix A

Mile Post 161 - 194

Horizontal Curve Stopping Sight Distance

Rating	Description	Begin MP	End MP	Direction
Good	> or = 70 mph	162.44	194.01	B
Fair	60 mph to 69 mph	--	--	--
Poor	< 60 mph	--	--	--

Cross Section Elements

Rating	Description	Begin MP	End MP	Direction
Good	Lane Width of 12 feet Right Shoulder Width at least 10 ft. Left Shoulder Width at least 3.5-ft paved (4-lane sections) or at least Left Shoulder Width at least 10-ft paved (for 6-1ane and 8-1ane sections)	--	--	--
Fair	Lane Width of 12 feet Right Shoulder Widths at least 10 feet Left Shoulder Width of 2 to 3.5 feet (for all freeway sections) • The absence of shoulders on long bridges (over 200ft) are given a fair rating.	179.20	181.20	NB
		181.60	192.40	NB
		192.30	192.31	NB
		192.74	192.97	B
		193.23	194.96	B
Poor	Lane Width less than 12 feet Right Shoulder Width less than 10 feet No left shoulder	161.20	179.20	B
		179.20	181.20	SB
		181.20	181.60	B
		181.60	192.40	SB
		192.30	192.31	SB
		192.31	192.74	B
		192.97	193.23	B

Corridor Overall Geometric Ratings Summary - Appendix A

Mile Post 161 - 194

Ramp Entrance/Exit Design

Rating	Description	MP	Type	Direction
	Exit: 4° Diverge or equivalent length for parallel lane design **Entrance**: 50:1 taper or greater			
Good	Accel/Decel Length is provided	159.80	EN	SB
		161.20	EN	NB
		163.00	EN	SB
		163.90	EN	SB
		167.10	EN	SB
		167.70	EX	SB
		167.80	EN	NB
		171.40	EX	NB
		171.40	EN	SB
		172.10	EN	NB
		172.70	EN	NB
		173.40	EN	SB
		174.10	EX	SB
		174.30	EN	NB
		180.40	EN	SB
		180.50	EX	NB
		181.20	EX	SB
		181.20	EN	NB
		181.60	EN	SB
		182.40	EN	NB
		183.80	EN	SB
		184.00	EN	SB
		184.50	EN	NB
		184.60	EN	NB
		184.60	EX	SB
		184.60	EN	NB
		184.70	EX	SB
		185.10	EX	NB
		185.10	EN	SB
		186.60	EN	SB
		186.70	EX	NB
		187.40	EN	NB
		188.00	EN	SB
		188.00	EX	NB
		188.60	EN	NB
		188.60	EX	SB
		189.00	EN	NB
		191.40	EN	SB
		191.60	EX	NB
		191.60	EN	SB

Corridor Overall Geometric Ratings Summary - Appendix A

Mile Post 161 - 194

Ramp Entrance/Exit Design (continued)				
		192.30	EN	NB
		192.40	EX	SB
		192.40	EN	NB
		192.60	EN	SB
		192.70	EN	NB
		193.30	EN	NB
		193.40	EN	NB
		193.50	EX	SB
		193.80	EX	NB
		193.90	EN	SB
Fair	**Exit:** 4° to 5° Diverge or equivalent length for parallel lane design **Entrance:** 40:1 to 50:1	182.20	EX	SB
		187.20	EX	SB
		192.60	EX	SB
Poor	**Exit**: Greater than 5° Diverge **Entrance:** Less than 40:1 taper Accel/Decel Length is not provided	160.20	EX	NB
		161.20	EX	SB
		163.20	EX	NB
		163.70	EX	SB
		167.00	EX	NB
		172.00	EX	SB
		172.50	EX	SB
		173.50	EX	NB
		181.60	EX	SB
		183.80	EX	NB

Corridor Overall Geometric Ratings Summary - Appendix A

Mile Post 161 - 194

Lane and Route Continuity

Rating	Description	Begin MP	End MP	Direction
Good	Section has lane/route continuity	161.00	194.00	B
Fair	Not applicable	--	--	--
Poor	Section lacks lane/route continuity	--	--	--

Lane Balance at Exits and Entrances

Rating	Description	Begin MP	End MP	Direction
Good		161.07	163.21	B
		163.50	180.57	B
		180.57	181.11	NB
		181.11	181.61	B
		181.61	185.30	NB
		185.30	186.63	SB
		186.63	188.77	B
		188.77	192.32	SB
		192.32	193.77	B
Fair	Not applicable	--	--	--
Poor	Lane balance criteria are not met by existing ramp terminal design	163.21	163.52	B
		180.57	181.11	SB
		181.61	185.30	SB
		185.30	186.63	NB
		188.77	192.32	NB

Ramp Sequence and Spacing

Rating	Description	Type	Begin MP	End MP	Direction
Good	Spacing meets or exceeds criteria		161.07	184.67	B
			186.63	192.33	B
			192.58	193.39	B
			193.39	193.77	SB
Fair	Not applicable		193.39	193.77	NB
Poor	Spacing is less than "absolute minimum"		184.52	186.67	B
			192.33	192.58	B

Corridor Overall Geometric Ratings Summary - Appendix A

Mile Post 161 - 194

Bridge Condition

Rating	Description	Structure #	MP	Feature Carried	Column1
Good	Each of the following: **Deck Rating:** 7 or greater **Sub Structure:** 7 or greater **Superstructure:** 7 or greater	--	--	--	--
		H-17-BB	160.751	SH 105 ON RAMP	
		H-17-CZ	160.763	SH 105 ML	
		H-17-CP	167.259	I-25 ML	
		G-17-DZ	180.813	I-25 ML SBND	
		G-17-DX	181.195	I-25 ML NBND	
		G-17-DY	181.196	I-25 ML SBND	
		G-17-BI	181.851	WOLFENSBERGER RD	
		G-17-BH	181.853	WOLFENSBERGER RD	
		G-17-CS	182.217	UPRR	
		G-17-BG	183.296	SANTA FE DRIVE	
		G-17-CT	188.486	CASTLE PINES PRKWY	
		G-17-T	189.719	I-25 ML	
		F-17-CR	191.086	I-25 ML	
		F-17-PT	192	I-25 ML	
		F-17-JM	192.99	LINCOLN AVE	
		F-17-WJ	193.689	PEDESTRIAN BRIDGE	
Fair	One of the following: **Deck Rating**: 5 or 6 **Sub Structure**: 5 or 6 **Superstructure:** 5 or 6		--	--	--
		H-17-CA	160.8	I-25 ML	
		H-17-CF	163.321	COUNTY LINE ROAD	
		H-17-CQ	171.981	I-25 ML	
		H-17-AH	172.179	I-25 ML	
		H-17-CG	172.307	SPRUCE MOUNTAIN	
		G-17-AJ	173.791	TOMAH ROAD	
		G-17-DA	181.517	5TH ST.	
		G-17-AM	184.212	MEADOWS	
Poor	One of the following: **Deck Rating:** 4 or lower **Sub Structure**: 4 or lower **Superstructure:** 4 or lower		--	--	--
		H-17-CH	171.783	I-25 ML NBND	
		H-17-CI	171.784	I-25 ML SBND	
		G-17-EA	180.769	I-25 ML NBND	
		G-17-AC	182.374	LIGGETT ROAD	
		G-17-AG	186.935	HAPPY CANYON ROAD	

Appendix B
Existing Traffic Data Technical Memorandum

TECHNICAL MEMORANDUM

Study Corridor Traffic Volume Data

PREPARED FOR:	Project File
COPY TO:	Zeke Lynch, Mandy Whorton
PREPARED BY:	Jacqueline Dowds Bennett
DATE:	January 4, 2017
PROJECT NUMBER:	680954

The purpose of this memorandum is to document the effort to collect available traffic volume data within the study corridor and identify potential uses for the data. The effort focused on the state highways (I-25, SH 83, and SH 105A) and local routes that serve as connection points between the interstate and the state highways (Palmer Divide Road, Greenland Road, Spruce Mountain Road, and frontage roads).

1.0 Collected Data

Table 1 summarizes the data collected date, to include source, location, date, and type of count. These are all mainline volumes – there are no ramp volumes or intersection turning movement volumes. As the table shows, the Colorado Department of Transportation (CDOT) provided historical, annual average daily traffic counts (AADT) for several locations along I-25, SH 83, and SH 105A. The historical monthly counts are from the two automatic traffic recorders (ATR) located south of Plum Creek Parkway and south of Lincoln Avenue. The hourly, bi-directional counts provided by the Pikes Peak Area Council of Governments (PPACG) are the most recent data available. For I-25 within the PPACG boundary, use of the PPACG counts is recommended since they are actual counts and higher than the CDOT volume data.

2.0 Data Application

The available data would be useful for the following aspects of the traffic analysis:

- **Density** (passenger cars per mile per lane) can be calculated at locations with hourly counts, and estimated at locations with daily counts by assuming the peak hour percentage
- **Volume-to-capacity ratio** can be calculated at locations with hourly counts, and estimated at locations with daily counts by assuming the peak hour proportion of the daily counts and the peak hour directional proportion
- **Level of Service** for I-25 mainline lanes can be calculated at locations with hourly counts and estimated at locations with daily counts
- **Level of Service** for SH83 and SH105A can be calculated at locations with hourly counts and estimated at locations with daily counts by assuming the peak hour proportion of the daily counts and the peak hour directional proportion
- **Comparison of Parallel Route Volumes** - During the course of the existing conditions evaluation phase for the South I25 PEL, stakeholders noted that traffic volumes on routes parallel to I-25 increased in 2016 in response to travel time issues on the I-25 mainline. Available data can be used to assess this issue.

Table 1. I-25 PEL Corridor Available Traffic Volumes

Source	Roadway	Location	Date	Annual AADT	Monthly Count	Hourly Count	By Direction
Pikes Peak Area Council of Governments	I-25	South of Second Street/SH 105	9/13/2016			X	X
Pikes Peak Area Council of Governments	I-25	North of Second Street/SH 105	9/13/2016			X	X
Pikes Peak Area Council of Governments	I-25	North of Palmer Divide Road	9/13/2016			X	X
Colorado Department of Transportation	I-25	ATR South of Plum Creek Pkwy	1999-2016		X		
Colorado Department of Transportation	I-25	ATR South of Lincoln Avenue	1999-2016		X		
Colorado Department of Transportation	I-25	Various Locations Between South of SH105 to North of Lincoln Avenue	1986-2016	X			
Pikes Peak Area Council of Governments	SH 105A	West of Mission Training International	9/13/2016			X	X
Pikes Peak Area Council of Governments	SH 105A	2nd St between Mitchell St and Front St	9/14/2016			X	X
Pikes Peak Area Council of Governments	SH 105A	Between Second St and Third St	9/14/2016			X	X
Pikes Peak Area Council of Governments	SH 105A	West of Jackson Creek Pkwy	9/14/2016			X	X
Pikes Peak Area Council of Governments	SH 105A	West of SH 83	10/12/2016			X	X
Pikes Peak Area Council of Governments	SH 105A	West of Woodmoor Drive	10/12/2016			X	X
Pikes Peak Area Council of Governments	Second Street	Between Beacon Lite Rd and CO-10	10/12/2016			X	X
Colorado Department of Transportation	SH 105A	Various Locations Between East of I-25 to SW of Spruce Mountain Road	1986-2016	X			
Pikes Peak Area Council of Governments	SH 83	South of Walker Road	10/13/2016			X	X
Pikes Peak Area Council of Governments	SH 83	North of Walker Road	10/12/2016			X	X
Pikes Peak Area Council of Governments	SH 83	North of Palmer Divide Road	10/12/2016			X	X
Colorado Department of Transportation	SH 83	Various Locations Between South of Walker Road to South of E470	1986-2016	X			
Pikes Peak Area Council of Governments	Palmer Divide Road	Between Beacon Lite Road and I-25	9/13/2016			X	X
Pikes Peak Area Council of Governments	Palmer Divide Road	Between I-25 and Monument Hill Road	10/12/2016			X	X
Pikes Peak Area Council of Governments	Palmer Divide Road	Between Beacon Lite Road and I-25	5/6/2010			X	X
Pikes Peak Area Council of Governments	Palmer Divide Road	Between I-25 and Monument Hill Road	5/6/2010			X	X
Pikes Peak Area Council of Governments	Spruce Mountain Road	East of County Line Road	10/12/2016			X	X
Pikes Peak Area Council of Governments	Furrow Road	North of County Line Road	9/14/2016			X	X

With the following data, a more complete traffic analysis could be conducted that could better inform the alternatives development and selection process:

- Mainline volumes – peak hour volumes for the I-25 mainline at locations north of milepost 160 would permit a more accurate calculation of level of service and density because fewer assumptions would be required to complete the analysis
- Ramp volumes – daily and peak hour volumes would permit the analyses of ramp capacity, weaving level of service, and merge/diverge level of service
- Ramp terminal intersection turning movement volumes – peak hour turning movement volumes for the ramps and crossroads would permit analyses of intersection operations including level of service, lane configurations, and traffic control requirements
- Frontage road volumes – peak hour volumes along segments and turning movement volumes at intersections would permit the analyses of level of service, lane configurations, and traffic control requirements.

3.0 Process to Obtain Available Volume Data

The process to collect available volume data involved the following two steps:

A. The following people/agencies were contacted via email or phone to request volume data for 2010-2016 for the following routes:
   - I-25: MP 160 – 194 – the study area
   - SH 83: MP 27 - 62
   - SH 105: MP 4-10
   - Perry Park Road
   - Spruce Mountain Road
   - Greenland Road
   - Palmer Divide Avenue/County Line Road
   - Frontage roads

   The following list documents the responses received:

   - **PPACG: Craig Casper and Ken Prather**
     Received from John Hanson on December 14, 2016:
     Database of counts taken on September 13, and October 12, 2016 for:
     - CO 105 (5 locations)
     - CO 83 (3 locations)
     - 2nd Street in Monument (2 locations)
     - I-25 south of 2nd Street/ CO 105
     - I-25 north of 2nd Street/ CO 105
     - Spruce Mountain Road
     - Palmer Divide Avenue (2 locations)
     - I-25 north of Palmer Divide Avenue
     - Furrow Road

     Received from Ken Prather on December 14, 2016:
     Database of counts taken on May 6, 2010 and October 12, 2016 for:
     - Spruce Mountain Road

- Palmer Divide Avenue (2 locations)
- County Line Road

- **DRCOG: Steve Cook and Jacob Riger**
  Received from Jacob Riger on December 13, 2016:
  Email stating he would ask staff to look into available volumes.

- **CDOT Region 1 Traffic: Paul Scherner**
  Received from Paul Scherner on December 13, 2016:
  Email explaining how to retrieve from OTIS historic data for ATR locations, of which there are two in the northern portion of the study corridor (MP 180 and MP 191).

- **CDOT Region 6 Traffic: Alazar Tesfaye**
  Called on December 15, 2016

- **El Paso County: Jennifer Irvine**
  Received from Jennifer Irvine on December 13, 2016:
  Email stating she would ask her staff to look into the availability of counts.

- **Douglas County: Kathie Haire**
  Received from Kathie Haire on December 12, 2016:
  Email stating Douglas County collected traffic counts on Spruce Mountain Road, SB I-25, and western frontage road between Plum Creek and Tomah interchanges in fall of 2016. Will pass these along as well as any other counts she can find.

B. Obtained volume data from Colorado Department of Transportation's Online Transportation Information System (OTIS) database for 25A, 83A, and 105A:

Recorded volumes in spreadsheet, with one tab for each roadway. Grouped counts at the same location but from different sources together for comparison.

The only historical volumes were for ATRs at MP 180 and 192.

The other volumes are 2016 estimates based on a previous year's count.

Appendix C
Travel Time Reliability Analysis Technical Memorandum

I-25 PEL: Colorado Springs to Denver Travel Reliability – Existing Conditions Assessment

PREPARED FOR:	CDOT
COPY TO:	Project file, Mandy Whorton/CH2M, Shane Binder/APEX
PREPARED BY:	Zeke Lynch/CH2M
DATE:	March 24, 2017
PROJECT NUMBER:	680954

Introduction

With an influx of residents and increasing number of drivers on our roadways, nearly all Colorado drivers experience, and plan around traffic congestion as part of their daily activities. However, on many primary roadways like interstates, travel times vary greatly from day to day, and travelers are less tolerant of unexpected delays. Comments and complaints received from I-25 corridor travelers nearly every day suggest that unexpected congestion and delays from incidents, weather, work zones, special events, fluctuations in demand, or other factors are especially frustrating. Travelers remember the "bad days" and report that bad days are becoming more common, even the norm.

Methodology

When drivers have a predictable travel time they are able to plan their trips and be relatively confident that they will arrive on time. However, as shown in Exhibit 1, it is the heavily congested days that they remember such as when they are late for work, miss an important appointment, or freight deliveries are impacted.

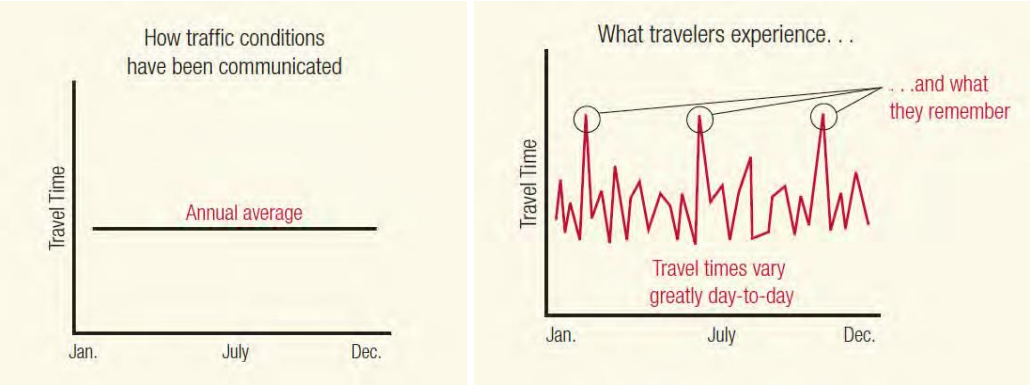


Exhibit 1 – Typical Travel Times – Source: FHWA. 2016. Travel Time Reliability Overview.

Because drivers on I-25 between Denver and Colorado Springs regularly and sometimes unexpectedly experience congestion, delay, and turbulence in the traffic stream not commonly found on rural freeways, the study team assessed corridor travel time reliability to best represent these known corridor conditions. This assessment helped understand the level of congestion, changing traffic conditions, and factors contributing to delay.

Travel times on I-25, both northbound and southbound, were obtained from INRIX, which collects roadway speeds from over 250 million real-time anonymous cell phones worldwide. Raw point-to-point travel times between exits were compiled from the INRIX database in 15-minute time periods over 2015 and 2016. CDOT has completed an assessment of INRIX travel time data and has validated its reliability.

For travel time purposes, the corridor was divided into two segments based on facility context. As shown in Exhibit 2, the southern segment, traversing a primarily rural area with few exits, is from Baptist Road to US 85 and the northern segment transitions into a suburban context, extending from US 85 to C-470.

Exhibit 3 illustrates the color gradient from green to yellow to red which was used to display the Good, Fair, and Poor travel times as compared to free-flow travel time (posted speed limit). The data was plotted on three-dimensional graphs, with the X-axis representing the day of the year, the Y-axis representing the time of day, and the Z-axis representing the calculated travel time.

For the most recent two years of data, 2015 and 2016, the travel time reliability was assessed separately by direction for northbound and southbound I-25. The data was further analyzed by day of the week to understand the effects of typical commuter travel during the week as well as recreational travel occurring on weekends. The data was stratified into weekdays (Monday through Thursday), and weekends (Friday through Sunday). Initial analysis indicated that the travel on Fridays more closely matched that of the weekends, so Fridays were included with the weekend data.

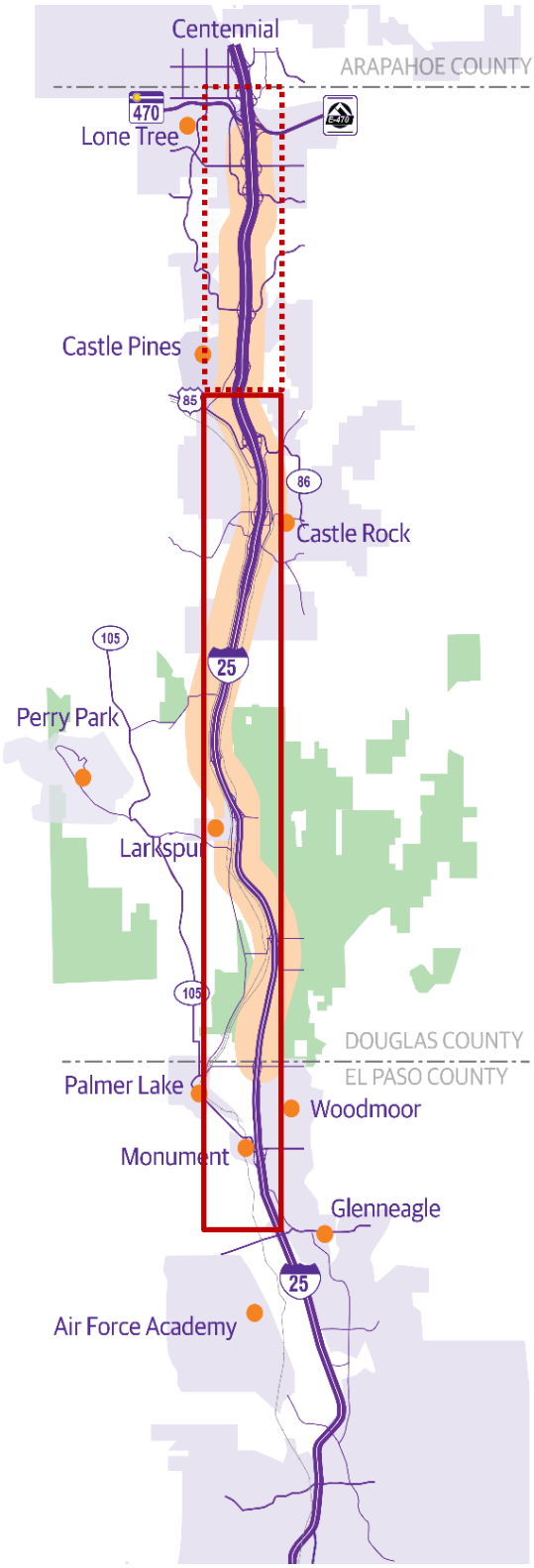


Exhibit 2 – Corridor Travel Time Segments

Finally, days with Fair or Poor travel time reliability were investigated to determine what specific factors contributed to the decreased reliability. Recorded stalled vehicles, police enforcement, and crashes were categorized into the incidents event type. Impacts due to weather were determined from CDOT logs and NOAA data. The planned and special events category included events such as the Renaissance Festival, Air Force Academy athletics, Denver Broncos football games, and scheduled CDOT maintenance activities. Those days that did not have an apparent causal factor were grouped into the unaccounted type when shear traffic volume was the most likely cause of the degraded travel time reliability. When days had multiple 15 minute periods of Fair or Poor travel time reliability and there were more than one apparent contributing factor, those days were listed in the incident event type.

Threshold	Compared to Free Flow Travel Time	Southern Segment Travel Time (minutes)	Northern Segment Travel Time (minutes)
Free flow	1.0	21	9
Good	< 1.4x	<29	<12.5
Fair	1.4x to 2.0x	29 to 42	12.5 to 18
Poor	>2.0x	>42	>18

Exhibit 3 – Travel Time Thresholds

Corridor Travel Time Reliability Assessment

Southern Segment

Exhibits 4 through 17, display the travel time reliability analysis for the southern segment. As shown in Exhibit 4, most of the Poor travel times (more than twice as long as free-flow travel time) in the southern segment occurred in the evening hours and are more prominent in the summer months. While this same trend appears in 2016, as shown in Exhibit 5, the duration of Poor travel reliability and number of Poor travel days increased when compared to 2015.

As shown in Exhibits 6 and 7, Poor travel time reliability southbound in the southern segment was greater in both 2015 and 2016 than the northbound direction. Like the northbound, more Poor travel time reliability occurred in the evening hours and the southbound also experienced more Poor travel time reliability in 2016 than 2015.

The weekday data shown in Exhibits 8 through 11, indicate that travel time reliability was worse in the southbound than in the northbound direction and 2016 was worse in both directions than 2015.

Travel time reliability was worse on the weekends than on the weekdays in both 2015 and 2016. There were more occurrences of Poor travel time reliability southbound than northbound and both southbound and northbound saw a greater number of Poor occurrences in 2016 than 2015.

Exhibits 16 and 17 show the causal factor analysis for 2015 and 2016, respectively. In 2015, nearly two thirds of the days of the year (243) had at least one 15 minute period experiencing Fair or Poor travel time reliability. This number jumped to 261, or 72% of the days of the year in 2016. Incidents (44%) and typical congestion (44%) comprised most of the Fair and Poor travel time reliability days. Incidents were a prevalent causal factor in both 2015 and 2016 of Fair and Poor travel time reliability on weekends.

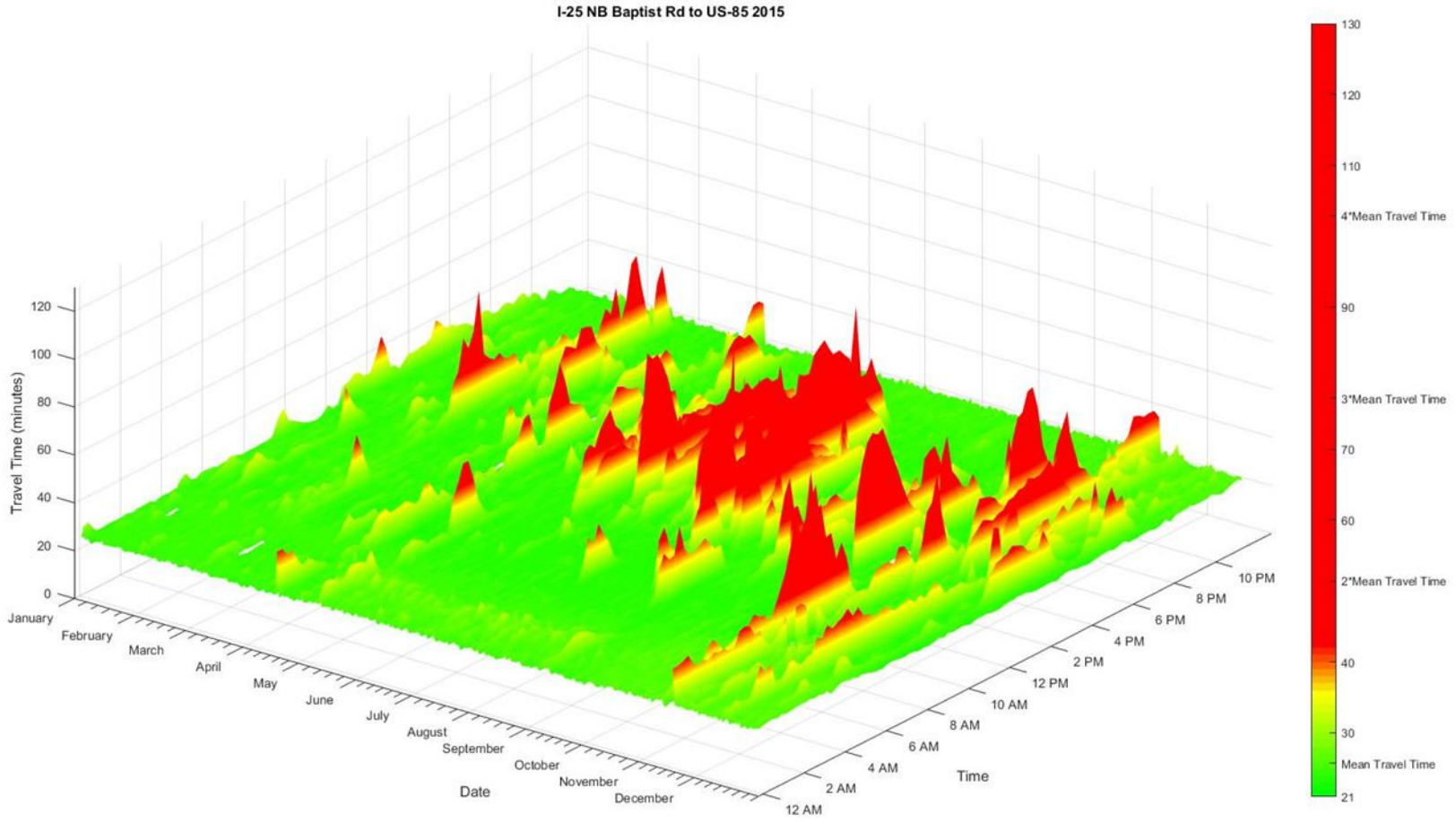


Exhibit 4 – Southern Segment – Northbound
All Days in 2015

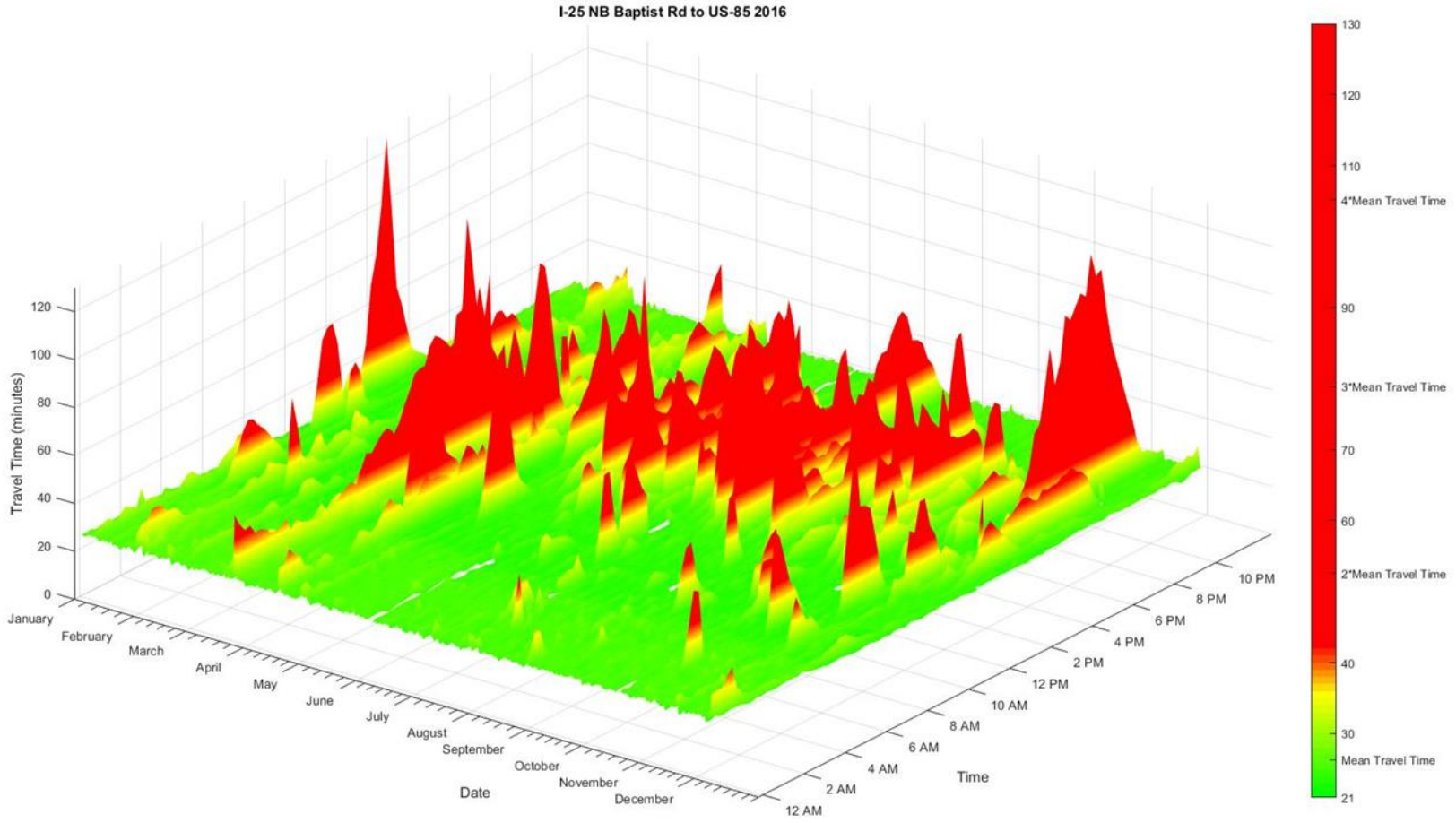


Exhibit 5– Southern Segment – Northbound
All Days in 2016

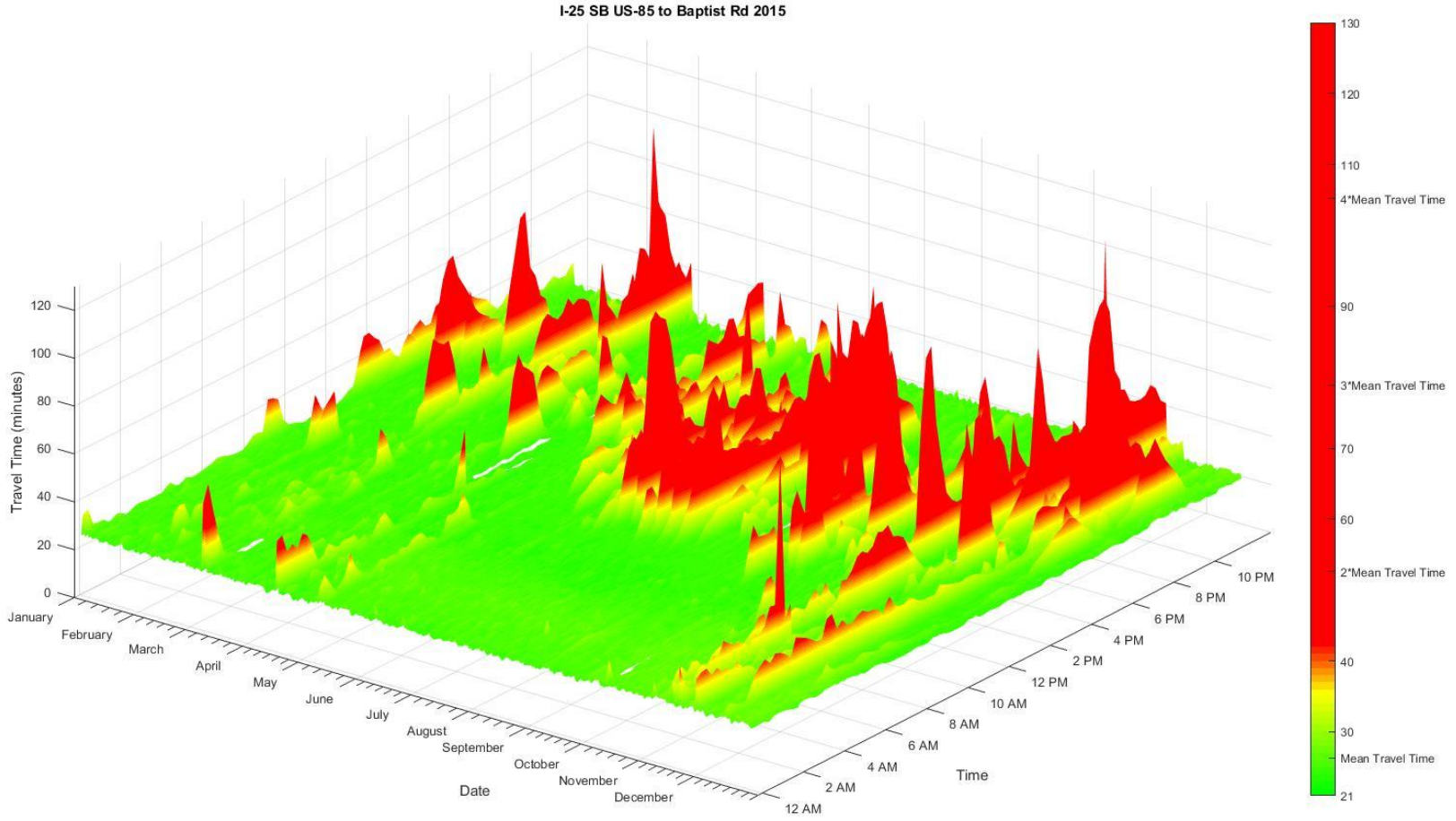


Exhibit 6 – Southern Segment – Southbound
All Days in 2015

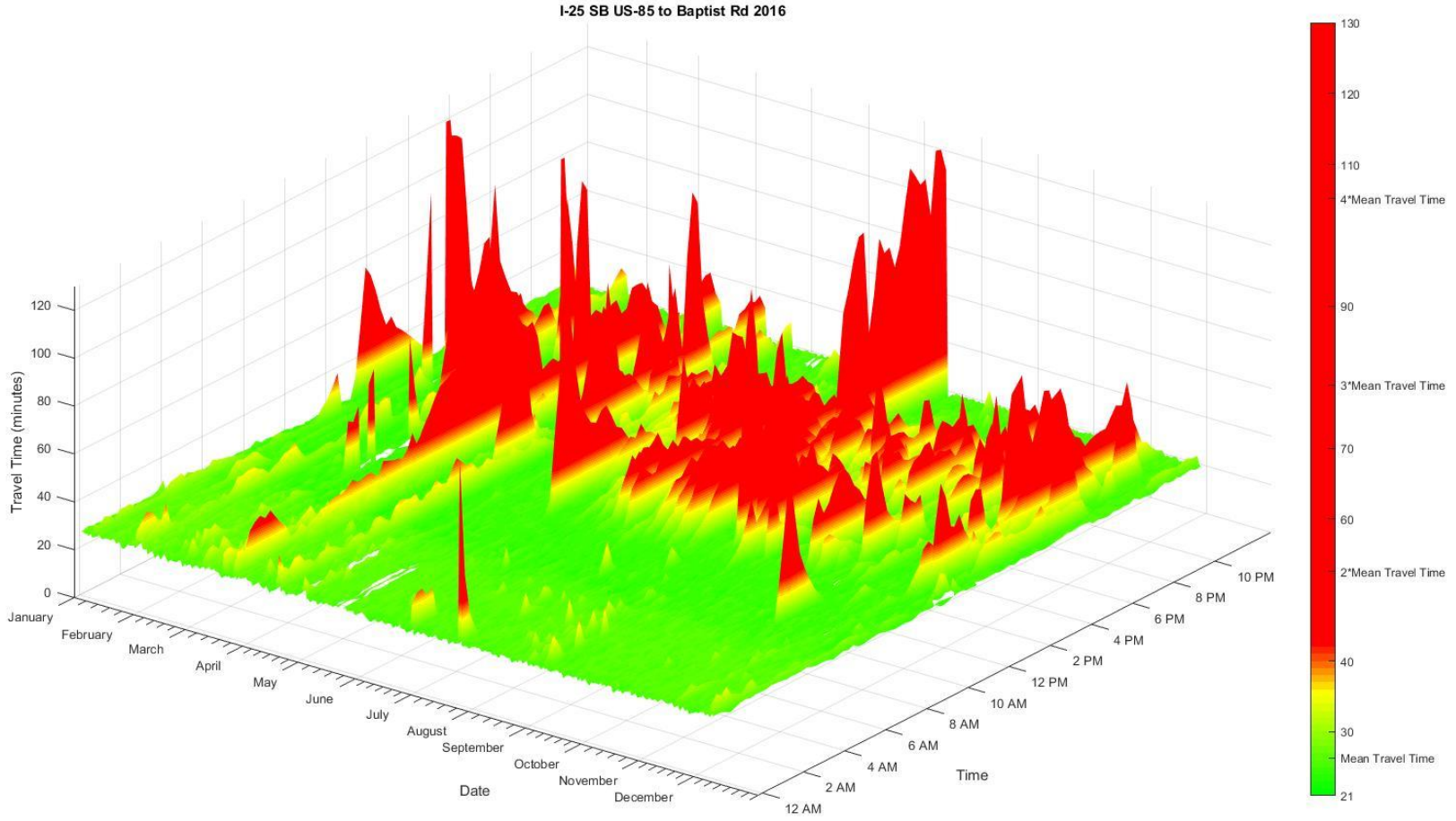


Exhibit 7 – Southern Segment – Southbound
All Days in 2016

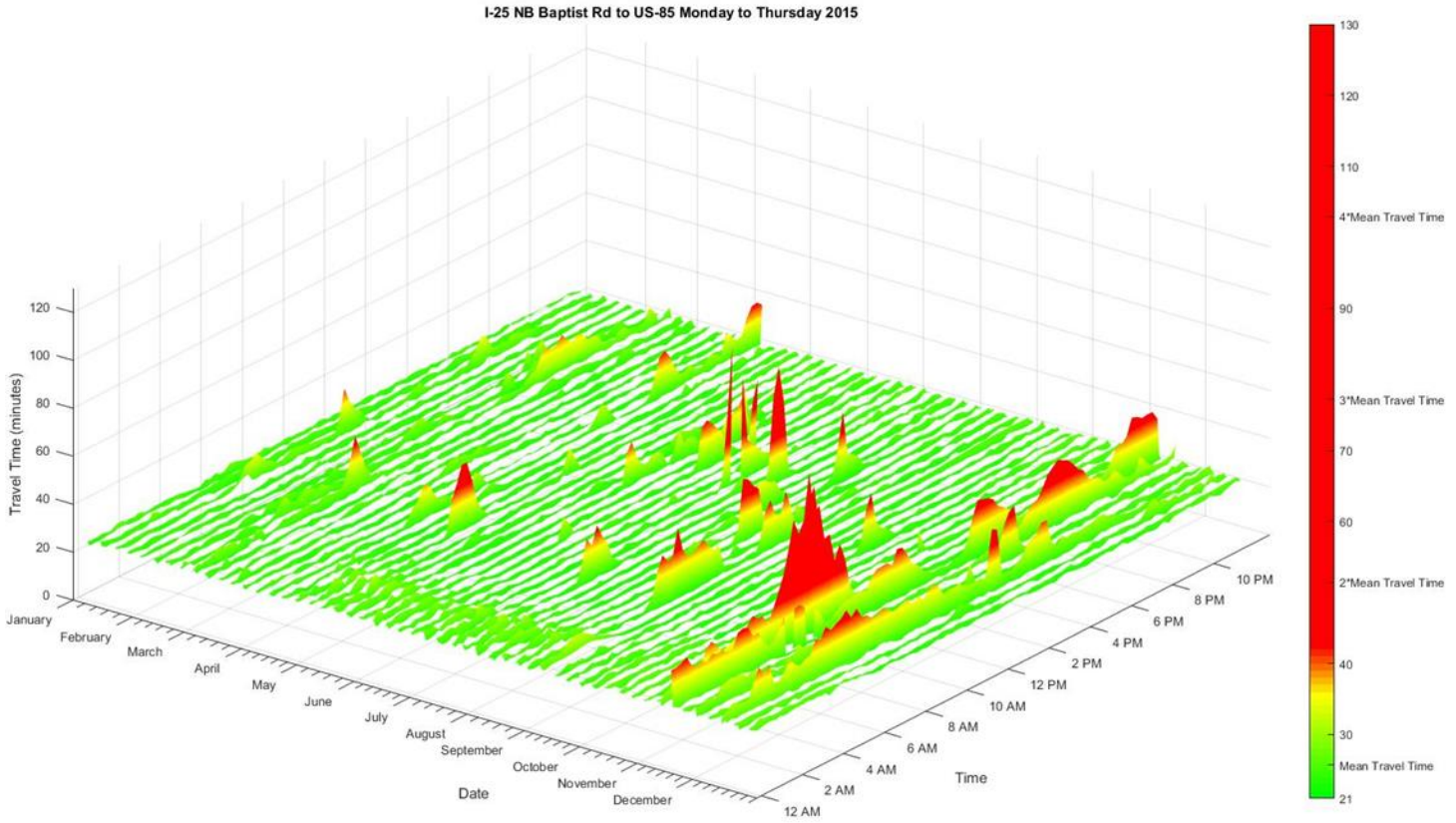


Exhibit 8 – Southern Segment – Northbound Weekdays (M-R): 2015

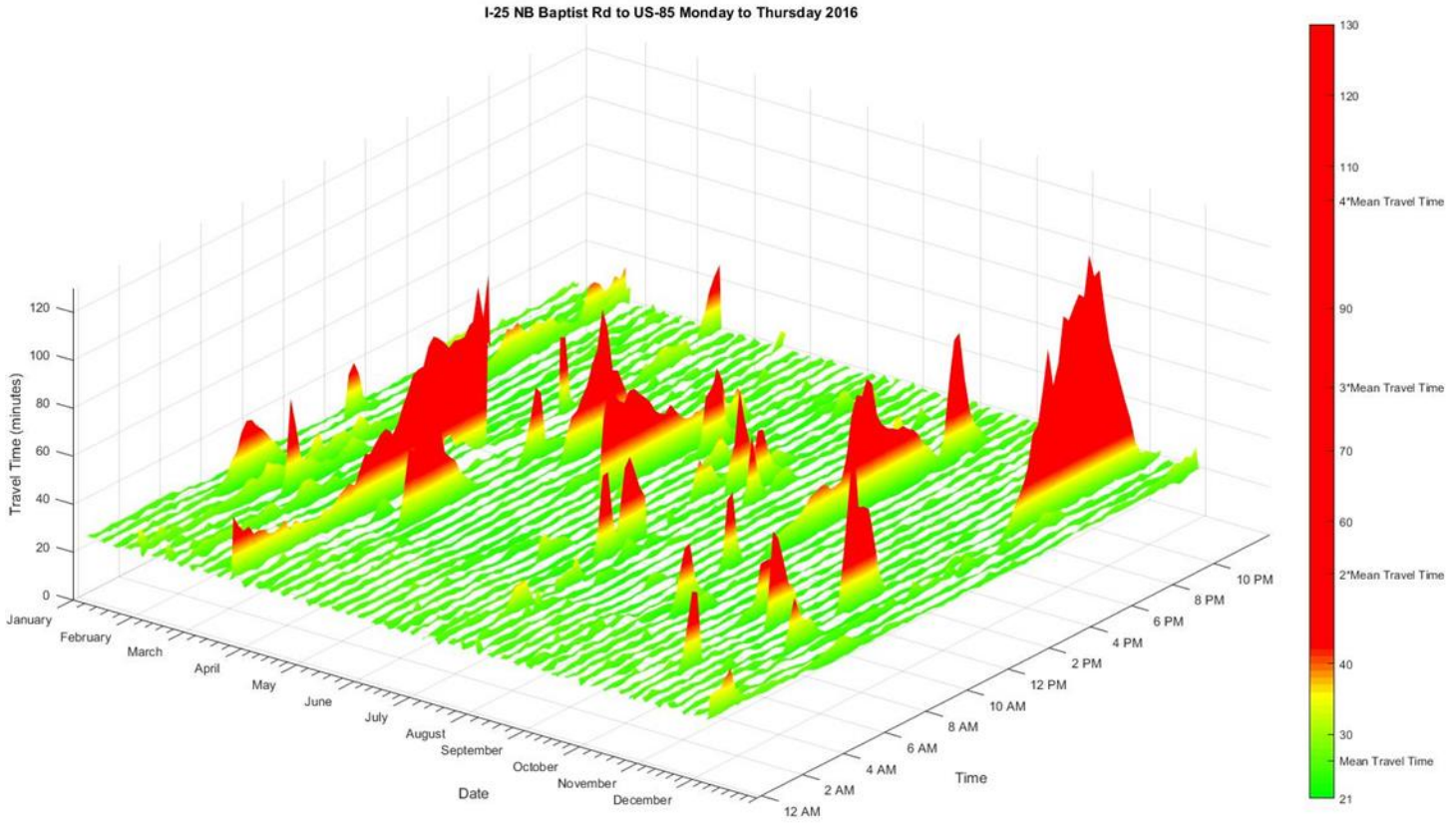


Exhibit 9 – Southern Segment – Northbound Weekdays (M-R): 2016

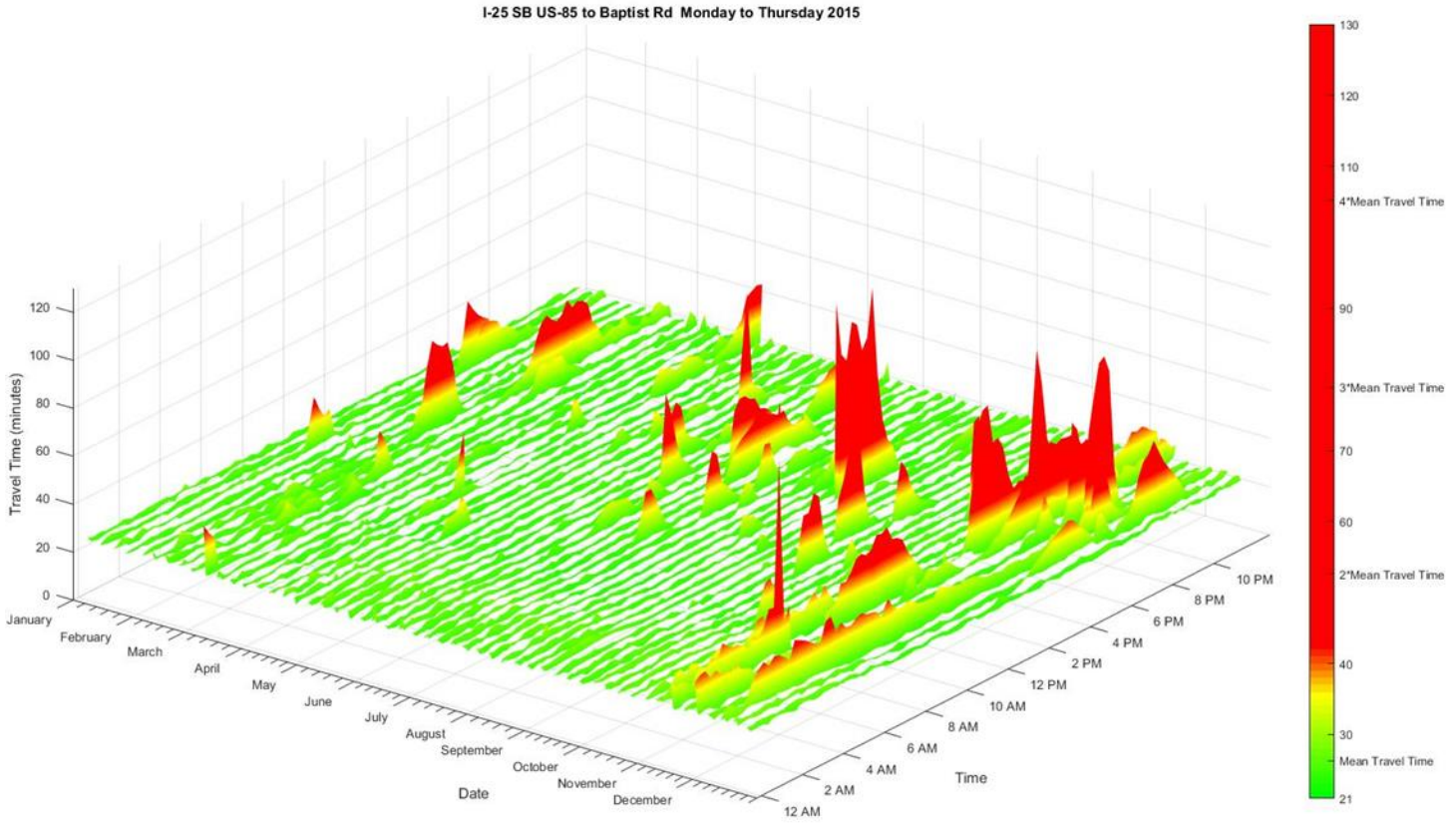


Exhibit 10 – Southern Segment – Southbound Weekdays (M-R): 2015

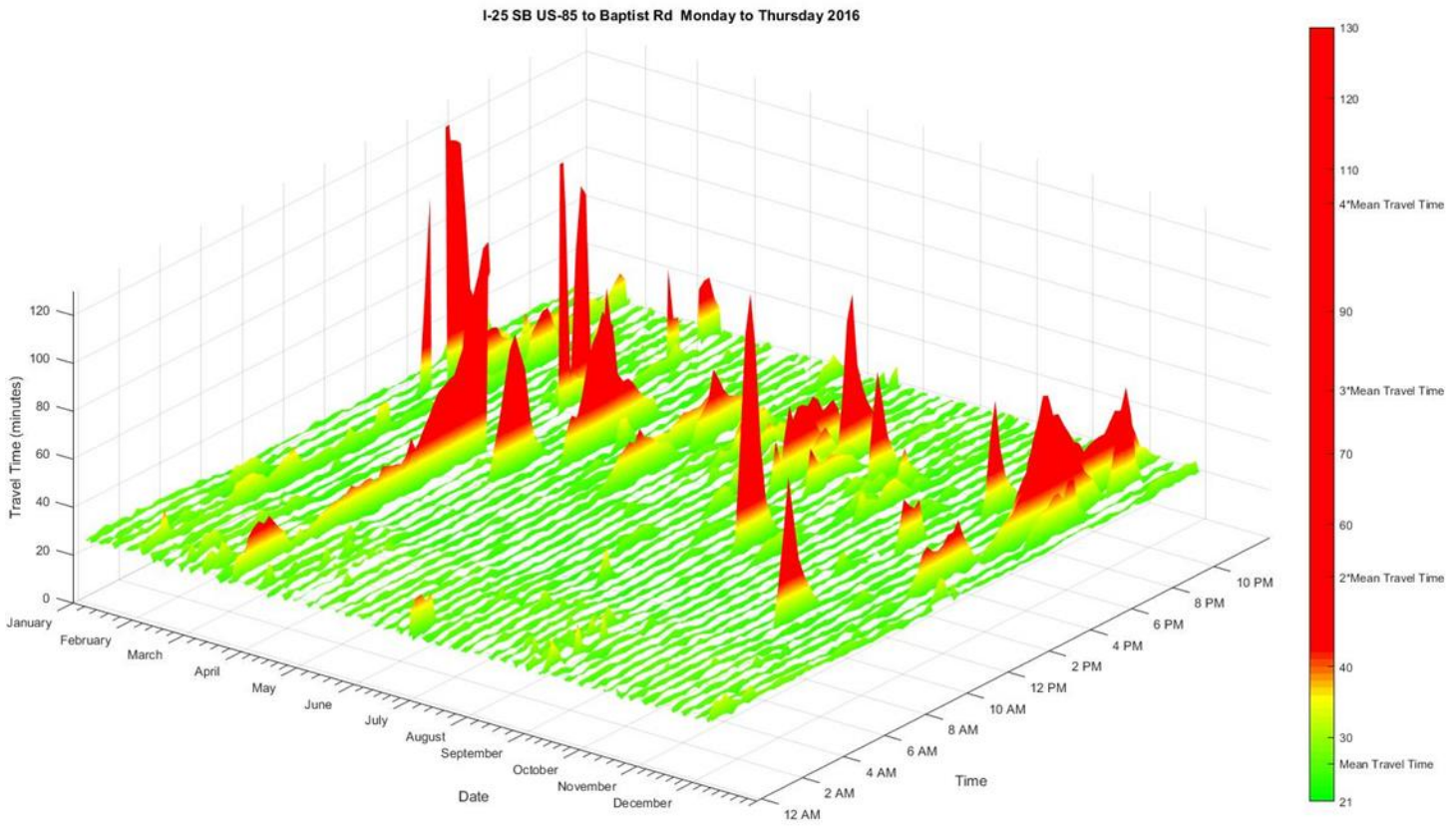


Exhibit 11 – Southern Segment – Southbound
Weekdays (M-R): 2016

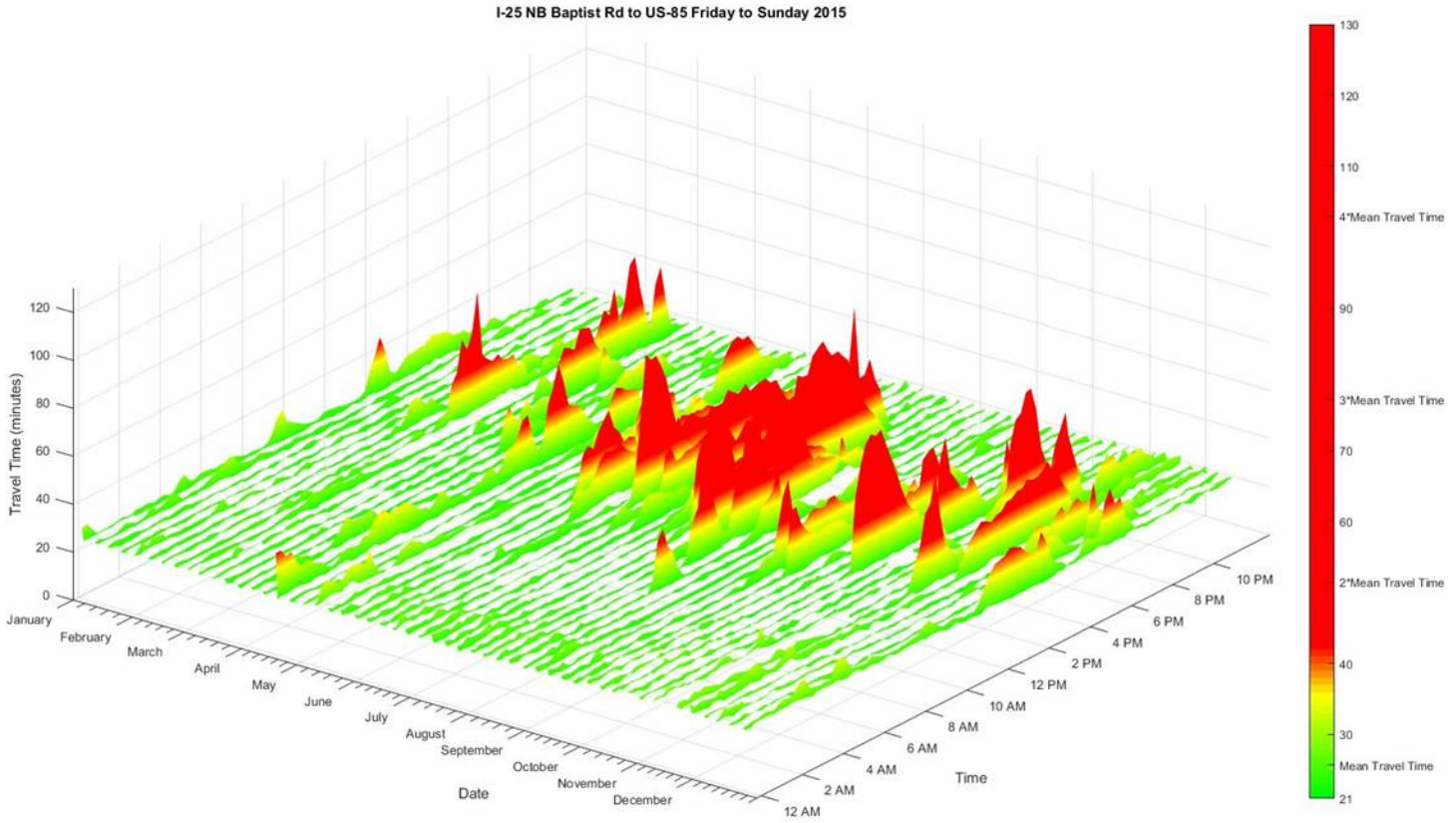


Exhibit 12 – Southern Segment – Northbound Weekends (Fri-Sat-Sun): 2015

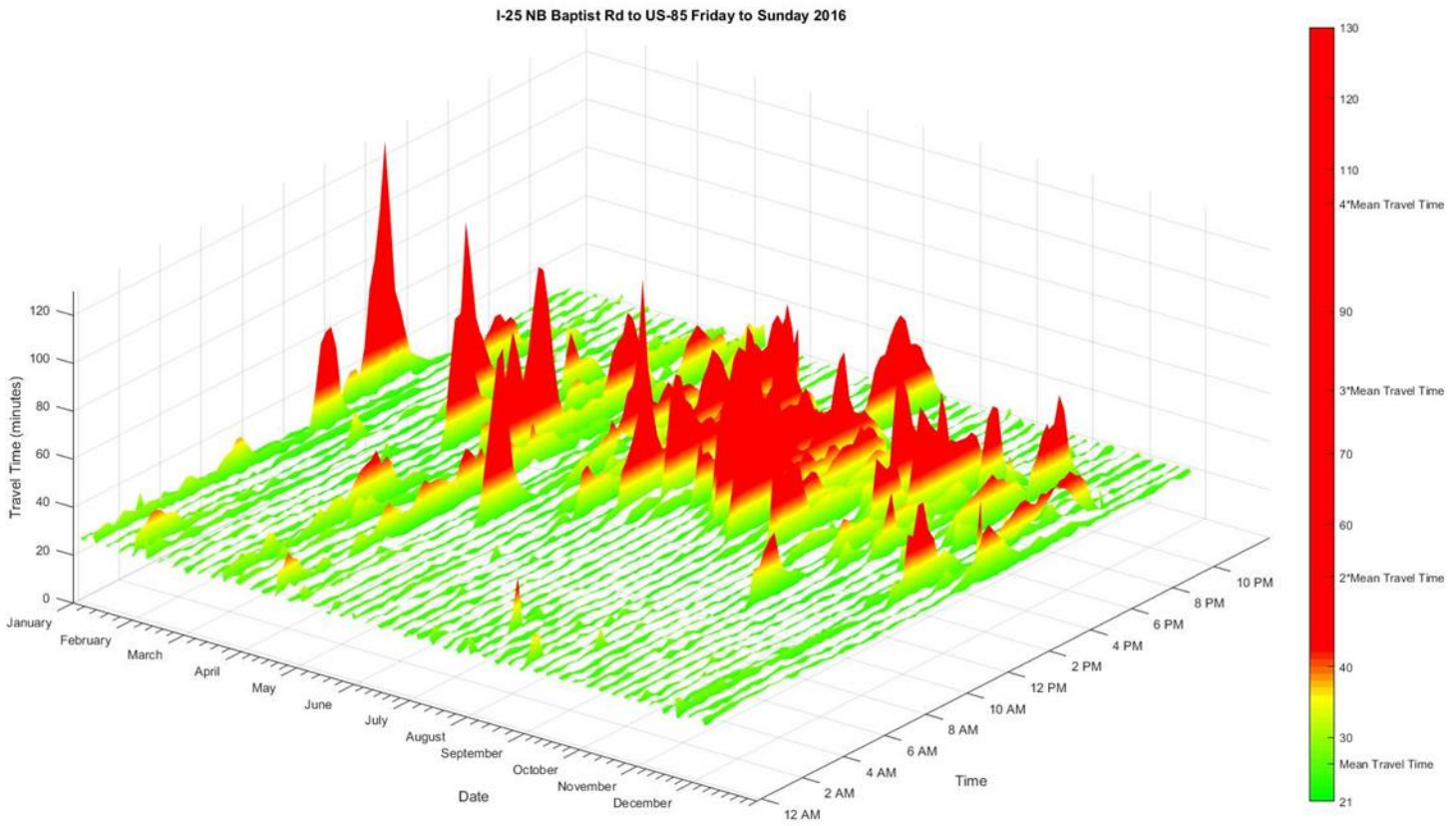


Exhibit 13 – Southern Segment – Northbound
Weekends (Fri-Sat-Sun): 2016

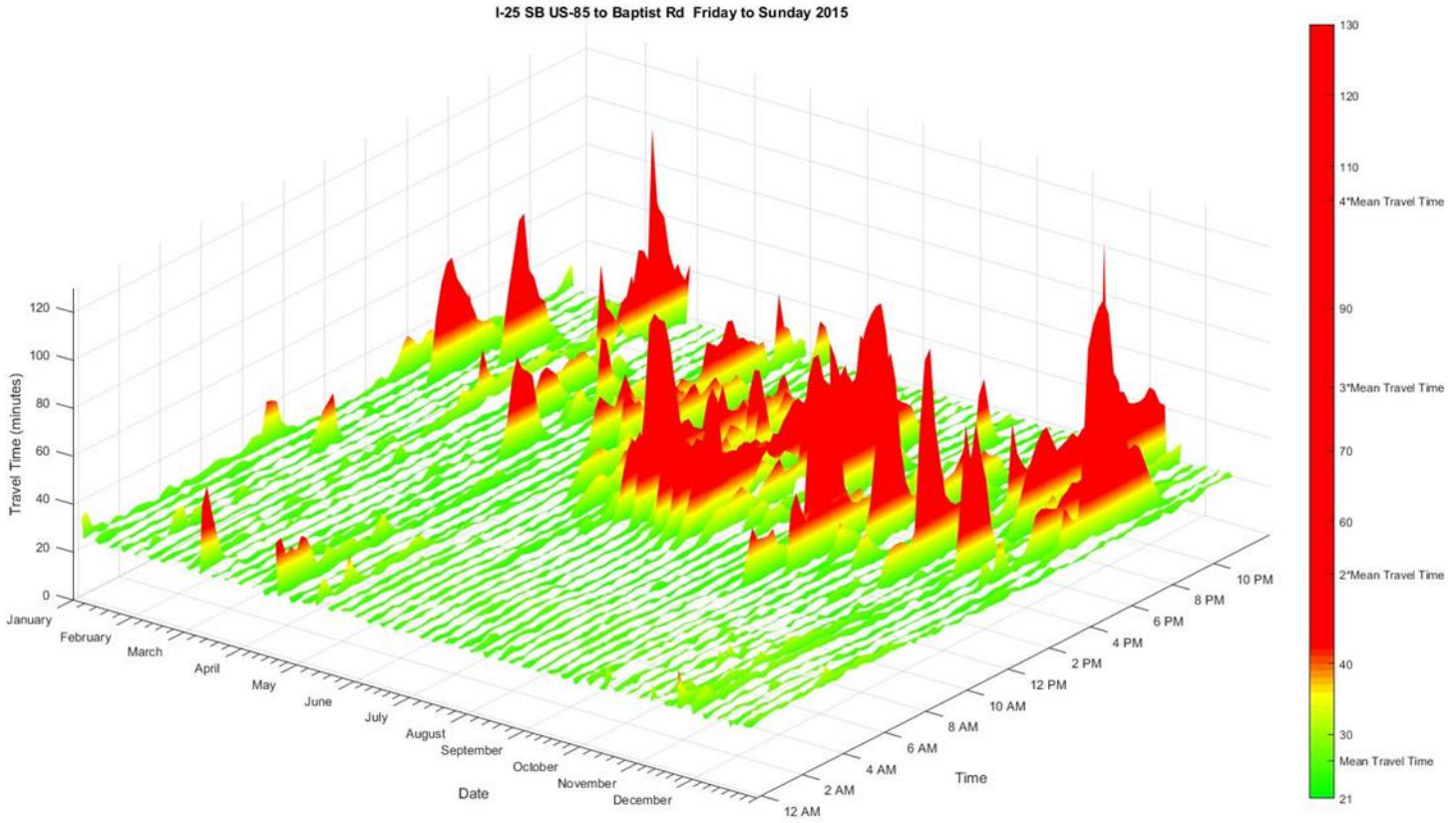


Exhibit 14 – Southern Segment – Southbound Weekends (Fri-Sat-Sun): 2015

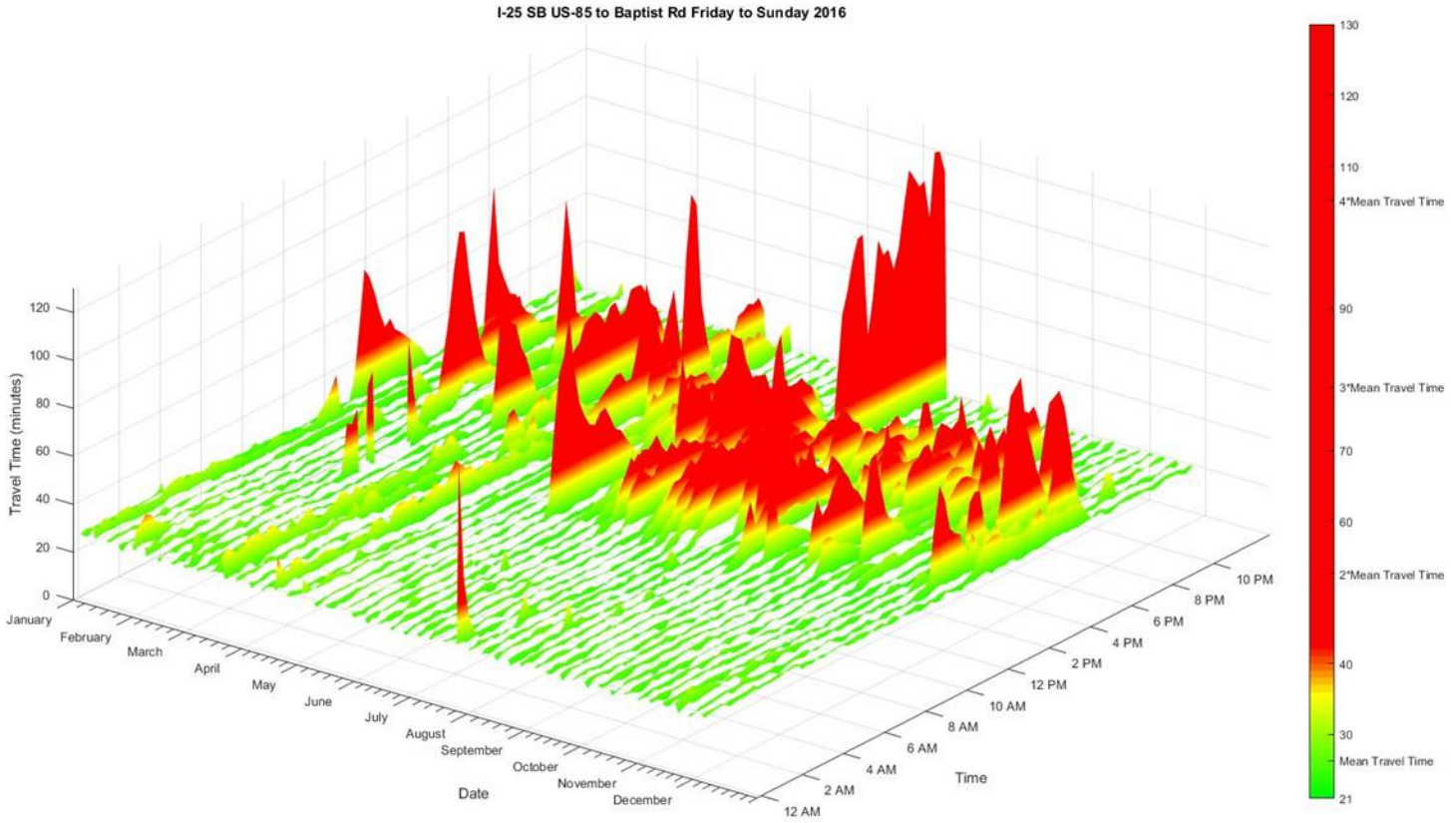


Exhibit 15 – Southern Segment – Southbound
Weekends (Fri-Sat-Sun): 2016

Causal Factor Analysis for Fair or Poor Days of 2015													
Event Type		Total Year				Day of Week							
		Count		% of Total Number of Events		Count				% of Total for Event Type			
						Weekday		Weekend		Weekday		Weekend	
Incidents		106		43.6%		44		62		41.5%		58.5%	
Weather		17		7.0%		10		7		58.8%		41.2%	
Planned/Special Event		12		4.9%		9		3		75.0%		25.0%	
Unaccounted/ Congestion	Monday	13	108	5.3%	44.4%	13	59	-	49	12.0%	54.6%	-	45.4%
	Tuesday	16		14.8%		16		-		14.8%		-	
	Wednesday	13		5.3%		13		-		12.0%		-	
	Thursday	17		7.0%		17		-		15.7%		-	
	Friday	17		7.0%		-		17		-		15.7%	
	Saturday	10		4.1%		-		10		-		9.3%	
	Sunday	22		9.1%		-		22		-		20.4%	
TOTAL		243		100.0%		122		121		50.2%		49.8%	

Exhibit 16 – Southern Segment
Causal Factors 2015

Causal Factor Analysis for Fair or Poor Days of 2016													
Event Type		Total Year			Day of Week								
		Count		% of Total Number of Events		Count				% of Total for Event Type			
						Weekday		Weekend		Weekday		Weekend	
Incidents		96		36.8%		34		62		35.4%		64.6%	
Weather		10		3.8%		6		4		60.0%		40.0%	
Planned/Special Event		25		9.6%		20		5		80.0%		20.0%	
Unaccounted/ Congestion	Monday	20	130	7.7%	49.8%	20	73	-	57	15.4%	56.2%	-	43.8%
	Tuesday	16		12.3%		16		-		12.3%		-	
	Wednesday	20		7.7%		20		-		15.4%		-	
	Thursday	17		6.5%		17		-		13.1%		-	
	Friday	21		8.0%		-		21		-		16.2%	
	Saturday	15		5.7%		-		15		-		11.5%	
	Sunday	21		8.0%		-		21		-		16.2%	
TOTAL		261		100.0%		133		128		51.0%		49.0%	

Exhibit 17 – Southern Segment
Causal Factors 2016

Northern Segment

Unlike the southern segment, the northern segment of the corridor operated more like a typical suburban commuter corridor with predominant northbound AM peak period traffic and southbound PM peak period traffic. Exhibits 18 through 31, display the travel time reliability analysis for the northern segment. As shown in Exhibit 18, most of Poor travel times (more than twice as long as free-flow travel time) in the northbound northern segment occurred in the morning hours and were fairly equally distributed throughout the year. The same general trend appeared in 2016, as shown in Exhibit 19, except the duration of Poor travel reliability and number of Poor travel days decreased in 2016. This decrease from 2015 to 2016 can be attributed to the completion of the "I-25 lane balance" project which constructed an additional lane on I-25 in each direction from Ridge Gate Parkway to C470. A similar, but less significant, decrease also occurred southbound between 2015 and 2016 as shown in Exhibits 20 and 21

Like the southern segment, the travel time reliability data was further stratified into weekdays (Monday through Thursday), and weekends (Friday through Sunday) for the northern segment. The effects of the lane balance project were equally clear upon review of the weekday travel time reliability as shown in Exhibits 22 through 25. The commuter peak periods were still observed but the occurrence of Fair and Poor travel time reliability was reduced from 2015 to 2016. There were a few exceptions which were attributable to incidents, weather, or planned/special events.

As shown in Exhibits 26 through 29, there was not the same type of weekend travel time reliability issue in the northern segment that were observed in the southern segment.

Exhibits 30 and 31 show the causal factor analysis for 2015 and 2016, respectively. The days with Fair or Poor travel time reliability were investigated to determine if specific factors contributed to the changes in reliability. The same methodology used for the southern segment analysis was applied to the northern segment.

In 2015, more than 85% of the days of the year (312) had at least one 15 minute period experiencing Fair or Poor travel time reliability. This number decreased to 256, or 71% of the days of the year in 2016. This decrease is attributable to the completion of the lane balance project. On a percentage basis, the causal factors remained about the same between 2015 and 2016 with congestion comprising approximately 50% of the days and incidents accounting for roughly 36% of the days of Fair or Poor travel time reliability.

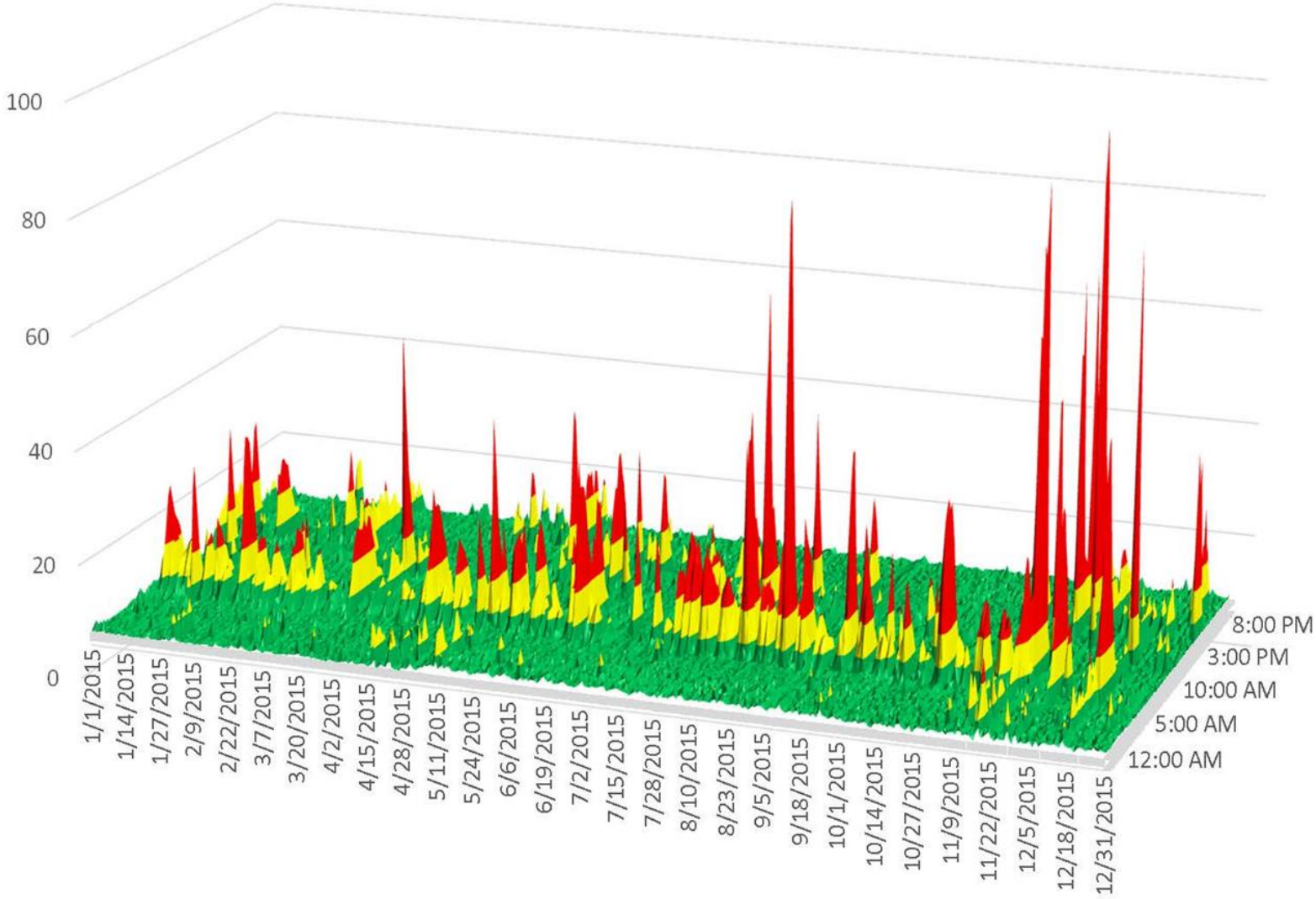


Exhibit 18 – Northern Segment – Northbound
All Days in 2015

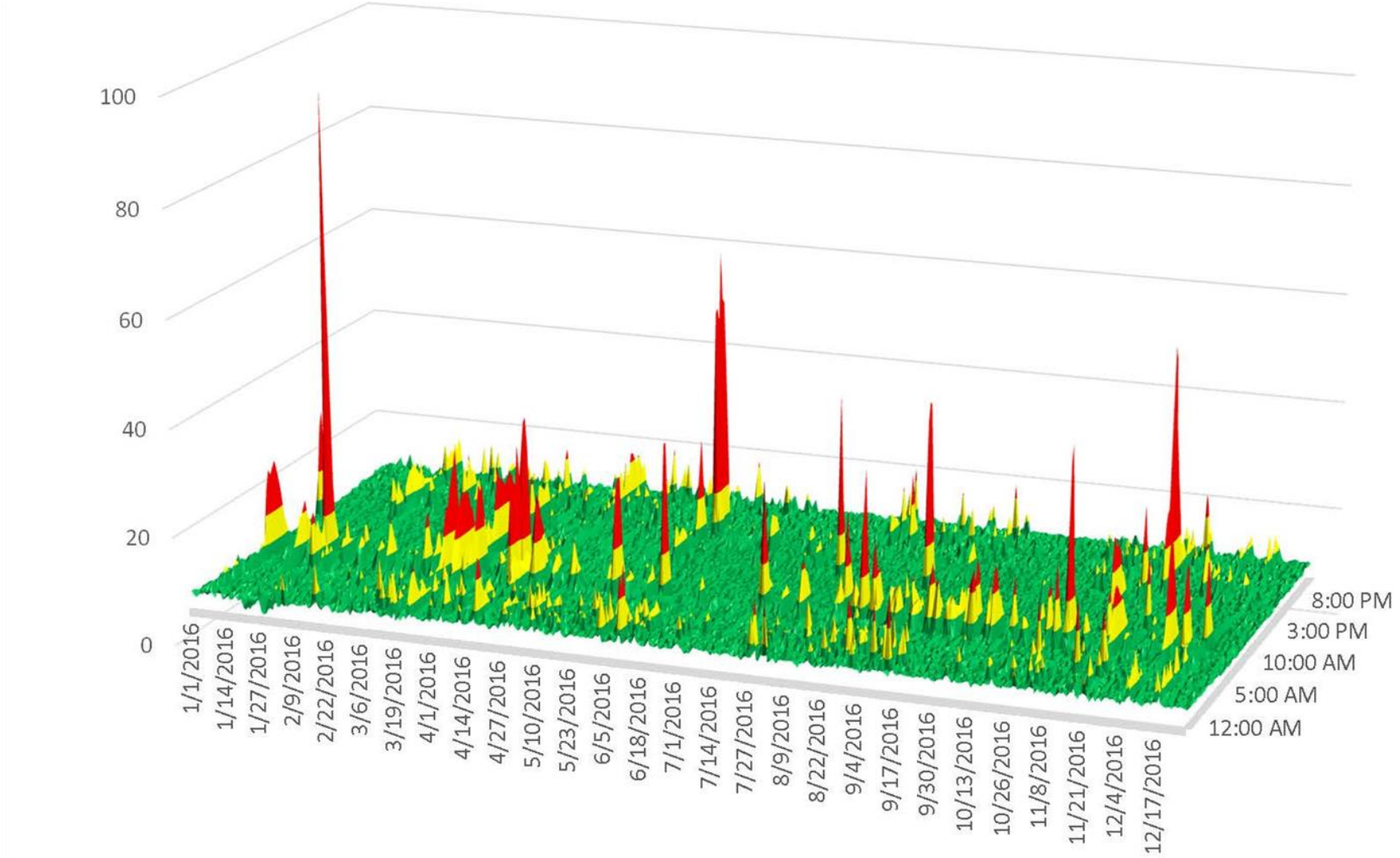


Exhibit 19 – Northern Segment – Northbound
All Days in 2016

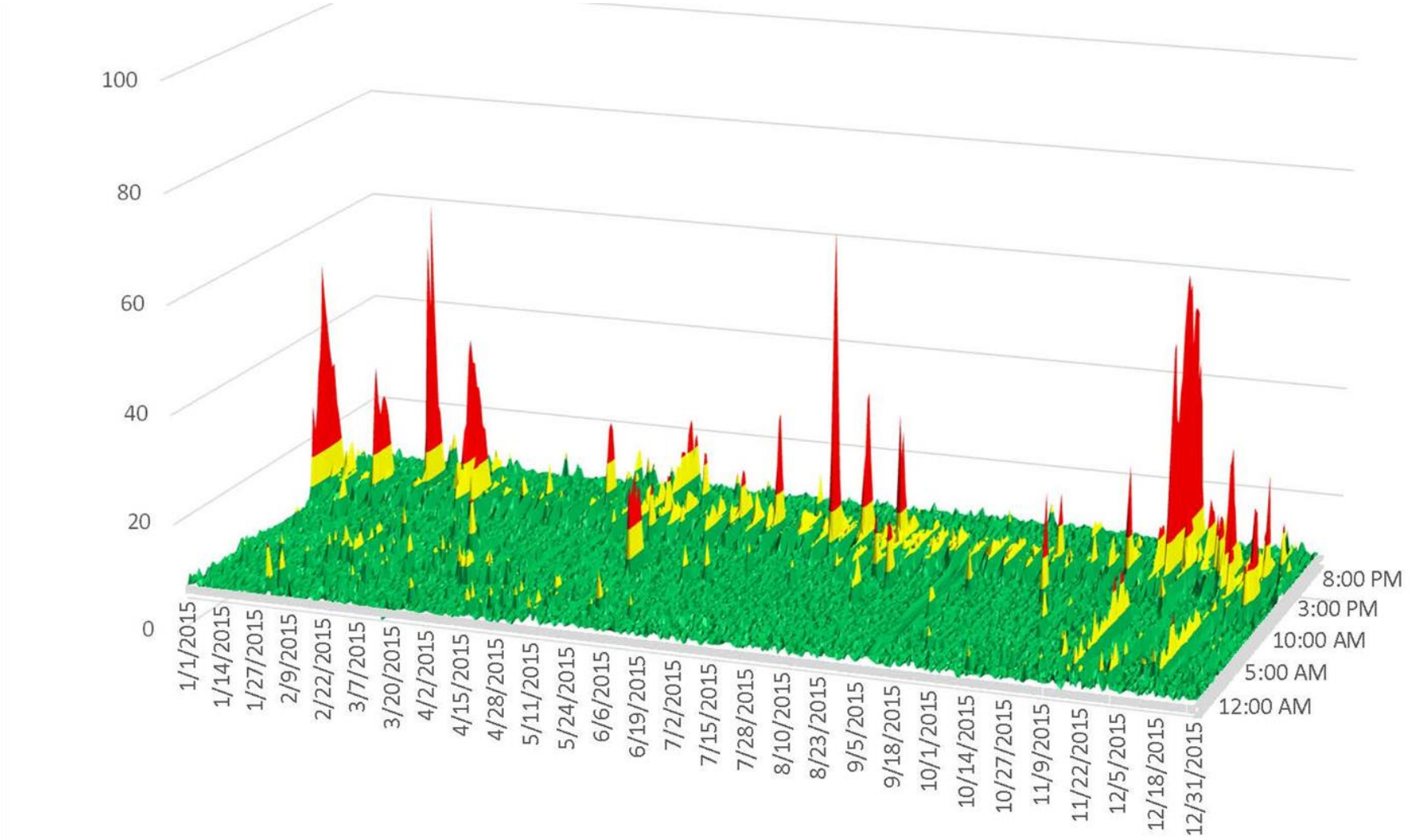


Exhibit 20 – Northern Segment – Southbound
All Days in 2015

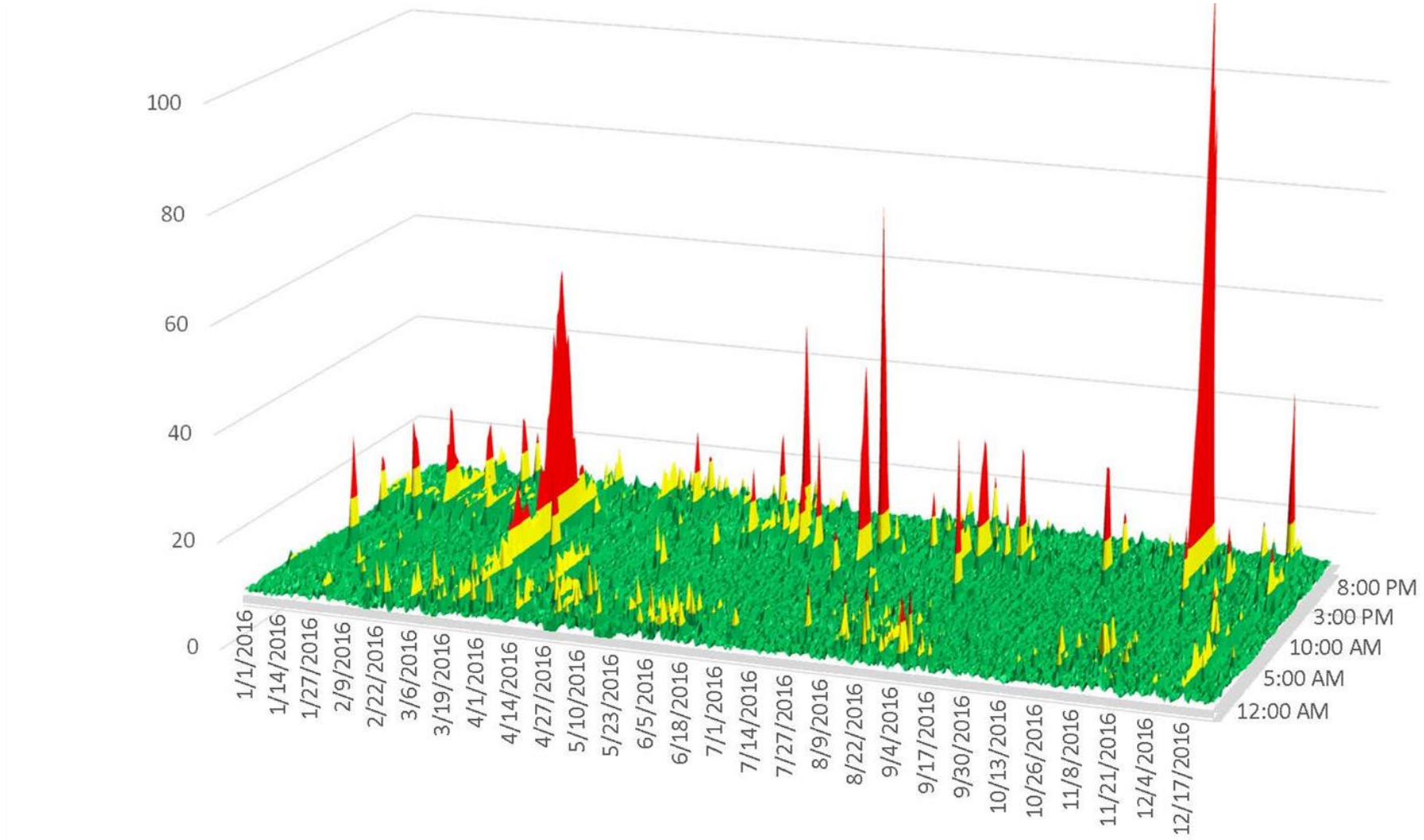


Exhibit 21 – Northern Segment – Southbound
All Days in 2016

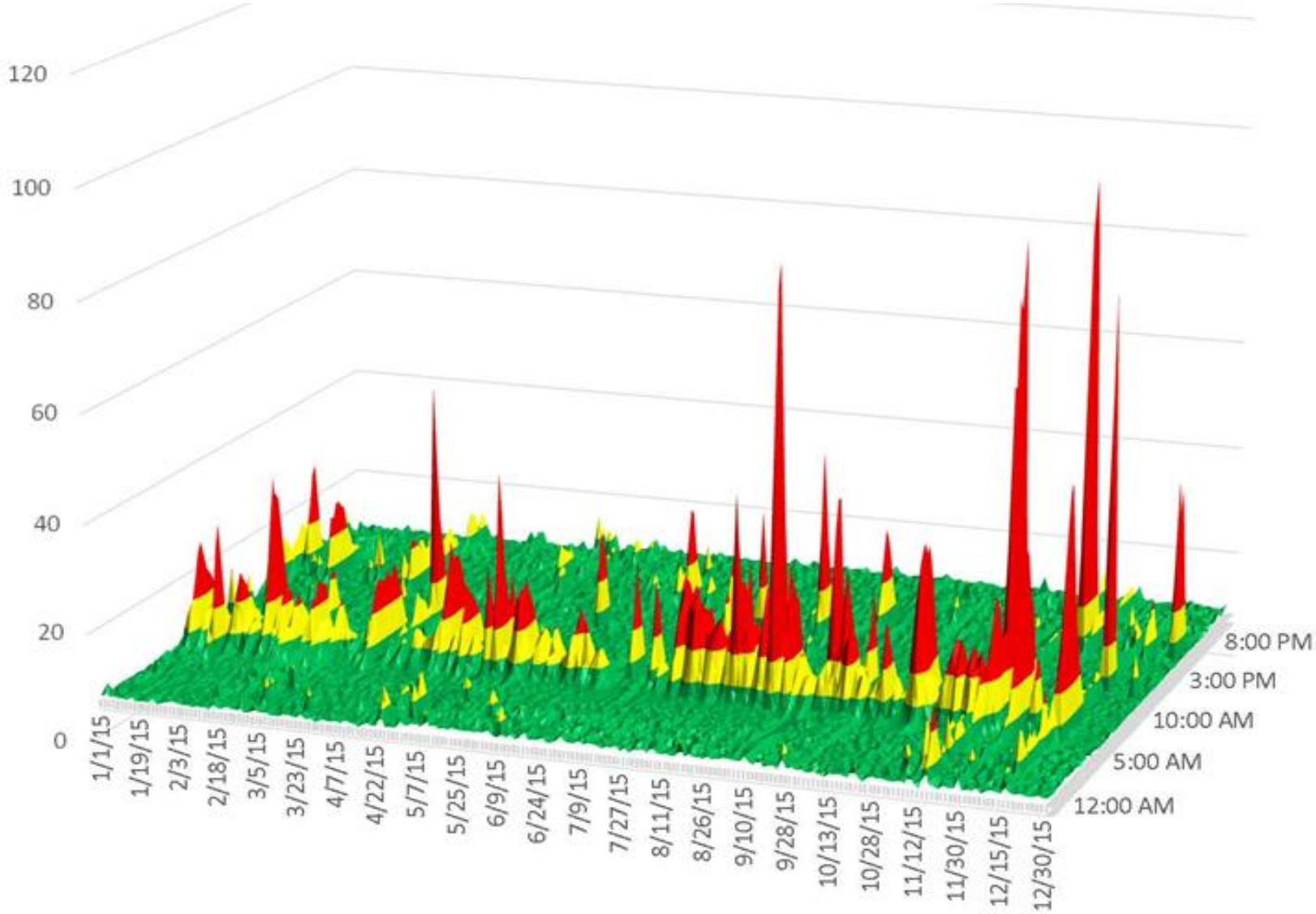


Exhibit 22 – Northern Segment – Northbound Weekdays (M-R): 2015

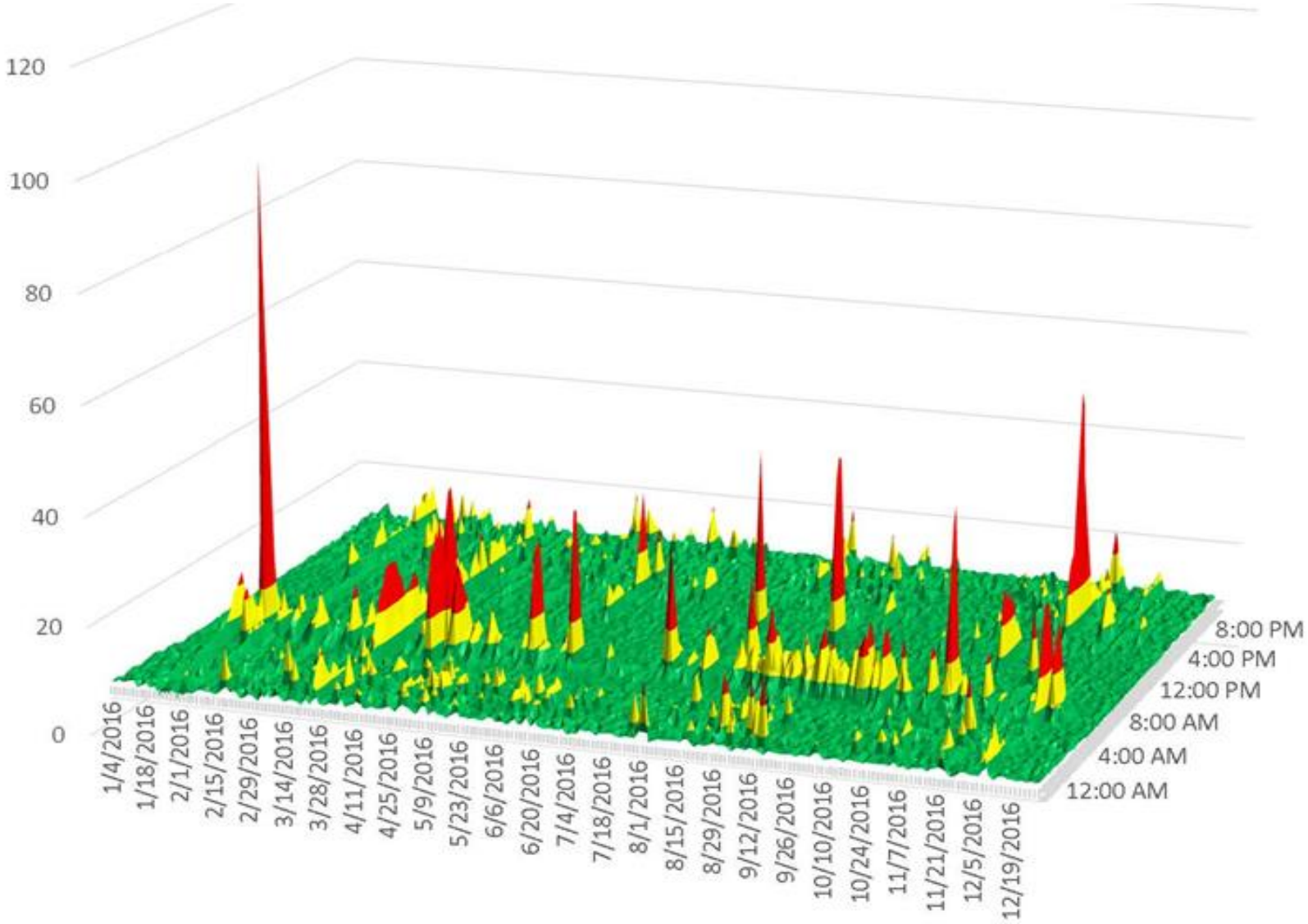


Exhibit 23 – Northern Segment – Northbound Weekdays (M-R): 2016

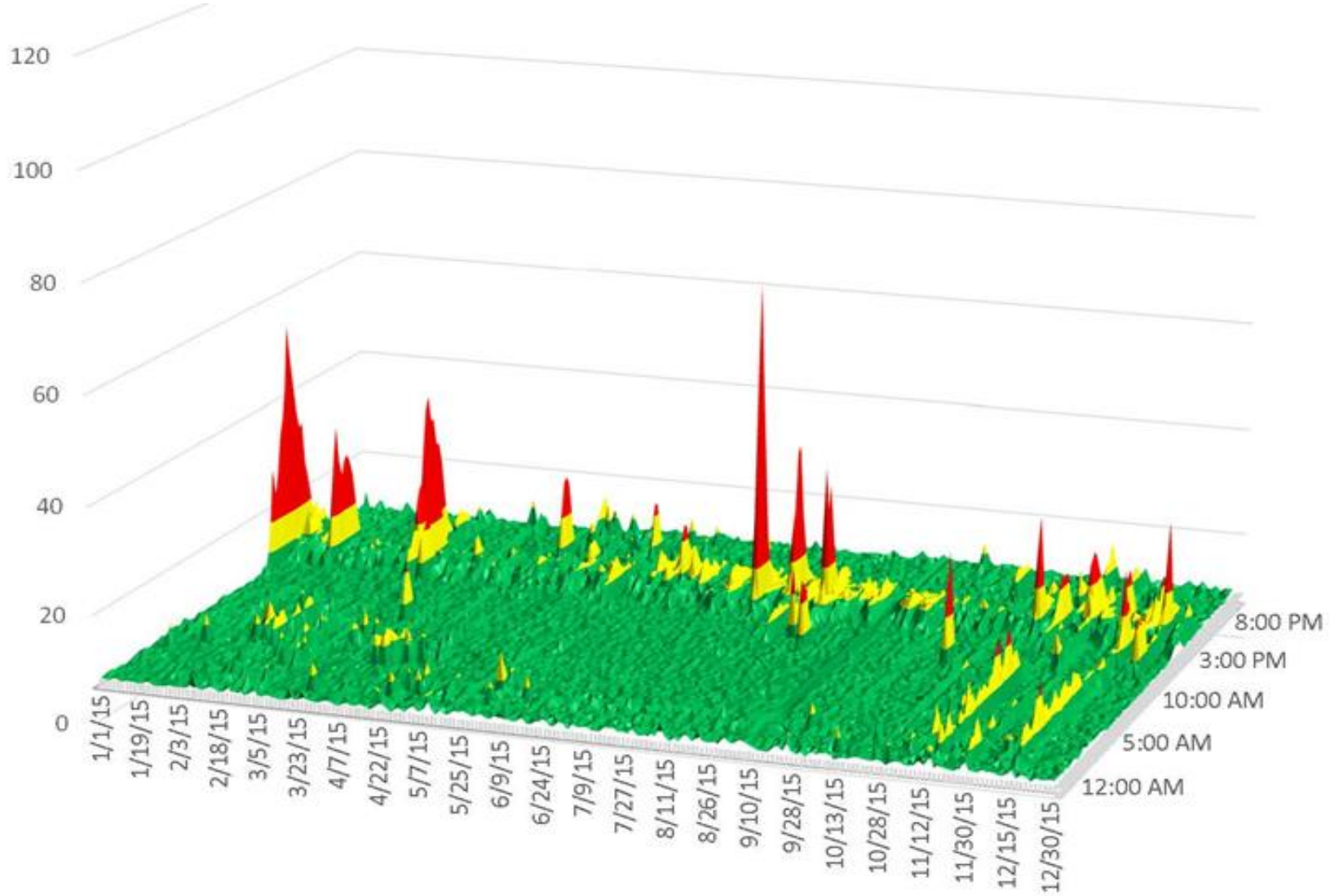


Exhibit 24 – Northern Segment – Southbound Weekdays (M-R): 2015

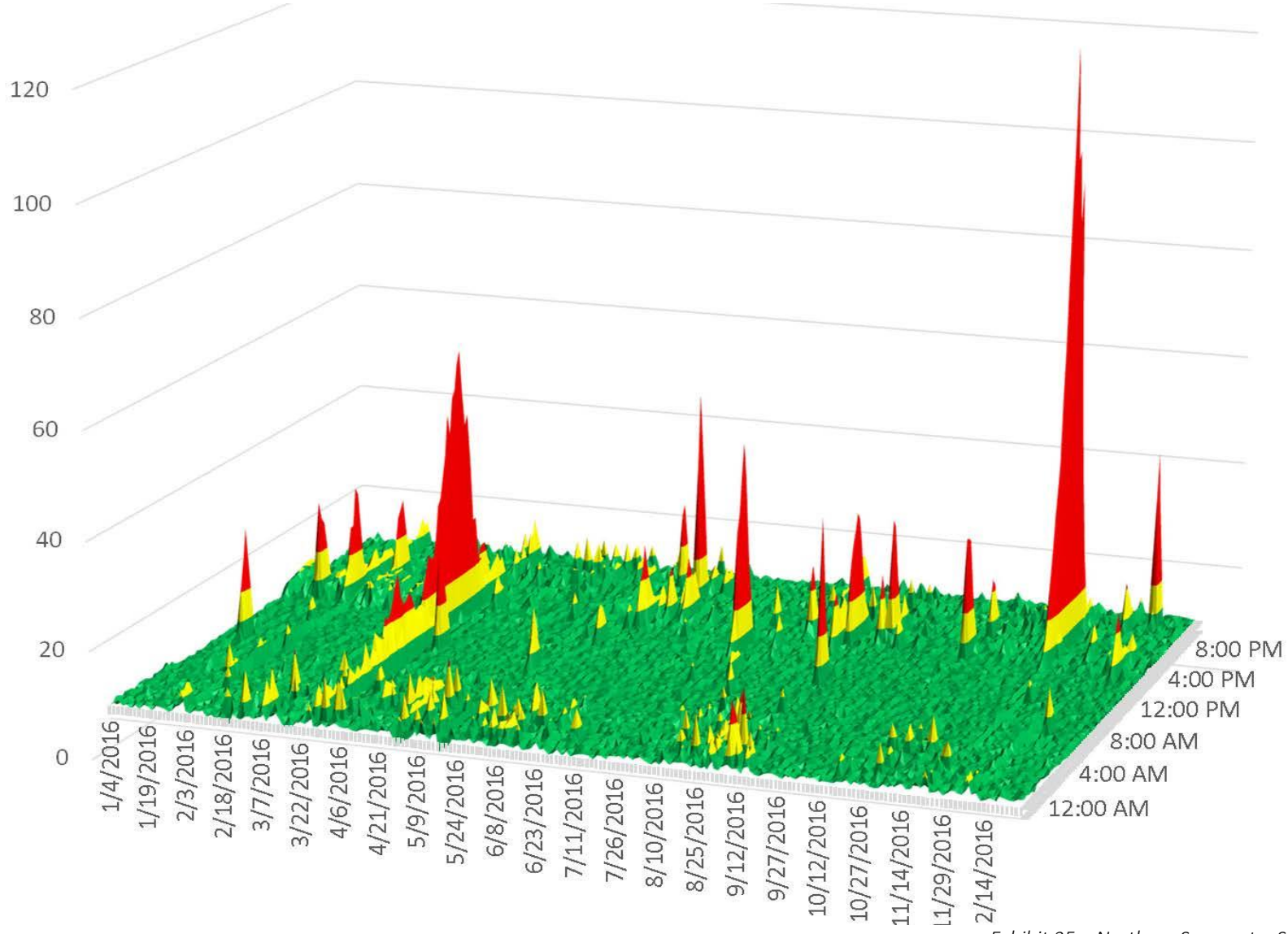


Exhibit 25 – Northern Segment – Southbound Weekdays (M-R): 2016

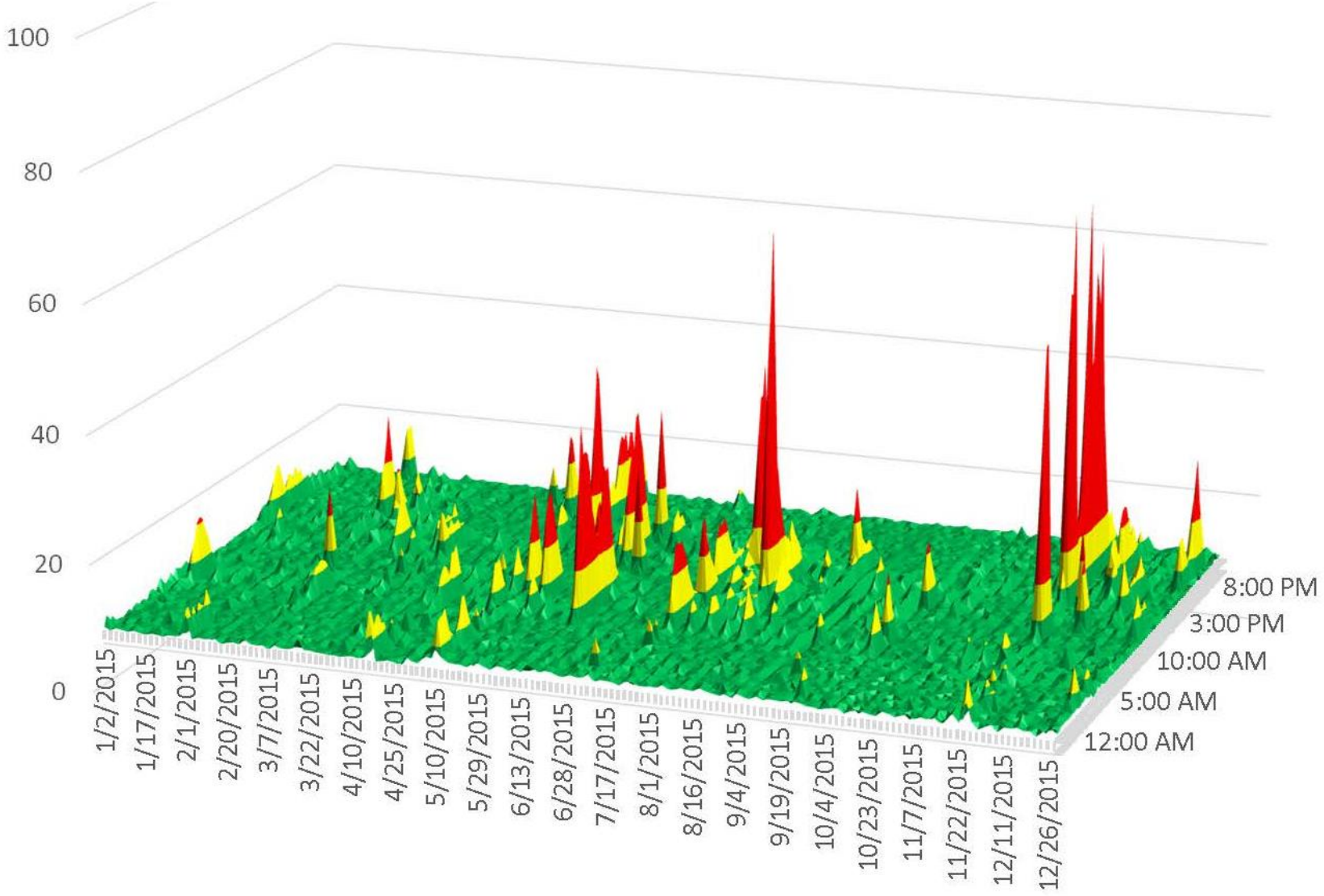


Exhibit 26 – Northern Segment – Northbound Weekends (Fri-Sat-Sun): 2015

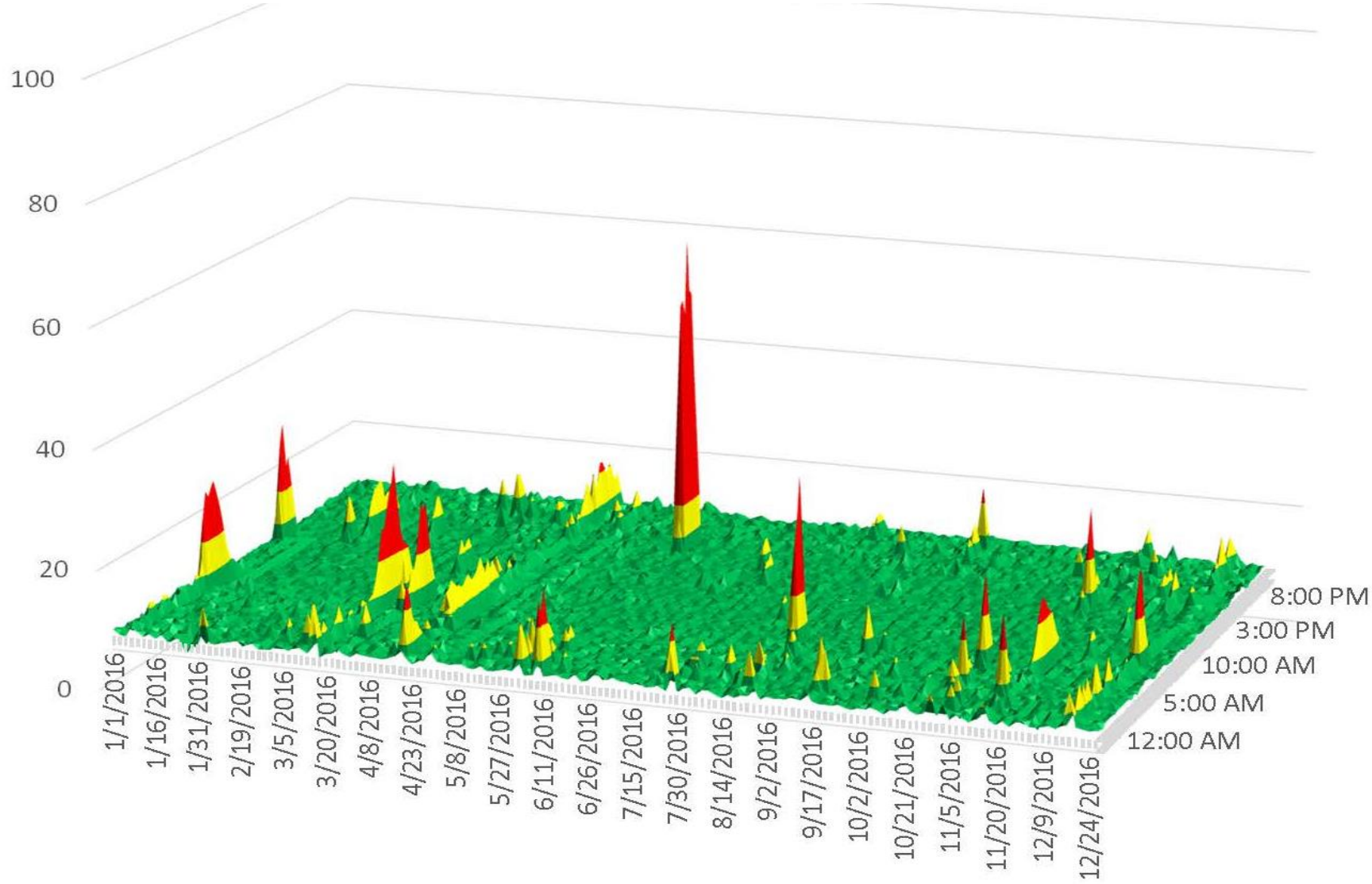


Exhibit 27 – Northern Segment – Northbound Weekends (Fri-Sat-Sun): 2016

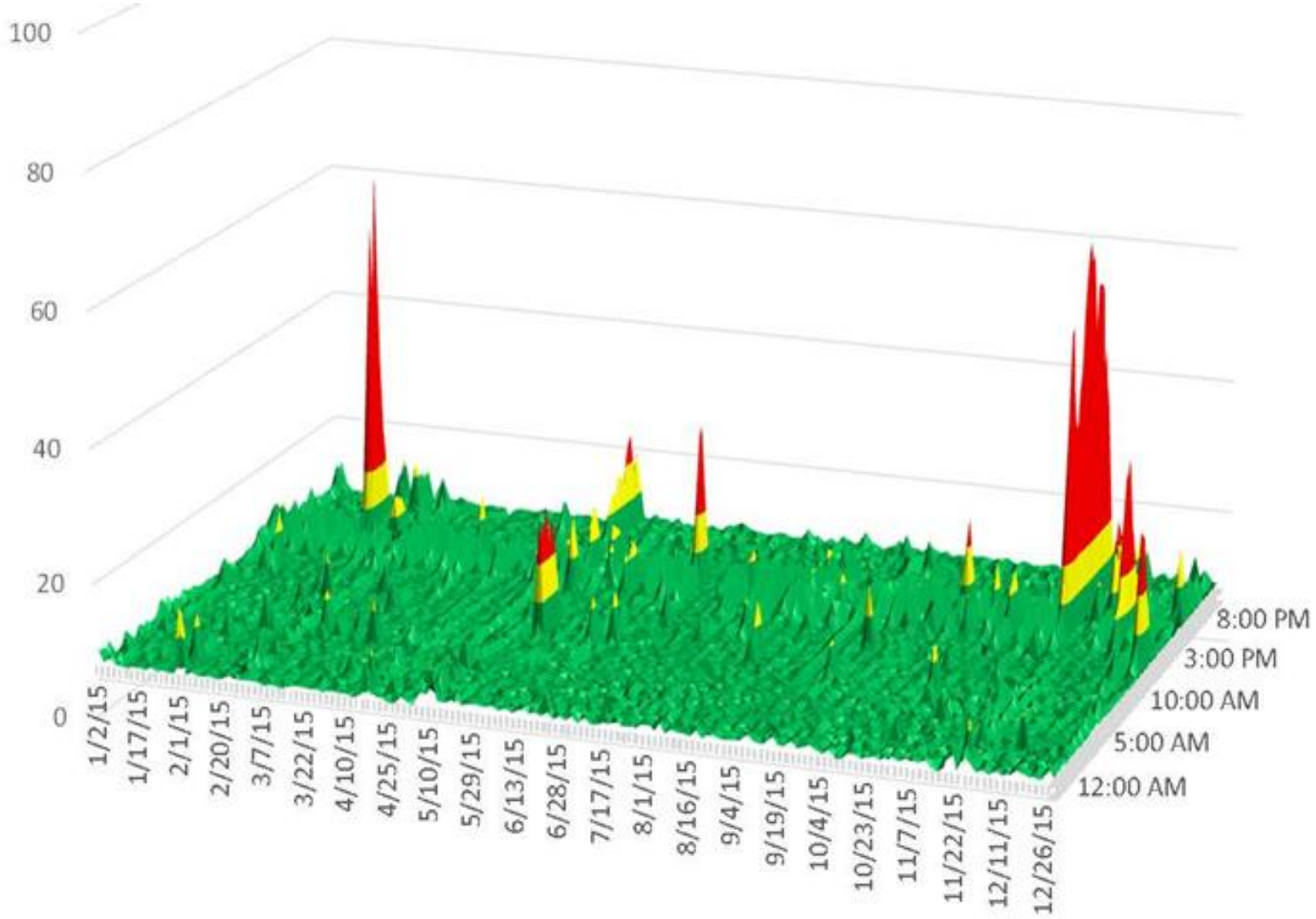


Exhibit 28 – Northern Segment – Southbound Weekends (Fri-Sat-Sun): 2015

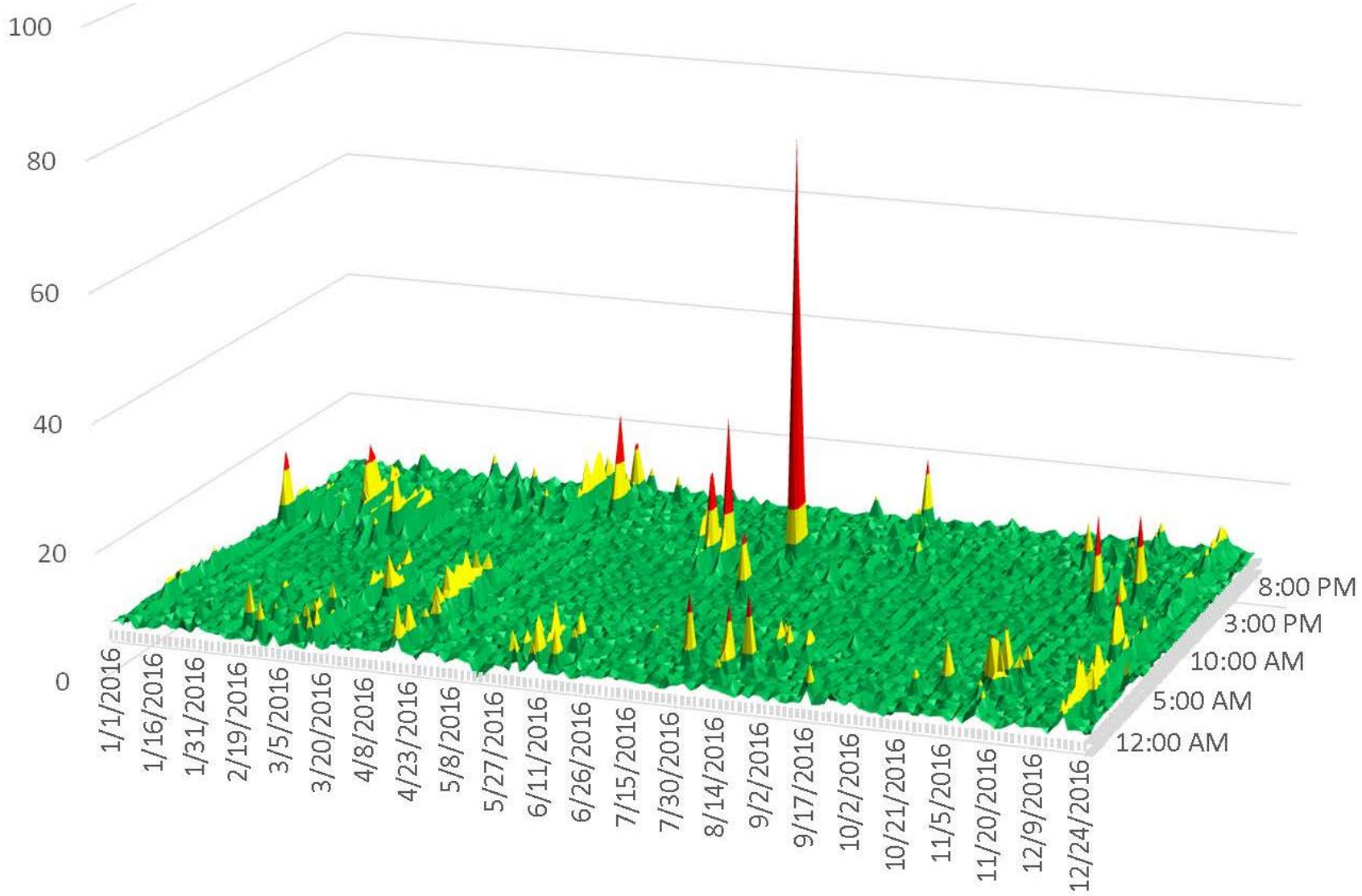


Exhibit 29 – Northern Segment – Southbound Weekends ((Fri-Sat-Sun): 2016

Causal Factor Analysis for Fair or Poor Days of 2015												
Event Type		Total Year				Day of Week						
		Count		% of Total Number of Events		Count				% of Total for Event Type		
						Weekday		Weekend		Weekday		Weekend
Incidents		111		35.6%		69		42		62.2%		37.8%
Weather		11		3.5%		4		7		36.4%		63.6%
Planned/Special Event		37		11.9%		28		9		75.7%		24.3%
Unaccounted/ Congestion	Monday	22	153	7.0%	49.0%	22	109	-	44	14.4%	71.2%	-
	Tuesday	28		9.0%		28		-		18.3%		-
	Wednesday	37		11.9%		37		-		24.1%		-
	Thursday	22		7.0%		22		-		14.4%		-
	Friday	17		5.5%		-		17		-		11.1%
	Saturday	16		5.1%		-		16		-		10.5%
	Sunday	11		3.5%		-		11		-		7.2%
TOTAL		312		100%		210		102		67.3%		32.7%

Exhibit 30 – Northern Segment
Causal Factors 2015

Causal Factor Analysis for Fair or Poor Days of 2016												
Event Type		Total Year				Day of Week						
		Count		% of Total Number of Events		Count				% of Total for Event Type		
						Weekday		Weekend		Weekday		Weekend
Incidents		91		35.5%		60		31		65.9%		34.1%
Weather		1		0.4%		0		1		0%		100%
Planned/Special Event		36		14.1%		29		7		80.6%		19.4%
Unaccounted/ Congestion	Monday	19	128	7.4%	50.0%	19	85	-	43	14.8%	66.4%	-	33.6%
	Tuesday	27		21.1%		27		-		21.1%		-	
	Wednesday	17		6.7%		17		-		13.3%		-	
	Thursday	22		8.6%		22		-		17.2%		-	
	Friday	22		8.6%		-		22		-		17.2%	
	Saturday	6		2.3%		-		6		-		4.7%	
	Sunday	15		5.7%		-		15		-		11.7%	
TOTAL		256		100%		174		82		68.0%		32.0%	

Exhibit 31 – Northern Segment
Causal Factors 2016

Conclusions

For the southern segment, the Poor travel time reliability occurred northbound on weekends during summer and fall afternoons as well as southbound weekday evenings. From 2015 to 2016, there was a 7% increase in the total number of days with Fair or Poor travel times and congestion-related increases in travel time grew by 20%. The increased travel times as a result of incidents predominantly occurred on weekends. Exhibit 32 summarizes the causal factors evaluation for the southern segment.

Event Type	Number of Days		Percentage of Days		Change
	2015	2016	2015	2016	From 2015 to 2016
Incidents	106	96	29%	28%	
Weather	17	10	5%	3%	
Special Events	12	25	3%	7%	
Congestion	108	130	30%	38%	
Uncongested	122	83	33%	24%	
Total Days Analyzed	365	344	100%	100%	

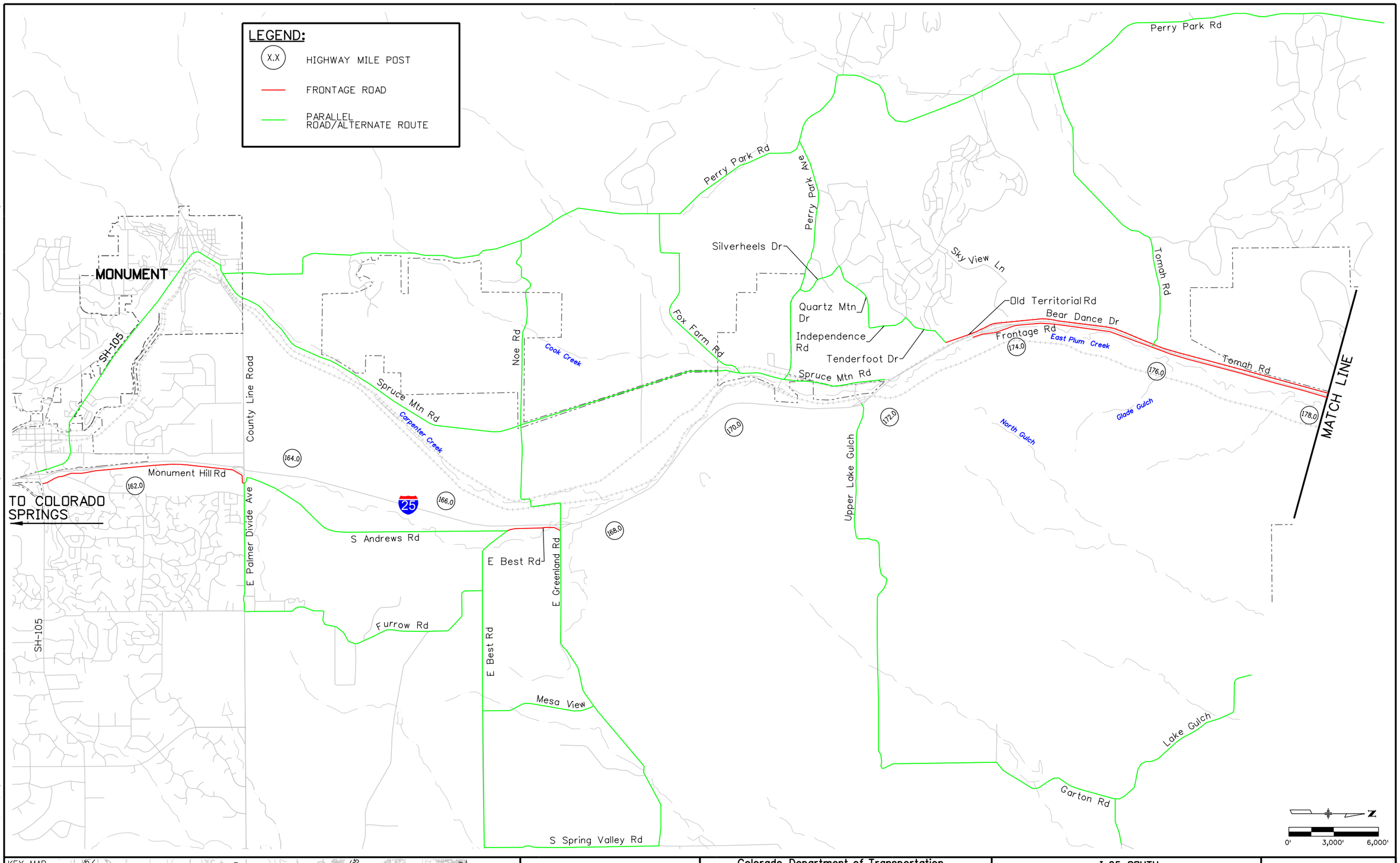
Exhibit 32 Causal Factor Summary: Southern Segment

For the northern segment, the Poor travel time reliability occurred northbound during AM weekday peaks and southbound PM weekday peaks. From 2015 to 2016, there was an 18% decrease in the total number of days with Fair or Poor travel times and a 16% decrease in the number of congested days. Both of these decreases can be primarily attributed to the completion of the I-25 Lane Balance Project. Exhibit 33 summarizes the causal factors evaluation for the northern segment.

Event Type	Number of Days		Percentage of Days		Change
	2015	2016	2015	2016	From 2015 to 2016
Incidents	111	91	30%	25%	
Weather	11	1	3%	1%	
Special Events	37	36	10%	10%	
Congestion	153	128	42%	35%	
Uncongested	53	107	15%	29%	
Total Days Analyzed	365	363	100%	100%	

Exhibit 33 Causal Factor Summary: Northern Segment

Appendix D
Alternate Routes, Frontage Roads, and Rail Crossings Plan Sheets



KEY MAP

ch2m

Colorado Department of Transportation
Region 1
2000 S. Holly Street
Denver, Co 80222
Phone: 303-757-9295
JKE

I-25 SOUTH
FRONTAGE ROAD SYSTEM

Sheet Number 1 of 2

LEGEND:

X.X HIGHWAY MILE POST

FRONTAGE ROAD

PARALLEL ROAD/ALTERNATE ROUTE

MATCH LINE

East Plum Creek

Tomah Rd

S Wilcox St

Wolfensberger Rd

Plum Creek Pkwy

Auburn Dr

Meadows Blvd

Meadows Pkwy

Prairie Hawk

US85

E Happy Canyon Rd

Castle Pines Pkwy

Monarch Blvd

Quebec

LONE TREE

Yosemite

C470

Cottonwood Creek

S Havana St

25

TO DENVER

E470

Hess Rd

Badger Gulch

Peoria

Lincoln Ave

Ridgegate Pkwy

Happy Canyon Creek

Wilcox

Front St

E Scott Blvd

Hangmans Gulch

CASTLE ROCK

Woodlands Blvd

5th

Gilbert

Crystal Valley Pkwy

Founders Pkwy

Lake Gulch

Crowfoot Valley

Chambers

CO-86

SH-83

180.0

182.0

184.0

186.0

188.0

190.0

192.0

194.0

0' 3,000' 6,000'

KEY MAP

TO COLORADO SPRINGS

SH-105 160 165 170 175 25 180 US85 185 190 C470 195 TO DENVER

ch2m

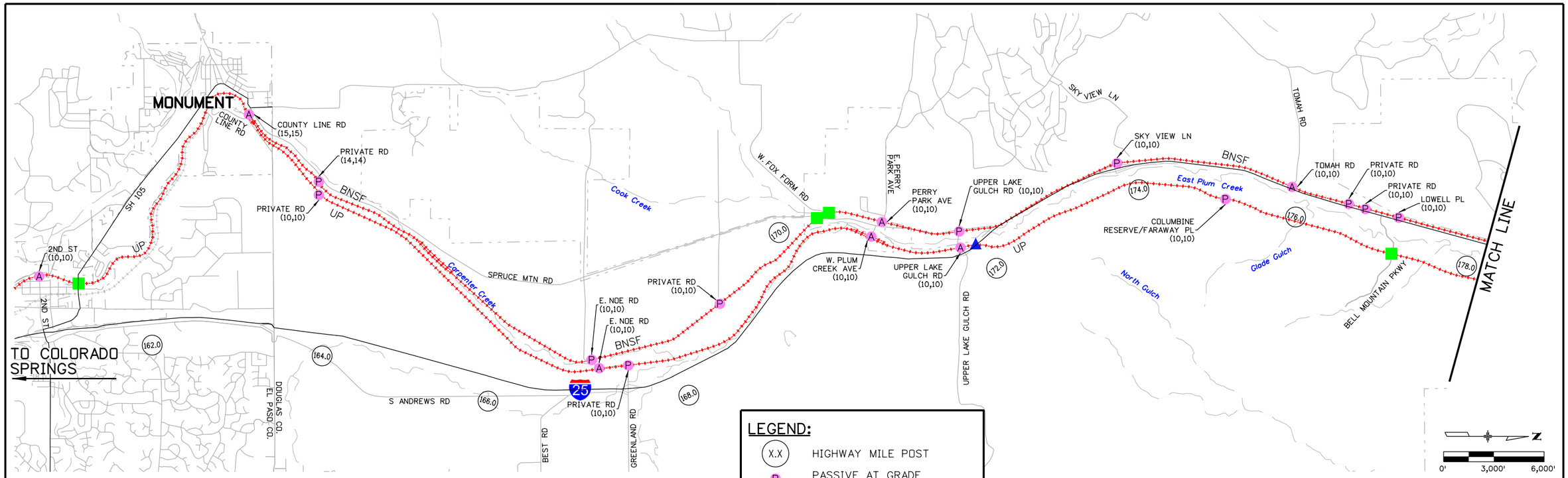
Colorado Department of Transportation

2000 S. Holly Street
Denver, Co 80222
Phone: 303-757-9295

Region 1 JKE

I-25 SOUTH
FRONTAGE ROAD SYSTEM

Sheet Number 2 of 2



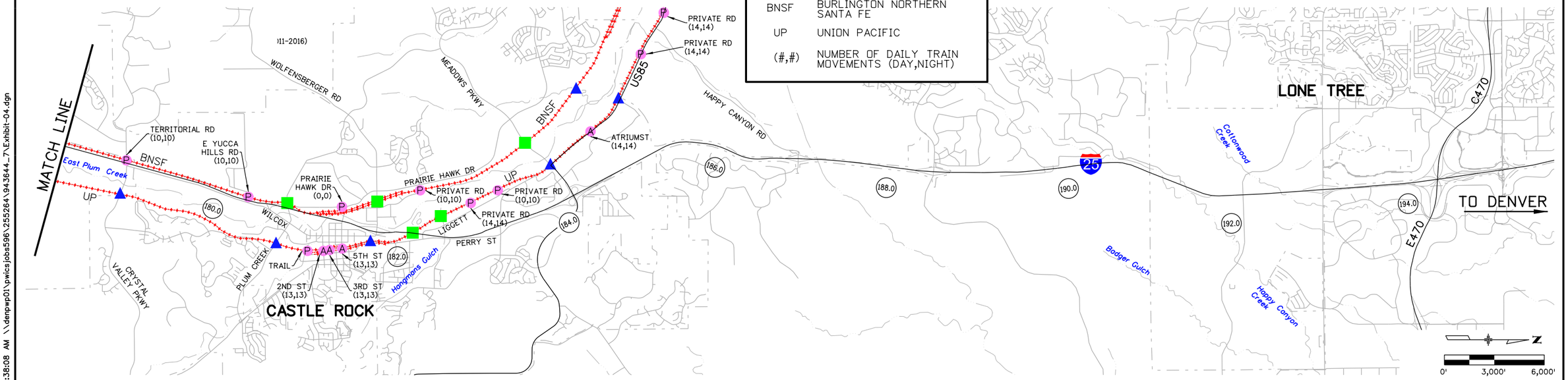
LEGEND:

X.X	HIGHWAY MILE POST
P	PASSIVE AT GRADE CROSSING
A	ACTIVE AT GRADE CROSSING
	RR OVER STREET
	RR UNDER STREET
BNSF	BURLINGTON NORTHERN SANTA FE
UP	UNION PACIFIC
(#,#)	NUMBER OF DAILY TRAIN MOVEMENTS (DAY,NIGHT)

NOTES

1. PASSIVE CONTROL SYSTEMS PROVIDE WARNING THROUGH STATIC SIGNS AND PAVEMENT MARKINGS.

2. ACTIVE TRAFFIC CONTROL SYSTEMS WARN USERS OF APPROACHING TRAINS. THIS WARNING CONSISTS OF FLASHING LIGHTS AND SOUNDS (COMBINED WITH STATIC CONTROLS SUCH AS SIGNS AND PAVEMENT MARKINGS) WHICH ARE TRIGGERED BY THE TRAIN.



KEY MAP

ch2m

Colorado Department of Transportation
Region 1
2000 S. Holly Street
Denver, Co 80222
Phone: 303-757-9295
JKE

I-25 SOUTH
RAILROAD CROSSINGS

Sheet Number

DENPWP01$ 11:38:08 AM \\denpwp01\pwics\jobs596\255264\943644_7\Exhibit-04.dgn

Appendix E
Travel Demand Modeling Approach Technical Memorandum

steer davies gleave

Memo

To	Mandy Whorton		
Cc	Zeke Lynch, David Cuneo		
From	Mark Feldman		
Date	3 January 2017		
Project	I-25 C-470 to Monument PEL	Project No.	23029301

Technical Memo - Travel Demand Modeling Approach

Introduction

Steer Davies Gleave's role in task order 1 for the I-25 PEL is to give an overview of the available models and recommendation of the preferred model to use for performing the project's travel demand forecasting.

In a prior memo, dated November 14th, 2016, we recommended the use of a version of DRCOG's 4-step travel demand model (COMPASS) that was modified to incorporate high speed rail transit for the ongoing Interregional Connectivity Study (ICS). We primarily recommended this model because of its inclusion of high speed rail, and because of its faster run time compared to activity based models such as DRCOG's newer FOCUS model.

In the past month, however, conversations among the project team and with technical stakeholders and advisors have brought to light a desire to use the most current forecasting tools in the region, i.e. FOCUS, as the newest version (FOCUS II) has substantially reduced run times. We have also learned that the ability to include and analyze high speed rail is not essential for the PEL.

Discussions have also highlighted interest in using a TransModeler (microscopic) model to potentially analyze elements of alternatives. The TransModeler model has also been identified as a critical component of work downstream of the PEL.

Therefore, we have revised our recommendation to 1) develop a macroscopic travel demand model as the main tool for analysis ; the macroscopic model will use FOCUS II as its core component and be supplemented by an interregional trip distribution model, and 2) develop a Transmodeler model to provide more detailed analysis of some alternatives. The details of the development of these models are described in the subsequent sections of this memo.

Macroscopic Travel Demand Model

We will use the latest version of the DRCOG model, FOCUS II, as the core travel demand forecasting tool.

DRCOG FOCUS Component

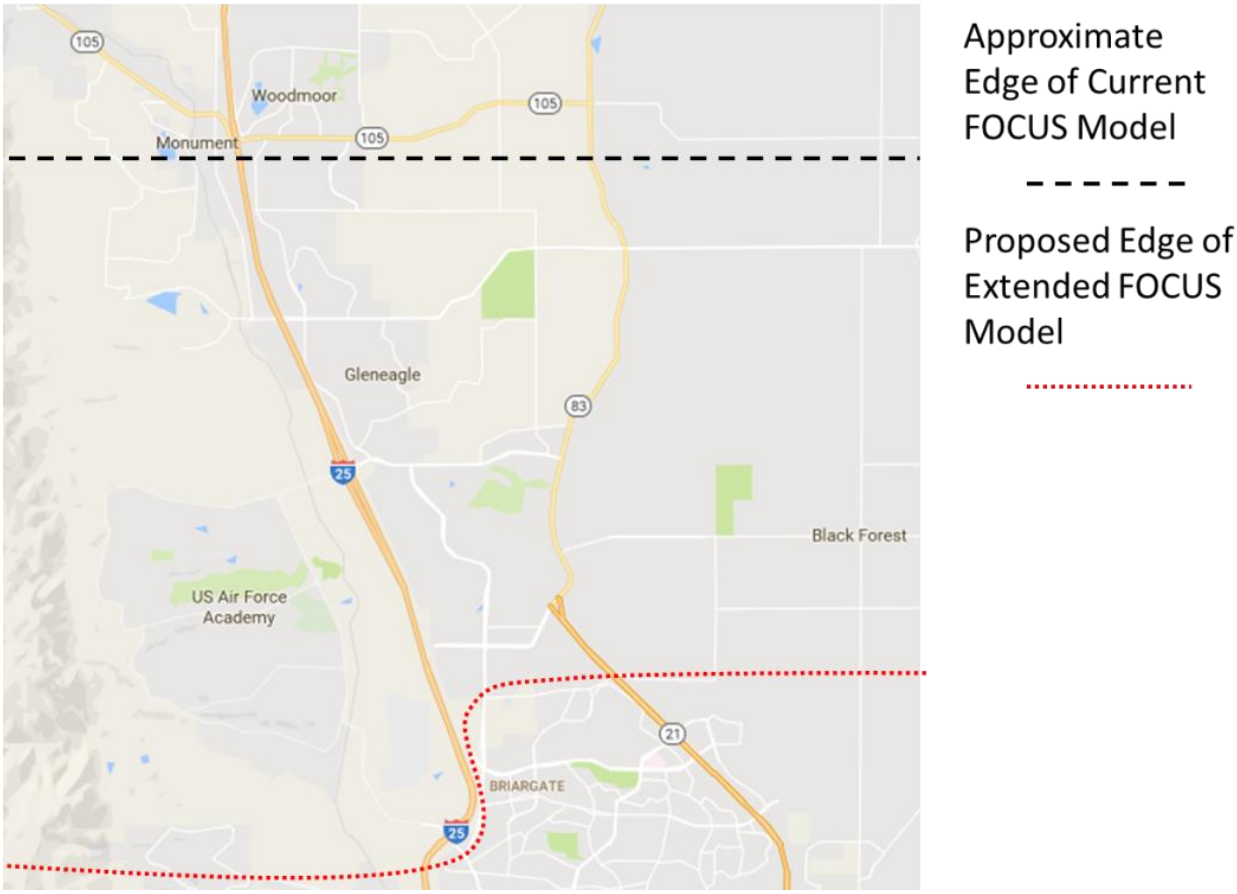
We will run the full FOCUS II model as the starting point of our model. This will provide the initial trip matrices that we will then modify using the trip distribution model described below.

We will perform a detailed calibration and validation of the model's forecasts to observed traffic counts in the study corridor. According to the FOCUS Model Calibration memo[1], the model overstates traffic by about 21% on a screenline which passes through the northern edge of the I-25 PEL study corridor (Castle Rock), and includes counts on two links as part of that screenline. We would collect more extensive traffic data in the study corridor, including on I-25 between every interchange, as well as all on ramps, off ramps and parallel routes, and use that data to establish a higher level model accuracy within the corridor.

After running and calibrating the FOCUS model for our study area, we will extend the highway network for this project since the PEL study corridor extends beyond the FOCUS model project limits. Specifically, the FOCUS model network extends as far south as Palmer Divide Road at the northern edge of Monument, whereas the study corridor extends a mile further south.

To provide a minimal number of likely entrances / exits to the model network for trips passing between the DRCOG and PPACG regions, we propose extending the FOCUS model network. Figure 1 depicts this extension, as compared to the current FOCUS model edge:

Figure 1: Comparison of Southern Edges of FOCUS Model to Proposed Extended Model

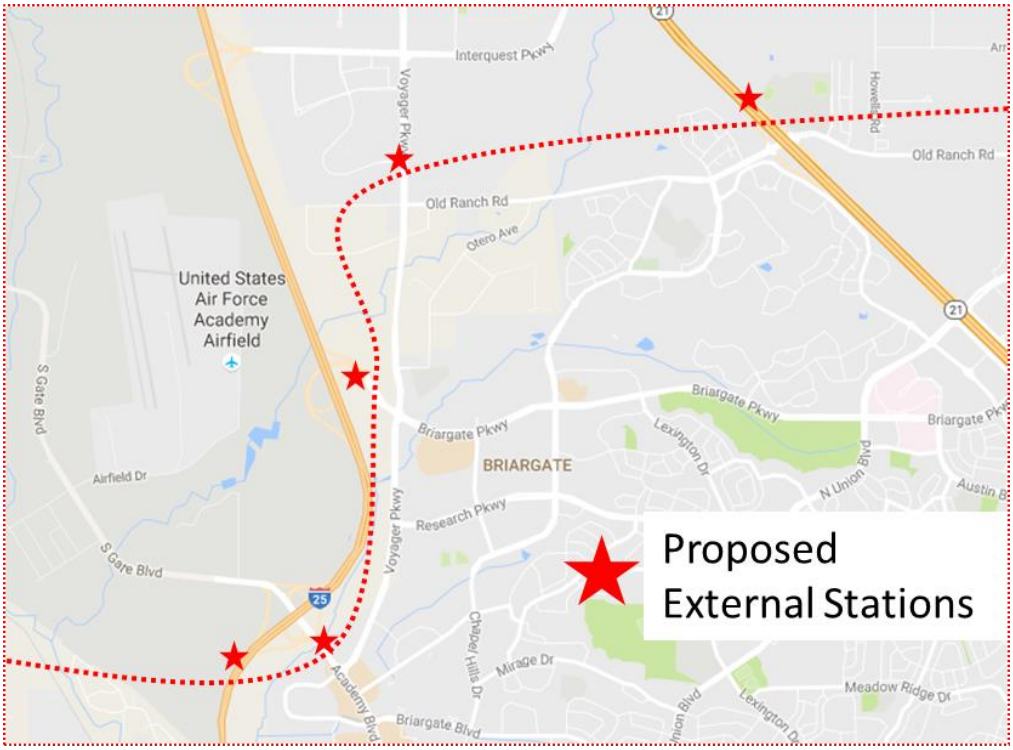


[1] FOCUS Model Calibration 1.0, DRCOG, 8/5/2010, Pages 47-48, Figure 13 and Table 52

Figure 2 zooms in on the proposed extension above and shows the locations of the proposed external stations, from :

- I-25
- Academy Boulevard
- Briargate Parkway
- Voyager Parkway
- North Powers Blvd (C-21)

Figure 2: Proposed External Stations for Extended FOCUS Model Network



We will obtain network attributes for the extended network (beyond the FOCUS model) and land uses for zones in the appended model region from the most current available version of the PPACG region's travel demand model.

Interregional Trip Distribution Model

To simply incorporate socioeconomic projections in the appended PPACG region is not sufficient by itself, because it can distort the model's trip distribution (allocation of zonal trip generation into origin-destination (OD) pairs using relative zone pair travel impedances) by treating all trip ends in the PPACG region as occurring at the same zone.

To address this issue while still including a method to analyze how an alternative may impact trip patterns, we will develop an interregional trip distribution model. We will estimate the parameters of this trip distribution model to fit observed regional travel patterns, which we will establish from one or more of the following sources:

- Interregional trip matrices from the Interregional Connectivity Study (ICS);

- AirSage cell phone OD data obtained in 2013 for the ICS;
- Streetlight OD data: either already collected by CDOT or new data obtained for this project; and
- Front Range regional household survey data

Note that the OD data will have larger zones than the FOCUS model. If new data is obtained, we propose to define zones with the FOCUS model boundaries along the study corridor.

The observed travel patterns will be fit to a trip distribution gravity model, which relates interzonal impedance to a set of factors that monotonically decrease with increasing impedance.

We will develop future trip matrices using the zone system of the OD data source from the above list and each zone's total trips generated as estimated from the regional travel demand models, socioeconomic projections from local sources and/or projections from national sources such as Moody's.

After calibrating the trip distribution gravity model, we will use it as an input to running alternative improvements. We will update future network impedances corresponding to the alternative being run, and then rerun the distribution model to figure out how much to adjust the external zone traffic. We will apply the gravity model to each zone's trip total, with a procedure known as iterative proportional fitting (IPF).

Finally, the future trip matrix will be adjusted to the zone system in the slightly-extended DRCOG focus model, as follows:

- Trip ends to the south of the model (in the PPACG region or further south) will be assigned to one of the external gateway zones in Figure 1, with most being assigned to the I-25 gateway.
- Trip ends within the model and on the study corridor will be disaggregated from the coarser OD data zone system into the more refined FOCUS zone system (if new data is collected, the OD data zones will be the same as the FOCUS zones on the study corridor and this won't be necessary).
- Outside the study corridor, the FOCUS zones will be aggregated into the OD data zone system, to reduce model run time.

Microsimulation

Along with the macroscopic travel demand model, we will develop a microsimulation in TransModeler. This tool will be used primarily to analyze details that are not covered by macroscopic travel demand models, such as roadway geometry, steepness, weaving and merging, and traffic signal operations.

When we embark on this TransModeler model development, we will determine the geographical extent of the model as it could cover the entire corridor, or may focus on the key sections with the most significant operational concerns.

A further motivation for developing the TransModeler model now, is that the data collection and set-up time of these sorts of models can be considerable, and thus it would be better to begin developing in advance of when the model could be needed for activities downstream of the PEL. Therefore, data collection can occur in parallel with that for the macroscopic model, and development can occur in tandem to the extent possible, to increase project efficiency, reduce costs, and enable the project to stay on schedule for the purposes of eventually obtaining financing.

Appendix F
Safety Assessment of Existing Conditions Technical Memorandum

TECHNICAL MEMORANDUM

Safety Assessment of Existing Conditions

PREPARED FOR:	Project File
COPY TO:	Zeke Lynch, Mandy Whorton
PREPARED BY:	Jacqueline Dowds Bennett
DATE:	January 24, 2017
PROJECT NUMBER:	680954

Introduction

The purpose of this memorandum is to document the initial analysis of crash data within the study corridor and resultant preliminary findings. The data analysis was conducted as part of the first phase of a Planning and Environmental Linkages study for I-25 between milepost 160 and 194 (Monument and C-470) to document existing conditions in the corridor. The crash experience was compared to various aspects of the existing conditions to identify potential causal relationships between roadway geometry, turbulence in the traffic stream, weather conditions, and roadway surface conditions. These types of comparisons assist to narrow the focus of strategy development to those that have the greatest potential to reduce crashes along the study corridor. The preliminary findings were presented at two Technical Working Group meetings and two public meetings. Through a series of graphs and tables, the crash experience for this segment of I-25 was conveyed along with potential causal factors evident from the data records and comparison to existing conditions.

While the initial analysis was conducted in adherence with the Colorado Department of Transportation (CDOT) Safety Engineering and Analysis Group philosophies and served the purpose of documenting existing conditions in the corridor within the study schedule, the analysis did not include all of the components of the typical methodology followed by CDOT to produce a *Safety Assessment Report* (SAR). Therefore, these crash data records will be further analyzed and a SAR produced by Muller Engineering Company. The SAR is anticipated to be completed in spring, 2017. Once completed, this document will serve as the safety reference document for the remainder of the PEL study and subsequent National Environmental Policy Act (NEPA) and preliminary design processes. CH2M personnel coordinated with Muller personnel to define the scope of the SAR. In addition, CH2M personnel provided the data records and preliminary analysis results to Muller for use in the SAR effort.

Methodology

CDOT provided crash data for the years 2011 through 2015 between mileposts 160 and 194 in an Excel spreadsheet. These data were queried to assess a variety of characteristics including severity, location, type, contributing factors, and circumstances such as time of day and weather conditions. The data were also used to perform a Level of Service of Safety (LOSS) analysis and to compare the corridor crash experience to statewide normatives for similar facilities. Average daily traffic volumes (AADT) were obtained from CDOT historical volume data. The Safety Performance Function (SPF) classifications were determined from both CDOT sources and current laneage. Some of the sections in the study corridor have been widened since the last update to the SPF classifications, necessitating judgement as to which SPF classifications to apply to this corridor. For these sections, the LOSS was performed using the current lane configuration. For the normatives comparison, statewide normatives for each of the SPF classifications were obtained from CDOT.

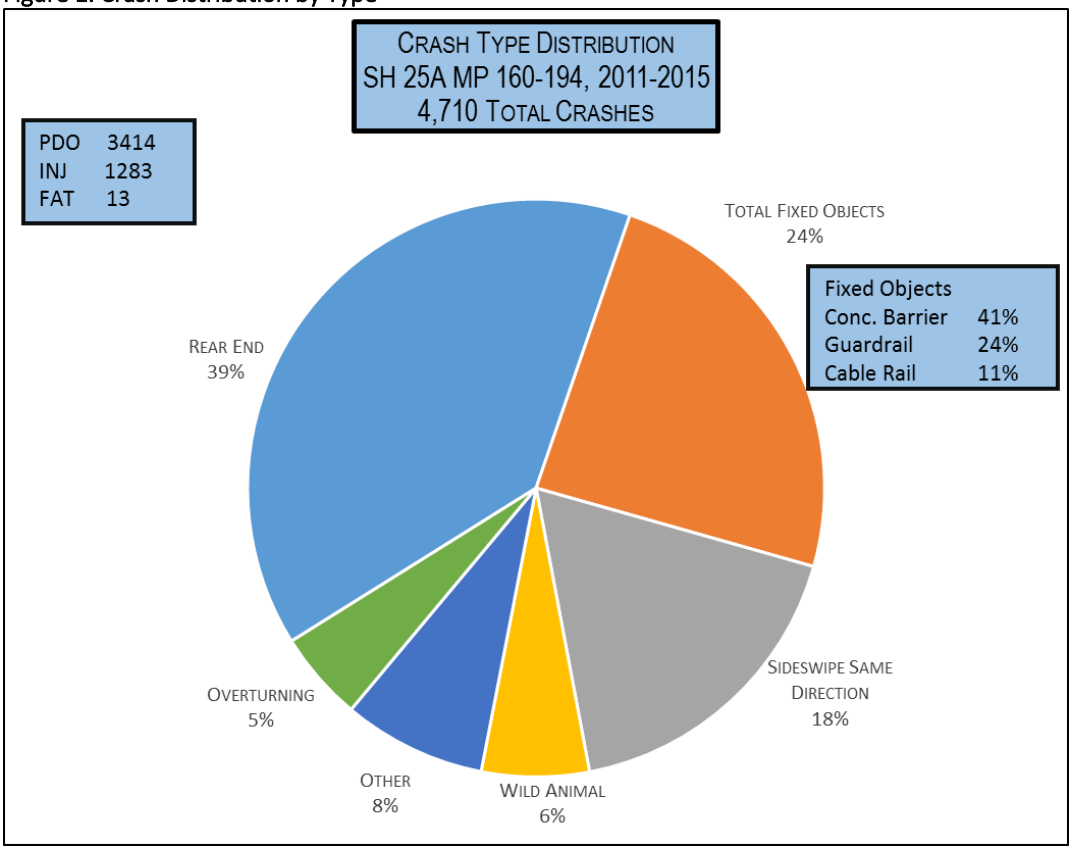
Crash Data Summary

These crash records indicate that a total of 4,710 crashes were reported during this 5-year time period. Of this total, 27 percent resulted in injuries and less than 1 percent resulted in fatalities. This section presents a sample of the many characteristics assessed with the data. The Power Point presentation prepared for the January, 2017 Technical Working Group meeting contains graphics that depict the characteristic and notes that interpret the data. The appendix contains a copy of this presentation.

Crash Type

Figure 1 shows the distribution of crashes by crash type. The most common crash type was rear-end, followed by fixed object and sideswipe same direction. Rear-end and sideswipe same direction crashes can be indicative of turbulence in the traffic stream due to volume demand, transitions between 2- and 3-lane sections, interchange influence areas, speed limit changes, and topography (such as, slower moving vehicles on steep grades).

Figure 1. Crash Distribution by Type



Single vehicle crashes accounted for 34 percent of the total corridor crashes. For the sections that are classified as the urban 4 and 8-lane sections, the proportion of single vehicle crashes is higher than expected when compared to similar facilities throughout the state. This proportion increases to almost half in the 4-lane section between MP 160.5 - 163.9 which is near Monument. For the 8-lane section at the northern portion of the study corridor, the 29 percent proportion of single-vehicle crashes is nearly triple the statewide expectation. Along the same lines, the proportion of crashes that occurred off the road is higher than expected since single-vehicle crashes result when a driver leaves the travelway.

Some of the same contributing factors to multiple-vehicle crashes may also contribute to single vehicle crashes in the sense that some of these crashes may occur as drivers overcorrect after realizing that they are changing lanes into another vehicle or as drivers attempt to avoid a rear-end collision and

subsequently hit concrete barrier or guardrail. Since turbulence is not a typical contributing factor to single-vehicle crashes, this can help explain the higher proportion of single-vehicle crashes in this corridor.

Crash Circumstances

The following list highlights the pertinent characteristics of the crash data set:

- **Facility Type:** The majority of crashes (85 percent) occurred on the mainline. Another 6 percent occurred on the ramps while 5 percent occurred at the ramp terminal intersections with the crossroads. The remainder occurred on the crossroads and frontage roads.
- **Time of Day:** The highest proportions of crashes occurred in the 7 to 8 AM and 3 to 4 PM hours.
- **Day of Week:** Just over half of the crashes occurred on the weekdays of Monday through Thursday (53 percent). The highest proportion of crashes occurred on Saturdays, followed by Fridays. Multiple crashes occurred on the same day more often on weekends than on weekdays.
- **Month of Year:** Although the distribution among the months is fairly even for most of the year (particularly in the second half of the year), the highest proportions of crashes occur in the months of June-July-August.
- **Multiple Crashes per Day:** Saturday had the most number of days with multiple crashes on the same day. Over the 5-year study period, there were 65 Saturdays that each had 5 or more crashes on a single day.
- **Lighting**: 33 percent of the crashes occurred in dawn/dusk, dark-lighted or dark-unlighted conditions. Daylight and dark-unlighted conditions have the highest percentage of injury crashes at 28 percent of their total crashes.
- **Roadway Surface:** 28 percent of the crashes occurred when the roadway surface was wet, icy or snowy.
- **Weather Conditions:** 22 percent of the crashes occurred during a weather event such as snow, rain or hail.
- **Reported Speed:** Most of the crashes occurred when the speed of the primary vehicle was below the posted speed limit of 65 or 75 miles per hour (mph). This suggests that factors were present that forced a reduction in operating speed. These factors could have been turbulence in the traffic stream or volume demand or roadway/weather conditions.
- **Rear-end and Sideswipe Same Direction Crashes:** The daily pattern for timing is similar to all crashes with the spikes occurring in the 7AM and 3PM hours. Very few of these crash types occur in the early morning hours, which is presumably the lowest volume time period. The frequency of these crash types peaks within interchanges and at transition points where the number of lanes is increasing or decreasing.

Fatal Crashes

Thirteen fatal crashes occurred during the study timeframe. Figure 2 summarizes these crashes. Six of the crashes involved a driver under the influence of alcohol (refer to the shaded cells), which is a higher proportion than national crash statistics. In one of these crashes, a pedestrian was under the influence of alcohol. Large trucks were involved in four of the fatal crashes, which is a higher proportion than the truck crashes in the entire dataset. Thus, heavy trucks are overrepresented in fatal crashes in this corridor. Half of the crashes occurred in darkness conditions with the 10 PM hour as the most common time period. These crashes occurred throughout the year, with January and December being the only

months not represented. Seven of the crashes occurred on the weekend days of Friday, Saturday, and Sunday. Excessive speed does not appear to be a contributing factor in most of these crashes.

Figure 2. Fatal Crash Summary

Year	Direction	Milepost	Crash Characteristics
2015	SB	160.49	Motorcycle ran off road at on-ramp curve and overturned
2012	SB	160.52	Motorcycle ran off road at on-ramp curve and overturned; alcohol involved
2015	NB	162.81	Sideswipe same direction while motorcycle and truck attempting passing maneuvers in dawn lighting conditions
2013	NB	166.63	Large truck overturned on curve with dry road; driver preoccupied
2013	NB	168.96	SUV overturned on straight section in dark-unlighted conditions
2015	SB	176.00	Pedestrian on roadway in dark-unlighted conditions; alcohol involved with vehicle driver
2013	NB	176.37	SUV sideswipe opposite direction on frontage road in dark-unlighted conditions; alcohol/drugs involved
2012	SB	180.61	Pedestrian (alcohol involved) on roadway in dark-lighted conditions
2012	SB	183.32	SUV hit parked motor vehicle in dark-unlighted conditions; alcohol involved
2014	SB	186.25	Car hit inside concrete barrier on curve in dark-unlighted conditions; alcohol involved
2011	SB	189.64	Sideswipe same direction in dark-unlighted conditions; SUV and large truck
2013	NB	190.58	SUV ran off road at curve in dark-unlighted conditions; alcohol/drugs involved
2011	NB	191.00	Large truck overturned on wet road in adverse weather and dark-unlighted conditions; likely overcorrected while changing lanes

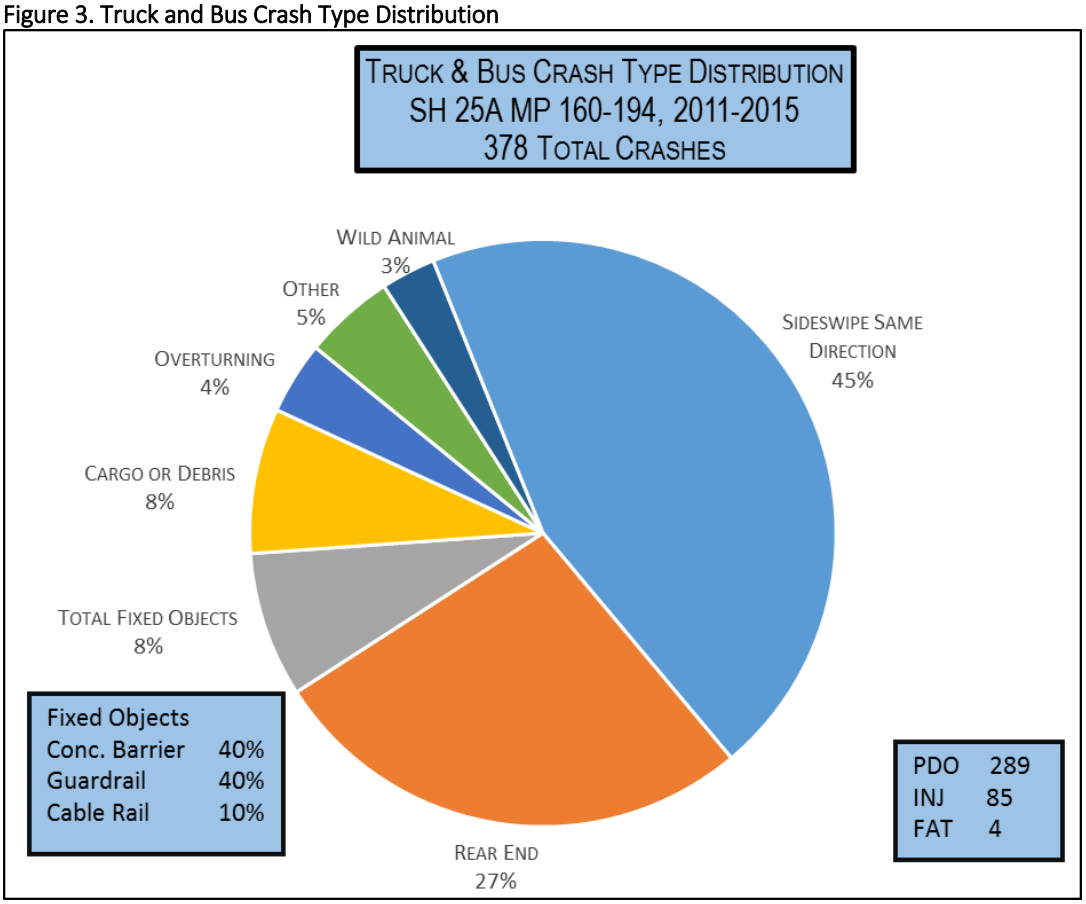
Wild Animal Crashes

The crash dataset and carcass data provided by CDOT were reviewed to assess the wild animal crashes. Comparison of these two data sets indicates there could be a few unreported wild animal collisions or other types of collisions caused by a driver reacting to a wild animal in the roadway. These crashes occurred along the entire length of the study area, but appear to be concentrated at mileposts 161 to 162 and mileposts 171 to 174. Between 2005 and 2016, 162 carcasses were retrieved from the roadway. The crash data set includes 291 records with wild animal as the crash type between 2011 and 2015. This number represents 6 percent of the total crashes. Most occurred on dry roads and in dawn/dusk/ darkness conditions.

Truck and Bus Crashes

A total of 378 truck and bus crashes occurred in the corridor during the 5-year study timeframe. From the dataset, it is not possible to distinguish between truck or bus, but this analysis assumes the majority of these crashes involve heavy trucks. These crashes represent 8 percent of the total crashes. North of Palmer Divide Avenue, this 8 percent is a higher proportion than the 5 to 7 percent of trucks in the traffic stream, suggesting trucks are overrepresented in crashes. South of Monument Hill, the proportion falls in the middle of the 7 to 9 percent of trucks in the traffic stream. Figure 3 represents the distribution of the truck and bus crashes.

Figure 3. Truck and Bus Crash Type Distribution



This distribution varies from the overall dataset in that the most common crash type is sideswipe same direction, followed by rear end crashes. Together, these two crash types accounted for 72 percent of the truck or bus crashes. In the overall dataset, rear-end crashes are the most common, followed by fixed object and then sideswipe same direction. The other crash type includes seven collisions with parked motor vehicle. Of these, three occurred when the truck was the parked vehicle.

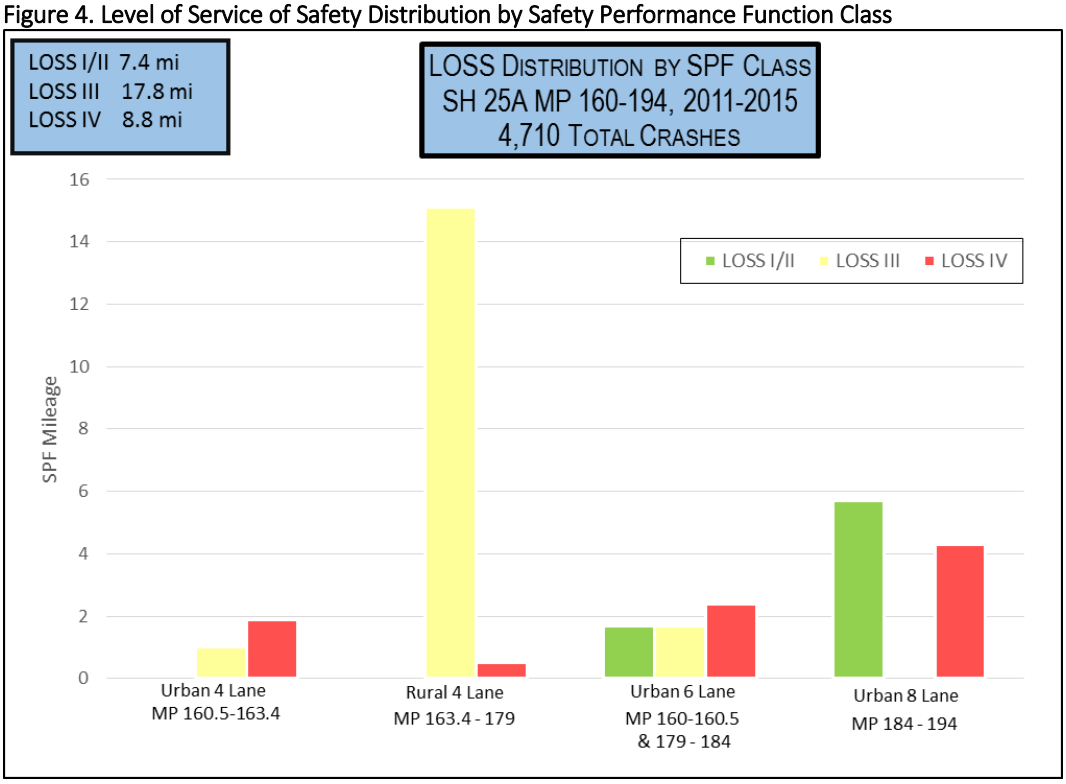
In just over half of the crashes (54 percent), the truck driver was the initiating driver. Likewise, 54 percent of the sideswipe same direction crashes occurred when the truck driver was changing lanes or passing. This pattern suggests some drivers of passenger vehicles and smaller trucks may be traveling in truck blind spots.

The proportion of 11 percent single-vehicle crashes is one-third the proportion for the overall dataset. Likewise, hit fixed object crash type is also one-third the proportion of the overall dataset. Thus, most of the truck crashes are in the travel lanes and involve other vehicles. The lighting, roadway, and weather conditions closely match the overall dataset. Driver Inexperience as a contributing factor occurred at twice the proportion as the overall dataset.

Level of Service of Safety

Figure 4 shows the results of the LOSS analysis for total crashes. LOSS in the III category suggests moderate to high potential to reduce crashes by implementing strategies targeted at the specific crash issues at the location. LOSS IV suggests high potential. Along this corridor, the LOSS analysis suggests moderate to high potential to reduce crashes along three-fourths of the mileage.

Figure 4. Level of Service of Safety Distribution by Safety Performance Function Class



The **Urban 4 lane** section is between the south end of corridor and the Palmer Divide Avenue interchange. Several transition points and severe topography increase the potential for conflict and turbulence in the traffic stream. The truck weigh station and its entrance/exit points are in this segment. The topography and resultant weather patterns in this area are likely more similar to conditions encountered for rural 4 lane interstates. However, when comparing this dataset of adverse weather and wet roadway crashes to the statewide normatives for the 4-lane rural interstates, the proportions are still significantly higher, suggesting the turbulence in the traffic stream likely plays a role in crash causation during weather events. The crashes in dark-lighted conditions occurred in a proportion that is twice what is expected and in a proportion much lower than expected for dark-unlighted conditions.

The **Rural 4 lane** section very closely matches the statewide normatives in all categories. Thus, weather and roadway surface conditions did not play a role in crash causation in a greater proportion than expected. The rear-end and sideswipe same direction crashes account for nearly half of the total crashes in the **Urban 6 lane** section, suggesting turbulence in the traffic stream is contributing to crashes.

In the **Urban 8 lane** section, the proportion of single vehicle crashes is almost triple the expected single vehicle percentage. Likewise, fixed object crashes (in particular, concrete barrier) were more than double the proportion expected. The crash frequency on wet/snowy roads and during adverse weather was double the proportion expected. This could possibly be due to a higher level of maintenance within urban areas to which this segment is being compared.

Comparison to Other Aspects of the Existing Conditions

In addition to safety, other aspects of the corridor were simultaneously evaluated to establish the existing conditions. The crash data was compared to these findings to identify potential relationships.

Horizontal Curves

Crashes that occurred on horizontal curves represented 13 percent of the overall dataset. A geometric analysis identified horizontal curve radii on the mainline (i.e., excluding ramps or crossroads) that were fair or poor as compared to current design standards. To identify if any crashes could have been related to the radii at these particular curves, the crash data set was filtered to develop a subset of data appropriate for this comparison. This subset, which consisted of run-off-road and sideswipe same direction crashes that occurred on dry roadway surfaces on the mainline only, contained 10 percent of all the mainline horizontal curve crashes. Thus, there is a potential to reduce these particular types of crashes by improving the radii geometry.

Vertical Curves

Crashes that occurred at a hillcrest or on a vertical grade represented 29 percent of the overall dataset. A geometric analysis identified vertical curve crests on the mainline (i.e., excluding ramps or crossroads) that were fair or poor as compared to current design standards. To identify if any crashes could have been related to the crest, or stopping sight distance, at these particular curves, the crash data set was filtered to develop a subset of data appropriate for this comparison. This assessment is based on the assumption that a driver may not realize there is a queue of slowed or stopped vehicles due to congestion on the other side of the crest, and may not have sufficient stopping distance. This subset, which consisted of rear-end and sideswipe same direction crashes that occurred on dry roadway surfaces on the mainline only, contained 12 percent of all the mainline vertical curve crashes. Thus, there is a potential to reduce these particular types of crashes by improving the stopping sight distance.

Reliability

Reliability was assessed based on travel time delay. With the assumption that free-flow movement would require a 29-minute trip through the portion of the corridor between Monument and Founders/Meadows Parkway in Castle Rock, delay was defined as a trip that required more than 29 minutes. The following lists the summary of the comparison between crash data and reliability data for 2015:

- The reliability assessment shows that the higher frequency of crashes during the 7AM hour did not appear to impact travel time. The travel time delays generally seemed to begin around 10AM. On the other hand, the increased number of crashes between 3 and 6PM seemed to initiate delay that took several hours to recede.
- Compared to the reliability graphs for 2015, the three months of June-July-August, 2016 had the greatest variability in travel time in the northbound direction. This relationship is likely linked to the higher number of crashes in this particular 3-month period. The incidents where the reliability decreased for the southbound direction seemed to occur primarily in the second half of the year, which is partially indicative of the fact that there was not a huge fluctuation in monthly crashes between these six months.
- The weekend days of Friday-Saturday-Sunday had more individual days with more than 5 crashes than did the weekdays. This coincides with the reliability graphs that clearly show more travel time variability over the weekends.

Preliminary Findings

These preliminary findings are based on the initial analysis of crash data and may change upon completion of the SAR effort. The findings are as follows:

- The most common crash type was rear-end, followed by fixed object and sideswipe same direction. Fewer rear-end and more fixed object crashes occurred than expected as compared to similar facilities.
- Rear-end and sideswipe same direction crashes are indicative of turbulence and lane changes required by cross section transitions.
- The higher percentage of single-vehicle crashes than expected corresponds to the higher than expected proportions of run-off road and fixed object crashes, which occur when a driver departs the travelway. Concrete barrier and guardrail crashes could be related to congestion/turbulence when drivers avoid a rear-end collision by moving into a narrow shoulder and striking a barrier. Also, drivers may overcorrect when drifting out of lane or changing lanes into another vehicle and then ultimately depart the travelway, resulting in overturning or fixed object crashes.
- The majority of crashes occurred on the mainline, as expected. The occurrence of crashes along the ramps, crossroads, and at ramp/crossroad intersections suggests that there is a potential to improve safety if the alternatives development and selection includes the complete system encompassing the mainline, ramps and ramp terminal intersections.
- The LOSS analysis suggests there is moderate to high potential to reduce crashes along 75 percent of the study corridor length.
- The highest proportions of crashes occur in the months of June-July-August. The highest volume months have been June-July-August for the last several years dating back to 1999, so there is a relationship between exposure and crash frequency in this corridor.
- The highest proportion of crashes occurs in this corridor on Saturday, followed by Friday. From a national perspective, Friday has the highest number of crashes, followed by Wednesday. Saturday is the second lowest day nationally, with Sunday being the lowest crash day. Therefore, this corridor shows that the volume of recreational / non-commuting travel, or the variation in the traffic stream induced by it (RV's, travelers pulling campers/trailers/boats), or non-commuter drivers unfamiliar with the corridor, could be contributing factors to the crashes.
- The proportion of darkness crashes is as expected, just distributed differently between lighted/unlighted for the urban 4 and 8 lane sections.
- More crashes occurred during weather events and on non-dry roadways on the urban SPF sections than expected as compared to similar facilities. This could result from driving too fast for conditions. Likewise, reduced traction on the roadway surface can lead to drivers losing control, resulting in collisions or departing the travelway. Of the crashes that occurred during weather events, 15 percent were attributed to driver inexperience. Of the crashes that occurred on icy/slushy/snowy/wet roads, 10 percent were attributed to driver inexperience.
- Most crashes occurred below the posted speed limit, which suggests turbulence or adverse weather / roadway surface conditions contributed to crash occurrence.
- Alcohol was a factor more often than expected in the 13 fatal crashes. Also, heavy trucks appear to be overrepresented in the fatal crashes. One of the fatal crashes occurred when a state trooper standing on the shoulder at the scene of an incident was struck by a driver under the influence of alcohol.

- Turbulence in the traffic stream contributes to crashes. This turbulence likely results from topography, transitions in cross-sections, speed limit changes, speed differentials resulting from varying driver comfort levels, drivers unfamiliar with the area and volume demand.
- Some drivers may not be responding to conditions and adjusting travel speed and vehicle headways as appropriate. For example, when the road surfaces are not dry and when approaching slower moving vehicles at the back of a queue.
- There appears to be opportunity to reduce the potential for crashes in the near future and in the ultimate condition through implementation of strategies targeted toward the crash patterns that vary from the expectations per similar facilities statewide.

Truck Drivers' Safety Concerns

A representative of the Colorado Motor Carriers Association provided the following feedback from truck drivers who travel through the corridor regularly:

- **Monument Hill Weigh Station**
  - Conflicts with traffic stream to enter/exit mainline I-25 are exacerbated by steep grades
  - Drivers use the NB climbing lane as a passing lane
  - Difficult to merge from climbing lane into right lane at NB transition
- **Lane Widths**
  - Shoulders are too narrow: width not adequate for emergency parking, drivers open door and exit vehicle into travel lane when they do have to pull over on shoulder
  - Shoulders are not usable when plowed snowed is stored on shoulder
  - 11-foot lanes not acceptable due to trailer widths
- **Rest Areas**
  - Lost a safe area for chain-up or rest activities when Larkspur closed
  - CDOT will open Larkspur to truckers for chaining-up, but frequently does not happen in timely manner
  - Parking areas that are safe for the drivers to rest are a necessity; Federal mandates require a ½ hour rest period every four hours
    - On and off ramps are not desirable for this activity
- **Chain up Areas**
  - None in SB direction
  - Need another one in NB direction
- **Road Closures**
  - Shoulders inadequate for emergency parking
  - Detour routes do not all accommodate height/length/weight requirements of heavy vehicles
- **Speed Limit**
  - Not obvious…request more signs posted along right side of travel lanes

  - Variations of speed in traffic stream and excessive speed increase difficulty for truck drivers to react to changing conditions and navigate through the corridor

Recommendations for the SAR Effort

The following issues were recommended for further evaluation during the SAR assessment:

- **Level of Service of Safety Analysis:** Determine if it is necessary to stratify the LOSS analysis into two time periods for those segments which were widened at some point during the 5-year study timeframe:
  - LOSS analysis for MP 160 – 160.5 was done as urban 3-lane, was only 3-lane for part of time period…is it necessary to segregate into 4-lane and 6-lane analyses?
  - LOSS analysis for MP 179-180 was done as urban 2-lane, was only 2-lane for part of time period…is it necessary to segregate into 4-lane and 6-lane analyses?
  - LOSS analysis for MP 184-194 was done as urban 8-lane, was only 8-lane for part of time period……is it necessary to segregate into 6-lane and 8-lane analyses?
- **Work Zone Crashes:** The question was asked during a Technical Working Group meeting about how the crash patterns and frequency changed during construction periods.
- **Truck Crashes:** Trucks seem to be involved in crashes in a higher proportion than their proportion of the volume stream north of Palmer Divide Avenue. South of this road, truck crashes seem to be a proportion similar to the volume proportion in the traffic stream.
- **Congestion-related Crashes:** Review time of day/day of week crash patterns for rear-end/sideswipe same direction type crashes. Also consider including single vehicle, fixed object crash types for which the object struck is concrete barrier or guardrail (for incidents in which the driver may have been avoiding a rear-end collision at the end of a congestion-related queue).
- **Potential Strategies:** The following strategies were identified during the data analysis process based on the crash patterns and characteristics. These have been provided as input to the SAR process and may be incorporated into the recommendations in that report:
  - Public education campaign about avoiding traveling in truck blind spots
  - Variable speed limit signs to harmonize speeds during periods of weather events, wet road surfaces, and congestion
  - Truck climbing lanes to reduce turbulence
  - Upgrade geometry to meet 75 mph posted speed limit
  - Shoulder and edge line rumble strips

Appendix

Presentation to Technical Working Group on January 6, 2017

Appendix G
Exiting Intelligent Transportation System Inventory Technical Memorandum

memo

APEX DESIGN, PC

TO:	Mandy Whorton (CH2M)
FROM:	Shane Binder (Apex)
CC:	Scott Thomas (Apex), Zeke Lynch (CH2M)
DATE:	November 14, 2016
RE:	I-25 Monument to C-470 – Existing ITS Technical Memo

This memo documents the existing ITS infrastructure present along the I-25 corridor from Monument (MP 160.75) to the C-470 interchange (MP 193.80). The attached inventory was assembled from data out of two CDOT systems – Cognos (a database query tool) and the CTMS software (CDOT's ITS management software) – supplemented by site visits and discussion with CDOT staff. As well, ad-ready plans for CDOT projects #19764 and #20166, which are presently installing ITS infrastructure along the corridor, were supplied by Scott Burger, and incorporated into the inventory.

Corridor Background

The I-25 South planning-environmental linkage (PEL) study is evaluating the primary north-south connection between Denver and Colorado Springs, including the portion of the freeway that has only a four-lane cross-section. I-25 suffers from high congestion and unreliable travel time issues through this corridor. The PEL study will evaluate a number of proposed alternatives, including ITS improvements, to address these issues. In consultation with CDOT staff, the existing ITS infrastructure along the corridor will be included from the Monument interchange (MP 160.75) to the County Line Node (MP 194.75).

General ITS Infrastructure

ITS infrastructure along the corridor falls into four categories, which are broadly defined as follows:

Surveillance:

- *Closed-circuit television (CCTV) cameras* provide 360-degree real-time still or streaming video to help identify incidents along the freeway.

Detection:

- *Travel time indicators (TTI)* are roadside antennas that pick up toll transponder signals to calculate travel time between indicator stations.
- *Microwave vehicle radar detectors (MVRD)* report traffic volume, speed, and occupancy at a fixed point using radar detection.
- *Doppler speed sensors* report traffic speed at a fixed point using radar detection.

Messaging:

- *Variable message signs (VMS)* display messaging for communication with motorists about traffic congestion, incidents, roadwork, special events, or alerts (Amber, etc).
- *Travel time signs (TTS)* are small VMS in static signs that display travel times to fixed downstream destinations.

- *Dynamic chain law signs* alert motorists when chain laws are in effect with flashing beacons or blank-out signs.

Miscellaneous:

- *Roadway weather information stations (RWIS)* gather data on weather and road surface conditions to pass on to motorists and guide maintenance decisions.
- *Weigh-in-motion (WIM) systems* capture and record heavy vehicle weights upstream of weigh stations, to aid in processing commercial vehicle operations.

Overall, the existing devices are summarized in the following table.

ITS Infrastructure	SB Device Count	NB Device Count
CCTV cameras	14	16
Travel time indicators (TTI)	12	13
Microwave vehicle radar detectors (MVRD)	2	3
Doppler speed sensors	9	13
Variable message signs (VMS)	4	4
Travel time signs (TTS)	2	1
Dynamic chain law signs	1	0
Roadway weather information stations (RWIS)	4	2
Weigh-in-motion (WIM) systems	1	0
Fiber optic communications system	Entire length of corridor	
Communication system nodes	2	

Existing ITS Inventory

An inventory of existing ITS infrastructure along the I-25 corridor is attached.

I-25 South - Monument to C-470 - PEL Study COMP: SIB
Existing ITS Inventory DATE: 11/14/2016

Milepost	NB/SB	ITS Infrastructure	Device	Notes	Verification
160.75	NB	I-25 SB @ CO-105	CCTV	**Monument Interchange**	CTMS
160.90	SB	TTI #025S161	TTI	on SB overhead sign structure	CDOT plans
160.90	NB	TTI #025N161 - Sirit	TTI		CTMS
161.30	NB	I-25 @ Monument Hill	CCTV		CTMS
161.90	NB	Monument Node	Node	Monument Weigh Station	Cognos
162.40	NB	Doppler #025N163 - SpeedInfo	Doppler		CTMS
162.80	SB	RWIS #025S162 - SSI	RWIS		CTMS
162.80	SB	Weigh in Motion	WIM	On Google	Cognos
162.95	NB	NB VMS #025N163 - Skyline	VMS		CTMS
162.95	SB	SB VMS #025S162 - Skyline	VMS		CTMS
162.95	SB	I-25 SB Top of Monument Hill	CCTV	not in Cognos or CTMS; constructed in 19764	CDOT plans
163.00	SB	Doppler #025S163 - SpeedInfo	Doppler		CTMS
163.32	SB	I-25 @ County Line	CCTV	**County Line Rd/Palmer Divide Interchange**	CTMS
163.90	SB	I-25 SB 0.5 mi N of County Line	CCTV	Adjacent to SB TTS on Google	CTMS
164.10	NB	TTI #025N164	TTI	Relocated in project #19764	CDOT plans
164.10	SB	TTI #025S164 - Sirit	TTI		CTMS
164.10	SB	SB TTS #025S164 - Skyline	TTS		CTMS
164.30	NB	Doppler #025N165 - SpeedInfo	Doppler		CTMS
165.30	NB	Doppler #025N166 - SpeedInfo	Doppler		CTMS
166.00	NB	Doppler #025N166 - SpeedInfo	Doppler		CTMS
166.80	NB	Doppler #025N167 - SpeedInfo	Doppler		CTMS
166.80	NB	I-25 NB 0.7 mi S of Greenland	CCTV		CTMS
167.46				**Greenland Rd Interchange**	--
167.70	SB	SB VMS #025S167 - Skyline	VMS		CTMS
167.70	SB	TTI #025S168 - Sirit	TTI	On SB VMS structure	CTMS
167.70	NB	TTI #025N168	TTI	Relocated in project #19764	CDOT plans
167.70	SB	I-25 SB 0.3 mi N of Greenland	CCTV	On SB VMS structure	CTMS
168.50	NB	Doppler #025N169 - SpeedInfo	Doppler		CTMS
168.90	NB	I-25 NB 1.5 mi N of Greenland	CCTV	Installed in project #20166	CDOT plans
169.45	NB	Doppler #025N170 - SpeedInfo	Doppler		CTMS
170.60	NB	I-25 NB 1.3 mi S of Upper Lake Gulch	CCTV	On NB pole in rest area on-ramp gore	CTMS
170.60	NB	TTI #025N171 - Sirit	TTI	On NB CCTV structure	CTMS
170.70				**Upper Lake Gulch Rest Area (Closed)**	--
170.90	SB	TTI #025S170 - Sirit	TTI	Relocated in project #19764	CTMS
171.45	NB	Doppler #025N172 - SpeedInfo	Doppler		CTMS
171.66	SB	Chain Law Sign w/ Beacons	Chain Law		Google
171.82				**S Lake Gulch Rd Interchange**	--
172.40	NB	Doppler #025N173 - SpeedInfo	Doppler	On NB CCTV structure	CTMS
172.40	NB	I-25 NB @ Spruce Mtn Rd	CCTV	**Larkspur/Spruce Mtn Rd Interchange**	CTMS
173.36	NB	NB TTS #025N174 - Skyline	TTS		CTMS
173.80	SB	TTI #025S173	TTI	Relocated in project #19764	CDOT plans
173.80	SB	I-25 NB @ Tomah Rd	CCTV	**Tomah Rd/Skyview Interchange**	CTMS
173.80	NB	TTI #025N174 - Sirit	TTI	On NB CCTV structure	CTMS
173.90	NB	MVRD #025N174 - Wavetronix	MVRD	On NB CCTV structure	CTMS
175.40	SB	I-25 SB 1.8 mi N of Tomah Rd	CCTV		CTMS
175.40	SB	MVRD #025S175 - Wavetronix	MVRD	on SB CCTV structure	CTMS
177.07	SB	SB TTS #025S177 - Skyline	TTS		CTMS
177.07	SB	TTI #025S177 - Sirit	TTI	on SB CCTV structure	CTMS
177.07	NB	TTI #025N177	TTI	Relocated in project #19764	CDOT plans
177.07	SB	I-25 SB 3.8 mi S of Plum Cr	CCTV	Adjacent to SB TTS on Google	CTMS
177.07	SB	MVRD #025S177 - Wavetronix	MVRD	on SB CCTV structure	CTMS
179.80	SB	TTI #025S179	TTI	Relocated in project #19764	CDOT plans
179.80	NB	I-25 NB 1.2 mi S of Plum Cr	CCTV	On NB VMS structure	CTMS
179.80	NB	NB VMS #025N180 - Skyline	VMS		CTMS
179.80	NB	TTI #025N180 - Sirit	TTI	On NB VMS structure	CTMS
180.70	SB	I-25 SB @ Plum Cr	CCTV	**Plum Cr Pkwy Interchange**	CTMS
181.90	NB	I-25 NB @ Wolfensberger	CCTV	**Wolfensberger Rd/Wilcox St Interchange**	CTMS
	SB	TTI #025S182	TTI		Cognos
182.40	NB	Doppler #025N183 - SpeedInfo	Doppler		CTMS
182.65	NB	NB VMS #025N183 - Skyline	VMS		CTMS
182.65	NB	I-25 NB 0.8 mi N of Wolfensberger	CCTV	On NB VMS structure	CTMS
182.65	NB	TTI #025N183 - Sirit	TTI	On NB VMS structure	CTMS
182.80	NB	Doppler #025N183 - SpeedInfo	Doppler	On NB sign structure	CTMS

I-25 South - Monument to C-470 - PEL Study COMP: SIB
Existing ITS Inventory DATE: 11/14/2016

Milepost	NB/SB	ITS Infrastructure	Device	Notes	Verification
183.39	NB	Doppler #025N184 - SpeedInfo	Doppler	On NB sign structure	CTMS
184.20	NB	I-25 NB @ Founders (on bridge luminaire)	CCTV	**Founders Pkwy Interchange**	CTMS
184.80	SB	Doppler #025S184 - SpeedInfo	Doppler		CTMS
185.05				**Castle Rock Pkwy Interchange**	--
185.12	SB	I-25 SB 1.0 mi N of Founders	CCTV	On SB VMS structure	CTMS
185.12	SB	SB VMS #025S185 - Skyline	VMS		CTMS
185.12	SB	TTI #025S185 - Sirit	TTI	On SB VMS structure	CTMS
185.20	SB	RWIS #025S185 - SSI	RWIS		CTMS
185.55	SB	I-25 SB 1.2 mi N of Castle Rock	CCTV		CTMS
185.80	SB	Doppler #025S185 - SpeedInfo	Doppler		CTMS
186.10	NB	TTI #025N186 - Sirit	TTI	Adjacent to NB CCTV; installed in project #20166	CTMS
186.10	NB	I-25 NB 0.8 mi S of Happy Cyn	CCTV		CTMS
186.50	SB	TTI #025S186 - Sirit	TTI	On luminaire; relocated in project #19764	CDOT plans
186.90	NB	TTI (NB)	TTI	on NB CCTV structure	CTMS
186.90	NB	I-25 NB @ Happy Cyn	CCTV	**Happy Cyn Rd Interchange**	CTMS
187.20	SB	Doppler #025S187 - SpeedInfo	Doppler		CTMS
187.92	NB	TTI #025N188 - Sirit	TTI		CTMS
188.00	SB	Doppler #025S188 - SpeedInfo	Doppler		CTMS
188.50	NB/SB	I-25 NB/SB @ Castle Pines (2 cameras)	CCTV	**Castle Pines Pkwy Interchange**	CTMS
188.80	SB	Doppler #025S188 - SpeedInfo	Doppler		CTMS
189.10	NB	RWIS #025N189 - SSI	RWIS		CTMS
189.50	NB	MVRD #025N190 - Wavetronix	MVRD		CTMS
189.55	NB	I-25 NB 0.9 mi N of Castle Pines	CCTV	On RWIS	CTMS
189.70	SB	Doppler #025S189 - SpeedInfo	Doppler	On SB sign structure	CTMS
190.70	NB	Doppler #025N191 - SpeedInfo	Doppler		CTMS
191.00	SB	RWIS #025S191 - Vaisala	RWIS	North of Happy Cyn Cr	CTMS
191.35	NB	NB VMS #025N19 - Skyline	VMS		CTMS
191.35	NB	I-25 NB 0.6 mi S of RidgeGate	CCTV	On NB VMS structure	CTMS
191.35	NB	TTI #025N192 - Sirit	TTI	On NB VMS structure	CTMS
191.35	SB	TTI #025S191	TTI	Relocated in project #19764	CDOT plans
192.05	SB	I-25 SB @ RidgeGate	CCTV	**RidgeGate Pkwy Interchange**	CTMS
192.60	SB	Doppler #025S192 - SpeedInfo	Doppler		CTMS
193.00	SB	I-25 SB @ Lincoln	CCTV	**Lincoln Ave Interchange**	CTMS
193.00	SB	TTI #025S192	TTI	2 new CCTVs to be installed in STU 0252-399 (in the future)	CDOT plans
193.00	NB	TTI #025N193- Sirit	TTI		CTMS
193.60	SB	Doppler #025S193 - SpeedInfo	Doppler		CTMS
193.70	SB	SB VMS #025S193 - Skyline	VMS		CTMS
193.80				**C-470 Interchange**	--
194.00	NB	RWIS #025N194 from C-470 EB - SSI	RWIS		CTMS
194.35	SB	RWIS #025N194 C-470 onramp - Vaisala	RWIS		CTMS
194.40	NB/SB	C-470 from I-25 NB (2 cameras)	CCTV	On RWIS	CTMS
194.53	NB	MVRD #025N195 - Wavetronix	MVRD		CTMS
194.75	NB	County Line Node	Node		Cognos

Appendix H
Environmental Resource Memorandums

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions
Appendix H: Introduction

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Acronyms and Abbreviations

AADT	annual average daily traffic
CDOT	Colorado Department of Transportation
COSMIX	Colorado Springs Metro Interstate Expansion
EA	environmental assessment
EIS	environmental impact statement
DOLA	Colorado Department of Local Affairs
Front Range	eastern slope of the Rocky Mountains
MP	mile post
PEL	planning and environmental linkages
ROD	record of decision
The Gap	A 2-lane stretch of I-25, roughly equivalent to Segment 1, extending from MP 160 to MP 179.

1.0 Project Background and Location

Eighty percent of the approximately 5.5 million residents of Colorado are connected via I-25, which extends north to south through the entire state along the eastern slope of the Rocky Mountains (hereafter referred to as the Front Range). I-25 serves as both a vital link between Front Range communities and as the major nexus for east-west facilities connecting the Great Plains to the Rocky Mountains. Since the first 11-mile segment of I-25 was opened through Denver in 1958, I-25 has undergone near continuous improvement to facilitate the vehicular movement of the state's rapidly growing population (CDOT, 2016a). With population growth expected to continue at an aggressive rate into the foreseeable future, the state's infrastructure—particularly I-25—will be pushed to its limit.

Denver and Colorado Springs are the two largest, and fastest-growing, metropolitan areas in Colorado (U.S. Census Bureau, 2010). Separated by approximately 70 miles of I-25, these two metropolitan areas generate substantial I-25 traffic—and average daily trips between the two are projected to double by the year 2035 (CDOT, 2014). Although several segments of I-25 between Denver and Colorado Springs have undergone significant improvements during the last two decades, the segment between approximately the Town of Castle Rock and the Town of Monument remains one of the few 4-lane sections of I-25 in the state. This approximately 18-mile segment of interstate is referred to as The Gap because it is the only remaining 4-lane segment of I-25 between Colorado Springs and Denver. Improving the connection between Colorado's two largest urban areas would deliver great benefits to the health and well-being of daily commuters, the reliability of commerce, and the livability of adjacent Front Range communities.

Colorado Department of Transportation (CDOT) has initiated this Planning and Environmental Linkages (PEL) Study to identify immediate and longer-term solutions to this vital stretch of highway, connecting Colorado Springs and the south Denver Metro area. Figure 1 shows the limits of the PEL Study.

The PEL Study limits extend from the Town of Monument (mile post [MP] 160) north to the I-25/C-470/E-470 interchange (MP 195). The southern limit for potential physical improvements begins at Monument, which was the northern limit of the I-25 design-build widening project completed in 2014 (this whole area is referred to collectively as the Study Area). Although this is the southern physical limit of the study, the limits of travel demand modeling and analyses will extend farther south because of the predominance of the regional traffic from the south and the importance of the corridor for travelers south of Monument in El Paso County and beyond.

The northern limit at the I-25/C-470/E-470 interchange was determined because of the existing heavy traffic volumes between the Town of Castle Rock and C-470 and the continued population and traffic growth in Castle Rock and the City of Lone Tree. Additionally, the C-470/E-470 corridor connects regional I-25 travelers to important destinations, including the I-70 mountain corridor and Denver International Airport.

Environmental resources were considered within the Study Area, which extends from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and SH 105 at Monument and 50 feet beyond the CDOT right-of-way. The study areas for a few resources—land use and cumulative—extend beyond the 50-foot buffer and farther north and south to include the travel shed between Colorado Springs and south Denver Metro to understand potential indirect effects. Section 2 describes the Study Area and any adjustments used for the resource evaluated in this environmental overview.

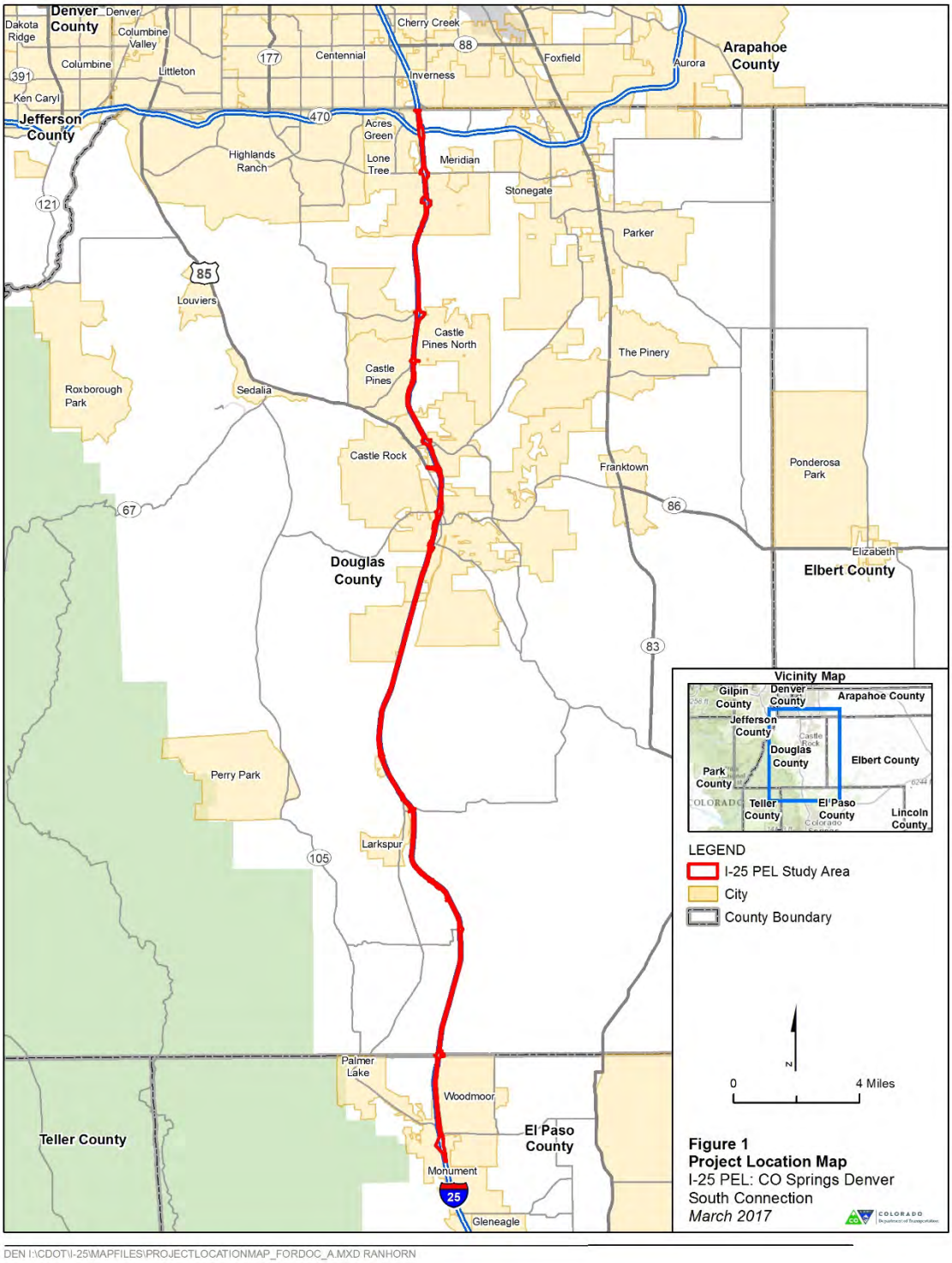


Figure 1. Project Location Map

2.0 Corridor Characteristics

I-25 between Monument and C-470 provides the main travel link for residents, visitors, commuters, and military personnel between Colorado Springs and Denver. This vital link is the backbone for several communities, including Monument, Larkspur, Castle Rock, Castle Pines, and Lone Tree.

Approximately half the trips on this corridor are through trips with origins and destinations outside the Study Area. This trend is expected to continue as the primary travel demand is coming from the Colorado Springs area and El Paso County, which by 2040 is projected to be the state's most populous county (DOLA, 2017).

The corridor is characterized by scenic vistas, open space, and small communities, all bookended by the state's two largest urban areas. Between Monument and Castle Rock, there has been limited development, driven by significant conservation easements and county purchase of open space lands. The Study Area is rich in natural resources and recreational amenities. Streams and wetlands meander along and under the highway and provide riparian habitat for listed and non-listed wildlife species.

I-25 through the Study Area is a high-speed facility with tight horizontal curves and steep vertical grades. A mixture of 8-lane, 6-lane, and 4-lane sections are present. These lane configurations correlate with the growth patterns along the corridor, which range from rural to urban from Colorado Springs to Denver, as shown on Figures 2 through 4. Although the corridor is divided into segments, environmental resources will be evaluated for the corridor as a whole and not be divided into these segments. The following are the three segments of the corridor:

- Segment 1 – The Gap (MP 160 to MP 179)
- Segment 2 – Castle Rock to Castle Pines (MP 179 to 189)
- Segment 3 – south Denver Metro (MP 189 to MP 195)

2.1 Segment 1 – The Gap (MP 160 to MP 179)

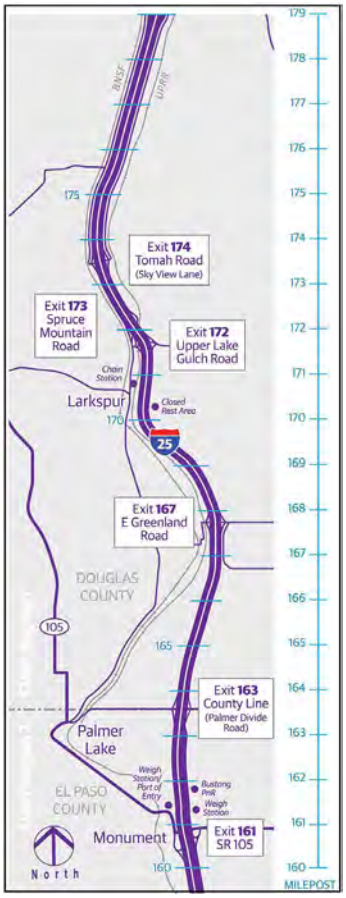


Figure 2. Segment 1

Segment 1 is the longest of the three segments. Primarily a rural, 4-lane highway with narrow shoulders, the surrounding land is open and expansive. This segment has areas of structured lanes—vertically offset northbound and southbound. There are five, mostly original, interchanges, built in the 1960s. The 2015 Annual Average Daily Traffic (AADT) ranges from 64,000 to 68,000, with a truck makeup ranging from 5.8 to 6.8 percent of the traffic (CDOT, 2015).

2.2 Segment 2 – Castle Rock to Castle Pines (MP 179 to MP 189)

This segment is primarily an urban, 6-lane highway with narrow shoulders. The surrounding land use is mostly already developed and continuing to grow. There are five interchanges in this segment. This segment is more developed and urban than Segment 1; therefore, traffic is higher than Segment 1, with a 2015 AADT range of 99,000 to 121,000 and a truck percentage ranging from 5.1 to 5.5 percent of the traffic (CDOT, 2015).

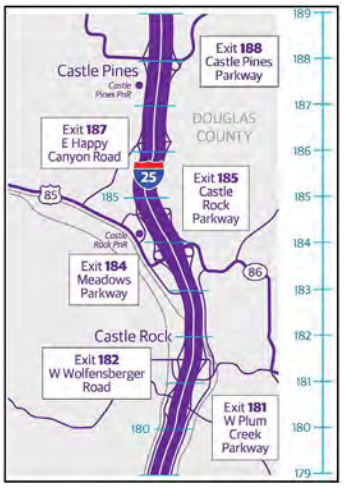


Figure 3. Segment 2

2.3 Segment 3 – South Denver Metro (MP 189 to MP 195)

This is the shortest of the three segments. The highway travels through an urban area, and the highway was recently widened to 8-lanes. The surrounding land use is developed and continues to rapidly develop into commercial and residential areas. There are three interchanges in this segment. As it is even more developed than the other two segments, traffic is highest here, with a 2015 AADT range of 126,000 to 224,000 and truck percentage ranging from 4.8 to 7.2 percent of the traffic (CDOT, 2015).

Environmental resources within the corridor, creeks, and trails transcend the segments defined on Figures 2 through 4 and will be discussed in terms of the Study Area. However, there are resources that follow growth and development patterns, like land and noise; where applicable, the environmental discussion to the segments may be referenced for consistency.

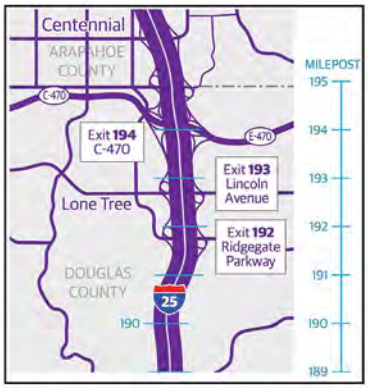


Figure 4. Segment 3

3.0 Summary of Previous Studies and Projects

Within the project area, numerous corridor-level and local-level studies and/or projects have been completed that must be taken into consideration during the PEL process. Descriptions of relevant resource-level studies and/or projects are included in Section 2.1.

3.1 Corridor-Level Studies

Over the past 25 years, CDOT has completed several major studies, some of which have resulted in recent and ongoing improvements, within or adjacent to this corridor.

3.1.1 South I-25 Corridor and US 85 Corridor Revised Record of Decision

This 2002 Environmental Impact Statement (EIS) and Record of Decision (ROD) (CDOT, 2002) evaluated I-25 from Douglas/Arapahoe County Line to Crystal Valley/Dawson Ridge. This EIS led to five construction projects for completing the widening and improvements of I-25 from County Line Road to Plum Creek Parkway, including the addition of a frontage road from Ridge Gate to Castle Pines. The last

of the interstate widening that was identified in the EIS was completed in early 2016 between County Line Road and Lincoln Avenue. Early action projects were built while the EIS was being completed. This included two projects to build truck climbing lanes on I-25 from Lincoln to Meadows/Founders Parkway.

3.1.2 I-25, Colorado Springs to Monument Environmental Assessment

This 2004 Environmental Assessment (EA) (CDOT, 2004a) focused on the segment of I-25 from Colorado Springs to Monument. This EA led to the widening and improvements of I-25 in two major phases: south of Bijou Street north to Woodmen Road in the heart of Colorado Springs (the Colorado Springs Metro Interstate Expansion [COSMIX] project completed in 2007) and from Woodmen Road north next to the Air Force Academy to Monument (the I-25 North Design-Build completed in 2014). Interchange reconstruction that was identified is still being completed through the Colorado Springs area, including the Fillmore Street and Cimarron Street interchange reconstructions.

A portion of this project (MPs 149 through 161) was reevaluated in 2012 when funding became available to execute the second phase of the project, which included widening I-25 from a 4-lane to 6-lane highway in northern El Paso County between Woodmen Road and SH 105 (CDOT, 2012). The widening on the north end of the second phase represents the beginning of Segment 1 (i.e., The Gap) of this PEL. The reevaluation concluded no substantial changes in impacts had occurred and reaffirmed the findings of the 2004 Finding of No Significant Impact (CDOT, 2004b).

3.1.3 Interregional Connectivity Study

In partnership with the Federal Railroad Association, CDOT has completed a statewide feasibility study of high-speed rail. The study considered high-speed technologies, alignment, funding options, and travel demand and ridership. CDOT published its draft findings in January 2014. Initial recommendations of the study include a segment of high-speed rail between Colorado Springs and the Denver metropolitan area.

3.2 Local Agency Studies

Over the past few decades, the towns and cities between the south Denver Metro area and Colorado Springs have experienced explosive growth. The municipalities in the Study Area include the City of Lone Tree, City of Castle Pines, Town of Castle Rock, Town of Larkspur, and the Town of Monument. As the I-25 through lanes have become more congested with the growth of Colorado Springs and Denver, the interchanges and local roads serving local communities have become more congested with the growth of the I-25 adjacent municipalities. The last two decades of local municipality growth has reinforced the importance of CDOT's partnership with local agencies and the common goal of providing efficient and safe transportation. The local agency projects in the Study Area include the following.

3.2.1 North Meadows Extension to US 85 and I-25

A 2010 EA (CDOT, 2010), with a Finding of No Significant Impact signed in March 2011 (CDOT, 2011), evaluated traffic congestion solutions at the Meadows Parkway/I-25 interchange at Castle Rock. The preferred alternative included an extension of North Meadows Avenue and a new loop interchange at I-25. Construction of the project is complete, and the new interchange was opened to the traveling public in September 2016.

3.2.2 Castle Pines Interchange

As part of the 2002 ROD (CDOT, 2002), the Castle Pines Parkway Interchange was reconfigured by adding a loop ramp in the southeast quadrant of the Castle Pines Parkway Interchange to improve traffic operations for eastbound to northbound traffic in response to proposed development in the area. In addition, the Castle Pines Parkway Bridge was rehabilitated and modified. The improved interchange was opened to the traveling public in 2006.

3.2.3 Happy Canyon Road Bridge and Interchange

As part of the 2002 ROD (CDOT, 2002), the Happy Canyon Road Bridge was cleared to be widened to allow both I-25 widening and the creation of left-turn lanes onto I-25 in both the northbound and southbound directions. The project has not yet been constructed, and CDOT is currently going through the 1601 Interchange Approval Process. The improvements will increase the overall capacity and safety of the Happy Canyon Road/I-25 interchange and allow for I-25 widening to eight lanes.

3.2.4 RidgeGate Parkway Interchange

As part of the 2002 ROD (CDOT, 2002), a new partial cloverleaf interchange was included to connect the future RidgeGate Parkway (now constructed) to the interstate. The new interchange, which was opened to the traveling public in May 2009, alleviates congestion along Lincoln Avenue while also providing regional connections to E-470, Parker Road, and Castle Pines Parkway.

3.2.5 Crystal Valley/Dawson Ridge Parkway/I-25 Interchange

This joint project between CDOT and adjacent land developers will construct a new diamond interchange with Crystal Valley/Dawson Ridge Parkway crossing over I-25 at the intersection of I-25 and Douglas Lane on the east, and Territorial Road on the west. The purpose of the project is to enhance the local ancillary roadway network and eliminate one railroad crossing, thereby improving safety of access. An EA and draft Section 4(f) Evaluation was completed in September 2004 and a Finding of No Significant Impact/Final Section 4(f) Evaluation was issued in February of 2005.

4.0 References

Colorado Department of Transportation (CDOT). 2002. *South I-25 Corridor and US 85 Corridor Revised Record of Decision*. https://www.codot.gov/library/studies/southi25us85-feis-rod/record-of-decision-rod. Accessed Nov 15, 2016.

—. 2004a. *I-25, Colorado Springs to Monument Environmental Assessment*. https://www.codot.gov/library/studies/I25EAColoSpgsMonument/environmental-assessment. Accessed Nov 10, 2016.

—. 2004b. *I-25 Colorado Springs Area Finding of No Significant Impact (FONSI)*. https://www.codot.gov/library/studies/i-25-finding-of-no-significant-impact-fonsi. Accessed Nov 10, 2016.

—. 2010. *North Meadows Extension to US 85 and I-25 Environmental Assessment.* http://www.crgov.com/DocumentCenter/Home/View/920. Accessed Nov 9, 2016.

—. 2011. *North Meadows Extension to US 85 and I-25 Finding of No Significant Impact*. http://www.crgov.com/DocumentCenter/Home/View/1240. Accessed Nov 9, 2016.

—. 2012. *Interstate 25, Colorado Springs to Monument, Mileposts 149 to 161*. Reevaluation. http://hermes.cde.state.co.us/drupal/islandora/object/co%3A21568/datastream/OBJ/view. Accessed Jan 17, 2017.

—. 2014. *Interregional Connectivity Study Final Report*. Division of Transit and Rail. https://www.codot.gov/projects/ICS/ics-draft-report-january-2014. Accessed Nov 4, 2016.

—. 2015. *Traffic Data Explorer.* Online Transportation Information System (OTIS). http://dtdapps.coloradodot.info/otis/trafficdata#ui/1/0/0/criteria//35/true/true/. Accessed January 17, 2017.

—. 2016a. Interstate 25 History. https://www.codot.gov/about/CDOTHistory/50th-anniversary/interstate-25. Accessed Nov 2, 2016.

Colorado Department of Local Affairs (DOLA). 2017. 2040 Colorado Population Estimates by County. https://data.colorado.gov/Demographics/Total-Population-by-County-by-Year/9dd2-kw29. Accessed June 21, 2017.

U.S. Census Bureau. 2010. *Population, Housing Units, Area, and Density: 2010 - State -- Place and (in selected states) County Subdivision*. American Fact Finder. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed November 2, 2016.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Air Quality Resources Technical Memorandum

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CH2M Project No.:
680954

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Figures

Acronyms and Abbreviations

AADT	annual average daily traffic
CAA	Clean Air Act of 1970 (42 U.S. Code 7401 et seq.)
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CO	carbon monoxide
DRCOG	Denver Regional Council of Governments
EPA	U.S. Environmental Protection Agency
FHWA	U.S. Federal Highway Administration
Front Range	eastern slope of the Rocky Mountains
GHG	greenhouse gas
MSAT	mobile source air toxics
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
OTIS	Online Transportation Information System
PM_{10}	particulate matter less than 10 microns in diameter
$PM_{2.5}$	particulate matter less than 2.5 microns in diameter
SIP	state implementation plan
Study Area	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument

1.0 Air Quality

1.1 Methodology for Initial Assessment

The purpose of the air quality characterization is to confirm that transportation actions are consistent with planning goals in the air quality State Implementation Plan (SIP), present relevant air quality analysis issues and information related to the Interstate 25 (I-25) corridor's current conditions, and provide information to support a subsequent analysis under the National Environmental Policy Act (NEPA).

Air quality is regulated at the national level by the Clean Air Act of 1970 (42 U.S. Code 7401 et seq.) (CAA) as amended in 1977 and 1990. The CAA regulates emissions through the National Ambient Air Quality Standards (NAAQS) and the Hazardous Air Pollutants Program, which includes Mobile Source Air Toxics (MSAT). Specific requirements are placed on the transportation planning process in air quality nonattainment areas and areas that have been reclassified from nonattainment to maintenance areas.

The NAAQS regulates six criteria pollutants—carbon monoxide (CO), ground level ozone, sulfur dioxide, nitrogen dioxide, particulate matter (particulate matter less than 10 microns in diameter [PM_{10}] and particulate matter less than 2.5 microns in diameter [$PM_{2.5}$]), and lead. The United States Environmental Protection Agency (EPA) has established health and welfare-based exposure and concentration limits for the NAAQS. Of the six NAAQS pollutants, transportation sources contribute to CO, nitrogen dioxide , PM_{10} and $PM_{2.5}$, and ozone (EPA, 2017a). The EPA works with state and local jurisdictions to monitor ambient air levels for these pollutants. In addition, MSATs have been identified as an issue of concern related to transportation projects (EPA, 2017b). Furthermore, the Colorado Department of Transportation (CDOT) requires additional non-conformity air quality analysis of Greenhouse Gases (GHGs) and criteria pollutants to satisfy the requirements of the National Environmental Policy Act.

The Colorado Department of Public Health and Environment (CDPHE) is the agency responsible for overseeing SIPs in Colorado. Current attainment status of criteria pollutants for the Study Area were gathered from their website. CDOT's Online Transportation Information System (OTIS) collects traffic data including current and projected annual average daily traffic (AADT) counts, including truck counts (CDOT, 2015). OTIS was used to derive AADT considered in the Study Area.

1.2 Resource Conditions

Currently, all areas in Colorado are in attainment for all NAAQS pollutants except for ground level ozone (CDPHE, 2017).

The Douglas County portion of the Study Area falls within the following maintenance areas: Denver Metropolitan and Denver-Boulder CO maintenance areas, as shown in Figure 5 (CDPHE, 2005a); Denver Metropolitan PM_{10} maintenance area, as shown in Figure 6 (CDPHE, 2005b); and Denver Metropolitan area and North Front Range ozone nonattainment area, as shown in Figure 7 (CDPHE, 2008).

The El Paso County portion of the Study Area falls within the Colorado Springs CO maintenance area, as shown in Figure 5 (CDPHE, 2009).

The Transportation Conformity Rule, promulgated through the CAA, is a mechanism through which transportation projects are evaluated for air quality impacts in nonattainment and maintenance areas (40 Code of Federal Regulations Parts 51.390 and 93). The conformity process has two levels—regional air quality conformity and project-level conformity.

1.2.1 Regional Conformity

The transportation conformity process is the mechanism used by the responsible metropolitan planning organization, in this case the Denver Regional Council of Governments (DRCOG) and the Pikes Peak Associated Council of Governments, to assure that requirements of the CCA are met for planned transportation improvements within the region. The fiscally-constrained Regional Transportation Plan and Transportation Improvement Program must identify all projects that are expected to receive federal funds or that will require Federal Highway Administration (FHWA) approval. Regionally-significant projects, regardless of funding source, and federally funded projects must be included in a regional emissions analysis that demonstrates conformity to the SIPs to comply with the CAA. In order to meet the requirements of the federal conformity regulation and Colorado's conformity regulation, the project must be included in the appropriate Transportation Improvement Programs including fiscal constraint and the latest planning assumptions. For the purposes of transportation conformity, non-attainment and maintenance areas are treated the same.

1.2.2 Project -Level Conformity

To determine whether a project will cause a violation of the NAAQS air pollution in localized areas, the project must be assessed for elevated concentrations known as hotspots. The NAAQS pollutants of primary concerns for the study area are CO, PM_{10} and O_3; only CO is a potential hotspot pollutant. CO hotspots are most likely to be a concern where traffic is very congested and slow moving, such as congested, high-volume intersections. A PM_{10} hot spot analysis is required if building the project would result in a high number of heavy trucks or other large diesel vehicles in the study area. However, heavy truck volumes in the area are not estimated to increase as a result of the project; therefore, this situation is not expected in the study area. Based on this information, this project is not a "project of air quality concern" in terms of federal conformity screening criteria for particulate matter. O_3 is influenced by regional pollutant emissions and is not a hotspot concern—a local analysis is not appropriate for O_3.

- **Ozone** – The North Front Range area, including the Denver metropolitan area, is currently an ozone nonattainment area for violating the 2008 8-hour standard. A portion of the I-25 Study Area resides in Douglas County, which is in the Denver metropolitan nonattainment area (CDPHE, 2017). Therefore, a quantitative ozone precursor analysis may be necessary in a subsequent NEPA study. The quantitative analyses of volatile organic compounds and oxides of nitrogen emissions from mobile sources would be based on the EPA MOVES model.
- **CO** – The Study Area is within the Denver and Colorado Springs CO maintenance areas. A quantitative CO hotspot analysis for a subsequent NEPA study would be triggered if any of the four conditions listed under 40 CFR 93.123(a)(1) apply.
- **PM_{10} and $PM_{2.5}$** – The Douglas County portion of the Study Area is within the Denver PM_{10} maintenance area. A subsequent NEPA study for I-25 may require a PM_{10} hotspot analysis if the number of diesel vehicles is expected to increase as a result of the project. $PM_{2.5}$ is not a pollutant of concern in Colorado as there are no nonattainment or maintenance areas in the state for this pollutant.

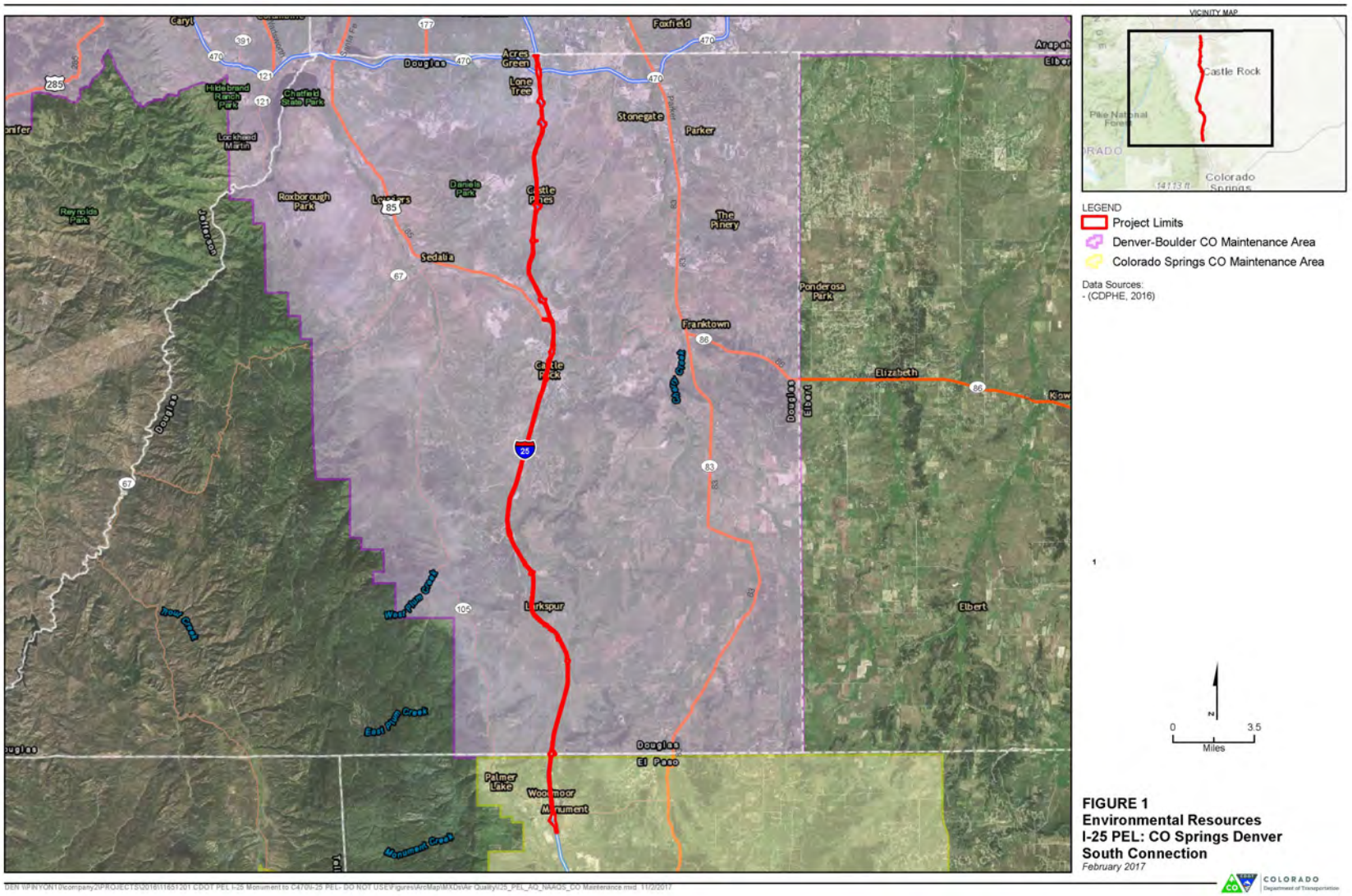


Figure 1. Colorado Maintenance Areas in the Study Area

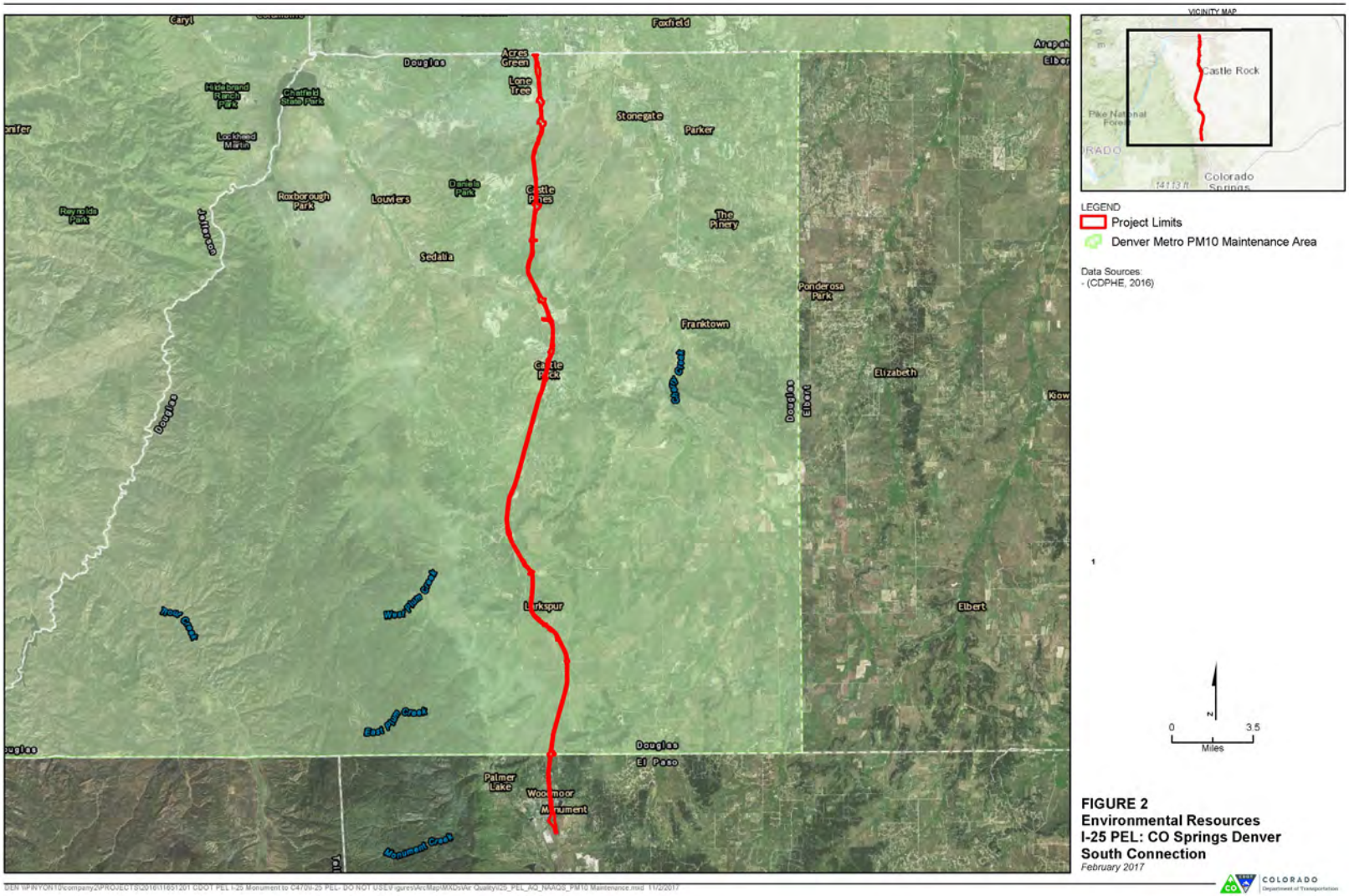


Figure 2. PM_{10} Maintenance Area in the Study Area

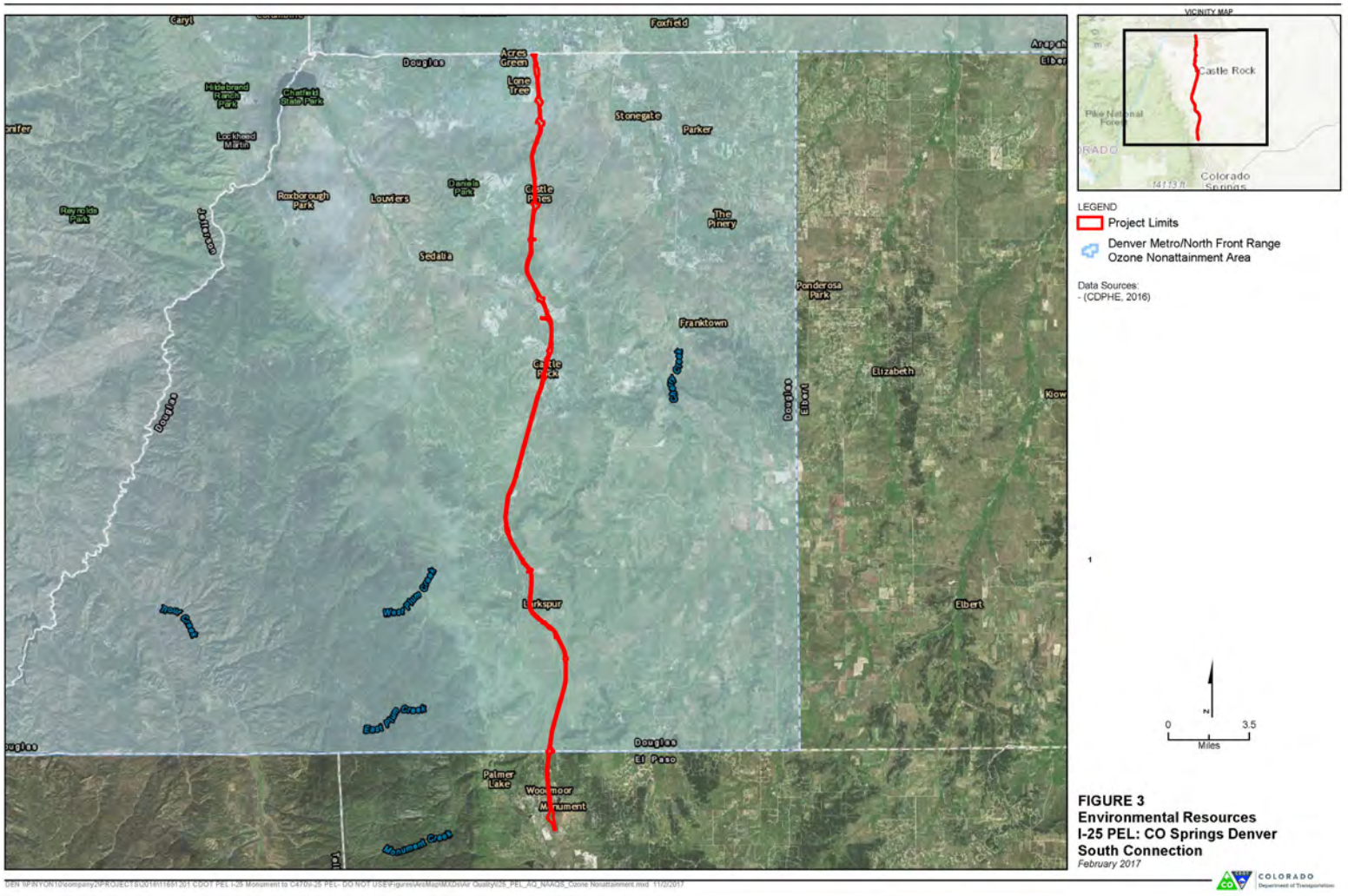


Figure 3. Ozone Nonattainment Area in the Study Area

- **MSATs—**Tools and techniques for assessing MSATs are limited and there are no approved exposure-concentration limits. TheFHWA has issued interim guidance for MSAT analyses associated with NEPA studies based on a tiered approach with no analysis necessary for projects with no potential MSAT effects, a qualitative analysis for projects with low potential MSAT effects, and a quantitative analysis to differentiate alternatives with higher potential MSAT effects (FHWA, 2016a). Current AADT in the Douglas County portion of the Study Area is above the threshold (140,000 to 150,000 AADT) where a quantitative analysis could be necessary; however, the study area is not considered to be significantly populated. Therefore, a quantitative analysis is not likely to be required.
- **GHGs—**Recent concerns with climate change have prompted calls for reducing GHGs, of which carbon dioxide is a primary component. Appendix F of the CDOT NEPA manual (CDOT, 2017) includes standard language for GHG analysis.

1.3 Scoping Input

In February, the Technical Working Group participated in an Innovations Workshop that focused on engineering and operational alternatives and funding/finance and project delivery opportunities. As part of the workshop, the group discussed the steps for air quality conformity for an early action project:

- There is an approximate 7-month lead time for DRCOG.
- Funding should be *reasonably expected* before CDOT submits to either the DRCOG or the Pikes Peak Area Council of Governments.
- DRCOG needs to model what type of lane is going to be built and needs to know the toll rate and access points. It would be beneficial to have a level one traffic and revenue study. If the type of lane is changed after the DRCOG submittal, the model process will need to start over.
- Application to DRCOG by fall 2017.
- Final DRCOG Board of Directors action in March/April 2018.

As future projects are programmed from the Planning and Environmental Linkages program, each resource, including air quality and associated resources, will be evaluated during the NEPA phase of project development. The NEPA evaluation process will be more in-depth and includ the determination of potential impacts and mitigation.

2.0 References

Colorado Department of Transportation (CDOT). 2015. *Traffic Data Explorer.* Online Transportation Information System (OTIS). https://www.codot.gov/safety/safety-data-sources-information/online-transportation-information-systems-otis. Accessed January 17, 2017.

—. 2017. *NEPA Manual (Version 5)*. Appendix F – Standard Language. Accessed Sept 5, 2017.

Colorado Department of Public Health and Environment (CDPHE). 2005a. *Carbon Monoxide Maintenance Plan for the Denver Metropolitan Area.* https://www.colorado.gov/pacific/sites/default/files/AP_PO_Denver-Carbon-Monoxide-Attainment-Maintenance-Plan.pdf. Accessed February 23, 2017.

—. 2005b. *PM_{10} Maintenance Plan for the Denver Metropolitan Area.* https://www.colorado.gov/pacific/sites/default/files/AP_PO_Denver-PM10-Attainment-Maintenance-Plan.pdf. Accessed February 23, 2017

—. 2008. *Denver Metro Area & North Front Range Ozone Action Plan.* https://www.colorado.gov/pacific/sites/default/files/AP_PO_Denver-Ozone-Action-Plan-2008.pdf. Accessed Sept 5, 2017.

—. 2009. *Revised Carbon Monoxide Attainment/Maintenance Plan for the Colorado Springs Attainment/Maintenance Area.* https://www.colorado.gov/pacific/sites/default/files/AP_PO_Colo-Spgs-Carbon-Monoxide-Attainment-Maintenance-Plan-Revised-2009.pdf. Accessed February 23, 2017

—. 2017. *State Implementation Plans*. https://www.colorado.gov/pacific/cdphe/state-implementation-plans-sips

U.S. Environmental Protection Agency (EPA). 2017a. *Reviewing National Ambient Air Quality Standards (NAAQS): Scientific and Technical Information.* https://www.epa.gov/naaqs

—.2017b. *Mobile Source Pollution and Related Health Effects.* https://www.epa.gov/mobile-source-pollution

U.S. Federal Highway Administration (FHWA). 2016a. *Interim Guidance Update on Mobile Source Air Toxic Analysis in NEPA.* http://www.fhwa.dot.gov/environment/air_quality/air_toxics/policy_and_guidance/msat/index.cfm

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Acronyms and Abbreviations

CDOT	Colorado Department of Transportation
CRA	common resource area
CFR	Code of Federal Regulations
CWA	Clean Water Act
CWI	Colorado Wetland Inventory
JD	jurisdictional determination
HUC	hydrologic unit code
MOA	memorandum of agreement
MP	mile post
NHD	National Hydrologic Data
NRCS	Natural Resource Conservation Service
NWI	National Wetland Inventory
PEM	palustrine emergent
PSS	palustrine scrub-shrub
RCZ	Riparian Conservation Zone
RHA	River and Harbors Act of 1899
Study Area	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument
USGS	U.S. Geological Survey
USFWS	U.S. Fish and Wildlife Service
WRCC	Western Regional Climate Center

1.0 Aquatic Resources

Aquatic resources is an inclusive term for wetlands and surface waters. Aquatic resources are protected under Section 10 of the River and Harbors Act of 1899 (RHA) (33 Code of Federal Regulations [CFR] Part 322) and the Clean Water Act (CWA) (33 CFR 323). The RHA applies to any modifications to navigable waters of the U.S., including dredging or disposal of dredged materials, excavation, filling, and rechannelization, and applies to all structures. The CWA is a 1977 amendment to the Federal Water Pollution Control Act of 1972, which set the basic structure for regulating discharges of dredged or fill materials into jurisdictional wetlands and waters of the U.S. Project actions with the potential to discharge dredged or fill materials into jurisdictional wetlands and/or waters of the U.S., are regulated by Section 10 of the RHA and Section 404 of the CWA. Summaries of the Sections 10 RHA and 404 CWA regulatory jurisdiction and permitting requirements are provided in Section 3.0, Recommended Next Steps.

1.1 Methodology for Initial Assessment

Initial assessment research included a review of the U.S. Fish and Wildlife Service (USFWS) National Wetlands Inventory (NWI) (USFWS, 2016), Colorado Wetland Inventory (CWI) (CNHP, 2016), U.S. Geological Survey (USGS) 7.5-minute topographic maps (1986; 1973; 1979; 1994a; 1994b; 1994c; 1994d; 1994e), Google Earth aerial photography (Google Earth, 2016); Natural Resources Conservation Service (NRCS) soil survey maps (2016a), NRCS rapid watershed assessments (2007; 2009; 2010), and the National Hydrography Dataset (NHD) (USGS, 2014). See Appendix H for figures identifying aquatic resources.

Aquatic resources identified during the initial assessment have been classified using the Cowardin classification system (Cowardin et al., 1979). Wetlands were classified into three groups: palustrine emergent (PEM), palustrine scrub-shrub (PSS), and PEM/PSS combination. Surface water features were classified into two categories: fresh water pond and riverine. Fresh water ponds in the Aquatic Resources Study Area were classified as palustrine aquatic bed. Riverine features were classified into two groups: riverine lower perennial and riverine intermittent. Modifiers were included as applicable.

1.2 Resource Conditions

1.2.1 Existing Conditions

The Aquatic Resources Study Area is predominantly located within the NRCS common resource area (CRA) known as the Southern Rocky Mountain Foothills with the southern project limits in the Southern Rocky Mountains – High Mountains and Valleys CRA. The Southern Rocky Mountain Foothills CRA is the transition zone between the Great Plains and the Southern Rocky Mountains. The area is characterized as having a mesic to frigid temperature regime and an ustic moisture regime. Vegetation communities ranges from grasslands and shrubs to coniferous forests (NRCS, 2007; 2009; 2010).

The Southern Rocky Mountains – High Mountains and Valleys CRA consists of steep, high mountain ranges and mountain valleys with an elevation range from 6,500 to 14,400 feet. Temperature regimes are mostly frigid and cryic with ustic to udic moisture regimes. Vegetation communities at lower elevations are dominated by sagebrush-grassland that transition to coniferous forest and alpine tundra as elevation increases (NRCS, 2007; 2009; 2010).

Elevation in the Aquatic Resources Study Area ranges from approximately 6,050 to 7,350 feet above mean sea level. Precipitation along the corridor ranges from 17 to 23 inches annually, with most precipitation occurring in the Monument area (WRCC, 2004; 2016).

The majority of the Aquatic Resources Study Area is located within a rural environment with urban centers located at the ends of the project. Within the rural section, the majority of the land us is agriculture, approximately 68 percent based on Douglas and El Paso counties land use data. The rural and urban areas include a combination of transportation, planned development, commercial and industrial, residential, and land classified as parks, open space, or recreation.

1.2.2 Vegetation

The Aquatic Resources Study Area supports five broad vegetative communities: Landscape, Woodland, Farmland, Wetland/Riparian, and Disturbed/Barren.

Landscape communities are dominant in urban and semi-urban areas. The term landscape encompasses commercial, residential, and CDOT maintained (i.e., mowed) areas.

Woodland communities with in the study area tend to be matrix-forming mixed-conifer forest with the ponderosa pine (*Pinus ponderosa*) as the predominant conifer. The understory is typically a combination of graminoids and herbaceous with some shrubby species. The composition of the over and understories is dependent on the temperature and moisture regime of a given area.

Farmland areas include both active and fallow fields, as well as land being used for grazing animals.

The Wetland/Riparian vegetative community is associated with surface water features in the Aquatic Resources Study Area. The wetland communities are either a combination of wetland/riparian vegetation associated with a surface water feature or are an isolated feature. Mapped wetlands are predominantly herbaceous vegetation (USFWS, 2016). One isolated wetland has been mapped by USFWS (2016). Wetlands are discussed in more detail in Section 1.2.5.1.

The Riparian zone is located adjacent to surface waters. The Riparian zone is typically composed of mature trees and large woody shrubs, which contribute a significant cover component in the Riparian community. The Riparian understory may be bare or composed of grasses and small- to medium-sized woody shrubs. In Douglas County, Riparian Conservation Zones (RCZ) have been established, which are composed of the active water feature channel, alluvial floor, upland side slopes adjacent to the channel or alluvial floor, and a component of the upland vegetation adjacent to the upland side slopes.

The Disturbed/Barren vegetative community comprises the remainder of the major vegetative communities and includes generally non-native, weedy, or invasive vegetation that has developed because of previous disturbance and/or intentionally barren areas such as paved or gravel parking lots and roadways.

1.2.3 Soil

A custom soil report was developed for the Aquatic Resources Study Area that generated a list of general soil map units intersecting the Study Area. Thirty-seven soil types occur within the Aquatic Resources Study Area and are described in Table 1. Soils with a hydric rating of “Yes” have the capability of forming hydric soils; the existence of hydric soils cannot be confirmed from a desktop survey. The National Technical Committee of Hydric Soils defines hydric soil as “soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part” of the soil profile (Federal Register, 1994).

Table 1. Soil Types Occurring in the I-25 PEL Study Area, Douglas and El Paso Counties, Colorado

Name/Description[a]	ID	Classification	Hydric Rating[b]
Alamosa loam, 1 to 3% slopes	1	Fine-loamy, mixed, superactive, frigid Typic Argiaquolls	Yes
Blakeland-Orsa association, 1 to 4% slopes	Bo	Sandy, mixed, mesic Torriorthentic Haplustolls	NA
Bresser sandy loam, 1 to 3% slopes	BrB	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls	Yes
Bresser sandy loam, 3 to 9% slopes	BrD	Fine-loamy, mixed, superactive, mesic Aridic Argiustolls	Yes
Bresser-Truckton sandy loams, 5 to 25% slopes	BtE	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Aridic Argiustolls	Yes
Crowfoot-Tomah sandy loams, 5 to 25% slopes	CrE	Fine-loamy, mixed Boralfic Argiborolls	No
Englewood clay loam	En	Fine, montmorillonitic, mesic Torrertic Argiustolls	Yes
Fondis clay loam, 3 to 9% slopes	FoD	Fine, montmorillonitic, mesic Aridic Paleustolls	Yes
Fondis-Kutch association	Fu	Fine, montmorillonitic, mesic Aridic Paleustolls	Yes
Hilly gravelly land	Hg	none	Yes
Jarre-Brussett association	Jb	Fine-loamy, mixed Aridic Argiborolls	Yes
Kettle gravelly loamy sand, 8 to 40% slopes	41	Coarse-loamy, mixed, superactive, frigid Lamellic Haplustalfs	Yes
Kettle loamy sand, 5 to 25% slopes	KeE	Mixed Psammentic Eutroboralfs	No
Kippen loamy sand, 1 to 20% slopes	KnE	Sandy, mixed Torriorthentic Haploborolls	Yes
Kutch sandy loam, 5 to 20% slopes	KtE	Fine, montmorillonitic, mesic Torrertic Argiustolls	Yes
Kutch clay loam, 4 to 8% slopes	KuD	Fine, montmorillonitic, mesic Torrertic Argiustolls	Yes
Kutch-Newlin-Stapleton complex, 8 to 40% slopes	KwF	Fine, montmorillonitic, mesic Torrertic Argiustolls	No
Loamy alluvial land	Lo	None	Yes
Loamy alluvial land, dark surface	Lu	None	Yes
Loamy wet alluvial land	Lw	None	Yes
Newlin gravelly sandy loam, 8 to 30% slopes	NeE	Fine-loamy over sandy or sandy-skeletal, mixed, mesic Aridic Argiustolls	Yes
Peyton sandy loam, wet, 1 to 5% slopes	PfC	Fine-loamy, mixed Aridic Argiborolls	Yes
Peyton-Pring complex, 8 to 15% slopes	69	Fine-loamy, mixed, superactive, frigid Aridic Argiustolls	Yes
Peyton-Pring-Crowfoot complex, 3 to 15% slopes, eroded	PrE2	Fine-loamy, mixed Aridic Argiborolls	No
Peyton-Pring-Crowfoot sandy loams, 5 to 25% slopes	PpE	Fine-loamy, mixed Aridic Argiborolls	Yes
Pits, gravel	GP	None	Yes
Pring and Kippen gravelly sandy loams, 1 to 25% slopes	PvE	Coarse-loamy, mixed Aridic Haploborolls	Yes

Name/Description[a]	ID	Classification	Hydric Rating[b]
Pring coarse sandy loam, 3 to 8% slopes	71	Coarse-loamy, mixed, superactive, frigid Aridic Haplustolls	Yes
Renohill-Buick complex, 5 to 25% slopes	RmE	Fine, montmorillonitic, mesic Ustollic Haplargids	Yes
Renohill-Manzanola clay loams, 3 to 20% slopes	RnE	Fine, montmorillonitic, mesic Ustollic Haplargids	No
Sampson loam	Sa	Fine-loamy, mixed, mesic Pachic Argiustolls	Yes
Sandy alluvial land	Sd	None	Yes
Sandy wet alluvial land	Se	None	Yes
Stony rough land	Su	None	No
Stony steep land, cold	Sw	None	No
Tomah-Crowfoot loamy sands, 3 to 8% slopes	92	Coarse-loamy, mixed, superactive Boralfic Argiborolls	Yes
Tomah-Crowfoot complex, 8 to 15% slopes	93	Coarse-loamy, mixed, superactive Boralfic Argiborolls	Yes

[a] NRCS, 2016a

[b] NRCS, 2016b

1.2.4 Hydrology

The Aquatic Resources Study Area crosses three watersheds: Fountain, Upper South Platte, and Middle South Platte – Cherry Creek. The Fountain watershed hydrologic unit code (HUC) 11020003, is located at the southern end of both the Planning and Environmental Linkages (PEL) study areas and the Aquatic Resources study areas (referred to collectively as the study areas) from approximately MP 160 to MP 163 (EPA, 2016). Named surface water features within the Fountain watershed that cross the study areas include Dirty Woman Creek and Crystal Creek. Dirty Woman Creek is an intermittent/perennial surface water that flows west into Monument Creek, crossing I-25 at MP 160.6. Crystal Creek is an intermittent surface water that flows west into Monument Lake, crossing I-25 at MP 161.3. Fountain Creek is the ultimate receiving water for this watershed.

The Upper South Platte HUC 10190002 is the largest watershed within the Aquatic Resources Study Area located approximately between MP 163 to MP 187 (EPA, 2016). Named surface water features within the watershed that cross the study areas include Carpenter Creek, East Plum Creek, Sellars Gulch, and Hangman's Gulch. Carpenter Creek is a perennial feature that flows south to north paralleling the west side of I-25 with minor deviations from approximately MP 167.9 to MP 170.4, where it forms a confluence with East Plum Creek. Carpenter Creek does not cross I-25. East Plum Creek is a perennial feature that flows south to north and parallels I-25 with minor deviations, from approximately MP 170.4 to MP 182.2. East Plum Creek passes under I-25 twice: the first from the west to east side of I-25 at MP 172.2; the second crosses back to the west side of I-25 at MP 181.3. Sellar's Gulch is a perennial stream that flows west and forms a confluence with East Plum Creek just inside the study areas at MP 181.3. Hangmans Gulch is an intermittent feature that flows west, passing under I-25 at MP 182.5. Numerous unnamed intermittent and ephemeral streams cross the study areas and flow to Carpenter Creek or East Plum Creek. The South Platte River via Chatfield Reservoir is the ultimate receiving water for the surface waters that cross the study areas in this watershed.

The Middle South Platte - Cherry Creek HUC 10190003 is the northernmost watershed within the study areas from approximately MP 187 to MP 195 (EPA, 2016). Named surface water features within the watershed that cross the study areas include Newlin Gulch, Happy Canyon Creek, Arapahoe Canal, and

Cottonwood Creek. Newlin Gulch is an intermittent feature that flows west to east and crosses the study areas at MP 187.2. Happy Canyon Creek is an intermittent feature that flows south to north, paralleling the west side of I-25 from approximately MP 190.4 to 191.7. Happy Canyon Creek crosses to the east side of I-25 at MP 191.1. Arapahoe Canal is a perennial feature that flows east and crosses I-25 at MP 192.4. Cottonwood Creek is an intermittent feature that flows south to north and crosses I-25 at MP 192.5. Numerous unnamed intermittent and ephemeral streams cross the study areas and flow to one of these named surface water features. Cherry Creek via Cherry Creek Reservoir is the ultimate receiving water for the surface waters that cross the study areas in this watershed.

1.2.5 Aquatic Resources

Thirty-eight wetlands, 66 surface waters features (10 of which are named surface water features), and two ponds have been identified within the Aquatic Resources Study Area using NWI, CWI, and NHD data sets (USFWS, 2015; CNHP, 2016; USGS, 2014; Mapbook Appendix H). These data sets are appropriate for the high-level analysis reflected in this report; however, more detailed data sources—including field surveys—will be needed for subsequent analysis.

1.2.5.1 Wetlands

NWI and CWI indicates that of the 38 wetlands, 21 are PEM and 17 are PSS wetlands. Wetland locations are shown on the Mapbook, Appendix H. Despite the Aquatic Resources Study Area supporting more PEM wetlands than PSS wetlands, the acreages are similar. PEM wetlands cover 35.5 acres, and PSS wetlands account for 38.2 acres, totaling 73.7 acres of the Study Area. All but one of the wetlands identified are hydrologically connected to one of the named surface water features and/or their unnamed tributaries.

PEM wetlands are further divided by the hydrologic regime they experience throughout most years. Eighteen PEM wetlands are classified as PEMC, meaning they experience seasonal flooding through the growing season. Even when surface water is not present, the water table is variable, extending from the surface to well below the ground level. Two wetlands are classified as PEMF, meaning they experience semi-permanent flooding through the growing season. Even in dry years, the water table is at or near the surface. One wetland is considered a combination wetland (PEM/PSSA), having defined areas of both PEM and PSS vegetation within the boundaries of one wetland. The “A” indicates the wetland is temporarily flooded, for a few days to a few weeks, during the growing season; however, the water table is usually well below the ground surface for most of the season (Cowardin et al., 1979).

All 17 of the PSS wetland have a hydrologic regime of “C”, meaning they experience seasonal flooding through the growing season. Even when surface water is not present, the water table is variable, extending from the surface to well below the ground level (Cowardin et al., 1979).

NWI and CWI data does not account for roadside wetlands. As projects move forward, each specific project areas will need be surveyed to capture any roadside wetlands and or changes that have occurred to previously mapped wetlands.

1.2.5.2 Surface Water Features

Carpenter Creek, East Plum Creek, and Happy Canyon Creek are the most conspicuous surface water features within the study areas, as they parallel I-25. Other surface waters features comprise single crossing named features, smaller tributaries, spring or seeps, ditches, and canals.

Sixty-six linear surface water features and two ponds were identified within the study areas, including all named features, most of which are small intermittent or ephemeral drainages. The larger surface waters include the eight named features identified in Section 2.2.4, Hydrology.

NWI, CWI, and NHD data do not account for all culverts or drainage features that may develop because of land developments both inside and adjacent to the study areas. As projects move forward, each specific project area will need be surveyed to capture any changes that have occurred within the study areas.

1.3 Scoping Input

Leadership from the county and municipal areas relevant to the analysis have been involved in the PEL process through numerous committees and technical groups established at the project's outset. Additionally, resource agencies—such as Colorado Parks and Wildlife (CPW), the USFWS, and the EPA—continue to be involved in the project through team meetings and technical reviews.

CPW has provided recommendations to improve portions of East Plum Creek that run parallel to I-25, particularly near Tomah Road, between approximately MPs 173 and 176. Through this area, portions of East Plum Creek have become channelized and have been highly altered by historical highway work. CPW would also like to see the aquatic habitat be protected from erosion/sedimentation and increased overland runoff from adjacent properties with impervious surfaces. These areas of concern will be looked at as potential locations for onsite wetland mitigation. In addition, Douglas County stated they are considering collaborating with CDOT to create a wetland mitigation bank near Tomah Road during the December 6, 2016, I-25 South PEL Resource Agency Group Meeting (CDOT, 2016b).

As future projects are programmed from the PEL, each resource, including environmental justice and associated resources, will be evaluated during the National Environmental Policy Act of 1969 phase of project development. The National Environmental Policy Act evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

2.0 References

Colorado Department of Transportation (CDOT). 2016b. I-25 South PEL: Resources Agency Group Meeting Summary. December 6.

Colorado Natural Heritage Program (CNHP). 2016. Colorado Wetland Inventory Mapper. http://csurams.maps.arcgis.com/apps/webappviewer/index.html?id=a8e43760cb934a5084e89e46922580cc. Accessed December 6, 2016.

Cowardin, L.M., V. Carter, F. Golet, and E. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service. FWS/OBS-79/31. 103 pp.

Environmental Laboratory. 1987. *Corps of Engineers Wetland Delineation Manual*. January. Technical Report Y-87-1. http://www.lrh.usace.army.mil/Portals/38/docs/USACE%2087%20Wetland%20Delineation%20Manual.pdf.

—2010a. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Great Plains* (Version 2.0). Vicksburg, Mississippi. March. http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/gp_supp.pdf.

—2010b. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coasts* (Version 2.0). Vicksburg, Mississippi. May. http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp2.pdf

Federal Register. July 13, 1994. *Changes in Hydric Soils of the United States*. Washington, DC. (Definition of hydric soils.)

Google Earth. 2016. Source: I-25 Corridor between Centennial, Colorado and Monument, Colorado. Accessed December 6, 2016.

Lichvar, R.W., D.L. Banks, W.N. Kirchner, and N.C. Melvin. 2016. The National Wetland Plant List: 2016 wetland ratings. Phytoneuron 2016-30: 1-17. Published 28 April 2016. ISSN 2153 733X.

Natural Resources Conservation Service (NRCS). 2007. *Fountain Watershed Hydrologic Unit Code 111020003 Rapid Assessment*. August. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_060554.pdf. Accessed December 6, 2016.

—2009. *Middle South Platte- Cherry Creek Watershed Hydrologic Unit Code 10190003 Rapid Assessment*. October. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_060843.pdf. Accessed December 6, 2016.

—2010. *Upper South Platte Watershed Hydrologic Unit Code 10190002 Rapid Assessment*. February. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_060867.pdf. Accessed December 6, 2016.

—2016a. Web Soil Survey for Portions of Douglas and El Paso Counties. http://websoilsurvey.nrcs.usda.gov/. Accessed December 6, 2016.

—2016b. State Soil Data Access Hydric Soils List. http://websoilsurvey.nrcs.usda.gov/. Accessed December 6, 2016.

U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (EPA). 2007. *U.S. Army Corps of Engineers Jurisdictional Determination Form Instructional Guidebook*. http://www.nap.usace.army.mil/Portals/39/docs/regulatory/jd/jd_guidebook_051207final.pdf.

U.S. Army Corps of Engineers (USACE). 2008. Regulatory Guidance Letter 08-02. June 26. http://www.nap.usace.army.mil/Portals/39/docs/regulatory/rgls/rgl08-02.pdf.

U.S. Environmental Protection Agency (EPA). 2015. *Guidance on Identifying Waters Protected by the Clean Water Act.* https://www.epa.gov/cwa-404/guidance-identify-waters-protected-clean-water-act. Accessed December 6, 2016. Date of last update October 27, 2015.

—2016. National Hydrography Dataset Plus. https://www.epa.gov/waterdata/nhdplus-national-hydrography-dataset-plus. Accessed December 6, 2016. Date of last update August 24, 2016.

—2016. National Wetlands Inventory. http://www.fws.gov/wetlands/Data/Mapper.html. Accessed December 5, 2016.

U.S. Geological Survey (USGS). 1973. *Greenland, CO* 7.5-minute topographic quadrangle map, 1954, Photorevised 1969, minor revision 1973.

—1979. *Larkspur, CO* 7.5-minute topographic quadrangle map, 1954, Photorevised 1979.

—1986. *Monument, CO* 7.5-minute topographic quadrangle map.

—1994a. *Dawson Butte, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

—1994b. *Castle Rock South, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

—1994c. *Castle Rock North, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

—1994d. *Sedalia, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

—1994e. *Parker, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

—2014. National Hydrography Dataset. Accessed at http://nhd.usgs.gov. Date of last update February 16, 2017.

Western Regional Climate Center (WRCC). 2004. Monument, Colorado 1988-2004 Monthly Climate Summary. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?co5734. Accessed March 15, 2017.

—2016. Castle Rock, Colorado 1893-2016 Period of Record Monthly Climate Summary. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?co1401. Accessed March 15, 2017.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Environmental Justice Resources Technical Memorandum

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Acronyms and Abbreviations

ACS	American Community Survey
CDOT	Colorado Department of Transportation
EO	Executive Order
FHWA	Federal Highway Administration
HUD	Department of Housing and Urban Development
I-25	Interstate 25
LEP	Limited English Proficiency
PEL	Planning and Environmental Linkages
USC	United States Code

1.0 Environmental Justice

This technical memorandum presents the methodology and results of the Title VI and Environmental Justice analysis for the Interstate 25 (I-25) South Planning and Environmental Linkages (PEL) Project. The analysis follows the Colorado Department of Transportation (CDOT) methodology for Environmental Justice reviews as presented in CDOT's *National Environmental Policy Act Manual, Version 5 Update* (CDOT, 2017).

2.0 Regulatory Context

Title VI of the Civil Rights Act of 1964, as amended, is a non-discrimination statute. Specifically, 42 United States Code (USC) 2000d states that:

> *No person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.*

Environmental Justice, a component of Title VI, is a public policy goal of promoting the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. It is grounded in the following three principles that establish an approach to identify and address disproportionately high and adverse effects of proposed decisions on Low-Income and minority populations:

- To avoid, minimize, or mitigate disproportionately high and adverse human health or environmental effects, including social and economic, on minority populations and Low-Income populations.
- To ensure the full and fair participation by all potentially affected communities in the transportation decision-making process.
- To prevent the denial of, reduction in, or significant delay in the receipt of benefits by minority and Low-Income populations.

Executive Order (EO) 12898, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," placed further emphasis on the Title VI protections of race and national origin by requiring federal agencies to identify and address disproportionately high and adverse effects of their actions on minority and Low-Income populations. EO 12898 and the United States Department of Transportation and Federal Highway Administration (FHWA) orders that followed (Order 5610.2 and Order 6640.23, respectively) expanded upon Title VI to include Low-Income populations and ensure greater public participation in the decision-making process.

Although the non-discrimination principles of EO 12898 and the Title VI statute intersect, they are two separate mandates and each has unique requirements. The term "minority," which is a protected category under Environmental Justice, overlaps with "race, color, and national origin," which the Title VI statute protects. Environmental Justice principles, however, also apply to Low-Income populations, which are not covered under the Title VI statute.

Although the Title VI statute protects persons from discrimination solely based on race, color, and national origin, there are other non-discrimination statutes that afford legal protection. These statutes include Section 162 (a) of the Federal-Aid Highway Act of 1973 (23 USC 324) (sex), Age Discrimination Act of 1975 (age), and Section 504 of the Rehabilitation Act of 1973/Americans with Disabilities Act of 1990 (disability). On August 11, 2000, President William Clinton signed EO 13166, "Improving Access to Services for Persons with Limited English Proficiency," requiring federal agencies to examine the services

they provide and identify any need for services to Limited English Proficiency (LEP) Populations. Taken together, these requirements define FHWA's Title VI Program, which ensures that FHWA policies, programs, and activities do not discriminate based on race, color, national origin, income, sex, age, disability, or LEP (FHWA, 2015).

3.0 Methodology and Results

3.1 Scoping and Outreach

During the scoping period, stakeholders from communities within the corridor were engaged to provide local knowledge of Low-Income and minority populations. Castle Rock was an area identified as likely containing Low-Income and/or minority populations. Through the analysis conducted for this report, Castle Rock—in addition to other areas—was confirmed to include minority, Low-Income, and LEP populations. For further information on outreach and public involvement techniques please see the Public Outreach Technical Memo.

3.2 Minority Populations

The Study Area for the Project is from approximately mile post 160 in Monument to mile post 195 in Lone Tree. The Study Area includes portions of Douglas County and El Paso County, specifically block groups that intersected a 2-mile buffer from the project centerline. The buffer was reduced on the northern and southern ends of the project, ending at the southern limit of Arapahoe County, to concentrate the analysis in the two counties where potential improvements would be located.

As defined by EO 12898, minority classifications include Black, Hispanic, Asian, American Indian/Alaska Native, and Native Hawaiian or Pacific Islander. The most recent data available from the U.S. Census Bureau for ethnicity and race is from the 2012–2016 American Community Survey (ACS) 5-year estimates at the United States Census Block Group level. ACS Table DP05- "Race by Block Group" (Black, Hispanic, Asian, American Indian/Alaska Native, and Native Hawaiian or Pacific Islander, and Some other race alone) was used in combination with table ACS Table B03002- "Hispanic or Latino by Race" to determine the number and percentage of minorities present in block groups intersecting the 2-mile project buffer. Thirty block groups, all within Douglas County, were identified within the study area where the minority population exceeds the respective county average. No block groups were identified in El Paso County where the minority population exceeds the respective county average. Minority populations are identified in Tables 1 and 2, and in Figure 1.

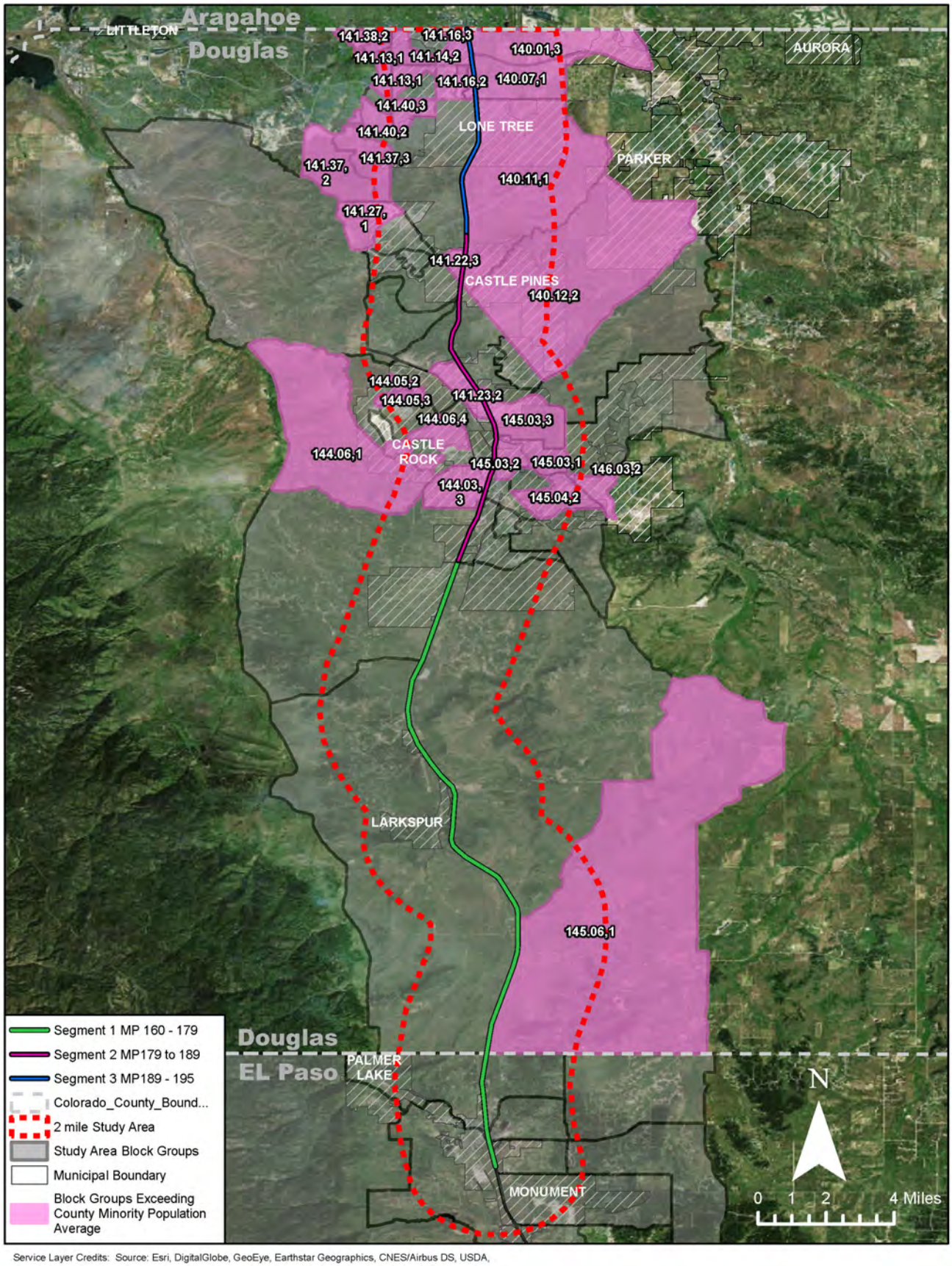

Figure 1. Minority Populations Exceeding County Average within the Study Area

Table 1. Minority Populations Exceeding County Average in Douglas County

Project Segment	Location	Total Population	Minority Population	Percent Minority	Exceeds County Average?
All	Douglas County Total	314238	47082	15.0%	N/A
Segment 3	Block Group 3, Census Tract 140.01	2760	593	21.5%	Yes
Segment 3	Block Group 1, Census Tract 140.07	2142	763	35.6%	Yes
Segment 3, Segment 2	Block Group 1, Census Tract 140.11	2476	598	24.2%	Yes
Segment 3, Segment 2	Block Group 1, Census Tract 140.12	1805	123	6.8%	No
Segment 3, Segment 2	Block Group 2, Census Tract 140.12	3725	621	16.7%	Yes
Segment 3, Segment 2	Block Group 3, Census Tract 140.12	1026	95	9.3%	No
Segment 3, Segment 2	Block Group 1, Census Tract 140.13	3082	290	9.4%	No
Segment 3, Segment 2	Block Group 2, Census Tract 140.13	2760	371	13.4%	No
Segment 3	Block Group 1, Census Tract 141.13	2090	578	27.7%	Yes
Segment 3	Block Group 2, Census Tract 141.13	1275	267	20.9%	Yes
Segment 3	Block Group 1, Census Tract 141.14	1098	149	13.6%	No
Segment 3	Block Group 2, Census Tract 141.14	2369	530	22.4%	Yes
Segment 3	Block Group 1, Census Tract 141.15	2249	321	14.3%	No
Segment 3	Block Group 2, Census Tract 141.15	1997	293	14.7%	No
Segment 3	Block Group 1, Census Tract 141.16	1803	489	27.1%	Yes
Segment 3	Block Group 2, Census Tract 141.16	1513	325	21.5%	Yes
Segment 3	Block Group 3, Census Tract 141.16	2312	1160	50.2%	Yes
Segment 2	Block Group 1, Census Tract 141.22	1707	59	3.5%	No
Segment 2	Block Group 2, Census Tract 141.22	2413	255	10.6%	No
Segment 2	Block Group 3, Census Tract 141.22	735	201	27.3%	Yes
Segment 2	Block Group 4, Census Tract 141.22	2562	203	7.9%	No
Segment 2	Block Group 1, Census Tract 141.23	1385	46	3.3%	No
Segment 2	Block Group 2, Census Tract 141.23	1761	486	27.6%	Yes
Segment 3, Segment 2	Block Group 1, Census Tract 141.25	3608	399	11.1%	No
Segment 3, Segment 2	Block Group 1, Census Tract 141.27	2502	446	17.8%	Yes
Segment 3, Segment 2	Block Group 2, Census Tract 141.27	2817	304	10.8%	No

Project Segment	Location	Total Population	Minority Population	Percent Minority	Exceeds County Average?
Segment 3, Segment 2	Block Group 1, Census Tract 141.35	3589	327	9.1%	No
Segment 3	Block Group 2, Census Tract 141.37	3971	1160	29.2%	Yes
Segment 3	Block Group 3, Census Tract 141.37	2493	439	17.6%	Yes
Segment 3	Block Group 1, Census Tract 141.38	1510	511	33.8%	Yes
Segment 3	Block Group 2, Census Tract 141.38	1975	403	20.4%	Yes
Segment 3	Block Group 1, Census Tract 141.40	943	67	7.1%	No
Segment 3	Block Group 2, Census Tract 141.40	2425	387	16.0%	Yes
Segment 3	Block Group 3, Census Tract 141.40	2000	335	16.8%	Yes
Segment 1	Block Group 1, Census Tract 144.03	2602	184	7.1%	No
Segment 2, Segment 1	Block Group 2, Census Tract 144.03	1869	132	7.1%	No
Segment 2	Block Group 3, Census Tract 144.03	815	141	17.3%	Yes
Segment 2	Block Group 1, Census Tract 144.05	3204	235	7.3%	No
Segment 2	Block Group 2, Census Tract 144.05	976	172	17.6%	Yes
Segment 2	Block Group 3, Census Tract 144.05	1716	311	18.1%	Yes
Segment 2	Block Group 1, Census Tract 144.06	2509	536	21.4%	Yes
Segment 2	Block Group 2, Census Tract 144.06	2003	282	14.1%	No
Segment 2	Block Group 3, Census Tract 144.06	1453	68	4.7%	No
Segment 2	Block Group 4, Census Tract 144.06	4228	691	16.3%	Yes
Segment 2	Block Group 1, Census Tract 145.03	2181	434	19.9%	Yes
Segment 2	Block Group 2, Census Tract 145.03	1525	437	28.7%	Yes
Segment 2	Block Group 3, Census Tract 145.03	1674	355	21.2%	Yes
Segment 2	Block Group 1, Census Tract 145.04	441	63	14.3%	No
Segment 2	Block Group 2, Census Tract 145.04	3057	588	19.2%	Yes
Segment 2	Block Group 3, Census Tract 145.04	1108	144	13.0%	No
Segment 2	Block Group 1, Census Tract 145.05	1774	236	13.3%	No
Segment 2	Block Group 2, Census Tract 145.05	1538	146	9.5%	No
Segment 2, Segment 1	Block Group 3, Census Tract 145.05	1686	152	9.0%	No
Segment 1	Block Group 1, Census Tract 145.06	1305	262	20.1%	Yes
Segment 2, Segment 1	Block Group 2, Census Tract 145.06	2907	234	8.0%	No
Segment 2	Block Group 2, Census Tract 146.03	2589	406	15.7%	Yes

Source: U.S. Census Bureau, 2018a; 2012-2016 American Community Survey 5-Year Estimates: Table B03002, B02001, B01003

Table 2. Minority Populations Exceeding County Average in El Paso County

Project Segment	Location	Total Population	Minority Population	Percent Minority	Exceeds County Average?
All	El Paso County Total	665171	185089	27.8%	N/A
Segment 1	Block Group 1, Census Tract 37.01	1450	75	5.2%	No
Segment 1	Block Group 2, Census Tract 37.01	2397	478	19.9%	No
Segment 1	Block Group 3, Census Tract 37.01	3892	816	21.0%	No
Segment 1	Block Group 2, Census Tract 72.02	4587	690	15.0%	No
Segment 1	Block Group 1, Census Tract 73	4426	348	7.9%	No
Segment 1	Block Group 2, Census Tract 73	2674	342	12.8%	No
Segment 1	Block Group 3, Census Tract 73	2605	136	5.2%	No
Segment 1	Block Group 1, Census Tract 74	3591	298	8.3%	No
Segment 1	Block Group 2, Census Tract 74	2419	352	14.6%	No
Segment 1	Block Group 3, Census Tract 74	2595	89	3.4%	No

Source: U.S. Census Bureau, 2018a; 2012-2016 American Community Survey 5-Year Estimates: Table B03002, B02001, B01003

3.3 Low-Income Populations

To identify and define Low-Income populations, a combination of United States Census data and data from the U.S. Department of Housing and Urban Development (HUD) was used. CDOT uses HUD thresholds of Extreme Low-Income Levels, which are tailored by county and more inclusive than poverty thresholds established by the U.S. Department of Health and Human Services. HUD's Low-Income thresholds are adjusted according to household size, which is 2.76 in Douglas County and 2.60 in El Paso County.

The most recent income data available from the U.S. Census Bureau is from the 2012-2016 American Community Survey 5-year estimates at the United States Census Block Group level. Table B19001: Household Income in the Past 12 Months (in 2016 inflation-adjusted dollars) was used for this analysis. Using CDOT's methodology, households with incomes of less than $25,000 per year are considered Low-Income in Douglas County, and households with incomes of less than $20,000 are considered Low-Income in El Paso County.

Low-Income Populations are identified in Block Groups where the percentage of Low-Income Households that fall below the county income threshold exceeds the county average. As shown in Tables 3 and 4, and on Figure 2, Low-Income Populations are identified in 22 Block Groups within the study area, all within Douglas County.

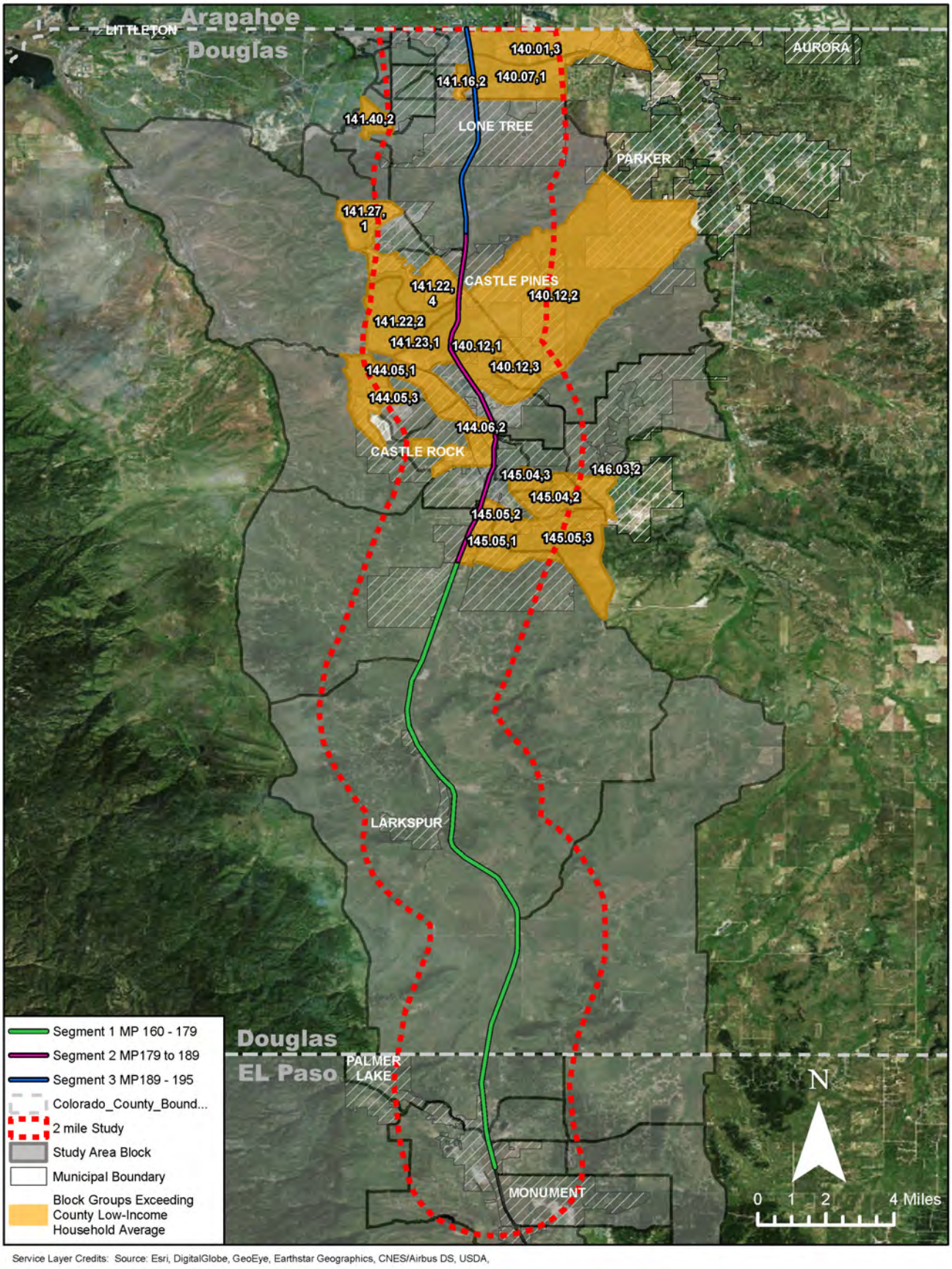

Figure 2. Low-Income Populations Exceeding County Average within the Study Area

Table 3. Low-Income Populations Exceeding County Averages in Douglas County

Project Segment	Location	Total Households	Low-Income Households	Percent Low-Income	Exceeds County Average?
All	Douglas County Total	114,017	7,912	6.94%	N/A
Segment 3	Block Group 3, Census Tract 140.01	1,043	86	8.25%	Yes
Segment 3	Block Group 1, Census Tract 140.07	1,271	201	15.81%	Yes
Segment 3, Segment 2	Block Group 1, Census Tract 140.11	251	0	0.00%	No
Segment 3, Segment 2	Block Group 1, Census Tract 140.12	1,120	105	9.38%	Yes
Segment 3, Segment 2	Block Group 2, Census Tract 140.12	832	145	17.43%	Yes
Segment 3, Segment 2	Block Group 3, Census Tract 140.12	1,048	140	13.36%	Yes
Segment 3, Segment 2	Block Group 1, Census Tract 140.13	356	13	3.65%	No
Segment 3, Segment 2	Block Group 2, Census Tract 140.13	392	13	3.32%	No
Segment 3	Block Group 1, Census Tract 141.13	938	29	3.09%	No
Segment 3	Block Group 2, Census Tract 141.13	821	10	1.22%	No
Segment 3	Block Group 1, Census Tract 141.14	665	8	1.20%	No
Segment 3	Block Group 2, Census Tract 141.14	406	13	3.20%	No
Segment 3	Block Group 1, Census Tract 141.15	404	42	10.40%	Yes
Segment 3	Block Group 2, Census Tract 141.15	1,065	65	6.10%	No
Segment 3	Block Group 1, Census Tract 141.16	828	55	6.64%	No
Segment 3	Block Group 2, Census Tract 141.16	854	83	9.72%	Yes
Segment 3	Block Group 3, Census Tract 141.16	604	10	1.66%	No
Segment 2	Block Group 1, Census Tract 141.22	729	47	6.45%	No
Segment 2	Block Group 2, Census Tract 141.22	1,109	116	10.46%	Yes
Segment 2	Block Group 3, Census Tract 141.22	648	33	5.09%	No
Segment 2	Block Group 4, Census Tract 141.22	738	65	8.81%	Yes
Segment 2	Block Group 1, Census Tract 141.23	346	85	24.57%	Yes
Segment 2	Block Group 2, Census Tract 141.23	807	18	2.23%	No
Segment 3, Segment 2	Block Group 1, Census Tract 141.25	538	29	5.39%	No
Segment 3, Segment 2	Block Group 1, Census Tract 141.27	690	182	26.38%	Yes
Segment 3, Segment 2	Block Group 2, Census Tract 141.27	1,484	60	4.04%	No

Project Segment	Location	Total Households	Low-Income Households	Percent Low-Income	Exceeds County Average?
Segment 3, Segment 2	Block Group 1, Census Tract 141.35	837	55	6.57%	No
Segment 3	Block Group 2, Census Tract 141.37	979	18	1.84%	No
Segment 3	Block Group 3, Census Tract 141.37	1,115	65	5.83%	No
Segment 3	Block Group 1, Census Tract 141.38	1,147	14	1.22%	No
Segment 3	Block Group 2, Census Tract 141.38	1,130	62	5.49%	No
Segment 3	Block Group 1, Census Tract 141.40	871	84	9.64%	Yes
Segment 3	Block Group 2, Census Tract 141.40	695	100	14.39%	Yes
Segment 3	Block Group 3, Census Tract 141.40	1,028	61	5.93%	No
Segment 1	Block Group 1, Census Tract 144.03	361	8	2.22%	No
Segment 2, Segment 1	Block Group 2, Census Tract 144.03	795	24	3.02%	No
Segment 2	Block Group 3, Census Tract 144.03	640	17	2.66%	No
Segment 2	Block Group 1, Census Tract 144.05	1,021	116	11.36%	Yes
Segment 2	Block Group 2, Census Tract 144.05	717	48	6.69%	No
Segment 2	Block Group 3, Census Tract 144.05	395	98	24.81%	Yes
Segment 2	Block Group 1, Census Tract 144.06	924	0	0.00%	No
Segment 2	Block Group 2, Census Tract 144.06	346	28	8.09%	Yes
Segment 2	Block Group 3, Census Tract 144.06	529	29	5.48%	No
Segment 2	Block Group 4, Census Tract 144.06	623	16	2.57%	No
Segment 2	Block Group 1, Census Tract 145.03	866	42	4.85%	No
Segment 2	Block Group 2, Census Tract 145.03	701	0	0.00%	No
Segment 2	Block Group 3, Census Tract 145.03	591	22	3.72%	No
Segment 2	Block Group 1, Census Tract 145.04	1,338	58	4.33%	No
Segment 2	Block Group 2, Census Tract 145.04	816	87	10.66%	Yes
Segment 2	Block Group 3, Census Tract 145.04	693	111	16.02%	Yes
Segment 2	Block Group 1, Census Tract 145.05	588	57	9.69%	Yes
Segment 2	Block Group 2, Census Tract 145.05	272	117	43.01%	Yes
Segment 2, Segment 1	Block Group 3, Census Tract 145.05	1,053	209	19.85%	Yes
Segment 1	Block Group 1, Census Tract 145.06	449	8	1.78%	No
Segment 2, Segment 1	Block Group 2, Census Tract 145.06	557	9	1.62%	No
Segment 2	Block Group 2, Census Tract 146.03	654	55	8.41%	Yes

Source: U.S. Census Bureau, 2018a; 2012-2016 American Community Survey 5-Year Estimates: Table B19001;

Table 4. Low-Income Populations Exceeding County Averages in El Paso County

Project Segment	Location	Total Households	Low-Income Households	Percent Low-Income	Exceeds County Average?
All	El Paso County Total	709	91	12.83%	N/A
Segment 1	Block Group 1, Census Tract 37.01	579	35	6.04%	No
Segment 1	Block Group 2, Census Tract 37.01	1020	89	8.73%	No
Segment 1	Block Group 3, Census Tract 37.01	1275	99	7.76%	No
Segment 1	Block Group 2, Census Tract 72.02	1,040	37	3.56%	No
Segment 1	Block Group 1, Census Tract 73	772	31	4.02%	No
Segment 1	Block Group 2, Census Tract 73	582	16	2.75%	No
Segment 1	Block Group 3, Census Tract 73	854	61	7.14%	No
Segment 1	Block Group 1, Census Tract 74	1,113	34	3.05%	No
Segment 1	Block Group 2, Census Tract 74	837	37	4.42%	No
Segment 1	Block Group 3, Census Tract 74	892	42	4.71%	No

Source: U.S. Census Bureau, 2018a; 2012-2016 American Community Survey 5-Year Estimates: Table B19001;

3.4 Limited English Proficiency Populations

Persons with Limited English proficiency are individuals who do not speak English as their primary language and who have a limited ability to read, write, speak, or understand English. Populations with Limited English Proficiency (LEP) were evaluated in the early stages of the project in coordination with the public involvement team. As indicated by the English proficiency data from the 2012–2016 American Community Survey (presented in Table 3), populations within the project area are predominantly English speaking. Although all data was considered, emphasis was placed on Census Tracts that contained LEP populations that equaled or exceeded county averages presented in Figure 3**.** Twenty-three block groups are present where percentage of the population that speaks English “less than very well” exceed the associated county average. Twenty-two of the block groups are located in Douglas County and one is located in El Paso County.

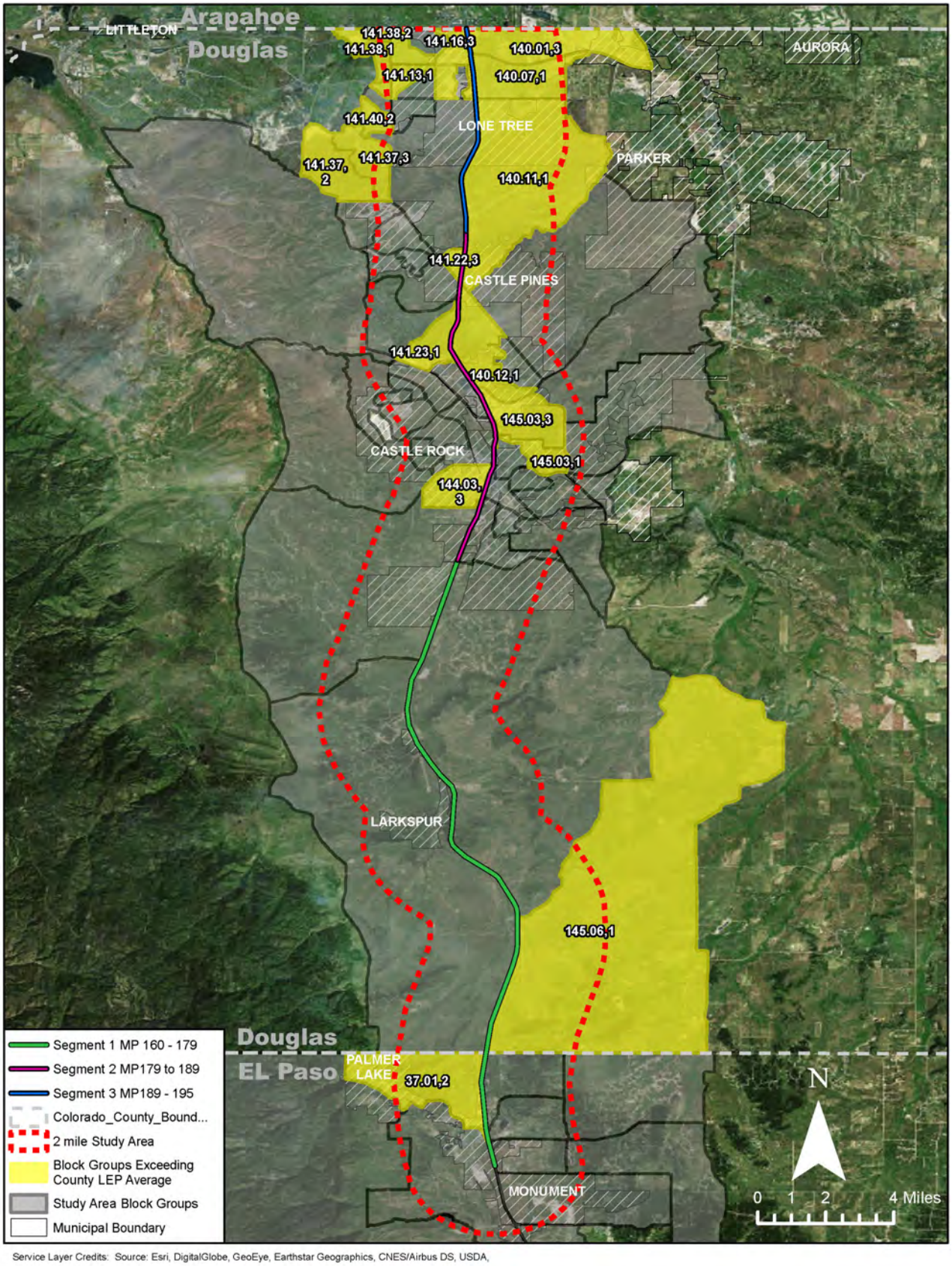

Figure 3. LEP Populations Exceeding County Average within the Study Area

Table 5. Limited English Proficiency Populations Exceeding County in Douglas County

Project Segment	Location	Total Population (5 Years and Over)	Population that Speaks ONLY English	Spanish	Other Indo-European	Asian & Pacific Island	Other Languages	Percent of Population that Speak English "Less than Very Well"	Exceeds County Average?
All	Douglas County Total (2015 ACS)	294275	267268	3110	1606	2139	127	2.5	N/A
Segment 3	Block Group 3, Census Tract 140.01	2442	1927	228	0	42	0	11.1%	Yes
Segment 3	Block Group 1, Census Tract 140.07	2099	1652	17	19	41	0	3.7%	Yes
Segment 3, Segment 2	Block Group 1, Census Tract 140.11	2296	1903	10	7	132	0	6.5%	Yes
Segment 3, Segment 2	Block Group 1, Census Tract 140.12	1631	1513	49	0	0	0	3.0%	Yes
Segment 3, Segment 2	Block Group 2, Census Tract 140.12	3326	3094	0	0	0	0	0.0%	No
Segment 3, Segment 2	Block Group 3, Census Tract 140.12	978	936	10	0	0	0	1.0%	No
Segment 3, Segment 2	Block Group 1, Census Tract 140.13	2575	2440	35	4	6	0	1.7%	No
Segment 3, Segment 2	Block Group 2, Census Tract 140.13	2509	2348	0	8	0	0	0.3%	No
Segment 3	Block Group 1, Census Tract 141.13	1942	1536	59	0	36	0	4.9%	Yes
Segment 3	Block Group 2, Census Tract 141.13	1152	1000	19	17	16	0	4.5%	Yes
Segment 3	Block Group 1, Census Tract 141.14	994	963	0	0	10	0	1.0%	No
Segment 3	Block Group 2, Census Tract 141.14	2338	2059	41	18	24	0	3.6%	Yes
Segment 3	Block Group 1, Census Tract 141.15	2089	1804	26	20	23	0	3.3%	Yes
Segment 3	Block Group 2, Census Tract 141.15	1911	1667	0	0	26	0	1.4%	No
Segment 3	Block Group 1, Census Tract 141.16	1718	1367	0	46	79	0	7.3%	Yes
Segment 3	Block Group 2, Census Tract 141.16	1393	1119	0	0	16	0	1.1%	No
Segment 3	Block Group 3, Census Tract 141.16	2185	1656	38	102	33	0	7.9%	Yes
Segment 2	Block Group 1, Census Tract 141.22	1612	1550	0	0	0	0	0.0%	No
Segment 2	Block Group 2, Census Tract 141.22	2334	2201	18	0	0	0	0.8%	No
Segment 2	Block Group 3, Census Tract 141.22	663	560	45	0	0	0	6.8%	Yes
Segment 2	Block Group 4, Census Tract 141.22	2527	2445	14	15	11	0	1.6%	No

Project Segment	Location	Total Population (5 Years and Over)	Population that Speaks ONLY English	Spanish	Other Indo-European	Asian & Pacific Island	Other Languages	Percent of Population that Speak English "Less than Very Well"	Exceeds County Average?
Segment 2	Block Group 1, Census Tract 141.23	1351	1278	12	14	12	0	2.8%	Yes
Segment 2	Block Group 2, Census Tract 141.23	1679	1549	13	0	0	0	0.8%	No
Segment 3, Segment 2	Block Group 1, Census Tract 141.25	3468	3203	18	0	11	0	0.8%	No
Segment 3, Segment 2	Block Group 1, Census Tract 141.27	2421	2041	30	23	0	0	2.2%	No
Segment 3, Segment 2	Block Group 2, Census Tract 141.27	2708	2497	0	0	18	0	0.7%	No
Segment 3, Segment 2	Block Group 1, Census Tract 141.35	3364	2989	24	0	5	0	0.9%	No
Segment 3	Block Group 2, Census Tract 141.37	3620	2836	0	63	149	0	5.9%	Yes
Segment 3	Block Group 3, Census Tract 141.37	2333	2067	0	42	36	0	3.3%	Yes
Segment 3	Block Group 1, Census Tract 141.38	1373	1047	39	16	18	0	5.3%	Yes
Segment 3	Block Group 2, Census Tract 141.38	1881	1683	0	63	24	0	4.6%	Yes
Segment 3	Block Group 1, Census Tract 141.40	905	828	8	10	28	0	5.1%	Yes
Segment 3	Block Group 2, Census Tract 141.40	2249	2039	12	17	39	0	3.0%	Yes
Segment 3	Block Group 3, Census Tract 141.40	1795	1662	0	6	0	0	0.3%	No
Segment 1	Block Group 1, Census Tract 144.03	2519	2442	4	9	0	0	0.5%	No
Segment 2, Segment 1	Block Group 2, Census Tract 144.03	1828	1680	7	0	0	0	0.4%	No
Segment 2	Block Group 3, Census Tract 144.03	780	681	39	0	16	0	7.1%	Yes
Segment 2	Block Group 1, Census Tract 144.05	2920	2757	0	0	12	0	0.4%	No
Segment 2	Block Group 2, Census Tract 144.05	888	842	0	0	0	0	0.0%	No
Segment 2	Block Group 3, Census Tract 144.05	1634	1488	39	0	0	0	2.4%	No
Segment 2	Block Group 1, Census Tract 144.06	2237	1961	16	14	0	0	1.3%	No
Segment 2	Block Group 2, Census Tract 144.06	1952	1842	0	0	0	0	0.0%	No
Segment 2	Block Group 3, Census Tract 144.06	1359	1296	0	0	0	0	0.0%	No
Segment 2	Block Group 4, Census Tract 144.06	3775	3636	25	0	15	0	1.1%	No

Project Segment	Location	Total Population (5 Years and Over)	Population that Speaks ONLY English	Spanish	Other Indo-European	Asian & Pacific Island	Other Languages	Percent of Population that Speak English "Less than Very Well"	Exceeds County Average?
Segment 2	Block Group 1, Census Tract 145.03	1996	1826	130	0	0	0	6.5%	Yes
Segment 2	Block Group 2, Census Tract 145.03	1423	1329	0	0	35	0	2.5%	No
Segment 2	Block Group 3, Census Tract 145.03	1547	1452	72	0	0	0	4.7%	Yes
Segment 2	Block Group 1, Census Tract 145.04	389	374	0	0	0	0	0.0%	No
Segment 2	Block Group 2, Census Tract 145.04	2801	2316	215	10	0	0	8.0%	No
Segment 2	Block Group 3, Census Tract 145.04	1068	1006	20	0	0	0	1.9%	No
Segment 2	Block Group 1, Census Tract 145.05	1647	1607	16	0	0	0	1.0%	No
Segment 2	Block Group 2, Census Tract 145.05	1424	1372	0	0	0	0	0.0%	No
Segment 2, Segment 1	Block Group 3, Census Tract 145.05	1591	1465	10	0	8	0	1.1%	No
Segment 1	Block Group 1, Census Tract 145.06	1169	1034	43	0	0	0	3.7%	
Segment 2, Segment 1	Block Group 2, Census Tract 145.06	2716	2455	20	5	0	0	0.9%	No
Segment 2	Block Group 2, Census Tract 146.03	2413	2344	8	0	7	0	0.6%	No

Source: U.S. Census Bureau, 2018a; 2012-2016 American Community Survey 5-Year Estimates: Table B16004; 2018b 2015-2015 American Community Survey 5-Year Estimates: Table B16004

Table 6. Limited English Proficiency Populations Exceeding County in El Paso County

Project Segment	Location	Total Population (5 Years and Over)	Population that Speaks ONLY English	Spanish	Other Indo-European	Asian & Pacific Island	Other Languages	Percent of Population that Speak English "Less than Very Well"	Exceeds County Average?
All	El Paso County Total (2015 ACS)	609,044	537,136	15328	2,336	5,125	819	3.9	N/A
Segment 3	Block Group 1, Census Tract 37.01	1368	1351	0	0	12	0	0.9%	No
Segment 3	Block Group 2, Census Tract 37.01	2274	1994	186	0	9	0	8.6%	Yes
Segment 1	Block Group 3, Census Tract 37.01	3563	3248	66	0	0	0	1.9%	No
Segment 1	Block Group 2, Census Tract 72.02	4391	4091	0	15	0	0	0.3%	No
Segment 1	Block Group 1, Census Tract 73	3997	3690	0	0	21	0	0.5%	No
Segment 1	Block Group 2, Census Tract 73	2543	2297	28	14	0	0	1.7%	No
Segment 1	Block Group 3, Census Tract 73	2490	2427	10	19	0	0	1.2%	No
Segment 1	Block Group 1, Census Tract 74	3564	3433	0	0	0	0	0.0%	No
Segment 1	Block Group 2, Census Tract 74	2313	2168	0	0	15	0	0.6%	No
Segment 1	Block Group 3, Census Tract 74	2540	2357	0	0	0	0	0.0%	No

Source: U.S. Census Bureau, 2018a; 2012-2016 American Community Survey 5-Year Estimates: Table B16004; 2018b 2015-2015 American Community Survey 5-Year Estimates: Table B16004

4.0 Summary

Minority, Low-Income, and LEP populations have been identified in all three project segments within the Study Area. Minority and Low-Income populations were only identified the Douglas County portion of the Study Area and are primarily located in the urbanized areas within Castle Rock, Castle Pines, and Lone Tree. LEP populations were identified within both Douglas and El Paso counties. In El Paso County, the LEP population is located immediately south of the county line, west of I-25 in the Palmer Lake neighborhood. In Douglas County, the LEP population areas reflect the same general urban areas as the minority and Low-Income populations.

As future projects are programmed from the PEL, each resource, including environmental justice and associated resources, will be evaluated during the National Environmental Policy Act of 1969 phase of project development. The National Environmental Policy Act evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

5.0 References

Colorado Department of Transportation (CDOT). 2017. *National Environmental Policy Act Manual, Version 5 Update*.

Federal Highway Administration (FHWA). 2011. *Environmental Justice Emerging Trends and Best Practices Guidebook.*

Federal Highway Administration (FHWA). 2015. *Federal Highway Environmental Justice Reference Guide.*

U.S. Census Bureau. 2018a. *2012-2016 American Community Survey 5-Year Estimates, Table B16001, B3002, B9001, B2001, B01003, B1004*

U.S. Census Bureau. 2018b. *2011-2015 American Community Survey 5-Year Estimates, Table B01004*

U.S. Census Bureau. 2018c. *Tiger/Line Shapefiles for Census Block Groups*. Accessed October 2018. https://www.census.gov/cgi-bin/geo/shapefiles/index.php.

U.S. Department of Housing and Urban Development (HUD). 2017. *Federal Year 2017 Income Limits Summary for Douglas and El Paso Counties.* Accessed October 2017. https://www.huduser.gov/portal/datasets/il/il2017/2017summary.odn.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions
Farmland Resources Technical Memorandum

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Acronyms and Abbreviations

CDOT	Colorado Department of Transportation
CRA	common resource area
FPPA	Farmland Protection Policy Act of 1981
MP	mile post
NRCS	Natural Resource Conservation Service
PEL	Planning and Environmental Linkages
ROW	right-of way
Study Area	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument
USDA	United States Department of Agriculture

1.0 Farmland

Prime and Unique Farmlands are protected under The Farmland Protection Policy Act of 1981 (FPPA). The FPPA is intended to minimize the impact federal programs have on the unnecessary and irreversible conversion of farmland to nonagricultural uses. Under the FPPA, farmland includes prime and unique farmland (national) and land of statewide or local importance.

- **Prime Farmland** is land of national importance that has the best combination of physical and chemical characteristics for producing food, feed, fiber, forage, oilseed, and other agricultural crops with minimum inputs of fuel, fertilizer, pesticides, and labor and without intolerable soil erosion, as determined by the Secretary of Agriculture. It may include lands currently used to produce livestock and/or timber (NRCS, 2015a).
- **Unique Farmland** is land of national importance other than prime farmland that is used for production of specific high-value food and fiber crops, as determined by the Secretary of Agriculture. Examples of such crops include citrus, tree nuts, olives, cranberries, fruits, and vegetables (NRCS, 2015a).
- **Farmland of Statewide Importance** is in addition to prime and unique farmland and is of statewide importance for the production of food, feed, fiber, forage, and oil seed crops. Criteria for defining and delineating this land are to be determined by the appropriate state agency or agencies. Generally, additional farmlands of statewide importance include those that are nearly prime farmland and that economically produce high yields of crops when treated and managed according to acceptable farming methods. Some may produce as high a yield as prime farmlands if conditions are favorable. In some states, additional farmlands of statewide importance may include tracts of land that have been designated for agriculture by state law (NRCS, 2015a).
- **Farmland/Soil of Local Importance** are lands not identified as having national or statewide importance. In some local areas, there is concern for using additional farmlands for the production of food, feed, fiber, forage, and oilseed crops. Where appropriate, these lands are to be identified by the local agency or agencies concerned. In some locations, additional farmlands of local importance may include tracts of land that have been designated for agriculture by local ordinance (NRCS, 2015a).
- **Farmland** does not have to be used for cropland; it can be forest land, pastureland, cropland, or other land but it does not include land already in or committed to urban development or water storage. Farmland already committed to urban development or water storage includes all such land with a density of 30 structures per 40-acre area. Farmland already in urban development also includes lands identified as an urbanized area on the Census Bureau Map, as an urban area that is mapped with a tint overprint on the United States Geological Service topographical maps, or as an urban-built-up on the United States Department of Agriculture (USDA) Important Farmland Maps. Areas shown as white on the USDA Important Farmland Maps are not designated as farmland and therefore are not subject to the FPPA. Farmland that is committed to urban development or water storage includes all such land that receives a combined score of 160 points or less using the land evaluation and site assessment system criteria (NRCS, 2015a).

1.1 Methodology for Initial Assessment

Initial assessment research included data and information from the FPPA; Natural Resources Conservation Service (NRCS) soil survey (NRCS, 2015b; 2015c); and the Northwest Corridor Transportation and Environmental Planning Study (CDOT, 2008).

Through the initial assessment, soils with characteristics of prime or unique farmland, farmland of statewide importance, and/or farmland of local importance have been identified in the Farmland Resources Study Area. Appendix H contains figures identifying farmland resources.

1.2 Resource Conditions

The Farmland Resources Study Area is predominantly located within the NRCS common resource area (CRA) known as the Southern Rocky Mountain Foothills with the southern limits in the Southern Rocky Mountains – High Mountains and Valleys CRA. The Southern Rocky Mountain Foothills CRA is the transition zone between the Great Plains and the Southern Rocky Mountains. The area is characterized as having a mesic to frigid temperature regime and an ustic moisture regime. Vegetation communities range from grasslands and shrubs to coniferous forests (NRCS, 2007; 2009; 2010).

The Southern Rocky Mountains – High Mountains and Valleys CRA consist of steep, high mountain ranges and mountain valleys with an elevation range of 6,500 to 14,400 feet. Temperature regimes are mostly frigid and cryic with ustic to udic moisture regimes. Vegetation communities at lower elevations are dominated by sagebrush-grassland, which transitions to coniferous forest and alpine tundra as elevation increases (NRCS, 2007; 2009; 2010).

Elevation in the Farmland Resources Study Area ranges from approximately 6,050 to 7,350 feet above mean sea level. Precipitation along the corridor ranges from 17 inches to 23 inches annually, with most precipitation occurring in the Monument Area (WRCC, 2004; 2016).

The majority of the Farmland Resources Study Area is located within a rural environment with urban centers located at the ends of the project. Within the rural section, the majority of the land use is agriculture, approximately 68 percent based on land use data for Douglas and El Paso Counties. The rural and urban areas are composed of a combination of transportation, planned development, commercial and industrial, residential, and land classified as parks, open space, or recreation.

NRCS has classified farmland soil data as prime, unique, of statewide importance, and/or of local importance, the soil data was used during the initial assessment of the Farmland Resources Study Area. Farmland soils in the Farmland Resources Study Area are included in Table 1 and are shown in the Built Environment mapbook included in the attachment to Appendix H

Table 1. Farmland within the Farmland Resources Study Area

Map Unit Symbol	Map Unit Name	Rating	Within Farmland Resources Study Area	Within CDOT ROW	Mapbook Location (page)
1-95356	Alamosa loam, 1 to 3% slopes	Prime Farmland	Yes MP 160.6, MP 163.3, MP 177.9	Yes MP 160.6, MP 163.3	2, 4, 5
PfC-498747	Peyton sandy loam, wet, 1 to 5% slopes	Prime Farmland	Yes MP 167.3, MP 167.8, MP 168.7	Yes MP 167.3, MP167.8	9, 10
Sa-498761	Sampson loam	Farmland of statewide importance	Yes MP 176.5 – MP 176.7, MP 176.9 -MP 177.7, MP 177.9, MP 178.5 -MP 178.9	Yes MP 176.6, MP 177.7, MP 177.9, MP 178.5 - MP 178.9	18, 19, 20, 21,

Map Unit Symbol	Map Unit Name	Rating	Within Farmland Resources Study Area	Within CDOT ROW	Mapbook Location (page)
En-498716	Englewood clay loam	Prime Farmland	Yes MP 177.1 - MP 177.4	Yes MP 177.2 - MP 177.4	19
BrB-498703	Bresser sandy loam, cool, 1 to 3% slopes	Farmland of statewide importance	Yes MP 179.0 – MP 179.2, MP 182.2, MP 183.0 – MP 183.3, MP 184.7 – MP 184.8, MP 184.9	Yes MP 179.0 - MP 179.2, MP 182.2, MP 183.0 - MP 183.3	21, 24, 25, 26, 27

Sources: NRCS, 2015b; NRCS 2015c

CDOT = Colorado Department of Transportation
MP = mile post
ROW = right-of-way

1.3 Scoping Input

Leadership from Douglas and El Paso counties and adjacent municipal entities relevant to the analysis have been involved in the Planning and Environmental Linkages (PEL) process through numerous committees and technical groups. In addition, the land management agencies for areas adjacent to this stretch of I-25 continue to be involved in the project through team meetings and technical reviews.

During the initial scoping period, farmlands were thought to be a non-existent resource within the I-25 corridor. Preliminary research indicated that prime and unique farmland with Colorado Department of Transportation (CDOT) right-of-way (ROW) was designated for urban development and/or I-25 (CDOT, 2016b); therefore, disqualifying the farmlands for protection under the FPPA. However, much of the farmland continues beyond the CDOT ROW. All farmlands identified as prime, unique, of statewide importance, and/or of local importance are shown in the mapbook (included in the attachment at the end of Appendix H).

As future projects are programmed from the PEL, each resource, including farmlands and associated resources, will be evaluated during the National Environmental Policy Act of 1969 phase of project development. The National Environmental Policy Act evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

2.0 References

Natural Resources Conservation Service (NRCS). 1994. *FPPA Rule, 7 CFR 658.* https://www.nrcs.usda.gov/wps/portal/nrcs/main/national/landuse/fppa/. Accessed January 11, 2017.

—. 2007. *Fountain Watershed Hydrologic Unit Code 111020003 Rapid Assessment.* https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_060554.pdf. Accessed December 6, 2016.

—. 2009. *Middle South Platte- Cherry Creek Watershed Hydrologic Unit Code 10190003 Rapid Assessment.* https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_060843.pdf. Accessed December 6, 2016.

—. 2010. *Upper South Platte Watershed Hydrologic Unit Code 10190002 Rapid Assessment*. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_060867.pdf. Accessed December 6, 2016.

—. 2015a. *Prime and Important Farmlands*. https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/soils/survey/?cid=nrcs142p2_053369. Accessed January 2017.

—. 2015b. *Web Soil Survey for Portions of Douglas County*. http://websoilsurvey.nrcs.usda.gov/. Accessed October 7, 2015.

—. 2015c. *Web Soil Survey for Portions of El Paso County*. http://websoilsurvey.nrcs.usda.gov/. Accessed October 7, 2015.

Western Regional Climate Center (WRCC). 2004. Monument, Colorado 1988-2004 Monthly Climate Summary. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?co5734. Accessed March 15, 2017.

—. 2016. Castle Rock, Colorado 1893-2016 Period of Record Monthly Climate Summary. http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?co1401. Accessed March 15, 2017.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

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Contents

Acronyms and Abbreviations

CDOT	Colorado Department of Transportation
CFR	Code of Federal Regulations
CWCB	Colorado Water Conservation Board
EO	Executive Order
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
GIS	Geographic Information Systems
I-25	Interstate 25
MP	mile post
NEPA	National Environmental Policy Act
PEL	Planning and Environmental Linkages
PPRBD	Pikes Peak Regional Building Department
ROD	record of decision
SEMSWA	Southeast Metro Stormwater Authority
Study Area	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument
UDFCD	Urban Drainage and Flood Control District

1.0 Floodplains

Floodplains are the lands on either side of a stream that are inundated when the capacity of the stream channel is exceeded. The National Flood Insurance Program encourages state and local governments to adopt sound floodplain management programs. To provide a national standard without regional discrimination, the 100-year flood has been adopted by the Federal Emergency Management Agency (FEMA) as the base flood for floodplain management and flood insurance purposes. This section identifies FEMA-mapped floodplains in the Interstate 25 (I-25) Planning and Environmental Linkages (PEL) Study Area.

A regulatory floodway means the channel of a river or other watercourse and the adjacent land areas that must be reserved to discharge the base flood without cumulatively increasing the water surface elevation more than a designated height (FEMA, 2016a). Communities must regulate development in these floodways to ensure that there are no increases in upstream flood elevations. For streams and other watercourses where FEMA has provided Base Flood Elevations, but no floodway has been designated, the community must review floodplain development on a case-by-case basis to ensure that water surface elevation increases do not occur (FEMA, 2016a).

A 100-year flood is calculated to be the level of flood water expected to be equaled or exceeded every 100 years on average; thus, it has a 1 percent chance of being equaled or exceeded in any single year. Changes in the floodplain, such as adding fill material, constructing buildings or bridges, or limiting the natural conveyance of floodwaters, can cause a rise in the 100-year water surface and can subsequently impact properties that were not previously anticipated to be affected by a 100-year storm event.

The following regulatory requirements apply to the floodplains:

- Executive Order (EO) 11988, Floodplain Management (1977), was authorized to direct federal agencies to "provide leadership and take action to reduce the risk of flood loss, to minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains." This EO was authorized to assist in furthering National Environmental Policy Act (NEPA), the National Flood Insurance Act of 1968 (amended), and the Flood Disaster Protection Act of 1973.
- Code of Federal Regulations (CFR), Title 23 – Highways, Chapter I – Federal Highway Administration (FHWA), United States Department of Transportation, Part 650 – Bridges, Structures, and Hydraulics, prescribes the policies and procedures that the FHWA is directed to implement in the "location and hydraulic design of highway encroachments on floodplains."
- CFR, Title 44 - Emergency Management and Assistance, Chapter I - FEMA, contains the basic policies and procedures of FEMA to regulate floodplain management and to analyze, identify, and map floodplains for flood insurance purposes.

These regulations are typically enforced by local governments. For projects within the floodplains, a floodplain development permit is generally required from the local jurisdictions to allow construction within the floodplain. Local governments are responsible for administration of floodplain lands within their jurisdictions as part of the land use planning process with assistance from agencies such as the Urban Drainage and Flood Control District (UDFCD), Southeast Metro Stormwater Authority (SEMSWA), and the Colorado Water Conservation Board (CWCB). For the I-25 PEL project, Douglas County administers a Floodplain Development Permit for projects constructed within floodplains and the Pikes Peak Regional Building Department (PPRBD) administers Floodplain Development Permits for areas within El Paso County (Douglas County, 2016; PPRBD, 2016).

1.1 Methodology for Initial Assessment

Two primary sets of data were used to identify 100-year floodplains and floodways. FEMA digital geographic information systems (GIS) data was used to identify floodplains and floodways in Douglas County. El Paso County FEMA data is not available in GIS or digital format; therefore, FEMA hard copy Flood Insurance Rate Maps (FIRM) Map Panels were obtained for the corridor and used to identify areas of floodplains and floodways within El Paso County.

1.2 Resource Conditions

Floodplains are present in numerous locations along the I-25 PEL study area. Specifically, the I-25 corridor crosses 100-year floodplains associated with the Cottonwood Creek, Happy Canyon Creek, Hangmans Gulch, East Plum Creek, Carpenter Creek, Crystal Creek, and Dirty Woman Creek, along with numerous unnamed tributaries (Table 1) (Figure 1). There also are three regulatory floodways in the study area associated with Dirty Woman Creek, Crystal Creek and East Plum Creek (Table 1).

Table 1. 100-Year Floodplains and Regulatory Floodways Within the I-25 PEL Study Area

Name	Notes	Approximate Location	Flood Zone	Regulatory Floodway
Dirty Woman Creek	Dirty Woman Creek flows to Monument Lake to the southwest.	Crosses the I-25 at approximately Mile Post (MP) 160.6, just south of the Monument/Palmer Lake interchange	AE	Yes
Crystal Creek Split Flow Channel	This drainage parallels I-25 on the east side, but never crosses I-25 in the study area.	Located along the east side of I-25, around MP 161	AE	No
Crystal Creek	Crystal Creek flows to Monument Lake to the southwest.	Crosses I-25 at approximately MP 161.25	AE	Yes
None	This is a tributary of Carpenter Creek.	Crosses I-25 at approximately MP 167.25	A	No
Carpenter Creek	Carpenter Creek and its associated floodplain meanders in and out of the study area along the west side of I-25. It never crosses the I-25.	Along the west side of I-25 from approximately MP 169.75 to MP 168.5	A	No
None	This is a tributary of East Plum Creek.	Crosses I-25 at approximately MP 171.75	A	No
East Plum Creek	East Plum Creek enters the study area from the west at approximately MP 182 on I-25. The floodplain (and floodway) meanders in and out of the study area and crosses I-25 to the east at approximately MP 181.25. It then parallels the I-25 east side (entering study area occasionally) until it crosses back to the west side of I-25 at approximately MP 172.25.	From approximately MP 182 on I-25 to MP 172 (crosses I-25 twice)	A/AE	Yes
Hangmans Gulch	This also is a tributary of East Plum Creek.	Crosses I-25 at approximately MP 182.5	AE	Yes
None	This is an unnamed tributary of East Plum Creek.	Crosses I-25 at approximately MP 183.5, just south of the Meadows Parkway and I-25 Interchange	A	No

Name	Notes	Approximate Location	Flood Zone	Regulatory Floodway
None	This is an unnamed tributary of East Plum Creek. Only a small portion of the floodplain is within the I-25 PEL study area within the northwest quadrant of Interchange.	Located at approximately I-25 MP 184.25, just north of the Meadows Parkway and I-25 Interchange	A	No
None	This is an unnamed tributary of East Plum Creek. It never crosses I-25 with only a small portion of floodplain in study area along west side of I-25.	Located at approximately MP 185.75 on I-25	A	No
None	This is an unnamed tributary of East Plum Creek. It never crosses I-25 with only a small portion of floodplain in study area along west side of I-25.	Located at approximately MP 186 on I-25	A	No
None	This is an unnamed tributary of Newlin Gulch.	Crosses I-25 at MP 188	A	No
Happy Canyon Creek	On the west, the creek meanders in and out of the study area.	Meanders in and out of study area. Crosses I-25 just north of MP 191	A	No
Cottonwood Creek	This drainage crosses I-25 via a box culvert.	Located at approximately I-25 MP 192.5. Near Sky Ridge Medical Center	A	No

Source: FEMA, 1997a, 1997b, and 1997c, 2016b

Notes:

A = Areas of 100-year flood; base flood elevations and flood hazard factors not determined.
AE = Areas of 100-year flood; base flood elevations and flood hazard factors are determined.

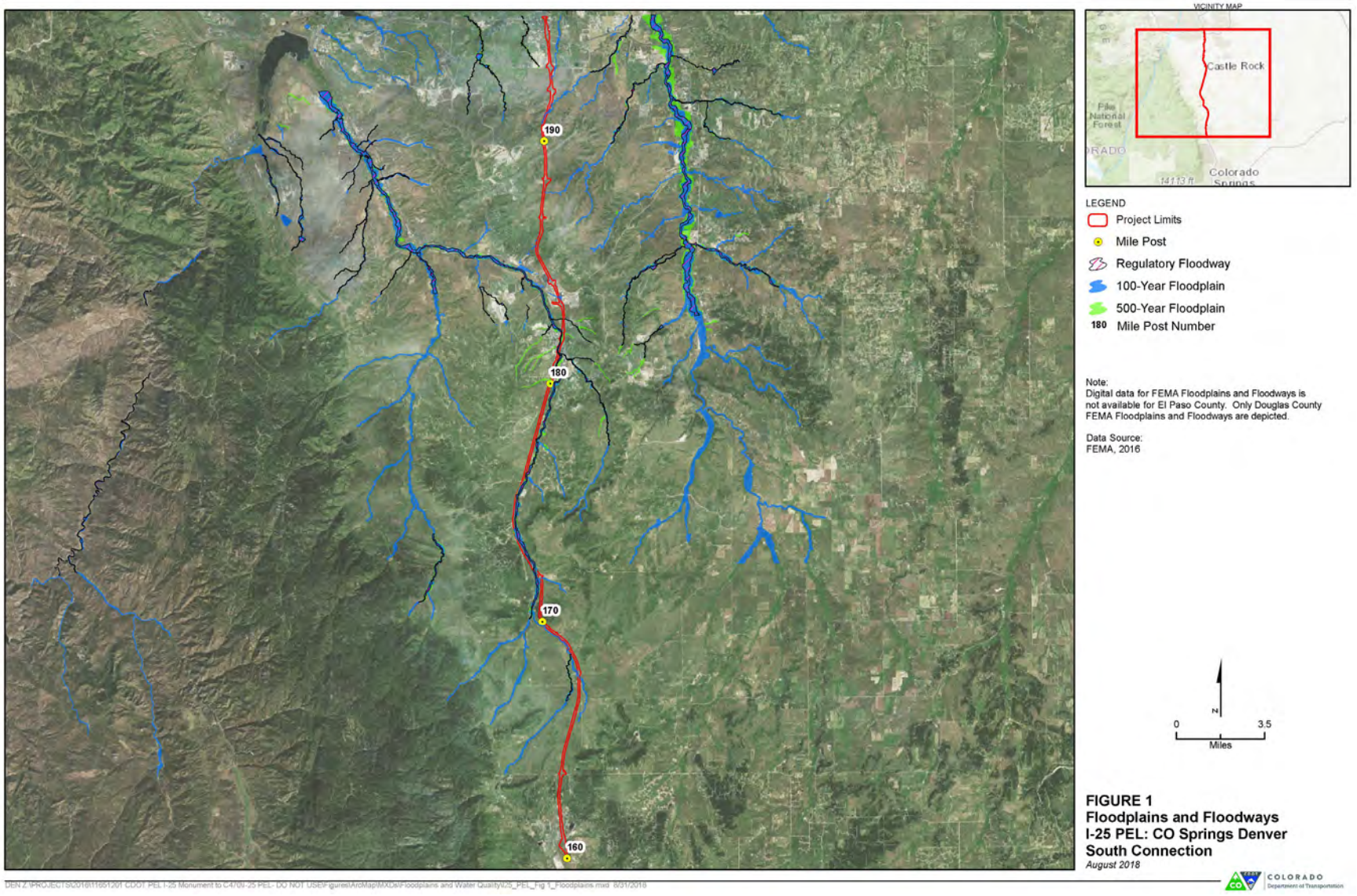


Figure 1. 100-Year Floodplains and Regulatory Floodways in the I-25 PEL Study Area

1.3 Scoping Input

During the CDOT Environmental Scoping meeting, CDOT commented that substantial rains and flooding were experienced within the corridor in the Surry Ridge/Happy Canyon area during the 2015 Heavy Rain event. She asked the project team to consider this area during the floodplain evaluation (CDOT, 2016b).

As future projects are programmed from the PEL, each resource, including floodplains and associated resources, will be evaluated during the NEPA phase of project development. The NEPA evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

2.0 References

Douglas County. 2016. *Floodplain Development Permit.* Website: https://www.douglas.co.us/documents/floodplain-development-permit-form.pdf. Accessed November 2016.

Federal Emergency Management Agency (FEMA). 1997a. *FIRM Flood Insurance Rate Map, El Paso County, Colorado and Incorporated Areas.* Community-Panel No. 080041C275 F. March 17, 1997.

Federal Emergency Management Agency (FEMA). 1997b. *FIRM Flood Insurance Rate Map, El Paso County, Colorado and Incorporated Areas*. Community-Panel No. 080041C276 F. March 17, 1997.

Federal Emergency Management Agency (FEMA). 1997c. *FIRM Flood Insurance Rate Map, El Paso County, Colorado and Unincorporated Area.* Community-Panel No. 080041C278 F. March 17, 1997.

Federal Emergency Management Agency (FEMA). 2016a. *FEMA Floodways.* Website: https://www.fema.gov/floodway. Accessed November 2016.

Federal Emergency Management Agency (FEMA). 2016b. *FEMA GIS Data for Douglas County, Colorado.*

Pikes Peak Regional Building Department (PPRBD). 2016. *Regional Floodplain Management.* Website: https://www.pprbd.org/Download/Floodplain#FloodplainJump. Accessed November 2016.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Hazardous Materials Resources Technical Memorandum

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Acronyms and Abbreviations

CDLE	Colorado Department of Labor and Employment
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
COSTIS	Colorado Storage Tank Information System
EPA	U.S. Environmental Protection Agency
LUST	leaking underground storage tank
MP	mile post
NEPA	National Environmental Policy Act
NFA	No Further Action
PEL	Planning and Environmental Linkages
RCRA	Resource Conservation and Recovery Act of 1976
Study Area	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument
TCHD	Tri-County Health Department
USC	United States Code

1.0 Hazardous Materials

Hazardous materials include substances or materials determined by the U.S. Environmental Protection Agency (EPA) to be capable of posing an unreasonable risk to health, safety, or property. Hazardous materials may exist within the study area at facilities that generate, store, or dispose of these substances, or at locations of past releases of these substances. Examples of hazardous materials include asbestos, lead-based paint, heavy metals, dry-cleaning solvents, and petroleum hydrocarbons (for example, gasoline and diesel fuels), all of which could be harmful to human health and the environment.

Hazardous materials are regulated by various state and federal regulations. National Environmental Policy Act (NEPA), as amended (42 United States Code [USC] 4321 et seq., Public Law 91-190, 83 Stat. 852), mandates that decisions involving federal funds and approvals consider environmental effects from hazardous materials. Other applicable regulations include the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) (42 USC 9601 et seq.), which provides federal authority for the identification, investigation, and cleanup of sites throughout the U.S. that are contaminated with hazardous substances (as specifically designated in the CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA) (42 USC 321 et seq.), which establishes a framework for the management of both solid and hazardous waste. The federal Hazardous and Solid Waste Amendments of 1984 established a new comprehensive regulatory program for underground storage tanks containing petroleum products and hazardous chemicals regulated under CERCLA.

1.1 Methodology for Initial Assessment

An environmental records search, including federal and state environmental resources, was conducted for a 0.25-mile buffer area from the I-25 centerline, constituting the Hazardous Materials Study Area. The following databases were queried for potential hazardous material facilities:

- Leaking underground storage tank (LUST) facilities (CDLE, 2016a and 2016b)
- EPA Brownfields (EPA, 2016a)
- RCRA generators (EPA, 2016b)
- Superfund and National Priority List sites, designated under CERCLA (CDPHE, 2016)
- Tri-County Landfills (TCHD, 2017)

The database queries were supplemented with stakeholder input (see Section 2.3) to include existing and proposed maintenance, fueling, and de-icing facilities located in the Study Area.

1.2 Resource Conditions

The Study Area exhibits a variety of land uses including a mix of commercial, residential, and industrial development. Segment 1 of the Study Area, including Monument and Larkspur, consists primarily of commercial and residential development. Several hazardous material facilities, primarily LUST sites, are located within Monument. Segment 2, which includes portions of Castle Pines and Castle Rock, has the highest density of overall urban development and contains the majority of the hazardous material facilities identified in the database review. Segment 3, which includes small portions of Lone Tree and Centennial, consists primarily of residential and commercial development with few identified hazardous material facilities.

The majority of the hazardous material facilities are comprised of LUST and RCRA generators and are located in Segments 1 and 2 of the Study Area. These sites are concentrated within Castle Rock and Monument. Seven LUST releases from six facilities were identified within the Study Area, including four in Castle Rock and three in Monument. An open status as it pertains to this study does not mean an

active release of hazardous materials; it means the release event has not been issued a No Further Action (NFA) letter by the state. In the case of the seven LUST release events identified during the database queries, all seven are in the process of implementing Corrective Actions Plans, meaning the release has been identified, contained, and a cleanup plan has been initiated. Table 1 and Figure 1 provide quantities and locations, respectively, for hazardous material facilities identified in the Study Area.

Four CDOT maintenance facilities are located within the Hazardous Materials Study Area. The largest of the four facilities is a shared CDOT/Douglas County operations facility located in Segment 2, westerly adjacent to I-25 in Castle Rock near MP 184.0. Records from the Colorado Storage Tank Information System (COSTIS) database indicate LUST releases in 1991 and 1997, with cleanups and subsequent NFA status letters issued later in the same years the releases were detected. No releases from the Castle Rock facility have been documented since 1997 (CDLE, 2016).

The remaining three maintenance facilities are located in Segment 1: at located at the northeast corner of the I-25/Upper Lake Gulch Road interchange, at the southbound I-25 rest area at Larkspur, and at the northeast corner of the I-25/County Line Road interchange. These areas are used for the staging of CDOT vehicles, equipment, and materials. Above ground storage tanks for fuel and deicing liquids are present at all three locations; however, no documentation of past releases from any of the three sites was identified during the database query.

In addition to the LUST sites, four historic landfill locations we identified within the Hazardous Materials Study Area. Two historic landfills are located in Castle Rock and two in the Larkspur area. The Castle Rock landfills, Naylor Landfill and an unnamed landfill, were closed in 1976 and 1969, respectively. Both of these sites are now fully developed commercial areas with no documentation of hazardous material contamination following their closures. The Larkspur Landfill was closed in 1980 and remains undeveloped. The Larkspur Airport Dump operated as a vegetation burn pit with no closure date identified in the site records. No documentation of hazardous materials releases was found for either Larkspur area historic landfill.

Table 1. Hazardous Materials Search Results

Result Type	Number of Records within Study Area
Closed LUST	67[a]
Open LUST	7[a]
RCRA Generators	61
EPA Brownfields	0
Superfund/National Priority List Sites	0
Maintenance Facilities	4
Historic Landfills	4
Operating Landfills	0

[a] This quantity reflects the number of reported LUST releases not the number of facilities. In some instances, multiple releases have occurred at the same facility.

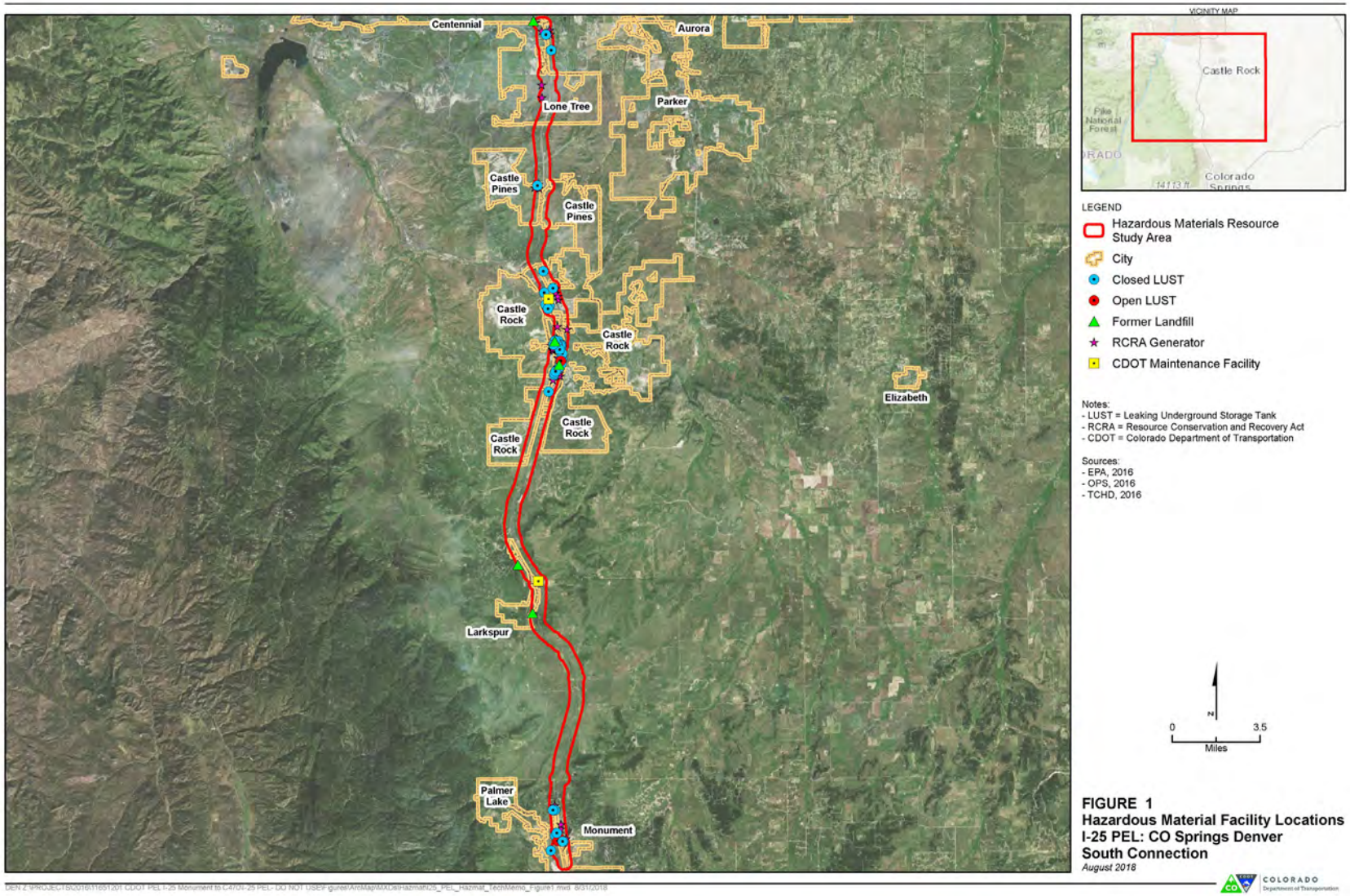


Figure 1. Hazardous Material Facility Locations

1.3 Scoping Input

Agency scoping input pertaining to hazardous materials has been focused on identifying the existing and potential future locations of CDOT maintenance facilities in the Study Area. No sites representing a high level of risk to the project have been identified by the public, the local municipalities, or the agencies to date. Coordination with stakeholders will continue throughout the Planning and Environmental Linkages (PEL) and NEPA phases of the project.

As future projects are programmed from the PEL, each resource, including hazardous materials and associated resources, will be evaluated during the NEPA phase of project development. The NEPA evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

2.0 References

Colorado Department of Labor and Employment (CDLE). Office of Oil and Public Safety. 2016a. *Active and Close Petroleum Release Events*. https://data.colorado.gov/Environment/OPS-Petroleum-Release-Events-in-Colorado/g3jr-97se. Accessed December 2016.

Colorado Department of Labor and Employment (CDLE). 2016b. *Colorado Storage Tank Information System (COSTIS).* https://opus.cdle.state.co.us/OIS2000/home.asp. Accessed December 2016.

Colorado Department of Public Health and Environment (CDPHE), Hazardous Materials and Waste Management Division. 2016. *Superfund Sites*. https://www.colorado.gov/pacific/cdphe/hm-gis-data. Accessed December 2016.

Tri-County Health Department (TCHD). 2017. *Historic Landfills*. https://www.tchd.org/284/Landfills-Solid-Waste. Accessed January 2017.

U.S. Census Bureau. 2010. *Population, Housing Units, Area, and Density: 2010 - State -- Place and (in selected states) County Subdivision.* American Fact Finder. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed November 2, 2016.

U.S. Environmental Protection Agency (EPA). 2016a. *Brownfield Properties*. https://www.epa.gov/enviro/geospatial-data-download-service. November 7.

U.S. Environmental Protection Agency (EPA). 2016b. *Facility Registry Service*. https://www.epa.gov/enviro/geospatial-data-download-service. July 15.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Historic Resources Technical Memorandum

I-25 PEL: CO Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Acronyms and Abbreviations

APE	Area of Potential Effect
ATSF	Atchison, Topeka and Santa Fe Railroad
DOT	U.S. Department of Transportation
DRGW	Denver and Rio Grande Western Railroad
Front Range	eastern slope of the Rocky Mountains
NA	not applicable
NEPA	National Environmental Policy Act
NRHP	National Register of Historic Places
OAHP	Office of Archaeology and Historic Preservation
PEL	Planning and Environmental Linkages
PEL Study Limits	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument
SHPO	State Historic Preservation Office
Study Area	Includes the PEL study limits with a buffer extending 50 feet beyond CDOT right-of-way

1.0 Historic Resources

1.1 Methodology for Initial Assessment

This preliminary evaluation is intended to provide a summary of existing conditions regarding the presence and potential for historic resources occurring in the Study Area. The Study Area was defined by creating a 50-foot buffer on the right-of-way through the study corridor to accommodate consideration of resources adjacent to the corridor. The Study Area represents the area being reviewed for historic resources as presented in this technical memorandum.

Historic resources are considered under two acts on transportation projects: National Historic Preservation Act and Section 4(f) U.S. Department of Transportation (DOT) Act, both passed in 1966. The review conducted for the purpose of this technical memorandum does not constitute evaluation under these regulations; compliance activities under these regulations will be conducted once a project is identified and the National Environmental Policy Act (NEPA) review process is initiated.

Historic resources include buildings, structures, objects, sites, and districts. Resources are generally considered to have historic potential when they meet or exceed 50 years of age. To allow resources that will meet this 50-year age threshold within the next 5 years and enable their consideration in the planning process, resources 45 years of age or more (constructed in 1972 or earlier) were included in the review.

Previously surveyed historic resources were identified through a file search of the Office of Archaeology and Historic Preservation (OAHP), History Colorado, and COMPASS database. Searches of the COMPASS database were completed on November 17, 2016, January 4, 2017, and March 3, 2017. The COMPASS database does not contain comprehensive data regarding the presence and eligibility of cultural resources, since not all resources in the state have been inventoried. Further, not all resources identified in the COMPASS database contain complete location information. Therefore, some sites identified in the COMPASS search of the Study Area could not be mapped on figures prepared for this technical memorandum. Potentially historic, un-surveyed resources were identified through records of the Douglas County and El Paso County Assessors data.

OAHP files and the Douglas County Assessor data were supplemented with aerial images available on Google Earth and through comparison of historic and current topographic maps. No field survey was completed for the purpose of this Planning and Environmental Linkages (PEL) process. Data included in this evaluation represents an overview of historic and potentially historic resources, and resource types present in the Historic Study Area.

1.2 Regulatory Framework

The National Historic Preservation Act was passed in 1966, containing a set of regulations commonly referred to as Section 106 process. Section 106 [36 CFR Part 800] is a process law requiring consideration of the effects to cultural resources created by projects receiving funds, permits, licenses, or approvals from federal agencies. The Section 106 process requires consultation with the State Historic Preservation Office (SHPO) and the involvement of consulting parties in determining effects to historic resources. Consulting parties may include local governments, historic preservation commissions, and non-profit organizations with an interest in historic preservation. Consulting party involvement includes establishment of the Area of Potential Effects (APE) and identification of historic properties, as well as assessing effects.

The three potential determinations of effect are (1) no historic properties affected, (2) no adverse effect, and (3) adverse effect. The Section 106 process asks federal agencies to avoid and/or minimize effects to

historic resources to the extent feasible. When avoidance is not possible, the agency should consider alternatives to minimize the impact. If avoidance and minimization are not possible, and the project results in a determination of adverse effect*,* the agency will be required to mitigate impacts to historic resources.

The DOT Act was passed in 1966, containing a regulation referred to as Section 4(f). Section 4(f) [23 CFR Part 774] is a substantive law requiring agencies under the authority of the DOT to avoid the use of Section 4(f) resources, including historic sites listed on or eligible for the National Register of Historic Places (NRHP). For historic sites, the Section 4(f) determination is closely linked to the determination of effect under the Section 106 process.

1.3 Resource Conditions

The Study Area consists primarily of the I-25 corridor. A comparison of COMPASS records and assessor data indicates the presence of historic and potentially historic resources throughout the project corridor, with higher concentrations around the Castle Rock near the center of the project area. A total of 112 built environment resources were indicated in the COMPASS search; a total of 10 are located in PEL Segment 1—The Gap, 96 are located in PEL Segment 2—Castle Rock to Castle Pines, and 6 are located in PEL Segment 3—Denver South. One resource, segment 5DA.922.4 of the Atchison, Topeka & Santa Fe Railroad (ATSF), is located in both PEL Segments 1 and 2. Buildings are the most common resource type within the Study Area, primarily represented by houses; however commercial buildings, churches, and schools are included. Structures are also represented, including bridges and linear resources. A linear resource is a resource with a length significantly longer than its width, and includes roads, railroads, and irrigation ditches. One irrigation ditch was identified in the corridor; the Arapahoe Ditch, which intersects I-25 just north of RidgeGate Parkway. Railroad resources are the most common within this corridor, namely the grades of the former ATSF and Denver and Rio Grande Western Railroad (DRGW). The historic ATSF line is currently owned by the Burlington Northern Santa Fe Railroad, and the historic DRGW is currently owned by the Union Pacific. These rail lines generally follow the I-25 corridor from the southern project limits to the Castle Rock area, where the rail lines turn west and follow the US 85 corridor. Not all segments of these lines within the Study Area have been surveyed. However, the surveyed segments have been determined to support the overall eligibility of the linear resources. Roads and highways have the potential to be considered eligible for inclusion on the NRHP. As a part of the interstate highway system, I-25 is exempt from consideration as a historic resource under the Advisory Council on Historic Preservation *Exemption Regarding Historic Preservation Review Process for Effects to the Interstate Highway System* (2005). Bridges identified through the COMPASS search have been determined ineligible for inclusion on the NRHP, primarily through the 2002 CDOT Historic Bridge Inventory. Additional bridges may be present in the Study Area. It is likely that bridges constructed in 1968 or before have been previously surveyed through the 2014 CDOT Historic Bridge Inventory update, which inventoried CDOT-owned bridges constructed through 1968. Results of this inventory have not been fully integrated into the COMPASS system. Bridges constructed between 1968 and 1972 may require survey once the project moves into a NEPA phase.

A review of historic topographic maps for the Study Area indicates development in the area was slow during the historic period before 1972. Clusters of potentially historic resources are located in and near Castle Rock and smaller settlements including Beverly Hills, Silver Heights, Larkspur, Greenland, and Monument. Construction of I-25, subsequent construction of E-470, and of interchanges such as Lincoln Avenue and North Gate Boulevard, created a catalyst for development beginning in the 1980s. These areas at the northern and southern limits of the Study Area, and around Castle Rock, experienced considerable growth that may have depleted the inventory, or at a minimum the historic setting, of potential resources located in these areas.

Table 1 provides the results of the COMPASS database search conducted on November 17, 2016, January 4, 2017, and March 3, 2017. General locations of OAHP COMPASS surveyed sites can be found in Attachment 1, Historic Figures.

Table 1. OAHP COMPASS Surveyed Sites

Site Number	Name	Address	Status	PEL Segment
5DA.1521	East Plum Creek Bridge H-17-AH	NA	Not Eligible—Officially (2016)	Segment 1
5DA.1522	County Road Underpass H-17-D Minor	NA	Not Eligible—Officially (2002)	Segment 1
5DA.1809	NA	1532 E I-25 Frontage Road, Castle Rock (Vicinity)	Not Eligible—Officially (2003)	Segment 1
5DA.1810	NA	1546 E I-25 Frontage Road, Castle Rock (Vicinity)	Not Eligible—Officially (2003)	Segment 1
5DA.1811	NA	1564 E I-25 Frontage Road, Castle Rock (Vicinity)	Not Eligible—Officially (2003)	Segment 1
5DA.2891	Snortland Sawmill	6988 S Interstate 25, Castle Rock	Determined Needs Data (2011)	Segment 1
5DA.921.8	**DRGW Railroad Segment**	**NA**	**Eligible (supporting)—Official (2001)**	**Segment 1**
5EP.4162	Gwillimville School, Tri-Lakes Chamber of Commerce	300 Highway 105 Monument, CO	Not Eligible—Officially (2004)	Segment 1
5EP.7347	Monument Community Church/Monument Presbyterian Church/ Monument Community Presbyterian Church/ Sheldon Jackson Memorial Chapel	238 Third Street, Monument	No Assessment	Segment 1
5DA.922.4	**ATSF Railroad (Segment)**	**NA**	**Eligible (supporting)—Official (2003)**	**Segment 1, 2**
5DA.1067	Cantril Courthouse	310 Fourth Street, Castle Rock	Not Eligible—Officially (1996)	Segment 2
5DA.1224	**Street Trees**	**Castle Rock**	**Eligible—Field (1985)**	**Segment 2**
5DA.1225	**NA**	**719 Wilcox Street, Castle Rock**	**Eligible—Field (1984)**	**Segment 2**
5DA.1226	**NA**	**718 Wilcox Street, Castle Rock**	**Eligible—Field (1985)**	**Segment 2**
5DA.1227	**NA**	**728 Wilcox Street, Castle Rock**	**Eligible—Field (1985)**	**Segment 2**
5DA.1228	NA	734 Wilcox Street, Castle Rock	No Assessment	Segment 2
5DA.1229	**NA**	**738 Wilcox Street, Castle Rock**	**Eligible—Field (1985)**	**Segment 2**
5DA.1230	**O'Brien's Park**	**600 Jerry Street, Castle Rock**	**Eligible—Field (1985)**	**Segment 2**
5DA.1231	**NA**	107 5th Street, Castle Rock	No Assessment	Segment 2
5DA.1232	**NA**	611 Wilcox Street, Castle Rock	No Assessment	Segment 2

Site Number	Name	Address	Status	PEL Segment
5DA.1233	Mason's Auto Shop	311 5th Street, Castle Rock	No Assessment	Segment 2
5DA.1236	**NA**	**608 Front Street, Castle Rock**	**Eligible—Field (1984)**	**Segment 2**
5DA.1237	NA	603 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1238	NA	509 5th Street, Castle Rock	No Assessment	Segment 2
5DA.1239	NA	503 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1240	NA	509 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1241	NA	517 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1242	NA	418 Front Street, Castle Rock	No Assessment	Segment 2
5DA.1243	NA	416 Front Street, Castle Rock	No Assessment	Segment 2
5DA.1244	NA	414 Front Street, Castle Rock	No Assessment	Segment 2
5DA.1246	NA	520 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1247	NA	518 Lewis Street, Castle Rock	No Assessment	Segment 2
5DA.1248	NA	510 Lewis Street, Castle Rock	No Assessment	Segment 2
5DA.1250	NA	421 Gilbert Street, Castle Rock	No Assessment	Segment 2
5DA.1251	NA	420 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1252	NA	410 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1256	NA	103 4th Street, Castle Rock	No Assessment	Segment 2
5DA.1257	NA	19 Lewis Street, Castle Rock	No Assessment	Segment 2
5DA.1258	**George H. Stewart House/Crumm Residence**	**422 Elbert Street, Castle Rock**	**Eligible—Officially (1999) Contributing to Historic District—Field (2005) Not Eligible—Field (2009)**	**Segment 2**
5DA.1260	Harry Jones' House	118 3rd Street, Castle Rock	No Assessment	Segment 2
5DA.1261	NA	115 3rd Street, Castle Rock	No Assessment	Segment 2
5DA.1262	NA	Between 104 and 114 4th Street, Castle Rock	No Assessment	Segment 2
5DA.1263	NA	104 4th Street, Castle Rock	No Assessment	Segment 2
5DA.1264	NA	314 Elbert Street, Castle Rock	No Assessment	Segment 2
5DA.1265	NA	310 Elbert Street, Castle Rock	No Assessment	Segment 2
5DA.1266	NA	105 3rd Street, Castle Rock	No Assessment	Segment 2
5DA.1268	NA	316 3rd Street, Castle Rock	No Assessment	Segment 2
5DA.1271	Navy Recruitment Office	311 Perry Street, Castle Rock	No Assessment	Segment 2
5DA.1272	NA	314 Wilcox Street, Castle Rock	Not Eligible—Field (1984)	Segment 2
5DA.1277	NA	310 Front Street, Castle Rock	No Assessment	Segment 2

Site Number	Name	Address	Status	PEL Segment
5DA.1281	NA	504 3rd Street, Castle Rock	No Assessment	Segment 2
5DA.1282	NA	212 Front Street, Castle Rock	No Assessment	Segment 2
5DA.1283	NA	204 Front Street, Castle Rock	No Assessment	Segment 2
5DA.1285	NA	312 Lewis Street, Castle Rock	No Assessment	Segment 2
5DA.1286	NA	206 Lewis Street, Castle Rock	No Assessment	Segment 2
5DA.1287	NA	219 Lewis Street, Castle Rock	No Assessment	Segment 2
5DA.1288	NA	14 Wilcox Street, Castle Rock	No Assessment	Segment 2
5DA.1289	NA	20 Wilcox Street, Castle Rock	No Assessment	Segment 2
5DA.1290	NA	101 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1291	NA	111 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1292	NA	19 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1294	NA	1 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1296	NA	118 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1298	NA	620 2nd Street, Castle Rock	No Assessment	Segment 2
5DA.1302	NA	6 Lewis Street, Castle Rock	No Assessment	Segment 2
5DA.1303	NA	17 Lewis Street, Castle Rock	No Assessment	Segment 2
5DA.1381	Jack Pine Motel/— Castle Pines Motel and Florist Shop	807 Wilcox Street, Castle Rock	Not Eligible—Officially (1999)	Segment 2
5DA.1382	Monk Residence/ Johnson Residence	412 Elbert Street, Castle Rock	Not Eligible—Officially (1999)/Not Eligible – Field (2007)	Segment 2
5DA.1384	Hockemeyer Residence	418 Elbert Street, Castle Rock	Not Eligible—Officially (1999)	Segment 2
5DA.1481	NA	10 Cantril Street, Castle Rock	No Assessment	Segment 2
5DA.1516	US 85 Overpass G-17-K	NA	Not Eligible—Officially (2002)	Segment 2
5DA.2039	Atchison, Topeka, and Santa Fe Depot	698 Prairie Hawk, Castle Rock	Not Eligible—Field (2009)	Segment 2
5DA.2669	**Ramsour Residence/ Signdesign Inc.**	**109 Fourth Street, Castle Rock**	**Eligible—Field (2011)**	**Segment 2**
5DA.2670	Walter and Sarah Jane Priest Residence/Better Life Chiropractic	104 Fourth Street, Castle Rock	Not Eligible—Field (2011)	Segment 2
5DA.2718	Edgar Eichling House	706 N Wilcox Street, Castle Rock	Not Eligible—Field (2009)	Segment 2
5DA.2992	Castle Rock Post Office/ Legacy Hospice	412 Jerry Street, Castle Rock	Not Eligible—Field (2012)	Segment 2
5DA.2993	Castle Cleaners/Bobbin Along and Castle Cleaners	206 and 208 Fifth Street, Castle Rock	Not Eligible—Field (2012)	Segment 2

Site Number	Name	Address	Status	PEL Segment
5DA.3505	Station Master's House/Freed Residence	300 Prairie Hawk, Castle Rock	Not Eligible—Field (2009)	Segment 2
5DA.641	**NA**	**3 Cantril Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.642	**Steckman House**	**20 Cantril Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.646	**Upton Treat Smith House**	**403 Cantril Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.647	**The Maples/George P. Stewart House**	**422 Front Street, Castle Rock**	**Eligible—Field (1985)/ Contributing to District – Field (1985)**	**Segment 2**
5DA.648	Christ Episcopal Church (Castle Rock)	615 4th Street, Castle Rock	Not Eligible – Determined (1988)	Segment 2
5DA.651	**Christensen House/ Circle Creations**	**420 Jerry Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.655	**Lowell Thomas House**	**15 Lewis Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.656	**William Carver House/ Marr House**	**20 Lewis Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.659	**Mary Ann Foster House/Owens House**	**213 and 215 Perry Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.662	**Columbine Copy Center**	**302 Wilcox Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.663	**Decorators Delight**	**304 Wilcox Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.666	**Razor's Edge Barber Shop/Mira International**	**310 Wilcox Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.667	**NA**	**312 Wilcox Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.671	**NA**	**510 Wilcox Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.672	**Henry Mcallister House/Golden Dobbin**	**519 Wilcox Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.673	**Dobbins Carriage House**	**519 Wilcox Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.674	**Wilcox School**	**620 Wilcox Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**

Site Number	Name	Address	Status	PEL Segment
5DA.675	**The Pleasant House**	**703 Wilcox Street, Castle Rock**	**Eligible—Field (1985)/ Contributing to District – Field (1985)**	**Segment 2**
5DA.676	**Wilson/Sheets House**	**704 Wilcox Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.678	**NA**	**309 - 311 Third Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.680	**Hackett Funeral Parlor/ Castle Rock Chamber of Commerce**	**213 and 215 4th Street, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.682	**NA**	**SW Corner 2nd and Perry Streets, Castle Rock**	**Not Eligible—Field (1984)**	**Segment 2**
5DA.685	**NA**	**514 Wilcox Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.686	**NA**	**522 Wilcox Street, Castle Rock**	**Contributing to District – Field (1984)**	**Segment 2**
5DA.687	**Blacksmith Shop/ Murphy Building**	**3rd Street Between Jerry and Wilcox Streets, Castle Rock**	**Eligible—Field (1984)/ Contributing to District – Field (1984)**	**Segment 2**
5DA.921.1	**Denver and Rio Grande Railroad (Segment)**	**NA**	**Eligible—Field (2004)/ Supports Eligibility of Entire Linear Resource (2013)**	**Segment 2**
5DA.922.3	**ATSF Railroad (Segment)**	**NA**	**Eligible (supporting)—Official (2006)**	**Segment 2**
5AH.1583	County Line Road Overpass F-17-DK	NA	Not Eligible—Officially (2002)	Segment 3
5DA.1508	Happy Canyon Bridge F-17-BT	NA	Not Eligible—Officially (2002)	Segment 3
5DA.1509	Happy Canyon Bridge F-17-BU	NA	Not Eligible—Officially (2002)	Segment 3
5DA.1518	Surrey Ridge Road Underpass G-17-X Minor	NA	Not Eligible—Officially (2002)	Segment 3
5DA.1548	Arapahoe Ditch	NA	No Assessment	Segment 3
5DA.1548.1	Arapahoe Ditch	NA	Not Eligible—Officially (2000)	Segment 3

NA = not applicable

1.4 Scoping Input

Public and agency scoping input pertaining to historic resources will be obtained throughout the planning process for I-25 between C-470 and Monument. Scoping input for this planning process to date has been received as presented in Table 2. No comments pertaining specifically to historic resources were provided during these meetings.

Table 2. Scoping Input

Date	Scoping Input
November 17, 2016	CDOT Maintenance Meeting
December 6, 2016	Resource Agency Meeting
December 29, 2016	Colorado Parks and Wildlife Meeting
January 12, 2017	I-25 South PEL comments from the CDPHE

CDPHE = Colorado Department of Public Health and Environment

2.0 Recommendations

In December 2016, CDOT announced plans to accelerate the environmental and planning process for improvements on I-25 from C-470/E-470 to Colorado Springs, with attention to The Gap area from Monument to Castle Rock. This means that the PEL Study will continue from C-470/E-470 to Monument while accelerating a NEPA project within Segment 1. By accelerating the environmental planning for I-25, CDOT will have a project ready for construction by summer 2019, with a project fully constructed between Castle Rock and Monument in 5 years, if funding is identified for construction. With this timeline in mind, the project team has identified recommendations for next steps for the PEL and NEPA processes.

2.1 PEL Process

Next steps in the PEL process include screening of project alternatives for the entire Study Area. This screening process may consider the historic and potentially historic resources identified through the historic resources existing conditions analysis contained in this technical memorandum. Avoidance of historic resources should be included in the alternatives screening process, with emphasis on eligible sites and linear resources, specifically the railroad resources located throughout the corridor that run roughly parallel to the interstate. Any changes to the Study Area will require additional analysis.

2.2 NEPA Project

As part of the NEPA process, Section 106 review and consultation with SHPO and any appropriate consulting parties will be required. Survey forms for bridges previously surveyed by CDOT bridge inventories will be required to be obtained, as well as identifying bridges located within the interstate rights of way, and the status of their NRHP eligibility based on prior CDOT bridge inventories. The NEPA analysis for historic properties will also be expanded to include landmarks, agricultural properties, and other historic resource categories. This review will include development of an APE, which is likely to differ from the Study Area in sections to reflect the direct and indirect effects of the project design. Indirect effects include visual and noise impacts on adjacent resources. Any additional identification of resources within areas that extend beyond the limits of the Study Area will be conducted using COMPASS records and the appropriate County Assessor database using the methodology outlined in this technical memorandum.

The NEPA planning process will be conducted including project scoping, description of alternatives to be considered, and analysis of existing conditions in The Gap. Field work will be conducted as needed and will include collection of data to support the cultural resource survey of architectural resources in the APE identified through the NEPA project Section 106 process. The level of survey necessary will be determined by the proposed impacts of the project and the state of each resource. Factors include whether the resource has been previously surveyed, whether that survey resulted in an official

determination of eligibility, and the age of the determination. Resources identified in the COMPASS search with a no assessment or field determination will require re-survey at the intensive level. Resources with official determinations made more than five years ago may require a re-visitation survey.

Avoidance and minimization of effects to historic resources is recommended. Where avoidance and minimization are not feasible, the project may result in a determination of adverse effect, which would require the completion of mitigation. These determinations, including the APE, determinations of eligibility, and determinations of effect, will be submitted to SHPO for review.

Under Section 4(f), avoidance of the use of NRHP-eligible resources is required, unless no feasible and prudent alternative is identified that avoids use, as defined under Section 4(f). Adverse effects to cultural resources under the Section 106 process typically result in a use under Section 4(f). The design team should incorporate Section 4(f) resource information into the development of alternatives to avoid and minimize use of these resources wherever possible.

As future projects are programmed from the PEL, each resource, including environmental justice and associated resources, will be evaluated during the NEPA phase of project development. The NEPA evaluation process will be more in-depth and include the determination of potential impacts and mitigation.

3.0 References

Advisory Council on Historic Preservation. 2005. *Exemption Regarding Historic Preservation Review Process for Effects to the Interstate Highway System.*

Colorado Department of Local Affairs (DOLA). 2017. 2040 Colorado Population Estimates by County. https://data.colorado.gov/Demographics/Total-Population-by-County-by-Year/9dd2-kw29. Accessed June 21, 2017.

Castle Rock. 1985. *Castle Rock Historic Building Inventory.* CU for the Town of Castle Rock. DA.LG.R1.

Colorado Department of Transportation (CDOT). 2002. *South I-25 Corridor and US 85 Corridor Revised Record of Decision*. https://www.codot.gov/library/studies/southi25us85-feis-rod/record-of-decision-rod. Accessed November 15, 2016.

—. 2004a. *I-25, Colorado Springs to Monument Environmental Assessment*. https://www.codot.gov/library/studies/I25EAColoSpgsMonument/environmental-assessment. Accessed November 10, 2016.

—. 2004b. *I-25 Colorado Springs Area Finding of No Significant Impact (FONSI)*. https://www.codot.gov/library/studies/i-25-finding-of-no-significant-impact-fonsi. Accessed November 10, 2016.

—. 2010. *North Meadows Extension to US 85 and I-25 Environmental Assessment.* http://www.crgov.com/DocumentCenter/Home/View/920. Accessed November 9, 2016.

—. 2011. *North Meadows Extension to US 85 and I-25 Finding of No Significant Impact*. http://www.crgov.com/DocumentCenter/Home/View/1240. Accessed November 9, 2016.

—. 2012. *Interstate 25, Colorado Springs to Monument, Mileposts 149 to 161*. Reevaluation. http://hermes.cde.state.co.us/drupal/islandora/object/co%3A21568/datastream/OBJ/view. Accessed January 17, 2017.

—. 2014. *Interregional Connectivity Study Final Report*. Division of Transit and Rail. https://www.codot.gov/projects/ICS/ics-draft-report-january-2014. Accessed November 4, 2016.

—. 2015. *Traffic Data Explorer. Online Transportation Information System (OTIS)*. https://www.codot.gov/safety/safety-data-sources-information/online-transportation-information-systems-otis. Accessed January 17, 2017.

—. 2016. *Interstate 25 History*. https://www.codot.gov/about/CDOTHistory/50th-anniversary/interstate-25. Accessed November 2, 2016.

U.S. Census Bureau. 2010. *Population, Housing Units, Area, and Density: 2010 - State -- Place and (in selected states) County Subdivision*. American Fact Finder. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed November 2, 2016.

U.S. Geological Survey (USGS). 1973. *Greenland, CO* 7.5-minute topographic quadrangle map, 1954, Photorevised 1969, minor revision 1973.

—. 1979. *Larkspur, CO* 7.5-minute topographic quadrangle map, 1954, Photorevised 1979.

—. 1986. *Monument, CO* 7.5-minute topographic quadrangle map.

—. 1994a. *Dawson Butte, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

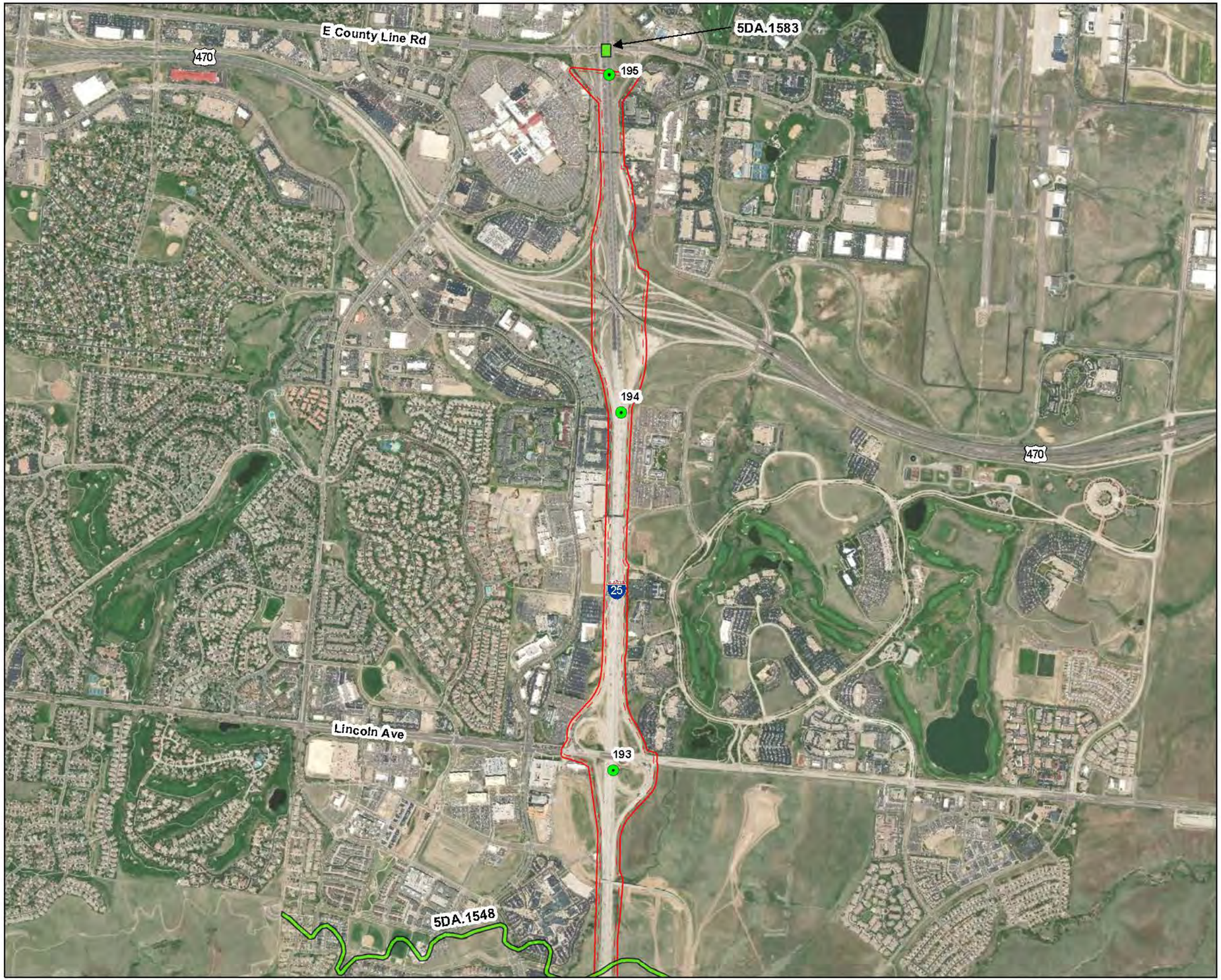
—. 1994b. *Castle Rock South, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

—. 1994c. *Castle Rock North, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

—. 1994d. *Sedalia, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

—. 1994e. *Parker, CO* 7.5-minute topographic quadrangle map, 1965, Revised 1994.

Attachment 1
Historic Figures



VICINITY MAP

LEGEND

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Data Sources:
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Environmental Resources
I-25 PEL: CO Springs Denver South Connection
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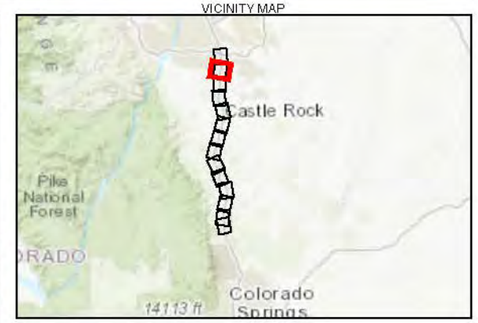

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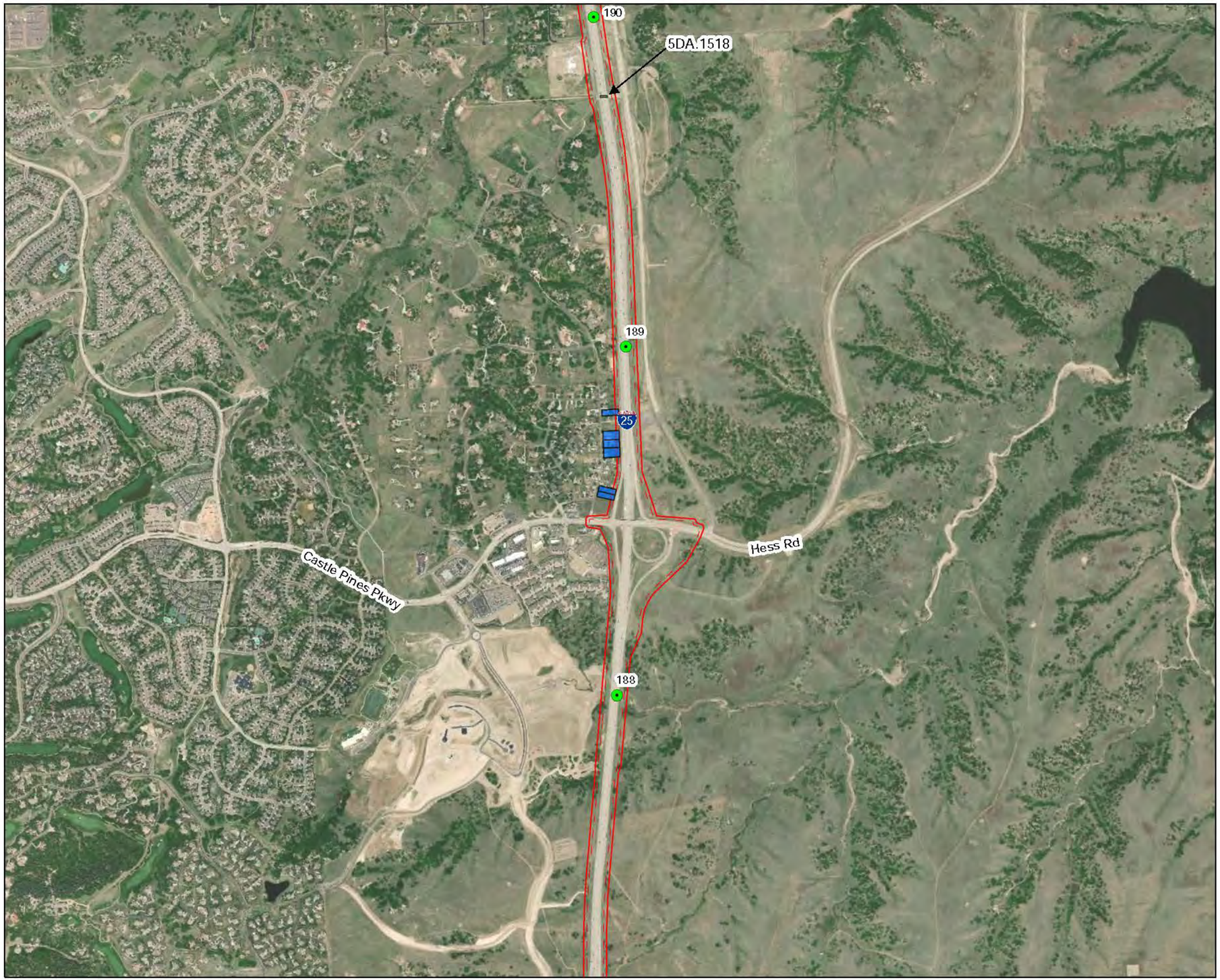

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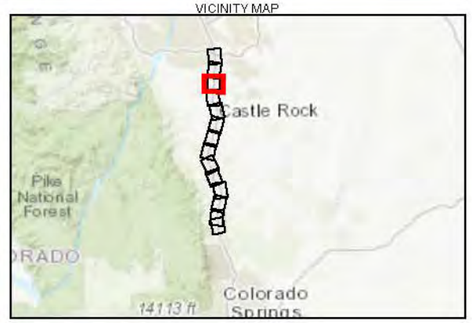

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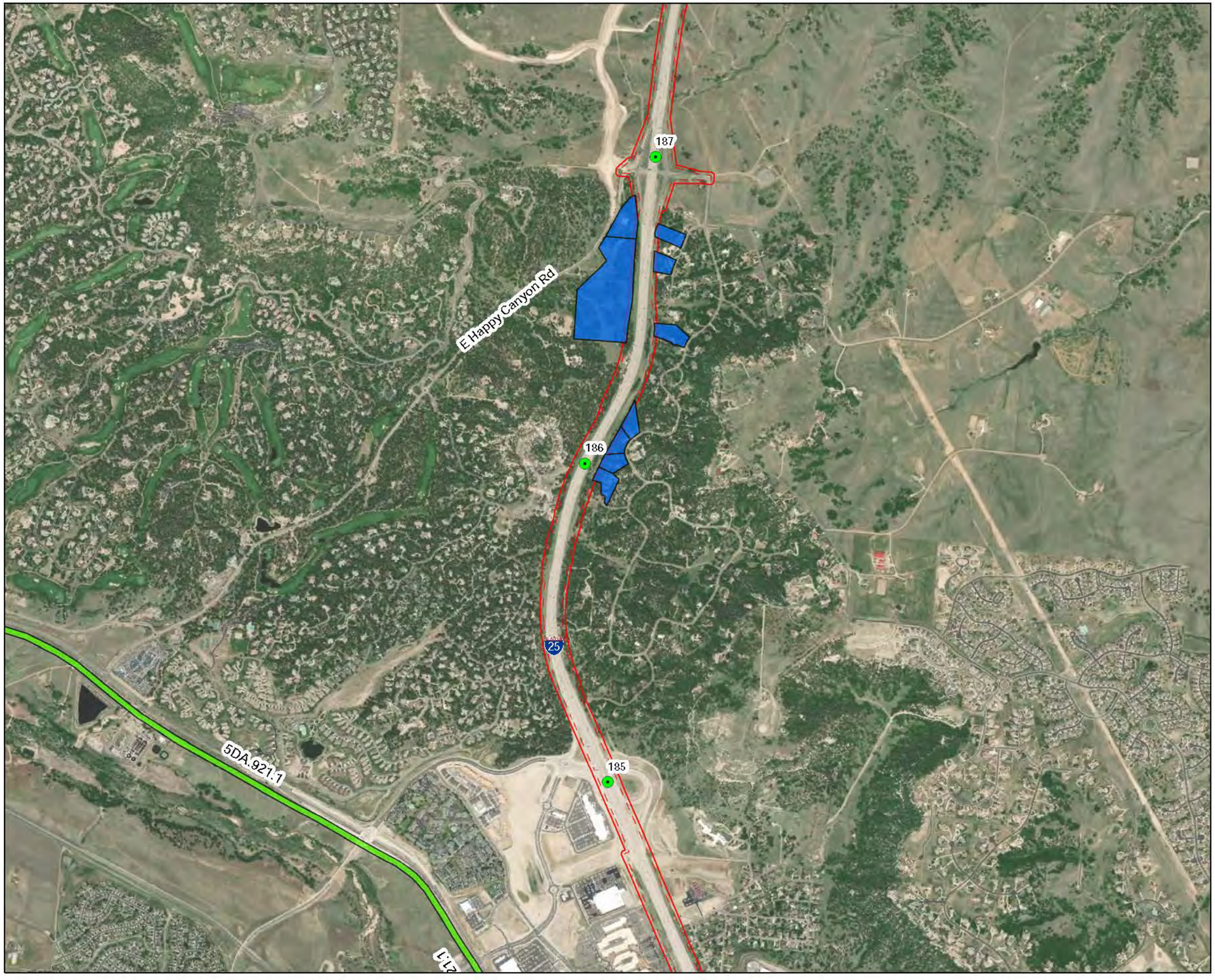

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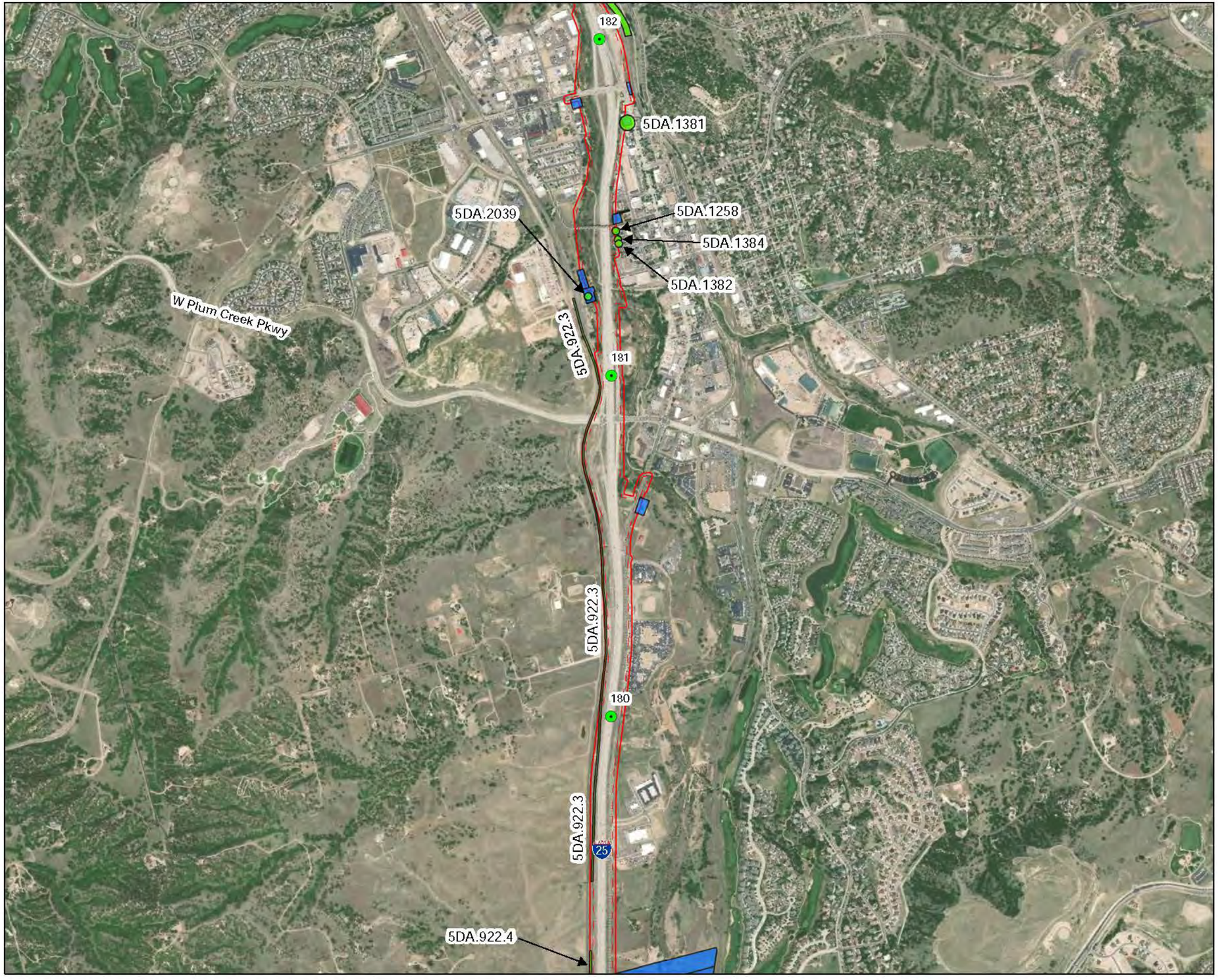

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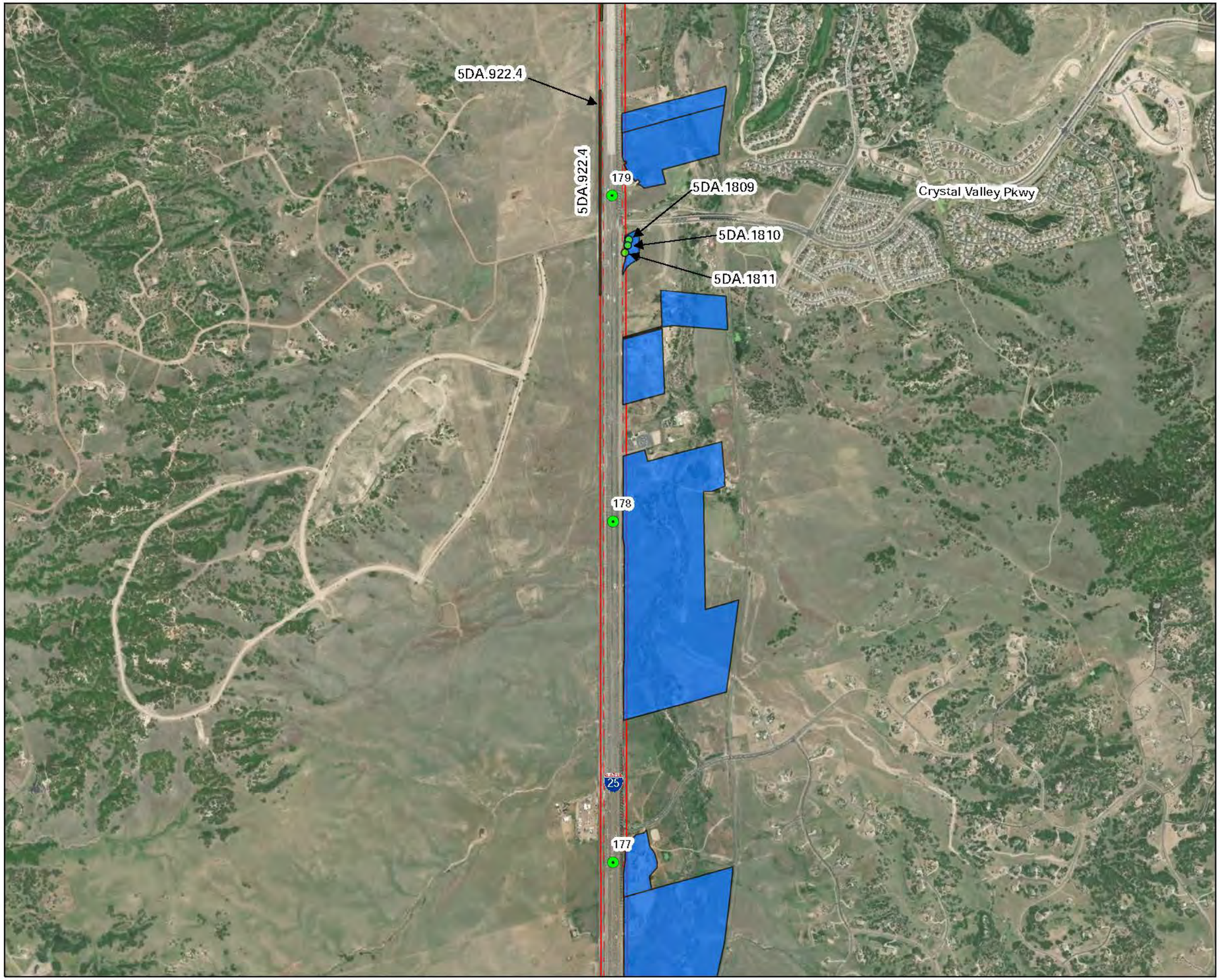

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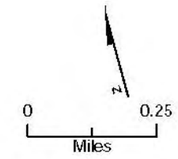

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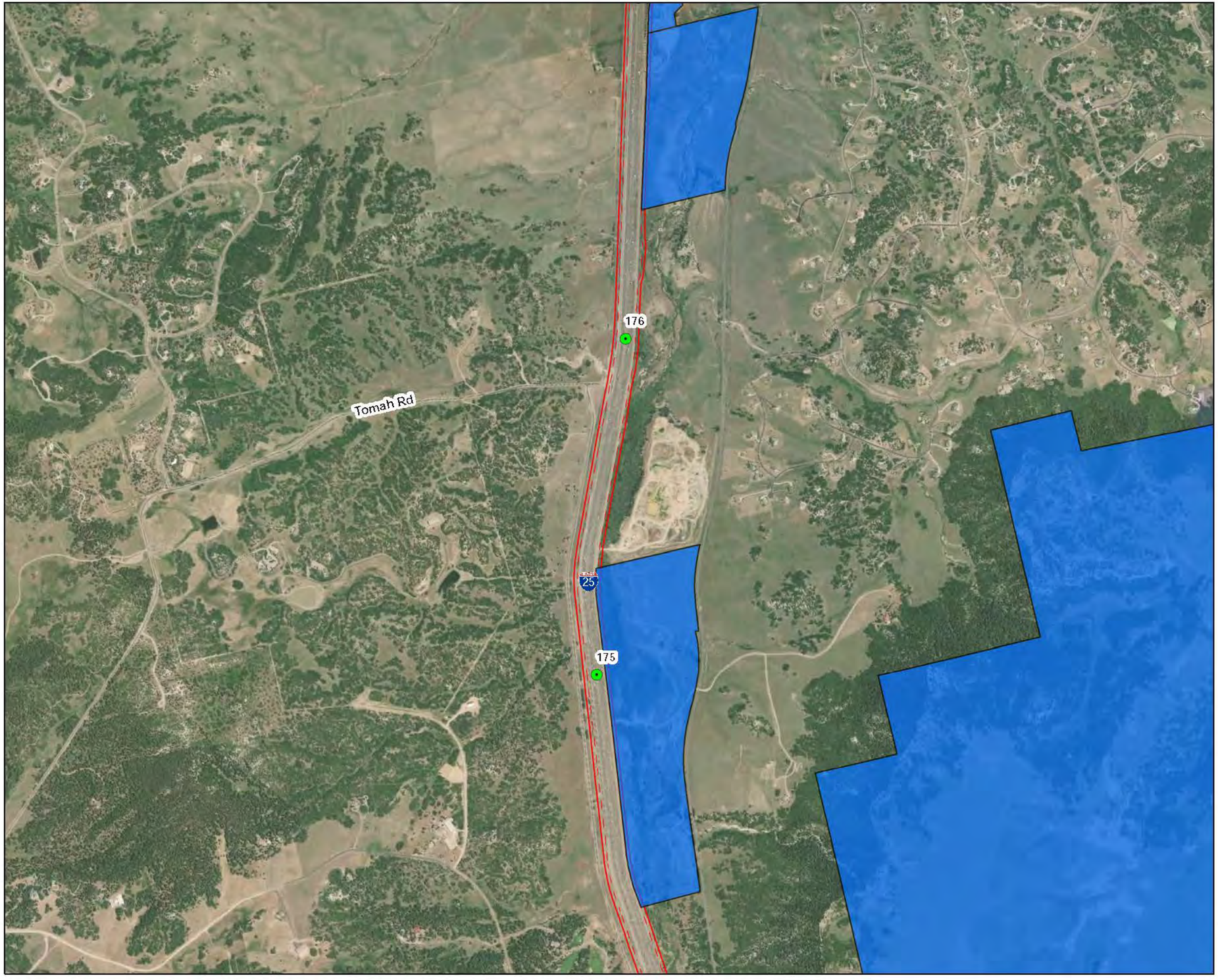

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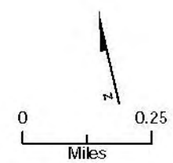

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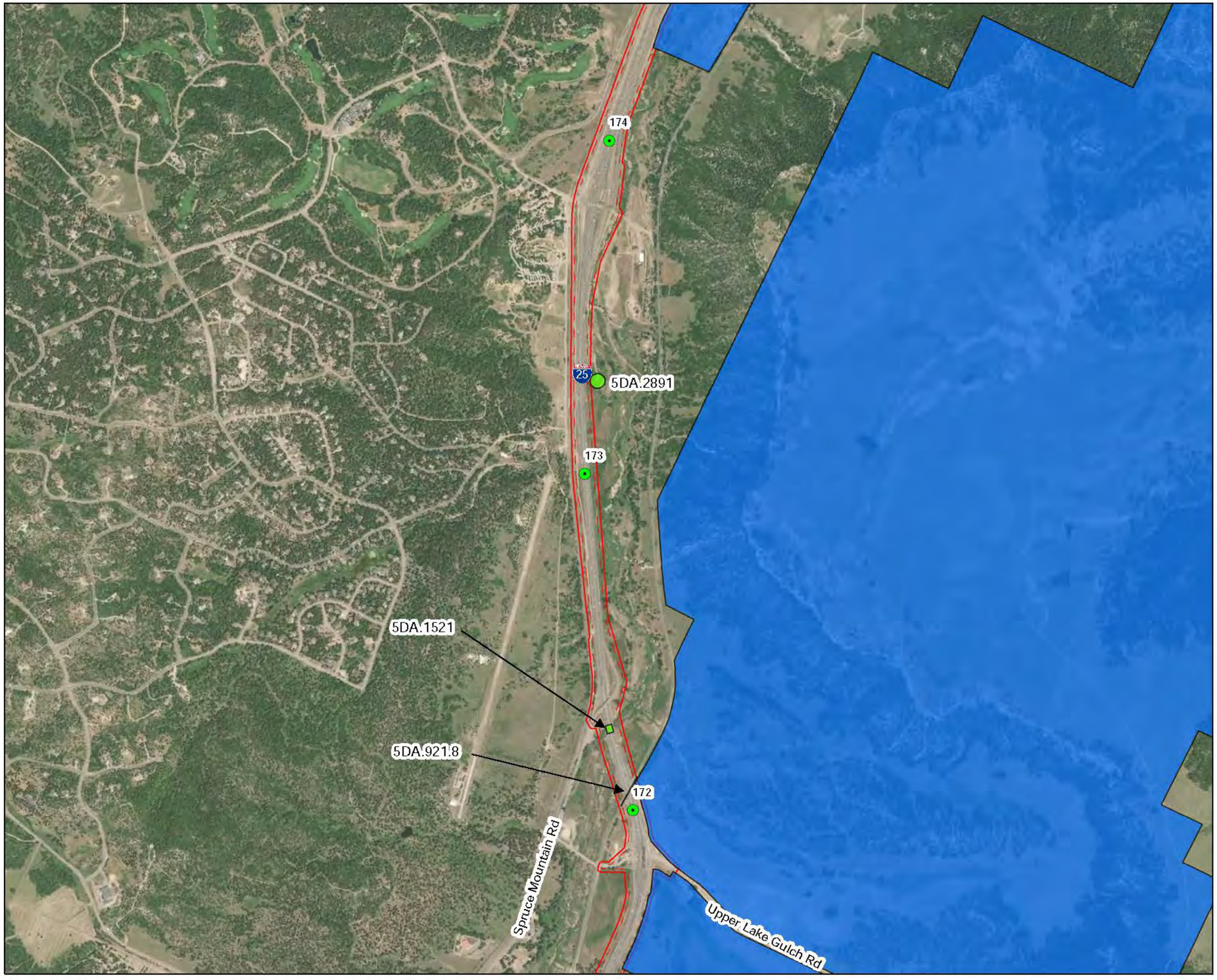

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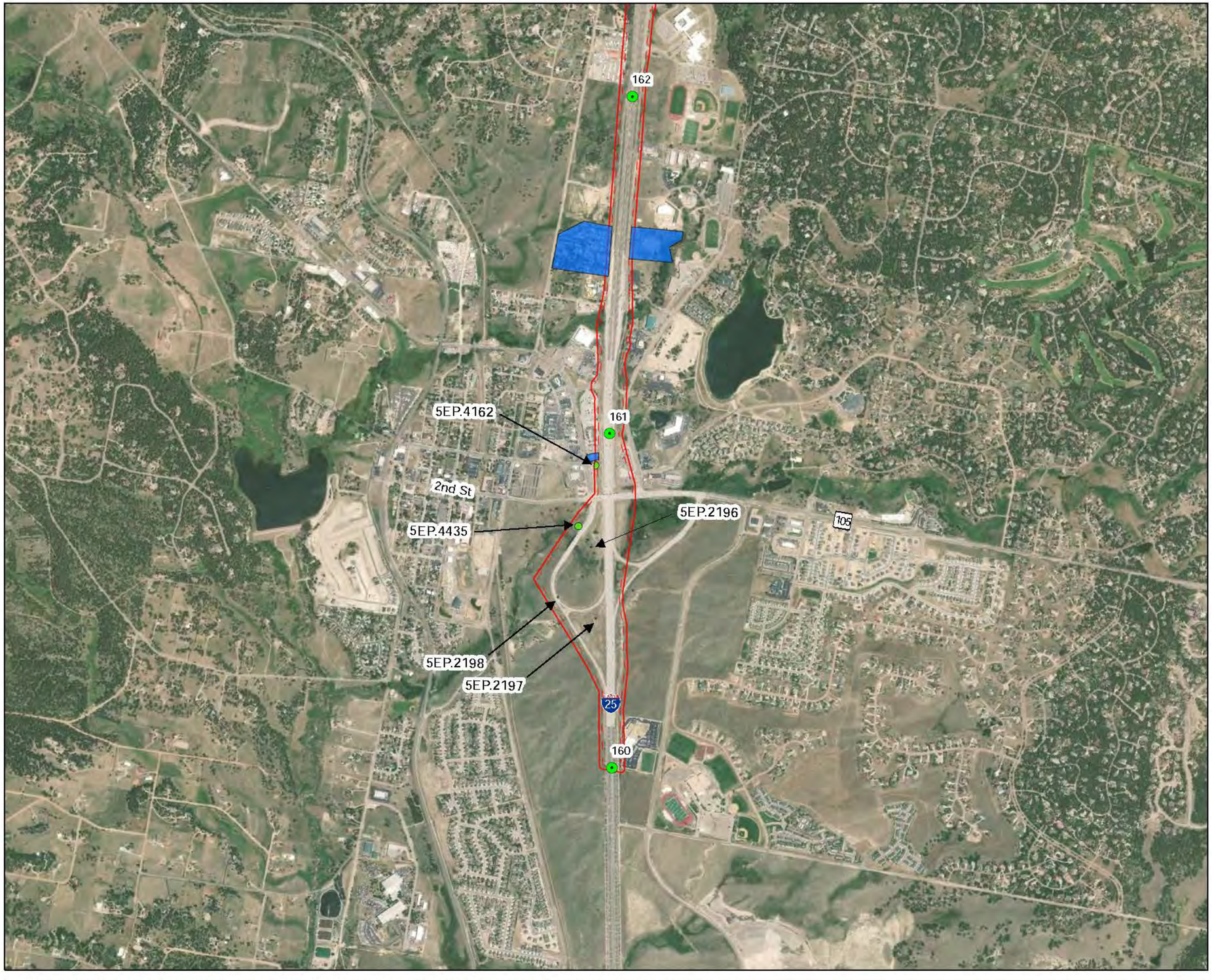

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Attachment 1
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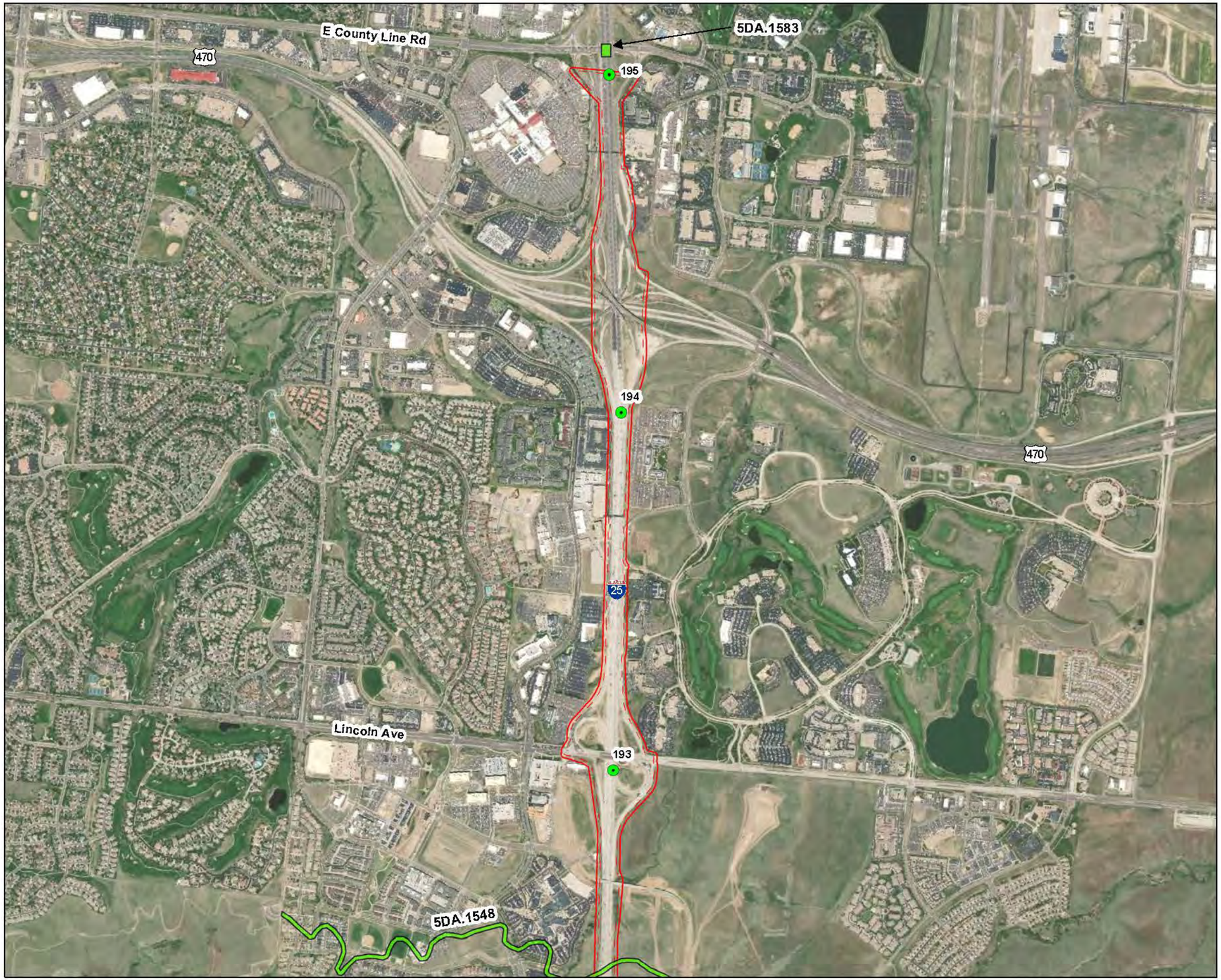

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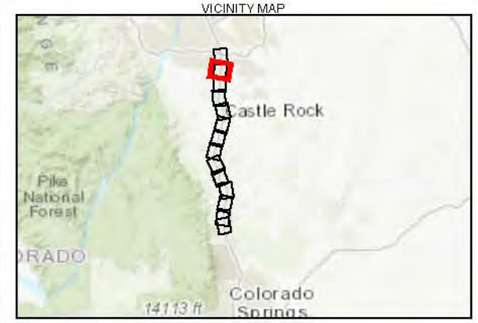

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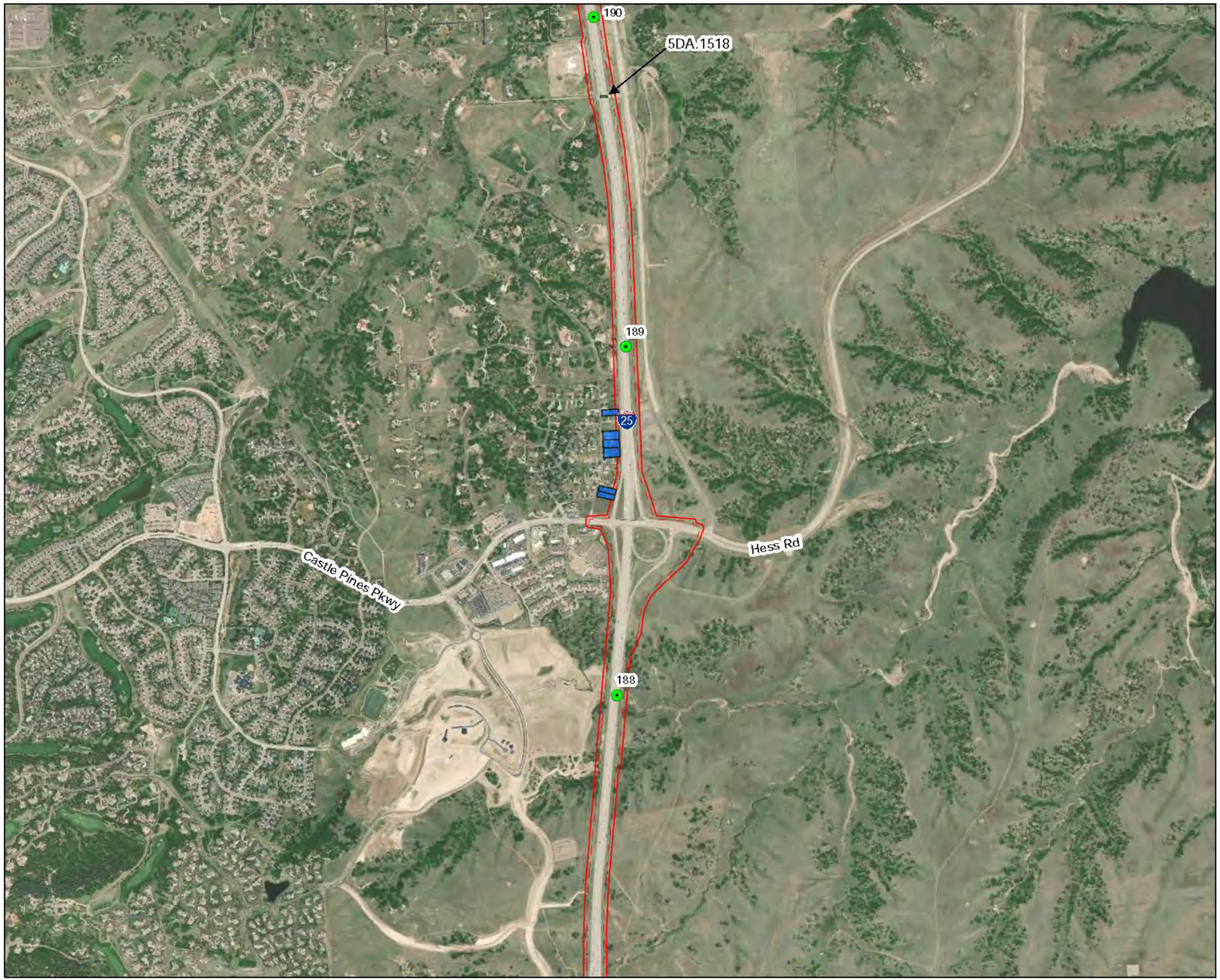

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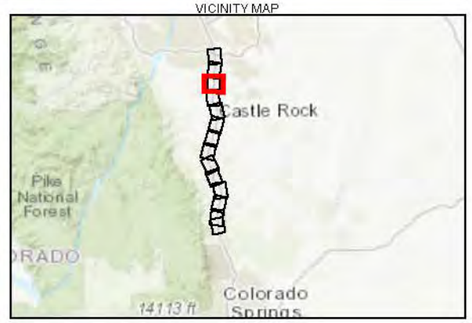

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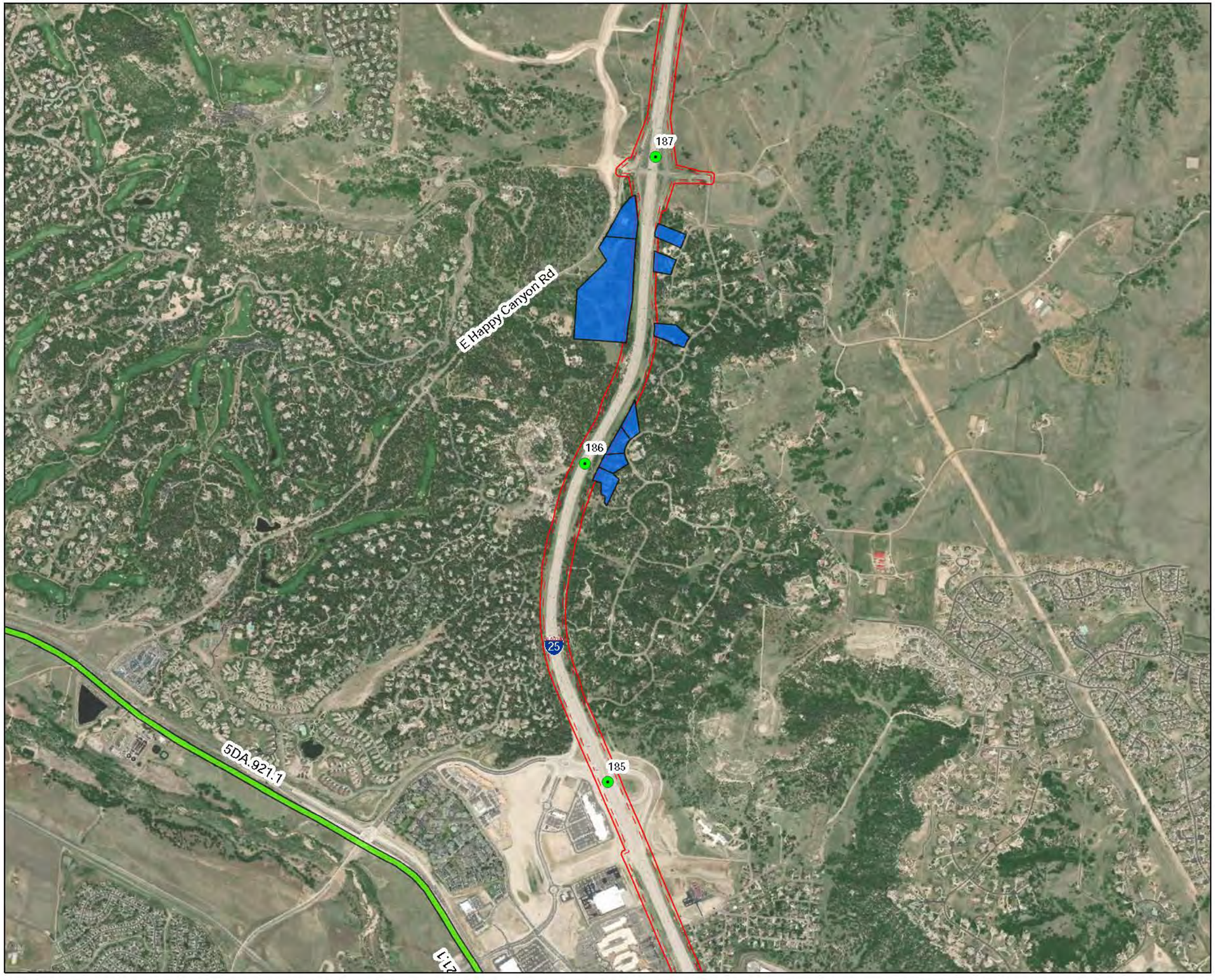

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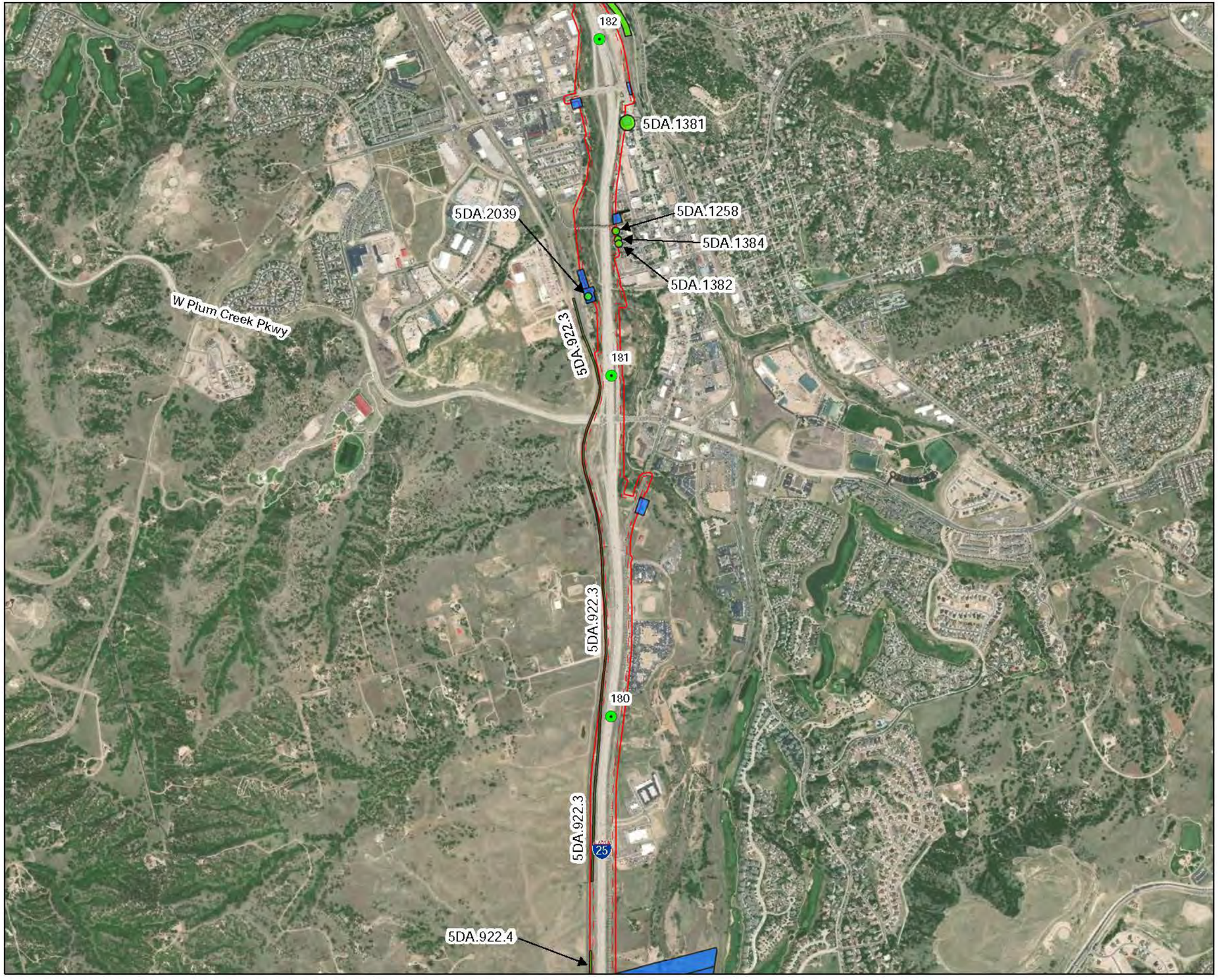

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- Assessor Data/Potentially Historic (1972 or Older)
- Mile Post
- 189 Mile Post Number

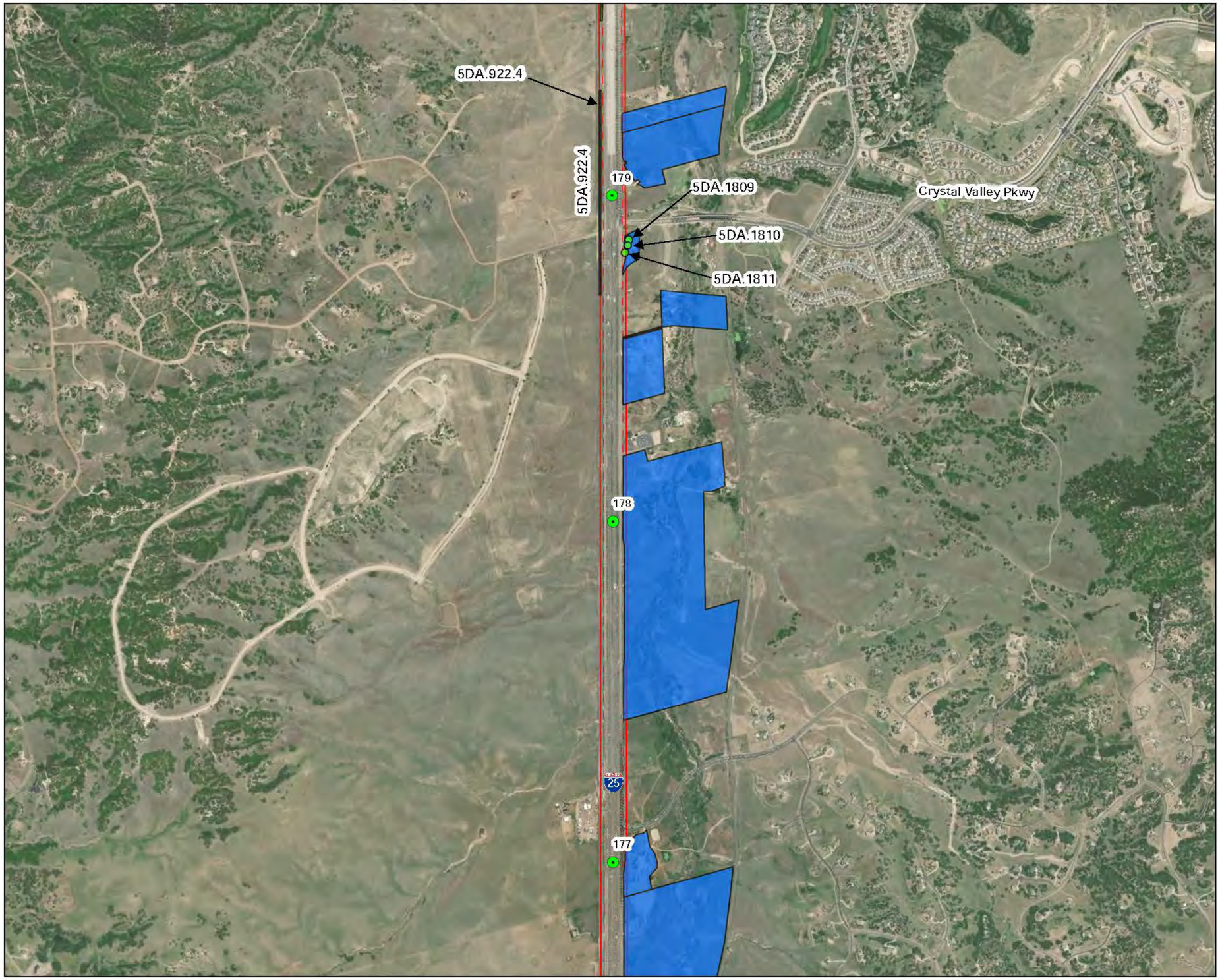
Data Sources:
OAHP, 2016 and 20107
Douglas County, 2016
El Paso County, 2016

N

0 0.25
Miles

Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

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- Right-of-Way (ROW)
- OAHP Surveyed Site
- Assessor Data/Potentially Historic (1972 or Older)
- Mile Post
- 189 Mile Post Number

Data Sources:
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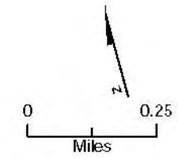

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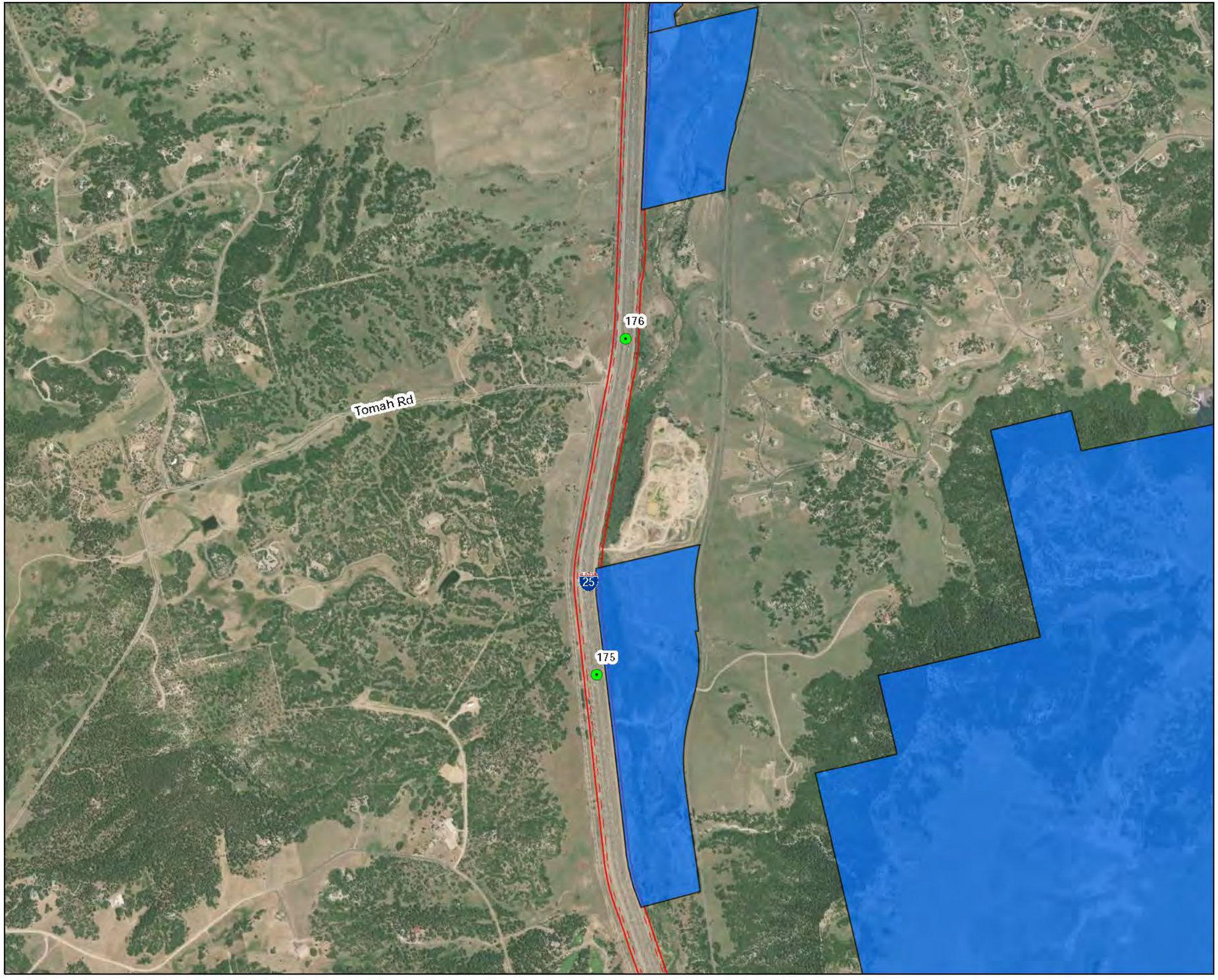

VICINITY MAP

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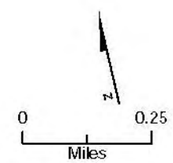

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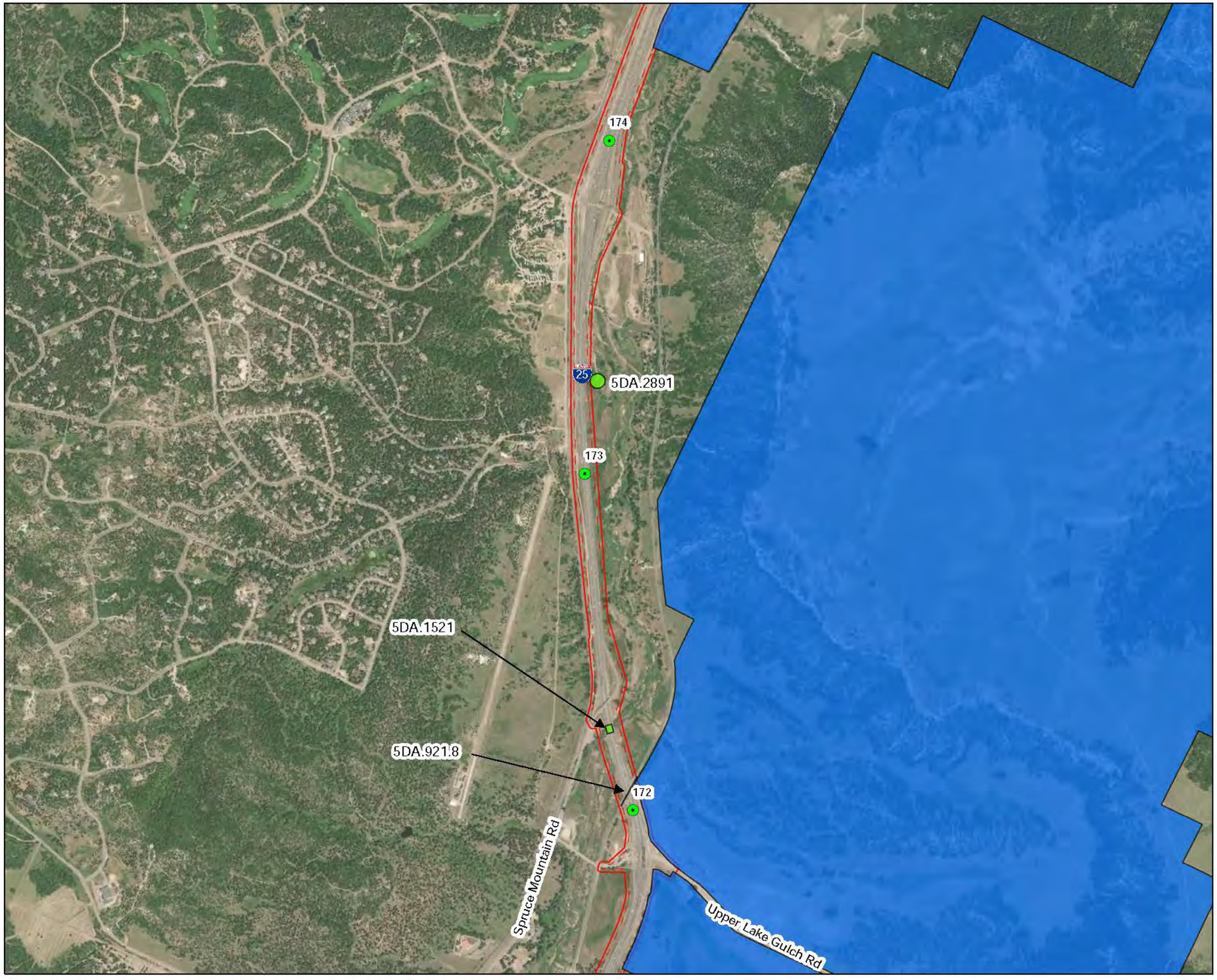

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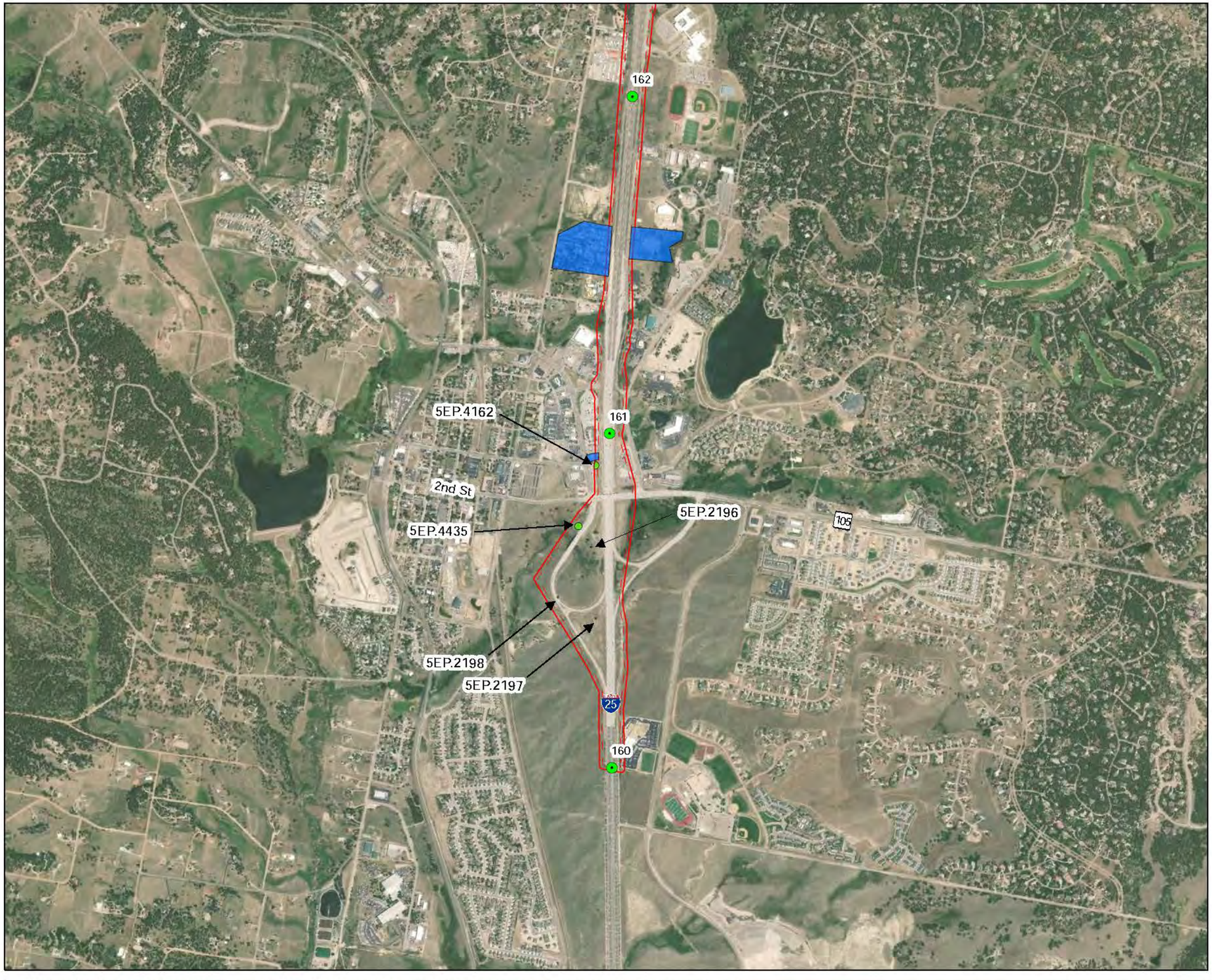

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Environmental Resources
I-25 PEL: CO Springs Denver South Connection

October 2018

COLORADO Department of Transportation

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Department of Transportation

October 2018

Environmental Existing Conditions

Land Use Resources Technical Memorandum

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Figures

See Land Use Mapbook

Acronyms and Abbreviations

ACS	American Community Survey
CDOT	Colorado Department of Transportation
CDP	census designated place
CLT	City of Lone Tree
DoCo	Douglas County
DTC	Denver Tech Center
Front Range	eastern slope of the Rocky Mountains
GIS	geographic information systems
I-25	Interstate 25
MP	mile post
PEL	Planning and Environmental Linkages
SH	State Highway
Study Area	I-25 corridor from Denver to Colorado Springs
TCR	Town of Castle Rock

1.0 Land Use

Land uses in the Study Area have changed significantly over the past several decades. What once was an Interstate 25 (I-25) corridor dominated by undeveloped land is now a main artery of commercial and residential development, with capillary roadways feeding expansion for miles to the east and west. The limits of physical improvements of the Planning and Environmental Linkages (PEL) Study extend from approximately the State Highway (SH) 105/I-25 interchange 35 miles north to the I-25/C-470/E-470 interchange. However, the Study Area for this land use analysis includes a larger segment of I-25, extending the approximately 70 miles between Denver and Colorado Springs. The analysis for this land use memo includes broader discussion of the I-25 corridor extending north to Denver and south to Colorado Springs and focuses on the incorporated and unincorporated areas of Douglas County and El Paso County adjacent to the proposed physical improvements. In El Paso County, these adjacent jurisdictions include unincorporated El Paso County and the Town of Monument. In Douglas County, the adjacent jurisdictions include unincorporated Douglas County, Town of Larkspur, Town of Castle Rock, City of Castle Pines, and City of Lone Tree.

1.1 Methodology for Initial Assessment

The land use Study Area limits were expanded to assist in understanding potential indirect effects these major urban centers may have on the immediate area of physical improvements being considered in this PEL. Despite the rapid expansion in population and land area in the majority of the municipalities adjacent to I-25 in the area of proposed physical improvements, as described in Section 1.2, roughly half the trips extend through Segments 1, 2, and 3, with Denver and Colorado Springs the bookend destinations. Along the I-25 corridor, the land use analysis includes contextual discussion of the broader land use patterns while focusing on the current and proposed land uses adjacent to the interstate.

Approximately 32.5 of the 35 miles of I-25 within the Study Area are located in Douglas County. Douglas County has been the driving force behind land use changes and how the adjacent land to this segment of I-25 is currently used. As such, for the purposes of land use analysis as part of this PEL, the *Douglas County Comprehensive Master Plan 2035* (hereafter referred to as the DoCo Comprehensive Plan) (DoCo, 2014) should be considered the document that establishes the overarching land use framework for the Study Area. While El Paso County does not have a standalone comprehensive master plan, for the approximately southernmost 2.5 miles of the project south of the Douglas County/El Paso County line, the *Tri-Lakes Comprehensive Plan* (El Paso County, 2000) and *Town of Monument Comprehensive Plan* (2003) encompasses the respective portion of the Study Area. South of the Tri-Lakes area, the *City of Colorado Springs Master Plan* (2001) and *Briargate Master Plan* (2007) cover the remaining portion of the Study Area. The Air Force Academy, which encompasses all the lands west of I-25 through this area, was not included in this land use analysis because of its establishment as a military facility.

The municipal areas identified in Section 2.0 along the Study Area have demonstrated a high degree of commitment and foresight dedicated to land use planning. Several of these communities have standalone master plans or land use plans that are used in conjunction with the county plans to provide a comprehensive land use picture within the Study Area. The *City of Lone Tree Comprehensive Plan* (2015a), *Town of Castle Rock 2030 Comprehensive Master Plan* (2015), *Castle Pines Comprehensive Plan* (2016), and *Town of Monument Comprehensive Plan* (2003), are a small sampling of the types of plans utilized in this land use analysis. For the Town of Larkspur, which has no available comprehensive or master plan, land use information was gathered from the DoCo Comprehensive Plan (DoCo, 2014), zoning data, and aerial imagery.

Comprehensive plans were supplemented with geographic information systems (GIS) data from the county and municipal levels. The GIS data gathered include zoning, parks and open space, annexation

(both past and proposed), parcel data, and other pertinent land use information. The project entered into a GIS use agreement with El Paso County and used the El Paso County parcel data for the respective area discussions.

1.2 Resource Conditions

1.2.1 North Colorado Springs

Immediately south of Gleneagle on the east side of I-25, the jurisdiction changes from Unincorporated El Paso County to the EL Paso Incorporated area of the City of Colorado Springs. This northernmost portion of Colorado Springs is referred to as Northgate and extends from Colorado Springs northern corporate limits south to approximately Interquest Parkway. Northgate is characterized by a largely undeveloped land base with small concentrated areas of open space, medium-density residential, institutional (i.e., academic) and office/industrial development concentrated along Voyager Parkway (City of Colorado Springs, 2010). The Northgate area experienced string development in the mid-1990s and early 2000s, followed by a more recent period of slowed growth (Grossman, 2015). The Copper Ridge area, located at the northern end of Northgate and adjacent to I-25, has been identified by Colorado Springs as an Urban Renewal Area. A complete urban renewal plan was prepared by the City for the area in 2010, providing a turn-key development plan aimed at attracting new businesses to the Northgate area. In general, the Northgate area is seen as an area ripe for infill commercial development. Directly south of the Northgate area is Briargate.

The City of Colorado Springs is the second most populous urban area in Colorado behind only Denver (U.S. Census, 2015d). Of the approximately 450,000 residents—and 185,000 housing units—in Colorado Springs, the Briargate Community represents roughly 10 percent, or 45,000, of those residents. Plans to develop Briargate began in the early 1990s, and the area has expanded rapidly over the past two decades. Presently, Briargate covers 15 square miles in northeast Colorado Springs. Medium-density residential development saturates the area. Two non-residential developments play an important role in understanding the importance of Briargate to the Study Area—in particular, the Briargate Business Campus.

Located at the western edge of Briargate, the Briargate Business Campus is accessible via the I-25 interchanges with Briargate Parkway to the north and Academy Boulevard to the south. The 1,000,000-square-foot office space is home to some of the largest employers in the region. The daytime work population of campus is approximately 250,000 individuals (Promenade, 2014). Open space in the Briargate area generally follows the local drainages and an extensive interlinking trail system. The Pine Creek Golf Club extends east to west across the north central Briargate Area, extending as far east as Voyager Parkway, which buffers Briargate from I-25. The undeveloped land buffer between I-25 and the developments to the east begins in Gleneagle and extends south through Northgate and Briargate.

1.2.2 Unincorporated El Paso County

The portions of Unincorporated El Paso County included in the Land Use Study Area are composed of the census designated places (CDPs) of Woodmoor and Gleneagle. Woodmoor and Gleneagle are part of the Unincorporated El Paso County area that, combined with other CDP, make up the Tri-Lakes Comprehensive Planning Area. The *Tri-Lakes Comprehensive Plan* (2000) is the master planning document for Woodmoor and Gleneagle.

Woodmoor occupies all the land adjacent to I-25 on the east side extending from the I-25/SH 105 interchange north to the El Paso County line. The *Tri-Lakes Comprehensive Plan* (El Paso County, 2000) identifies the entirety of the Woodmoor area (Tri-Lake Sub Area Number 7) as medium-density residential. The 2,000-acre development, consisting primarily of single-family homes, is near fully built out to its 3,000-lot capacity (Woodmoor, 2016). While Woodmoor does offer park areas for its residents,

none are located adjacent to I-25; however, the Colorado Heights Camping Resort is adjacent to I-25 at approximately mile post (MP) 162.5. The Colorado Heights Camping Resort is a private recreational vehicle campground with approximately 200 spaces that offers fishing, swimming, and other recreational amenities (Colorado Heights Camping Resort, 2016). Woodmoor is accessed via I-25 from the County Line Road interchange on the north end and the SH 105 interchange to the south.

Gleneagle is also situated east of I-25 and is directly south of the southern corporate limits of Monument. Slightly smaller in area than Woodmoor, the 1,200-acre development (Tri-Lake Sub Area Number 10) is primarily composed of medium-density residential development concentrated at the eastern CDP limit. The western portion of the area contains a mixture of low-density residential and mixed-use commercial development. Commercial development in Gleneagle is limited to a handful of businesses along Baptist Road and Suthers Road (El Paso County, 2000). Like Woodmoor, Gleneagle is already near its full build-out capacity of approximately 650 lots, with the remaining undeveloped areas used as open spaces (Gleneagle, 2016).

1.2.3 Town of Monument

The most northern I-25-adjacent municipality in El Paso County and incorporated in 1879, Monument is a town of approximately 15,000 residents occupying 8,000 homes (U.S. Census, 2015d). Within the existing 4.6-square-mile jurisdictional area, single-family residential development is concentrated at the southeast, northeast, and western Town limits. Similar to the municipalities within the Study Area in Douglas County, Monument has experienced swift population growth over the past two decades. The Town has sought to strike a balance between maintaining its small town feel and expanding to seize the economic opportunity driven by the expanding Front Range population. Larkspur is accessed via I-25 from the north at the County Line Road interchange, the SH 105 interchange in the central part of Town, and the Baptist Road interchange to the south.

With the exception of the I-25/SH 105 interchange, adjacent lands to the I-25 corridor through Monument (approximately 157.5 to MP 162.2) remain largely undeveloped. The undeveloped lands adjacent to I-25 have been identified by Town leadership as ripe for commercial development (Grossman, 2016) intermingled with new open spaces along Monument Creek and its nearby tributary creeks (Town of Monument, 2016). No developed parks exist adjacent to I-25 through the Monument portion of the Study Area. Monument has a generous supply of undeveloped land. Approximately 2,000 acres, or 70 percent, of the existing jurisdictional area is undeveloped, with half of those acres zoned for residential development and half for commercial development (Town of Monument, 2016).

There are two major mixed-use commercial developments that support the Town. The Monument Marketplace—a 650,000-square-foot retail center built in the mid-2000s and Monument's largest commercial development—is located adjacent to I-25 just north of the Baptist Road interchange. A second mixed-use commercial area is located northwest of the SH 105/I-25 interchange, providing direct commercial support to the residential areas west of I-25.

1.2.4 Unincorporated Douglas County

Situated between Colorado's two most populous counties, Denver and El Paso, Douglas County has an unincorporated area population of approximately 190,000 people (DoCo, 2016a). The majority (59 percent or 69,200) of the housing units in Douglas County are located in unincorporated areas. Unlike the incorporated areas, which are adjacent to I-25, the unincorporated urban centers are situated several miles east and west of the I-25 corridor. The largest urban center, located in the Highlands Ranch area several miles west of the I-25 corridor, represents over 60 percent of all the houses in Unincorporated Douglas County. Non-urban housing—concentrated along SH 105 and SH 83—represents 15 percent, or roughly 11,000 homes, of the total homes in the unincorporated area (DoCo, 2016b).

The western third of the county is occupied by Pike National Forest. From I-25, the major access into the forest is via U.S. Highway 85 and SH 67. While the large incorporated areas in Douglas County can be defined by their rapid residential and commercial expansions, Unincorporated Douglas County is defined by its rapid expansion of protected open space. Preservation of open space is a top priority of Douglas County government, which differentiates it when compared to other Front Range counties. The stated purpose of the DoCo Comprehensive Master Plan is to "find an appropriate balance in land use that will provide opportunities for preservation of open space and wildlife habitat, while meeting the needs of daily life…" (DoCo, 2014). With a strong focus on meeting this purpose, the last two decades have witnessed a remarkable effort by the county to acquire and protect open space along the Study Area.

Approved by voters in 1994, the Douglas County Open Space Program was created with the passage of a sixth-of-a-cent sales and use tax. The county has leveraged these tax dollars through partnerships with other agencies and non-profits, such as the Great Outdoors Colorado Trust Fund, The Conservation Fund, Colorado Parks and Wildlife, and The State Historic Fund. To date, more than $120 million from the Open Space Sales and Use Tax fund have been spent in the protection of more than 47,000 acres of open space in the county (CDOT, 2016b). Although Douglas County's open space is distributed throughout the county, the great majority exists along both sides of the Study Area in the form of conservation easements. East of I-25, these easements extend from the southern corporate limits of Castle Rock to the El Paso County line, and on the west side of I-25 from Larkspur south to the El Paso County line. In essence, the I-25 adjacent lands between MP 163.3 (the El Paso County line) and MP 175.2 that occur in Unincorporated Douglas County are protected under open space conservation easements. No other segment of I-25 between Colorado Springs and Denver contains anywhere near this amount of adjacent, contiguous open space.

1.2.5 Town of Larkspur

The southernmost municipality within Douglas County in the Study Area, the Town of Larkspur is centrally located 35 miles from both Denver and Colorado Springs. The smallest municipality in the Study Area and incorporated in 1979, Larkspur is composed of roughly 200 residents occupying 150 dwellings (U.S. Census, 2015c) on the west side of I-25. The Town's jurisdictional area encompasses 1.5 square miles and consists primarily of single family residential lots and community spaces. Via I-25, Larkspur is accessed from the Sky View Lane interchange at the north end of town and through the Upper Lake Gulch Road and Greenland Road interchanges to the south.

In stark contrast to Lone Tree, Castle Pines, and Castle Rock, Larkspur does not entertain the desire for aggressive population and land development growth. The Town does not have an established master plan or similar overarching planning document but instead relies on the *Town of Larkspur Municipal Code* (2016) to establish regulations guiding development. The DoCo Comprehensive Master Plan identifies Larkspur as an incorporated Municipal Planning Area and therefore shares land use policies with the Town, including Policy 2-16A.1 to "[d]evelop a coordinated, strategic approach to address major land use issues such as annexation and adjacent development" (DoCo, 2014).

The Yogi Bear Jellystone Camp and Resort occupies the northern portion of the Town, immediately south of the Sky View Lane/I-25 interchange at approximately MP 174. South of the resort, residences and the few commercial properties in the Town are concentrated in the Plum Creek drainage. Located 0.25 mile west of I-25 but buffered by Plum Creek and the railroad, Larkspur Community Park is the primary developed open space in the Town, providing a baseball field, tennis court, playground, paved walking trail, and other recreation-oriented amenities. Easily accessible designated open spaces border the community at Spruce Mountain, Spruce Meadows, Greenland Ranch, and Dawson Butte.

Larkspur is celebrated for its annual hosting of the Colorado Renaissance Festival. During the festival, a large portion of the southernmost part of town is transformed into a 16th century village. The festival occurs on weekends during an 8-week stretch of summer from mid-June through early August. The

Town typically experiences festival visitation between 200,000 and 250,000 visitors annually (Colorado Renaissance Festival, 2015).

1.2.6 Town of Castle Rock

Incorporated in 1881 and occupying approximately 34 square miles, the Town of Castle Rock has added nearly 36,000 residents since 2000 to a 2015 population of approximately 50,000 (U.S. Census, 2015b) and continues to grow quickly within Douglas County. Unlike Lone Tree or Castle Pines and because of the topography of the area, many of the residential developments are physically separated from each other and are scattered throughout the Town's jurisdictional area. The majority of the Town's commercial land is located adjacent to the corridor in the area 0.5 mile east and west of the interstate; however, retail- and service-oriented commercial uses are now beginning to develop in the outlying residential areas to serve individual developments. From I-25, the Town can be accessed via the Castle Rock Parkway, Founders/Meadows Parkway, Wolfensberger Road, and Plum Creek interchanges.

Over 60 percent of the lands in Castle Rock are either undeveloped or identified as parks/open space. Town residents enjoy over 5,000 acres of open space and 1,400 acres of developed parks. Easterly adjacent to I-25 at approximately MP 183.4, Metzler Park is a large developed recreation area with several baseball fields, in-line hockey rinks, picnic pavilions, soccer fields, and other resources. One mile south of Metzler Park, and similarly adjacent to I-25 on the east side, at MP 182.0 the Rock Park area is an established local hiking and walking trail area. Open space areas can be found throughout the Town and on both sides of the majority of Plum Creek, which crosses I-25 at MP 181.2 slightly north of Plum Creek Parkway interchange.

Residential and commercial growth has continued at an aggressive rate. A small sampling of the residential developments currently underway across the Town includes: Crystal Valley Rach (924 residences), Covenant at Castle Rock (100 homes), Meadows (300-500), and Pine Canyon (515 homes). When fully built out, the Town's population is anticipated to nearly triple to 120,000 residents (TCR, 2015). The Promenade at Castle Rock development is the Town's largest non-residential development currently underway, and one in which is closely supported by the new I-25 interchange at Castle Rock Parkway. Located directly southwest of the Castle Rock Parkway interchange, the Promenade is a proposed 166 acres of combined retail and town center community space.

1.2.7 City of Castle Pines

Situated a mere 3 miles south of Lone Tree via I-25, the City of Castle Pines is an urban area of approximately 10,600 residents occupying 3,500 households and that exhibits a strikingly similar growth pattern to Lone Tree. Although not officially incorporated until 2008, residences began to be built in the present-day city in the 1980s. In 2009, the City annexed 3,500 acres of undeveloped land east of I-25, doubling the size of the City. Today, the total 9.5-square-mile jurisdictional area within Douglas County remains largely undeveloped, with the existing residential and commercial development located in the westernmost portion of the city. The existing land use in the City is overwhelmingly single-family residential with only small pockets of mixed-`use commercial and multi-family residential. From I-25, the City is accessed via the Castle Pines Parkway interchange at MP 188.5.

Within the City, there are 560 total acres of open space, 70 of which comprise existing developed parks. Castle Pines has four developed local parks: Elk Ridge Park, Retreat Park, Coyote Ridge Park, and Daniel's Gate Park. The closest park to I-25 is Elk Ridge Park, located 0.5 mile west of the interstate. Although outside the jurisdictional City area, Daniel's Park—a 1,000-acre historic ranch—is accessible from the western corporate limits.

Commercial and residential development remain ongoing within the City. Adjacent to I-25 on the west, the Lagae Ranch and Castle Pines Town Center developments are currently underway, adding over 1,200 new dwelling units and 900,000 square feet of mixed-use commercial space. Adjacent to the

interstate to the east, The Canyons development will add another 2,500 dwelling units and 2 million square feet of commercial space. When fully built out, the Lagae Ranch, Town Center, and Canyons developments will double the number of dwelling units and triple the developed City area (City of Castle Pines, 2016).

1.2.8 City of Lone Tree

Originally incorporated in 1995, the City of Lone Tree (CLT) has undergone more than fifteen separate annexations during the past two decades, representing a greater than a five-fold increase in land area (CLT, 2015b). Today, the city encompasses approximately 10 square miles within Douglas County, consisting of single and multi-family residential, mixed commercial, parks/open space, and undeveloped areas. The existing suburban and multi-family developed areas are located in the northern and western portions of the city, with mixed use commercial development centrally located near the I-25 interchanges at Lincoln Avenue and RidgeGate Parkway. The 2011-2015 American Community Survey (ACS) estimates identify the City's population at approximately 12,500 people occupying 5,100 housing units (U.S. Census, 2015a). From I-25, the City is accessed via the RidgeGate Parkway and Lincoln Avenue Parkway interchanges at MP 192 and MP 193, respectively.

Providing parks and open spaces for the City's growing population is reflected in the goals, policies, and objectives of the City's Comprehensive Plan (CLT, 2015a). At the City's southern edge, approximately 700 acres of protected open space has been acquired through annexation and rezoning. All of the developed neighborhoods contain local parks, and Bluffs Regional Park serves as the main trial hub for the western part of the City. Although not constructed yet, a high-density, mixed-use city center is planned just southeast of the Lincoln Avenue/I-25 Interchange. The RidgeGate and Southridge Preserve developments also include additional parks and open space (CLT, 2015a). Although no developed parks exist adjacent to I-25, the Bluffs Regional Park open space straddles I-25 from approximately MP 190.9 to MP 191.8.

Several significant commercial and residential developments support the City's ongoing growth. In 2006, the same year the Lone Tree Chamber of Commerce was established, the City annexed the Park Meadows Metropolitan District, which included Park Meadows Mall. In 2000, the City approved a master plan for the RidgeGate community, a 3,500-acre residential development on both sides of I-25. RidgeGate will take several decades to develop and will ultimately have 12,000 new homes, a variety of commercial and office development, and 30,000 residents—roughly tripling the number of existing residents. Construction is well underway on the west side of I-25, with the Sky Ridge Medical Center, Lone Tree Recreation Center, Lone Tree Arts Center, Charles Schwab campus—now the largest employer in Douglas County—and a variety of commercial and residential developments completed, and full build out expected within the next couple of years. The Regional Transportation District began construction of the southeast light rail extension from Lincoln Avenue to RidgeGate Parkway in early 2016. The RidgeGate station will be a hub for additional mixed-use development on the east side of I-25, which will continue to build out for decades to come.

1.2.9 South Denver Metro Area

Jurisdictions included in this portion of the Study Area include the City and County of Denver, City of Greenwood Village, City of Centennial, and the Inverness CDP. In contrast to the individual municipalities discussed separately in Section 2.2, these municipalities have been grouped together as a reflection of their being, essentially, one continuous block of urban development on both sides of I-25, extending from the County Line Road/I-25 interchange all the way through Downtown Denver. This area is north of the limit of physical improvements being considered as part of the PEL; however, understanding this area's large-scale demographic trends is important to understanding how travelers use the I-25 corridor between the Towns of Monument and Castle Rock.

The population of the four jurisdictions included in this group is approximately 760,000, the vast majority (85 percent or 650,000) of which reside within the City and County of Denver (U.S. Census, 2015e). Proceeding north on I-25 from the County Line Road interchange, the Denver Tech Center (DTC) is a 400-acre, master-planned, mixed-use development. The 14,000,000 square feet of office space houses over 1,000 companies and 35,000 employees (DTC, 2017). The DTC is the largest office center in southwest Denver but is reflective of the land use mix that accompanies the commercial developments along the I-25 corridor leading to Denver. North of the DTC, land use in the I-25 corridor switches from mixed use commercial to high-density residential. This residential use pattern continues until the Broadway Street/I-25 intersection, where I-25 enters into a heavy industrial corridor bisected by the Union Pacific Consolidated Main Line and the South Platte River. Industrial land use continues to dominate the corridor for another 3 to 5 miles as I-25 approaches the downtown area.

More commuters travel into Denver from outside the county for work than any other city in the nation. Some 270,000 individuals commute into the city for work during the weekdays, the majority of which are coming from south of the city (U.S. Census, 2013). Additionally, trips into Denver from the south are expected to double by 2035. Approximately 85 percent of I-25 through Denver is projected to be congested and operate over capacity during peak travel periods. Southbound travel times from Denver into the DTC and beyond are expected to double (CDOT, 2014).

1.3 Scoping Input

Leadership from the county and municipal areas relevant to the analysis have been involved in the PEL process through numerous committees and technical groups established at the project's outset. Additionally, the land management agencies for areas adjacent to this stretch of I-25—such as Colorado Parks and Wildlife, the United States Fish and Wildlife Service, and The Conservation Fund—continue to be involved in the project through team meetings and technical reviews.

The future land use considerations along this segment of I-25 are a concern to the communities. Substantial monetary, personnel, and political resources have been expended to create long-term visions of development that are responsible, well planned, and consistent with community values. Voices from both the leaders and the general public within these Front Range communities will continue to be heard by the project and will be factored into the decision-making process as the project moves into the next stages of analysis.

As future projects are programmed from the PEL, each resource, including land use and associated resources, will be evaluated during the National Environmental Policy Act of 1969 phase of project development. The National Environmental Policy Act evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

2.0 References

Colorado Department of Local Affairs. 2017. 2040 Colorado Population Estimates by County. https://data.colorado.gov/Demographics/Total-Population-by-County-by-Year/9dd2-kw29. Accessed June 21, 2017.

Briargate. 2007. *Briargate Master Plan*. http://briargate.com/_literature_24640/Briargate_Master_Plan. Accessed January 18, 2017.

City of Castle Pines. 2016. *City of Castle Pines Comprehensive Plan*. http://www.castlepinesgov.com/comp-plan. Accessed December 29, 2016.

City of Colorado Springs. 2001. *City of Colorado Springs Master Plan.* https://coloradosprings.gov/communications/page/2001-comprehensive-plan. Accessed January 18, 2017

City of Colorado Springs. 2010. *Existing Land Use.* https://coloradosprings.gov/planning/page/planning-maps. Accessed January 18, 2017.

City of Lone Tree (CLT). 2015a. *City of Lone Tree Comprehensive Plan*. http://www.cityoflonetree.com/UserFiles/Servers/Server_745898/File/Government/Departments%20and%20Divisions/Planning/Comprehensive%20Plan/Lone%20Tree%20Comp%20Plan%202015.pdf. Accessed December 28, 2017.

City of Lone Tree. 2015b. City of Lone Tree Annexation History Map. http://www.cityoflonetree.com/UserFiles/Servers/Server_745898/File/Government/Departments%20and%20Divisions/Mapping%20and%20GIS/Map%20Gallery/CityAnnexations2017.pdf. Accessed December 29, 2016.

Colorado Heights Camping Resort. 2016. Resort Map. http://coloradoheights.com/resort-map/. Accessed January 12, 2017.

Colorado Renaissance Festival. 2015. "Festival Fact Sheet." http://coloradorenaissance.com/cr/wp-content/uploads/2013/03/2015-Colorado-Renaissance-Festival-Facts.pdf.

Denver Tech Center (DTC). 2017. "The DTC Story." http://www.dtcmeridian.com/about/places/the-dtc-story. Accessed January 19, 2017.

Douglas County (DoCo). 2014. *Douglas County 2035 Comprehensive Master Plan*. http://www.douglas.co.us/documents/full-cmp.pdf. Accessed December 28, 2016.

Douglas County (DoCo). 2016a. "Douglas County Growth and Development Profile." http://www.douglas.co.us/documents/douglas-county-growth-and-development-profile.pdf. Accessed January 5, 2017.

Douglas County (DoCo). 2016b. "Douglas County Housing Profile." http://www.douglas.co.us/documents/douglas-county-housing-profile.pdf. Accessed January 5, 2017.

El Paso County. 2000. *Tri-Lakes Comprehensive Plan*. http://dev.adm2.elpasoco.com/Planning/tri-lakes/Tri-Overview.asp. Accessed December 28, 2016.

Gleneagle. 2016. "Our History." http://www.gleneaglehoa.org/About-GCA/Our-History. Accessed January 18, 2017.

Grossman, Bryan. 2015. "Northeastern development hitting stride." Colorado Springs Business Journal. November 17. http://www.csbj.com/2015/11/17/northeastern-development-hitting-stride/. Accessed January 18, 2017.

Grossman, Bryan. 2016. "Boomtown or bedroom community? Monument walks fine line." Colorado Springs Business Journal. October 7. http://www.csbj.com/2016/10/07/boomtown-or-bedroom-community-monument-walks-fine-line/. Accessed January 10, 2017.

Promenade. 2014. Briargate Business Campus Demographics. http://www.poagllc.com/wp-content/uploads/2015/04/Briargate-Leasing-Overview.pdf. Accessed January 18, 2017.

Town of Castle Rock (TCR). 2015. *Draft 2030 Comprehensive Master Plan*. http://crgov.com/DocumentCenter/View/12758. Accessed December 29, 2016.

Town of Larkspur. 2016. Town of Larkspur Municipal Code. http://townoflarkspur.org/municipal-code/. Accessed January 4, 2017.

Town of Monument. 2003. *Town of Monument Comprehensive Plan*. Plan Update. http://www.townofmonument.org/departments/comprehensive-plan/. Accessed December 29, 2016.

Town of Monument. 2016. Community Open House: Master Plan Update. PowerPoint Presentation. Accessed January 9, 2017.

U.S. Census Bureau. 2010. Population, Housing Units, Area, and Density: 2010 - State -- Place and (in selected states) County Subdivision. American Fact Finder. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed November 2, 2016.

U.S. Census Bureau. 2013. Census Bureau Reports 269,000 Workers Commute into Denver County, Colo., Each Day. http://www.census.gov/newsroom/press-releases/2013/cb13-r05.html. Accessed January 20, 2017.

U.S. Census Bureau. 2015a. ACS Demographic and Housing Estimates: Lone Tree, Colorado. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed December 29, 2016.

U.S. Census Bureau. 2015b. ACS Demographic and Housing Estimates: Town of Castle Rock, Colorado. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. January 3, 2017.

U.S. Census Bureau. 2015c. ACS Demographic and Housing Estimates: Town of Larkspur, Colorado. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed January 4, 2017.

U.S. Census Bureau. 2015d. ACS Demographic and Housing Estimates: City of Colorado Springs, Colorado. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed January 18, 2017.

U.S. Census Bureau. 2015e. ACS Demographic and Housing Estimates: City and County of Denver, Colorado. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed January 19, 2017.

Woodmoor. 2016. “About Woodmoor.” https://www.woodmoor.org/. Accessed January

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Noise Resources Technical Memorandum

I-25 PEL: CO Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CH2M Project No.:
680954

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Acronyms and Abbreviations

CDOT	Colorado Department of Transportation
CFR	Code of Federal Regulations
dBA	A-weighted decibel
Leq	The equivalent steady-state sound level that in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period.
Leq(h)	hourly value of Leq
MP	mile post
NAC	noise abatement criteria
Study Area	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument

1.0 Noise

1.1 Methodology for Initial Assessment

Noise is defined as any unwanted sound. As mobility increases, transportation can be a key source of noise across transportation modes. The Federal Highway Administration procedures for noise abatement are outlined in Title 23 Code of Federal Regulations (CFR) Part 772, *Procedures for Abatement of Highway Traffic Noise and Construction Noise.* A receptor is defined as a discrete or representative location of a noise sensitive area(s), for any of the land uses listed in Table 1 (23 CFR 772). The land uses in Table 1 are listed in order of noise sensitivity, with category A being most sensitive to noise impacts and category G being least sensitive to noise impacts. The Colorado Department of Transportation (CDOT) has established a noise level at which a noise abatement must be considered. Known as Noise Abatement Criteria (NAC), these criteria vary according to a property's land use category and are described in Table 1.

CDOT has determined that a traffic noise impact occurs when the projected traffic noise levels meet or exceed the NAC levels, or when projected noise levels substantially exceed existing noise conditions. CDOT defines "substantially exceeding existing noise levels" as an increase of a 10 A-weighted decibel (dBA), or more, over existing conditions (CDOT, 2015b).

Table 1. CDOT Noise Abatement Criteria

Activity Category	Activity Leq(h)[1]	Evaluation Location	Activity Description
A	56	Exterior	Lands on which serenity and quiet are extraordinary significant 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[2]	66	Exterior	Residential
C[2]	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[2]	71	Exterior	Hotels, motels, time-share resorts, vacation rental properties, offices, restaurants/bars, and other developed lands, properties or activities not included in A through D or F.
F	NA	NA	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	NA	NA	Undeveloped lands that are not permitted for development.

Source: CDOT, 2015b

1 Hourly A-weighted sound level in dBA, reflecting a 1-dBA approach value below 23 CFR 772 values

2 Includes undeveloped lands that are building permitted or have government fiscally approved plans or designs for this activity category.

Leq = The equivalent steady-state sound level that in a stated period of time contains the same acoustic energy as the time-varying sound level during the same time period.

Leq(h) = hourly value of Leq

The traffic noise impact assessment will be conducted in accordance with CDOT's *Noise Analysis and Abatement Guidelines* (CDOT noise guidelines) (CDOT, 2015b). CDOT noise guidelines are approved by the Federal Highway Administration for use on federal-aid and federal nexus projects in Colorado. Per CDOT noise guidelines, noise sensitive receptors were identified within the Noise Study Area. The Noise Study Area is defined as the area contained within a 500-foot distance in all directions from the proposed edge of traveled lane(s) throughout the extents of the project. Several selected receptors have also been identified beyond the 500-foot distance to assure that noise levels have been adequately addressed outside the study corridor.

For the I-25 study corridor noise evaluation, online resources were used along with desktop utilities including Google Earth, to identify existing noise mitigation measures, and noise sensitive receivers along the study corridor. Both 66 dBA and 71 dBA existing condition noise contours were developed for the PEL corridor by using a straight-line noise model with standard 12-foot lanes and shoulders. To reflect the existing I-25 cross sections through each corridor Segment, four-lane (Segment 1), six-lane (Segment 2), and eight-lane (Segment 3) section contours were developed. Existing posted speeds were matched to the appropriate Segment (75 mph for Segments 1 and 3; 65 mph for Segment 2). Noise contours are identified in the mapbook included at the end of Appendix H.

1.2 Resource Conditions

1.2.1 Existing Noise Mitigation Measures

In the Study Area, there are two existing noise mitigation features. The first noise mitigation feature is located on the west side of I-25 just north of the Castle Pines Parkway/I-25 interchange. This noise mitigation feature is a combination of a concrete wall and earthen berm. The concrete wall portion of the feature extends from the southbound Castle Pines Parkway off-ramp north for approximately 1,300 feet, and then transitions to an earthen berm, extending an additional 850 feet north.

The second noise mitigation feature in the study area is located in Castle Rock on the east side of I-25, extending approximately 1,000 feet north from the Founders Parkway/Meadows Parkway/I-25 on-ramp. This feature is a concrete wall. Both the Castle Pines and Castle Rock noise mitigation features separate I-25 from adjacent residential areas. The noise map book at the end of Appendix H identifies the location of the two existing noise mitigation features in the Study Area.

1.2.2 Existing Noise Sensitive Locations

Existing land uses within the Noise Study Area were observed and potential noise sensitive receivers were documented. The locations with noise sensitive activity categories B, C, and select category E locations are shown in Figures 1 through 14 (figures are located in the noise mapbook at the end of Appendix H). The following summarizes each activity category within the project limits.

- No category A land uses were observed within the project limits.
- The category B land uses are highlighted in Figures 1 through 14, including locations that are permitted for future development. Because of the high level of this study, the location of category B receptors was identified, but not every receptor located within the neighborhood subdivision was identified.
- Numerous category C land uses exist within the Noise Study Area, which are highlighted as one large shaded area of potential receivers. The following are examples of category C sites in the project limits that may be impacted by roadway traffic noise:
  - Town parks and playgrounds
  - Schools

  - Churches
  - Trails
  - Golf courses

- Category D land uses, including day care centers, libraries, medical facilities, places of worship, schools and public institutional structures have been identified in the Noise Study Area. These land uses are typically within the town limits. This activity category only applies when all exterior analytical methods have been exhausted, and then only applies to these NAC Activity category C uses. These land uses are shown in Figures 1 through 14.
- Category E land uses, including restaurants, offices, hotels and other commercial uses, have been identified within the Noise Study Area. These land uses are typically within town limits. This activity category requires meeting a threshold of 71 dBA in order to consider mitigation. Property owners of category E land uses typically prefer business accessibility and visibility over lowered noise levels. So with the exception of hotels, category E land uses are not shown in Figures 1 through 14.
- Category F includes industrial and agricultural uses. There are numerous category F sites within the Noise Study Area. These locations are considered to generate significant onsite noise; therefore, they are not considered noise sensitive receivers.
- Category G land uses are undeveloped lands that are not permitted for development. These land use categories are shown in Figures 1 through 14.

1.3 Scoping Input

Public and agency noise scoping input will be obtained throughout the planning process for I-25, between C-470 and Monument. Scoping input for this planning process to date is presented in Table 2. During the scoping process, it was suggested that noise contours be generated for the north and south ends of the corridor. No other comments pertaining specifically to noise were provided during these meetings.

Table 2. Scoping Input

Date	Scoping Input
November 17, 2016	CDOT Maintenance Meeting
December 6, 2016	Resource Agency Meeting
December 29, 2016	Colorado Parks and Wildlife Meeting
January 12, 2017	I-25 South PEL comments from the Colorado Department of Public Health and Environment

2.0 References

Colorado Department of Transportation (CDOT). 2015b *Noise Analysis and Abatement Guidelines*. Available at: https://www.codot.gov/programs/environmental/noise/guidelines-policies/copy_of_cdot-noise-guidance/view

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Recreational Resources Technical Memorandum

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Tables

Figures

See Recreation Mapbook

Acronyms and Abbreviations

CDOT	Colorado Department of Transportation
CFRT	Colorado Front Range Trail
CPW	Colorado Parks & Wildlife
CRA	common resource area
FHWA	Federal Highway Administration
Fig.	Figure
Front Range	eastern slope of the Rocky Mountains
GIS	Geographic Information System
I-25	Interstate 25
LWCF	Land and Water Conservation Fund
MP	mile post
NRCS	National Resources Conservation Service
SR	State Route
Study Area	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument

1.0 Recreational Resources

There are a wide variety of recreational resources within the Study Area for many different types of users. The recreational resources within and adjacent to the Study Area have been identified and are shown in Table 1. Trails, in particular, may also have transportation functions in addition to their recreation use. Parks and recreational resources are important community facilities that warrant consideration during federally funded projects. These resources include publicly owned parks, recreational trails, wildlife/waterfowl refuges, and recreational areas.

Table 1. Recreational Resources

Resource Name	Resource Type	Description	Project Segment	Mapbook Reference
New Santa Fe Trail/Santa Fe Regional Trail	Trail/ Section 6(f)	Public access unpaved trail on the west side of I-25 approaching SR 105 approximately at MP 161.	Segment 1	Fig. 1-3
Greenland Luge Trail	Trail/ Section 6(f)	Public access unpaved adjunct trail of Greenland Kipps Loop approaching the Study Area approximately at MP 164 on west side of I-25.	Segment 1	Fig. 6-7
Greenland Open Space Trail	Trail	Located at MP 167. Public access unpaved trail on the west side of I-25 approaching the interstate just south of Greenland Road.	Segment 1	Fig. 6-9
Greenland Trail/ Kipps Loop	Trail/ Section 6(f)	Public access unpaved trail and branch of Greenland Open Space Trail approaching the study area approximately MP 167 on west side of I-25.	Segment 1	Fig. 6-8
Spruce Meadow Trail	Trail	Public access unpaved trail located in Spruce Meadows Open space (Pike National Forest) west of I-25 at MP 167.	Segment 1	Fig. 8-10
Spruce Meadows	Douglas County Conservation Easement/Open Space/Trail	Public Access Available. Open space and trail. Located on the west side of I-25 at MP 167.	Segment 1	Fig 8-10
Devon's Dog Park	Park	Public access 17-acre dog park located in Greenland Open Space the on the west side of I-25 at MP 167.5.	Segment 1	Fig. 8-9
Larkspur Community Park	Park	Located on the west side of I-25 at MP 171. Local Larkspur park.	Segment 1	Fig. 13
Columbine Open Space Trail	Trail	Public access unpaved trail located in Columbine Open Space beginning at just north MP 174 on the east side of I-25.	Segment 1	Fig. 17
East Plum Creek Trail	Trail	Public access paved multi-use trail located in Castle Rock beginning approximately MP 181 and crossing I-25 just South of MP 182.	Segment 2	Fig. 23-27
Sellars Gulch Trail	Trail	Located at MP 181. Public access paved branch Trail of East Plum Creek Trail. The trail connects to the East Plum Creek Trail and Crosses of I-25 simultaneously at MP 181.	Segment 2	Fig. 23-24
Centennial Park	Park/ Section 6(f)	Located on the East side of I-25 at MP 181. Public access local Castle Rock park.	Segment 2	Not visible
Douglas County Fairground	Open	Located on the east side of 1-25 at MP 181. Public access facility accommodating diverse activities including civic, recreational, entertainment, business, and youth activities.	Segment 2	Fig. 23

Resource Name	Resource Type	Description	Project Segment	Mapbook Reference
Rock Park	Open Space/ Trail/ Section 6(f)	Open space located on the east side of I-25 at MP 182.3. Public Access available.	Segment 2	Fig. 24
John Emerson Summit Trail	Trail	Located on the east side of I-25 at MP 182.3. Public access trail located in Rock Park.	Segment 2	Fig. 24
Paul Hill Trail	Trail	Located on the east side of I-25 at MP 182.3. Public access trail located in Rock Park.	Segment 2	Fig. 24
Hangman's Gulch Trail	Trail/ Section 6(f)	Intersects I-25 at approximately MP 183. Public access paved trail.	Segment 2	Fig. 25
Front Range Street Trail	Trail	Located approximately at MP 180-MP 183 on the east side of I-25. Public access paved trail between I-25 and Front Street.	Segment 2	Fig. 24-25
Glendale Farm Trail	Trail	Located approximately at MP 180-MP 183 on the east side of I-25. Public access unpaved trail loop.	Segment 3	Fig. 32
Glendale Farm	Open Space	Located on the east side of 1-25 at MP 190. Public access available. Open space and trail. Off leash Dog Park.	Segment 3	Fig. 33
East West Regional Trail	Trail	Public access unpaved trail ending at the west side intersection of Ridge Gate Parkway and I-25 approximately MP 192.	Segment 3	Fig. 35-36
Centennial/ Colorado State Highway-470 Trail	Trail	Public access paved multi-use trail located in Lone Tree approximately at MP 194.	Segment 3	Fig. 38
CFRT	Trail	See full description in next subsection.	Segment 1-3	Fig. 8-22
Local Castle Rock Trail (East Plum Creek Connection)	Trail	Trail on west side of I-25 approximately at MP 181 extending south from Plum Creek Parkway to extend just past Crystal Valley Parkway and crossover I-25 at MP 179 or Crystal Valley Parkway.	Segment 2	Fig. 20-22
East Plum Creek Trail Adjunct	Trail	Loop Extension of the East Plum Creek Trail to Wolfensberger Road approximately at MP 181 where East Plum Creek Trail crosses I-25.	Segment 2	Fig. 23
East West Regional Trail Connection	Trail	Extension of the East/Regional Trail. The trail will connect on the Westside of I-25 approximately at MP 192 or just south of Ridge Gate Parkway. The crosses I-25 at north MP 191. It continues east to Stonegate. An adjunct of the trail travels south to connect with the Glendale Farm Trail and end at Hess Road.	Segment 3	Fig. 30-34

Sources: All Trails, 2016; CDOT, 2014b; Douglas County, 2016a

1 Deeds provided by Douglas County for protected parcels within the Study Area.

Fig. = Figure
MP = mile post
SR = State Route

Since the mid-1960s, federal transportation policy has reflected an effort to preserve publicly owned public parks and recreation areas, waterfowl and wildlife refuges, and historic sites considered to have national, state, or local significance. The Department of Transportation Act of 1966 included a special provision to carry out this effort called Section 4(f). Another provision, Section 6(f), provides protection to parcels that are encumbered with Land and Water Conservation Fund (LWCF) money per the LWCF Act of 1965.

Section 4(f)

The Section 4(f) legislation provides protection to publicly owned parks, recreation areas, wildlife and waterfowl refuges, and public or private historic sites from conversion to a transportation use. The Secretary of the United States Department of Transportation may not approve of a project that requires the use of any publicly owned land from a public park, recreation, wildlife or waterfowl refuge, or historic site of national, state, or local significance unless there is no feasible and prudent alternative for using the land from the property, and the action includes all possible planning to minimize harm to the property resulting from such use (23 Code of Federal Regulations 774.3). Potential impacts to historic Section 4(f) resources can be found in the project Historic Resources Report.

Section 6(f)

Section 6(f)(3) of the LWCF Act ensures that investments in the LWCF are maintained for public outdoor recreation use. These properties include parks and recreation facilities that have been developed with the assistance of LWCF grants.

1.1 Methodology for Initial Assessment

The Recreational Resource Study Area was determined by reviewing recreational resources within 0.25 mile from Colorado Department of Transportation (CDOT) right-of-way on aerial photographs. If needed, the Recreational Resource Study Area was extended to determine entrance and access points for recreational resources. Study area maps were created with Geographic Information System (GIS) software.

Initial assessment research included a desktop survey of the corridor, which combined information contained in the various comprehensive, land use, open space, park, trail, bicycle and pedestrian, and other plans with GIS and parcel information provided by municipalities and counties. Recreational resources within or adjacent to the Study Area and under public ownership and accessibility were assessed. Property deeds for conservation easements, open space properties, and fee simples/titles provided by Douglas County Open Space, were also reviewed.

Privately owned recreation resources were also identified to ensure that no properties were missed even though they are not afforded the same level of protection under Section 4(f). See Table 2, which lists the privately owned recreational opportunities within the Study Area.

Table 2. Privately Owned Recreational Resources

Resource	Resource Type	Description	Project Segment	Map Book Reference	Status
Colorado Heights Camping Resort	Park	Located on the east side of I-25 at MP 163. Access by agreement. 28-acre camping resort and recreational vehicle park.	Segment 1	Fig. 4	Private
Yogi Bear's Jellystone Park Campground	Park	Located on the on the west side of I-25 at MP 174. 100-acre private campground and recreational vehicle park.	Segment 1	Fig. 15	Private
Plum Creek Golf Course	Park	Located on the east side of I-25 at MP 180 semi-private golf course.	Segment 2	Fig. 21-22	Semi Private
Meridian Golf Course	Park	Located on the east side of I-25 at MP 194.5.	Segment 3	Fig. 37	Private

1.2 Resource Conditions

The Recreational Resource Study Area is located within the common resource area (CRA) known as the Southern Rocky Mountain Foothills with the southern Project limits in the Southern Rocky Mountains –

High Mountains and Valleys CRA. The Southern Rocky Mountain Foothills CRA is the transition zone between the Great Plains and the Southern Rocky Mountains (NRCS, 2007; 2009; 2010).

The Study Area is located primarily within a rural environment with urban centers located at the ends of the project. Segment 1 is primarily rural consisting of larger homesteads, farms, and open space areas. Segments 2 and 3 are much more developed and urbanized. Within the rural section, approximately 68 percent of the land use is agricultural, according to the Douglas and El Paso counties land use data information. Land classifications in the rural and urban areas are a combination of transportation, planned development, commercial and industrial, residential, parks, open space, or recreation.

Recreational resources within the Study Area were divided into three categories:

- Easements/fee title/open space
- Trails
- Parks

The list of resources is shown in Table 3, and their locations are shown in the mapbook located at the end of this Appendix H.

1.2.1 Conservation Areas

Some properties inventoried for this technical memo fall under the category of Conservation Areas. These parcels are subject to one or more conservation tools put in place to ensure that the land is protected from future development, preserving unspoiled character, views, and in some cases, public use. Most of the conservation areas along the project corridor are found in Segment 1, or the Gap. For future National Environmental Policy Act study, determination of whether these properties are subject to Section 4(f) made on a case-by-case basis in working with the Federal Highway Administration and CDOT.

Table 3. Conservation Areas

Resource Name	Conservation Tool	Description	Project Segment	Mapbook Reference
Greenland Ranch	Douglas County Conservation Easement/Fee title	Located on the east side of I-25 at MP 171. No public access is permitted at this site. In the future, the private cattle property may be used for passive non-motorized recreational uses such as horseback riding, hiking, cross-country skiing, fishing and hunting in accordance with applicable laws and regulations. Golf courses, aircraft landing facilities, and other intensive or commercial recreational uses of the property are prohibited. Motorized vehicles may be used in the open area of the property only for agricultural or property management purposes. This property is associated with the Greenland Core deed.[1]	Segment 1	Fig. 5-13
Christensen Ranch	Colorado Cattleman's Agricultural Land Trust Conservation Easement	Located on the west side of I-25 at MP 167. No public access is permitted at this site. Agricultural open space and cattle ranch.	Segment 1	Fig. 7-10
Greenland Open Space	Douglas County Fee Title	Located on the west side of I-25 at MP 169. Public access available. Open space and trail present. This open space is associated with the Greenland West Deed.[1]	Segment 1	Fig. 8-12
Greenland Townsite	Douglas County Fee Title	Located on the west side I-25 at MP 167.2. Public access by agreement. Historic site at the Greenland trailhead. This property is associated with the Greenland Townsite Deed.[1]	Segment 1	Fig. 9

Resource Name	Conservation Tool	Description	Project Segment	Mapbook Reference
Douglas Heights	Douglas County Fee Title	Located on the west side of I-25 at MP 167. Public access available. Contains portion of Spruce Meadows Trail.	Segment 1	Fig. 9
JA Ranch	Douglas County Conservation Easement	Located on the east Side of I-25 MP 174. No public access; private cattle ranch. In the future, the property may be used for passive recreational uses such as hiking, cross-country skiing, fishing and hunting in accordance with applicable laws and regulations, non-commercial snowmobile operation and horseback riding. This property is associated with JA Ranch Deed.[1]	Segment 1	Fig. 12-14
Snortland	Douglas County Fee Title	Located on the east side of I-25 at MP 173. No public access, pending construction of a trail connection (CFRT). The property is adjacent to Columbine Open Space, Ramsour Open Space, and Douglas Valley Estates and may provide an important trail connection in the future from these open space properties. This property is associated with the Snortland Deed.[1]	Segment 1	Fig. 14-15
Martinez	Douglas County Fee Title	Located on the east side of I-25 at MP 173.7. No public access, pending construction of a trail connection (CFRT).	Segment 1	Fig. 14-15
Iron Horse	Douglas County Fee Title	Located on the east side of I-25 at MP 174. Planned future public access: CFRT.	Segment 1	Fig. 15-16
Ramsour	Douglas County Fee Title	Located on the east side of I-25 at MP 174.5. Public access available. Property has pending CFRT connection. Property shall be used only for conservation, wildlife habitat and recreational uses, or other uses permitted in the deed. This property is associated with the Ramsour deed.[1]	Segment 1	Fig. 16
Bear Dance Golf Course	Douglas County Conservation Easement	Located on the west side of I-25 at MP 174.5. A public golf course (by agreement) on an existing Douglas County Conservation Easement.	Segment 1	Fig. 15-16
Columbine Open Space	Fee Title and Conservation Easement	Located on the east side of I-25 at MP 175. Public access available. Columbine Open Space is the combination of two separate properties (the 590-acre Maytag[1] property and the 171-acre Ramsour/Kuester property). Protection of the property is the result of the efforts of two private conservation buyers, Great Outdoors Colorado, the Colorado Division of Wildlife, Douglas County Land Conservancy, Douglas County, and The Conservation Fund. No dogs are allowed due to wildlife concerns.	Segment 1	Fig. 16-17
Douglas County Conservation Easement	Conservation Easement	Located at MP 175 east adjacent to Columbine Open Space.	Segment 1	Fig. 17
Lowell Ranch	N/A	Open Space Agricultural Center. Located on the east side of I-25 at MP 178.	Segment 1	Fig. 20-21
Bell Mountain	N/A	Located on the east side of I-25 at MP 177. Public access by agreement. Equestrian center and open space.	Segment 1	Fig. 19

Sources: All Trails, 2016; CDOT, 2014b; Douglas County, 2016a

1 Deeds provided by Douglas County for protected parcels within the Study Area

CFRT = Colorado Front Range Trail

1.2.2 Colorado Front Range Trail

The Colorado Front Ranch Trail (CFRT) Project was initiated in 2003 to create an 867-mile multi-purpose trail from Wyoming to New Mexico, along the Front Range (CPW, 2006). Proposed, planned, and existing sections exist in the project corridor. Segments one, two, and three currently have existing sections of the trail including the New Santa Fe Regional Trail, Greenland Open Space trail, Columbine Open Space Trail, East Plum Creek Trail, and Hangman's Gulch Trail.

Within the Recreational Resource Study Area, the trail begins in Segment 1 at MP 160 on the existing New Santa Fe Trail/Santa Fe Regional Trail. The CFRT then connects to Greenland Open Space Trail at Palmer Lake. Following Carpenter Creek, the proposed trail will connect to the existing Greenland (Greenland Kipps Loop) and Old Territorial Road trails at MP 167, just south of Greenland Road. The trail is then proposed to continue north to follow the East Plum Creek through Larkspur, crossing to the east side I-25 at MP 172.5 or just North of Upper Gulch Lake Rd. The trail is then proposed to travel north on the east side of I-25 following the East Plum Creek to connect to the Columbine Open Space trail. The trail is planned to connect at the south end of East Plum Creek trail just south of MP 181, or Plum Creek Parkway in in Segment 2. The CFRT continues northwest with the East Plum Creek trail and also connects to the Hangman's Gulch trail to split and continue north/northeast in Segment 3. (Douglas County, 2017; CPW, 2006).

1.2.3 Privately Owned Recreational Resources

In addition to the resources listed above, there are several recreational resources within the Study Area that are located on private property but do not have an easement or fee title associated with the property. Private properties are not afforded the same protection under Section 4(f), but are listed to account for recreational resources along the corridor.

1.3 Scoping Input

During the initial environmental scoping, parks, open spaces, trails, and other recreation resources were identified as high importance and priority to the I-25 south corridor. Communication and outreach with The Conservancy Fund, Douglas County Land Conservancy, Douglas County Open Space, and El Paso County Trails and Open Space occurred during early stakeholder interviews and at the Resource Agency meeting. The entities provided consultation and data to identify recreation resources in the corridor. Early in the Planning and Environmental Linkages process, Cheryl Mathews from Douglas County Open Space was interviewed about improvements along I-25. She commented that success for this project would be to address the transportation issues in the corridor from Colorado Springs to Denver and retain the open space as it is. Additionally, she stated it would be ideal to have I-25 expanded without the acquisition of additional right-of-way on either side of the interstate—acquiring open space particularly on the west side of the interstate would impact the alignment and experience of the proposed CFRT connection (Douglas County, 2016b).

During the Resource Agency meeting in December 2016, The Conservation Fund's main concern was protecting the scenic integrity of the corridor, similar to what has been achieved in Glenwood Canyon. The Project should not introduce any eye sores to the corridor. When driving this segment at night, the absence of lighting should be seen as a positive, as it adds to the beauty of the drive; the dark plays a role in the driver experience. Over $120 million has been invested in open space in this corridor. It is important to honor those investments.

Colorado Parks and Wildlife suggested using trail and wildlife crossings together to maximize opportunities. While the trails are used by people during the day, wildlife can use the trails at night, provided the trails are not lighted.

As future projects are programmed from the Planning and Environmental Linkages program, each resource, including recreational and associated resources, will be evaluated during the National

Environmental Policy Act of 1969 phase of project development. The National Environmental Policy Act evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

2.0 References

All Trails. 2016. *Douglas County Trails.* http://www.alltrails.com/. Accessed February 1, 2017.

—. 2014b. *Map View.* Online Transportation Information System (OTIS). http://dtdapps.coloradodot.info/otis/Flex/MapView. Accessed February 17, 2017.

Colorado Parks & Wildlife (CPW). 2006. *Colorado Front Range Trail.* http://cpw.state.co.us/aboutus/Pages/TrailsCFRT.aspx. Accessed February 1, 2017.

Douglas County. 2016a. *Open Space.* http://www.douglas.co.us/government/departments/open-space/. Accessed February 1, 2017.

—. 2016b. Matthews, Cheryl. Interview. https://youtu.be/ZSpp-mpGMJg?list=PLYszme4xVADBaI5qBydtlBfHHL-vda1Xu. Accessed February 17, 2017.

—. 2017. *Real Property.* https://apps.douglas.co.us/dcmaps/map.html?mapInstance=realProperty. Accessed January 19, 2017.

Federal Highway Administration (FHWA). 1966. *Section 4(f) Tutorial.* https://www.environment.fhwa.dot.gov/section4f/default.aspx. Accessed February 17, 2017.

I-25 South Resources Agency Meeting. 2016. *Meeting minutes.* December 6, 2016.

Natural Resources Conservation Service (NRCS). 2007. *Fountain Watershed Hydrologic Unit Code 111020003 Rapid Assessment*. August. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_060554.pdf. Accessed December 6, 2016.

—. 2009. *Middle South Platte- Cherry Creek Watershed Hydrologic Unit Code 10190003 Rapid Assessment*. October. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_060843.pdf. Accessed December 6, 2016.

—. 2010. *Upper South Platte Watershed Hydrologic Unit Code 10190002 Rapid Assessment*. February. https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs144p2_060867.pdf. Accessed December 6, 2016.

Western Land Conservancy. 2016. *Passive Recreation Activities.* http://www.friendsofcrowellhilaka.org/uploads/4/3/4/1/4341799/passive_active_recreation.pdf Accessed February 24, 2017.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Threatened and Endangered Species Resources Technical Memorandum

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CH2M Project No.:
680954

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Acronyms and Abbreviations

C-470	Colorado State Highway 40
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
DOLA	Colorado Department of Local Affairs
ESA	Endangered Species Act
FT	federally listed as threatened
FHWA	Federal Highway Administration
FPT	federally proposed as threatened
Front Range	eastern slope of the Rocky Mountains
I-25	Interstate 25
IPaC	Information, Planning, and Conservation
MBTA	Migratory Bird Treaty Act
MP	mile post
NEPA	National Environmental Policy Act
PEL	Planning and Environmental Linkages
ROD	record of decision
SC	state-listed as concern
SE	state-listed as endangered
ST	state-listed as threatened
SREP	Southern Rockies Ecosystem Project
USFWS	United States Fish and Wildlife Service

1.0 Threatened and Endangered Species

This section summarizes the natural resources and habitats in the vicinity of the Planning and Environmental Linkages (PEL) Study Area as they relate to special status species. Special status species include federally and state-designated wildlife and plant species, and species that are specifically protected by a regulation or policy.

Natural resources discussed in this memo are protected by the following federal and state regulations and policies:

- **The United States Endangered Species Act (ESA)** protects federally listed plant and animal species with the goal of ensuring their long-term survival.
- **The Colorado Non-game, Endangered, and Threatened Species Conservation Act** provides some protection within the state for listed species and establishes the state's intent to protect endangered, threatened, or rare species.
- **The Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act** protects migratory birds, nests, and nesting activities, which have the potential to be disrupted or destroyed during vegetation clearing, earth moving, bridge demolition, and other construction activities.

The movement of wildlife, including threatened and endangered species, within and throughout their habitats varies greatly depending on the species' specific life history requirements. Therefore, this memo describes threatened and endangered species in the general vicinity of the Study Area, including portions of Douglas and El Paso Counties.

1.1 Methodology for Initial Assessment

A desktop review of readily available data for threatened and endangered species was completed. As part of this review, a list of federally and state-listed species with the potential to occur in the Study Area or be impacted by activities taking place in the PEL Study Area was compiled by reviewing the following:

- The U.S. Fish and Wildlife Serves (USFWS) online Information, Planning, and Conservation (IPaC) decision support system (USFWS, 2016)
- Colorado Parks and Wildlife (CPW) Threatened and Endangered List (CPW, 2016a)
- Colorado Natural Heritage Program (CNHP) Tracking List (CNHP, 2015)

Preliminary desktop assessments of existing habitat characteristics in the vicinity of the Study Area and habitat requirements for listed species were also completed by examining ecoregion descriptions (Chapman et al., 2006), local area planning documents (SREP, 2006), and species data available from CPW (2016b).

1.2 Resource Conditions

1.2.1 General Habitat and Wildlife

Land use in the area has been historically composed of large ranching operations. Since 1990, development has been rapidly expanding out from the city of Colorado Springs and the greater Denver Metro Area, particularly along the I-25 corridor, including the development of several large subdivisions and numerous acres of low-density residential properties. Despite this development, traditional land uses persist and aid in efforts to preserve large open spaces. Between 1994 and 2006, the Douglas County Open Space Department protected 2,400 acres of open space and 8,000 acres of additional

easements with the goal of preserving wildlife habitat and improving the permeability of the I-25 corridor for large and mid-sized animals (SREP, 2006).

Land in the vicinity of the Study Area is characterized by gently rolling terrain along the base of the Front Range foothills. In this area, several steep-sided buttes rise from the grasslands, providing potential denning and ambush habitat for predators. The elevation is relatively consistent throughout the Study Area, ranging from approximately 6,200 to 6,900 feet. I-25 follows several creeks and tributaries through the Study Area, including Cottonwood Creek and Happy Canyon Creek in northern portions (Segment 3) of the Study Area, East Plum Creek and Carpenter Creek south of Castle Rock, and Crystal Creek north of Monument (Segment 1) (SREP, 2006). The landscape in the vicinity of the Study Area is dominated by a mosaic of grassland, shrubland, and woodland, with riparian vegetation along the creeks. Ponderosa pine (*Pinus ponderosa*) and Gambel oak (*Quercus gambelii*) woodlands flank the sides and the tops of buttes in the area (SREP, 2006; Chapman et al., 2006).

1.2.2 Federally and State-Listed Species

Based on a review of the USFWS online IPaC System, there are ten federally listed species and one federally proposed species with the potential to occur in, or be impacted by, projects in the Study Area. Federally designated critical habitat for Preble's meadow jumping mouse (*Zapus hudsonius preblei*) also occurs within and adjacent to the Study Area (USFWS, 2016).

Of the ten federally listed species, five species are included because they occur downstream of the Study Area along the Platte and/or Missouri Rivers, and could be impacted by activities that result in water depletions to the Platte River or its tributaries. The majority of the Study Area is located within the South Platte River watershed (mile post [MP] 160 to MP 187). Species that could be impacted by water depletions to the South Platte, and therefore the Platte River, include the Interior Least Tern (federally endangered, *Sternula antillarum*), Piping Plover (federally threatened, *Charadrius melodus*), Whooping Crane (federally endangered*, Grus americana*), pallid sturgeon (federally endangered*, Scaphirhynchus albus*), and western prairie fringed orchid (federally threatened, *Platanthera praeclara*) (USFWS, 2016). General habitat requirements for the remaining five federally listed species are provided in Table 1.

According to CNHP, there are ten state-listed species that have the potential to occur in the vicinity of the Study Area (CNHP, 2015). One of these species, the Preble's meadow jumping mouse, is listed at both the federal and state levels. General habitat requirements for state-listed species are provided in Table 1.

Table 1. Special Status Species with the Potential to Occur in the PEL Study Area

Common Name	Scientific Name	Status	Notes
Mammals			
Preble's Meadow Jumping Mouse	*Zapus hudsonius preblei*	FT, ST	Occurs in the Colorado Front Range along permanent or intermittent streams in areas with herbaceous cover and adequate cover of shrubs and trees. Occupied habitat and federally designated critical habitat are shown in Figure 2 and Figure 3.
North American Wolverine	*Gulo gulo luscus*	FPT	Requires deep, persistent, and reliable spring snow cover in boreal forests and tundra. Suitable habitat must include areas that are cold enough to reliably maintain deep persistent snow late into the warm season.
Northern Pocket Gopher	*Thomomys talpoides macrotis*	SC	Inhabits a variety of habitat types, including deep tractable soils, heavily compacted soils, and shallow gravels. Known to occur in Arapahoe, Douglas, and Elbert counties. The Douglas County pocket gopher tolerates a variety of soil types.

Common Name	Scientific Name	Status	Notes
Birds			
Mexican Spotted Owl	*Strix occidentalis lucida*	FT	Requires mature, old-growth forests that possess complex structural components; canyons, riparian, and conifer communities.
Burrowing Owl	*Athene cunicularia*	ST	Primarily found in grasslands and mountain parks, usually in or near burrows that have been started by colonies of burrowing mammals (such as black-tailed prairie dogs). Habitat also includes areas with openness, short vegetation, and well-drained soils (e.g., steppes, prairies, and agricultural lands). Burrowing Owls are also protected under the MBTA.
Plains Sharp-tailed Grouse	*Tympanuchus phasianellus jamesi*	SE	Typically, the plains sharp-tailed grouse occupies medium to tall grasslands. Within Colorado, they are found almost exclusively in Conservation Reserve Program grasslands of northern and central Weld County.
Amphibian			
Northern Leopard Frog	*Lithobates pipiens*	SC	Found in the vicinity of springs, slow streams, marshes, bogs, ponds, canals, flood plains, reservoirs, and lakes; usually they are in or near permanent water with rooted aquatic vegetation. In summer, they commonly inhabit wet meadows and fields.
Fish			
Greenback Cutthroat Trout	*Oncorhynchus claki stomias*	FT	Known in select headwater streams in the Arkansas and South Platte river drainages. Adapted to cold, clear, oxygenated streams of moderate gradient.
Northern Redbelly Dace	*Phoxinus eos*	SE	Native to the South Platte River Basin. The fish requires vegetation and slow-flowing streams. The pond where the fish was documented has a sand substrate along the shoreline with submerged vegetation covering a substrate of decomposing material in the middle.
Iowa Darter	*Etheostoma exile*	SC	Inhabits clear sluggish vegetated headwaters, creeks, and small to medium rivers; over substrates of sand, peat, and/or organic debris. Occurs in deeper lake waters and in stream pools when not breeding.
Mountain Sucker	*Catostomus platyrhynchus*	SC	Prefers clear, cold creeks and small to medium rivers with clear rubble, gravel, or sand substrate.
Orangethroat Darter	*Etheostoma spectabile*	SC	Found in slow to swift shallow gravel riffles and sometimes rocky runs and pools of headwaters, creeks, and small rivers, with sand, gravel, rubble, or bedrock substrates.
Plains Minnow	*Hybognathus placitus*	SE	Inhabits shallow sandy runs and pools of creeks and small to medium rivers.
Plants			
Colorado Butterfly Plant	*Gaura neom exicana var. coloradensis*	FT	Occurs in stream channel sites that are periodically disturbed, sub-irrigated alluvial soils along streams, and open meadows on floodplains, including riparian areas. Colonies are often found in low depressions or along bends in wide, active, meandering stream channels a short distance upslope of the actual channel. The plant requires early- to mid-succession riparian habitat.
Ute Ladies'-tresses	*Spiranthes diluvialis*	FT	Occurs in sub-irrigated alluvial soils along streams and open meadows on floodplains including riparian areas.

Sources: USFWS, 2010; 2016; CNHP, 2015; CPW, 2016c; NatureServe, 2015

Notes:

FT = federally listed as threatened
FPT = federally proposed as threatened
SE = state-listed as endangered
ST = state-listed as threatened
SC = state-species of concern

1.2.3 Migratory Birds

In addition to the federally and state-listed avian species discussed in the previous section, the project could impact other migratory bird species. Large trees, which may be suitable nest sites, are present throughout and adjacent to the PEL Study Area, including along riparian corridors. Riparian habitats also extend out of the PEL Study Area where they still fall within the CPW Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors for many species (CPW, 2008). Additionally, there is a potential for nesting swallows to be present on various structures in the PEL Study Area, including bridges over water features and roadways, and culverts. Furthermore, prairie dog colonies, if present in the PEL Study Area and immediate vicinity, could provide suitable habitat for Burrowing Owls.

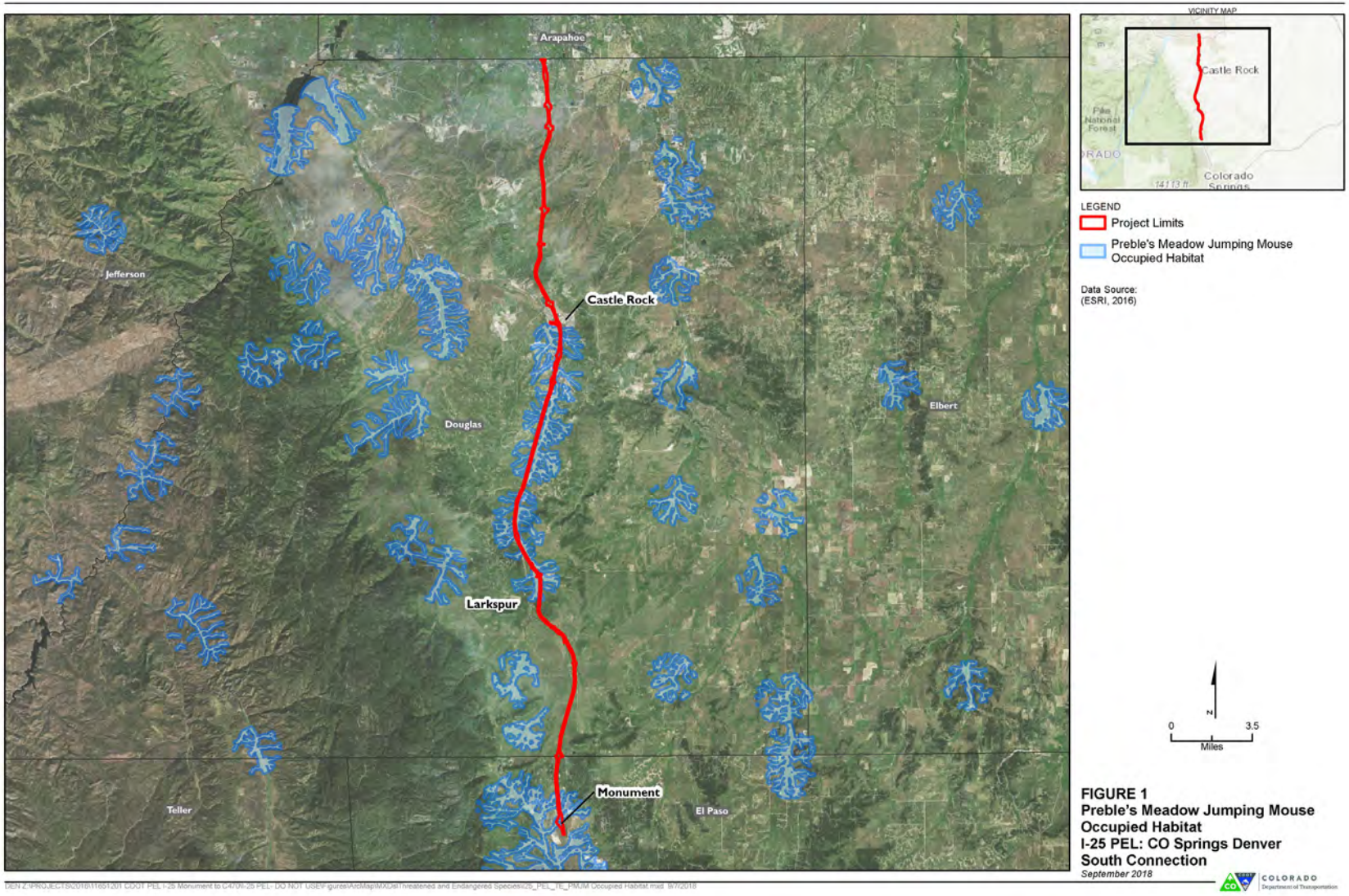

Figure 1. Preble's Meadow Jumping Mouse Occupied Habitat

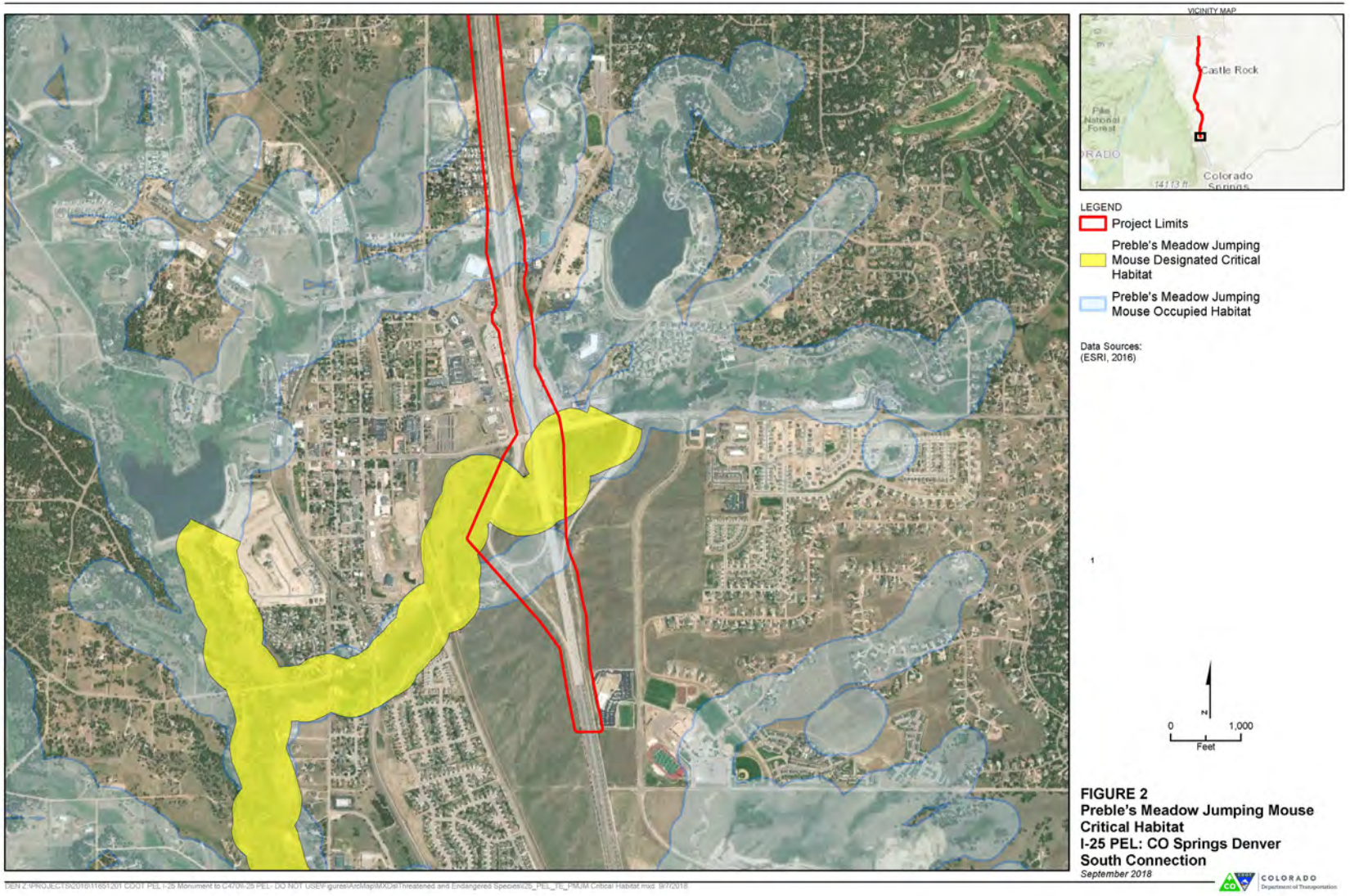

Figure 2. Preble's Meadow Jumping Mouse Critical Habitat

1.3 Scoping Input

Public and agency scoping input pertaining to threatened and endangered species will be obtained throughout the planning process for I-25 between C-470 and Monument. As part of the scoping process, both CPW and USFWS have been actively involved in the Technical Working Group Meetings and the Resource Agency Group Meetings. Scoping input for this planning process to date has been received as presented in Table 2.

Table 2. Scoping Input

Date	Source	Summary
October 12, 2016	CDOT Environmental Scoping Meeting (2016d)	A comment was provided during the CDOT scoping meeting to consider the plains sharp-tailed grouse, which is a state endangered species. The plains sharp-tailed grouse is a state endangered species that is included for consideration for quadrants within the Study Area. However, habitat within Colorado seems to be located predominantly in Weld County.
November 17, 2016	CDOT Maintenance Meeting (2016e)	Meeting was held to discuss available vehicle-animal collision data in the Study Area and to discuss issues with infrastructure, maintenance, and safety. Priorities and potential solutions for existing issues were also discussed.
December 6, 2016	Resource Agency Meeting (2016)	Meeting with representatives from CDOT, CPW, U.S. Environmental Protection Agency, USFWS, State Historic Preservation Office, Colorado Department of Health and Environment, El Paso County, Douglas County, The Conservation Fund, and the consultant team to discuss to discuss the planning process. Representatives from Douglas County indicated that they are in the process of revising the Habitat Conservation Plan for the Preble's meadow jumping mouse.
December 29, 2016	Colorado Parks and Wildlife Meeting (2016)	Meeting with CPW and the consultant team to discuss existing data pertaining to wildlife conflicts in the Study Area and to acquire input from CPW on the status of the Wildlife Movement Technical Memorandum. CPW will continue to provide input as part of a wildlife movement task force.
January 12, 2017	I-25 South PEL comments from the CDPHE (2016)	The CDPHE – Water Quality and Control Division provided preliminary feedback pertaining to potential waterway concerns associated with potential project-related construction activities.

CDOT = Colorado Department of Transportation
CDPHE = Colorado Department of Public Health and Environment

2.0 Recommended Next Steps

In December 2016, CDOT announced plans to accelerate the environmental and planning process for improvements on Interstate 25 (I-25) from Colorado State Highway 470 (C-470)/E-470 to Colorado Springs, with attention to The Gap area from Monument to Castle Rock. This means that the Study will continue from C-470/E-470 to Monument while accelerating a National Environmental Policy Act (NEPA) project within Segment 1. By accelerating the environmental planning for I-25, CDOT will have a project ready for construction by summer 2019, with a project fully constructed between Castle Rock and Monument in 5 years, if funding is identified for construction. With this timeline in mind, the project team has identified recommendations for the next steps for the PEL and NEPA processes.

As planning efforts continue for I-25 between C-470 and Monument, the presence of species of concern will be an important consideration that should be examined in more detail.

2.1 PEL Process

2.1.1 Federally and State-Listed Species

While preliminary review of the USFWS online IPaC System and county-level CNHP species data indicated that the species listed in Table 1 have the potential to occur in the vicinity of the Study Area, it is possible that suitable habitat for these species may not be present. For example, it is unlikely that suitable habitat for the North American wolverine is present in the vicinity of the I-25 corridor. Therefore, as planning efforts continue for improvements to I-25 between C-470 and Monument, Table 1 will be updated, and additional desktop-level assessments will be conducted to further determine potential presence or absence of suitable habitat for those species identified.

2.2 NEPA Project

2.2.1 Federally and State-Listed Species

Next steps in the NEPA process will build on the PEL process and will include continuing consultation and coordination with USFWS and CPW, including Section 7 consultation under ESA. The NEPA process will focus on Segment 1 of the Study Area (The Gap). Once all information has been collected, data regarding federally and state-listed species (i.e., Preble's meadow jumping mouse critical habitat) will be taken into consideration in development of alternatives for the NEPA process.

Based on the desktop assessments completed during the PEL process, and based on preliminary alternatives, onsite reconnaissance surveys will be conducted to determine the presence or absence of suitable habitat for species that may be affected by activities taking place in The Gap. Specifically, surveys for suitable habitat for the Colorado butterfly plant and Ute ladies'-tresses orchid may be necessary. If suitable habitat for one or more of these species would be affected, species-specific surveys should be completed. Once the presence of suitable habitat and potential impacts to those habitats have been determined, consultation with the USFWS and CPW will be necessary. Appropriate mitigations measures will be identified at this time. Analysis of Senate Bill 40 resources will also be completed as part of the NEPA planning process.

If water-related construction activities are anticipated as part of proposed alternatives that could result in water depletions to the Platte River watershed, potential impacts to downstream federally listed species will be analyzed during the NEPA process. It is recommended that project activities avoid any unauthorized depletions to Platte River tributaries. Further consultation with USFWS relating to downstream species may be required. Specifically, CDOT is participating in the South Platte Water Related Activities Program in cooperation with the Federal Highway Administration (FHWA). In response to the need for formal consultation for the water used from the South Platte basin, FHWA prepared a Programmatic Biological Assessment that estimates total water usage from 2012 until 2019. The water used for this project would need to be reported to the USFWS at the year's end after the completion of the project, per the aforementioned consultation.

A complete NEPA planning process will be conducted, including project scoping, description of alternatives to be considered, analysis of existing conditions in The Gap, description of potential impacts associated with implementation of alternatives, potential mitigation strategies, identification of the preferred alternative, completion of all associated consultation requirements, and all necessary documentation of the NEPA process.

2.2.2 Migratory Birds

As planning efforts continue for improvements to I-25 between C-470 and Monument, and as specific alternatives are developed, detailed and targeted surveys to identify and map migratory bird and raptor nest locations will be conducted. Areas with a high potential for nesting will be mapped (such as large trees or structures conducive to bird nesting) in The Gap and within the CPW nesting raptor buffer areas (CPW, 2008). If active nests are identified that may be impacted by project-related activities, mitigation measures will need to be identified.

Because prairie dog colonies provide suitable habitat for Burrowing Owls, which are protected under the MBTA, field surveys for prairie dog colonies will be completed to identify potential Burrowing Owl habitat. If habitat is present in The Gap, Burrowing Owl surveys will be necessary before any construction activities. Surveys should be conducted in accordance with the CPW Recommended Survey Protocol and Actions to Protect Nesting Burrowing Owls (CPW, 2008).

As future projects are programmed from the PEL, each resource, including threatened and endangered species, will be evaluated during the NEPA phase of project development. The NEPA evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

3.0 References

Colorado Department of Local Affairs (DOLA). 2017. 2040 Colorado Population Estimates by County. https://data.colorado.gov/Demographics/Total-Population-by-County-by-Year/9dd2-kw29. Accessed June 21, 2017.

Chapman, S.S., Griffith, G.E., Omernik, J.M., Price, A.B., Freeouf, J., and Schrupp, D.L. 2006. *Ecoregions of Colorado* (color poster with map, descriptive text, summary tables, and photographs). Reston, Virginia, U.S. Geological Survey (map scale 1:1,200,000).

Colorado Department of Public Health and Environment (CDPHE). 2017. *Comments to PEL for I-25 South Resource Agency*. January 12.

Colorado Department of Transportation (CDOT). 2002. *South I-25 Corridor and US 85 Corridor Revised Record of Decision*. October. https://www.codot.gov/library/studies/southi25us85-feis-rod/record-of-decision-rod. Accessed November 15, 2016.

—. 2004a. *I-25, Colorado Springs to Monument Environmental Assessment*. https://www.codot.gov/library/studies/I25EAColoSpgsMonument/environmental-assessment. Accessed November 10, 2016.

—. 2004b. *I-25 Colorado Springs Area Finding of No Significant Impact (FONSI)*. https://www.codot.gov/library/studies/i-25-finding-of-no-significant-impact-fonsi. Accessed November 10, 2016.

—. 2010. *North Meadows Extension to US 85 and I-25 Environmental Assessment.* http://www.crgov.com/DocumentCenter/Home/View/920. Accessed November 9, 2016.

—. 2011. *North Meadows Extension to US 85 and I-25 Finding of No Significant Impact*. http://www.crgov.com/DocumentCenter/Home/View/1240. Accessed November 9, 2016.

—. 2012. *Interstate 25, Colorado Springs to Monument, Mileposts 149 to 161*. Reevaluation. https://www.codot.gov/library/studies/i-25-finding-of-no-significant-impact-fonsi/Re-Evaluation/. Accessed Jan 17, 2017.

—. 2014. *Interregional Connectivity Study Final Report*. Division of Transit and Rail. https://www.codot.gov/projects/ICS/ics-draft-report-january-2014. Accessed November 4, 2016.

—. 2015. *Traffic Data Explorer.* Online Transportation Information System (OTIS). https://www.codot.gov/safety/safety-data-sources-information/online-transportation-information-systems-otis. Accessed January 17, 2017.

—. 2016. *Interstate 25 History*. https://www.codot.gov/about/CDOTHistory/50th-anniversary/interstate-25. Accessed November 2, 2016.

Colorado Parks and Wildlife (CPW). 2008. *Recommended Buffer Zones and Seasonal Restrictions for Colorado Raptors, Colorado Parks and Wildlife*. Revised February.

—. 2016a. Threatened and Endangered List. Available online at: http://cpw.state.co.us/learn/Pages/SOC-ThreatenedEndangeredList.aspx. Accessed December 1, 2016.

—. 2016b. Wildlife viewing guides and maps. http://cpw.state.co.us/thingstodo/Pages/Viewing.aspx. Accessed November 30, 2016.

—. 2016c. Species Profiles. http://cpw.state.co.us/learn/Pages/SpeciesProfiles.aspx. Accessed December 6, 2016.

—. 2016d. *I-25 South PEL: Resources Agency Group Meeting Summary*. December 6.

—. 2016e. *Maintenance Meeting.* November 17.

Colorado Natural Heritage Program (CNHP). 2015. *CNHP Conservation Status Handbook* (Tracking Lists). https://cnhp.colostate.edu/ourdata/trackinglist/. Accessed December 1, 2016.

Colorado Parks and Wildlife (CPW). 2016. *Meeting Minutes.* December 29.

NatureServe. 2015. NatureServe Explorer. An Online Encyclopedia of Life. Species Profiles. http://www.natureserve.org/. Accessed December 9, 2016.

Resource Agency. 2016. *Meeting Minutes.* December 6.

Southern Rockies Ecosystem Project (SREP). 2006. *Interstate 25 Douglas County Linkage Assessment. Linking Colorado's Landscapes Phase II Report*. Denver, CO.

U.S. Census Bureau. 2010. Population, Housing Units, Area, and Density: 2010 - State -- Place and (in selected states) County Subdivision. American Fact Finder. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml Accessed November 2, 2016.

U.S. Fish and Wildlife Service (USFWS). 2010. *Douglas County Pocket Gopher Species Profile*. https://www.fws.gov/mounTain-prairie/species/mammals/dougpocketgopher/. Accessed December 6, 2016.

—. 2016. Information for Planning and Conservation (IPaC) *Trust Resources Report for Douglas and El Paso Counties*. Colorado Ecological Services Field Office. November 28.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Water Quality Resources Technical Memorandum

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Acronyms and Abbreviations

C-470	Colorado State Highway 470
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CWA	Clean Water Act
EPA	U.S. Environmental Protection Agency
FEMA	Federal Emergency Management Administration
I-25	Interstate 25
MP	milepost
MS4	Municipal Separate Storm Sewer System
NB	Northbound
NHD	National Hydrology Dataset
PEL	Planning and Environmental Linkages
PWQ	Permanent Water Quality
SB	Southbound
SDWA	Safe Drinking Water Act
Study Area	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument
TMDL	total maximum daily loads

1.0 Water Quality

This memorandum summarizes water quality and water resources within the Study Area. Water-related resources generally include lakes, ponds, rivers, draws, ditches, and irrigation canals. These resources provide many important functions including irrigation to support agriculture, recreational opportunities such as fishing and rafting, quality habitat for resident and migrating wildlife, filtration of pollutants and sediments, and groundwater recharge.

The following regulatory requirements apply to water-related resources:

- **Sections 401 and 402 of the Clean Water Act (CWA)** – Establishes the basic structure for regulating discharges of pollutants into navigable waters. It provides the statutory basis for the National Pollutant Discharge Elimination System permit program and the basic structure for regulating discharge of pollutants into waters of the United States (U.S).
- **Section 404 of the CWA** – Regulates waters of the U.S., such as traditional navigable waters and associated wetlands. Impacts to these resources require permitting through the U.S. Army Corps of Engineers. Waters of the U.S. and wetlands are covered under a separate memorandum and not discussed further in the section.
- **Safe Drinking Water Act (SDWA) (40 Code of Federal Regulations Parts 141–143)** – Protects public health by regulating the nation's public drinking water supply and protecting drinking water and its sources. Colorado Department of Transportation (CDOT) is a stakeholder in the Colorado Source Water Assessment and Protection program mandated by the SDWA.
- **Erosion and Sediment Control on Highway Construction Projects (25 Code of Federal Regulations 650 Subpart B)** – Requires all highways that are funded in whole or in part by the Federal Highway Administration be designed, constructed, and operated according to standards that will minimize erosion and sediment damage to the highway and adjacent properties, and abate pollution of surface and groundwater resources.
- **Colorado Water Quality Control Act (Colorado Revised Statues Title 25, Article 8)** – Protects and maximizes the beneficial uses of state waters and regulates water quality.
- **Regulation #93 – Colorado's Section 303(d) List of Impaired Waters** – Establishes Colorado's List of Water-Quality-Limited Segments requiring total maximum daily loads (TMDL). This list was prepared to fulfill section 303(d) of the CWA, which requires that states submit a list of those waters for which technology-based effluent limitations and other required controls are not stringent enough to implement water quality standards to the U.S. Environmental Protection Agency (EPA).

  Once listed, the state is required to prioritize these waterbodies or segments (rivers, streams, lakes, and reservoirs) based on the severity of pollution and other factors. The state will then determine the causes of the water quality problem and allocate responsibility for controlling the pollution. This analysis is called the TMDL process and the results include 1) the determined amount of a specific pollutant that a segment can receive without exceeding a water quality standard (the TMDL), and 2) the apportionment to the different contributing sources of the pollutant loading (the allocation). The TMDL must include a margin of safety, waste load allocation (for point sources), and a load allocation (for non-point sources and natural background). The TMDL must include upstream loads in the assessment and apportionment process.
- **Municipal Separate Storm Sewer System (MS4) –** Through the National Pollutant Discharge Elimination System program, operators of regulated transportation MS4s such as CDOT are required to reduce the discharge of pollutants from their MS4 to the maximum extent practicable. This is achieved through compliance with the following minimum control measures: public education and

outreach, public participation/involvement, illicit discharge detection and elimination, construction site runoff control, post construction runoff control, and pollution prevention/good housekeeping.

In addition to CDOT's MS4, the Study Area crosses through or is adjacent to the following MS4 permit areas: Town of Monument, City of Lone Tree, Douglas County, Southeast Metropolitan Stormwater Authority, City of Castle Pines North, Castle Pine North Metropolitan District, Castle Pines Metropolitan District, Town of Castle Rock, El Paso County, and Heritage Hills Metropolitan District. Note that some of these MS4 entities have a Non-standard MS4 permit or Cherry Creek Reservoir Basin MS4 permit.

Permanent Water Quality (PWQ) control measures will be required for project areas within MS4 jurisdiction, classified as Priority Development or Cherry Creek Reservoir Development.

The EPA has delegated authority for enforcement of Section 303(d), 401 and 402 of the CWA, SDWA, and MS4 to the Colorado Department of Public Health and Environment (CDPHE). Under this authority, the Colorado Water Quality Control Act was passed and the Water Quality Control Commission was created to provide regulations to be implemented by CDPHE that keep Colorado in compliance with the CWA.

Based on requirements promulgated under Section 402 of the CWA, the WQCC has implemented Regulation 61 identifying CDOT as a regulated MS4. By definition, a separate storm sewer system is comprised of a storm drainage system but also includes ditches, gutters, or other similar means of collecting and conveying stormwater runoff that do not connect with a wastewater collection system or wastewater treatment facility. Portions of the project corridor are within the CDOT MS4 Urban Area. PWQ will be required in accordance with CDOT's new PWQ program requirements (CDOT, 2017).

1.1 Methodology for Initial Assessment

An assessment of the Study Area was conducted using available data of water-related resources. The following data sources were used for this task:

- Streams from the U.S. Geological Survey National Hydrology Dataset (NHD) (U.S. Geological Survey, 2016).
- Federal Emergency Management Administration (FEMA) floodplain maps (FEMA, 2016; 1997a; 1997b; 1997c).
- Current available aerial photography (e.g., Bing Maps and Google Earth).
- CDPHE List of Impaired Waters (CDPHE, 2016a and 2016b).
- CDOT Online Transportation Information System database of existing PWQ features in the corridor (CDOT, 2018).

Sixty-six NHD stream fragments in the Study Area were further characterized using aerial photography and FEMA floodplain maps to identify individual drainage features. For example, the main stems of East Plum Creek, Happy Canyon Creek, Carpenter Creek, and several unnamed drainages move in and out of the Study Area at various locations. These fragments of the same drainage were grouped into a single feature rather than multiple features of the same drainage. Therefore, the original NHD layer was reduced to 51 individual water features. Note that East Plum Creek runs parallel to Interstate 25 (I-25) just outside the study area for approximately 16 miles.

Table 1. Summary of Surface Waters within the I-25 Planning and Environmental Linkages Study Area

Type	Name	Description	Approximate Location	Flow Direction	CDPHE Impaired Water (303d)
Creek	Dirty Woman Creek	Flows to Monument Lake	Crosses the I-25 at approximately MP 160.6, just south of the Monument/Palmer Lake interchange	Southwest	No
Creek	Crystal Creek	Flows to Monument Lake	Crosses I-25 at approximately MP 161.25	Southwest	No
Ephemeral Drainage	None	An unnamed tributary of Carpenter Creek	Crosses I-25 at approximately MP 163.25, in and just south of the County Line Road and I-25 Interchange	North	No
Ephemeral Drainage	None	An unnamed tributary of Carpenter Creek	Crosses I-25 at approximately MP 164	Northeast	No
Ephemeral Drainage	None	An unnamed tributary of Carpenter Creek	Crosses I-25 at approximately MP 167.25	Northwest	Yes[a]
Ephemeral Drainage	None	An unnamed tributary of Carpenter Creek	Crosses I-25 at approximately MP 167.75	West	Yes[a]
Ephemeral Drainage	None	An unnamed tributary of Carpenter Creek	Crosses I-25 at approximately MP 168.4	West	No
Ephemeral Drainage	None	An unnamed tributary of Carpenter Creek	Crosses I-25 at approximately MP 169.25	West	No
Creek	Carpenter Creek	Meanders along west side of I-25, but never crosses	Located along I-25 from approximately MP 169.75 to 168.5	North	Yes[a]
Ephemeral Drainage	None	An unnamed drainage Does not appear to connect to a major waterway	Crosses I-25 at approximately MP 171.5	West	No
Ephemeral Drainage	None	An unnamed drainage Does not appear to connect to a major waterway	Crosses I-25 at approximately MP 171.75	West	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 173.25	Northeast	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 173.8	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 174.2	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 174.3	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 174.5	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 175.2	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 175.4	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 175.6	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 175.8	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 177.25	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 177.5	East	No

Type	Name	Description	Approximate Location	Flow Direction	CDPHE Impaired Water (303d)
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 177.75	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 178.5	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 178.9	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 179.25	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 179.5	East	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 179.75	East	No
Creek	None	A tributary of East Plum Creek and Westfield Creek	Crosses I-25 at approximately MP 180	East	No
Creek	East Plum Creek	Enters Study Area from west side of I-25 at MP 182 Meanders in and out of Study Area and crosses to the east at approximately MP 181.25 Parallels I-25 east side (entering Study Area occasionally) until it crosses back to the west side of I-25 at approximately MP 172.25	Located along I-25 from approximately MP 182 to 172 Crosses I-25 twice, once at approximately MP 181.25 and a second time at approximately MP 172.25	North	Yes (Aquatic Life-provisional)
Ephemeral Drainage	Sellers Gulch	A tributary of East Plum Creek	Merges with East Plum creek on east side of I-25 at approximately MP 181.25	West	No
Ephemeral Drainage	Peakview Tributary	A tributary of East Plum Creek	Crosses I-25 at approximately MP 182	West	No
Gulch	Hangmans Gulch	A tributary of East Plum Creek	Crosses I-25 at approximately MP 182.5	West	Yes[a]
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 just south of MP 183	West/ Northwest	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 183.5	West/ Northwest	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 183.75, just south of Meadows Parkway and I-25 Interchange	West/ Northwest	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 184.25, just north of Meadows Parkway and I-25 Interchange	West/ Southwest	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 184.5	West	No
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek	Crosses I-25 at approximately MP 185.75	Southwest	No

Type	Name	Description	Approximate Location	Flow Direction	CDPHE Impaired Water (303d)
Ephemeral Drainage	None	An unnamed tributary of East Plum Creek. Never crosses I-25 Just within the Study Area on the west side of I-25	Located at MP 186 of I-25	Southwest	No
Gulch	Newlin Gulch	Newlin Gulch crossing at I-25	Crosses I-25 at approximately MP 187.25, just north of the I-25 and Happy Canyon Interchange	Northeast	No
Ephemeral Drainage	None	An unnamed tributary of Newlin Gulch	Crosses I-25 at approximately MP 187.75	Northeast	No
Ephemeral Drainage	None	An unnamed tributary of Newlin Gulch	Crosses I-25 at MP 188	East and Northeast	No
Ephemeral Drainage	None	An unnamed tributary of Newlin Gulch	Located in the southeast quadrant of the I-25 and Castle Pines Parkway Interchange	Northeast	No
Ephemeral Drainage	None	An unnamed tributary of Happy Canyon Creek. Meanders in and out of the Study Area on the east side of I-25	Crosses I-25 at MP 190.5	West and North	No
Ephemeral Drainage	None	An unnamed tributary of Happy Canyon Creek	Crosses I-25 just south of MP 191	Northwest	No
Creek	Happy Canyon Creek	Crosses I-25 just north of MP 191. On the west, creek meanders in and out of the Study Area	Located around MP 191 of I-25 Meanders in and out of Study Area on the west side Crosses I-25 just north of MP 191	Northeast	No
Ephemeral Drainage	None	An unnamed tributary of Happy Canyon Creek	Crosses I-25 at approximately MP 191.3 Just south of the Surrey Road overpass	East	No
Canal	Arapahoe Canal	Manmade Canal Hydrologically connected to Cottonwood Creek	Crosses I-25 just south of Cottonwood Creek crossing and just north of the Ridge Gate Parkway and I-25 Interchange	East	No
Creek	Cottonwood Creek	Drainage crosses I-25 via box culvert, near Sky Ridge Medical Center	Crosses at approximately MP 192.5 of I-25	Northeast	No
Ditch	None	An unnamed channel. Appears to have been altered in the past by construction of the Interchange. Flow is to the west to Willow Creek	Located in the northwest quadrant of the I-25 and Colorado State Highway 470 Interchange	West	No

I-25 = Interstate 25
MP = mile post

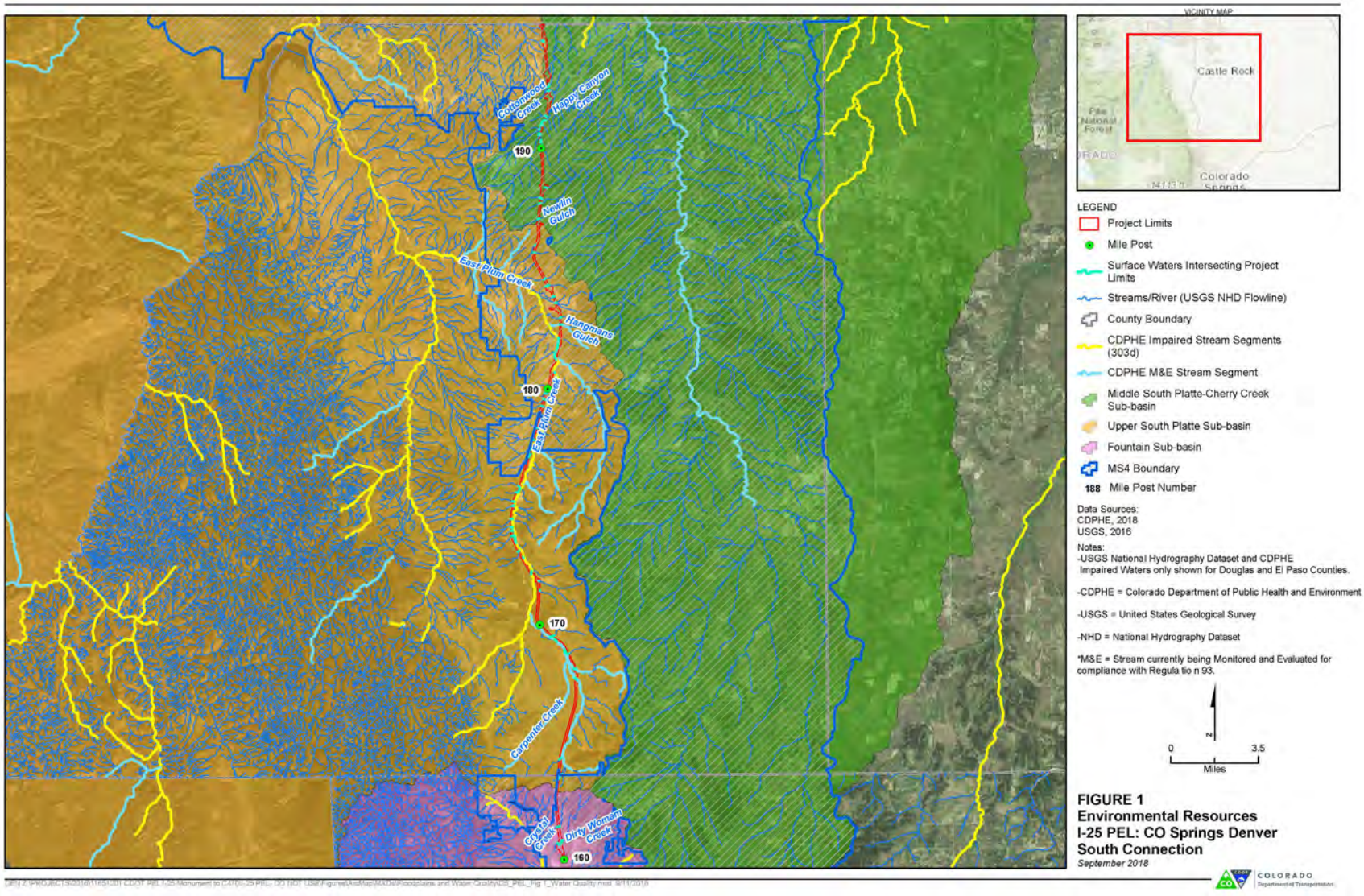

Figure 1. Water Resources within the I-25 Study Area

1.2 Resource Conditions

The majority of the Study Area lies within the South Platte River Basin (EPA, 2016). The South Platte River Basin's southern terminus is along the Palmer Divide, near the Douglas and El Paso County line. To the north, drainages are located within two sub-basins: the Upper South Platte and the Middle South Platte-Cherry Creek. The northern study area between Colorado State Highway 470 (C-470) and just north of Castle Rock lies within the Cherry creek basin. South of the Palmer Divide, the Study Area is located in the Upper Arkansas River Basin. The Study Area lies within the Fountain Creek sub-basin in this area.

Numerous drainages occur within the Study Area. The I-25 Study Area crosses 51 waterways, including six creeks (Dirty Woman Creek, Cottonwood Creek, Happy Canyon Creek, East Plum Creek, Carpenter Creek, and Crystal Creek), three gulches (Hangmans Gulch, Sellars Gulch, and Newlin Gulch), one ditch (the Arapahoe Canal), and numerous unnamed tributaries (refer to stream crossings in Table 1). Of the 51 water crossings, 49 are within the South Platte River Basin and 2, Crystal Creek and Dirty Woman Creek, are located within the Upper Arkansas River Basin.

Although there are numerous drainages in the I-25 Planning and Environmental Linkages (PEL) Study Area, surface water quality impacts are generally evaluated in the immediate vicinity of the streams and stream crossings, where surface water runoff from construction or the transportation system would collect and be discharged into the stream or waterbody. Five waterways are currently listed on the CDPHE 303(d) list of impaired streams. These include East Plum Creek and its tributary Hangmans Gulch, as well as Carpenter Creek and two of its tributaries. Although not listed, numerous unnamed tributaries cross the Study Area that flow directly into East Plum Creek between Castle Rock and Larkspur. East Plum Creek closely parallels the I-25 corridor in this area and this entire segment of the East Plum Creek is listed on the CDPHE 303(d) list for impaired waters.

Vehicle traffic moving on the I-25 corridor and construction-related activities would generate the majority of surface water pollutants in the Study Area. Particulate matter settling out of the air would also generate pollutants. If unmitigated, the larger impervious areas associated with the proposed improvements would generate runoff, carrying contaminants into receiving waters in the immediate vicinity of the Study Area.

During winter months, the application of de-icers to paved surfaces may also increase chloride levels and suspended solids in snowmelt, which could enter the receiving waters in the Study Area. There are currently two CDOT maintenance areas along the Study Area; in Castle Rock and in Larkspur. Maintenance activities as well as storage of sand or de-icers at these locations could also impact nearby surface waters if runoff is not properly mitigated.

In addition to the potential pollutants, soil erosion is a natural process that can have significant impacts on surface water quality. Soils eroded into streams or other waterbodies contribute suspended solids and add to the sediment load in the stream or other waterbodies. The increased contact between water and soil that occurs when the soil is eroded can increase the concentration of dissolved constituents in the water (i.e., salts, metals, chemicals) from the soil.

1.3 Water Quality Treatment

CDOT and municipalities operate under MS4 permits, which require the treatment of stormwater runoff. CDOT's OTIS database identifies all the existing PWQ in the PEL corridor. No PWQ features currently exist within the majority of Segment 1 (MP 161-179), which occurs largely adjacent to undeveloped, protected conservation easement areas. Detention basins, swales, and other water quality structures are utilized throughout Segments 2 and 3.

Table 2. Summary of Permanent Water Quality Features within the I-25 Planning and Environmental Linkages Study Area

Permanent Water Quality Description	Location (MP), Direction of I-25, and Segment
Infiltration Facility	194.5 NB
Extended Detention Basin	193.9 NB
Infiltration Facility	193.1 SB
Infiltration Facility	193.1 NB
Extended Detention Basin	192.9 NB
Extended Detention Basin	192.4 NB
Extended Detention Basin	192.3 SB
Extended Detention Basin	192.3 NB
Extended Detention Basin	191.8 NB
Extended Detention Basin	191.6 NB
Infiltration Facility	191.5 SB
Infiltration Facility	191.4 NB
Extended Detention Basin	191.3 NB
Infiltration Facility	191.3 NB
Extended Detention Basin	191.1 NB
Extended Detention Basin	190.9 NB
Treatment Swale	190.8 NB
Extended Detention Basin	190.5 NB
Extended Detention Basin	190.4 SB
Extended Detention Basin	190.0 NB
Extended Detention Basin	190 NB
Extended Detention Basin	189.9 NB
Extended Detention Basin	189.7 SB
Extended Detention Basin	189.3 NB
Infiltration Facility	188.6 SB
Extended Detention Basin	184.2 NB
Extended Detention Basin	East of 184
Treatment Swale	183.9 SB
Treatment Swale	183.8 SB
Treatment Swale	183.6 SB
Treatment Swale	183.5 SB
Extended Detention Basin	183.5 NB
Treatment Swale	183.4 SB
Infiltration Facility	183.2 SB
Treatment Swale	182.9 SB
Treatment Swale	182.6 SB
Infiltration Facility	182.4 NB

Permanent Water Quality Description	Location (MP), Direction of I-25, and Segment
Treatment Swale	182.0 SB
Extended Detention Basin	182.0 NB
Treatment Swale	181.4 NB
Treatment Swale	181.4 NB
Treatment Swale	181.4 NB
Extended Detention Basin	181.2 SB
Treatment Swale	181.2 NB
Treatment Swale	181.2 NB
Treatment Swale	181.2 NB
Treatment Swale	181.2 NB
Extended Detention Basin	180.8 SB
Extended Detention Basin	180.8 SB
Extended Detention Basin	180.6 NB
Extended Detention Basin	180.6 NB
Extended Detention Basin	180.1 NB
Extended Detention Basin	160.9 SB
Constructed Wetland	160.8 NB
Extended Detention Basin	160.8 NB
Constructed Wetland	160.7 SB
Treatment Swale	160.1 NB

NB = North Bound
SB = South Bound

1.4 Scoping Input

Public and agency scoping input pertaining to water quality will be obtained throughout the planning process for I-25 between C-470 and Monument. Scoping input for this planning process to date has been received as presented in Table 3. Comments pertaining specifically to water quality is included in Table 3.

Table 3. Scoping Input

Date	Source	Summary
November 17, 2016	CDOT Maintenance Meeting (2016)	Meeting was held with CDOT maintenance to discuss issues with infrastructure, maintenance, and safety. Priorities and potential solutions for existing issues were also discussed. There is a 300- to 400-foot culvert that is full of sediment from Frontage Road to Frontage Road at MP 175. This is a 10-foot by 6-foot culvert that is two-thirds full.
December 6, 2016	Resource Agency Meeting (2016d)	Meeting with representatives from CDOT, Colorado Parks and Wildlife, the EPA, U.S. Fish and Wildlife Service, State Historic Preservation Office, CDPHE, El Paso County, Douglas County, The Conservation Fund, and the consultant team to discuss the planning process. Douglas County is considering partnering with CDOT to create a wetland bank near Tomah Road and this consideration was discussed.
January 12, 2017	I-25 South PEL comments from the CDPHE (2017)	The CDPHE – Water Quality and Control Division provided preliminary feedback pertaining to potential waterway concerns associated with project-related construction activities. • Identify if groundwater is expected to be encountered. • Anticipate areas where groundwater may be encountered during construction and how that contaminated groundwater will be managed. If contaminated groundwater is discharged to waters of the state, a Colorado Discharge Permit System permit will be required and treatment may be necessary to meet permit limits. Projects should anticipate the cost and space requirements for treatment, if applicable. • Provide additional discussion on MS4. • Because PWQ will likely be needed, look for potential good sites (and soil types) to treat CDOT roadways. • Construction stormwater will be required. Special planning to comply with stormwater requirements near stream crossings should be incorporated early into the planning process. Projects should anticipate the cost and space requirements for stormwater control measures, particularly at stream crossings where compliance is particularly challenging. CDPHE is relying on the project team to comply with all required regulations and permits.

As future projects are programmed from the PEL, each resource, including water quality and associated resources, will be evaluated during the National Environmental Policy Act of 1969 phase of project development. The National Environmental Policy Act evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

2.0 References

Colorado Department of Public Health and Environment (CDPHE). 2016a. *Regulation #93, Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation List*. Adopted March 17, 2004, Amended November 30, 2016.

Colorado Department of Public Health and Environment (CDPHE). 2016b. Cleanwater; GIS Maps. Website: https://www.colorado.gov/pacific/cdphe/clean-water-gis-maps. Accessed November 2016.

Colorado Department of Public Health and Environment (CDPHE). 2016b. *I-25 South PEL: CDOT Maintenance Meeting*. November 17.

Colorado Department of Public Health and Environment (CDPHE). 2016c. *I-25 South PEL: Resources Agency Group Meeting Summary*. December 6.

Colorado Department of Public Health and Environment (CDPHE). 2017. *CDOT Permanent Water Quality Program Manual*. March 1.

Federal Emergency Management Agency (FEMA). 2016. FEMA GIS Data for Douglas County, Colorado.

Federal Emergency Management Agency (FEMA). 1997a. FIRM Flood Insurance Rate Map, El Paso County, Colorado and Incorporated Areas. Community-Panel No. 080041C275 F. March 17, 1997.

Federal Emergency Management Agency (FEMA). 1997b. FIRM Flood Insurance Rate Map, El Paso County, Colorado and Incorporated Areas. Community-Panel No. 080041C276 F. March 17, 1997.

Federal Emergency Management Agency (FEMA). 1997c. FIRM Flood Insurance Rate Map, El Paso County, Colorado and Unincorporated Area. Community-Panel No. 080041C278 F. March 17, 1997.

Resource Agency. 2016. *Resource Agency Meeting.* December 6.

U.S. Environmental Protection Agency (EPA). 2016. Surf Your Watershed: Colorado. Website: https://cfpub.epa.gov/surf/state.cfm?statepostal=CO , Accessed November 2016.

U.S. Geological Survey (USGS). 2016. National Hydrology Dataset (NHD). Available at: http://nhd.usgs.gov/.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Wildlife Movement Resources Technical Memorandum

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

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Acronyms and Abbreviations

CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CPW	Colorado Parks and Wildlife
CSP	Colorado State Patrol
FHWA	Federal Highway Administration
Front Range	eastern slope of the Rocky Mountains
km	kilometer
m	meter
MP	mile post
N/A	Not Applicable
PEL	Planning and Environmental Linkages
PEL Study Limits	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument
SREP	Southern Rockies Ecosystem Project
Study Area	Includes the PEL study limits with a buffer extending 50 feet beyond CDOT right-of-way
USGS	U.S. Geological Survey

1.0 Wildlife Movement

Wildlife species and habitats constitute an important part of the natural environment. The movement of wildlife within and throughout their habitats varies greatly depending on the species-specific life history requirements. Therefore, this memo focuses on the movement of wildlife species within and throughout the Study Area, which is located within portions of Douglas and El Paso Counties. The resulting characterization included below is presented in relation to the Study Area.

A separate memo has been developed to address threatened and endangered species, within the vicinity of the Study Area, and to describe federal and state regulations and policies relevant to the protection of those species and their habitat.

1.1 Methodology for Initial Assessment

A desktop assessment of readily available data for wildlife, wildlife habitat, and wildlife movement was completed for this memo (Colorado Parks and Wildlife [CPW], CDOT, U.S. Geological Survey [USGS], and Douglas County). Protected lands within Douglas County were identified including wildlife movement corridors, habitat conservation areas, overland connections, and other protected lands, which provide habitat for wildlife (Douglas County, 2016). In Douglas County, proposed development within and adjacent to these areas requires a strict review and mitigation to maintain healthy ecosystems (Douglas County, 2014). Similar data for the portions of the Study Area within El Paso County was not readily available for desktop assessment. It was assumed that wildlife movement within these areas would exhibit similar characteristics (for example, with characteristics closely associated with riparian habitats).

Information available from CPW, CDOT, and the Colorado State Patrol (CSP) also was examined for the entire Study Area (including both Douglas County and El Paso County) to provide information on wildlife presence, animal mortality incidents, and animal vehicle collisions within the Study Area. Animal mortality incident information is based on roadkill data provided by CDOT maintenance crews (CDOT, 2016d). Animal vehicle collision information is based on incident reports provided by CSP (CSP, 2016). For the purpose of this technical memorandum, animal mortality incidents and animal vehicle collisions are collectively referred to as wildlife conflicts.

1.2 Resource Conditions

Since 1990, development has been rapidly expanding from Colorado Springs and the greater Denver Metro area. This expansion includes the development of several large subdivisions and numerous acres of low-density residential properties in the vicinity of the Study Area. This is an exception for Segment 1, which is generally characterized by scenic vistas, open spaces, and small suburban communities. Because of limited development and the large amount of protected lands, the land surrounding Segment 1 is abundant in wildlife habitat. Douglas County has identified a variety of protected lands within the county including wildlife movement corridors, habitat conservation areas, overland connections, riparian conservation zones, as well as open space and parks (Douglas County, 2016). These areas are described in detail below. Within El Paso County, several recreational trails, riparian corridors, and parks are located in the vicinity of the Study Area, although detailed information about protected lands was not identified during this preliminary assessment (El Paso County, 2013).

Protected lands in the vicinity of the Study Area overlap and combine to create a system of interconnected, high-quality wildlife habitat. As a result, one piece of land may have multiple protected land designations (see Figure 1). This system of protected land provides wildlife with greater access to shelter and varied food sources, meets seasonal migration and life-cycle requirements, and generally supports healthy wildlife populations (Douglas County, 2012, 2016).

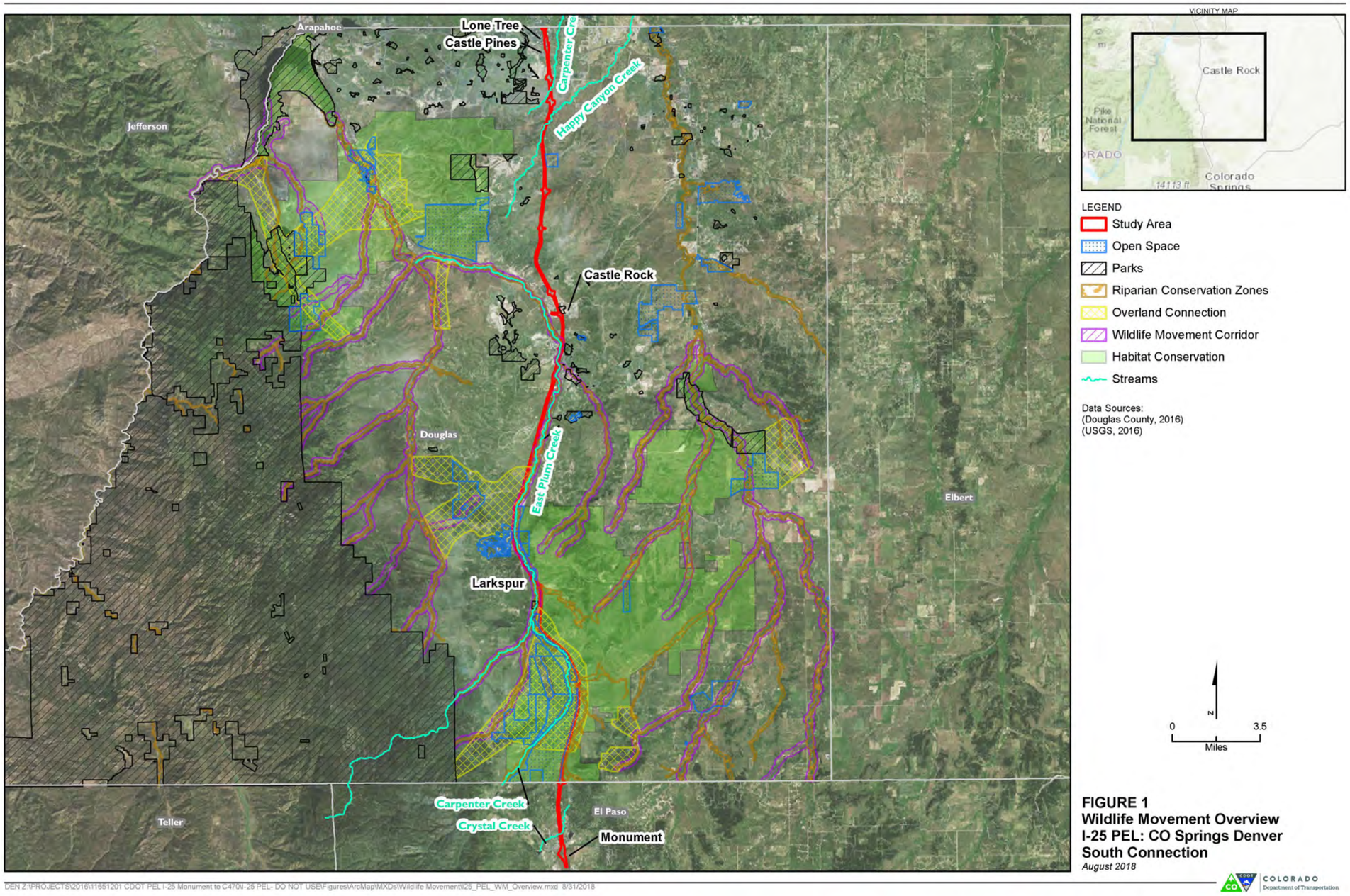


Figure 1. Wildlife Movement Overview

There are currently no formal wildlife crossings to facilitate large animals crossing Interstate 25 (I-25). However, several creeks, drainages, underpasses, and overpasses for traffic and pedestrian movement cross I-25 within the Study Area. (See Section 2.2.2 Potential Wildlife Crossing Locations.) To date, mule deer, coyote, raccoon, and bears have been recorded using informal crossing structures.

The open, mostly uninhabited areas surrounding Larkspur contains high-quality wildlife habitat, and is an area of particular concern for wildlife movement (Hough, 2016; Douglas County, 2014). Because this area is bisected by I-25, wildlife must cross the highway and the adjacent railroad lines in order to use the open areas around Larkspur Butte, Corner Mountain, Rattlesnake Butte, and Castlewood Canyon State Park. Resident populations of mule deer (*Odocoileus hemionus*), white-tailed deer (*Odocoileus virginianus*), and elk (*Cervus canadensis*) spend most of the year shifting within the vicinity of the Study Area (Hough, 2016). Non-resident populations of these species also may use this area as a movement corridor as they move from higher elevations of the Rocky Mountains, where they reside in the summer, to lower elevations around Larkspur Butte and Corner Mountain for the winter (Hough, 2016). Additionally, water and vegetation associated with East Plum Creek and Carpenter Creek, which parallel I-25 near Larkspur (MP 170-175), attract high concentrations of wildlife to areas immediately adjacent to the highway. Because of the high incidence of wildlife in this area, CPW has designated the area of I-25 between Castle Rock and Larkspur as a high-risk area for wildlife conflicts (CPW, 2016a). Additional information about wildlife conflicts is described in Section 2.2.3, Wildlife Movement Concerns.

1.2.1 Study Area Characteristics

Land in the vicinity of the Study Area is characterized by gently rolling terrain along the base of the Front Range foothills. In this area, several steep-sided buttes rise from the grasslands, providing overall range habitats for black bear (*Ursus americanus*), mountain lion (*Puma concolor*), bobcat (*Lynx rufus*), and coyote (*Canis latrans*). The elevation is relatively consistent throughout the Study Area ranging from approximately 6,200 to 7,350 feet. In portions of the Study Area, I-25 follows and crosses several creeks and tributaries, including Cottonwood Creek and Happy Canyon Creek in northern portions of the Study Area, East Plum Creek, and Carpenter Creek south of Castle Rock, Crystal Creek north of Monument, and Dirty Woman Creek in Monument (SREP, 2006). The landscape in vicinity of the Study Area is dominated by a mosaic of grassland, shrubland, and woodland, with riparian vegetation along the creeks. Ponderosa pine (*Pinus ponderosa*) and Gambel oak (*Quercus gambelii*) woodlands flank the sides and the tops of buttes in the area (SREP, 2006; Chapman et al., 2006). Wildlife species that are common to this area of Colorado include mule deer, white-tailed deer, elk, pronghorn (*Antilocapra americana*), coyotes, fox (*Vulpes* spp.), squirrels (*Spermophilus* spp.), beavers (*Castor Canadensis*), muskrats (*Ondatra zibethicus*), bobcats, mountain lions, black bears, raptors, owls, songbirds, grassland birds, waterfowl, and many species of reptiles and amphibians (CPW, 2016b).

Douglas County within the vicinity of the Study Area has been identified as one of the few remaining connections across Front Range habitats, providing local connectivity through ecotone habitat that has been extensively developed in Colorado. This connection was identified primarily for elk, black bear, and mountain lion, though several other species also move through these habitats including mule deer, bobcat, coyote, and numerous small mammals. While bighorn sheep do not appear to move across I-25 between habitats, a population has become established east of I-25 on buttes within Greenland Ranch (SREP, 2006; Hough, 2016).

Land use in the area has been historically composed of large ranching operations. Despite rapid development along the northern portion of the Study Area, traditional land uses persist and aid in efforts to preserve large open spaces. Between 1994 and 2006, the Douglas County Open Space Department protected 2,400 acres of open space and 8,000 acres of additional easements with the goal of preserving wildlife habitat and improving the permeability of the I-25 corridor for large and mid-sized animals (SREP, 2006). In 2016, Douglas County acquired a 12-mile-long wildlife corridor between Sterling Ranch and the Red Mesa and Sharptail Open Space west of Highway 85. This addition completed the

missing link for migration of elk and mule deer from the Pike National Forest in southwest Douglas County to conservation land south of Highlands Ranch (Gibbs, 2016).

1.2.1.1 Douglas County Protected Lands

The types of protected lands in Douglas County described below can be seen as a single entity of lands identified for protection. These areas are not necessarily protected from development; however, designation as protected lands weighs heavily in County planning decisions (Hough, 2016).

Wildlife Movement Corridors

Douglas County Open Space has identified wildlife movement corridors within the County. These corridors largely follow drainages, but also are located in areas where wildlife have been observed migrating, such as along a stretch of hogback (Hough, 2016). Several of the wildlife movement corridors are within or adjacent to the Study Area (Figure 1). One primary wildlife movement corridor overlaps the Study Area corridor between Larkspur and Castle Rock, approximately between MP 171 and MP 182. This movement corridor is connected to other movement corridors within the vicinity of the Study Area, all of which are closely linked to riparian habitats (Douglas County, 2016).

Habitat Conservation Areas

Two habitat conservation areas have been identified in Douglas County and are located in and near the Study Area (Figure 1). These consist of areas that are already largely protected, such as state park lands (Hough, 2016). One habitat conservation area is located between the Lone Tree and Castle Rock approximately one and a half miles west of the Study Area. The second habitat conservation area includes the Study Area surrounding Larkspur between MP 163 and MP 175 (Douglas County, 2016).

Overland Connections

There are seven overland connection areas identified in Douglas County (Figure 1). Overland connections are broad areas that facilitate wildlife movement, typically within or between large blocks of wildlife habitat (Douglas County, 2014). These areas have been identified by Douglas County as important for protecting the connectivity and integrity of protected lands in the future (Hough, 2016). One overland connection is within the Study Area north of Larkspur between MP 174 and MP 177. Another overland connection is within the Study Area immediately south of Larkspur between approximately MP 164 and MP 171 (Douglas County, 2016).

Riparian Conservation Zones

Several riparian conservation zones are located within and near to the Study Area, and throughout Douglas County (Figure 1). According to the Douglas County Habitat Conservation Plan, riparian conservation zones are areas of mapped potential for Preble's meadow jumping mouse (*Zapus hudsonius preblei*) identified along streams in Douglas County based on landforms and vegetation. Riparian conservation zones are closely associated with wildlife movement corridors (Douglas County, 2006; Douglas County, 2016).

Parks and Open Space

There are several parks and open space areas located in the vicinity of the Study Area that contribute to the total area of protected land in the region (Figure 1). Within Douglas County, there are large open space areas adjacent to the Study Area including:

- A half-mile stretch of open space located approximately 1 mile north of Castle Pines at MP 190
- A 3-mile stretch of open space to the north of Larkspur between MP 172 and MP 175
- An approximate 7-mile stretch of open space south of Larkspur between MP 164 and MP 171 (Douglas County, 2016)

1.2.1.2 El Paso County Protected Lands

In El Paso County, there are several trails, parks, and open space areas. Adjacent to the Study Area, the Santa Fe Regional Trail follows riparian habitat from the Palmer Lake Recreation Area into Monument where Crystal Creek crosses the Study Area (El Paso, 2013).

1.2.2 Wildlife Movement Concerns

The presence of interconnected, protected lands described above allows the movement of wildlife in the vicinity of the Study Area. Although spikes in wildlife-vehicle collision frequency are reported just south of the El Paso County line (mile post [MP] 162-163) and in the Larkspur area (MP 170-175), wildlife-vehicle conflicts occur throughout all three project segments (see Figure 2). Currently there are no formal wildlife crossings and the existing potential wildlife crossings (For example, underpasses and overpasses) are generally not sufficiently open enough to accommodate large mammal movement; this results in mortality of wildlife when animals attempt to cross the highway. Railroads and frontage roads that parallel the Study Area present additional constraints to wildlife movement through this area.

Over the past 10 years, CDOT records indicate an average of 3,300 reported wildlife conflicts per year in the state of Colorado (CDOT, 2016b). According to the CDOT website, these records have included: mule deer, white-tailed deer, elk, pronghorn, moose (*Alces alces*), bighorn sheep (*Ovis canadensis*), black bear, mountain lion, bobcat, coyote, fox, badger (*Taxidea taxus*), beaver, porcupine (*Erethizon dorsatum*), rabbit (*Sylvilagus* and *Lepus* spp.), raccoon (*Procyon lotor*), skunk (*Spilogale* spp.), prairie dog (*Cynomys* spp.), squirrel, raptors, owls, pheasant (*Phasianus colchicus*), cows, horses, cats, and dogs (CDOT, 2016c).

Wildlife conflicts, which increase during migration season and tend to occur in low-lighting conditions, present safety concerns for both wildlife and motorists, and can result in extremely costly damages. Between 2011 and 2015, 291 animal vehicle crashes were reported in the Study Area. Eighty eight percent of these incidents resulted in property damage only, with 12 percent resulting in human bodily injury; no animal vehicle accidents resulting in a human fatality were reported (CDOT, 2017).

Wildlife conflicts appear to decrease somewhat in areas closer to cities where traffic levels are greatest, and at the times of day when traffic flows are the highest (CDOT, 2016b; CSP 2016b). It is likely that high traffic levels on I-25, combined with other factors such as human activity, housing developments, topography, and relative lack of suitable habitat, discourage wildlife from attempting crossings closer to cities (SREP, 2006).

Wildlife conflict data from CPW, CDOT, and the CSP were collected and inferred to look at trends within the Study Area. CDOT maintenance crews provided wildlife conflict data within the Study Area for the 2005 to 2016 timeframe (CDOT, 2016d). Within the majority of the Study Area, CDOT has recorded fewer than five wildlife conflicts per mile from 2005 through 2016. Segment 1 of the Study Area reports the highest number of wildlife conflicts per mile (see Figure 3). Within Segment 1, the highest concentration of wildlife conflicts is located from MP 160 to MP 166 (south of Larkspur), and MP 174 to MP 175 (north of Larkspur). Refer to Figures 3 and 4, and the Environmental Data Mapbook (located in the attachment at the end of Appendix H) developed in support of the I-25 Planning and Environmental Linkages (PEL): CO Springs Denver South Connection. Both the figures and data mapbook show the wildlife conflict locations and numbers of conflicts at each location within the Study Area.

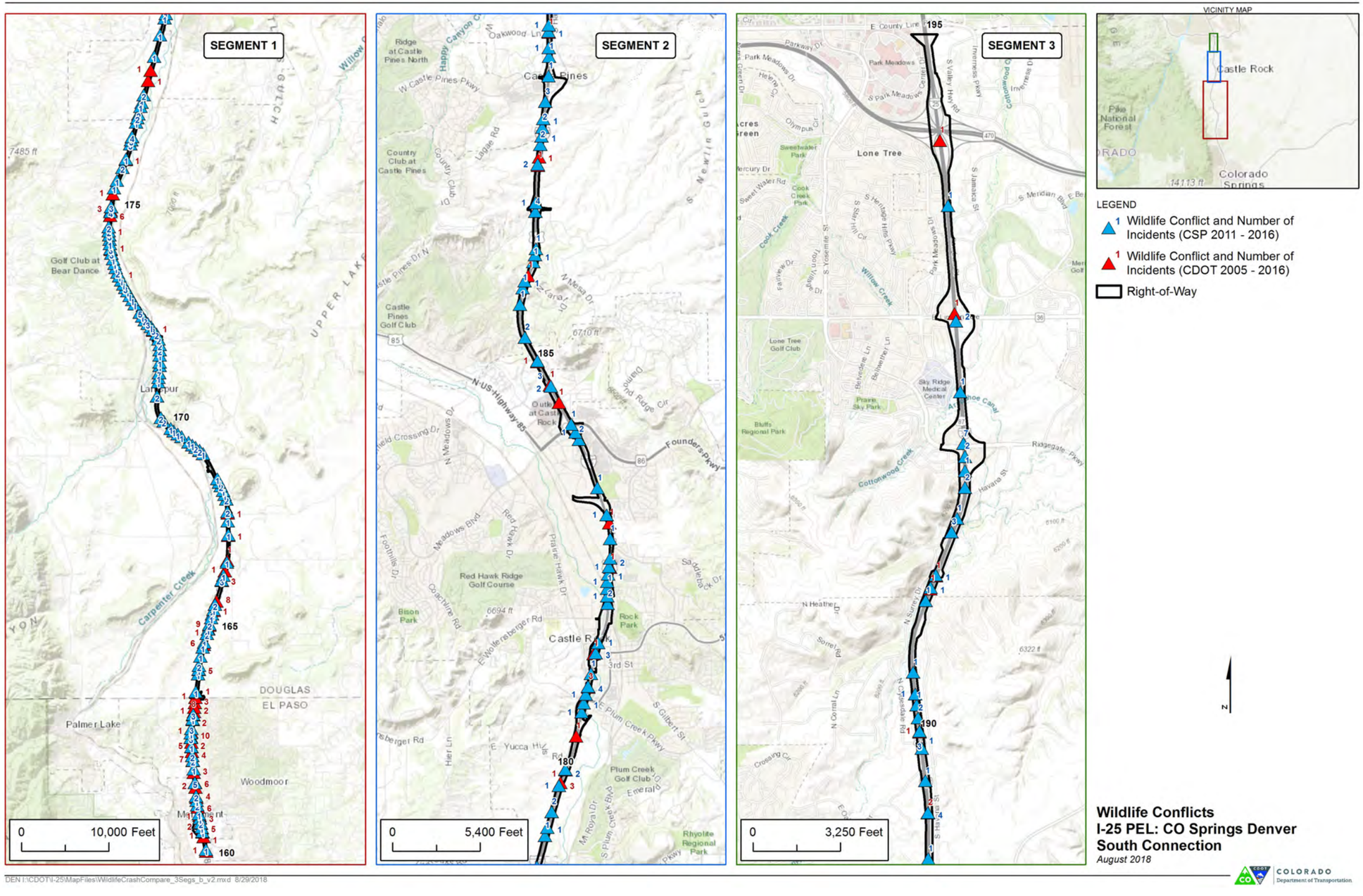


Figure 2. Wildlife-Vehicle Conflicts

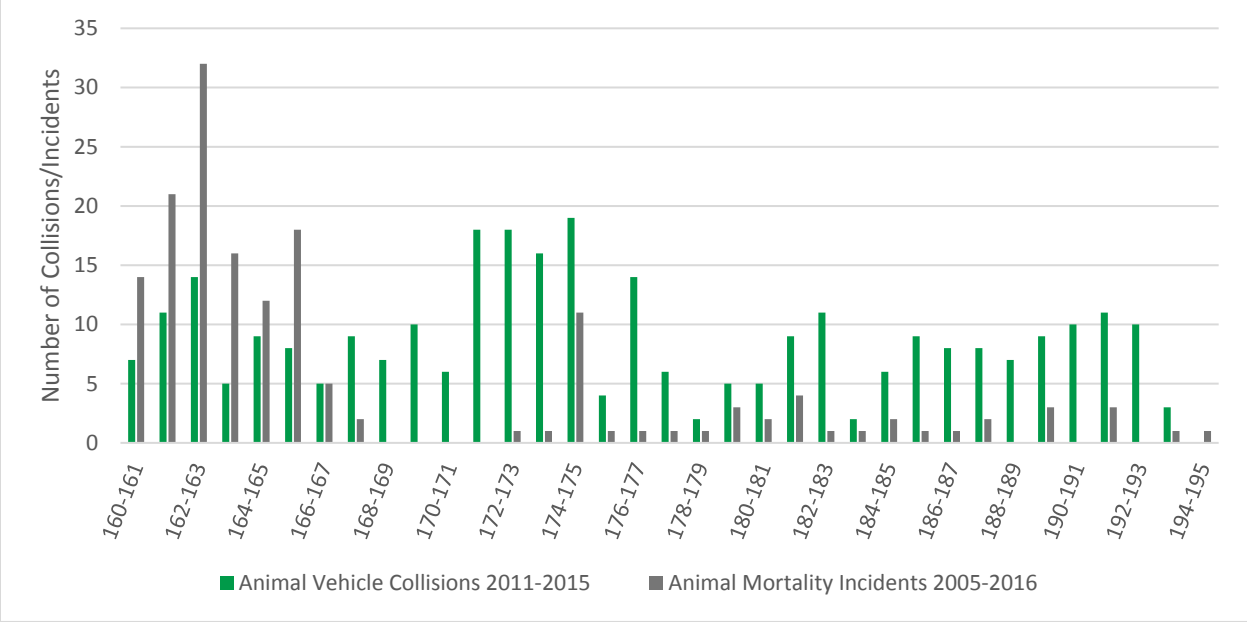


Figure 3. Wildlife Conflicts – Colorado State Patrol 2011-2015 and Colorado Department of Transportation 2005—2016

Source: CSP, 2016; CDOT, 2016d

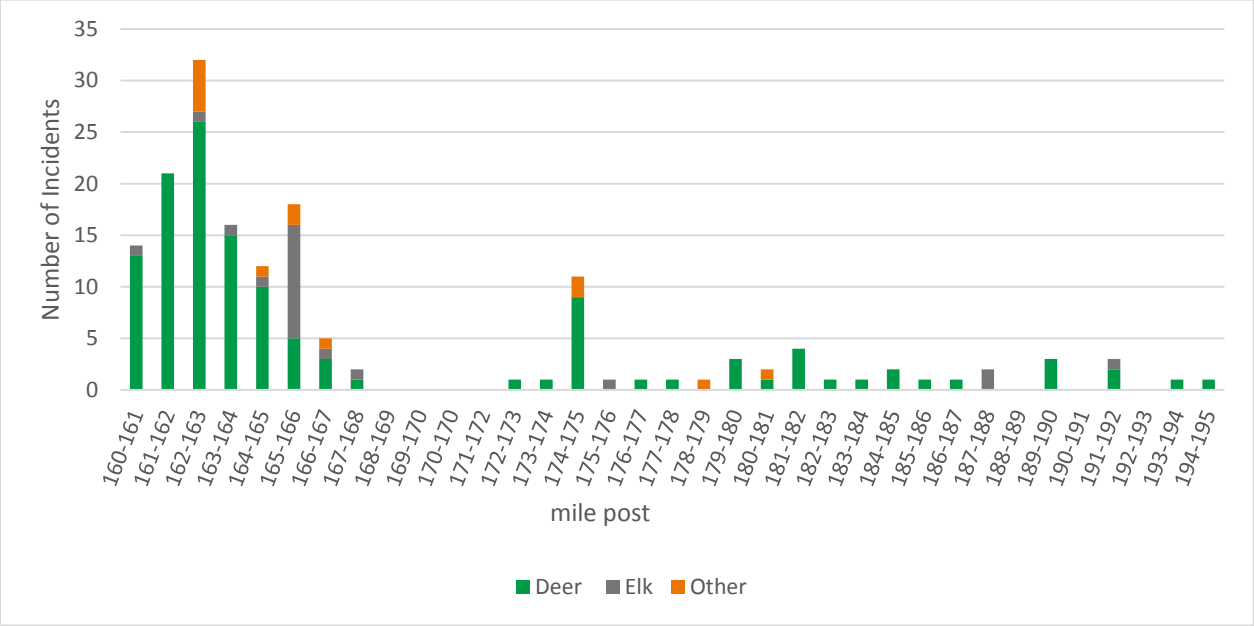


Figure 4. Wildlife Conflicts by Species from 2005 through 2016

Source: CDOT, 2016d

Note: "Other" consists of fox, black bear, coyote, porcupine, raptors, and unidentified animals.

CSP provided wildlife conflict data within the Study Area for the 2011 to 2015 timeframe. The CSP data contained additional information pertaining to the conditions surrounding each wildlife conflict. Based on this data, Segment 1 contains the highest number of wildlife conflicts. The largest concentration of wildlife conflicts occurs directly north of Larkspur, between MP 171 and MP 175. The area directly north of Monument, between MP 161 and MP 163 also reported high occurrences of wildlife conflicts. Figures 3 and 4 depict CDOT and CSP wildlife conflicts by MP (CDOT, 2016d; CSP, 2016). The highest number of wildlife conflicts were recorded in June and November (refer to Figure 5). Wildlife conflicts recorded

during this time peaked between 3:00 and 5:00 am. and between 9:00 and 10:00 p.m., with over half of all collisions occurring in dark, unlighted conditions (Table 1, Figure 6, [CSP, 2016]). As shown in Figure 4, the majority of wildlife conflicts within the Study Area involve mule deer (128 incidents) and elk (21 incidents). Other species involved in wildlife conflicts during the 2005 to 2016 timeframe included three fox, two black bear, one coyote, one porcupine, one hawk, one raptor, and four unidentified animals (CDOT, 2016d). Overall, the areas with more wildlife conflicts were located primarily in the southern portions of the Study Area, away from high density development and generally coincide with protected land that provide high quality habitat for wildlife.

By their nature, wildlife-vehicle conflicts are underreported. In night driving or other poor visibility conditions, and, depending on the size of the animal and type of strike, an animal may be struck without the driver being aware an impact has occurred. Additionally, depending on the severity of damage to the vehicle, the driver may choose not to alert authorities of the impact, especially if the vehicle remains drivable.

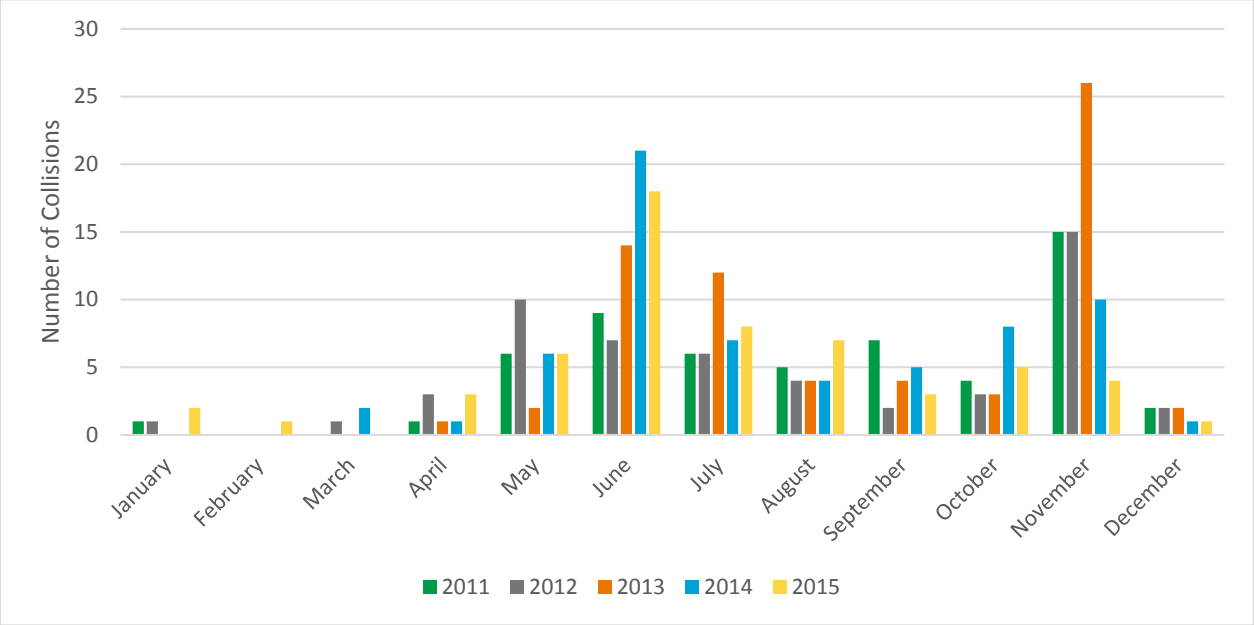


Figure 5. Wildlife Conflicts by Month from 2011-2015
Source: CSP, 2016

Table 1. Lighting Conditions for Wildlife Conflicts from 2011-2015

Lighting Condition at Time of Incident	Number of Incidents
Daylight	20 percent
Dawn or Dusk	7 percent
Dark – Lighted	15 percent
Dark – Unlighted	58 percent
Daylight	20 percent

Source: CSP, 2016

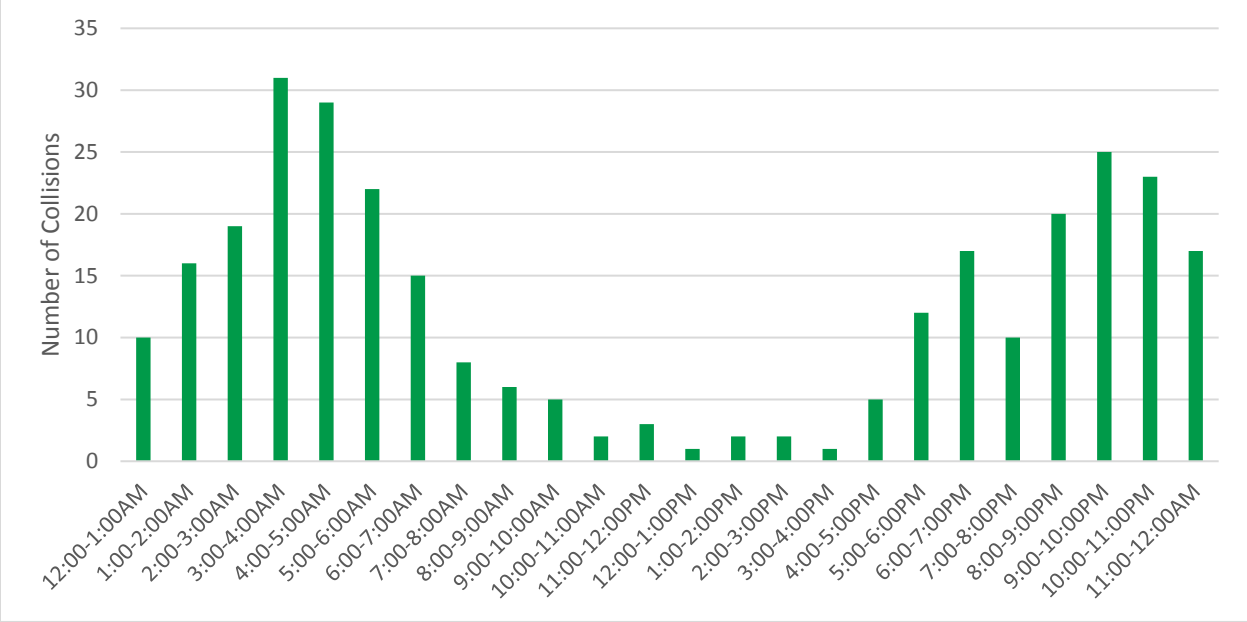


Figure 6. Wildlife Conflicts by Time of Day 2011-2015
Source: CSP, 2016

1.2.3 Potential Wildlife Crossing Locations

A complete inventory of existing structures and culverts within the Study Area has not been completed. However, the Southern Rockies Ecosystem Project (SREP) completed an inventory of structures and culverts for the area from MP 163 to MP 177 in the 2006 *Linkage Assessment,* which covers most of Segment 1 (SREP, 2006). Results of this inventory are provided in Table 2. Comparable linkage studies have not been conducted for Segments 2 and 3.

A complete inventory of existing structures and culverts in the Study Area will be developed in conjunction with project survey. Next steps will include a reevaluation of openness factors for all existing culverts within Segment 1, and recommendations for proposed wildlife overpasses and underpasses in limiting areas. Openness is only one measure of the suitability of a wildlife crossing. Other factors that will be taken into consideration could include culvert design, land use, fencing, stream presence, adjacent habitat, lighting, and potential for human use, among others.

The East Plum Creek/Raspberry Butte/Larkspur Butte Focal Zone (Figure 7), which extends for 4 miles between MP 168.5 and MP 172.5, was identified by the SERP study as an area of particular significance to wildlife movement. This area was identified as a focal zone for the following reasons:

- This zone captures the least developed portion of the linkage and contains extensive contiguous wildlife habitat for a diversity of species.
- Extensive protected lands adjacent to this zone ensure that approaches for potential wildlife crossings would be preserved.
- According to data examined during development of the 2006 *Linkage Assessment*, this zone ranges from nine to eleven wildlife conflicts per mile, including two recorded collisions with mountain lions.

A fill slope and two span bridges located within the focal zone present excellent opportunities for enhancing and constructing wildlife crossings through this segment of roadway.

Table 2. SREP Inventory of Potential Wildlife Crossing Locations – MP 163 to MP 177

Approximate MP	Description	Length (m)	Width (m)	Height (m)	Openness[a]	Wildlife Detected[b]
Bridge/Overpass Structure						
172	The Larkspur exit spans I-25 with a 2-lane paved road.	-[c]	-	-	N/A	N/A
172	Railroad tracks and a dirt/gravel service road span I-25.	N/A	16.3	N/A	N/A	Deer
172.5	Two-partition bridge spanning East Plum Creek.	34.3	32	4	1.87	Bobcat, coyote, deer
174	Overpass providing local road access to I-25.	-	-	-	N/A	N/A
Culvert Structure						
167	A tributary of East Plum Creek passes through a three-park box culvert.	56.2	15.6	4	0.37	Coyote, cow, horse, raccoon
167	Box culvert for 1-lane paved road.	42.8	4.3	4.4	0.44	N/A
167.5	Cattle crossing culvert with gates blocking access. Located near Rattlesnake Butte.	-	4.3	3	-	N/A
168.5	Cattle crossing culvert with a wooden gate blocking the east entrance. Located near Rattlesnake Butte.	-	-	-	-	N/A
171.5	Small box culvert located on the north side of the saddle between the two buttes before the highway drops into the East Plum Creek drainage. Situated beneath 3 to 4 meters of fill.	-	0.8	0.8	-	Coyote, deer, elk
172	Box culvert with a wetland located to the west and a farm located to the east. A small road provides interstate access just north of this structure. Located on the north side of the saddle between the two buttes before the highway drops into the East Plum Creek drainage.	100	4.2	~4[d]	~0.17	N/A
173	Two-chambered box culvert structure.	49.8	5.2	1.3	0.14	Deer, elk, bobcat, skunk
174	Box culvert drops down halfway under highway (For example, the east end is lower than the west end) and narrows.	-	~2	~3	-	Deer
174.5	Box culvert is narrower at east end.	-	~3	~3	-	Deer
175	Pipe box culvert with standing water on the east side.	-	3.1	2	-	Bear, raccoon
176	Box culvert.	-	<1	<1	-	N/A

Approximate MP	Description	Length (m)	Width (m)	Height (m)	Openness[a]	Wildlife Detected[b]
176.5	Double-pipe culvert. Only one end is visible.	-	~1.5	~1.5	-	N/A
177	Concrete box culvert.	84.5	1.9	2.1	0.05	N/A
Road Stream Crossing						
167	Three-partition box culvert for tributary of East Plum Creek. Substrate through structure is artificial. < 10 percent of the total area through structure is aquatic.	N/A	N/A	N/A	N/A	Species of special concern or native fish species within 5 km of crossing location
172.5	Large two-partition bridge over East Plum Creek. Substrate through structure is cobble, gravel, and sand. 11-25 percent of the total area through structure is aquatic.	N/A	N/A	N/A	N/A	Species of special concern or native fish species within 5 km of crossing location

Source: SREP, 2006

[a] Openness = (Width x Height)/Length

[b] "Wildlife detected" indicates that tracks, scat, carcass, and/or live animal were detected.

[c] No information is available.

[d] An approximate measurement. approximately

km = kilometer(s)
m = meter(s)
N/A = not applicable

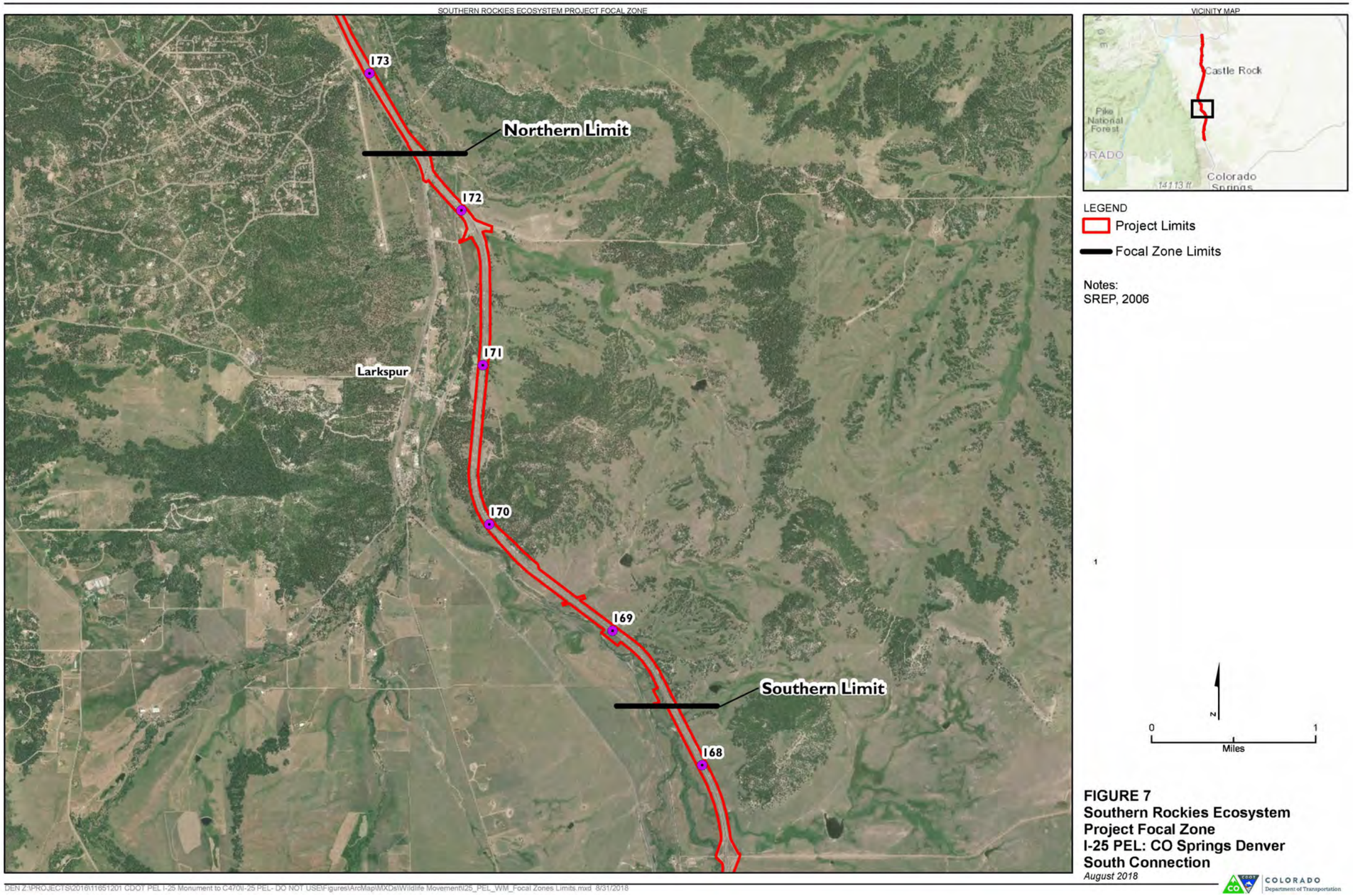


Figure 7. Southern Rockies Ecosystem Project Focal Zone

1.3 Scoping Input

Public and agency scoping input pertaining to wildlife movement will be obtained throughout the planning process for I-25 between C-470 and Monument. Table 3 provides details on scoping input that relates to wildlife movement obtained so far.

Table 3. Scoping Input

Date	Source	Summary
November 17, 2016	CDOT Maintenance Meeting (2016e)	Meeting was held to discuss available vehicle-animal collision data in the Study Area and to discuss issues with infrastructure, maintenance, and safety. Priorities and potential solutions for existing issues were also discussed.
December 6, 2016	Resource Agency Meeting (2016)	Meeting with representatives from CDOT, CPW, US Environmental Protection Agency, US Fish & Wildlife Service, State Historic Preservation Office, Colorado Department of Health and Environment, El Paso County, Douglas County, The Conservation Fund, and the consultant team to discuss to discuss the planning process. Existing conditions pertaining to wildlife movement were discussed. Potential funding sources for wildlife improvements or enhancements were also discussed. Agencies indicated that wildlife fencing is not effective without a sufficient number of wildlife crossings. Without an adequate number of crossings, fencing is disruptive to wildlife movement.
December 29, 2016	CPW Meeting (2016c)	Meeting with CPW and the consultant team to discuss existing data pertaining to wildlife conflicts in the Study Area and to acquire input from CPW on the status of the Wildlife Movement Technical Memorandum. CPW will continue to provide input as part of a wildlife movement task force.
January 12, 2017	I-25 South PEL comments from the CDPHE (2016)	The CDPHE – Water Quality and Control Division provided preliminary feedback pertaining to potential waterway concerns associated with potential project-related construction activities.

CDPHE = Colorado Department of Public Health and Environment

As future projects are programmed from the PEL, each resource, including wildlife and associated resources, will be evaluated during the National Environmental Policy Act of 1969 phase of project development. The National Environmental Policy Act evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

2.0 References

Chapman, S.S., Griffith, G.E., Omernik, J.M., Price, A.B., Freeouf, J., and Schrupp, D.L. 2006. “Ecoregions of Colorado” (color poster with map, descriptive text, summary tables, and photographs). Reston, Virginia. U.S. Geological Survey (map scale 1:1,200,000).

Colorado Department of Public Health and Environment (CDPHE). 2017. *Comments to PEL for I-25 South Resource Agency*. January 12.

Colorado Department of Transportation (CDOT). 2013. “Wildlife Program Book.” Colorado Department of Transportation. Last updated September 2013.

Colorado Department of Transportation (CDOT). 2016b. *Wildlife on the Move!* Colorado Department of Transportation. https://www.codot.gov/programs/environmental/wildlife/wildlifeonthemove. Accessed November 30, 2016.

Colorado Department of Transportation (CDOT). 2016c. *Annual Roadkill Reports*. Colorado Department of transportation. https://www.codot.gov/programs/environmental/wildlife/data/annual-roadkill-reports. Accessed November 11, 2016.

Colorado Department of Transportation (CDOT). 2016d. *Wildlife Conflict Data.* Roadkill data for 2005-2016 provided by CDOT Maintenance for I-25 mile posts. pp. 160-195.

Colorado Department of Transportation (CDOT). 2016e. *Maintenance Meeting.* November 17.

Colorado Parks and Wildlife (CPW). 2016a. *Avoid Wildlife Collisions.* Colorado Parks & Wildlife. http://cpw.state.co.us/learn/Pages/AvoidWildlifeCollisions.aspx. Accessed November 30, 2016.

Colorado Parks and Wildlife (CPW). 2016b. *Wildlife Viewing*. Colorado Parks & Wildlife. Wildlife viewing guides and maps. http://cpw.state.co.us/thingstodo/Pages/Viewing.aspx. Accessed November 30, 2016.

Colorado Parks and Wildlife (CPW). 2016c. *Meeting Minutes.* December 29.

Colorado State Patrol (CSP). 2016. *Animal Vehicle Collision Data.* Colorado State Patrol. CSP data for 2011-2015 provided by CDOT for I-25 mile posts. pp. 160-194.

Douglas County. 2006. *Habitat Conservation Plan and Environmental Assessment for Douglas County and the Towns of Castle Rock and Parker.* Prepared by Douglas County and the towns of Castle Rock and Parker. May 2006.

Douglas County. 2012. *Douglas County 2030 Parks, Trails, and Open Space Master Plan.* Douglas County Community Planning and Sustainable Development Department, Planning Services Division – Parks, Trails, and Open Space Section. Douglas County Planning Commission November 5, 2012.

Douglas County. 2014. *Douglas County 2035 Comprehensive Master Plan.* Douglas County Department of Community Development, Planning Services Division. Adopted by the Douglas County Planning Commission June 16, 2014.

Douglas County. 2016. *GIS Open Data Site for Douglas County, Colorado*. Douglas County, Colorado. http://gis.dougco.opendata.arcgis.com/datasets/. Accessed November 29, 2016.

El Paso County. 2013. *El Paso County Parks Master Plan*. El Paso County, Colorado. http://gis.dougco.opendata.arcgis.com/datasets/. Accessed December 2, 2016. Updated June 2013.

Federal Highway Administration (FHWA). 2011. *Wildlife Crossing Structure Handbook – Design and Evaluation in North America.* Federal Highway Administration. Central Federal Lands Highway Division. Publication No. FHWA-CFL/TD-11-003. March 2011.

Gibbs, J. 2016. *Missing link to wildlife corridor secured – Douglas County buys land for 'wonderful wildlife habitat' that was also eyed for housing development.* Posted in Castle Rock News-Press. October 29, 2016. http://castlerocknewspress.net/stories/missing-link-to-wildlife-corridor-secured,238281. Accessed December 29, 2016.

Hough, A. *2016. I-25 PEL – Wildlife Movement*. Email communication with Andy Hough, Environmental Resources Coordinator. Douglas County Open Space & Natural Resources. December 6, 2016.

Resource Agency. 2016. *Meeting Minutes.* December 6.

Southern Rockies Ecosystem Project (SREP). 2006. *Interstate 25 Douglas County Linkage Assessment. Linking Colorado's Landscapes Phase II Report.* Southern Rockies Ecosystem Project. Denver, Colorado.

United States Geological Survey (USGS). 2016. *National Hydrology Dataset*. https://nhd.usgs.gov/.

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Visual Resources Technical Memorandum

I-25 PEL: CO Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
21102

Contents

Acronyms and Abbreviations

CDOT	Colorado Department of Transportation
FEIS	Final Environmental Impact Statement
DOLA	Colorado Department of Local Affairs
FHWA	U.S. Federal Highway Administration
Front Range	eastern slope of the Rocky Mountains
I-25	Interstate 25
MP	mile post
NEPA	National Environmental Policy Act
RTD	Regional Transportation District
Study Area	from the I-25/C-470/E-470 interchange at the north end of the project to the intersection of I-25 and State Highway 105 at the Town of Monument
US 85	US Highway 85
VIA	visual impact assessment

1.0 Visual Resources

1.1 Local Planning for Visual Resources

1.1.1 Monument Comprehensive Plan

The Monument Comprehensive Plan (Town of Monument, 2017) specifically calls out the need to protect views from the Interstate 25 (I-25) corridor. Toward this end, the Town will create a visual overlay district to direct development in a way that preserves views through methods such as providing adequate setbacks and stepped-back building heights.

The plan describes input received from the public, stating, "[c]itizens remain concerned about the views one sees from the I-25 corridor and views from the east side of I-25 toward the mountains... Specifically, the citizens of Monument want to ensure that the views from the I-25 corridor provide a strong small town community identity by providing adequate open lands, trees, and buffers to deter noise and protect views."

1.1.2 2000 Tri-Lakes Comprehensive Plan

The Tri-Lakes Comprehensive Planning area includes communities in unincorporated northern El Paso County, at the southern end of the Study Area. The vision set forth in the 2000 Tri-Lakes Comprehensive Plan (El Paso County, 1999) emphasizes the natural beauty of the Tri-Lakes area, with unparalleled views of Pikes Peak, unique rock formations, and sightings of the abundant wildlife. Goal 2.3 of the plan is "[t]o preserve and protect significant visual resources." The objectives listed for this goal are to:

- Encourage site design and development standards that protect and preserve the character of the natural landscape.
- Preserve and reinforce panoramic views of the mountains and plains.
- Protect the environmental and visual quality of surface waters.
- Consider the individual character unique to each sub area.
- Preserve, protect, and maintain area lakes for all to enjoy, including visual leases, with property owners.
- Support protection of environmentally sensitive lands.

Specific to the I-25 corridor, this plan addresses development near the interstate with a focus on preserving the "views of the dramatic mountain backdrop from the top of Monument Hill down through Monument Valley extending south to the Air Force Academy," which serves as a point of entry into El Paso County. Maintaining the visual integrity of the views of the dramatic mountainous landscape in contrast to the rolling grasslands of the Greenland Ranch is a goal of the plan in reference to I-25.

1.1.3 El Paso County Parks Master Plan

The El Paso County Parks Master Plan (El Paso County, 2013) specifically details the character of the landscape and significant landforms in the county. The landscape types found in El Paso and described by the plan are Southern Rocky Mountains, Foothills and Transitional, and High Plains. Important landforms/landmarks listed in the plan are Table Rock, Elephant Rock, Cathedral Rock, Pulpit Rock, Monument Rock, Fremont Fort, and Ben Lomond Mountain.

The plan refers to the I-25 corridor as an important viewshed and stipulates that development should respect the community's character and sense of place.

1.1.4 Douglas County Comprehensive Master Plan

Douglas County's Comprehensive Master Plan (Douglas County, 2014) contains several objectives and policies that pertain to visual resources:

- Objective 2-2A: Balance development with preservation of environmental and visual resources (2-2).
- Policy 2-5A.1: Locate development away from environmentally and visually sensitive lands, including, but not limited to, primary ridges, bluffs, and horizon lines.
- Policy 2-5A.2: Protect the integrity of urban areas by protecting, where appropriate, views to and from significant natural features (2-4).

1.1.5 Castle Rock 2030 Comprehensive Master Plan

Visual resources are an integral part of Castle Rock's 2030 Comprehensive Master Plan (Castle Rock, 2017 [current updated draft]). The plan incorporates the 2013 Draft 2030 Vision, which lists "Town Identity" as one of the "Town Cornerstones," stating the need to "[p]reserve open space areas in and surrounding Castle Rock to protect the Town's natural environment, ridgelines and scenic views, and to maintain a physical separation from surrounding communities."

Goal 2-2 of the Plan is to "[s]upport environmental systems comprised of water, wildlife, wildlife habitat, recreation, and sense of place," under which is listed Objective 2-2A: "Balance development with preservation of environmental and visual resources."

1.1.6 Conservation Easements and Open Space

A large portion of the southern half of the I-25 South corridor, between County Line Road and Sky View Lane, is situated among a collection of protected open spaces as a result of concerted efforts on the part of Douglas County and agencies such as the Douglas Land Conservancy. From County Line Road north to Castle Rock, much of the land abutting the I-25 corridor is either publicly owned open space or private land under conservation easement. The conservation easements prevent the encroachment of development pressures from the north and the south by limiting the uses on these properties with the intent of preserving specific values. While these values vary from property to property, commonly protected values along the I-25 Gap corridor include rural character, scenic vistas, recreation, and wildlife habitat. The publicly owned open space and the private lands under conservation easements form a large, contiguous network of habitat and rural open space that provides connectivity for wildlife movement and creates uniquely beautiful and undisturbed views from I-25.

1.2 Existing Aesthetic Guidelines

1.2.1 I-25 Lincoln Avenue to Castle Rock Aesthetic Study and Design Guidelines

These 2002 guidelines apply to the northern 14 miles of the I-25 South Corridor between Lincoln Avenue in Lone Tree and what was originally Douglas Lane in south Castle Rock (now Crystal Valley Parkway) and were produced as part of the South I-25 Corridor and US Highway (US) 85 Corridor Final Environmental Impact Study (FEIS). They provide an overview of the corridor setting, and inventory of aesthetic treatments and elements existing at the time of the guidelines' publication, and design standard options for use in the project corridor. The standards identify wall textures, colors, slopes, guardrail types, sound wall design, lighting standards, sign types, and landscaping. The color palette identified by these guidelines was chosen to create an identifiable highway aesthetic that also coordinates with existing elements and general landscape colors.

1.2.2 US 85 C-470 to Castle Rock Aesthetic Study and Design Guidelines

Also prepared as part of the South I-25 Corridor and US 85 Corridor FEIS, these 2002 guidelines apply to the stretch of US 85 between Colorado State Highway 470 (C-470) at the north end and the interchange with I-25 at Founders Parkway at the south end. The guidelines provide an inventory of the setting and existing aesthetic elements at the time, and provide a set of recommendations for the colors, styles, and finishes for bridge and roadway elements for developing projects.

1.2.3 I-25 Colorado Springs

The I-25 in Colorado Springs Corridor Improvements Design Build Architectural Design Requirements were developed in 2004 for the I-25 Design-Build project, which implemented a variety of projects to improve capacity, including interchange reconstructions and lane additions. These guidelines provide details on requirements for bridges and walls through the project area, ending at Monument. Three different categories of bridges are described in these plans, ranging from highly prescriptive and stylized urban gateway bridges to more simple bridge standards for less populated or less visually significant structures.

1.3 Setting Inventory

An inventory of the visual setting is presented below. This inventory was developed using both field visits and review of online mapping, including Google Earth.

1.3.1 Segment 1

1.3.1.1 Monument/Woodmoor (Mile Post [MP] 160 – 164.5)

This landscape unit encompasses terrain that slopes gradually upward from State Highway 105 toward the Palmer Divide at the El Paso County/Douglas County line. It includes a portion of the Town of Monument and the unincorporated community of Woodmoor. Because much of the land near the I-25 corridor has been developed, this landscape unit has a suburban character. Traveling in the southbound direction, the Rocky Mountain foothills are clearly visible over the valley.

A representative photo of this landscape unit is seen in Figure 1.

Figure 1. Photo of Monument/Woodmoor Landscape Unit

1.3.1.2 Greenland (MP 164.5 – 168)

In this landscape unit, the highway travels through a broad, open valley that has maintained a highly rural appearance because most of the land is protected as open space through conservation easement. On the west side of I-25 is a part of Greenland Ranch, owned by Douglas County for use as public open space. The historic Greenland townsite is visible on the west side, where there is a small scattering of old commercial and ranch buildings. A large red barn, which is a frequently photographed landmark, is visible from I-25. On the east side, private ranch land is also under conservation easement to preserve views and open space. Views of these lands are of rolling grassland in the foreground and geologic landmarks in the mid-to-background, including Rattlesnake Butte, Larkspur Butte, Dawson Butte, and Monkey Face.

A representative photo of this landscape unit is seen in Figure 2.

Figure 2. Photo of the Greenland Landscape Unit

1.3.1.3 Larkspur (MP 168 – 174.6)

In the Larkspur landscape unit, the interstate travels through the narrow valley along East Plum Creek and Carpenter Creek, where the interstate has a series of curves as it travels through the narrow valley and along the toes of a series of forested buttes. On the west side of I-25 from the landscape unit's southern boundary at MP 168 to the southern end of the Town of Larkspur near MP 170.8, essentially all the land along the interstate is either publicly owned open space or protected under conservation easement. On the east side of the interstate, virtually all the land visible from the highway is ranch land that is protected from development by a conservation easement. Nodes of development along the highway corridor in this landscape unit exist in the Town of Larkspur and at the Jellystone Campground Park campground at the Sky View Lane exit near MP 173.8. With the exception of two billboards and a new truck stop at Upper Lake Gulch Road, development in the Town of Larkspur is not visible from I-25 because it is screened by intervening topography and vegetation.

A representative photo of this landscape unit is seen in Figure 3.

Figure 3. Photo of the Larkspur Landscape Unit

1.3.1.4 Plum Creek Valley (MP 174.6 – 179)

In the Plum Creek Valley Landscape Unit, the interstate travels through the broad, open valley along East Plum Creek. Here, the interstate is generally flat and straight as it travels through the wide valley. The valley is defined by low ridges to the east and by a series of ridges that include Dawson Butte to the west. On the south, it is defined by Hunt Mountain. Between MP 174.6 and MP 175.5, the land that borders the interstate on the east is publicly owned open space that includes the Columbine Open Space. The lands to the east of the railroad tracks that define the eastern edge of these publicly owned lands are protected from development by conservation easements.

On the flat lands along the interstate corridor there is relatively little development. Along much of the highway, the nearby lands maintain the appearance of open ranch lands. To the extent that there is development close to the interstate, it is concentrated in the area between MP 179 and MP 180.9 within Castle Rock's town limits. Along much of the corridor in this landscape unit, substantial numbers of large, single-family homes on large lots can be seen on the surrounding hillsides, 0.4 to 1 mile and more from the highway. In most of this landscape unit, I-25 is a rural, four-lane highway; however, near MP 179 it transitions to three lanes in each direction.

A representative photo of this landscape unit is seen in Figure 4.

Figure 4. Photo of the Plum Creek Valley Landscape Unit

1.3.2 Segment 2

1.3.2.1 Castle Rock (MP 179 – MP 187)

This landscape unit begins at Crystal Valley Parkway, which provides access to a newer residential area that has developed rapidly over the past decade and is slated to continue developing. Moving into Castle Rock to the north, the Castle Rock Butte rock formation becomes the focal point of views from the interstate and the surrounding community. As I-25 travels through Castle Rock, areas of commercial, institutional, and light industrial development can be seen on both sides of the interstate. On the north side of the Town of Castle Rock, pine forest screens large, single family residential lots abutting the highway on both sides between MPs 185 and 187. In the southbound direction through this wooded area, the interstate curves eastward as it descends into the community, offering views of the town, including its namesake butte formation.

A representative photo of this landscape unit is seen in Figure 5.

Figure 5. Photo of the Castle Rock Landscape Unit

1.3.2.2 Castle Pines (MP 187 – MP 189)

At Happy Canyon Road moving northward, the landscape becomes more rural beyond the development of Castle Rock. Some commercial development is presently centered on the Castle Pines Parkway interchange. All development is currently on the west side of I-25, but Castle Pines has plans for development on the east side.

1.3.3 Segment 3

1.3.3.1 RidgeGate South (MP 189 – MP 192)

Through this landscape unit, the view consists primarily of low rolling hills in the foreground with grassy vegetation. Historic Schweiger Ranch can be seen directly to the east of the interstate at MP 192. At approximately MP 191.5, the Happy Canyon creek bed with its heavier vegetation and trees winds next to the interstate and crosses under the roadway to the west side. When traveling southbound past Castle Pines Parkway, travelers can see Pikes Peak in the distance.

A representative photo of this landscape unit is seen in Figure 6.

Figure 6. Photo of the Castle Pines Landscape Unit

1.3.3.2 Lone Tree (MP 192 – 195)

From RidgeGate Parkway to the C-470/E-470 interchange in the Town of Lone Tree, the landscape transitions from open undeveloped grasslands to dense development with multifamily residential, institutional, and office buildings. The Regional Transportation District (RTD) Southeast Rail Extension line is currently under construction to extend the southern light rail lines down to the new RidgeGate station Park and Ride. In this landscape unit, views beyond adjacent parcels are limited.

A representative photo of this landscape unit is seen in Figure 7.

Figure 7. Photo of the Lone Tree Landscape Unit

1.3.4 Existing Aesthetic Features Inventory

1.3.4.1 Overview

This inventory documents the existing highway and bridge elements present in the I-25 South corridor. This inventory was prepared based on field observations and photography and on systematic review of Google Earth Street View photography for the corridor. The results of this research are documented in the attached Photo Inventory of Existing Aesthetic Elements. These figures consist of a set photographs with locations depicted on a map of the corridor and provide an understanding of the appearance of existing corridor features. The photos include views of all bridge structures and walls in the corridor, along with representative light poles and fixtures; signs; medians, median barriers, roadway edge barrier, and fences; and landscaping.

Review of the photos in the attached Photo Inventory of Existing Aesthetic Elements reveals that within the 34-mile corridor, a range of designs exist for the highway features. This range reflects the fact that in the Monument to Castle Rock segment of the corridor, there has been relatively little change to the highway since the time of its initial development in the 1960s. In contrast, in the segment from Castle Rock to C-470, there has been an incremental series of modifications to the highway since the 1960s that has resulted in replacement of some of the highway's original features with features whose design reflects both the more developed context of this segment of the corridor and more recent ideas about highway aesthetics. An additional factor that has affected the design of highway elements in the Castle Rock to C-470 segment was the adoption of the Lincoln to Castle Rock Guidelines in 2002 (CDOT, 2002) that has shaped the design of some of the project features that have been developed since then.

1.3.4.2 Bridge Structures

The bridge structures in the corridor reflect a variety of design approaches. Many of the bridges, particularly in the Monument to Castle Rock Gap segment, are utilitarian concrete structures with simple, functional designs, have no architectural enhancements, and make no use of color. The bridge structures fitting this description are those at County Line Road (MP 163.5), Greenland Road (MP 167.5), Upper Lake Gulch Road (MP 171.8), the railroad crossing near Larkspur (MP 171.2), the crossing of Plum Creek (MP 127.3), Spruce Mountain Road (MP 172.4), Liggett Road (MP 182.3), Happy Canyon (MP 186.9), and Oak Hill Lane (189.8). Two of the bridges in the corridor are generally utilitarian in design but include measures to increase their attractiveness. The bridge at Sky View Lane (MP 173.9) is a concrete structure that has modest level of architectural treatment. It is supported by square pillars, and between the pillars, the spans of the deck support structure have a slightly arched form. The railroad bridge that crosses over the highway at MP 182.2 in Castle Rock is an older utilitarian steel structure, the sides of which have been painted in white and brown to create the appearance of an arch.

The rest of the bridge structures in the corridor are newer structures, all of them located in the area from Castle Rock north through Lone Tree, that were designed to include some measure of visual enhancement:

Castle Rock Landscape Unit

The overcrossing of Plum Creek Parkway (MP 180.9) makes use of an accent color for the deck support girder and textured and colored retaining walls in front of the bridge's abutments.

The Park Street/Fifth Street overcrossing of the highway (MP 181.4) has an aesthetically enhanced design that includes a wide, open-appearing span, color treatment for the concrete bridge piers and the bridge's concrete walls, and color treatment for the steel bridge deck support girder. In addition, the retaining wall in front of the bridge's abutment on the east side of the highway is made of blocks with a textured surface appearance that are in several shades of brown that are laid to create a series of horizontal stripes.

The bulky concrete central pier, and the concrete deck support beam of the Wilcox Street/Wolfensberger Road overcrossing of the highway (MP 181.7) have been left in their natural concrete color, but the appearance of the bridge's concrete wall has been enhanced through color treatment that creates a brown stripe. The paving on the slopes in front of the bridge's abutments has a natural concrete color.

The Santa Fe Drive overcrossing of the highway (MP 183.4) has a wide span that creates a sense of space flowing under it and makes use of tinted concrete for the bridge's central piers and for the bridge deck support beam. The bridge's abutments and other elements have a smooth finish, giving the bridge a refined appearance. The paving on the slopes in front of the bridge's abutments has a natural concrete color.

The Meadows Parkway overcrossing of the highway (MP 184.2) incorporates use of tinted concrete for the central bridge piers and the bridge deck support beams. In addition, the retaining walls in front of the bridge's abutments have rounded corners and are constructed of concreted tinted in several tones of brown to create a striping pattern.

The highway's bridge that crosses over Castle Rock Parkway (MP 185.0) has smooth concrete walls that retain their natural concrete color. The bridge deck support beam is painted brown. The retaining wall and wing walls located in front of the bridge's abutments are constructed of textured block that is brown.

Castle Pines Landscape Unit

The design of the Castle Pines overcrossing of the highway (MP 188.5) is very similar to the design of the overcrossing at Santa Fe Drive in Castle Rock (MP 183.4). Like the Santa Fe Drive overcrossing, the Castle Pines overcrossing has a wide span that creates a sense of space flowing under it and makes use of tinted concrete for the bridge's central piers and for the bridge deck support beam. The bridge's abutments and other elements have a smooth finish, giving the bridge a refined appearance. The paving on the slopes in front of the bridge's abutments has a natural concrete color.

The highway's overcrossing of Oak Hill Lane (MP 189.8) is a structure of simple design with a single span that provides an open view down the roadway. The bridge's abutments and other elements have a smooth finish, giving the bridge a refined appearance. The paving on the slopes in front of the bridge's abutments has a natural concrete color.

Lone Tree Landscape Unit

The highway's overcrossing of RidgeGate Parkway (MP 192.0) incorporates several substantial aesthetic design features. The overcrossing spans RidgeGate Parkway without the use of center piers, creating an open view under the structure and down the roadway. The concrete rail running across the top of the overcrossing is white, has a textured surface, has smooth bands at its base and top, and has a series of smooth vertical elements spaced across its face that divide it up into a linear series of rectangles. The bridge deck support beam is light brown. The walls under the overcrossing consist of a series of large, white concrete panels separated by vertical inset areas whose surfaces are brown. On both sides of the parkway as it approaches the overcrossing, there are concrete retaining walls that slope up toward the bridge's deck. These walls have a textured surface on which a series of bands in different shades of brown have been created, suggesting thin bands of exposed rock strata.

The Lincoln Avenue overcrossing of the highway (MP 193.0) makes use of a set of round center piers. It has small concrete abutments and concrete abutment slope paving, all of which has been left with their natural concrete color. The wide bridge deck girder has a smooth brown surface. The thin rail of uncolored concrete that runs across the top of the structure has a smooth surface. The paving on the slopes in front of the bridge's abutments has a natural concrete color.

The C-470 interchange (MP 194.4) consists of a set of high curving ramps supported by tall piers. The interchange has a light, minimalist design that makes it visually interesting and appealing. The concrete of the piers and bridge deck has a light brown tint.

In the Lone Tree landscape unit, in addition to the three highway bridges, there are two pedestrian overpasses that are related to the Denver RTD rail system. The pedestrian overpass at the Lincoln rail station (MP 193.8) consists of a glassed-in walkway that is suspended from a steel arch structure. The overpass has a simple, uncluttered design. Because the walkway consists of a single span that is located relatively high above the roadway, it causes no obstruction of the view up the highway. The pedestrian overpass at the County Line rail station (MP 194.7) has a design that is generally similar. However, because the bridge's span is considerably longer than the one at the Lincoln station, it is supported by two arches and by a pier located in the center of the highway. Like the pedestrian bridge at the Lincoln station it, has clean lines, a light appearance, and does not obstruct views down the roadway.

1.3.4.3 Retaining Walls

Currently, there are no retaining walls or sound walls in The Gap segment of the corridor from Monument to Lone Tree. In the Castle Rock to Lone Tree segment, there is a small number of retaining walls, some along the edge of the highway and others along local roads at points where there are highway overcrossing structures:

Castle Rock Landscape Unit

At the Park Street/Fifth Street overcrossing of the highway (MP 181.4), there is retaining wall in front of the bridge's abutment on the east side of the highway that is made of blocks with a textured surface appearance. The blocks are tinted in several shades of brown and have been laid to create a series of horizontal stripes.

At the highway's undercrossing of the railroad (MP 182.2), there is a retaining wall on the east side of the highway just to the south of the crossing structure that has a smooth concrete surface and a top that curves to follow the slope of the hill that it retains. This wall appears to have been tinted a light brown color.

At the Meadows Parkway overcrossing of the highway (MP 184.2), there are retaining walls in front of the bridge's abutments. These walls have rounded corners and are constructed of concreted tinted in several tones of brown to create a striping pattern.

At the highway's bridge that crosses over Castle Rock Parkway (MP 185.0), there are retaining walls and wing walls located in front of the bridge's abutments that are treated with a fractured fin texture. Two colors are being used, tan on the retaining walls bridge abutments and wingwalls and brown on the bridge piers and wall tops/caps. In addition, on the west side of the highway, there is a poured concrete retaining wall along the southbound on-ramp that has a smooth surface and retains its natural concrete color.

At MP 185.5, there is a concrete retaining wall along the east side of the highway that was constructed using the Colorado Random Reveal pattern. Because this wall received no color treatment, it is natural concrete color.

At the Happy Canyon Road overcrossing of the highway (MP 186.9), the spaces between the bridge abutments and the roadway are occupied by short sections of paved slope that terminate at retaining walls adjacent to the roadway. The walls are constructed of poured concrete with a smooth, uncolored surface.

Castle Pines Landscape Unit

At MP 191.9 there is a section of poured concrete retaining wall bordering the outside edge of the southbound lanes. This wall has a Colorado Random Reveal surface texture bounded by a Type-7

concrete barrier at its base and smooth band at its top. Because this wall segment has not been color treated, it has a natural concrete color.

Lone Tree Landscape Unit

At the overcrossing of RidgeGate Parkway (MP 192.0), the walls under the overcrossing consist of a series of large, light beige concrete panels separated by vertical inset areas with brown surfaces. On both sides of the parkway as it approaches the overcrossing, there are concrete retaining walls that slope up toward the bridge's deck. These walls have a textured surface on which a series of bands in different shades of brown have been created, suggesting thin bands of exposed rock strata.

At MP 193.8, there is a retaining wall along the west side of the southbound lane, adjacent to the Lincoln light rail station and parking garage. This retaining wall is constructed of untinted concrete panels with an offset placement, creating a pattern of discontinuous horizontal seam lines.

1.3.4.4 Sound Walls

At present, the only sound wall in the 34-mile corridor is the sound wall in the Castle Pines landscape unit at MP 188.7 on the west side of the highway, just north of the Castle Pines Parkway exit. This wall is constructed of concrete panels with a "mountain" pattern on their face that consists of a lower fractured fin textures that is brown in color, representing hills or mountains, and a smooth upper area that is cream in color, representing the sky.

In addition to this sound wall, there is a sound attenuation berm in the corridor. It is located at MP 188.8, just north of the sound wall north of the Castle Pines Parkway exit. The slope of the berm that fronts on the highway has been planted with grasses and a thick planting of shrubs.

1.3.4.5 Lighting

Four types of lighting fixtures are used in the Monument to Lone Tree corridor.

The most common fixture type is a tapered steel pole with a cobra-style luminaire that is found along the illuminated segments of the roadway in the Monument landscape unit and in other landscape units in the roadway segments at off-ramps and on-ramp. Typical examples of the cobra-style luminaire can be seen in the photos of the roadway segments at MPs 161.0, 163.6, and 170.3.

In some locations, the cobra-style lighting fixtures make use of a scissor-like support arm like those in the photos taken at MPs 161.8. and 188.2.

At some locations in the Castle Pines and Lone Tree landscape units, some of the lighting fixtures use round luminaires like those in the photo taken at MP 181.1.

In the Lone Tree landscape unit, there are several areas with very tall poles with high-mast luminaire assemblies on top like those in the photos taken at MPs 192.8, 194.0, and 194.4.

In most cases, the poles are untreated galvanized steel, but in a few locations, particularly in the Monument landscape unit, the poles have a dark brown color, like those in the photo taken at MP 160.1.

1.3.4.6 Highway Signage

In the limited number of cases in which signs have been installed adjacent to the highway or in the median, the signs are supported by vertical steel poles, like those seen in the photos taken at MPs 177.1 and 190.3. Most of the signs in the Monument to Lone Tree corridor are overhead signs supported by monotubes. In many cases, the signs are mounted on a cantilever, as seen in the photos taken at MPs 162.9, 167.7, and 188.2. In other places, the signs are mounted on sign bridge structures that span the highway's lanes, as seen in the photos taken from MPs 181.2, 182.85, and 188.5. In the Lone Tree landscape unit, there are two monotube sign bridge structures that create a rectilinear design as seen in

the photo taken from MP 194.7. Although the sign supports have an untreated galvanized steel finish in most cases, there are a few locations, particularly in the Monument area where the supports have been painted brown, as seen in the photos taken at Mileposts 161.0 and 162.2.

2.0 Recommended Next Steps

2.1 Future National Environmental Policy Act Projects

As was done for the early action project in The Gap, future projects in the I-25 South corridor will need to go through the Visual Impact Analysis (VIA) process as prescribed by the Federal Highway Administration (FHWA). Future VIAs will follow the methodology presented in the latest guidance from FHWA, *Guidelines for the Visual Impact Assessment of Highway Projects (*FHWA-HEP-15-029) (FHWA, 2015).

This Initial Corridor Assessment developed for the Planning and Environmental Linkages Study may help future projects to complete the first three steps of the VIA process.

As future projects are programmed from the Planning and Environmental Linkages program, each resource, including visual and associated resources, will be evaluated during the National Environmental Policy Act of 1969 (NEPA) phase of project development. The NEPA evaluation process will be more in-depth and included the determination of potential impacts and mitigation.

3.0 References

Colorado Department of Local Affairs (DOLA). 2017. 2040 Colorado Population Estimates by County. https://data.colorado.gov/Demographics/Total-Population-by-County-by-Year/9dd2-kw29. Accessed June 21, 2017.

Colorado Department of Transportation (CDOT). 2002. *South I-25 Corridor and US 85 Corridor Revised Record of Decision*. October. https://www.codot.gov/library/studies/southi25us85-feis-rod/record-of-decision-rod. Accessed November 15, 2016.

—. 2004a. *I-25, Colorado Springs to Monument Environmental Assessment*. https://www.codot.gov/library/studies/I25EAColoSpgsMonument/environmental-assessment. Accessed November 10, 2016.

—. 2004b. *I-25 Colorado Springs Area Finding of No Significant Impact (FONSI)*. https://www.codot.gov/library/studies/i-25-finding-of-no-significant-impact-fonsi. Accessed November 10, 2016.

—. 2010. *North Meadows Extension to US 85 and I-25 Environmental Assessment.* http://www.crgov.com/DocumentCenter/Home/View/920. Accessed November 9, 2016.

—. 2011. *North Meadows Extension to US 85 and I-25 Finding of No Significant Impact*. http://www.crgov.com/DocumentCenter/Home/View/1240. Accessed November 9, 2016.

—. 2012. *Interstate 25, Colorado Springs to Monument, Mileposts 149 to 161*. Reevaluation. http://hermes.cde.state.co.us/drupal/islandora/object/co%3A21568/datastream/OBJ/view. Accessed Jan 17, 2017.

—. 2014. *Interregional Connectivity Study Final Report*. Division of Transit and Rail. https://www.codot.gov/projects/ICS/ics-draft-report-january-2014. Accessed November 4, 2016.

—. 2015. *Traffic Data Explorer.* Online Transportation Information System (OTIS). https://www.codot.gov/safety/safety-data-sources-information/online-transportation-information-systems-otis. Accessed January 17, 2017.

—. 2016. *Interstate 25 History*. https://www.codot.gov/about/CDOTHistory/50th-anniversary/interstate-25. Accessed November 2, 2016.

U.S. Census Bureau. 2010. Population, Housing Units, Area, and Density: 2010 - State -- Place and (in selected states) County Subdivision. American Fact Finder. https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml Accessed November 2, 2016.

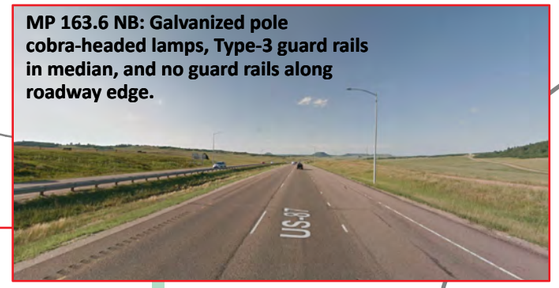
U.S. Federal Highway Administration (FHWA). 2015. *Guidelines for the Visual Impact Assessment of Highway Projects (FHWA-HEP-15-029)*. January. https://www.environment.fhwa.dot.gov/guidebook/documents/VIA_Guidelines_for_Highway_Projects.asp. Accessed March 16, 2017.

Attachment 1
Photo Inventory of Existing Aesthetic Elements

MP 161.0 NB: Start of segment. Median barrier, cobra-headed light pole and brown monotube cantilever sign.

MP 162.9 NB Galvanized monotube cantilever signs and Type-3 guard rails in median and along roadway edge.

MP 163.6 NB: Galvanized pole cobra-headed lamps, Type-3 guard rails in median, and no guard rails along roadway edge.

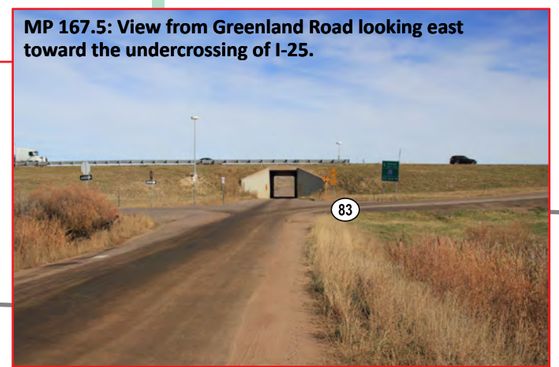


MP 167.7 SB: Galvanized monotube cantilever VMS sign and Type-3 guard rails in median and along roadway edge

MP 162.2 SB: Brown monotube sign bridge sign and Type-3 guard rails in median and along roadway edge.

MP 163.5 NB: County Line Road undercrossing.

MP 167.5: View from Greenland Road looking east toward the undercrossing of I-25.



Palmer Lake
Monument
Woodmoor
Larkspur
Castle Rock
Castle Pines
Lone Tree

EL PASO COUNTY
DOUGLAS COUNTY
ARAPAHOE COUNTY

MONUMENT
GREENLAND
LARKSPUR
PLUM CREEK VALLEY
CASTLE ROCK
CASTLE PINES
RIDGEGATE SOUTH
LONE TREE

Exit **161** SR 105
Exit **163** County Line (Palmer Divide Rd)
Exit **167** E Greenland Rd
Exit **172** Upper Lake Gulch Rd
Exit **173** Spruce Mountain Rd
Exit **174** Tomah Rd (Sky View Ln)
Exit **181** W Plum Creek Pkwy
Exit **182** W Wolfensberger Rd
Exit **184** Meadows Pkwy
Exit **185** Castle Rock Pkwy
Exit **187** E Happy Canyon Rd
Exit **188** Castle Pines Pkwy
Exit **192** Ridgegate Pkwy
Exit **193** Lincoln Ave
Exit **194** C470
Exit **195** E County Line Rd

105 85 C470 83 86 88 E470 25

N

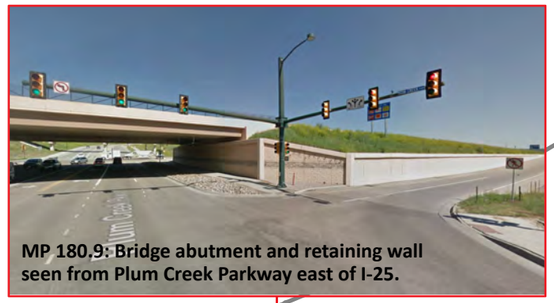
161 Milepost

Landscape Unit Boundary

Photo Inventory of Existing Aesthetic Elements
MP 161.0 - 167.7

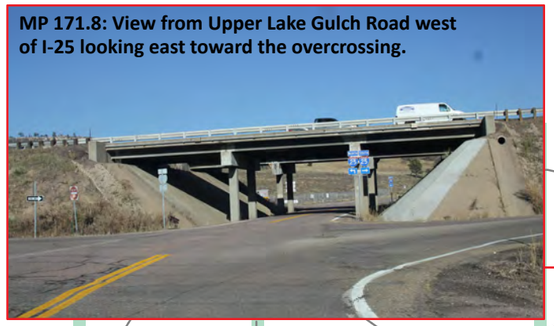
MP 172.35: Spruce Mountain Road overcrossing close-up.

MP 173.9 NB: Sky View Lane overpass. Subtle arches and untreated concrete.

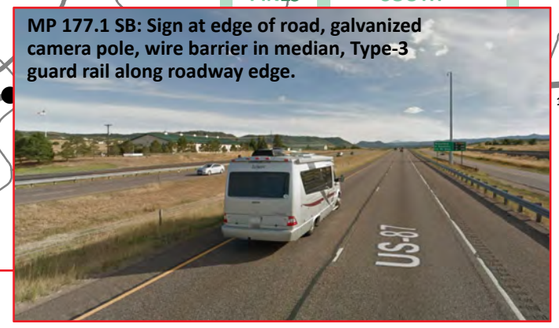


MP 180.9: Bridge abutment and retaining wall seen from Plum Creek Parkway east of I-25.

MP 180.9: View from Plum Creek Parkway looking west toward the undercrossing of I-25.

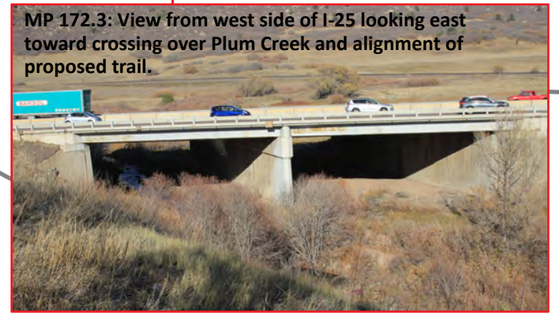


MP 171.8: View from Upper Lake Gulch Road west of I-25 looking east toward the overcrossing.



MP 177.1 SB: Sign at edge of road, galvanized camera pole, wire barrier in median, Type-3 guard rail along roadway edge.

MP 170.3 NB: Cobra-headed galvanized lamp fixture and trees on slope.



MP 172.3: View from west side of I-25 looking east toward crossing over Plum Creek and alignment of proposed trail.

MP 172.4 SB: Spruce Mountain Road overcrossing.

Monument
Woodmoor
Larkspur
Perry Park
Castle Rock
Lone Tree

Exit **161** SR 105
Exit **163** County Line (Palmer Divide Rd)
Exit **167** E Greenland Rd
Exit **172** Upper Lake Gulch Rd
Exit **173** Spruce Mountain Rd
Exit **174** Tomah Rd (Sky View Ln)
Exit **181** W Plum Creek Pkwy
Exit **182** W Wolfensberger Rd
Exit **193** Lincoln Ave
Exit **194** C470
Exit **195** E County Line Rd

MONUMENT
GREENLAND
LARKSPUR
PLUM CREEK VALLEY
CASTLE PINES
RIDGEGATE SOUTH
CASTLE ROCK
LONE TREE

N

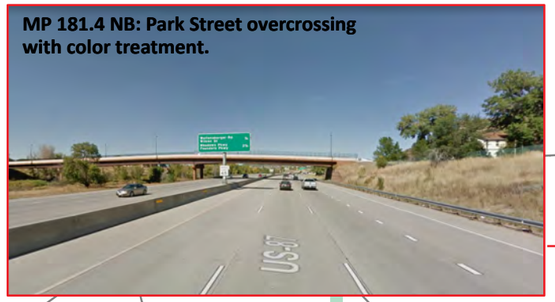
161 Milepost

Landscape Unit Boundary

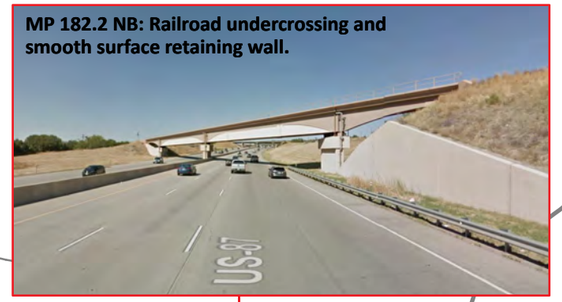
Photo Inventory of Existing Aesthetic Elements
MP 170.3 - 180.9

MP 181.1 NB: Type-7 guardrails.

MP 181.4 NB: Park Street overcrossing with color treatment.



MP 182.2 NB: Railroad undercrossing and smooth surface retaining wall.

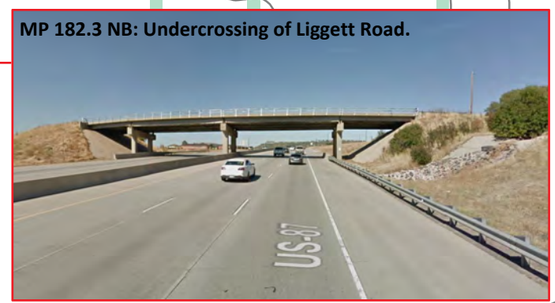


MP 182.85 NB: Galvanized monotube steel sign bridge sign, Type-7 guard rail in median.

105
85
C470
EL PASO COUNTY
DOUGLAS COUNTY
Monument
Woodmoor
Exit 161 SR 105
Exit 163 County Line (Palmer Divide Rd)
Exit 167 E Greenland Rd
Exit 172 Upper Lake Gulch Rd
Larkspur
Exit 173 Spruce Mountain Rd
Exit 174 Tomah Rd (Sky View Ln)
25
Exit 181 W Plum Creek Pkwy
Exit 182 W Wolfensberger Rd
Castle Rock
Exit 184 Meadows Pkwy
Exit 185 Castle Rock Pkwy
Exit 187 E Happy Canyon Rd
Exit 188 Castle Pines Pkwy
Castle Pines
Exit 192 Ridgegate Pkwy
Exit 193 Lincoln Ave
Lone Tree
Exit 194 C470
Exit 195 E County Line Rd
E470
ARAPAHOE COUNTY
88
83
86
MONUMENT
GREENLAND
LARKSPUR
PLUM CREEK VALLEY
CASTLE ROCK
RIDGEGATE SOUTH

MP 181.2 NB: Galvanized monotube steel cantilever and sign bridge sign supports and cannister light poles.

MP 182.3 NB: Undercrossing of Liggett Road.



MP 181.7 NB: Wolfsenberger Road overcrossing.

N

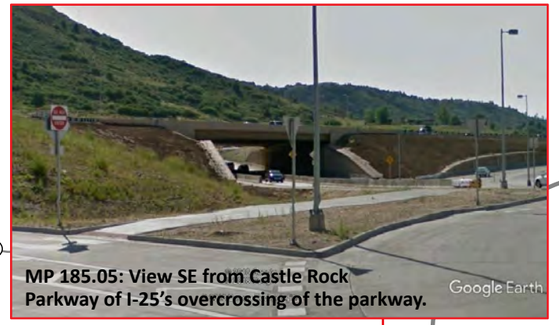
161 Milepost

Landscape Unit Boundary

Photo Inventory of Existing Aesthetic Elements
MP 181.1 - 182.85

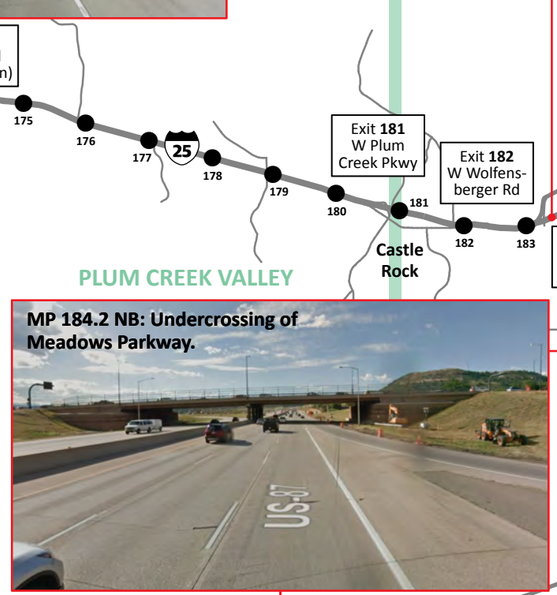
MP 186.9 NB: Happy Canyon Road overcrossing of I-25, closeup of slope paving and retaining wall.

MP 186.9 NB: Happy Canyon Road overcrossing of I-25.



MP 185.05: View SE from Castle Rock Parkway of I-25's overcrossing of the parkway.

MP 183.4 NB: Santa Fe Drive undercrossing with color treatment.



MP 184.2 NB: Undercrossing of Meadows Parkway.

MP 184.2 SB: Undercrossing of Meadows Parkway abutment detail.

MP 185.5 NB: Concrete retaining wall with vertical pattern.

Palmer Lake

Monument

Woodmoor

Larkspur

Castle Rock

Castle Pines

Lone Tree

EL PASO COUNTY

DOUGLAS COUNTY

ARAPAHOE COUNTY

MONUMENT

GREENLAND

LARKSPUR

PLUM CREEK VALLEY

CASTLE ROCK

RIDGEGATE SOUTH

105 85 25 C470 E470 83 88 86

159 160 161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195

Exit 161 SR 105

Exit 163 County Line (Palmer Divide Rd)

Exit 167 E Greenland Rd

Exit 172 Upper Lake Gulch Rd

Exit 173 Spruce Mountain Rd

Exit 174 Tomah Rd (Sky View Ln)

Exit 181 W Plum Creek Pkwy

Exit 182 W Wolfensberger Rd

Exit 184 Meadows Pkwy

Exit 185 Castle Rock Pkwy

Exit 187 E Happy Canyon Rd

Exit 188 Castle Pines Pkwy

Exit 192 Ridgegate Pkwy

Exit 193 Lincoln Ave

Exit 194 C470

Exit 195 E County Line Rd

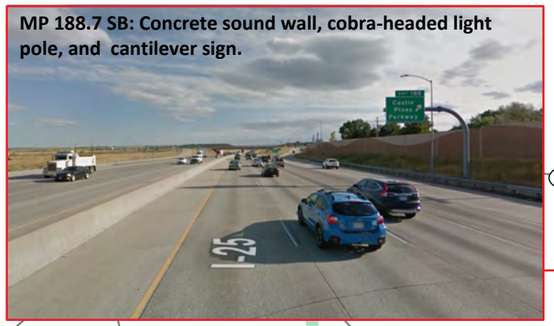
N

161 Milepost

Landscape Unit Boundary

Photo Inventory of Existing Aesthetic Elements
MP 183.4 - 186.9

MP 188.2 NB: Monotube cantilever sign and scisser design light pole.



MP 188.7 SB: Concrete sound wall, cobra-headed light pole, and cantilever sign.

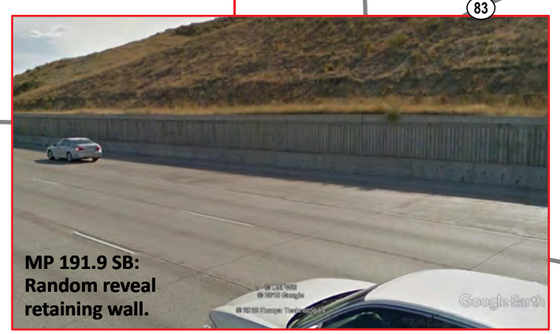
MP 189.8: View west from Oak Hill Lane toward overcrossing by I-25.

MP 191.8 NB: Smooth-surface retaining wall in median.

MP 188.5: View west from Castle Pines Parkway of undercrossing of I-25 with close-up of color treatment.

MP 188.8 SB: Planted sound attenuation berm.

MP 190.3 NB: Sign in median.



MP 191.9 SB: Random reveal retaining wall.

GREENLAND

LARKSPUR

PLUM CREEK VALLEY

CASTLE ROCK

CASTLE PINES

RIDGEGATE SOUTH

LONE TREE

DOUGLAS COUNTY

ARAPAHOE COUNTY

Exit **173** Spruce Mountain Rd

Exit **174** Tomah Rd (Sky View Ln)

Exit **172** Upper Lake Gulch Rd

Exit **181** W Plum Creek Pkwy

Exit **182** W Wolfensberger Rd

Exit **184** Meadows Pkwy

Exit **185** Castle Rock Pkwy

Exit **187** E Happy Canyon Rd

Exit **188** Castle Pines Pkwy

Exit **192** Ridgegate Pkwy

Exit **193** Lincoln Ave

Exit **194** C470

Exit **195** E County Line Rd

Larkspur

Castle Rock

Castle Pines

Lone Tree

159 169 170 171 172 173 174 175 176 177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192 193 194 195

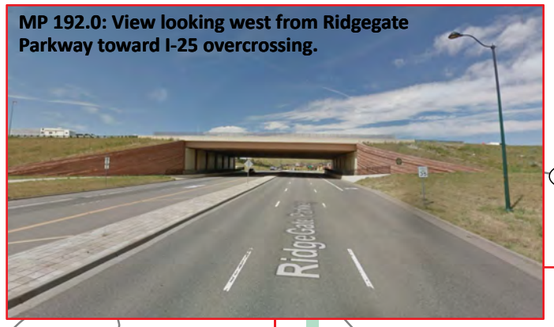
105 85 C470 25 E470 83 86 88

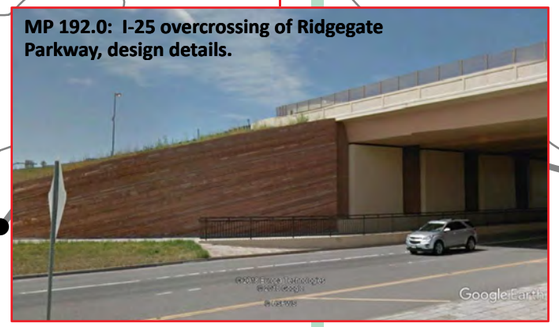
N

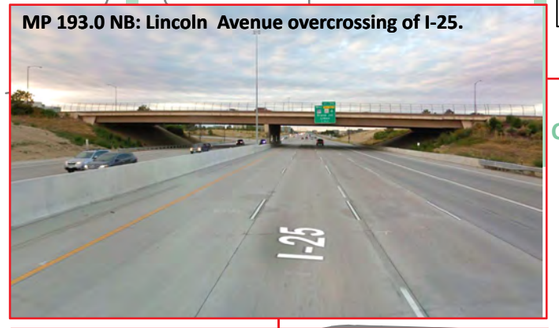
161 Milepost

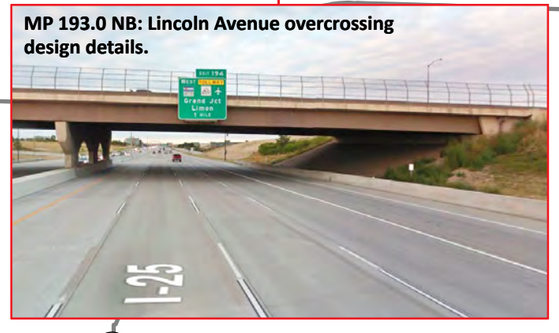
Landscape Unit Boundary

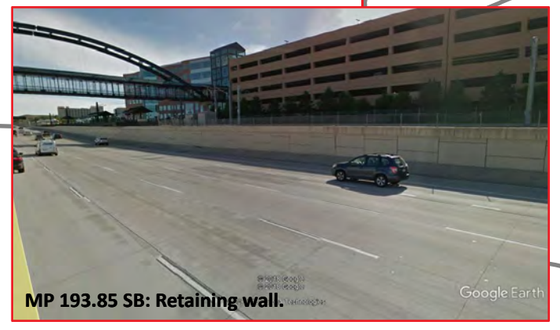
Photo Inventory of Existing Aesthetic Elements
MP 188.2 - 191.9











Palmer Lake
105
EL PASO COUNTY
DOUGLAS COUNTY
Monument
159
160
161
Exit 161 SR 105
Woodmoor
162
163
Exit 163 County Line (Palmer Divide Rd)
164
165
166
167
Exit 167 E Greenland Rd
168
MONUMENT
GREENLAND
LARKSPUR
PLUM CREEK VALLEY
179
180
Castle Rock
181
Exit 181 W Plum Creek Pkwy
182
Exit 182 W Wolfensberger Rd
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Exit 184 Meadows Pkwy
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Exit 185 Castle Rock Pkwy
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187
Exit 187 E Happy Canyon Rd
CASTLE ROCK
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Exit 188 Castle Pines Pkwy
Castle Pines
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Exit 192 Ridgegate Pkwy
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Exit 193 Lincoln Ave
Lone Tree
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Exit 194 C470
195
Exit 195 E County Line Rd
85
C470
E470
88
DOUGLAS COUNTY
ARAPAHOE COUNTY
CASTLE PINES
RIDGEGATE SOUTH
LONE TREE
83
86
N
161 Milepost
Landscape Unit Boundary

Photo Inventory of Existing Aesthetic Elements
MP 192.0 - 193.85

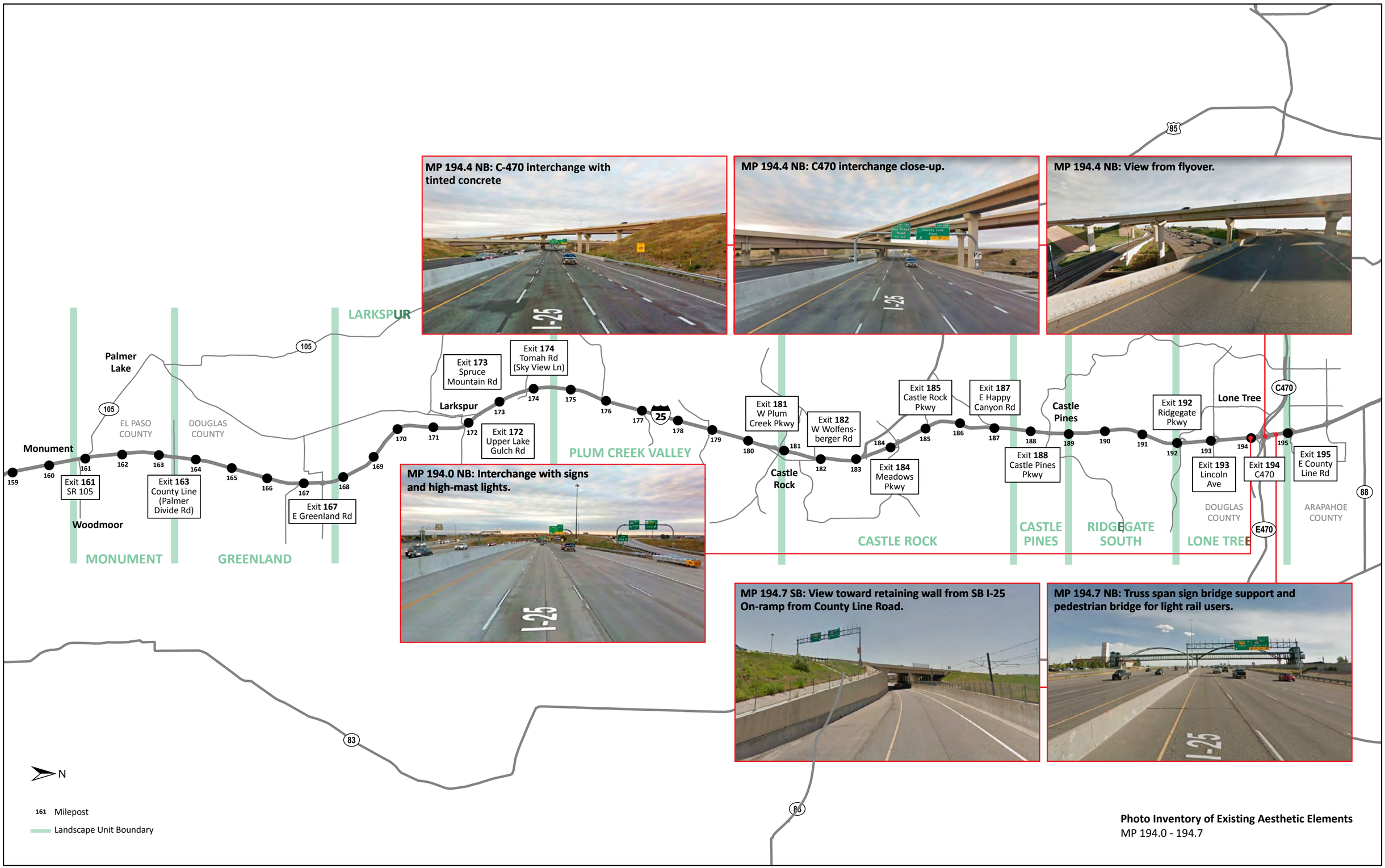


Photo Inventory of Existing Aesthetic Elements
MP 194.0 - 194.7

Appendix I
Corridor Plans

This document is available upon request

Appendix J
Addendum to the ICS: The I-25 South Gap Environmental Assessment

COLORADO
Department of Transportation

October 2018

Environmental Existing Conditions

Addendum to Appendix H

I-25 PEL: Colorado Springs Denver South Connection

Prepared for:
CDOT Region 1
2000 South Holly Street
Denver, CO 80222

CDOT Project No.:
NHPP 0252-450

CDOT Project Code:
2110

Acronyms and Abbreviations

CDOT	Colorado Department of Transportation
EA	Environmental Assessment
INFRA	Infrastructure for Rebuilding America
PEL	Planning and Environmental Linkages

Addendum to Appendix H

In August 2016, the Colorado Department of Transportation (CDOT) began a Planning and Environmental Linkages (PEL) study to consider improvements along a 34-mile corridor on I-25 between Monument and Colorado State Highway 470 (C-470) in the Denver South region. To understand the corridor context and support PEL development, a high-level environmental scan was completed and findings included as resource-specific technical memoranda. These memoranda are included as Appendix H to the Initial Corridor Assessment.

At the time the PEL was initiated, CDOT did not have any funding identified for corridor improvements, and no projects were included in either the Pikes Peak Area Council of Governments or Denver Regional Council of Governments long-range transportation plans. However, from the onset of the PEL study, CDOT and stakeholders recognized the need for immediate safety and travel reliability improvements through the I-25 Segment 1 (i.e., the Gap) between Monument and Castle Rock.

In response to public interest and documented needs through the Gap segment of I-25, CDOT and the Federal Highway Administration announced in January 2017 the acceleration of design and environmental studies for the Gap concurrently with the broader PEL study so that if funding for the priority project could be secured, construction of the priority project could also be accelerated. In April 2017, the I-25 Gap Coalition was formed by local governmental agencies and other corridor stakeholders to serve as an independent, proactive advocacy group focused on identifying funding to advance project implementation.

By summer 2017, CDOT had completed a needs assessment of the PEL corridor, developed numerous concepts for improvements for each of the corridor segments, and conducted detailed engineering and environmental surveys for the Gap. By fall 2017, CDOT and local governments had identified potential funding for about 80 percent ($280 million) of the $350 million project budget and came together to apply for a federal grant, Infrastructure for Rebuilding America (INFRA) grant. The I-25 South Project was awarded an INFRA grant for $65 million in June 2018 to complete the funding package. With funding in place, CDOT further accelerated the project schedule with a new target of construction by November 2018 or sooner.

In late December 2017, CDOT formally initiated the I-25 South Gap: Monument to Castle Rock Environmental Assessment (EA) (CDOT Project No. NHPP 0252-450, Project Code: 21102). The EA was signed by CDOT and the Federal Highway Administration on April 25th, 2018; the Finding of No Significant Impact was signed by both parties on June 27, 2018. The environmental analysis included in the Gap EA built upon the high-level environmental scan completed as part of the Initial Corridor Assessment from the PEL. Ultimately, the Gap EA supersedes the environmental data for Segment 1 presented in Appendix H, and therefore differs in the level of detail to the environmental data for Segments 2 and 3. Electronic copies of the complete EA and the Finding of No Significant Impact are available on CDOT's website at https://www.codot.gov/projects/i-25-south-monument-castle-rock-ea.

Built Environment Map Book

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

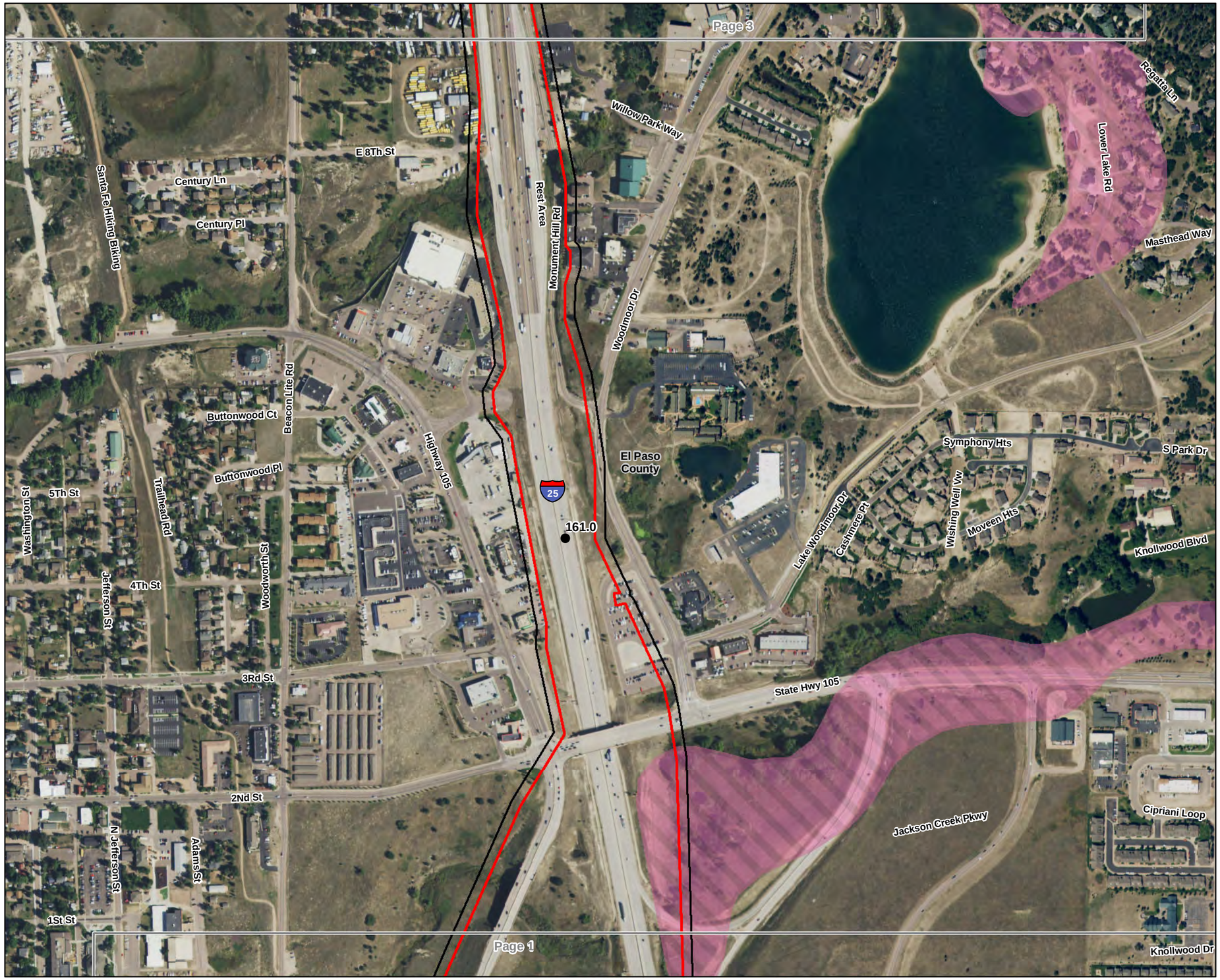
N

0 500

Feet

FIGURE 1
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
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- Farmland of Statewide Importance

N

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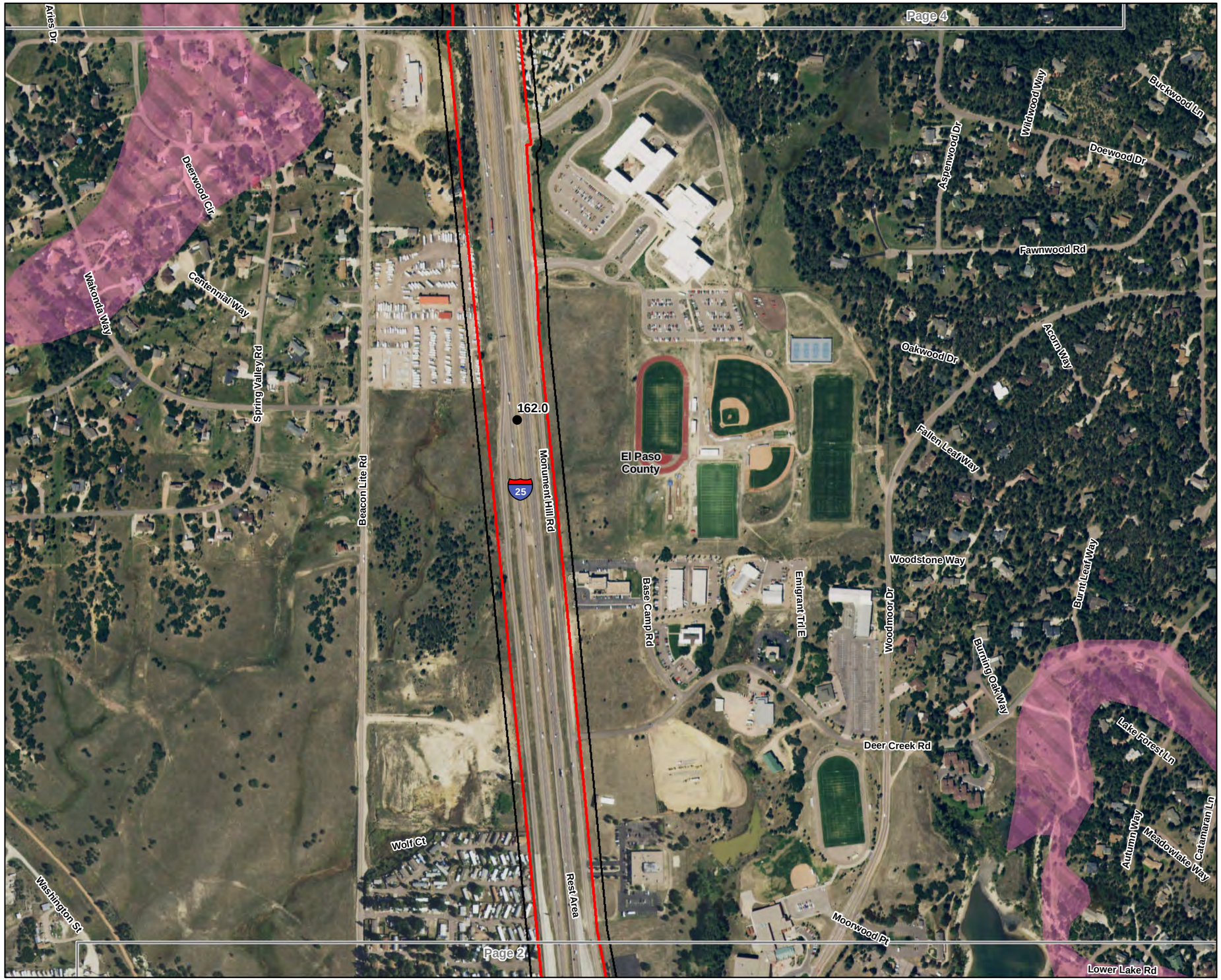
Feet

FIGURE 2
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

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- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

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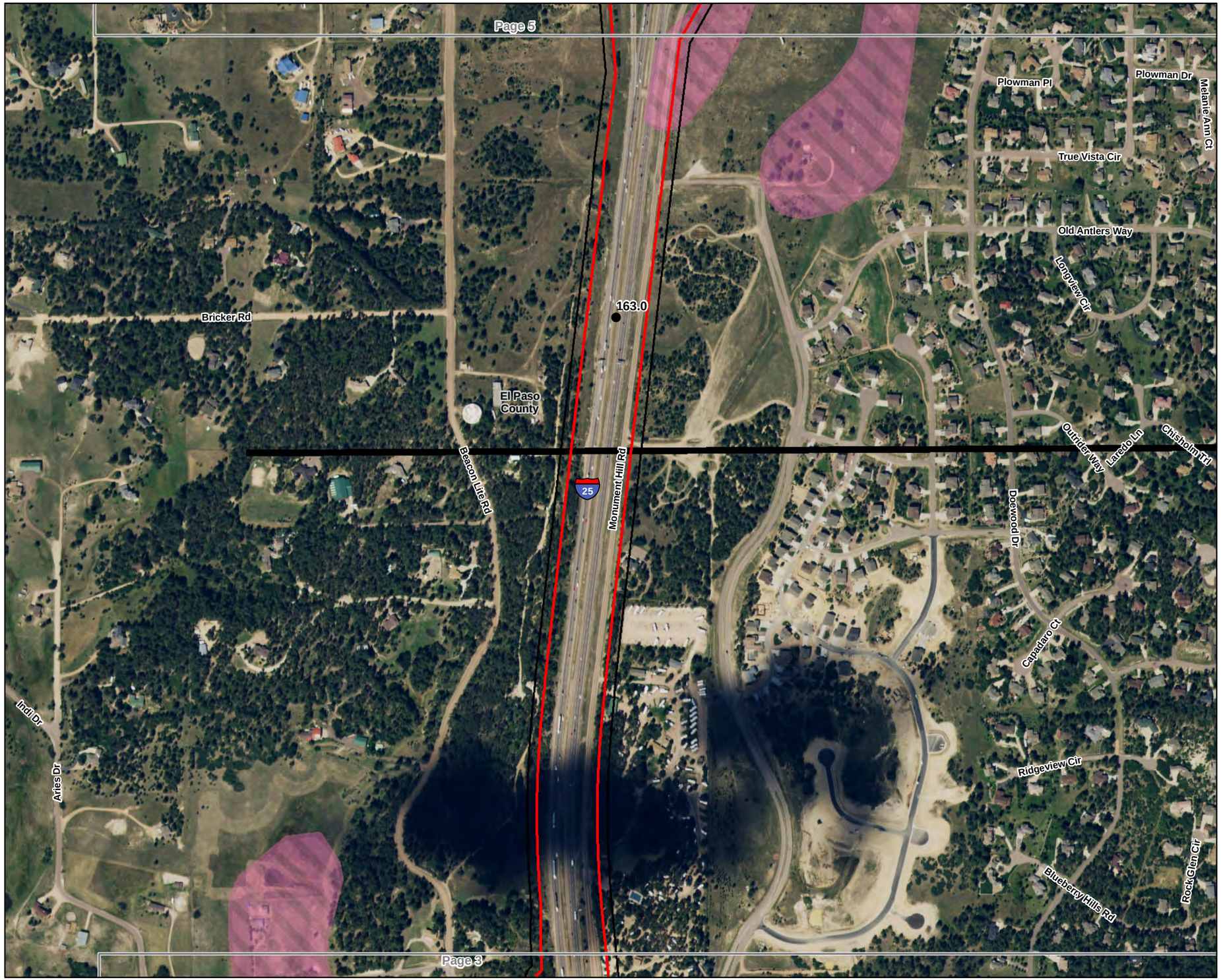
Feet

FIGURE 3
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

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- Prime Farmland
- Farmland of Statewide Importance

N

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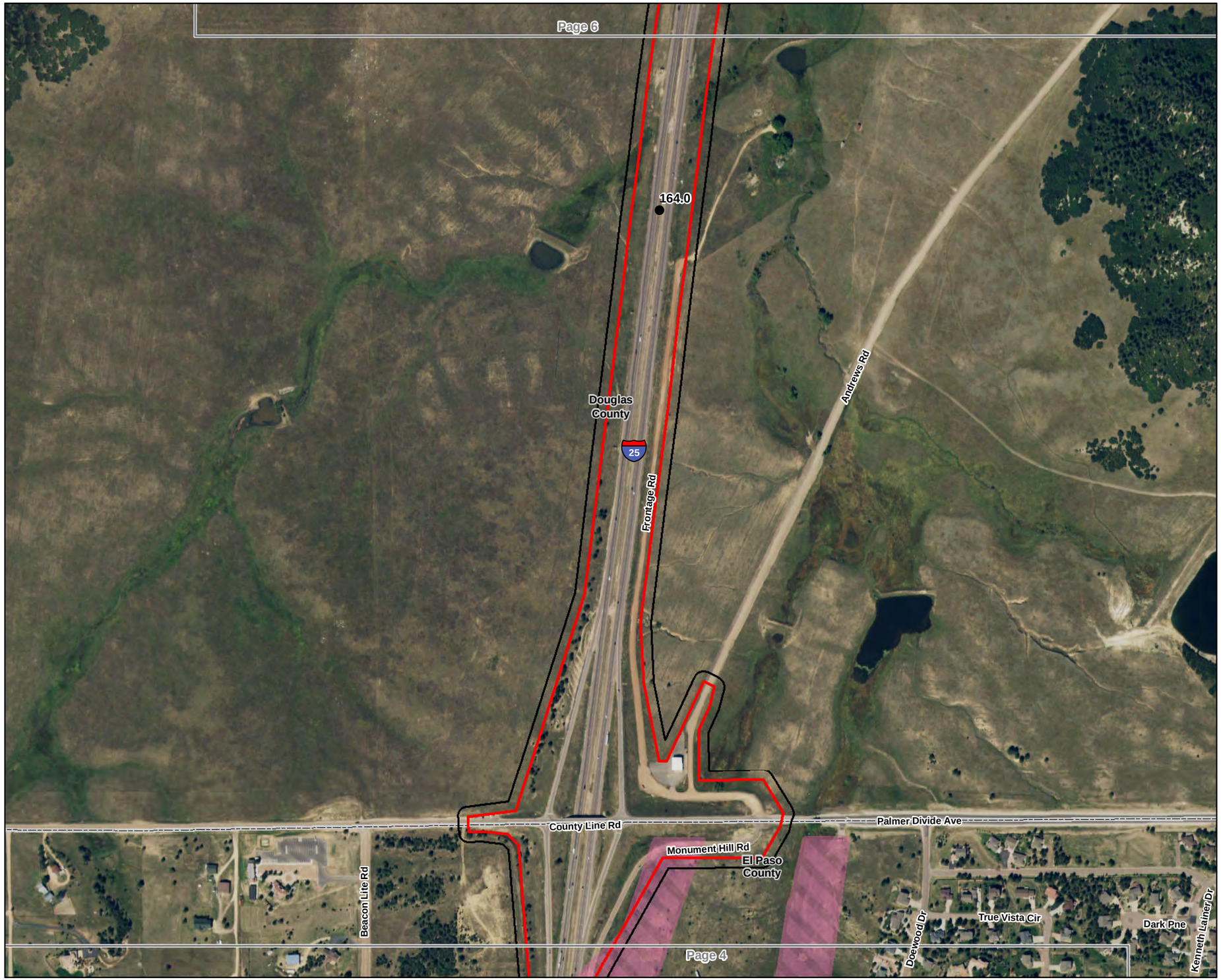
Feet

FIGURE 4
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

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- Prime Farmland
- Farmland of Statewide Importance

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Feet

FIGURE 5
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

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- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 6
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
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- Prime Farmland
- Farmland of Statewide Importance

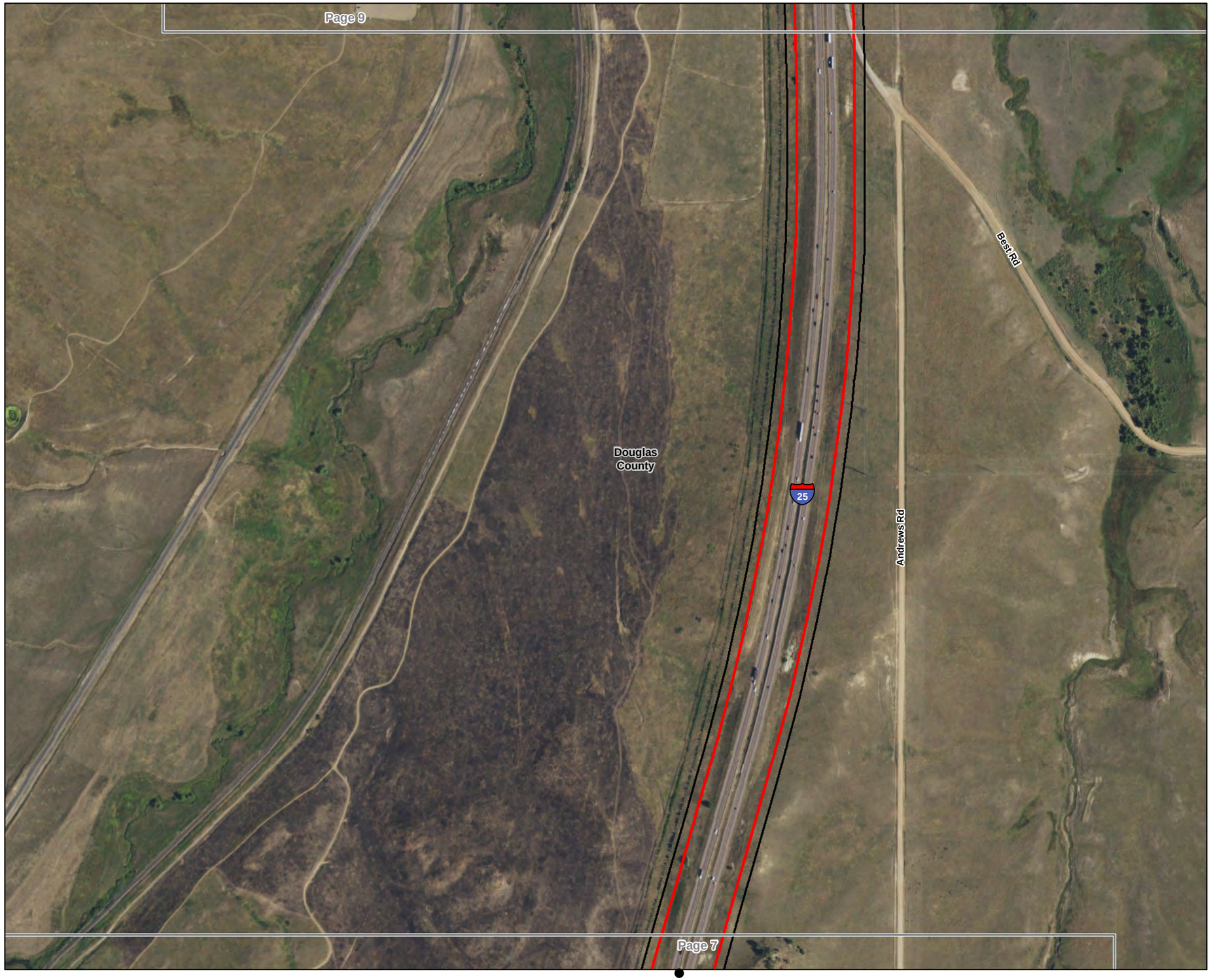
N

0 500

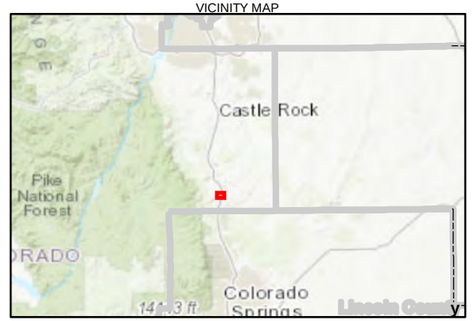
Feet

FIGURE 7
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



VICINITY MAP



LEGEND

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- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

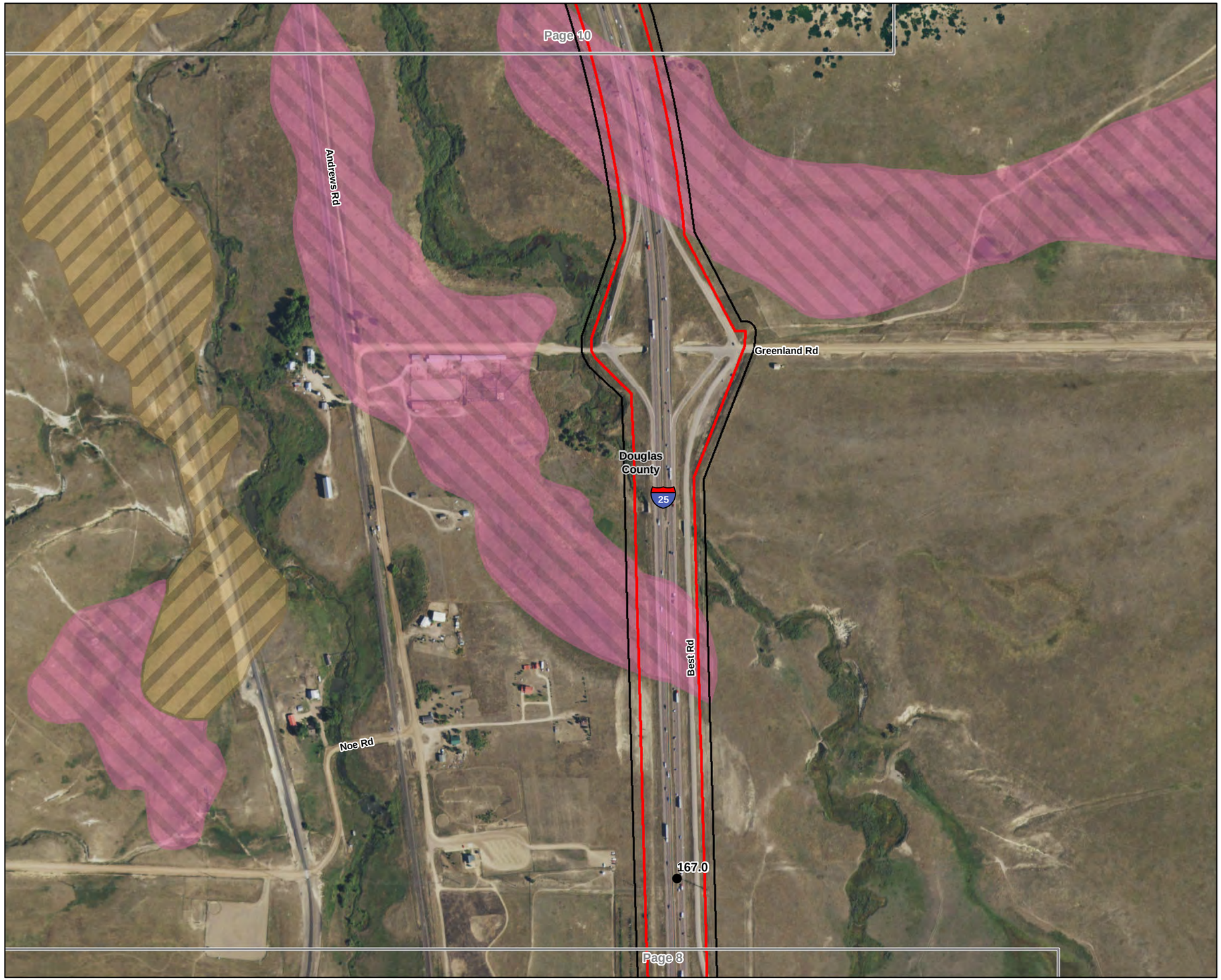
0 500

Feet

FIGURE 8
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

Page 10



Page 8

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

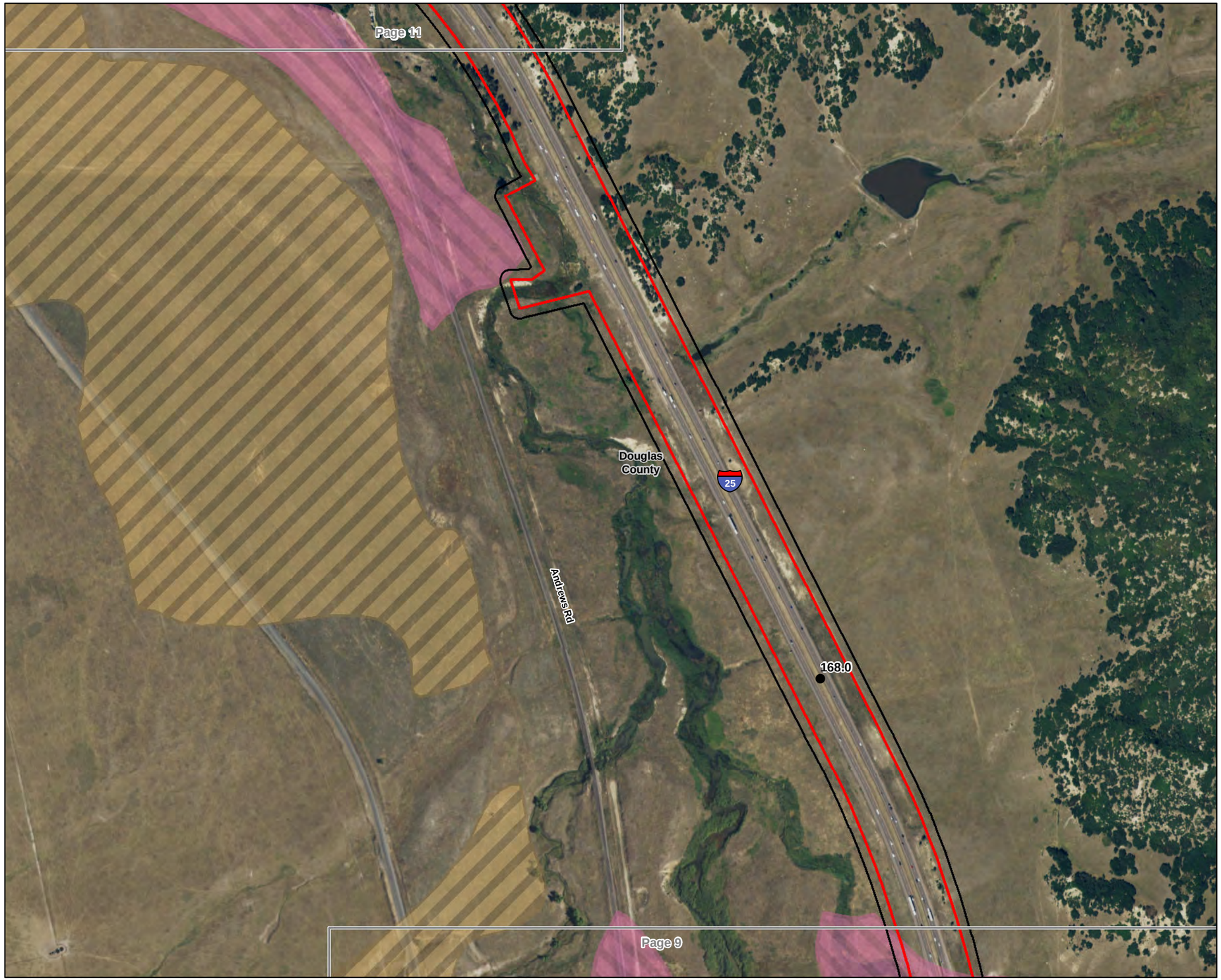
N

0 500

Feet

FIGURE 9
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

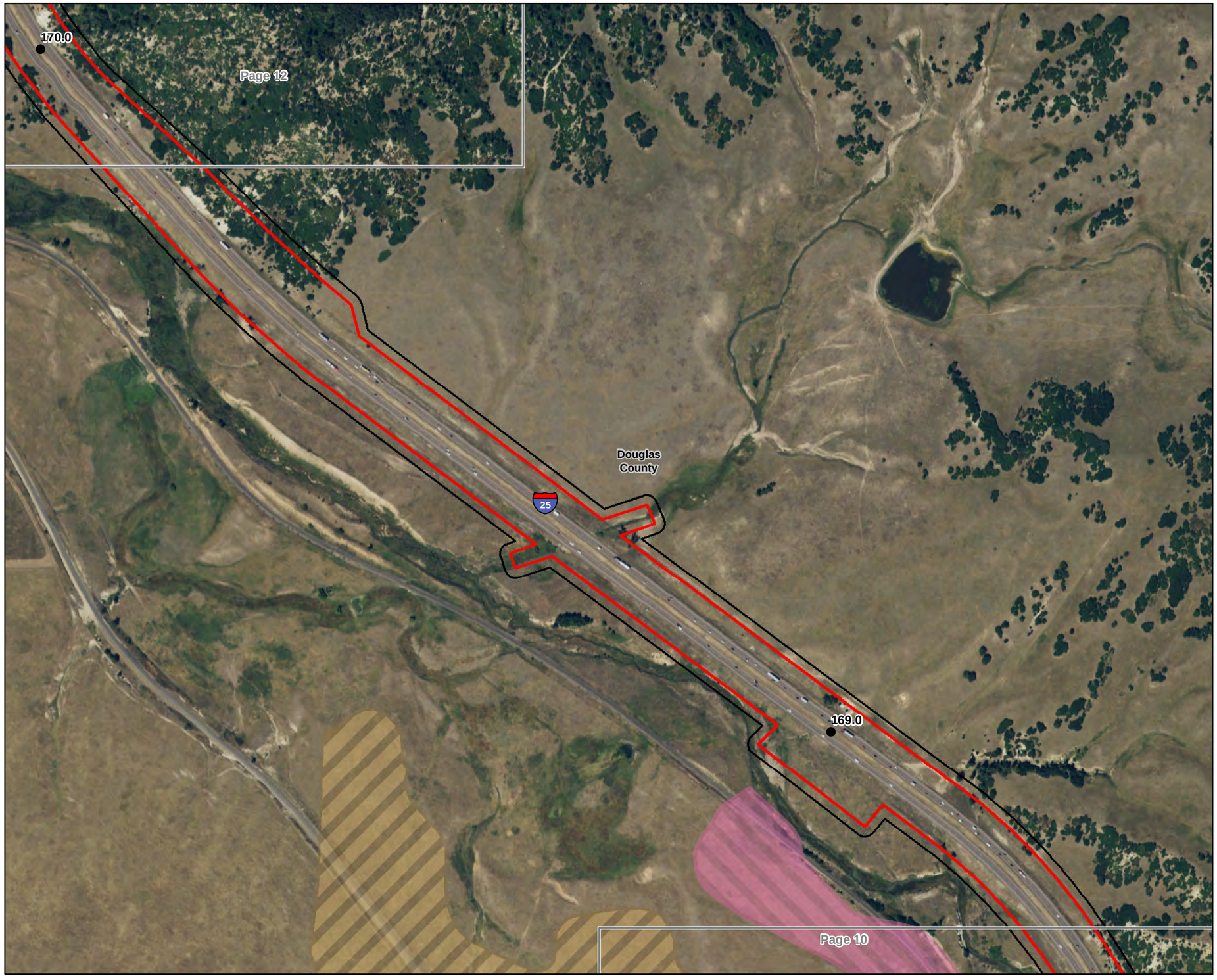
N

0 500

Feet

FIGURE 10
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 11
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

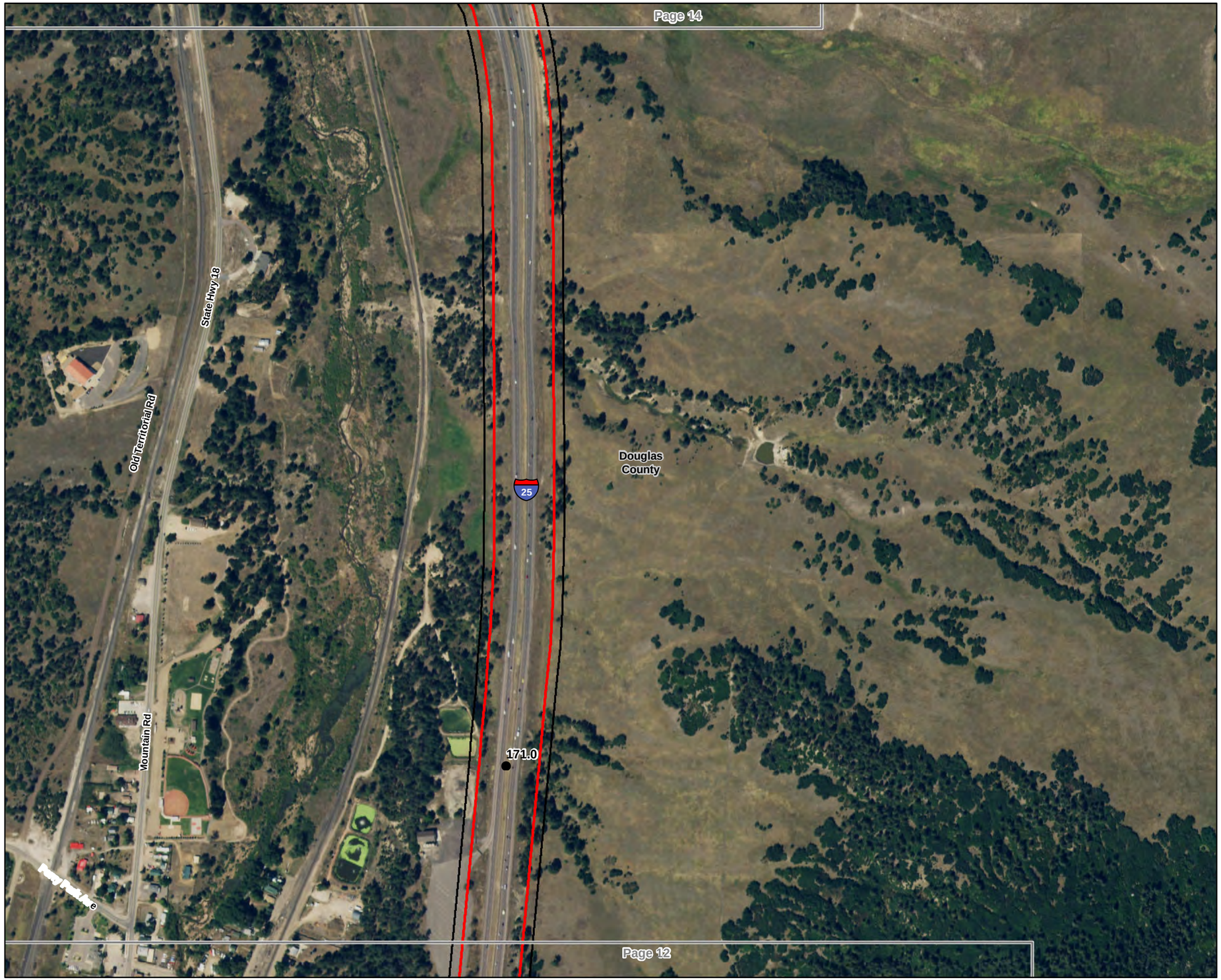
N

0 500

Feet

FIGURE 12
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 13
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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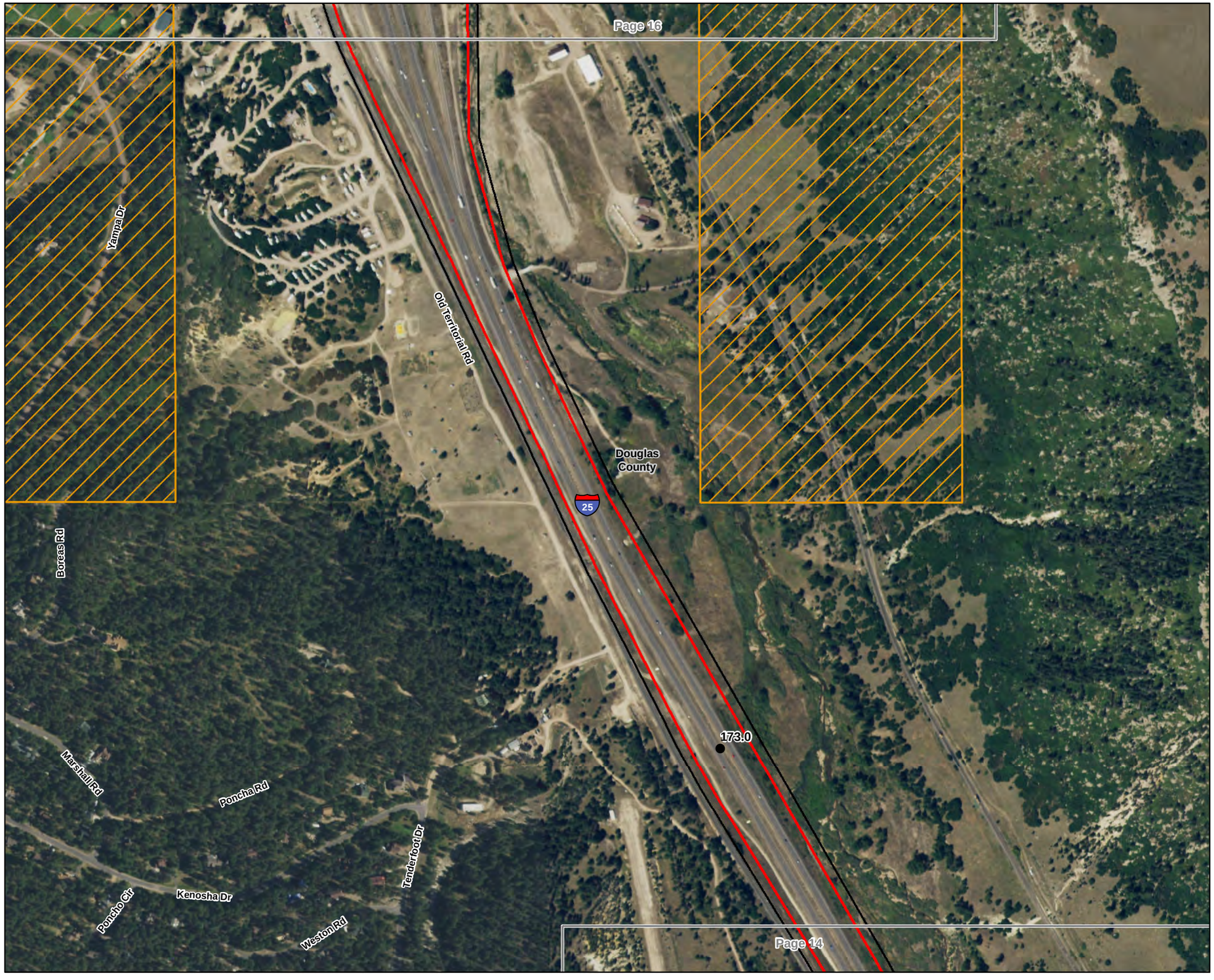
Feet

FIGURE 14
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 15
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

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Feet

FIGURE 16
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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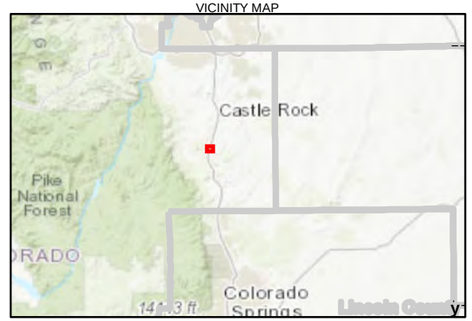
Feet

FIGURE 17
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

VICINITY MAP



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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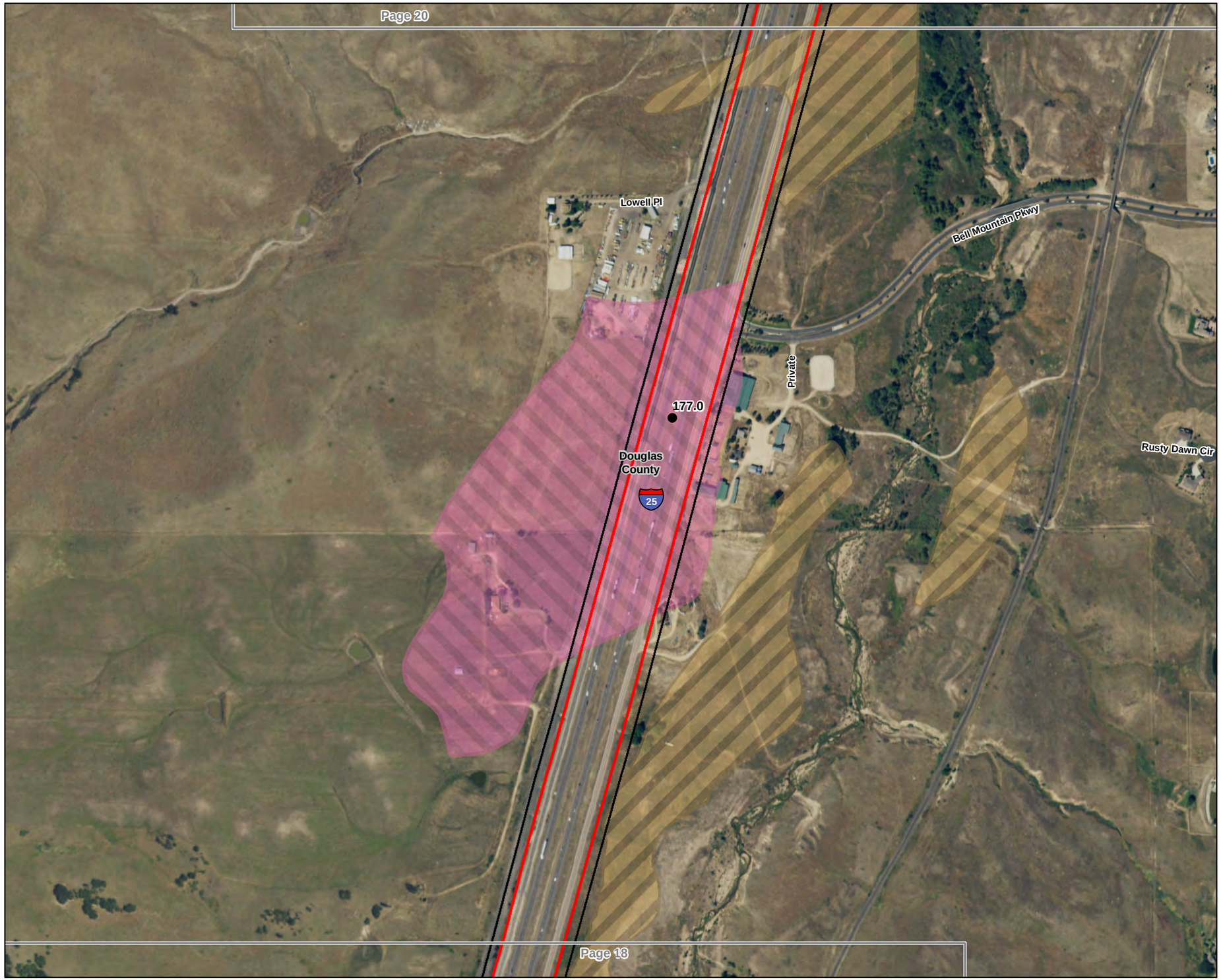
Feet

FIGURE 18
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



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VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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Feet

FIGURE 19
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

Page 21

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Douglas County

25

Page 19

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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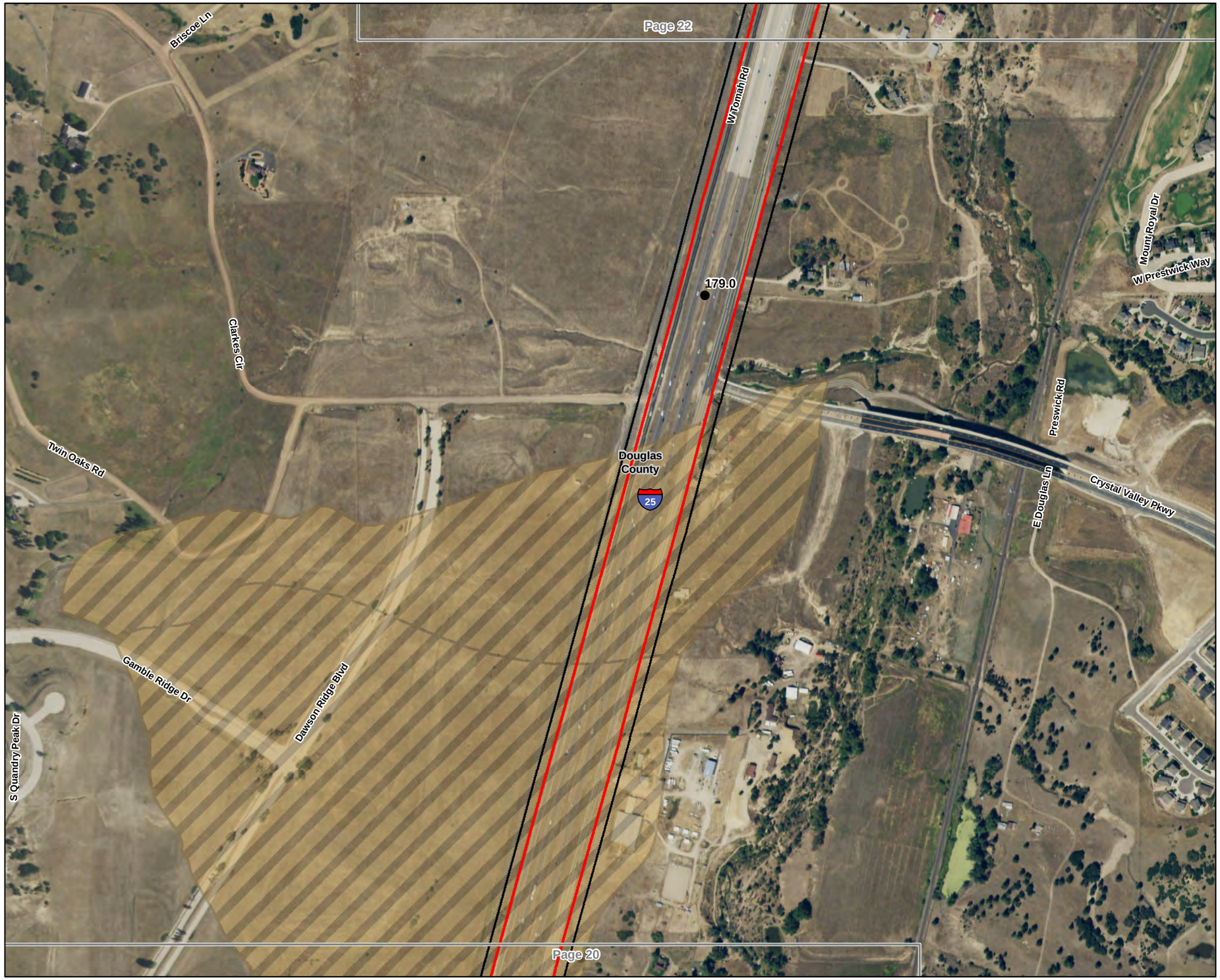
Feet

FIGURE 20
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

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Feet

FIGURE 21
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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Feet

FIGURE 22
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

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Page 22

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

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Feet

FIGURE 23
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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Feet

FIGURE 24
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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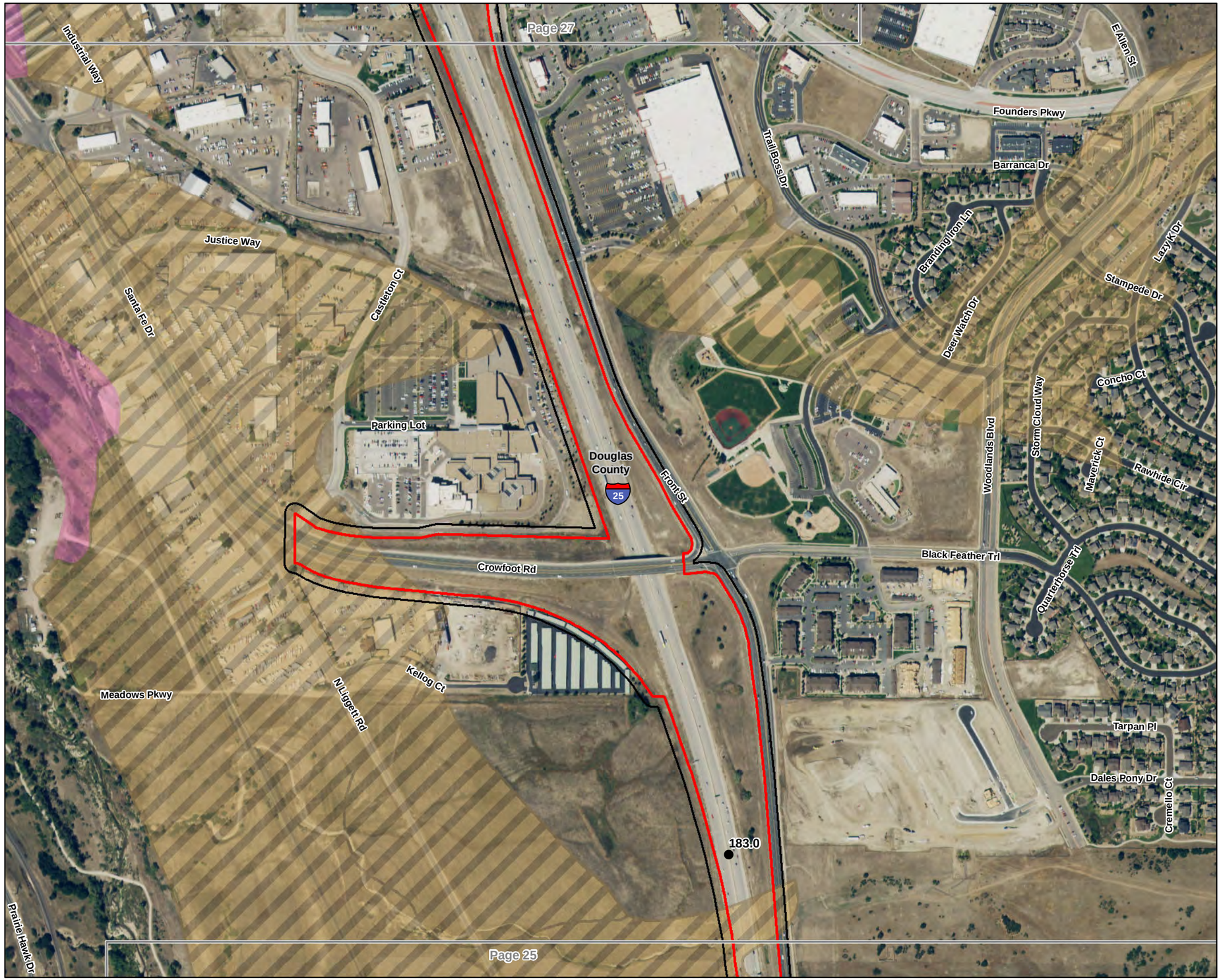
Feet

FIGURE 25
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

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Feet

FIGURE 26
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

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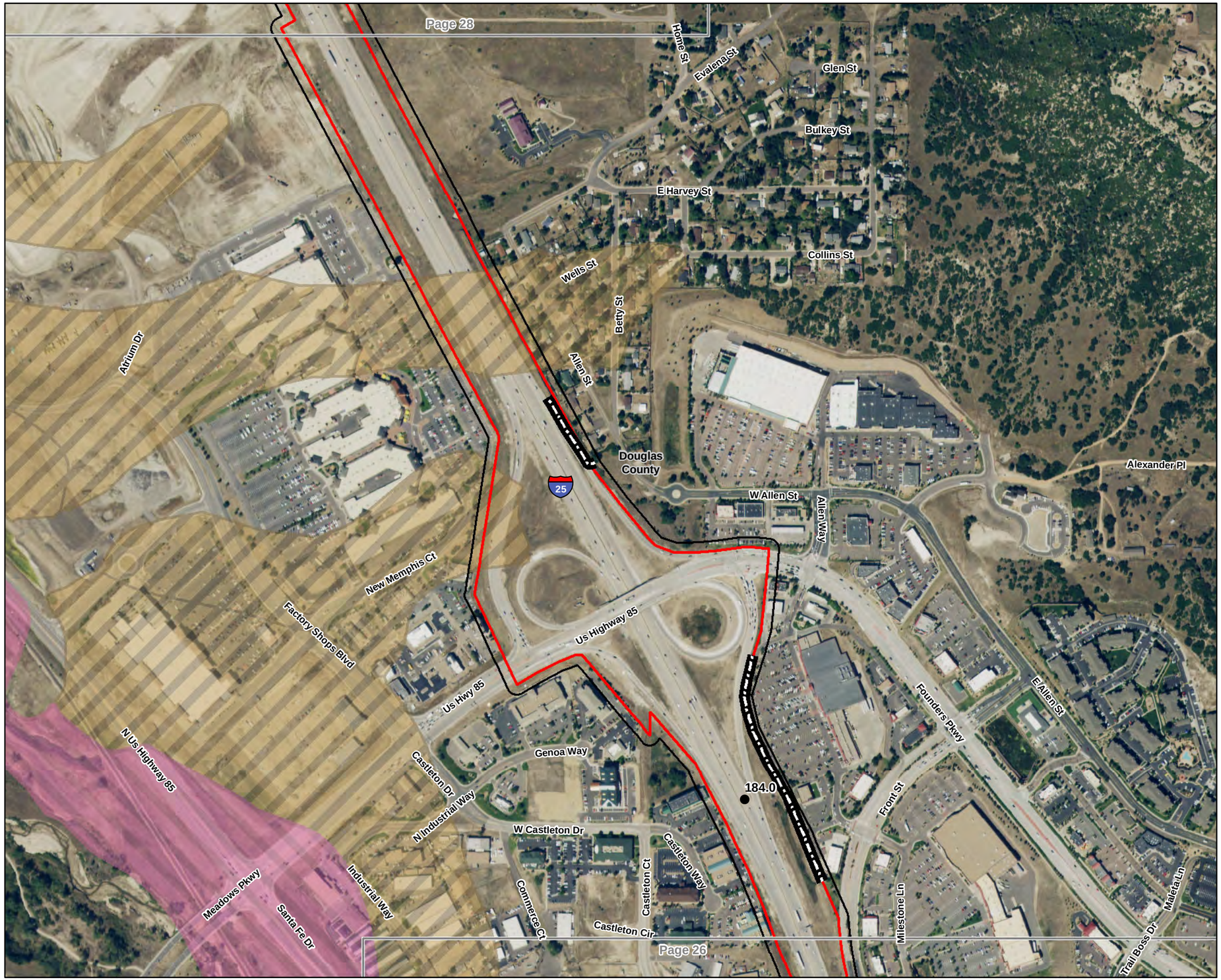

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VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

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Feet

FIGURE 27
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 28
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

Page 28

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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Feet

FIGURE 29
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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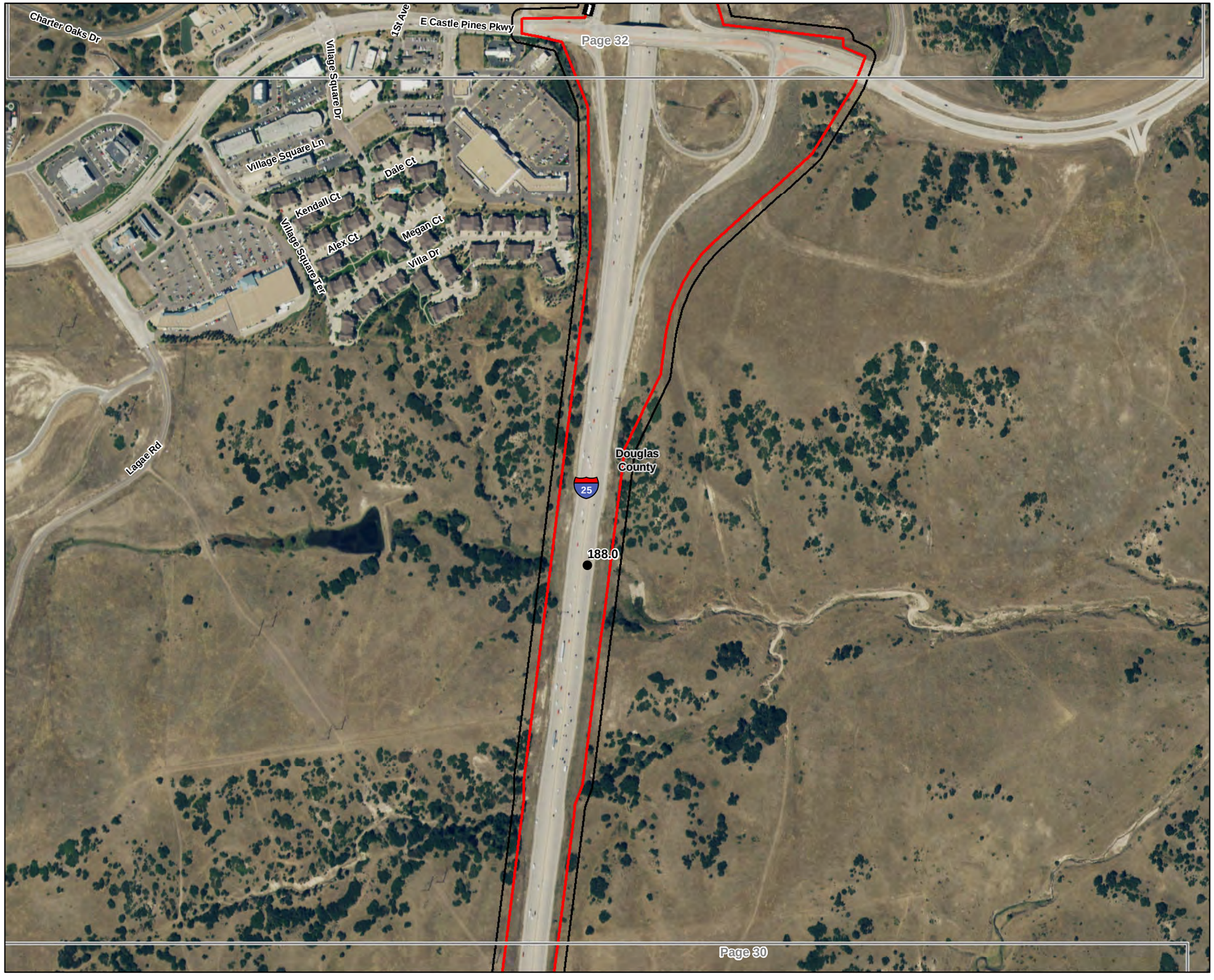
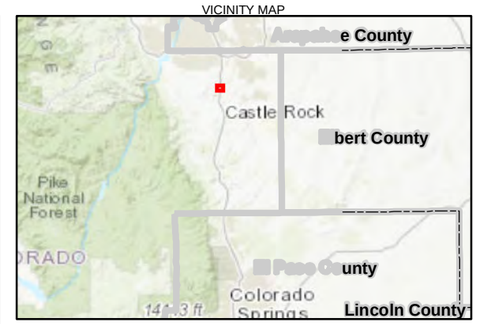
Feet

FIGURE 30
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation





LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

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Feet

FIGURE 31
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

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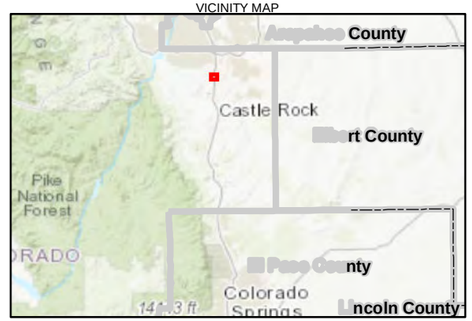
Feet

FIGURE 32
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

VICINITY MAP



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 33
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 34
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

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N
Feet

FIGURE 35
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 36
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 37
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

0 500

Feet

FIGURE 38
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- SLB Mineral Lease Area
- Historic Landfill
- Noise Mitigation Measure
- Prime Farmland
- Farmland of Statewide Importance

N

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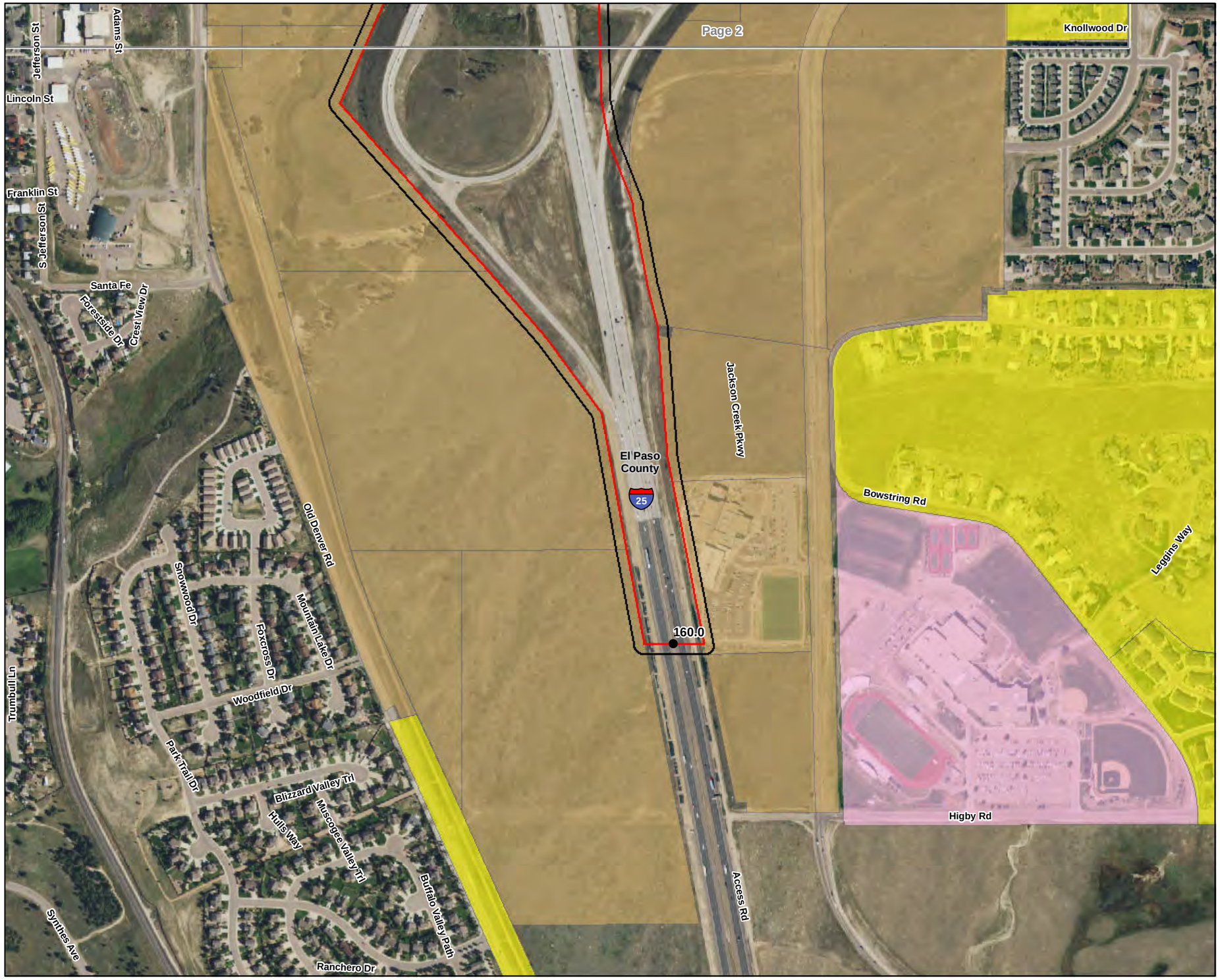
Feet

FIGURE 39
Built Environment Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

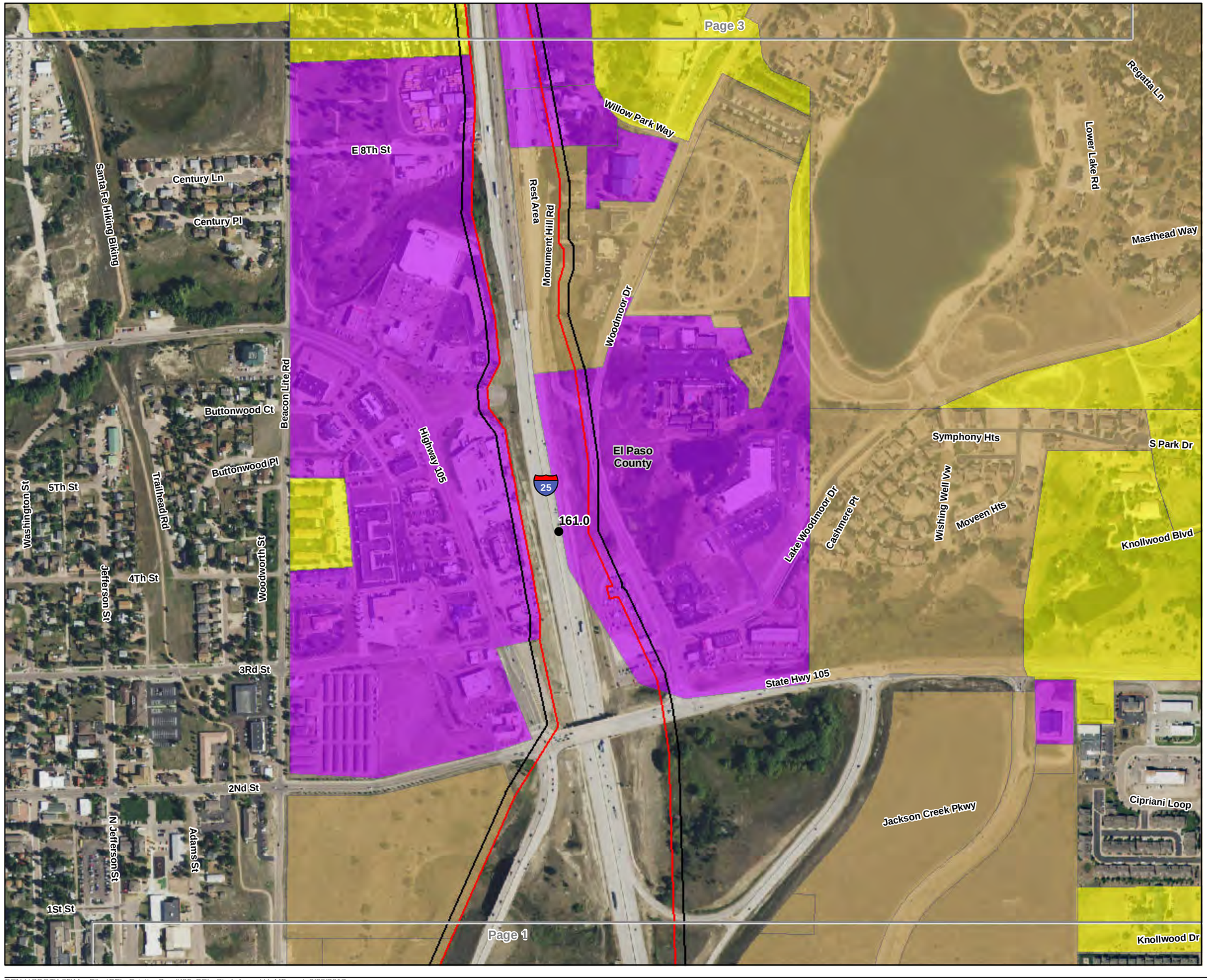
N

0 500

Feet

FIGURE 1
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

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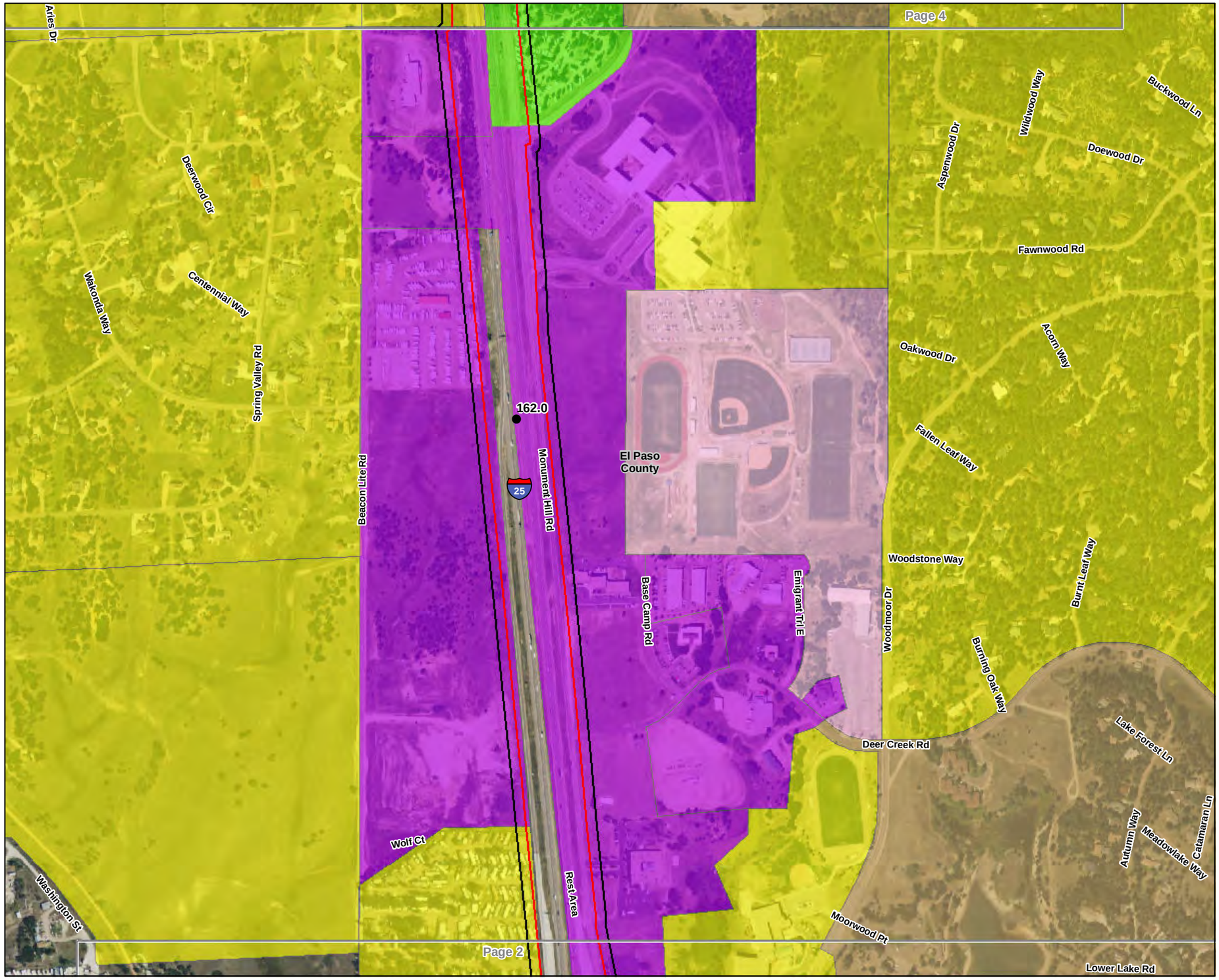
Feet

FIGURE 2
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

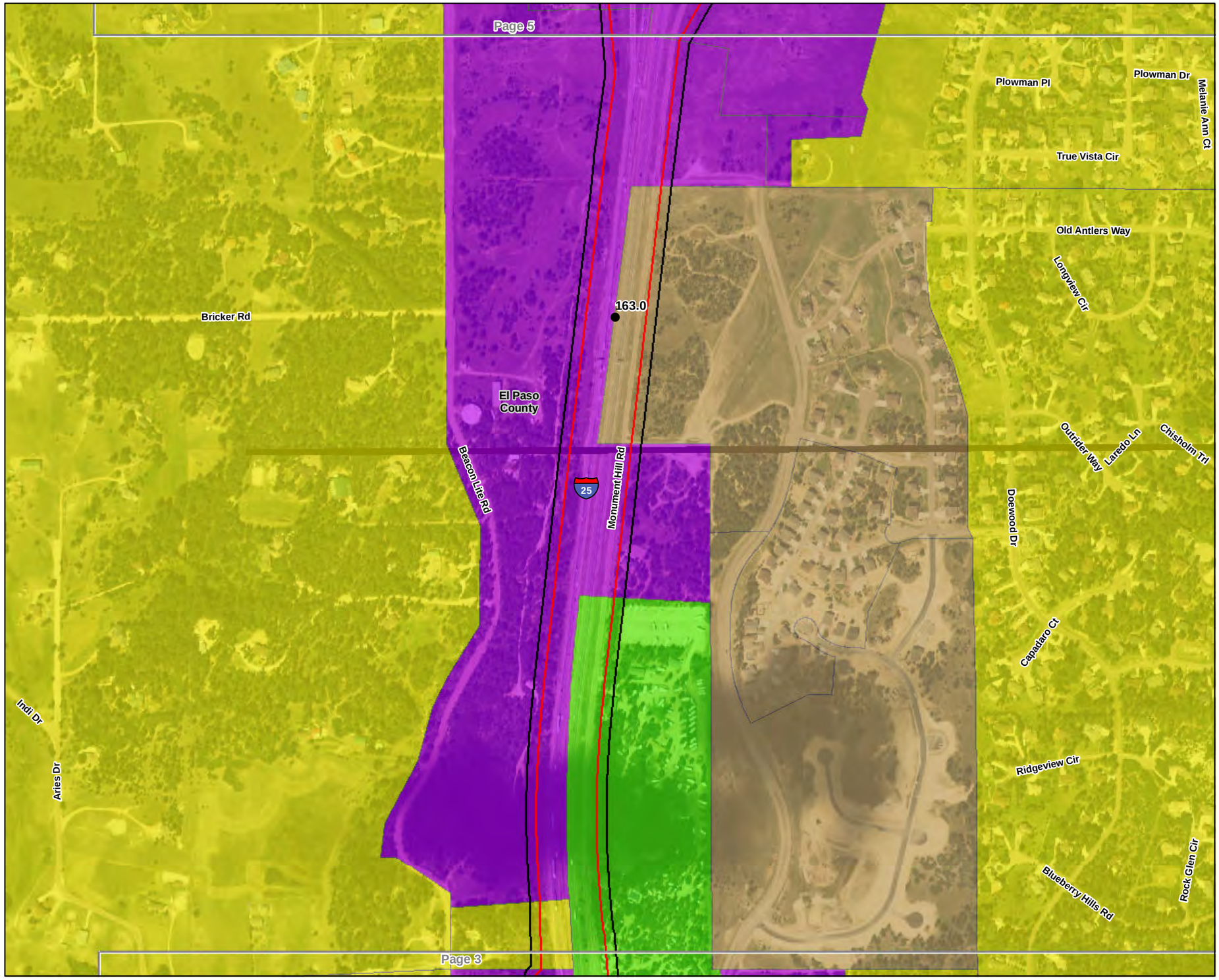
N

0 500

Feet

FIGURE 3
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

N

0 500

Feet

FIGURE 4
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

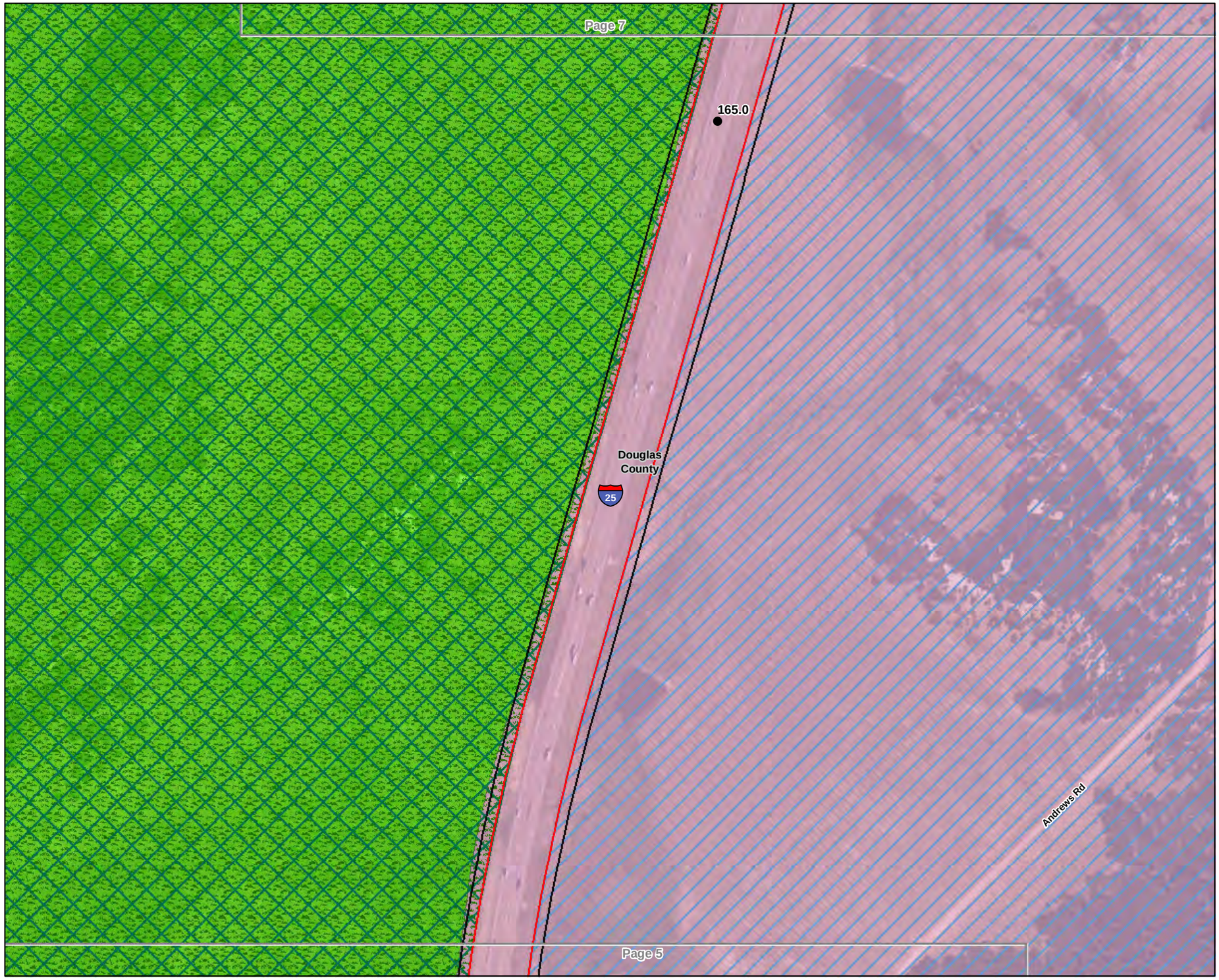
N

0 500

Feet

FIGURE 5
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

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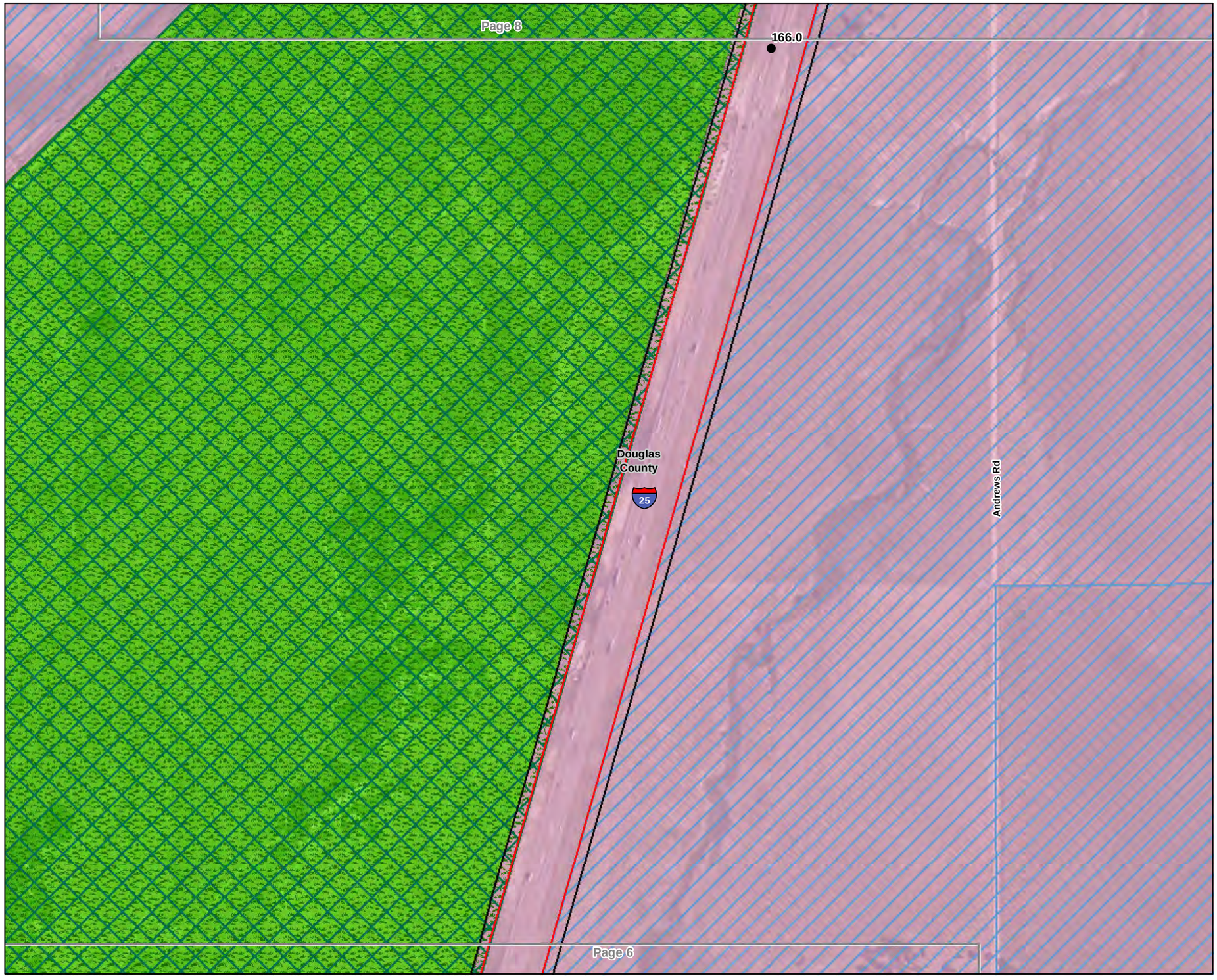
0 500

Feet

FIGURE 6
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

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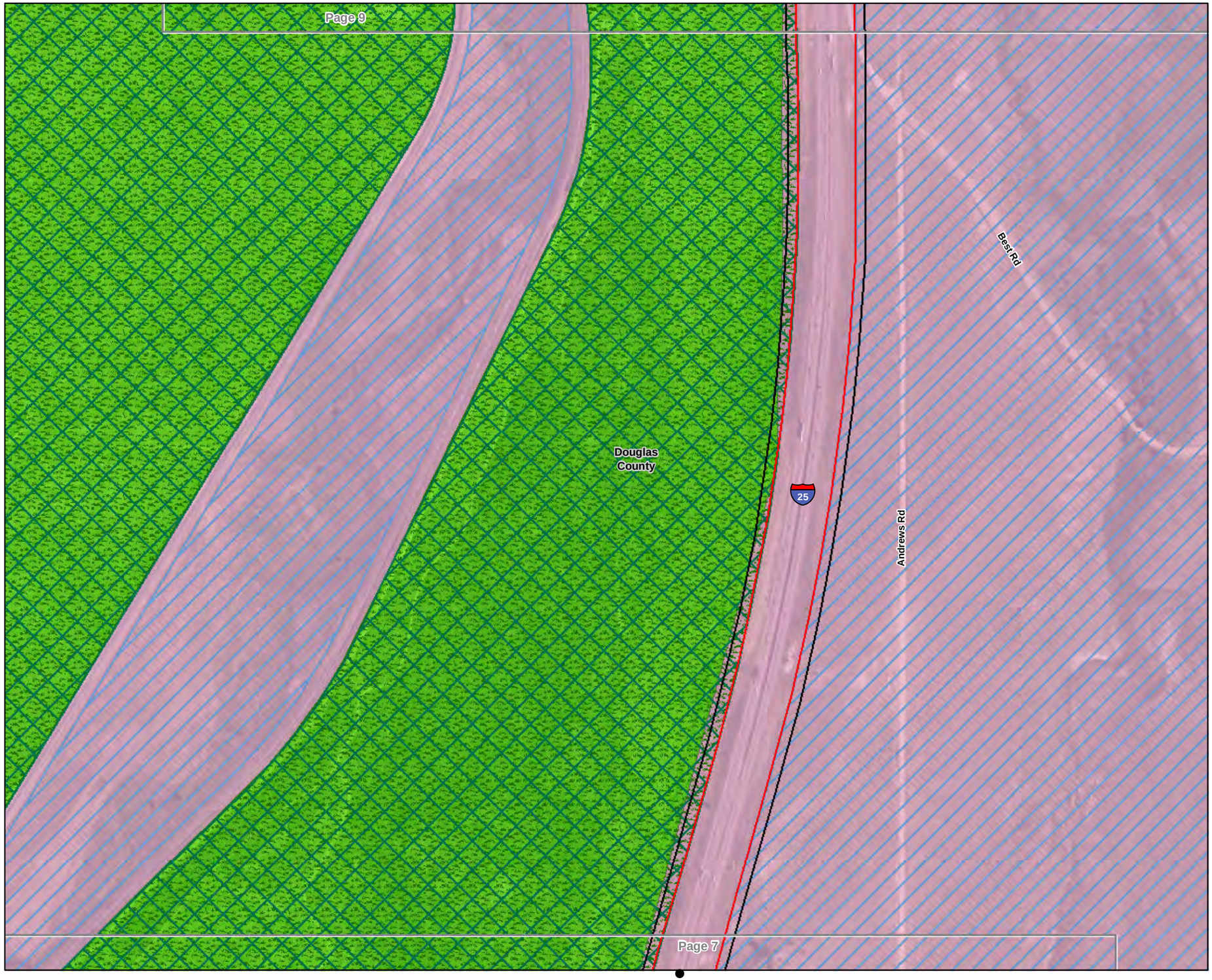
Feet

FIGURE 7
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

N

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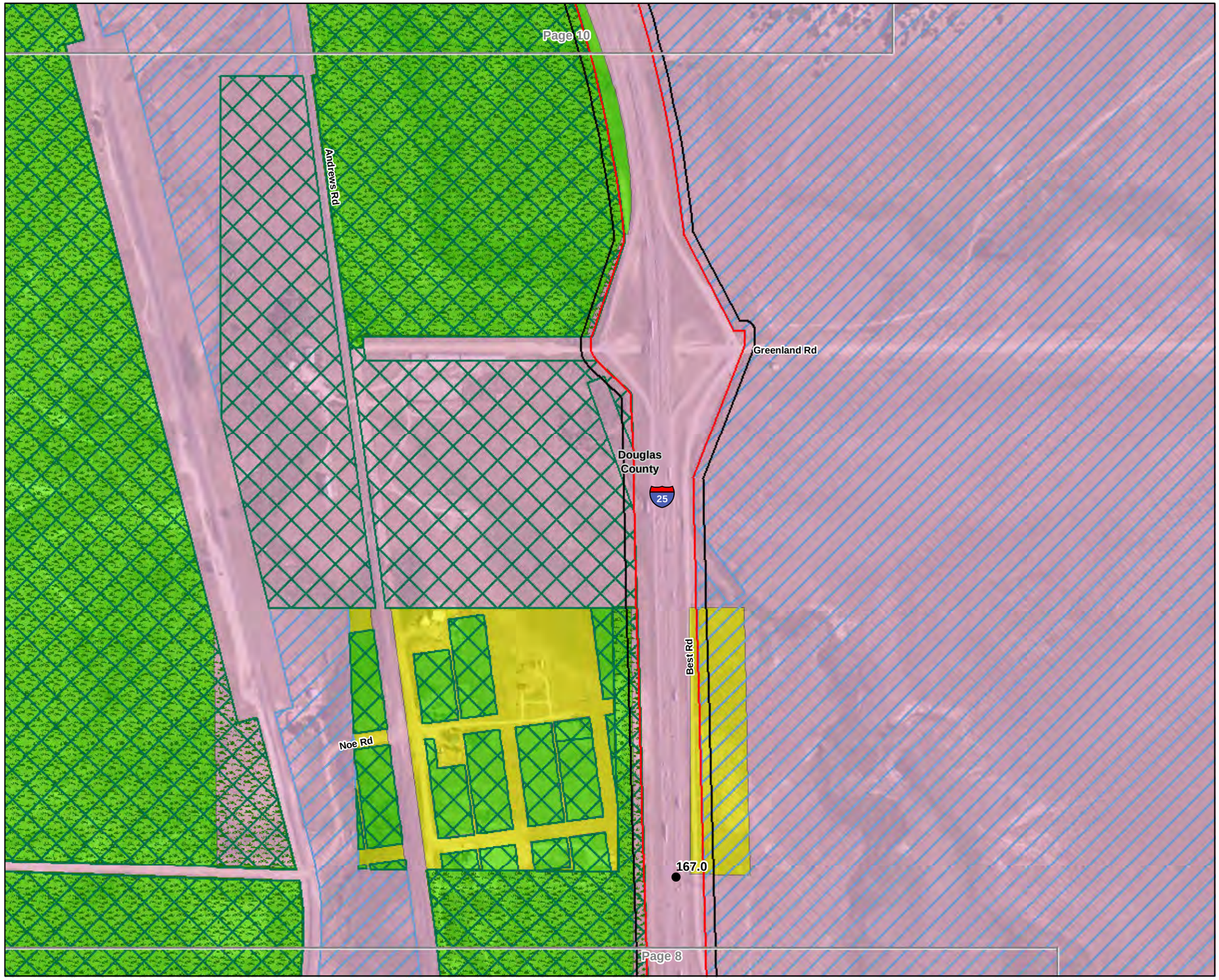
Feet

FIGURE 8
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

N

0 500

Feet

FIGURE 9
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

N

0 500

Feet

FIGURE 10
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

N

0 500

Feet

FIGURE 11
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

0 500 Feet

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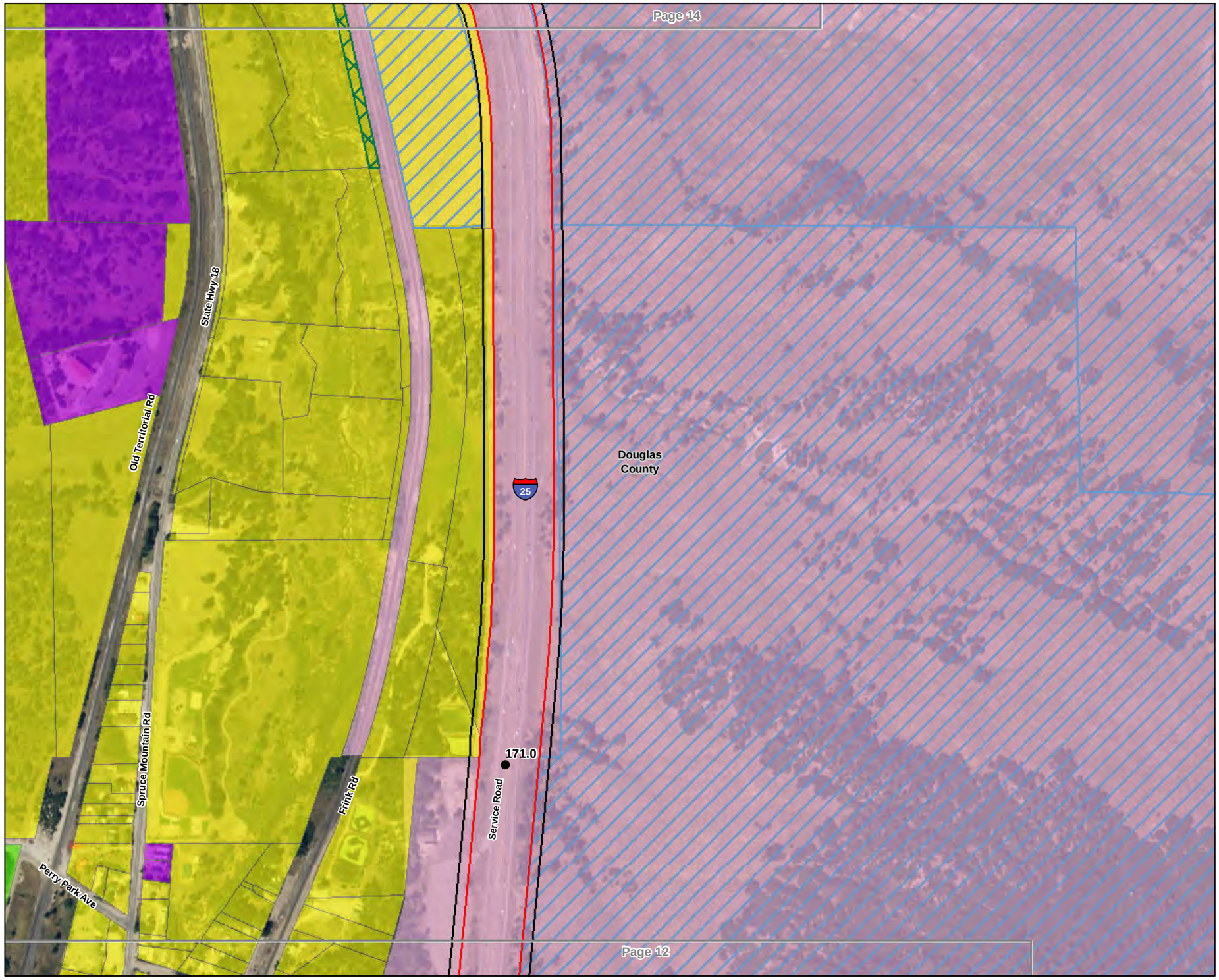
FIGURE 12
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



Page 12

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

N

0 500

Feet

FIGURE 13
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

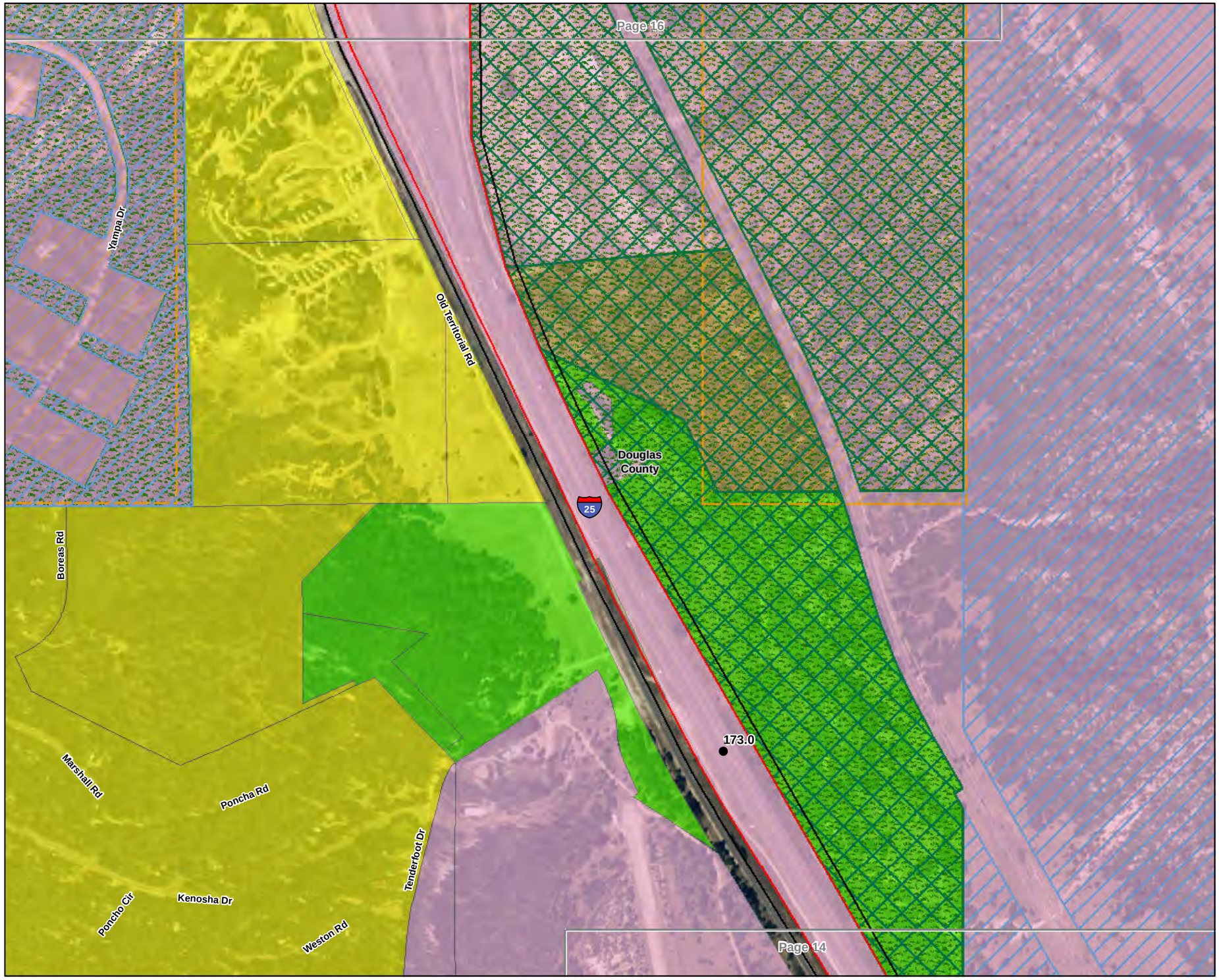
N

0 500

Feet

FIGURE 14
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

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Feet

FIGURE 15
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

N

0 500

Feet

FIGURE 16
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

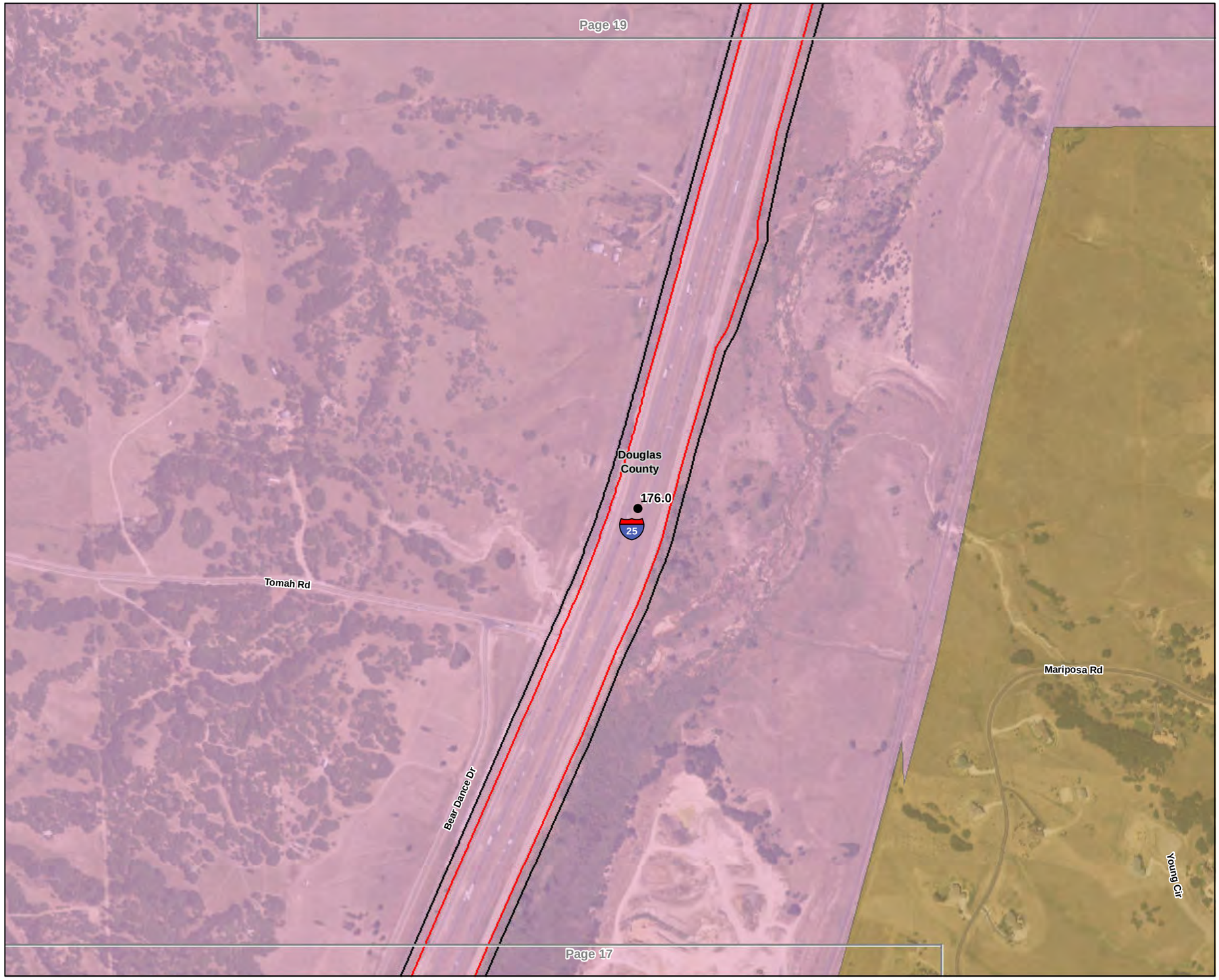
Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

0 500
Feet

FIGURE 17
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

N

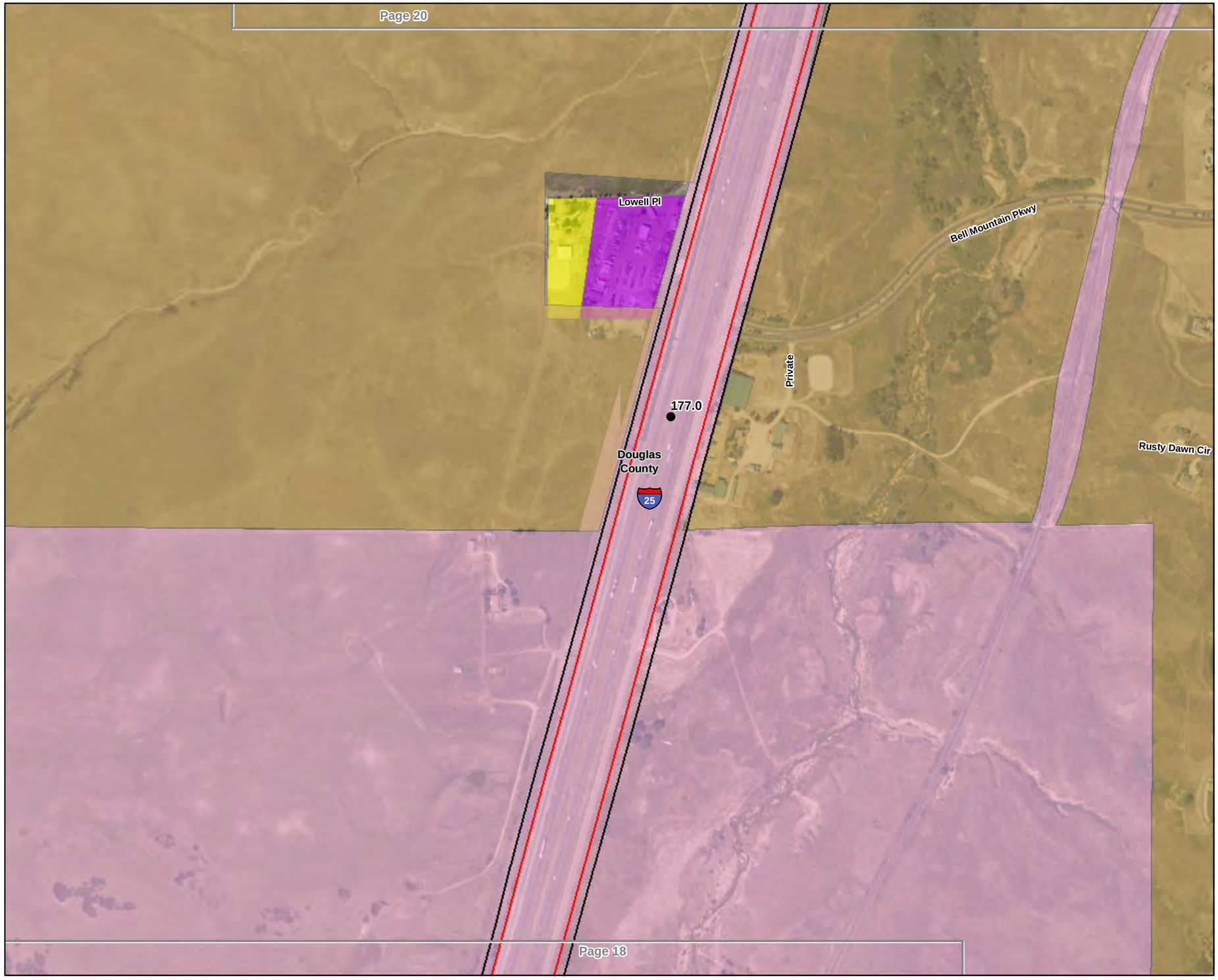
0 500

Feet

FIGURE 18
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

Page 20



Page 18

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

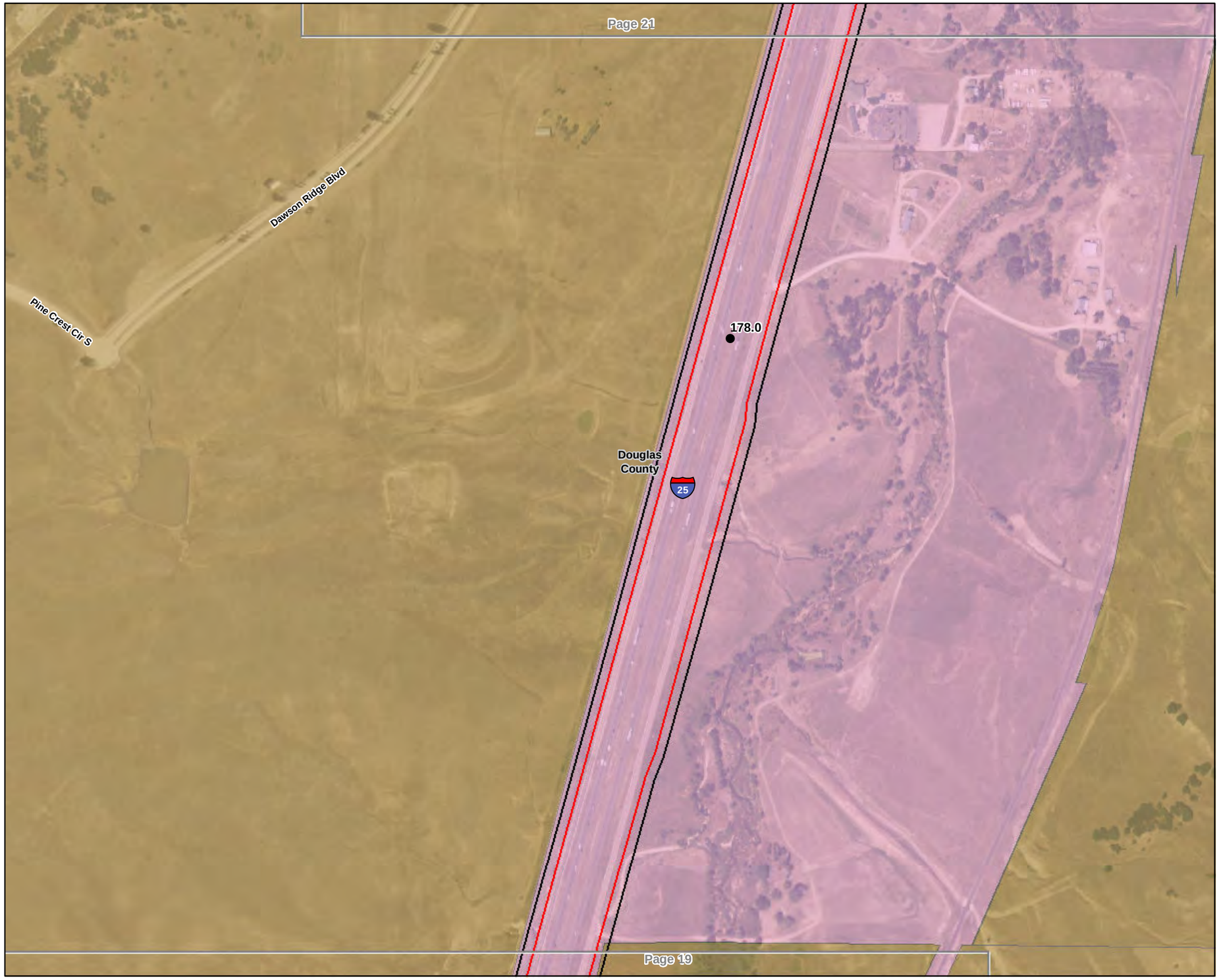
N

0 500

Feet

FIGURE 19
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

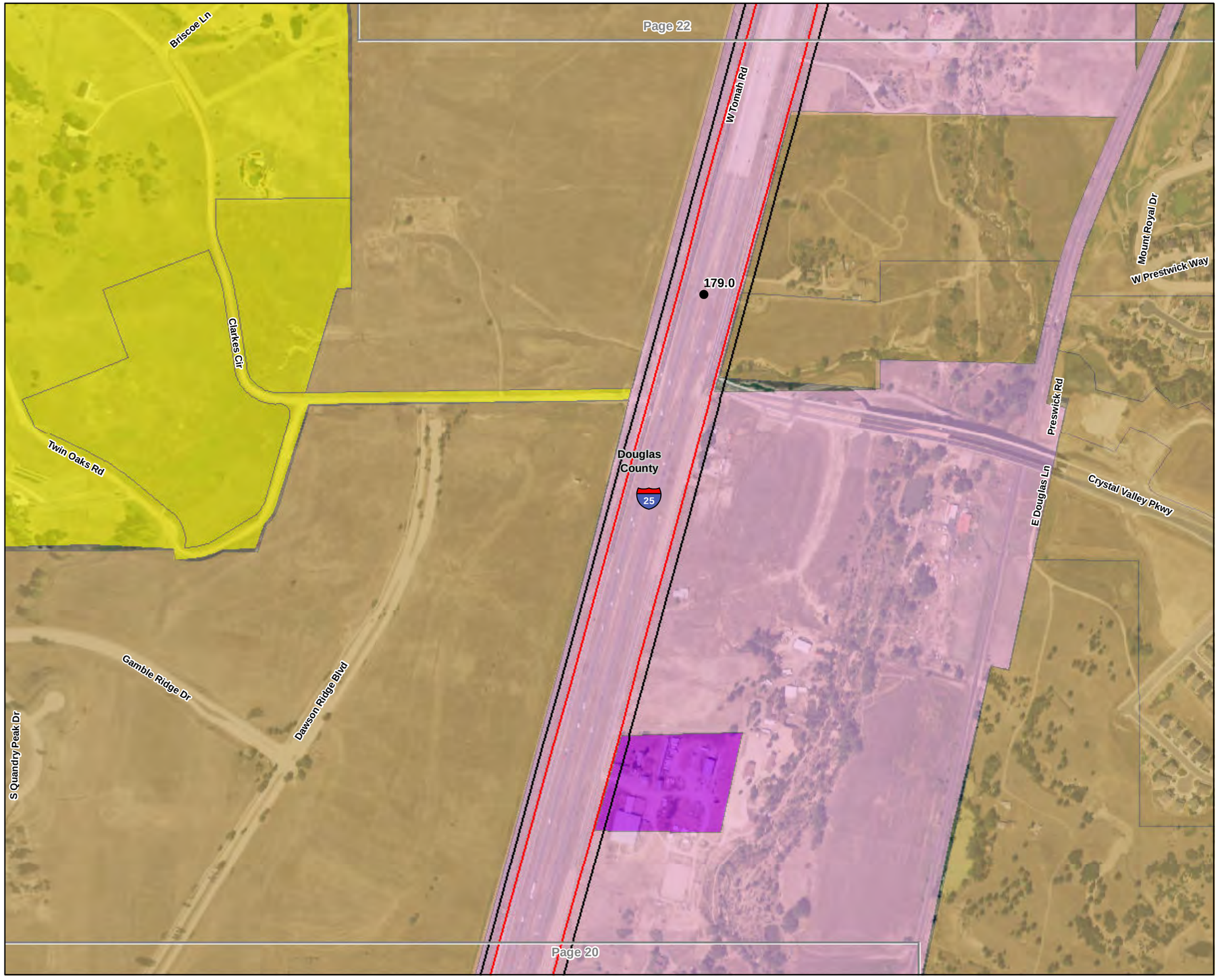
N

0 500

Feet

FIGURE 20
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

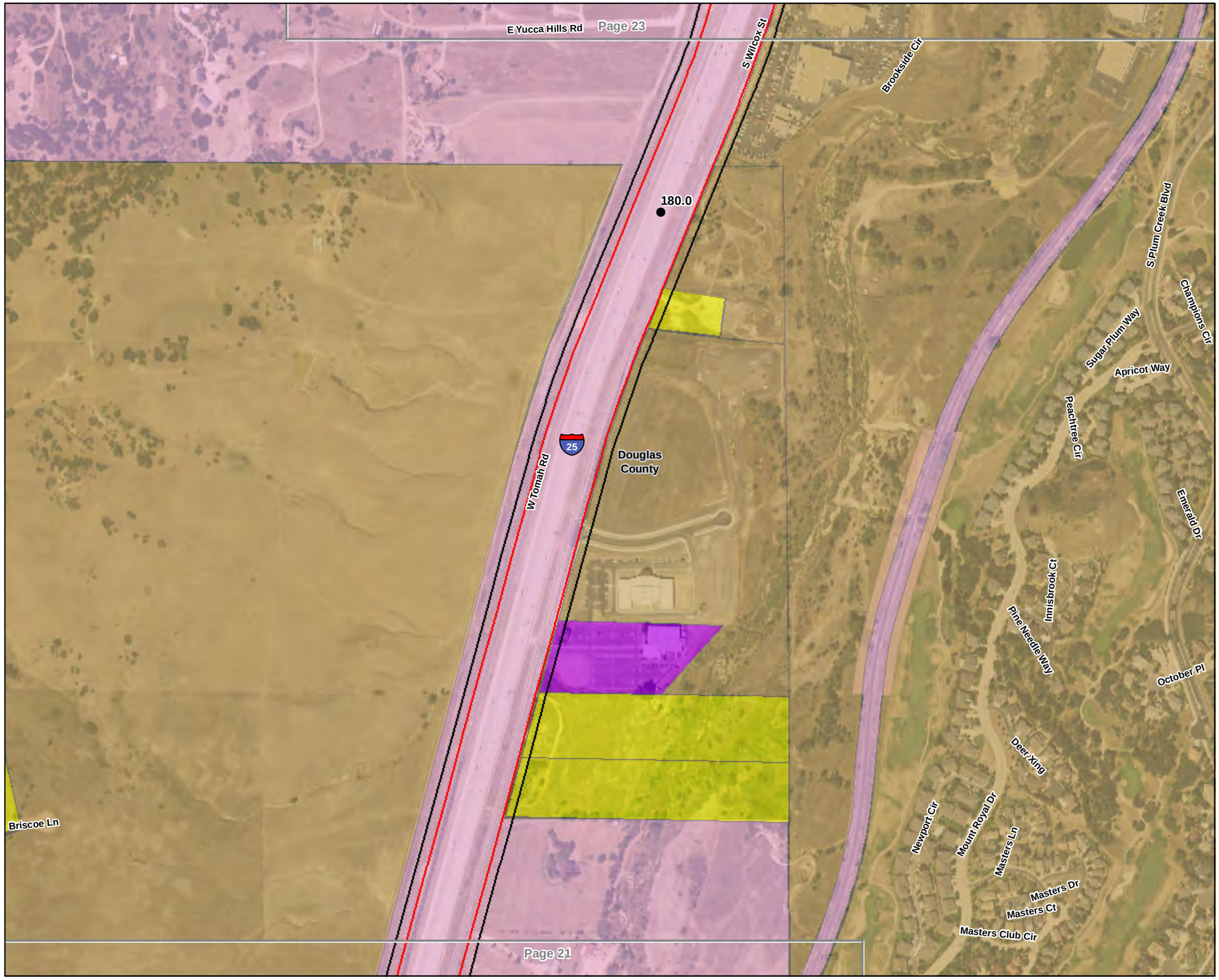
N

0 500

Feet

FIGURE 21
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

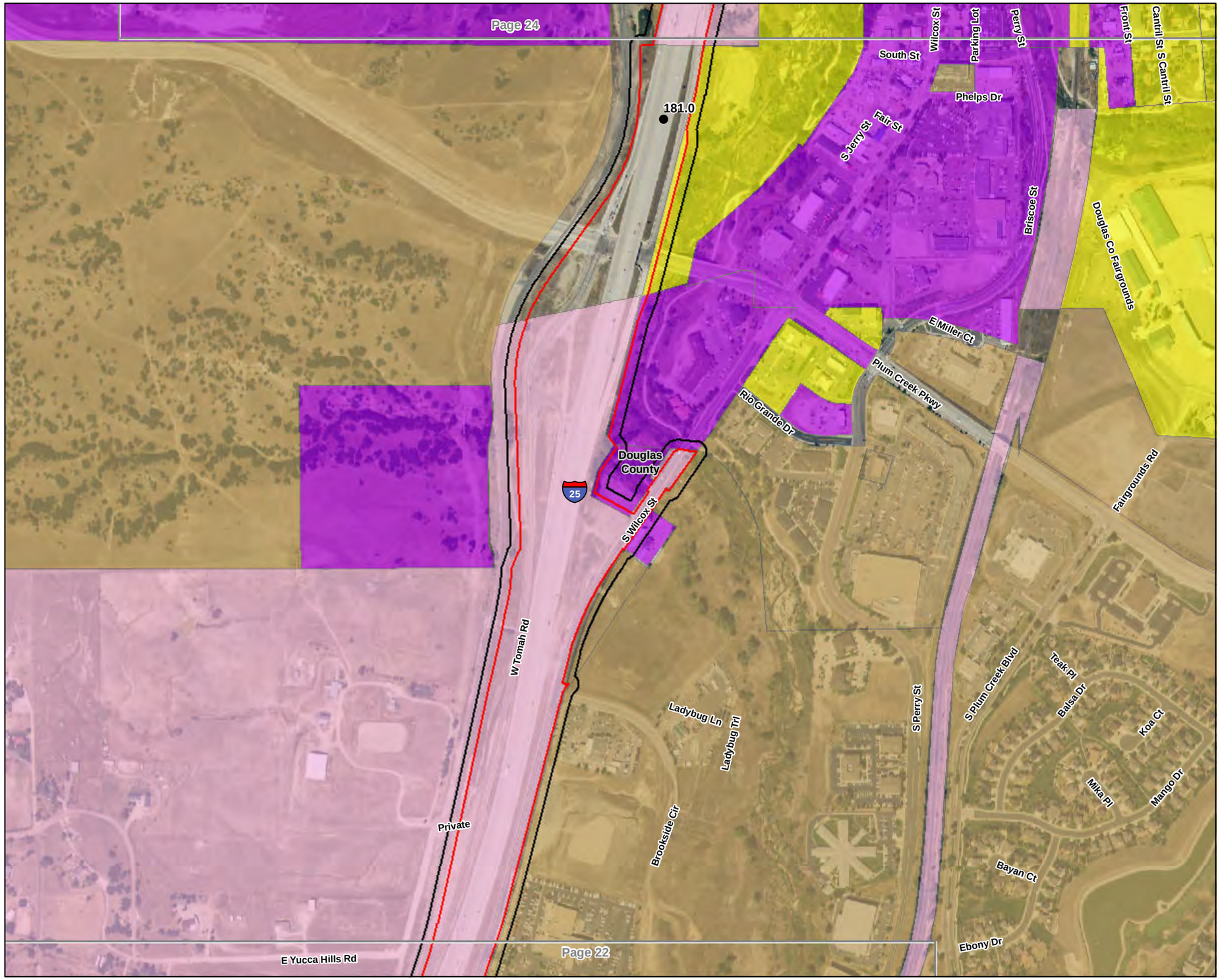
N

0 500

Feet

FIGURE 22
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

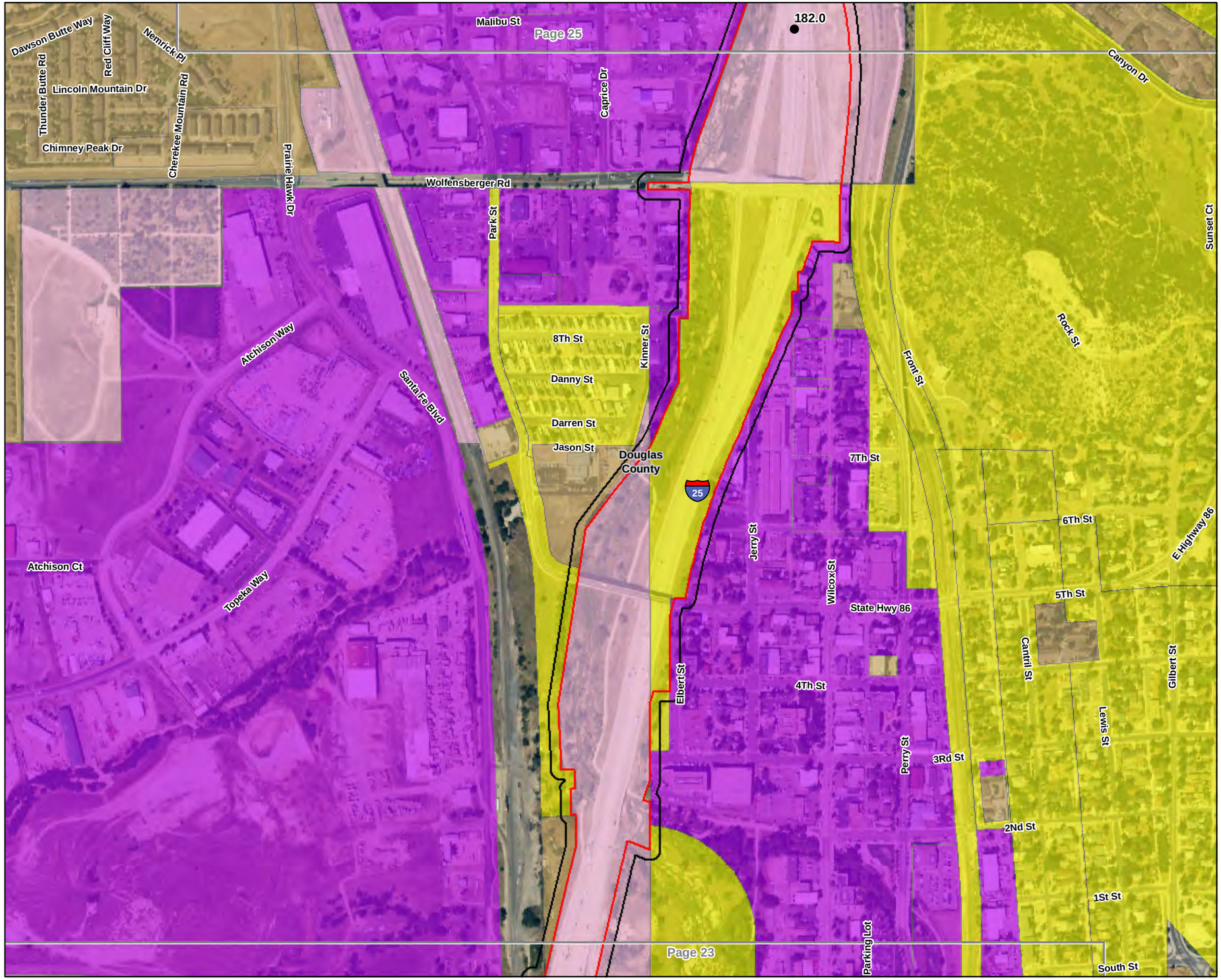
N

0 500

Feet

FIGURE 23
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

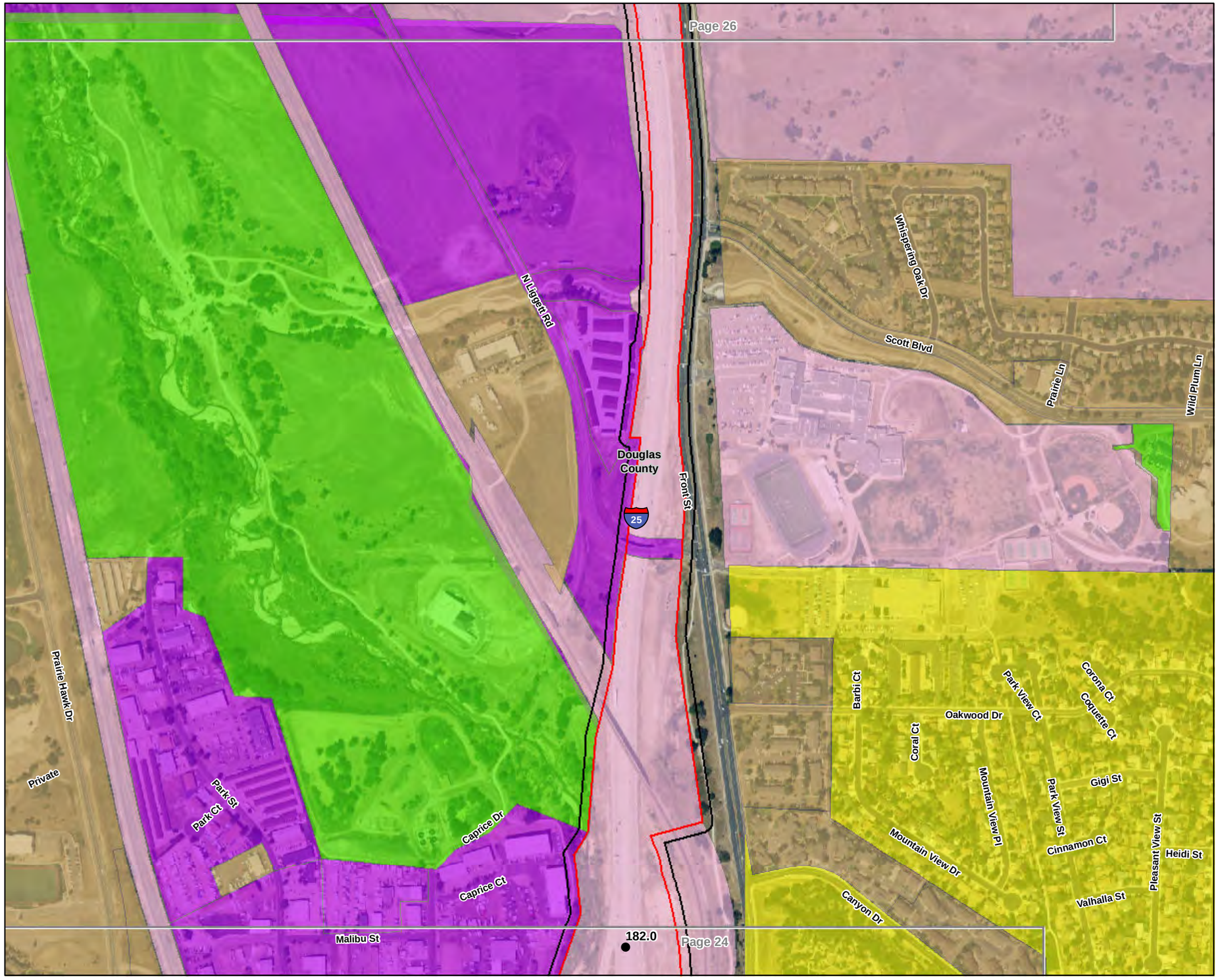
Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

0 500
Feet

FIGURE 24
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

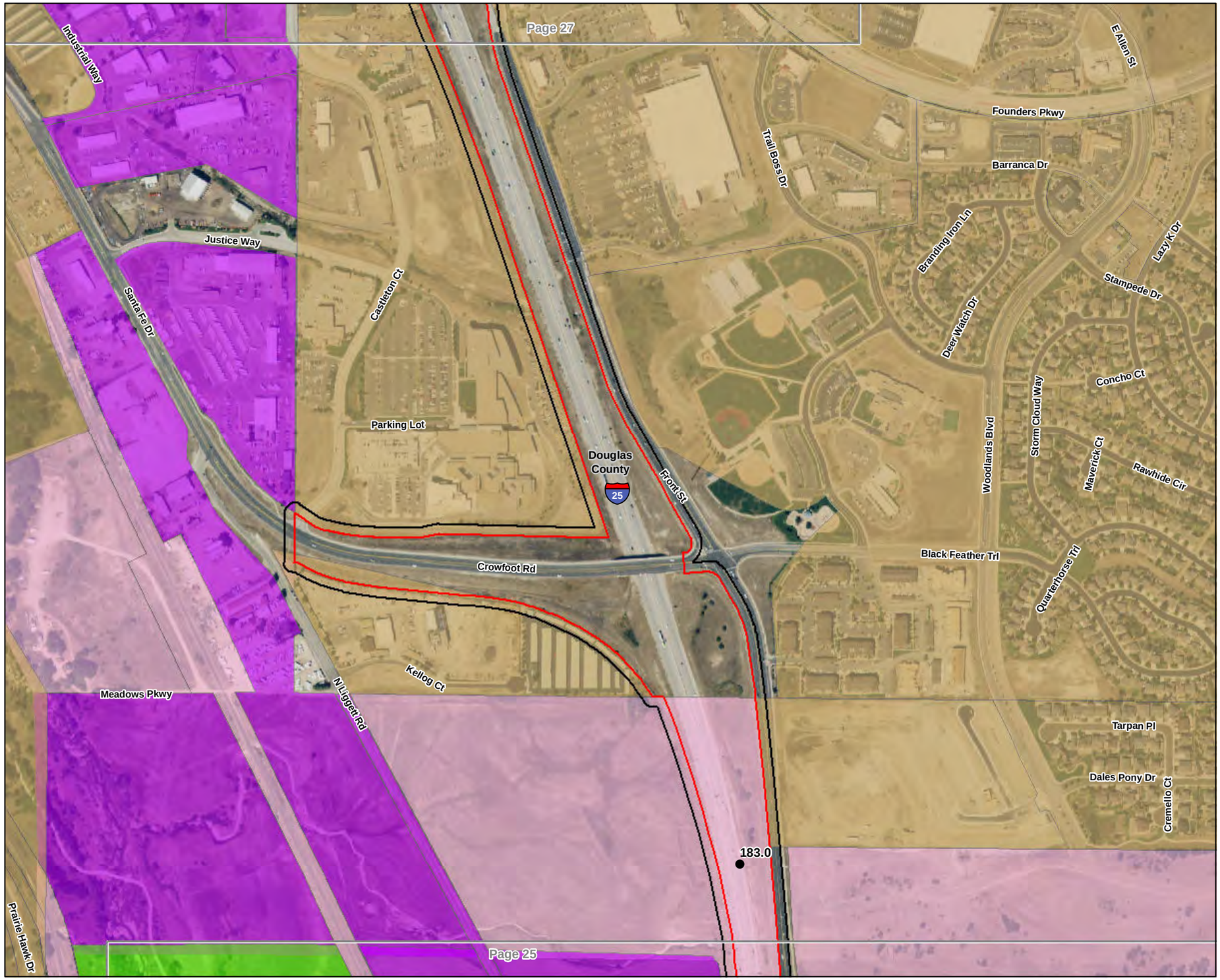
N

0 500

Feet

FIGURE 25
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

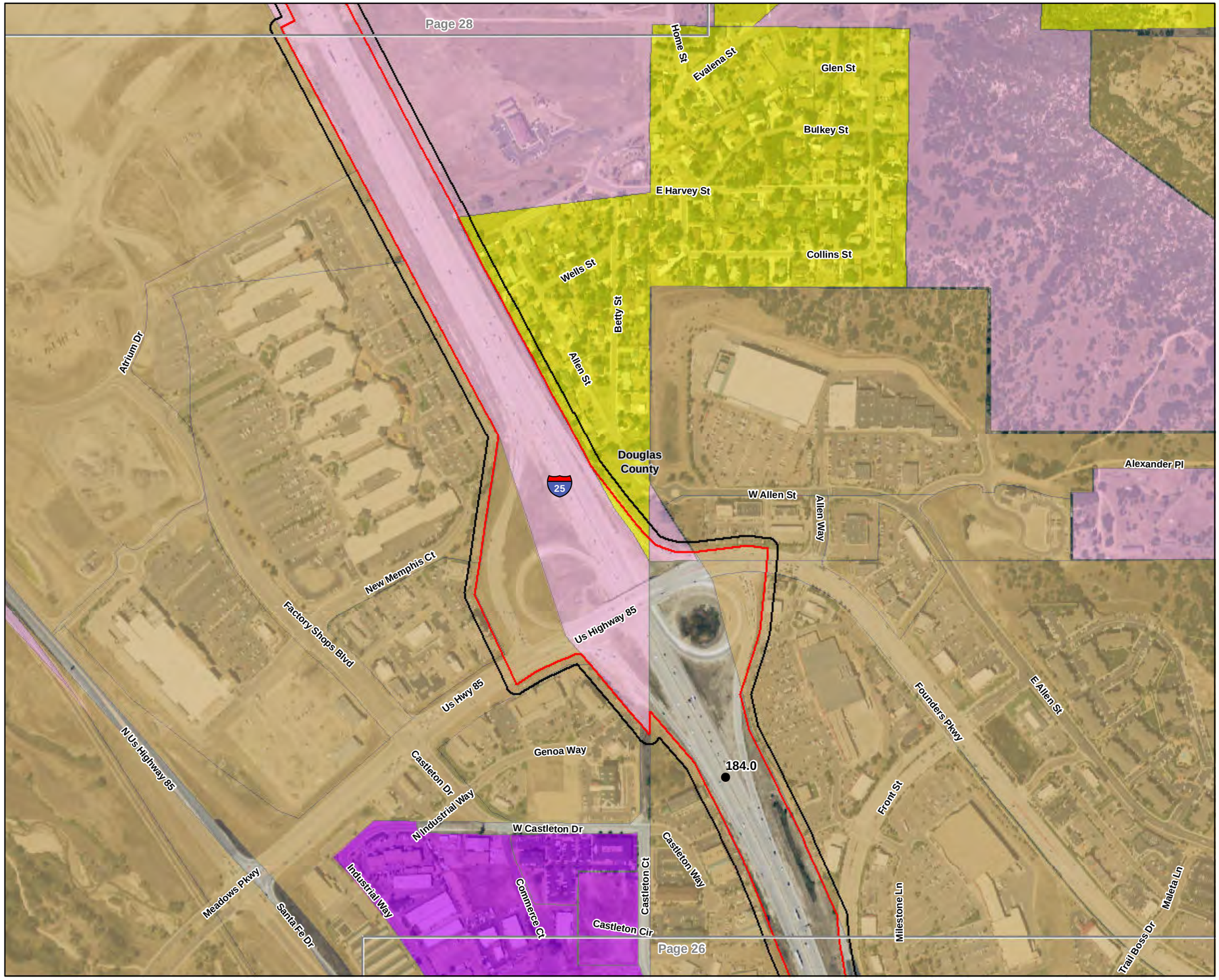
N

0 500

Feet

FIGURE 26
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

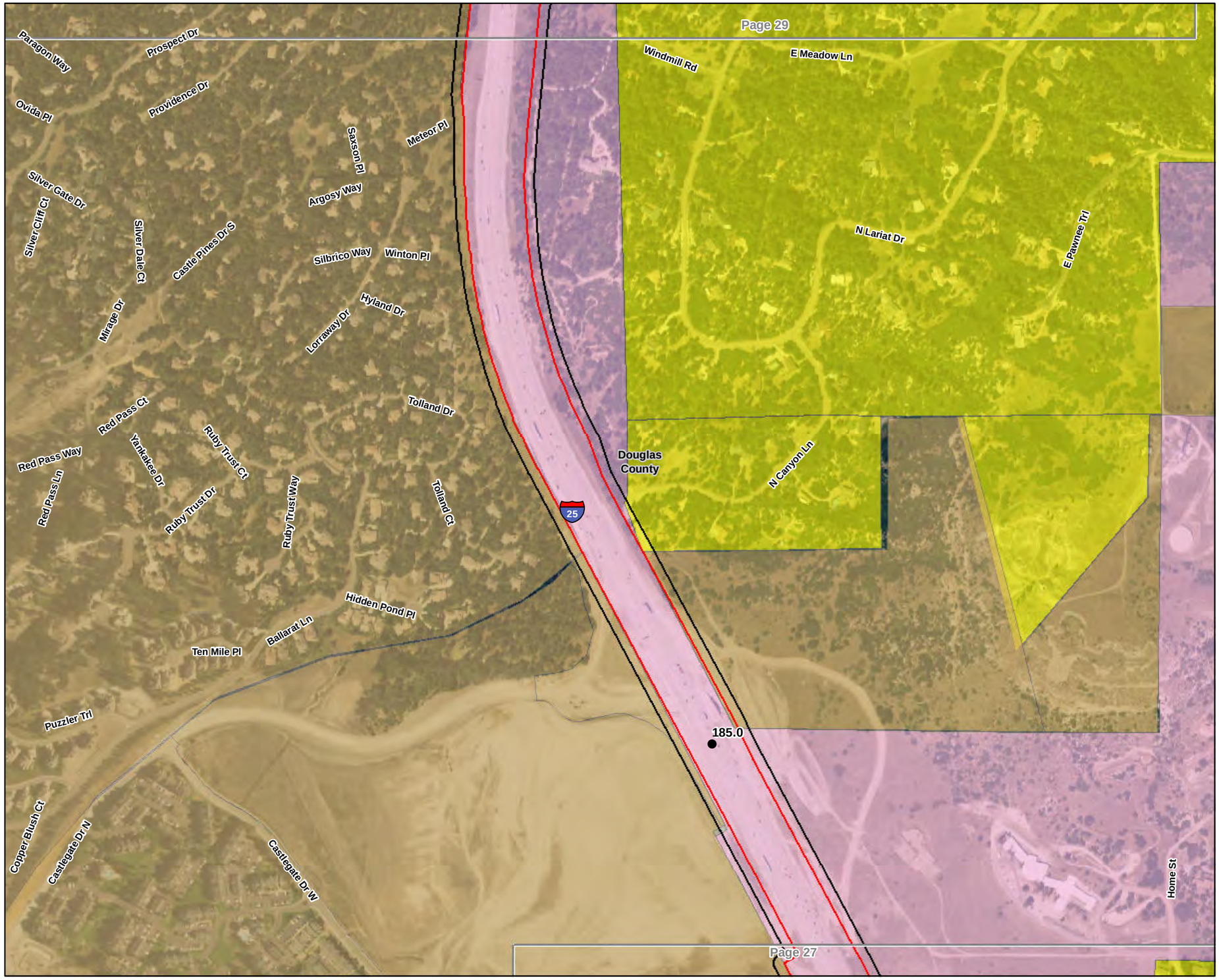
N

0 500

Feet

FIGURE 27
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

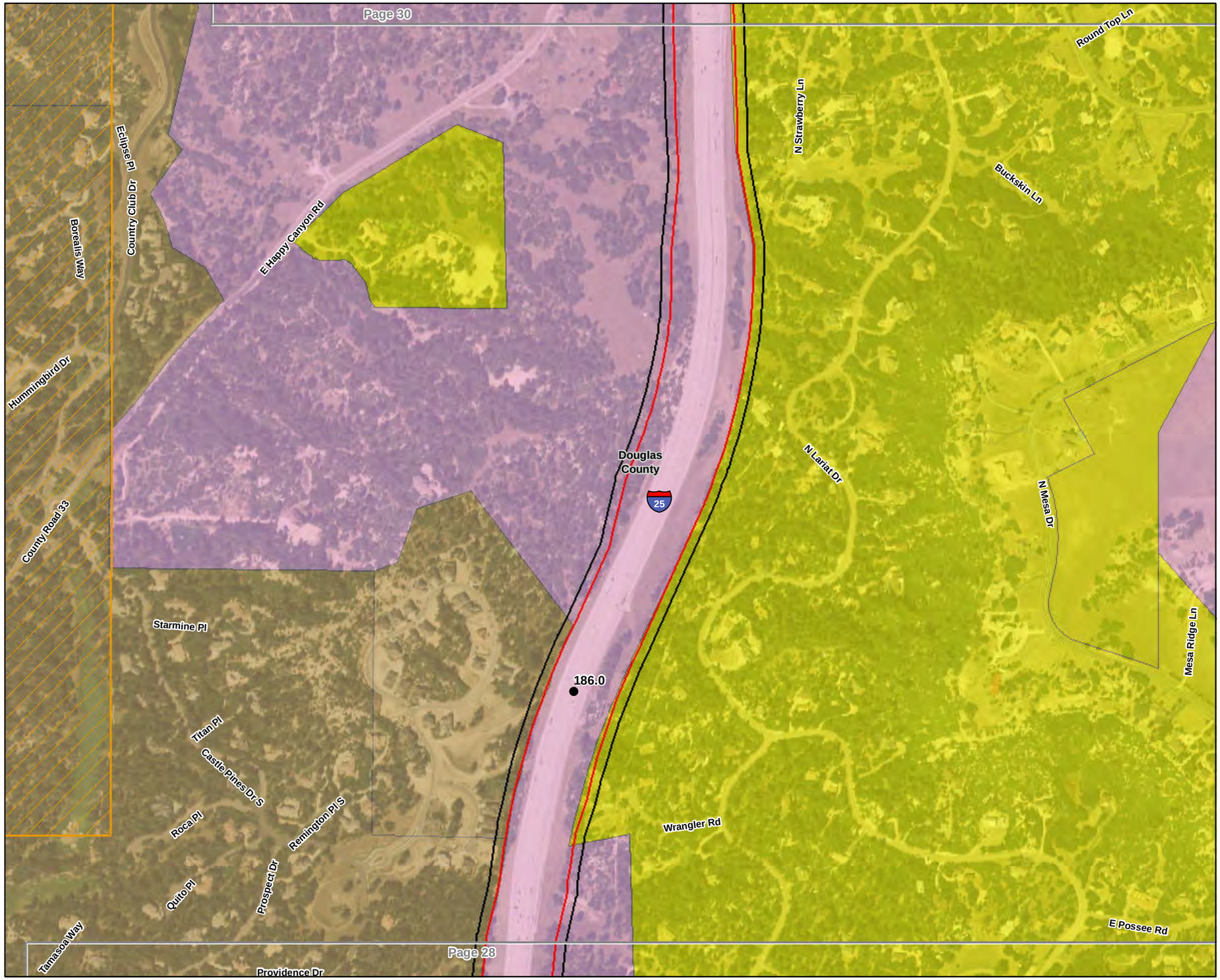
N

0 500

Feet

FIGURE 28
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

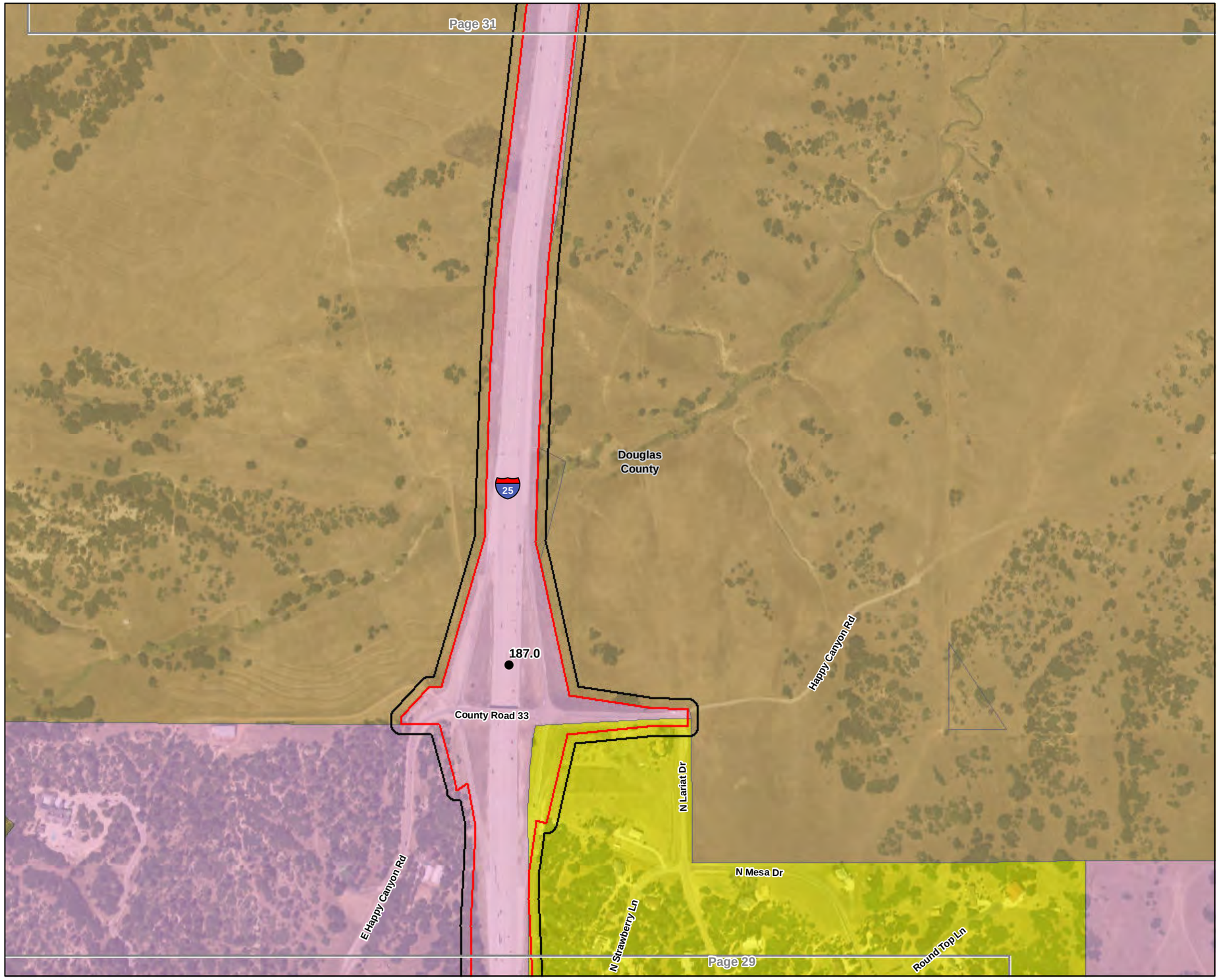
N

0 500

Feet

FIGURE 29
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

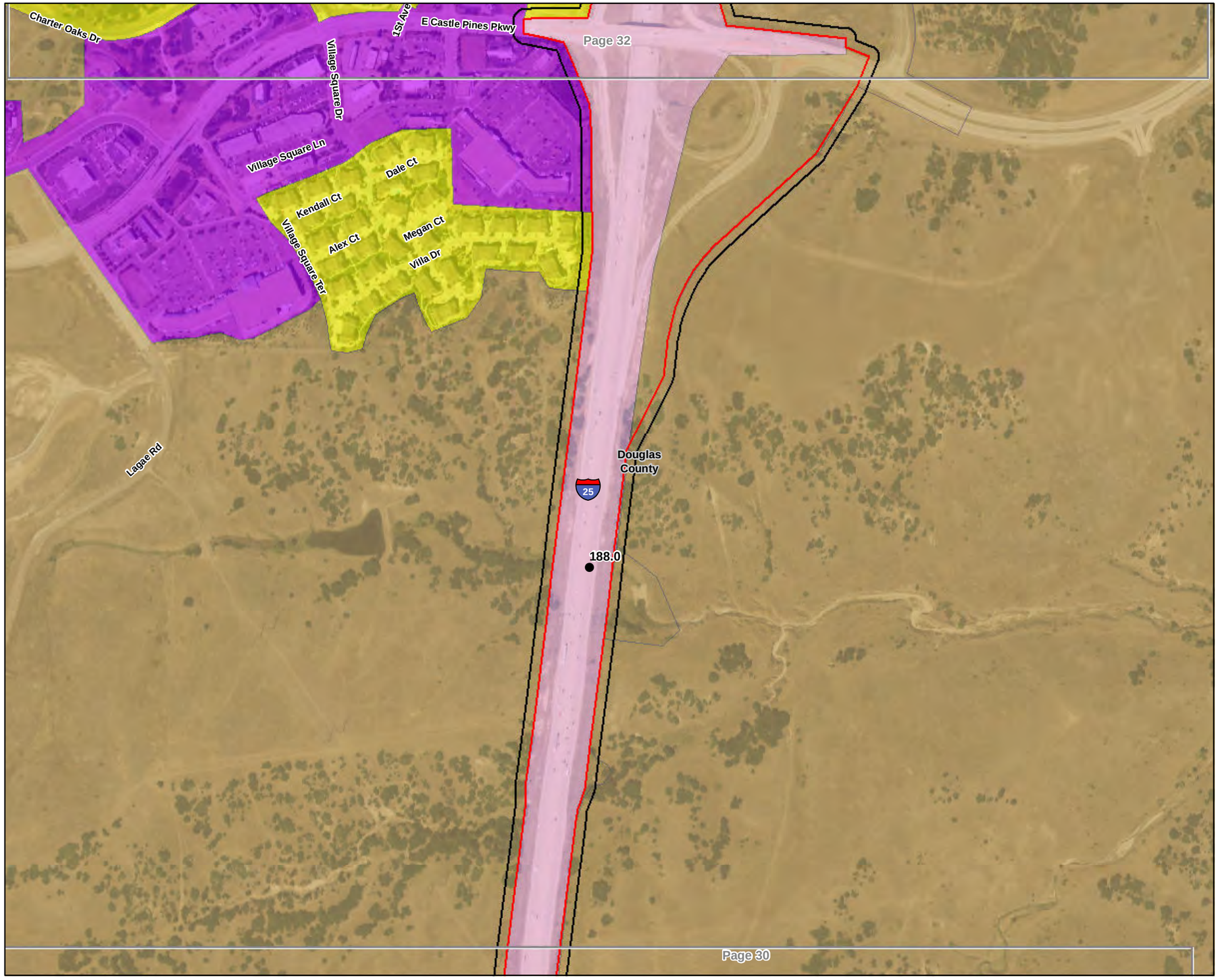
N

0 500

Feet

FIGURE 30
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

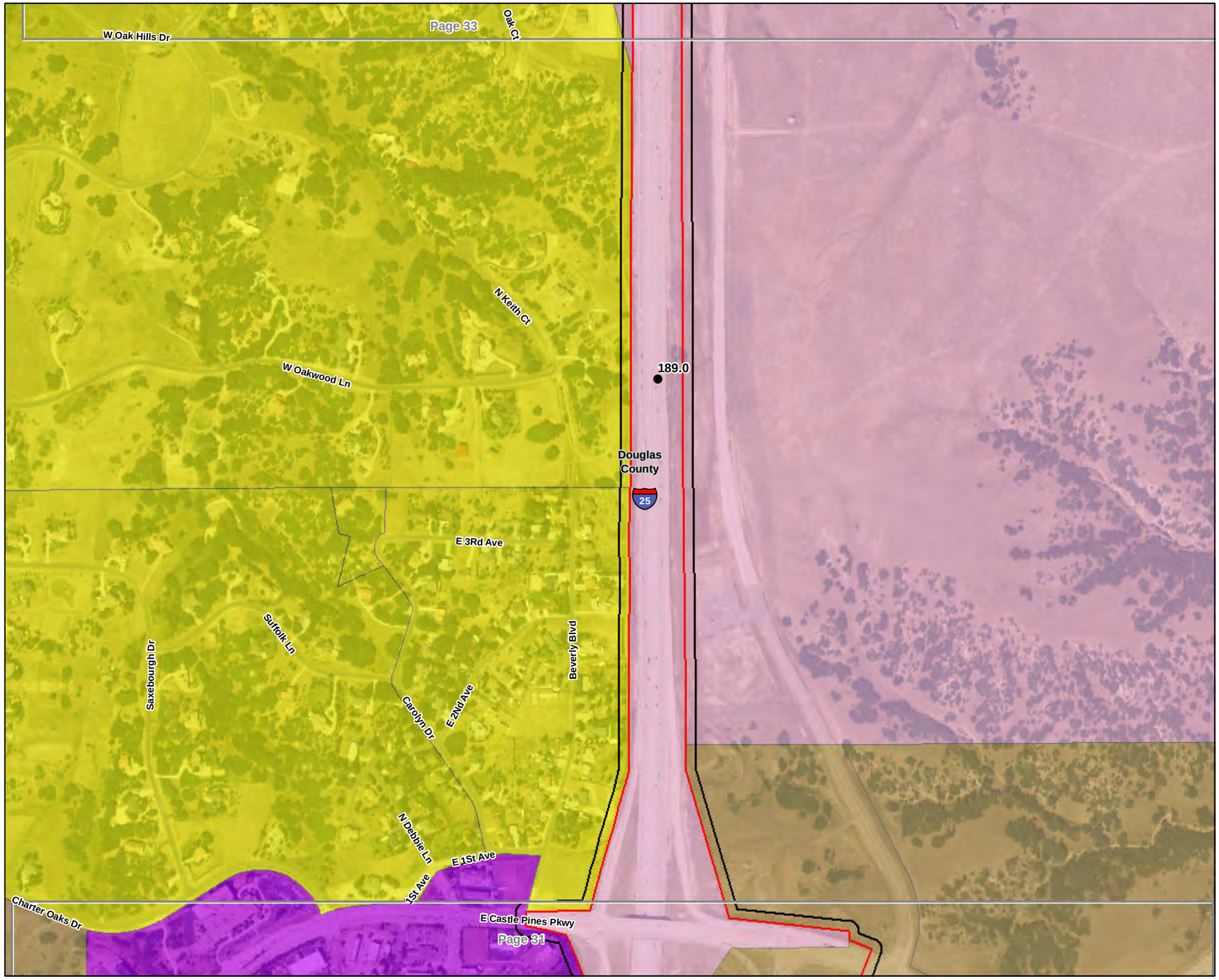
N

0 500

Feet

FIGURE 31
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

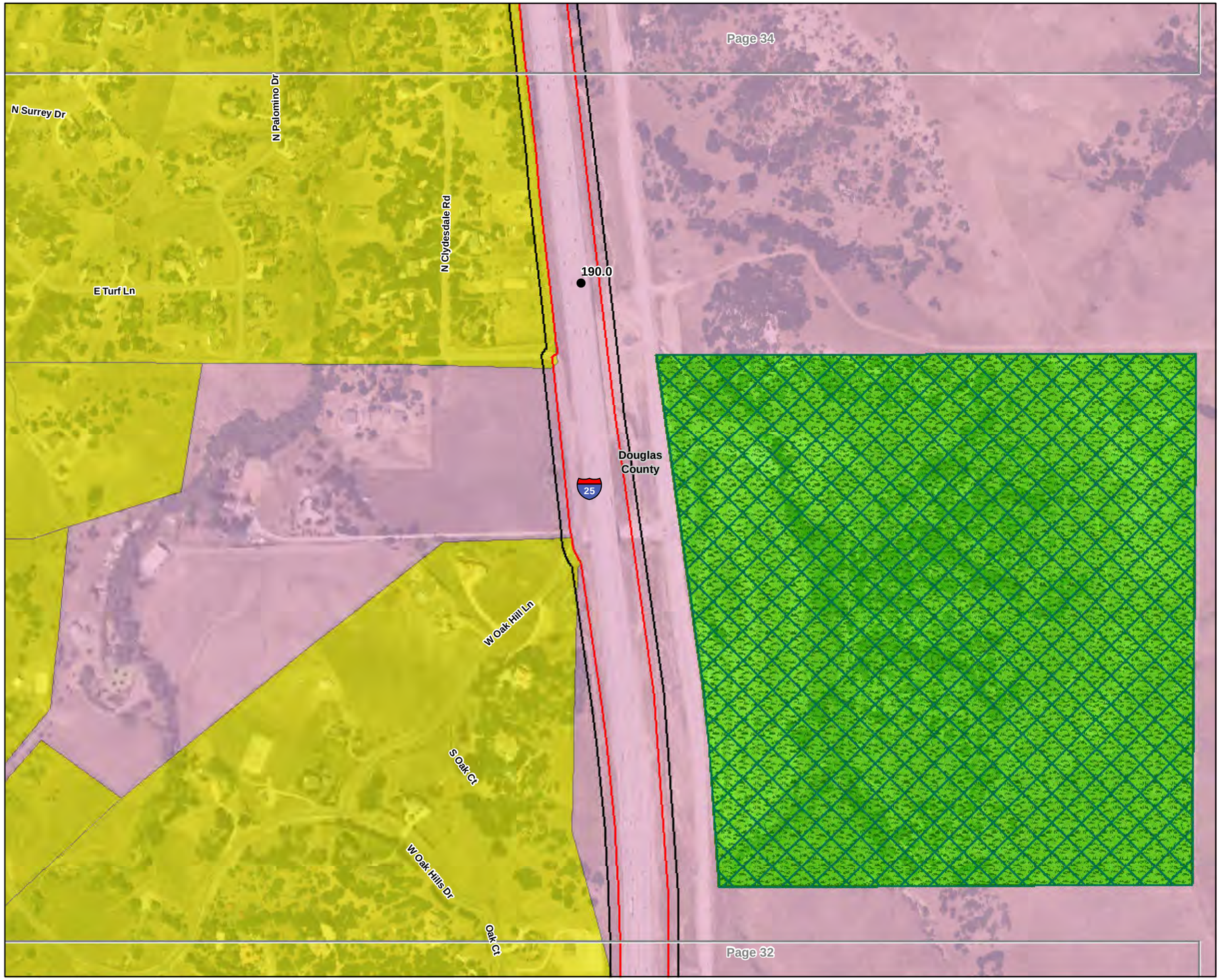
N

0 500

Feet

FIGURE 32
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

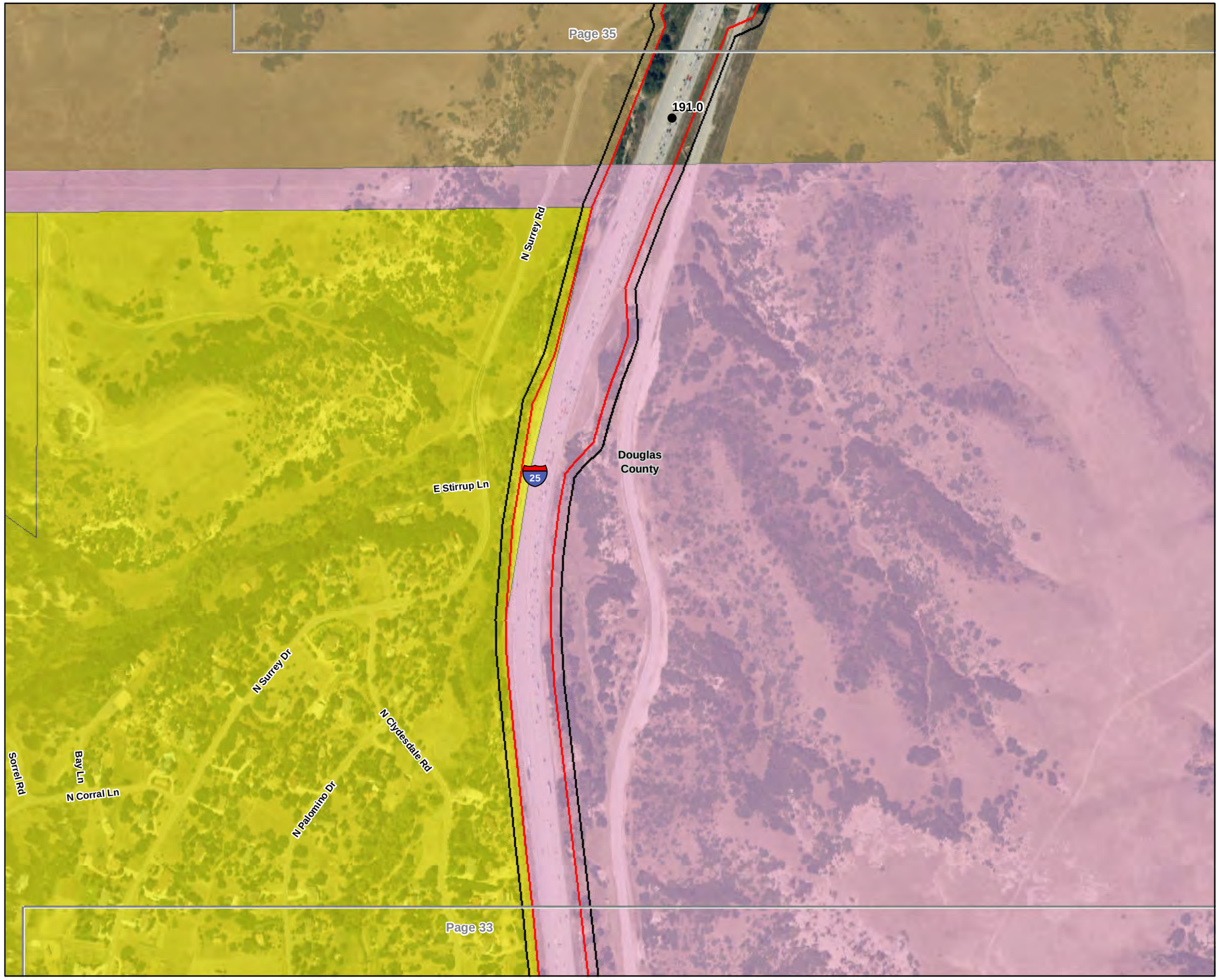
Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

0 500
N
Feet

FIGURE 33
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

N

0 500

Feet

FIGURE 34
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

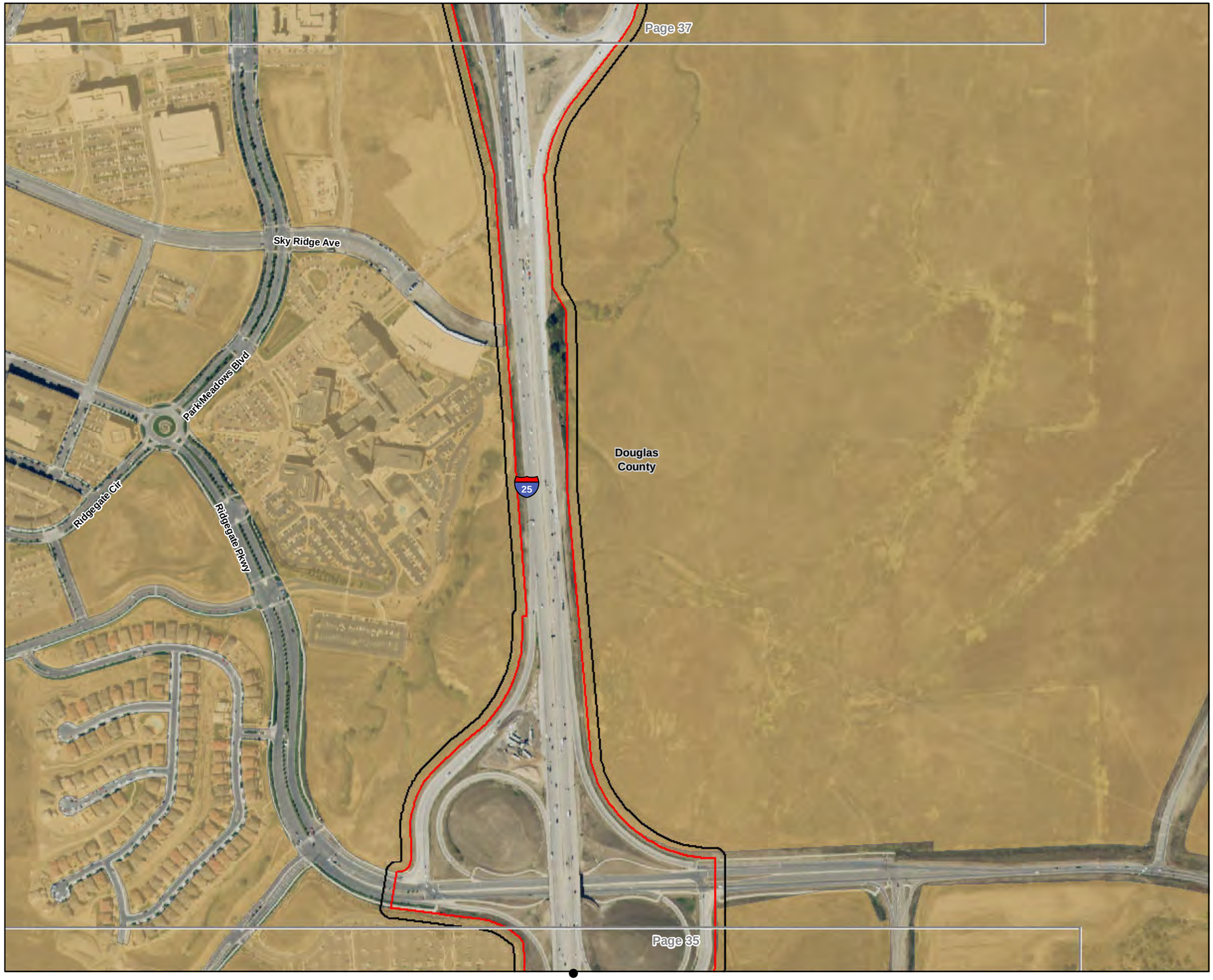
N

0 500

Feet

FIGURE 35
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

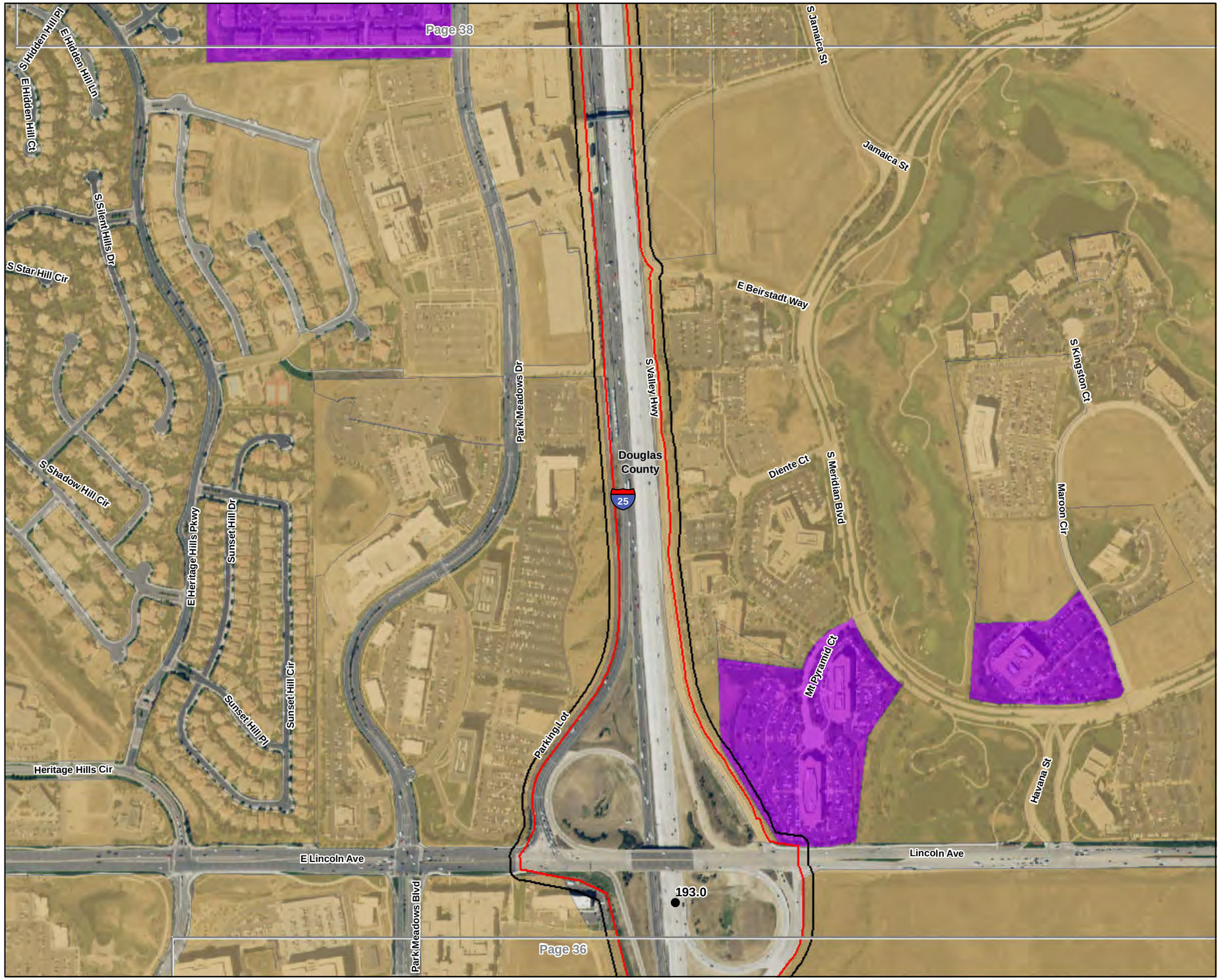
N

0 500

Feet

FIGURE 36
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

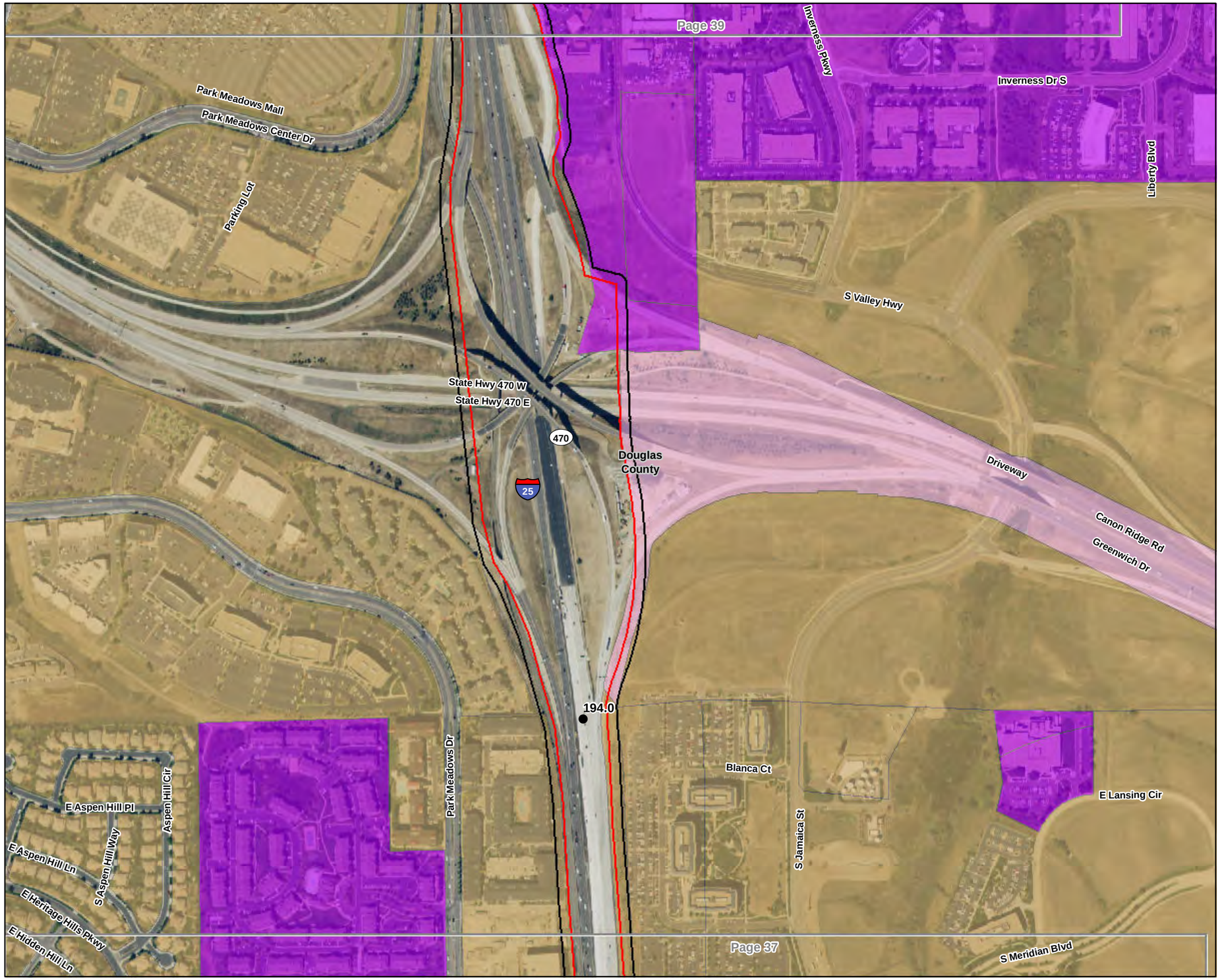
Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

0 500 Feet

FIGURE 37
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

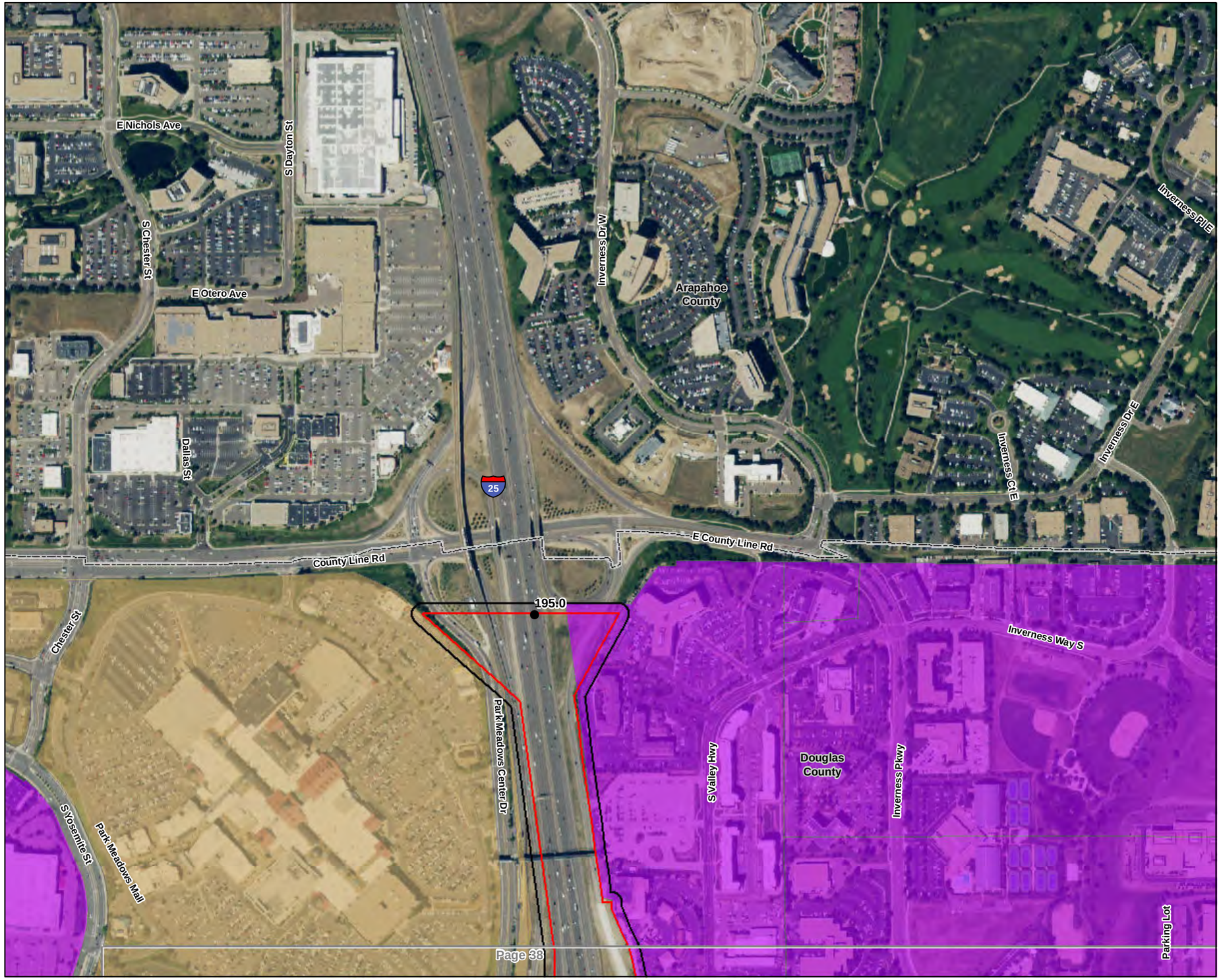
N

0 500

Feet

FIGURE 38
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Fee Title
- Conservation Easements
- SLB Mineral Lease Area

Zoning

- Agricultural
- Residential
- Commercial/Industrial
- Parks/Open Space/Recreational
- Forest
- Planned Development
- Open Space

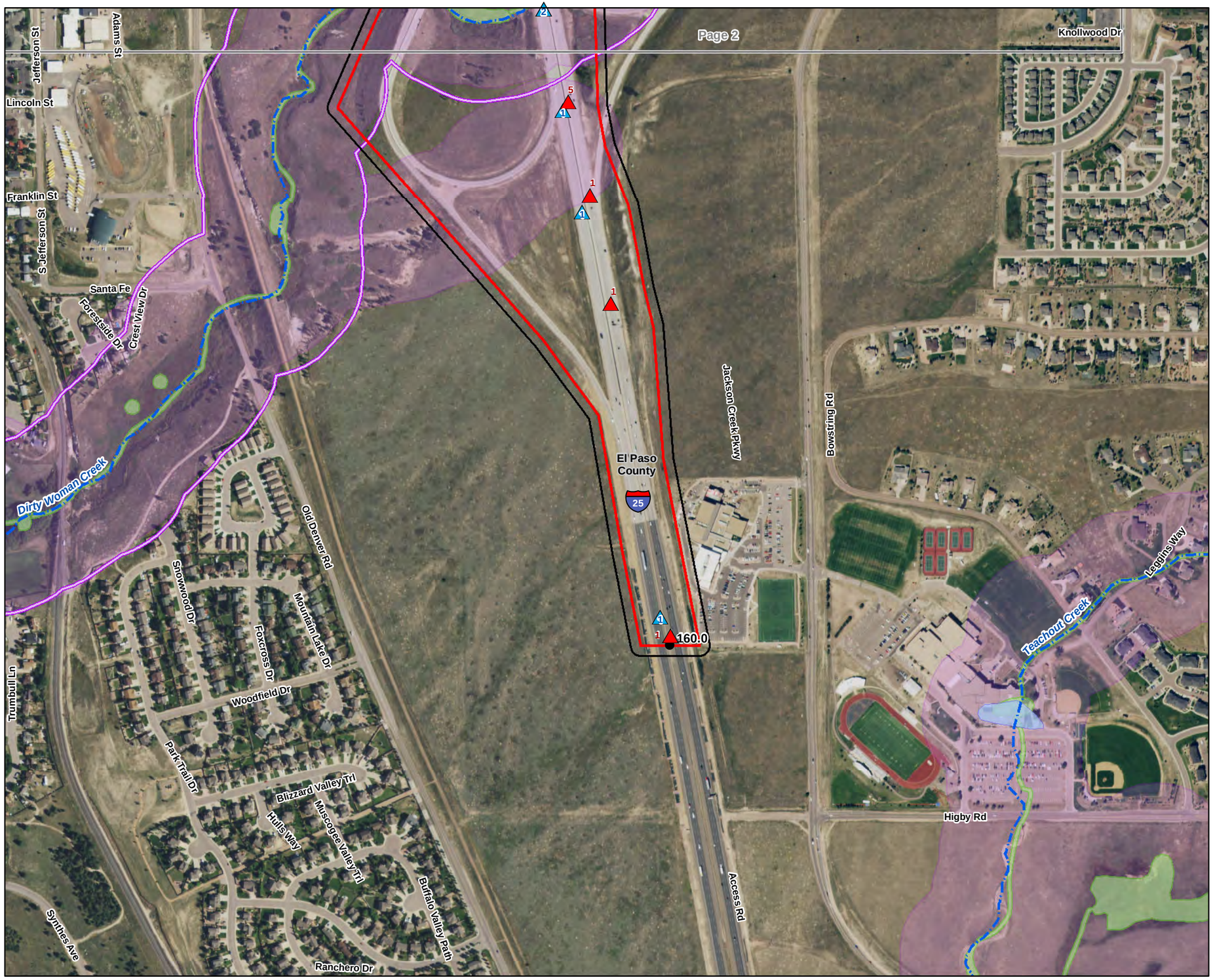
N

0 500

Feet

FIGURE 39
Land Use Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

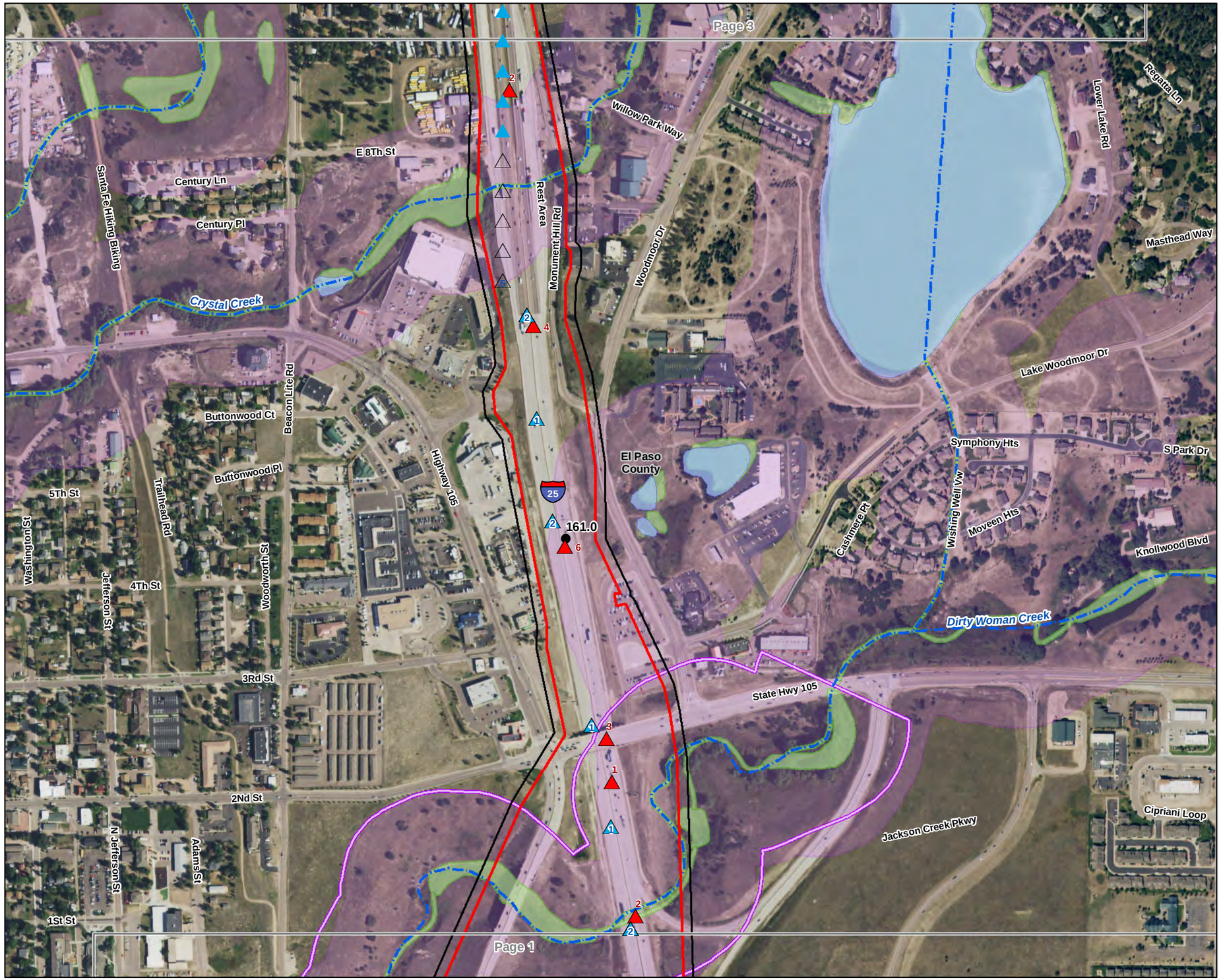
N

0 500

Feet

FIGURE 1
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

N

0 500

Feet

FIGURE 2
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

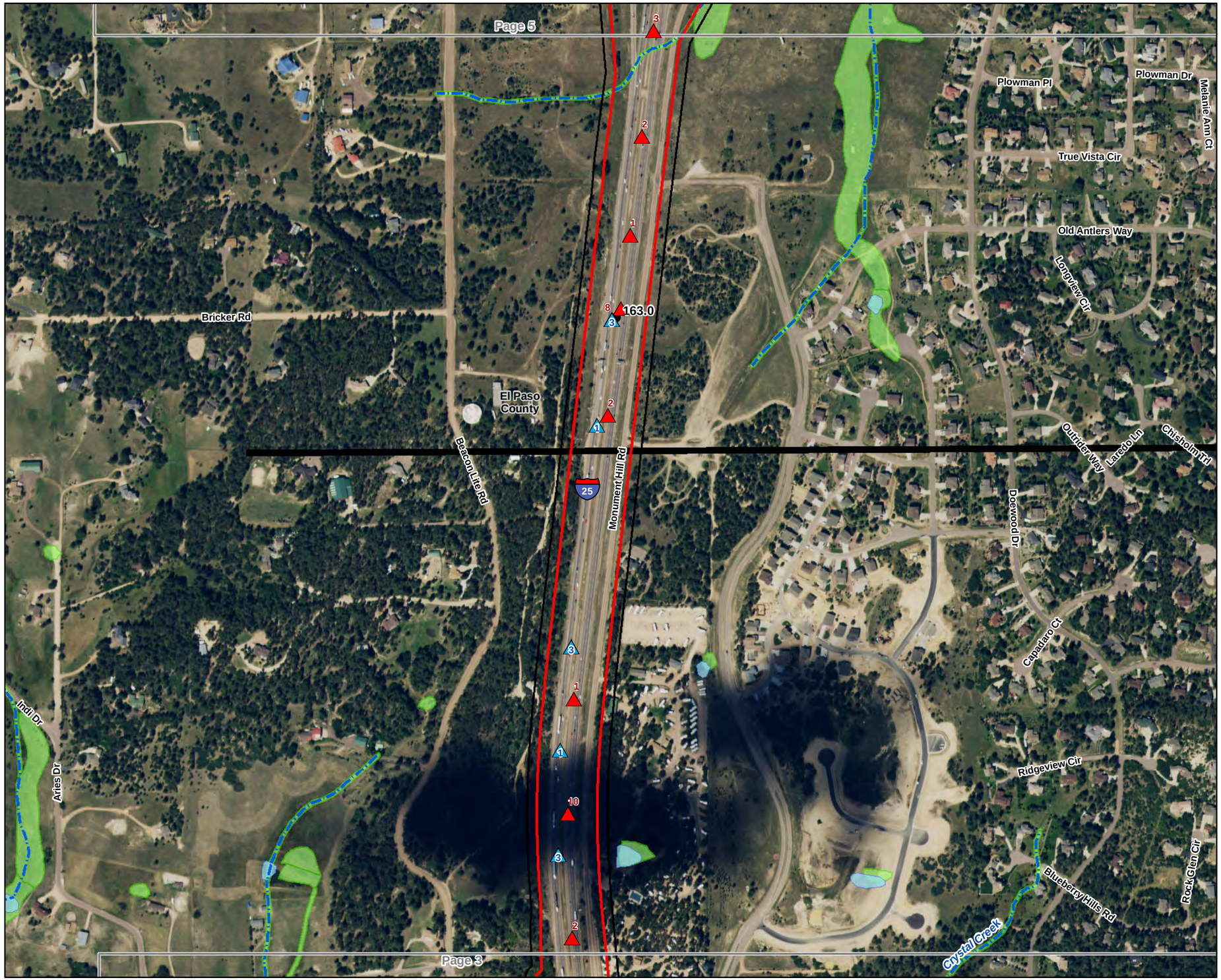
N

0 500

Feet

FIGURE 3
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

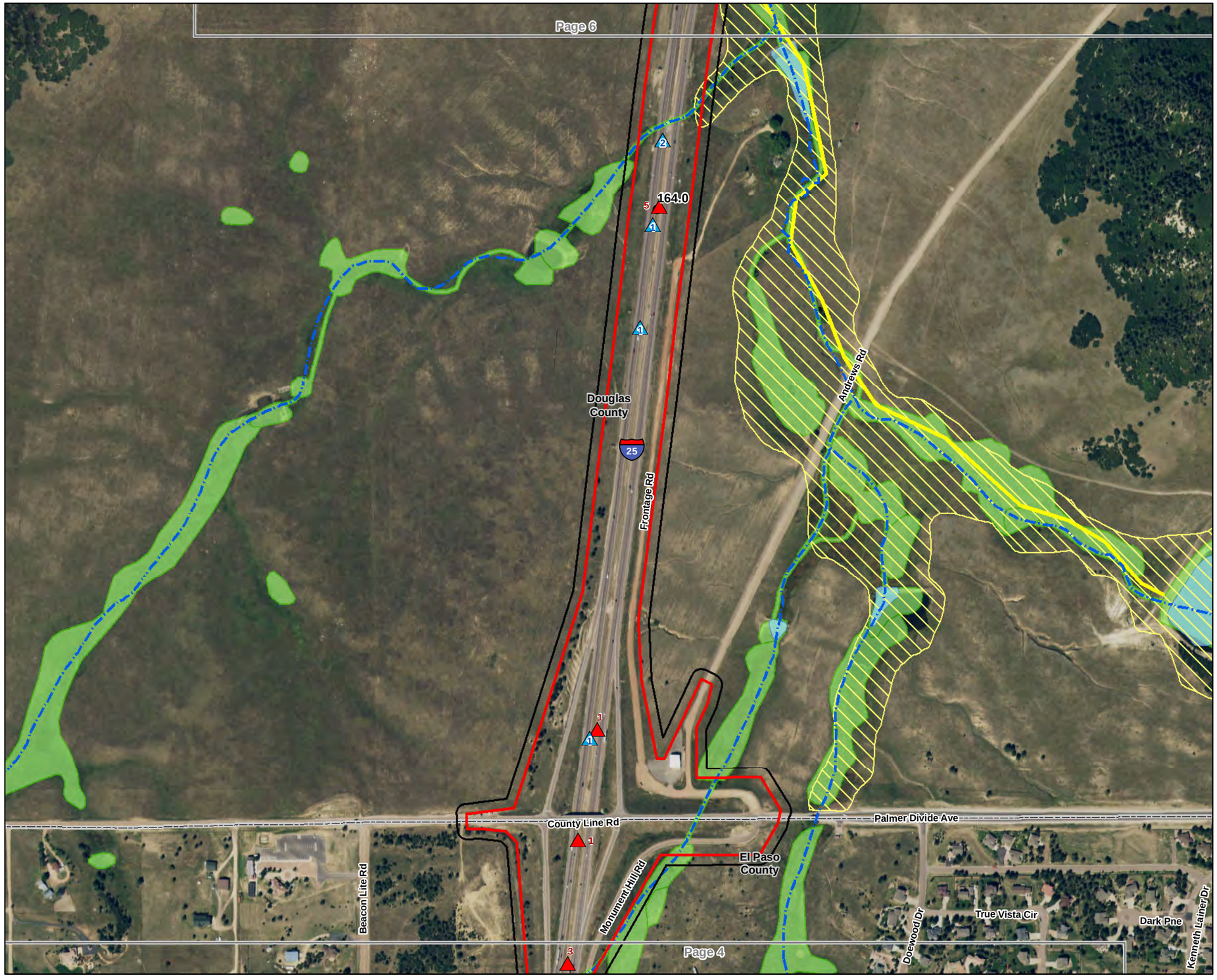
N

0 500

Feet

FIGURE 4
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
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- PMJM Occupied Range

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FIGURE 5
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
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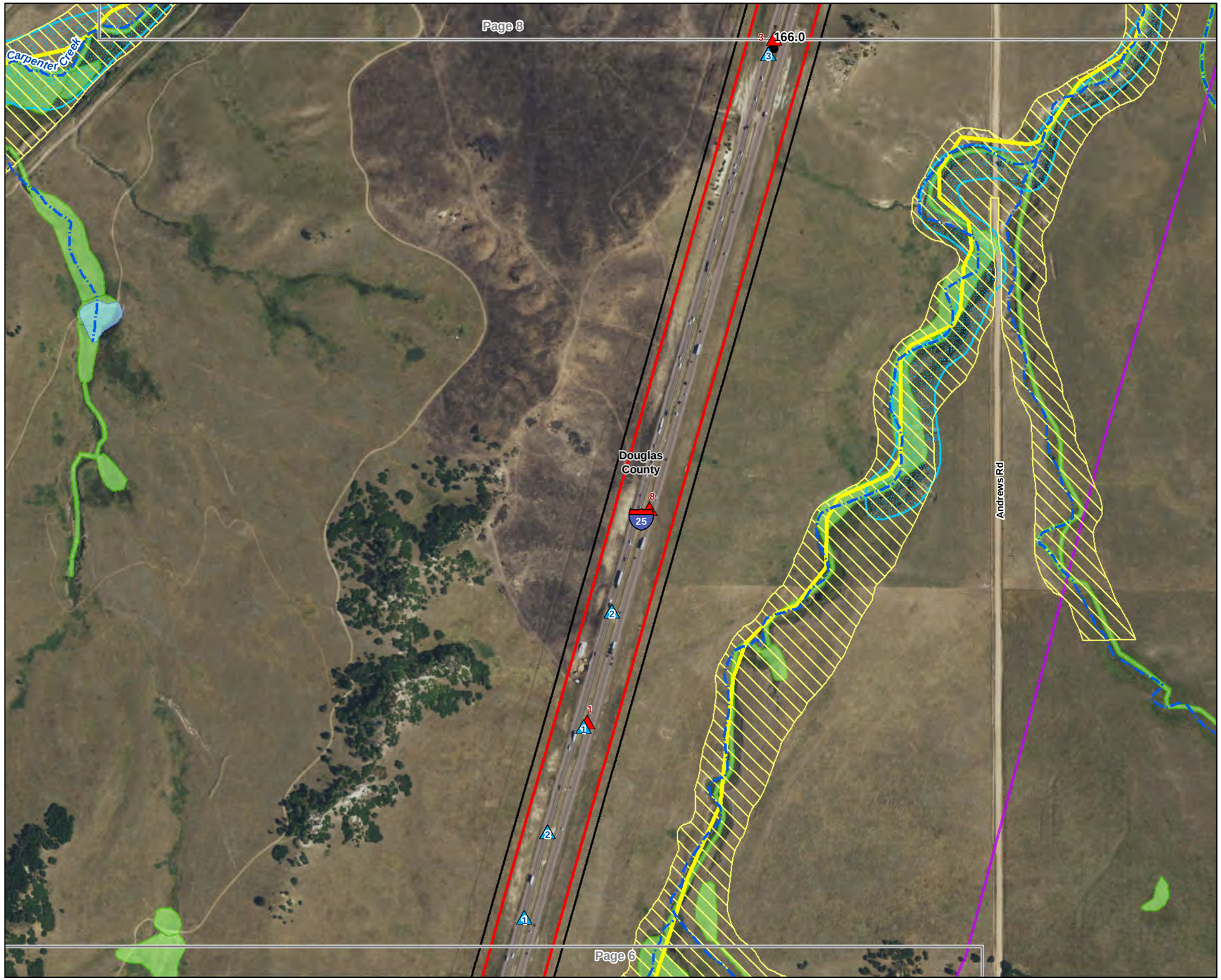
FIGURE 6
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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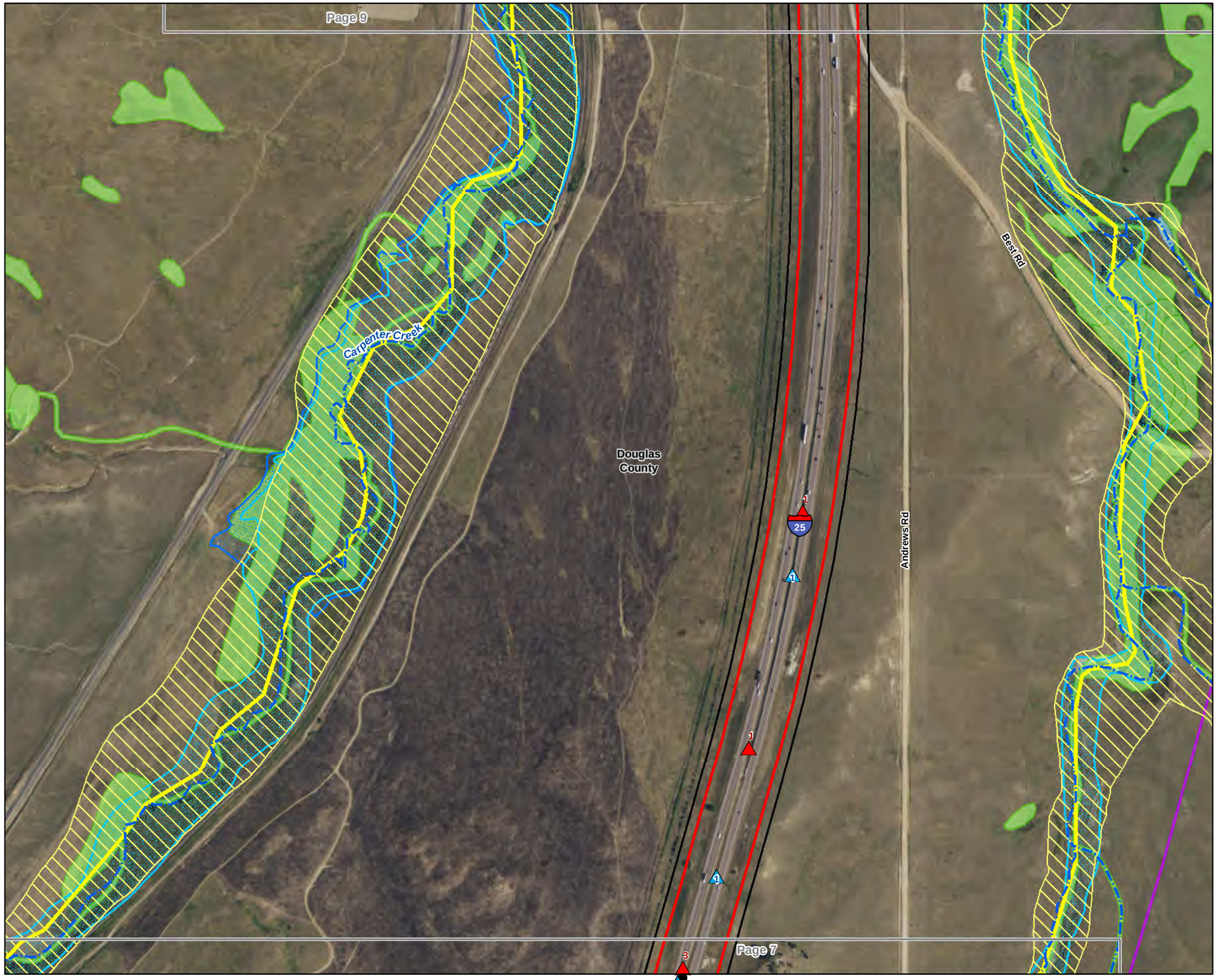
FIGURE 7
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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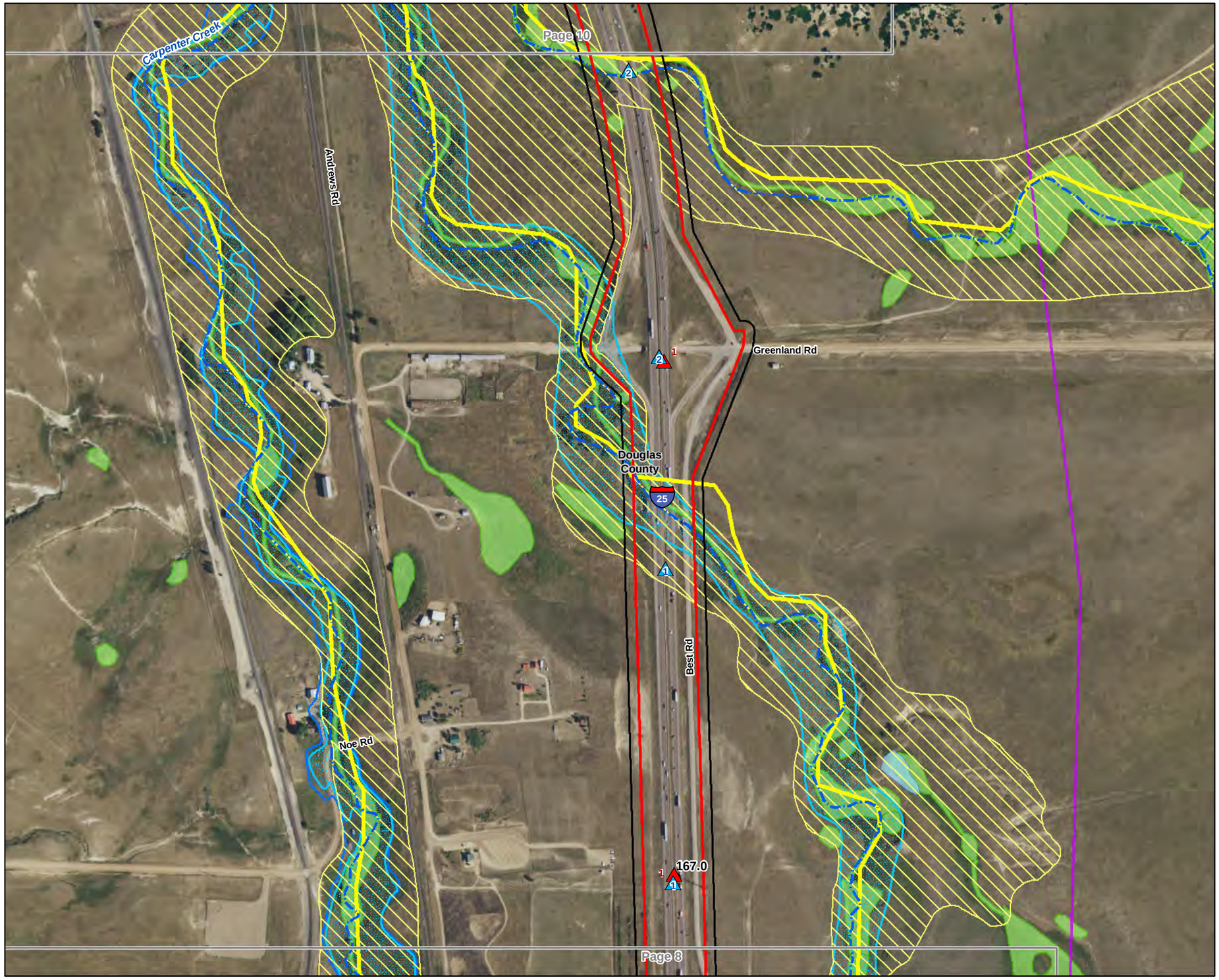
FIGURE 8
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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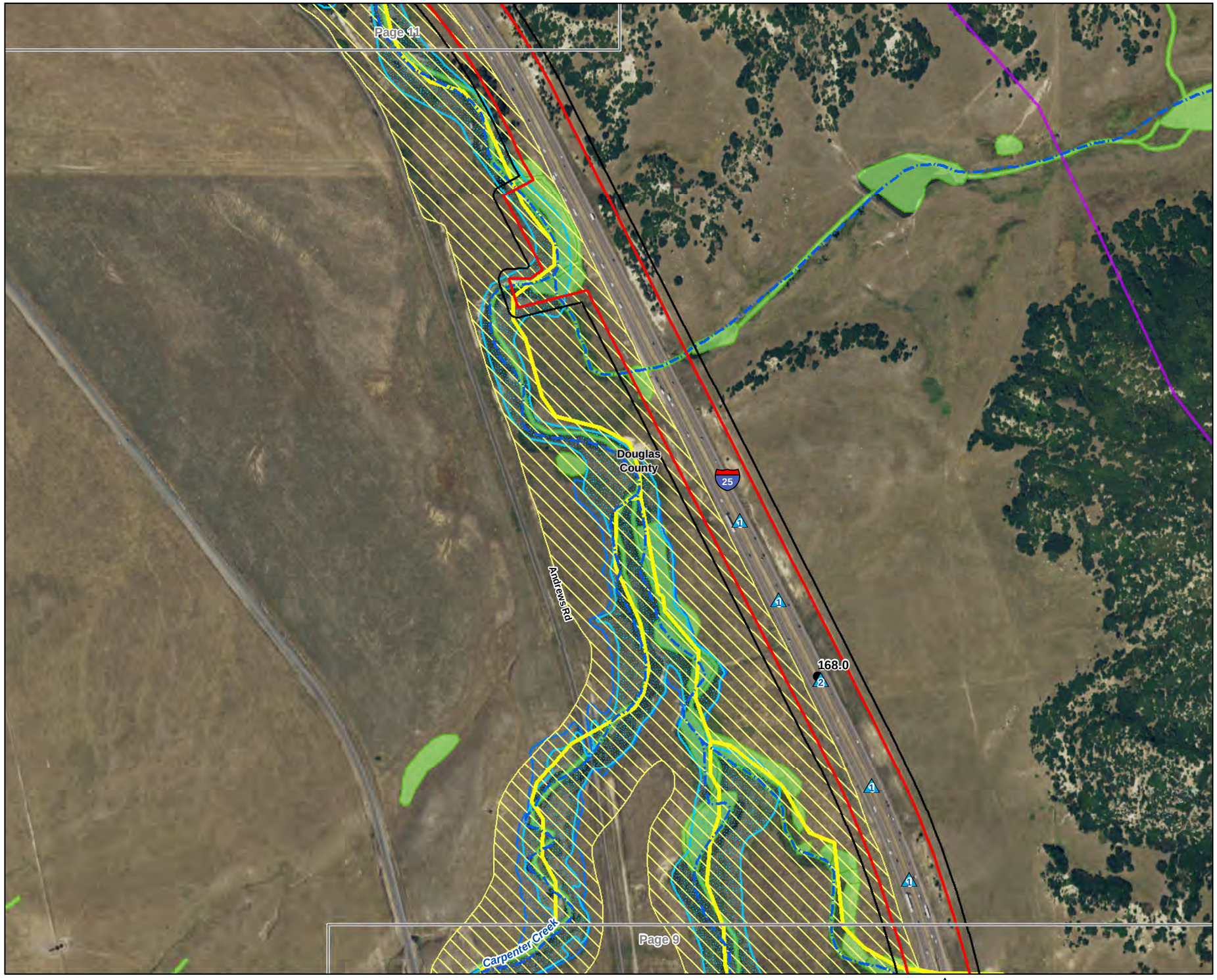
FIGURE 9
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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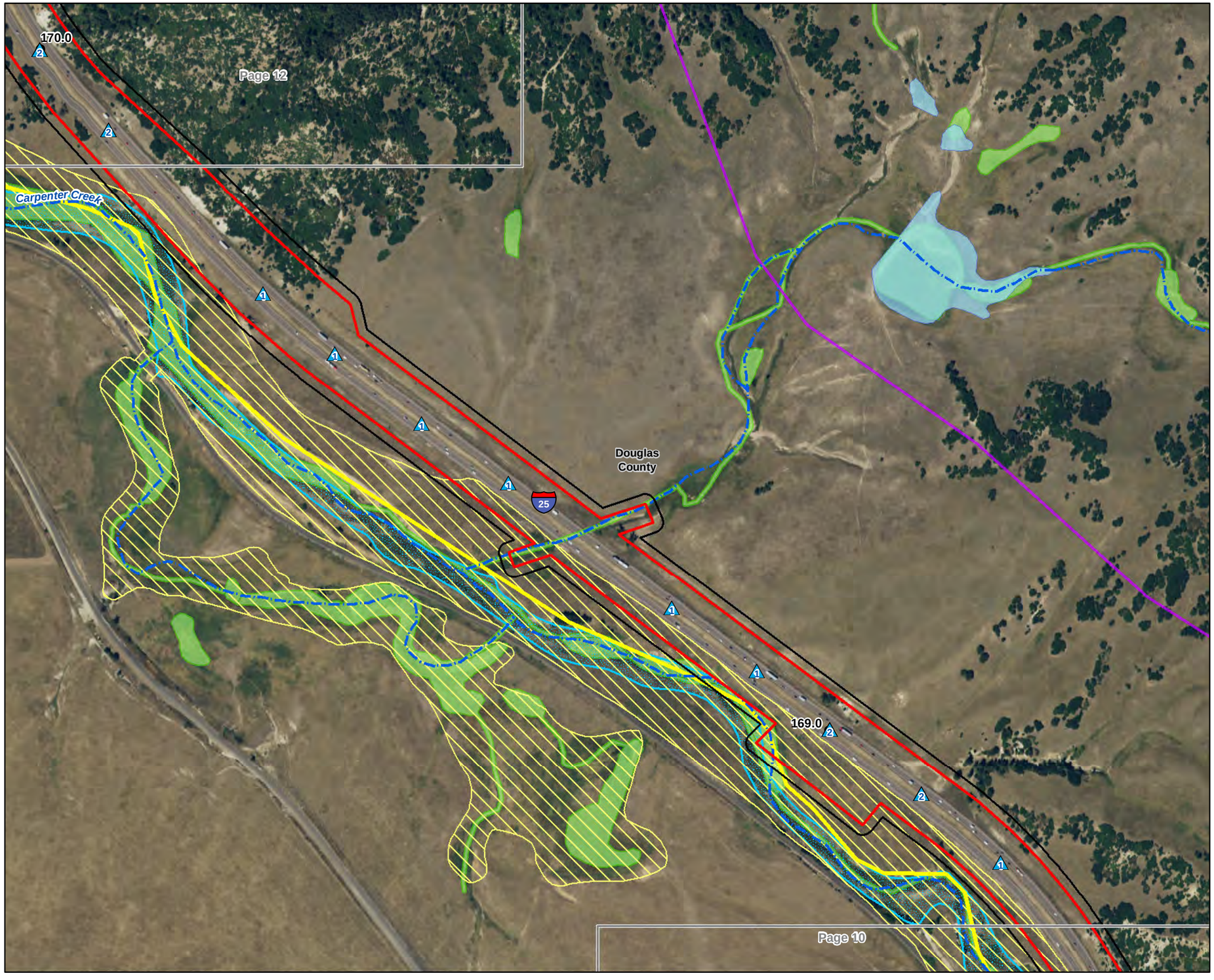
FIGURE 10
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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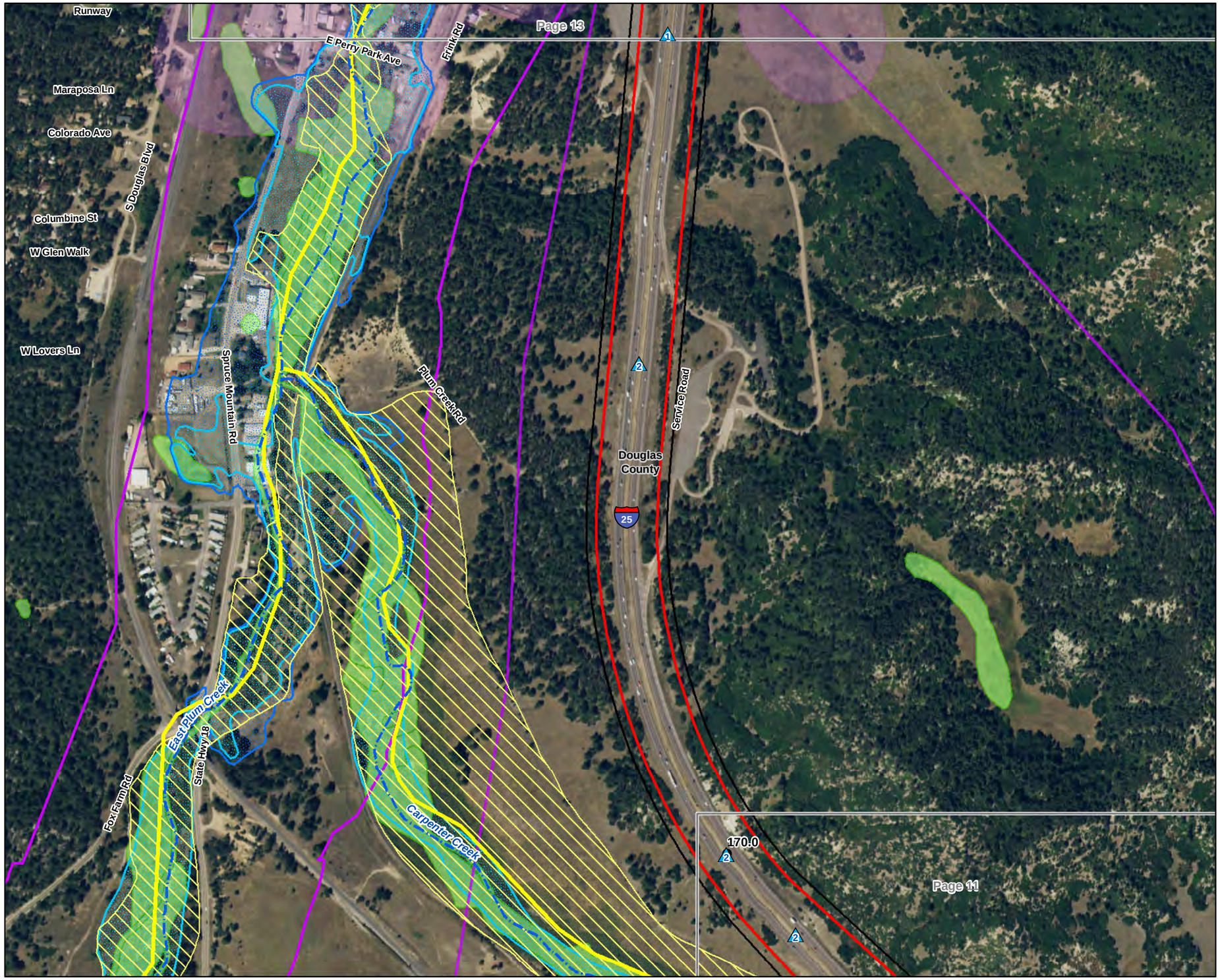
FIGURE 11
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

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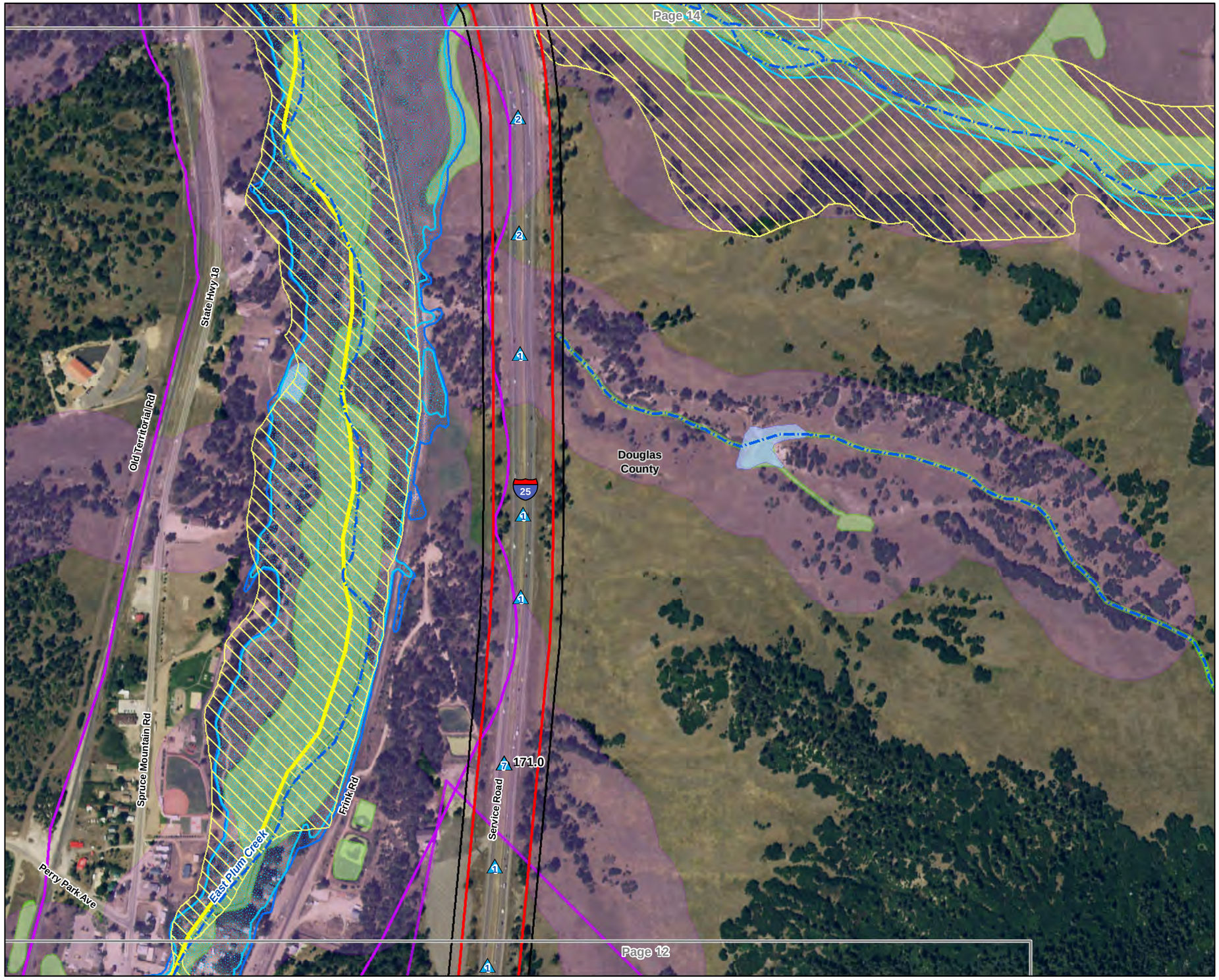
FIGURE 12
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

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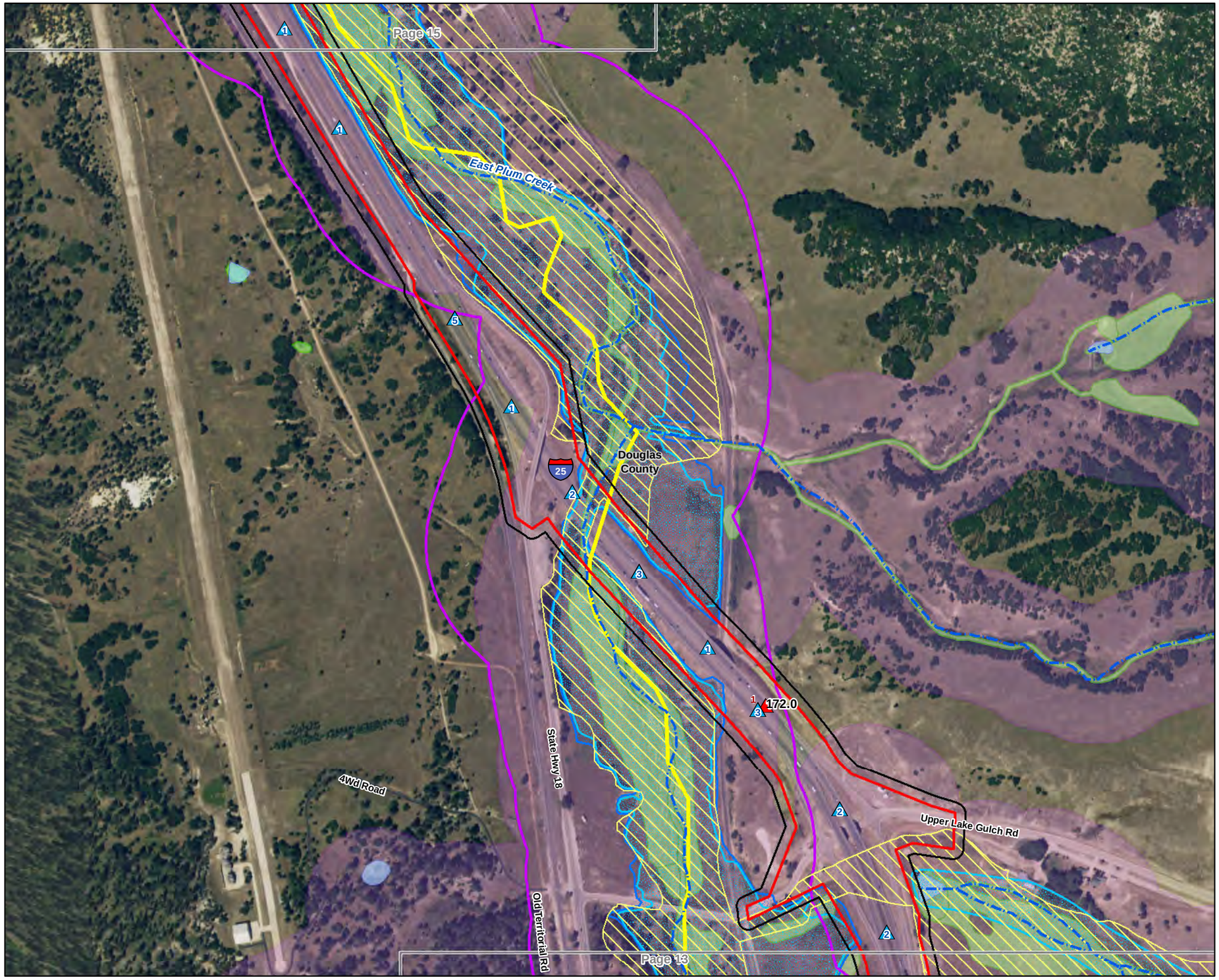
FIGURE 13
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

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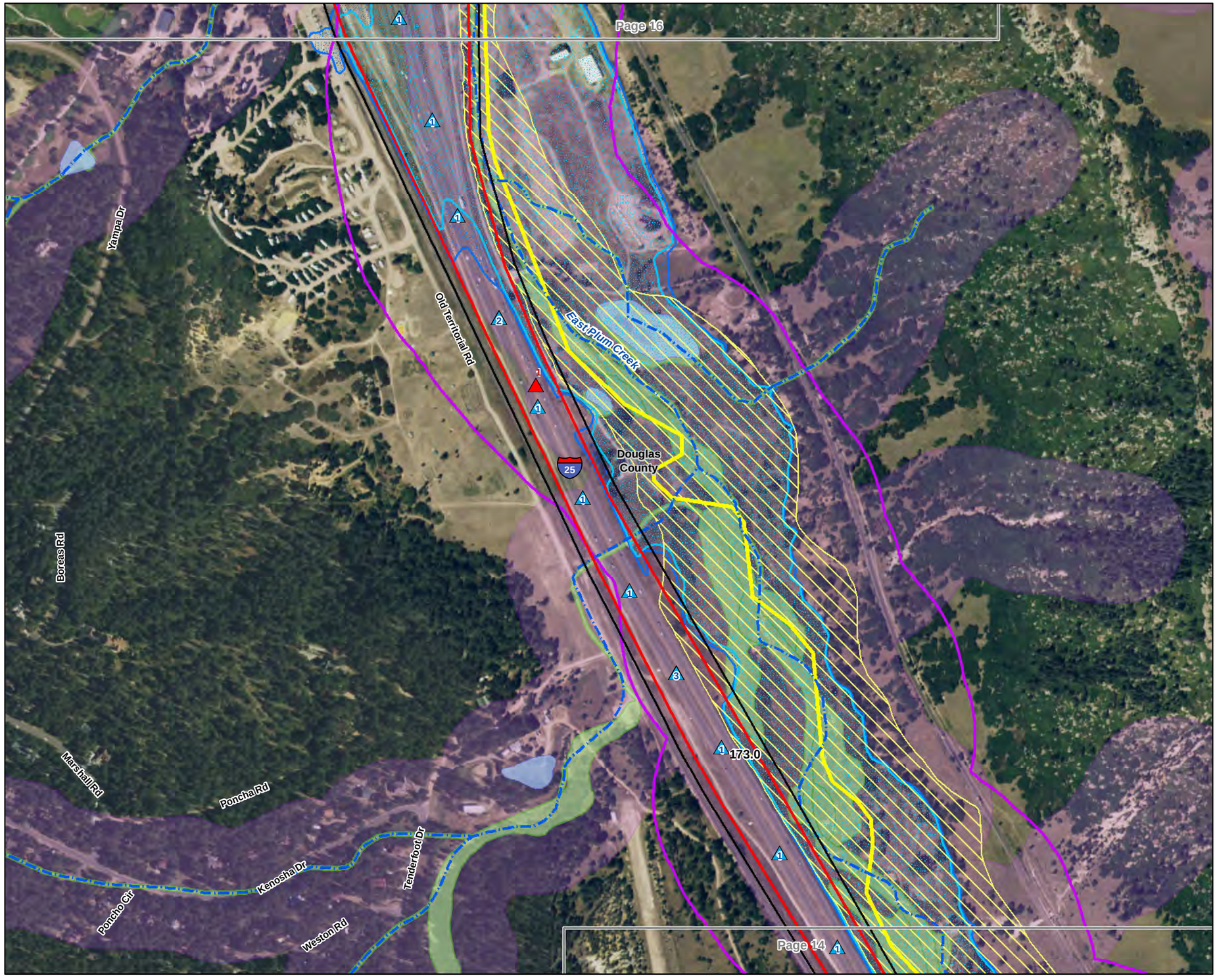
FIGURE 14
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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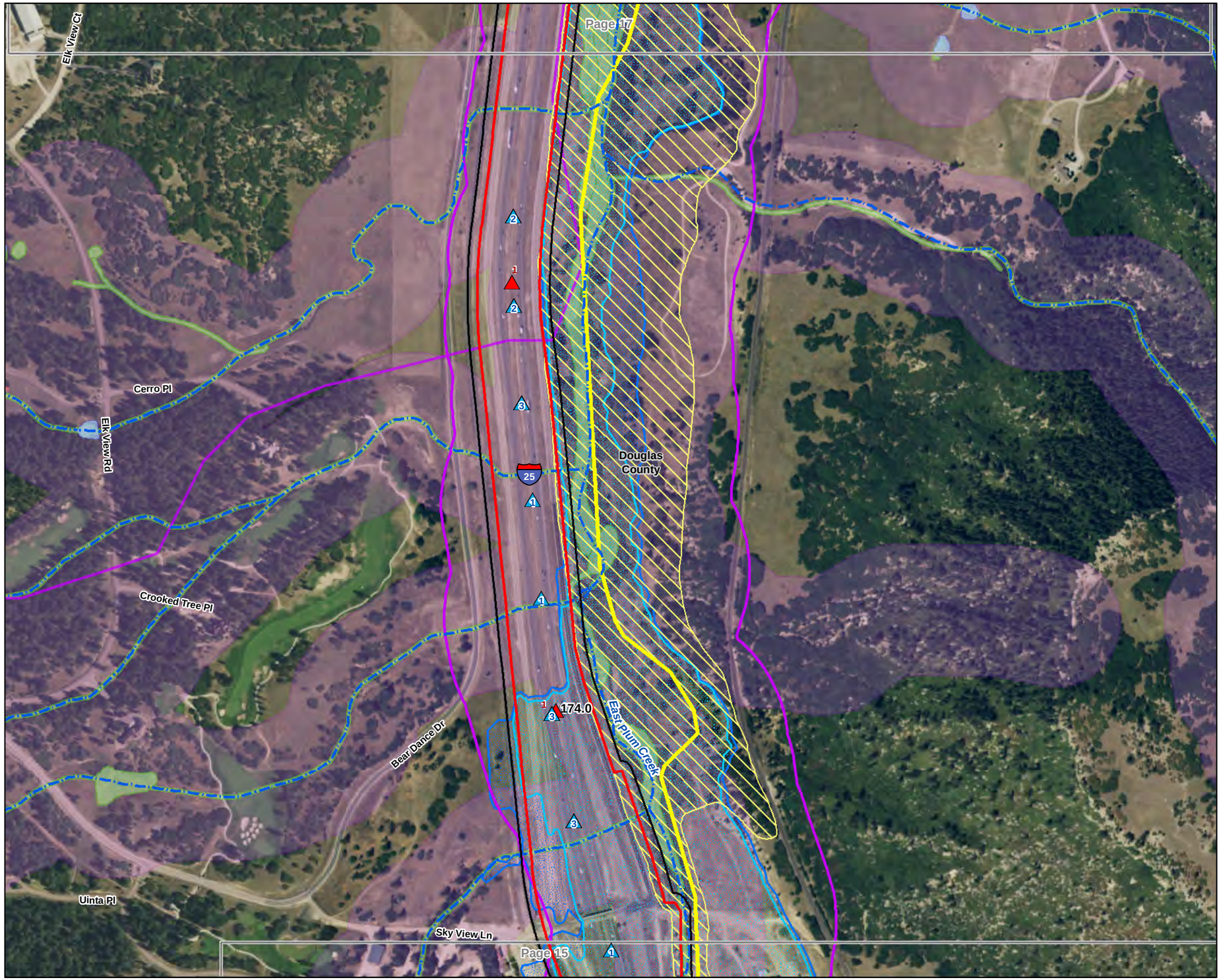
FIGURE 15
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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FIGURE 16
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

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East Plum Creek

Douglas County

Bear Dance Dr

175.0

Elk View Ct

Faraway Pl

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VICINITY MAP

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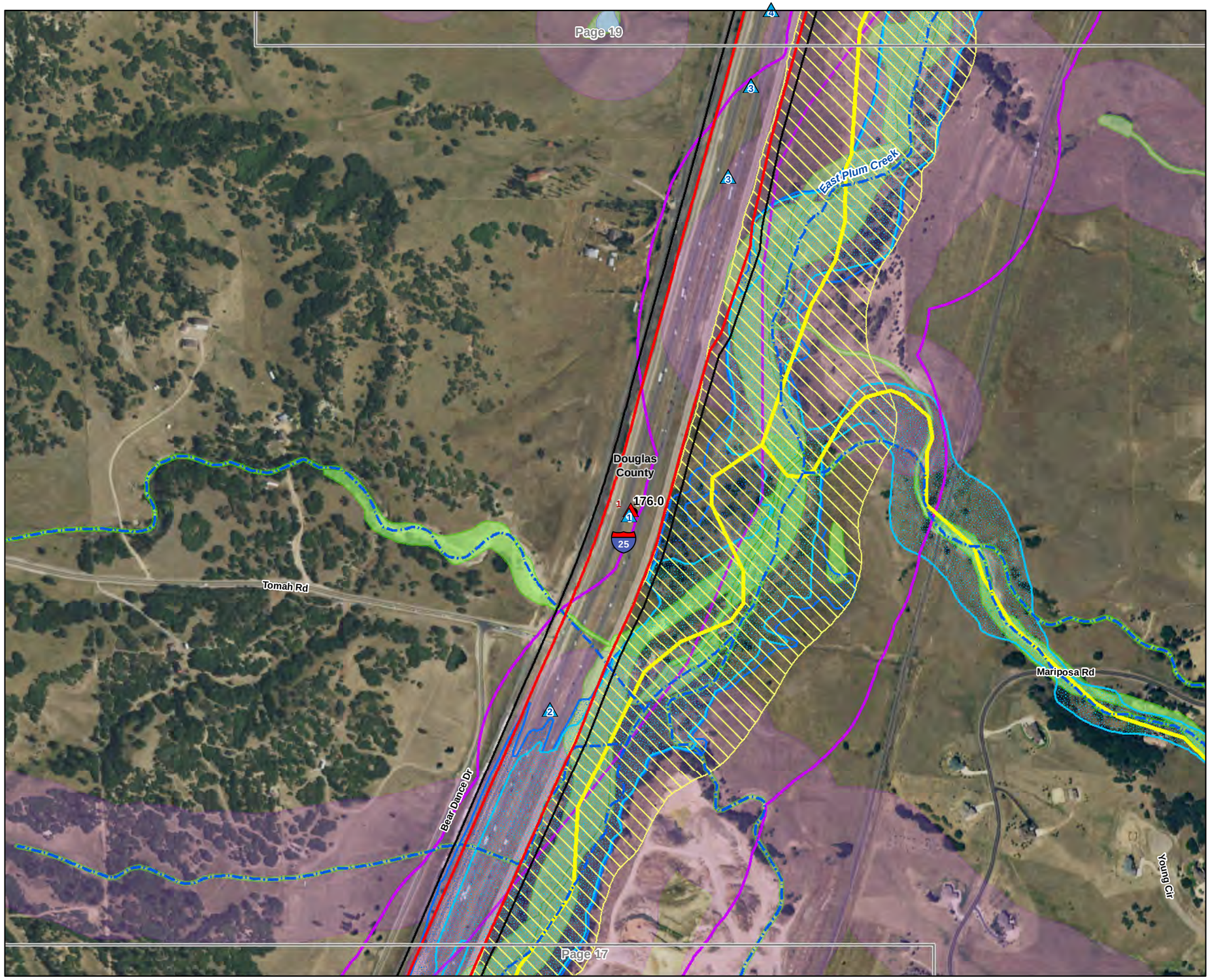
FIGURE 17
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

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FIGURE 18
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

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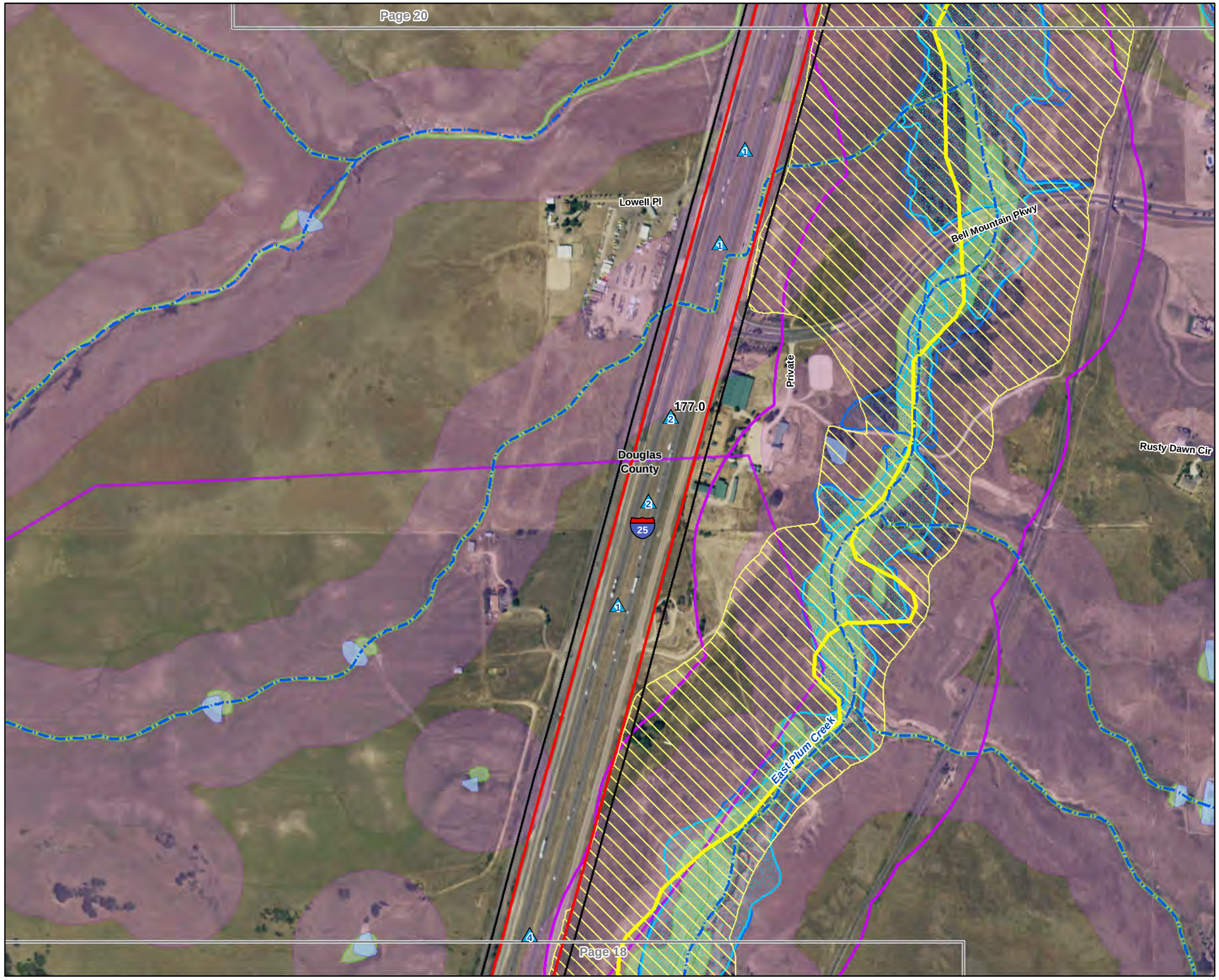

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VICINITY MAP

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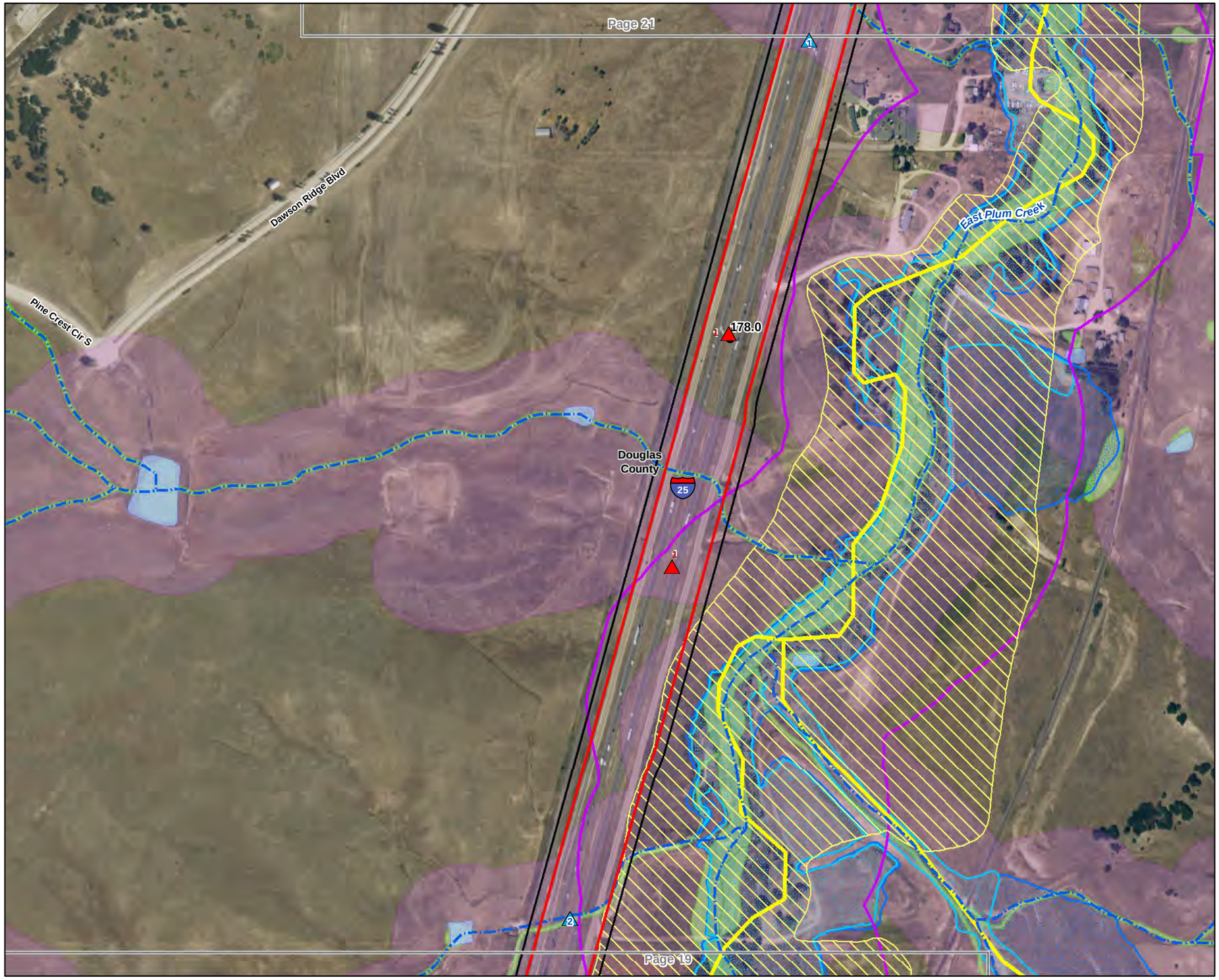
FIGURE 19
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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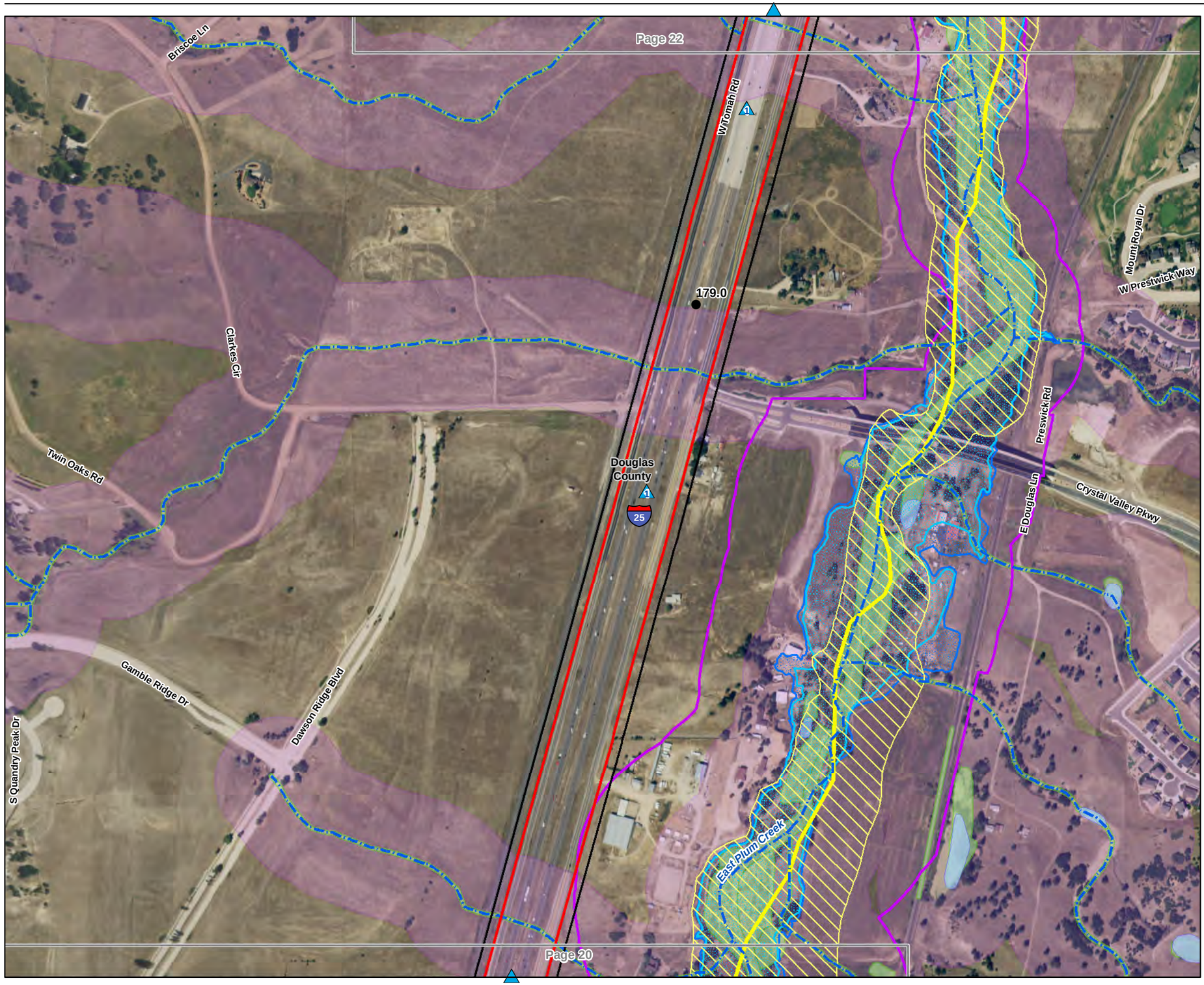
FIGURE 20
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

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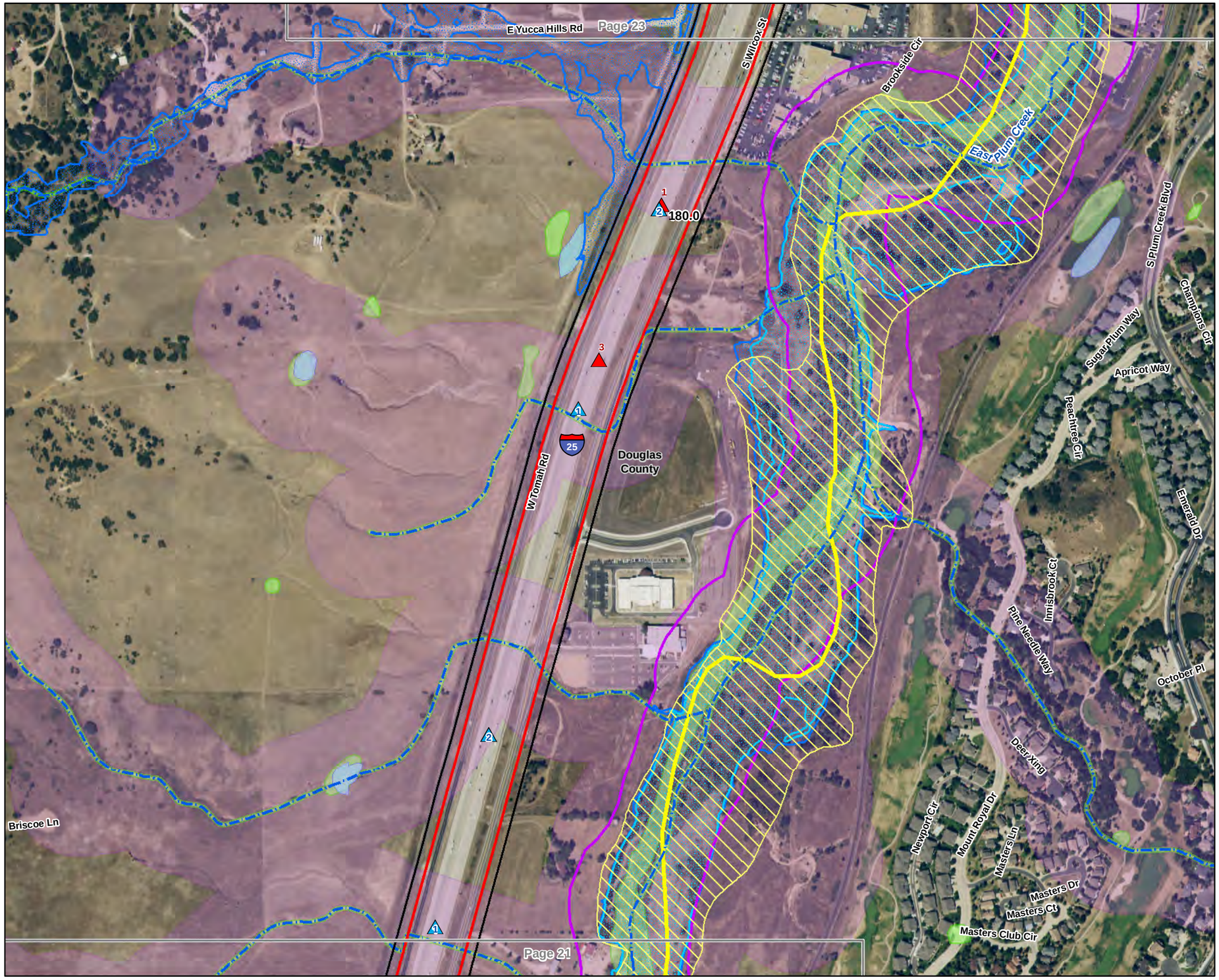
FIGURE 21
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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FIGURE 22
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

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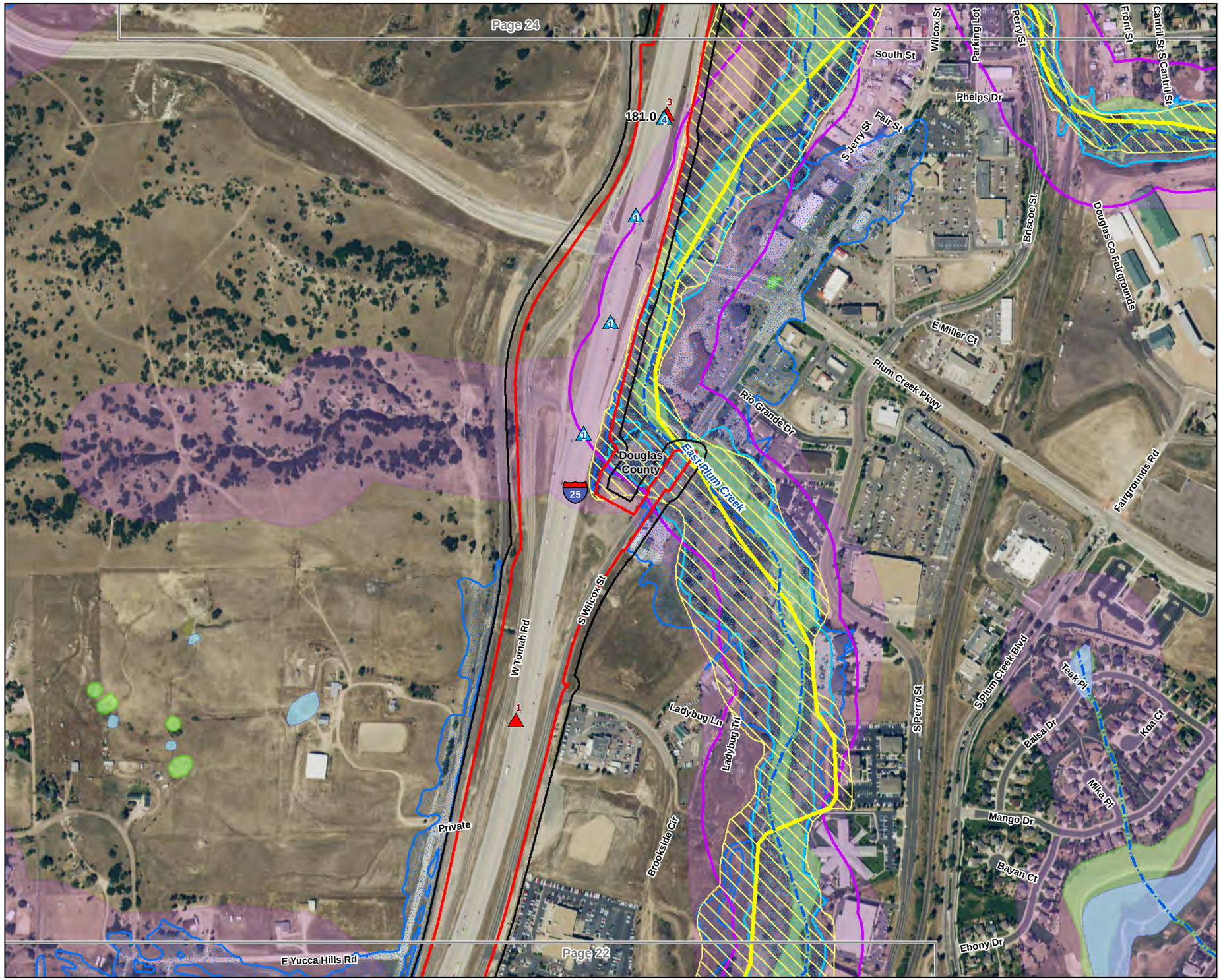

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VICINITY MAP

LEGEND

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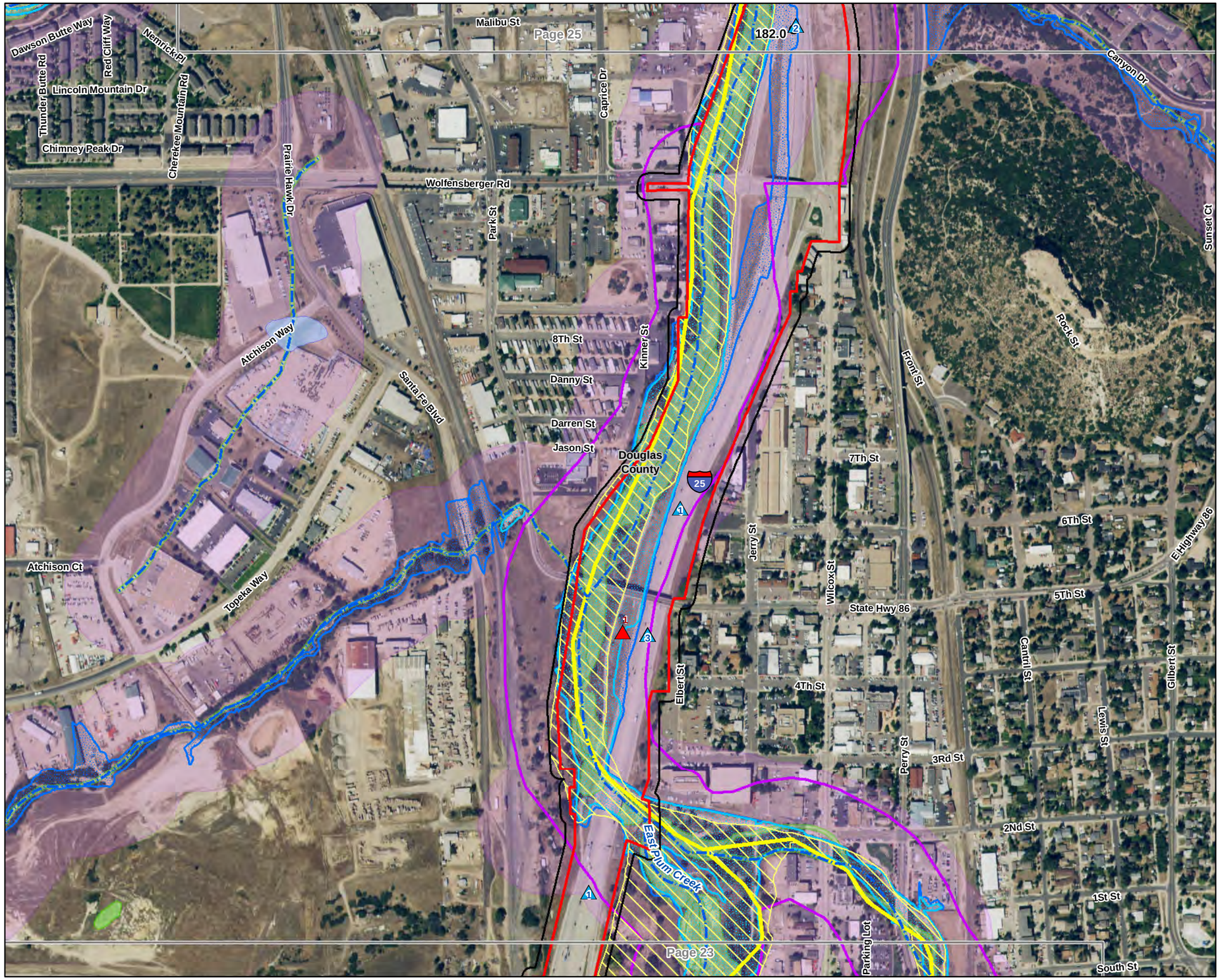
FIGURE 23
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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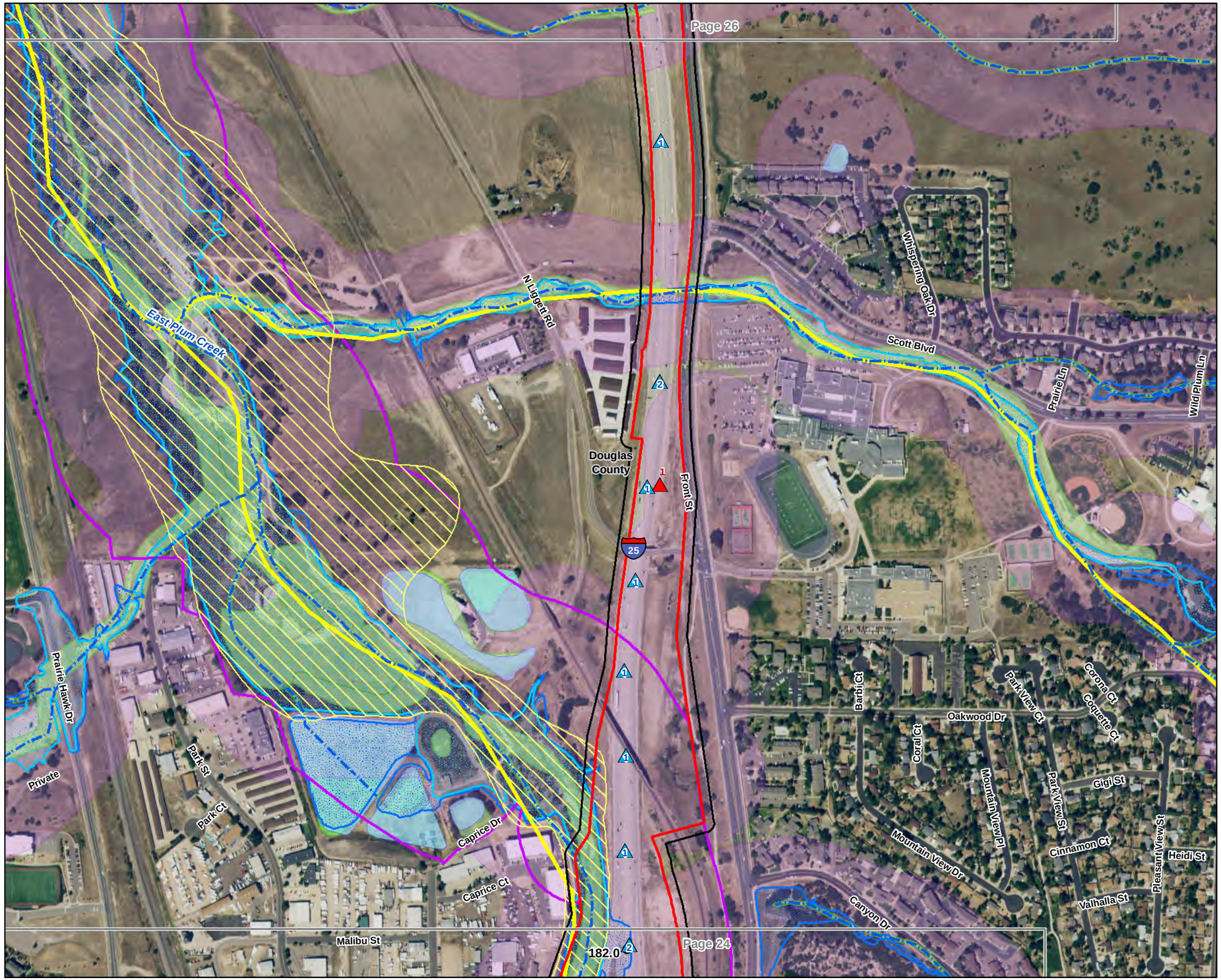
FIGURE 24
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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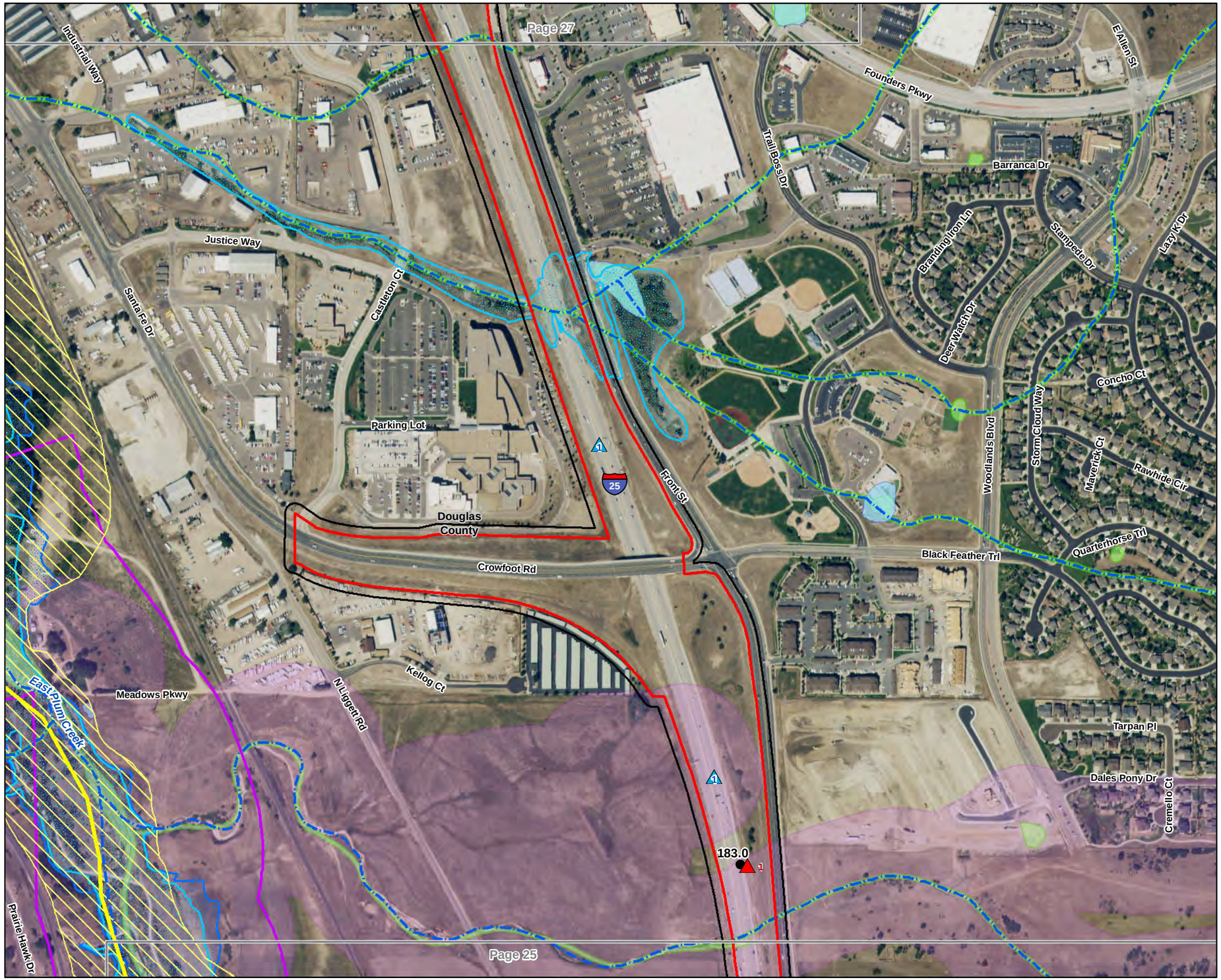
FIGURE 25
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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FIGURE 26
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

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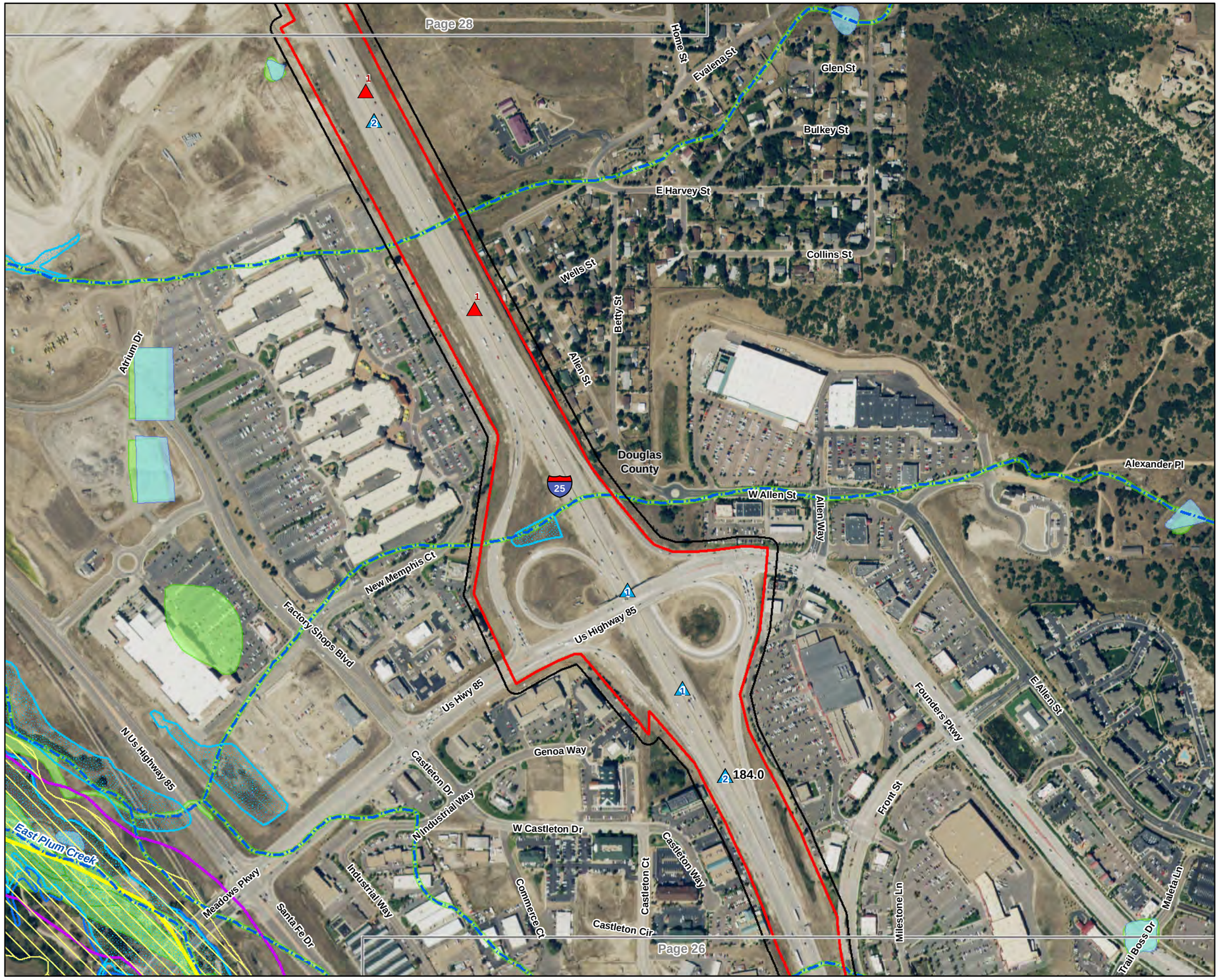

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VICINITY MAP

LEGEND

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FIGURE 27
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

VICINITY MAP

LEGEND

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- PMJM Occupied Range

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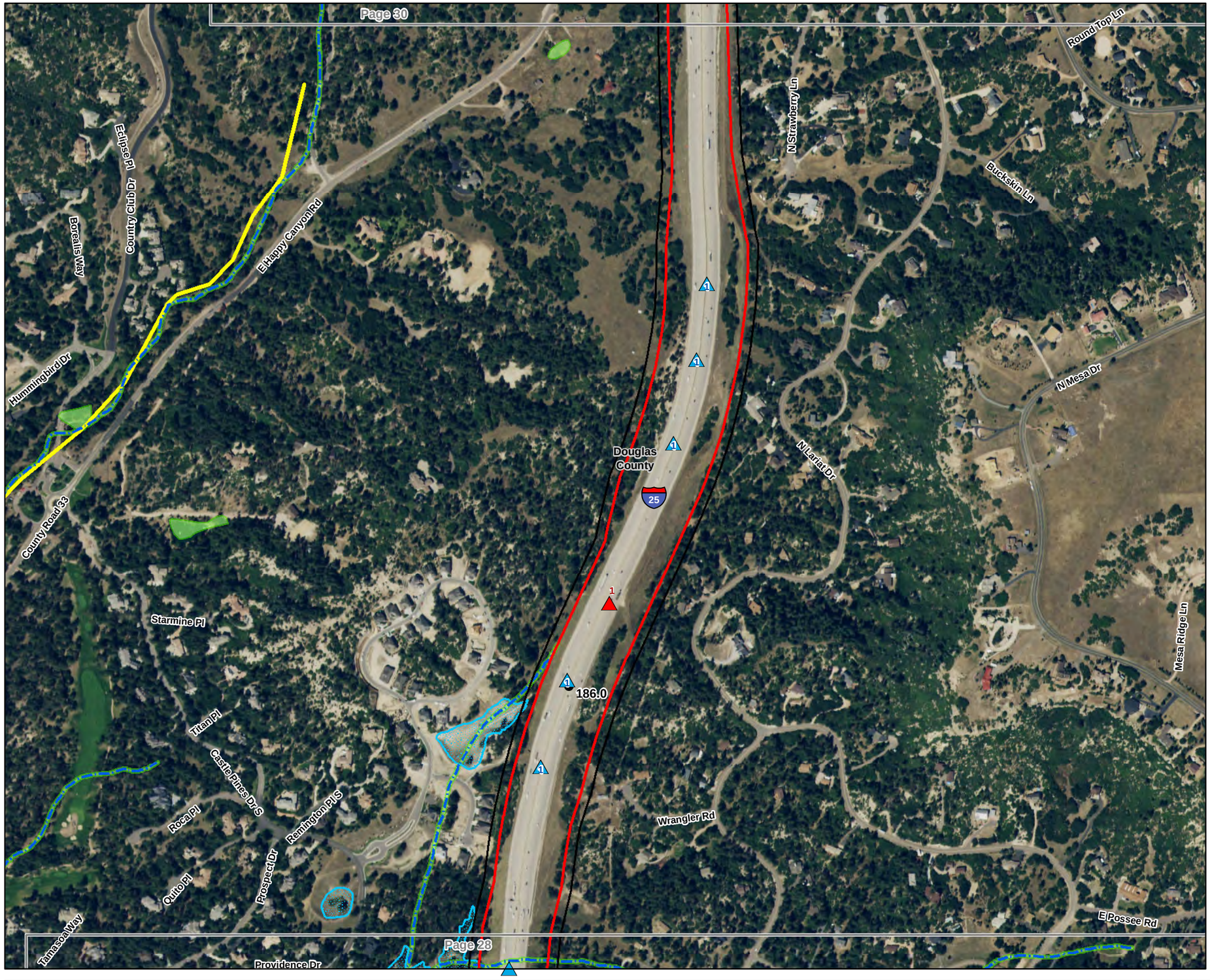
FIGURE 28
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

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FIGURE 29
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

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VICINITY MAP

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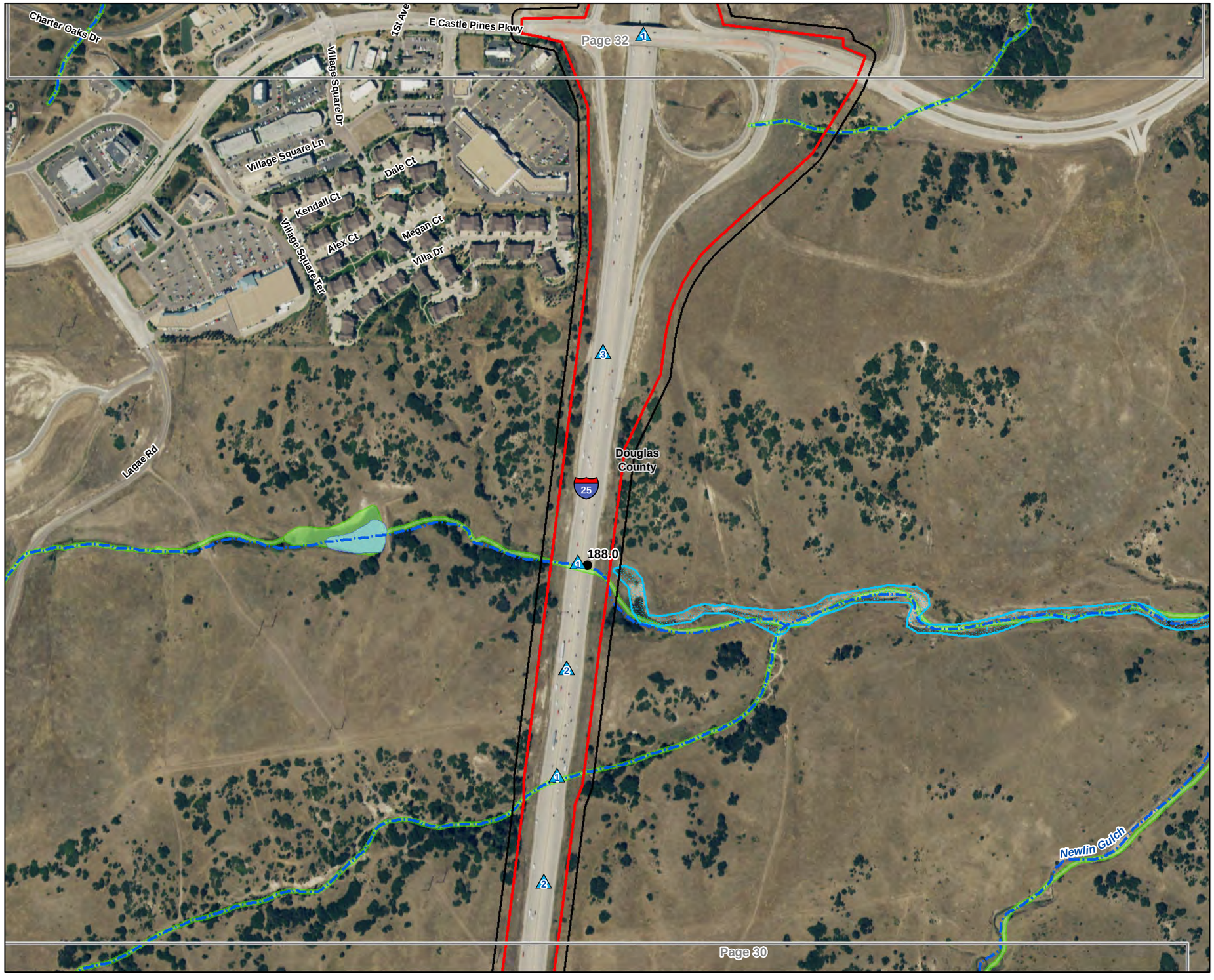
Feet

FIGURE 30
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

N

0 500

Feet

FIGURE 31
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

Page 33

Page 31

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

N

0 500

Feet

FIGURE 32
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

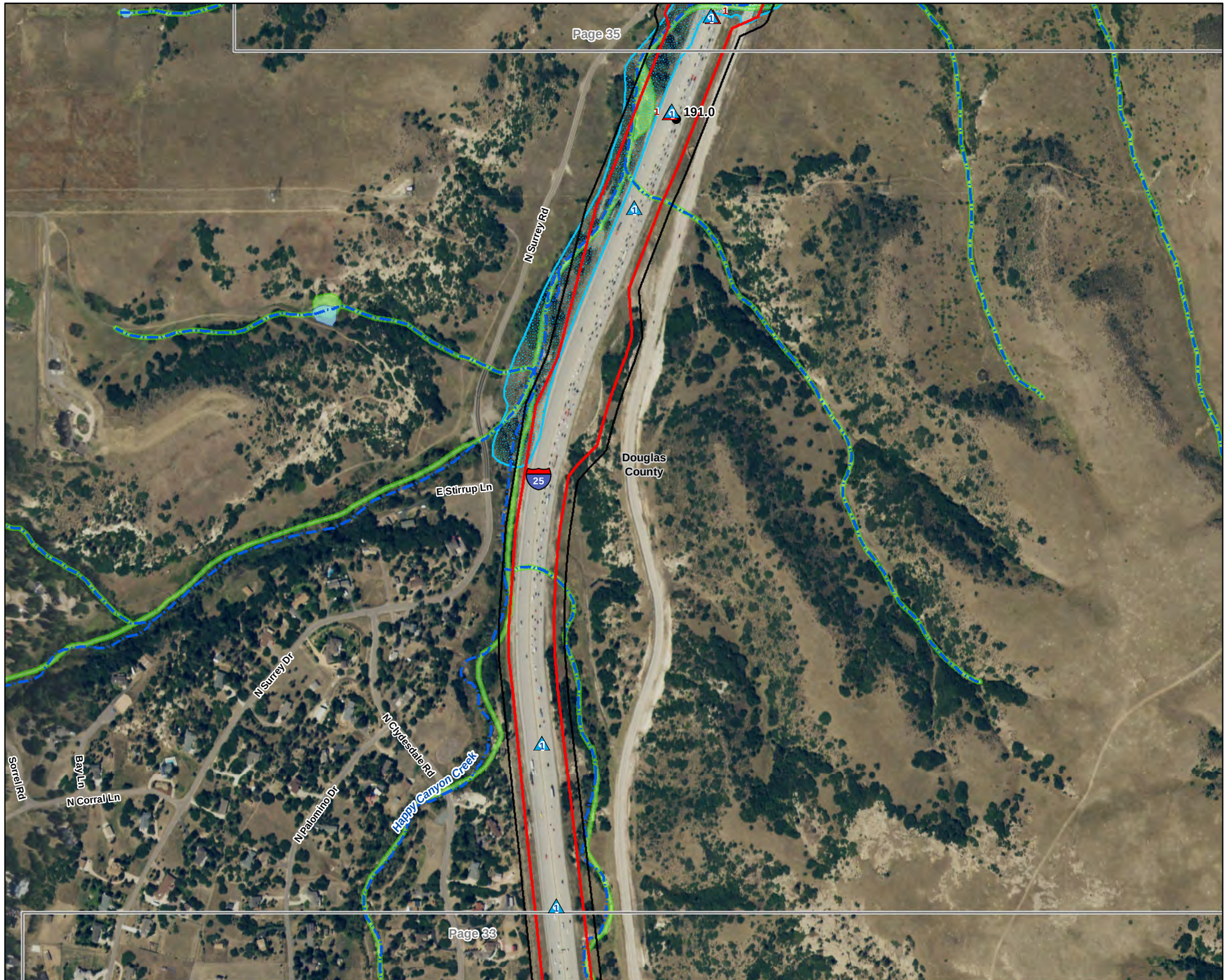
N

0 500

Feet

FIGURE 33
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

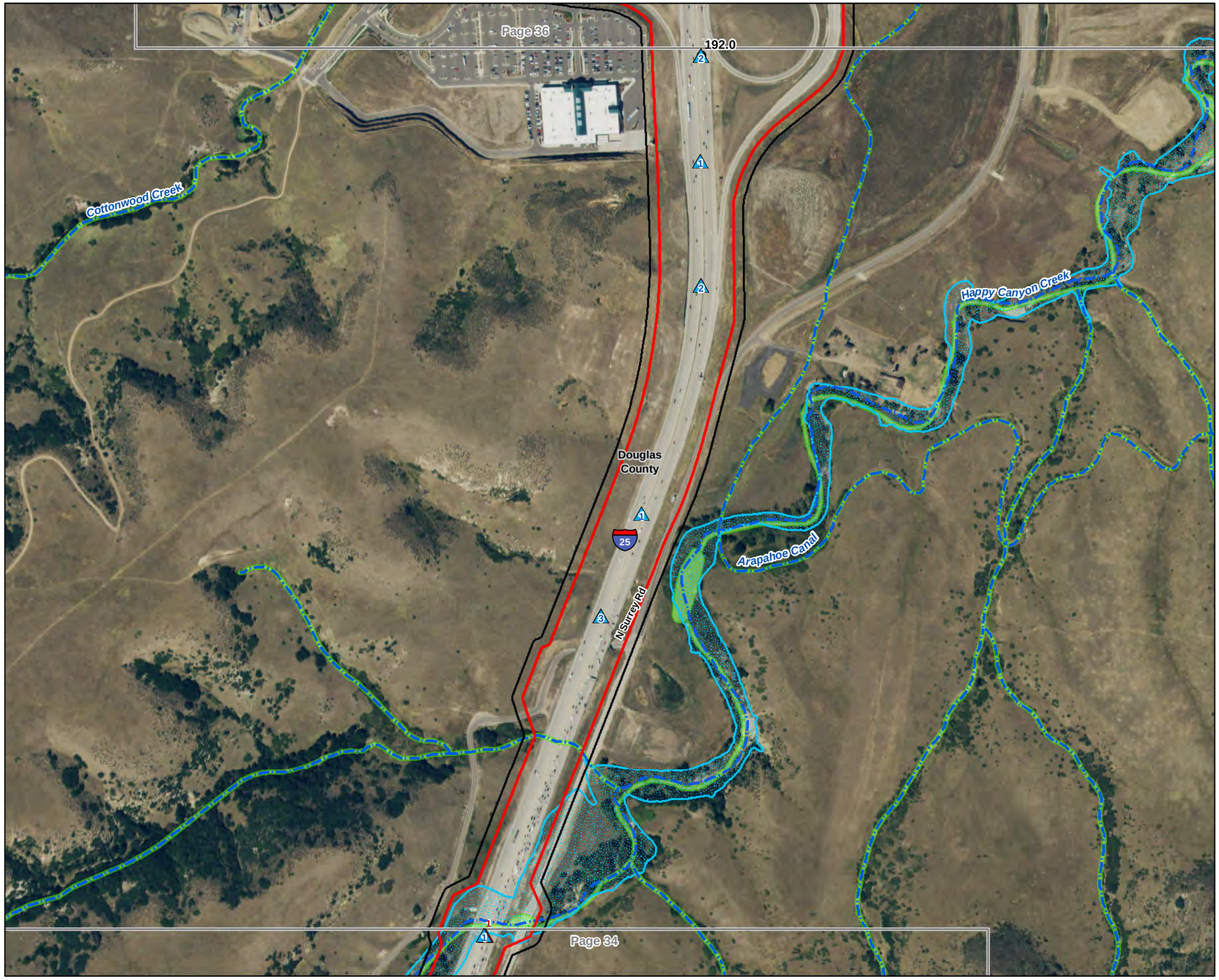
N

0 500

Feet

FIGURE 34
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

N

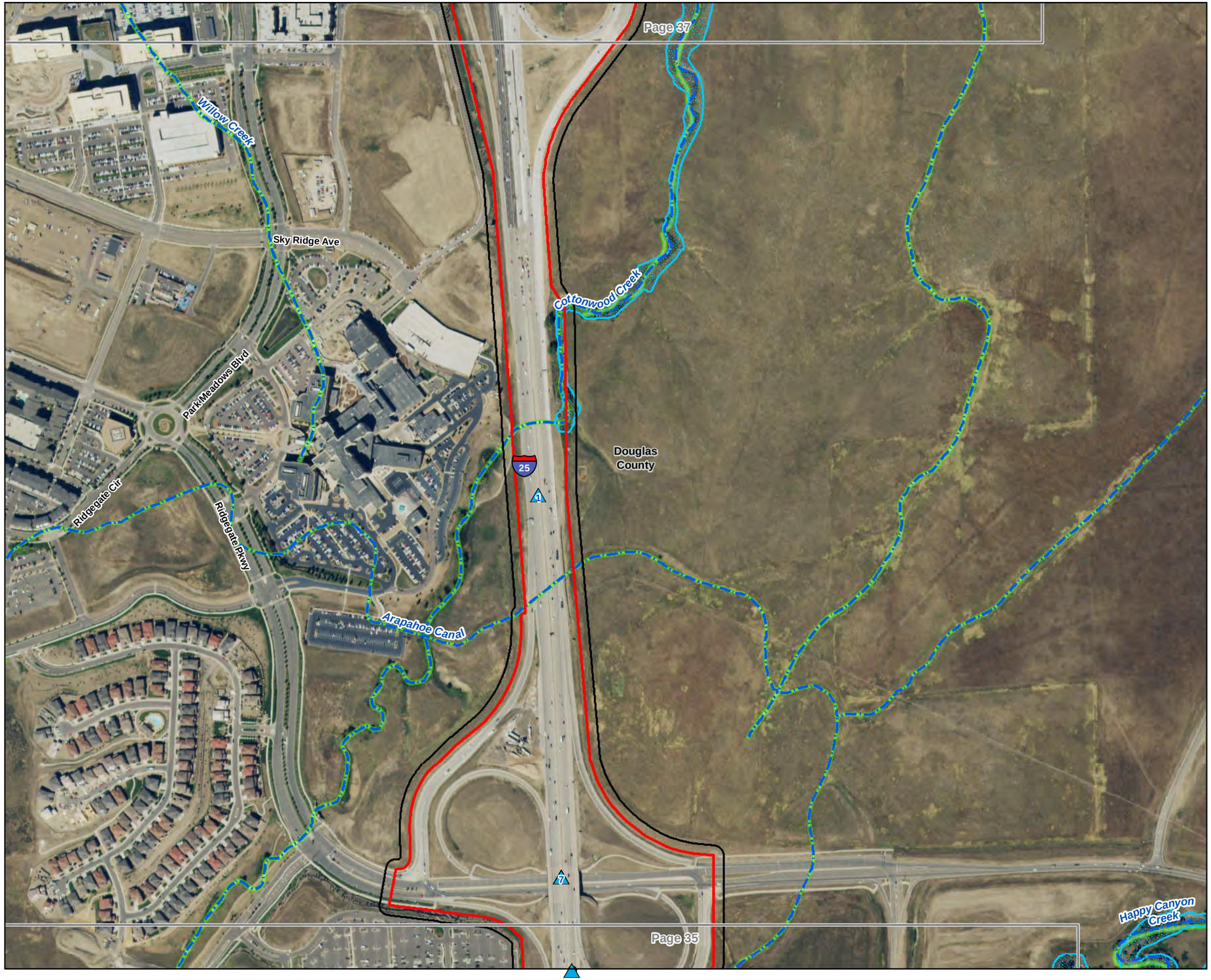
0 500

Feet

FIGURE 35
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

Page 37



Page 35

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

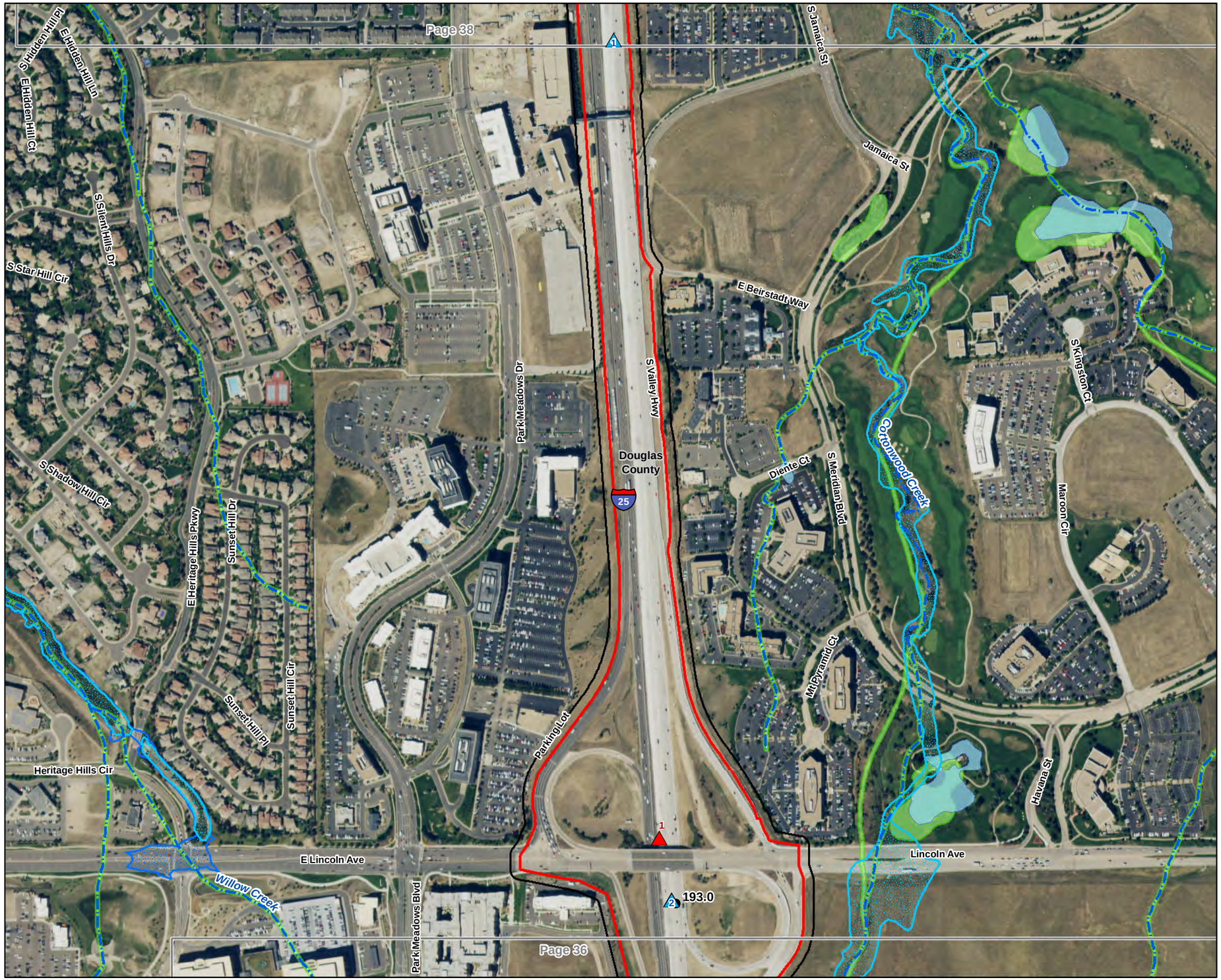
N

0 500

Feet

FIGURE 36
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

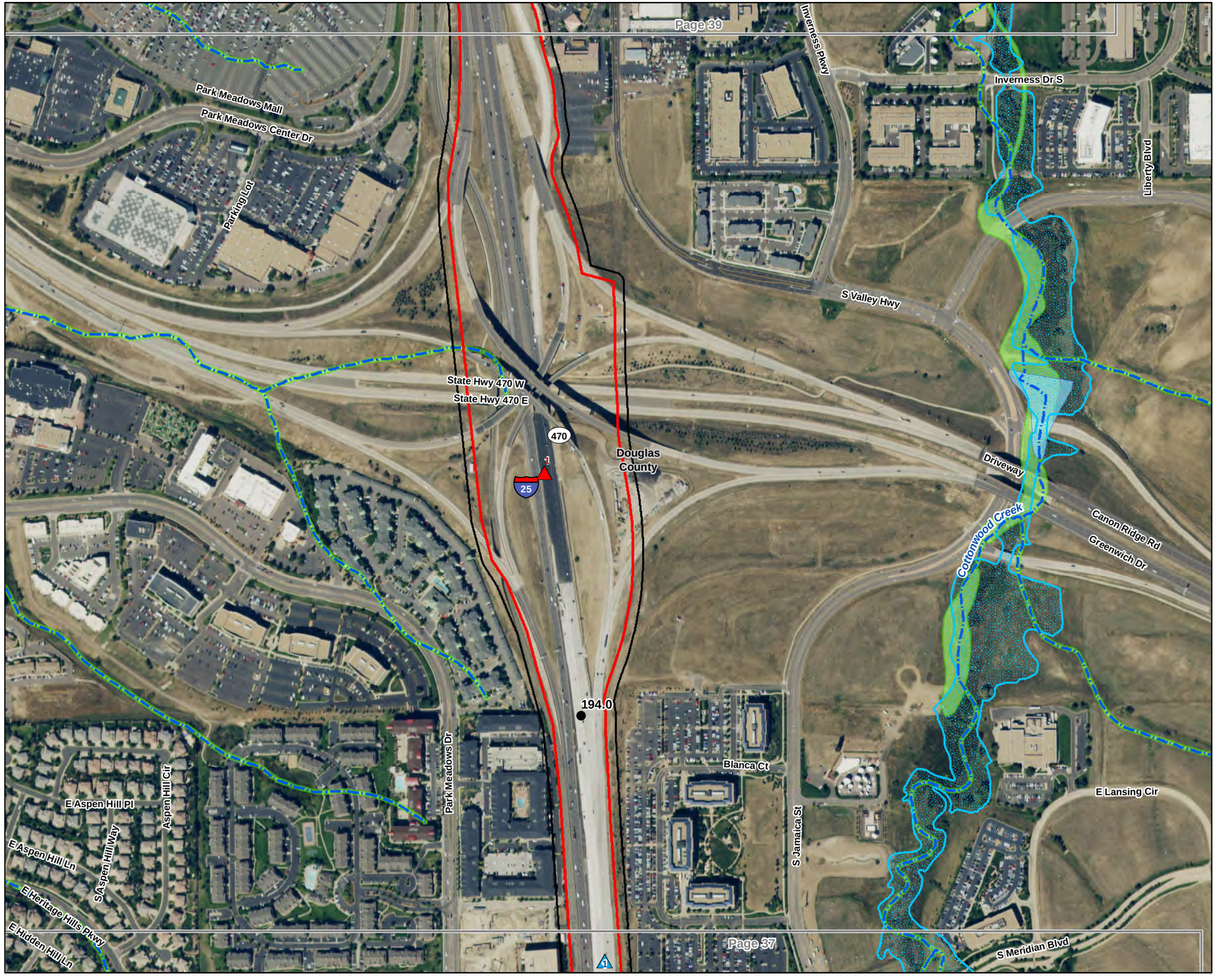
N

0 500

Feet

FIGURE 37
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation



LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

N

0 500

Feet

FIGURE 38
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- NHD Flowline
- 303(d) Impaired Stream
- NHD Waterbody
- Riparian Conservation Zone
- NWI Wetland
- 100-Year Floodplain
- 500-Year Floodplain
- Wildlife Conflict and Number of Incidents (CSP 2011 - 2016)
- Wildlife Conflict and Number of Incidents (CDOT 2005 - 2016)
- Wildlife Movement
- PMJM Critical Habitat
- PMJM Occupied Range

N

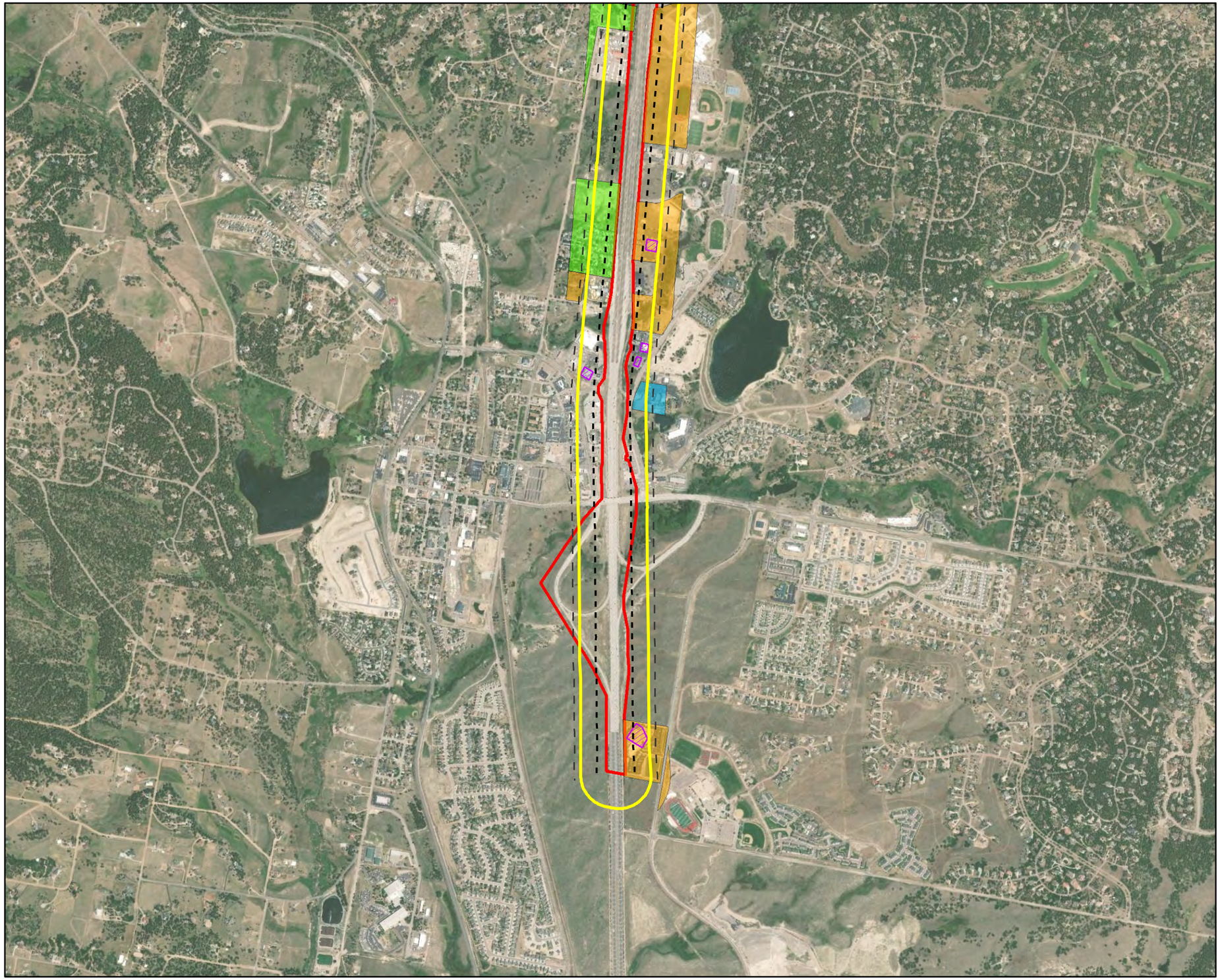
0 500

Feet

FIGURE 39
Natural Resources Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
June 2017

COLORADO Department of Transportation

Noise Map Book



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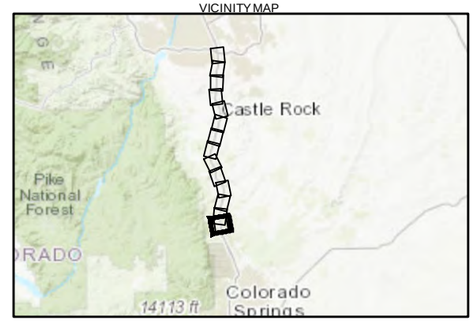


LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

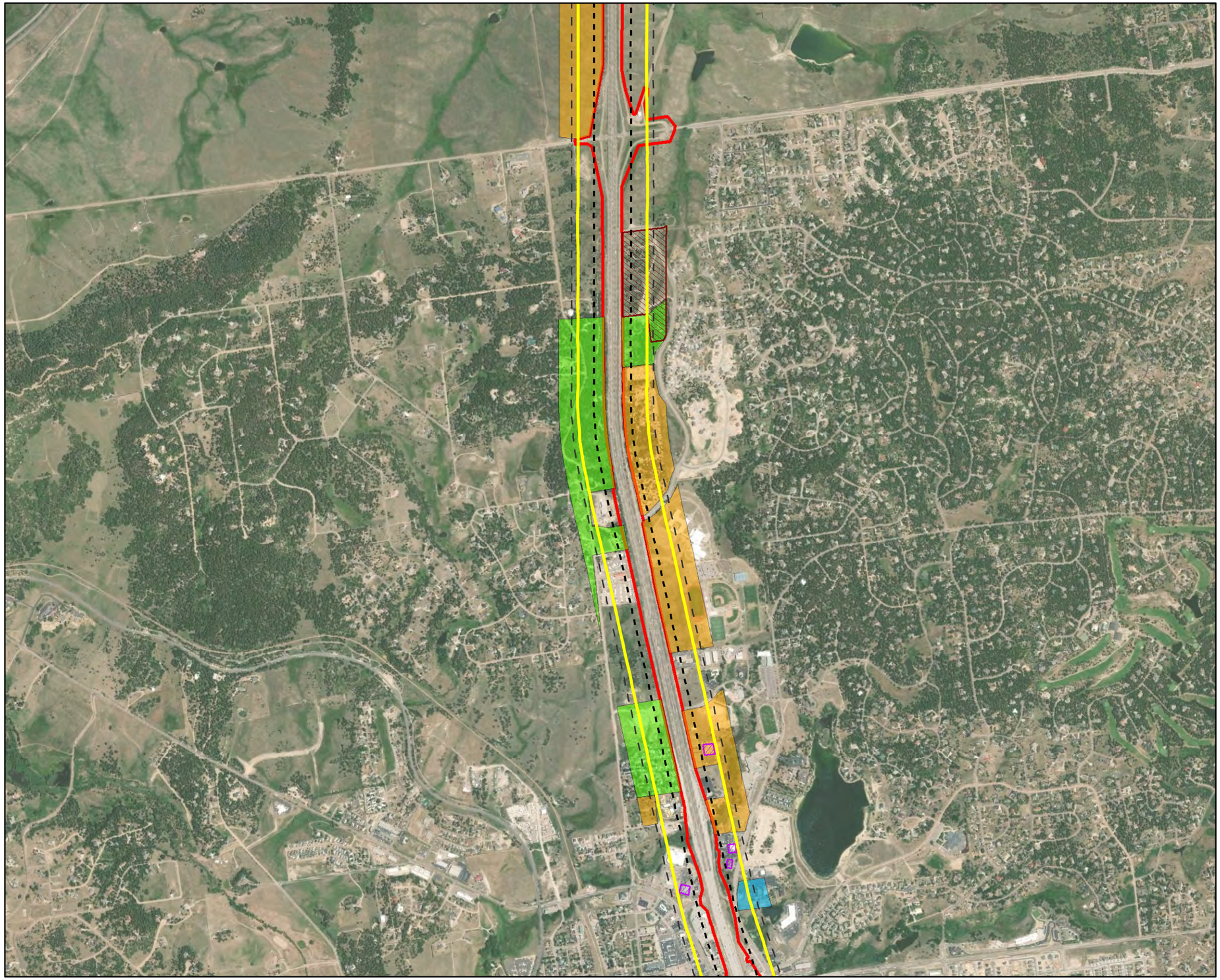
N

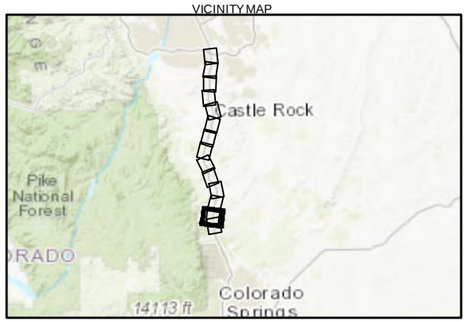
0 1
Miles

0 1,000
Feet

FIGURE 1
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation





LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

N

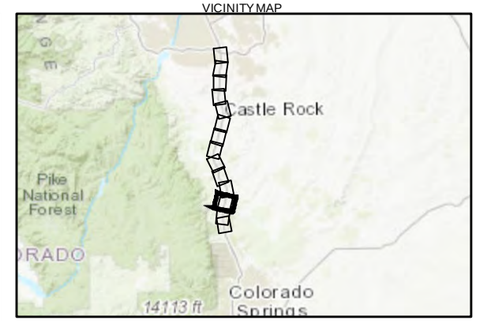
0 1
Miles

0 1,000
Feet

FIGURE 2
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation

VICINITY MAP



LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

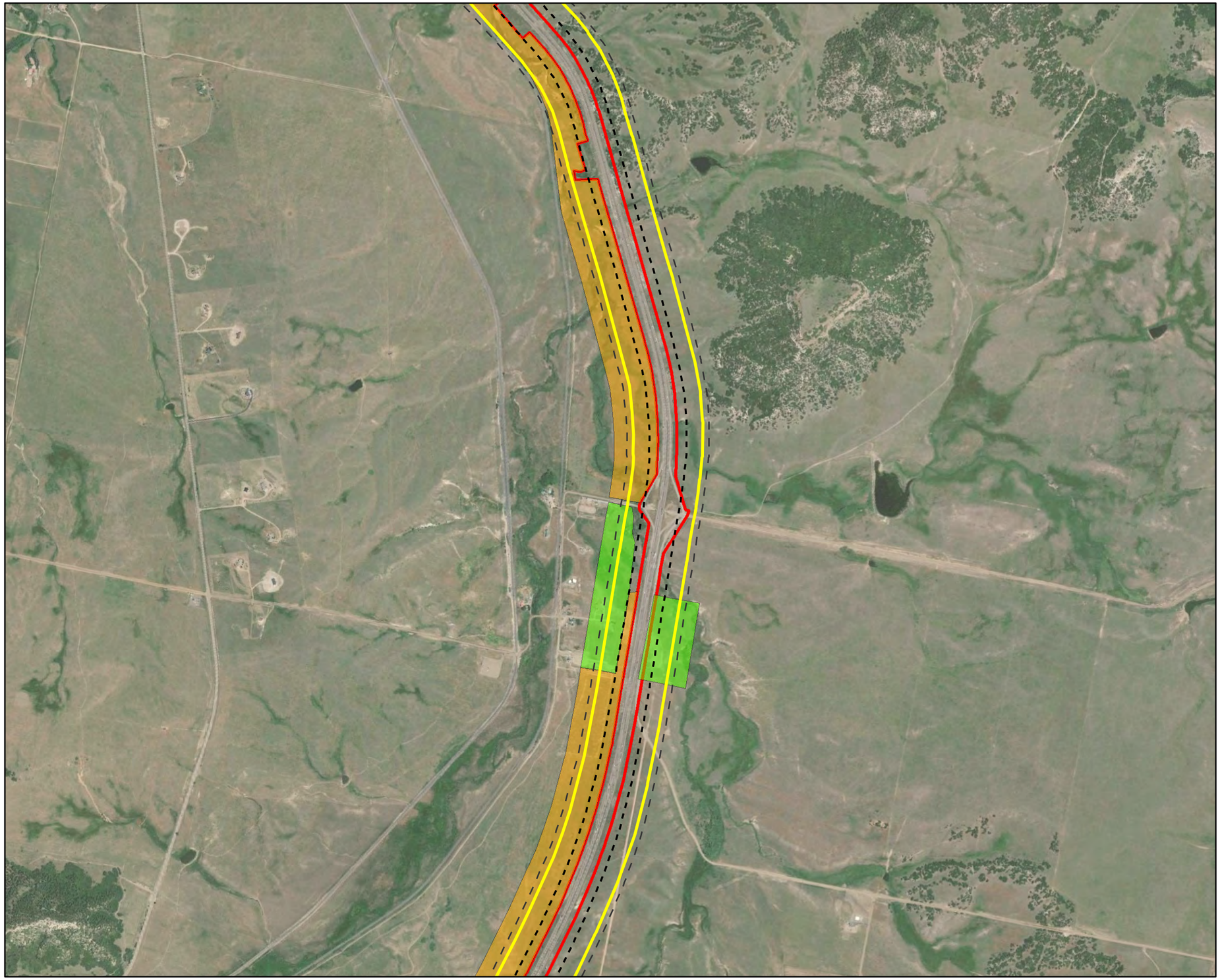
N

0 1
Miles

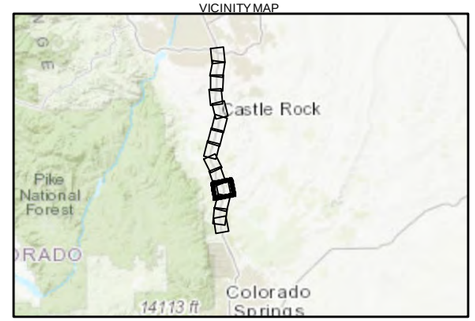
0 1,000
Feet

FIGURE 3
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation



VICINITY MAP



LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

N

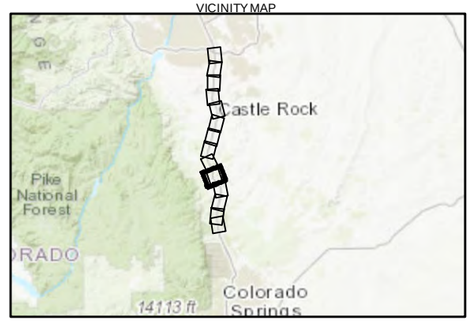
0 1
Miles

0 1,000
Feet

FIGURE 4
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation

VICINITY MAP



LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

N

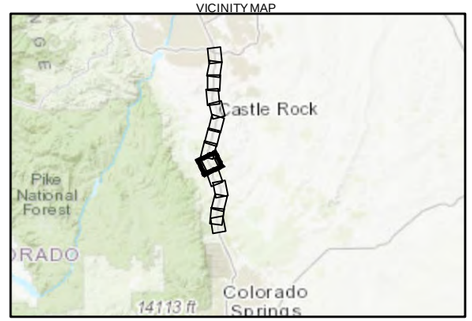
0 1
Miles

0 1,000
Feet

FIGURE 5
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation

VICINITY MAP



LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

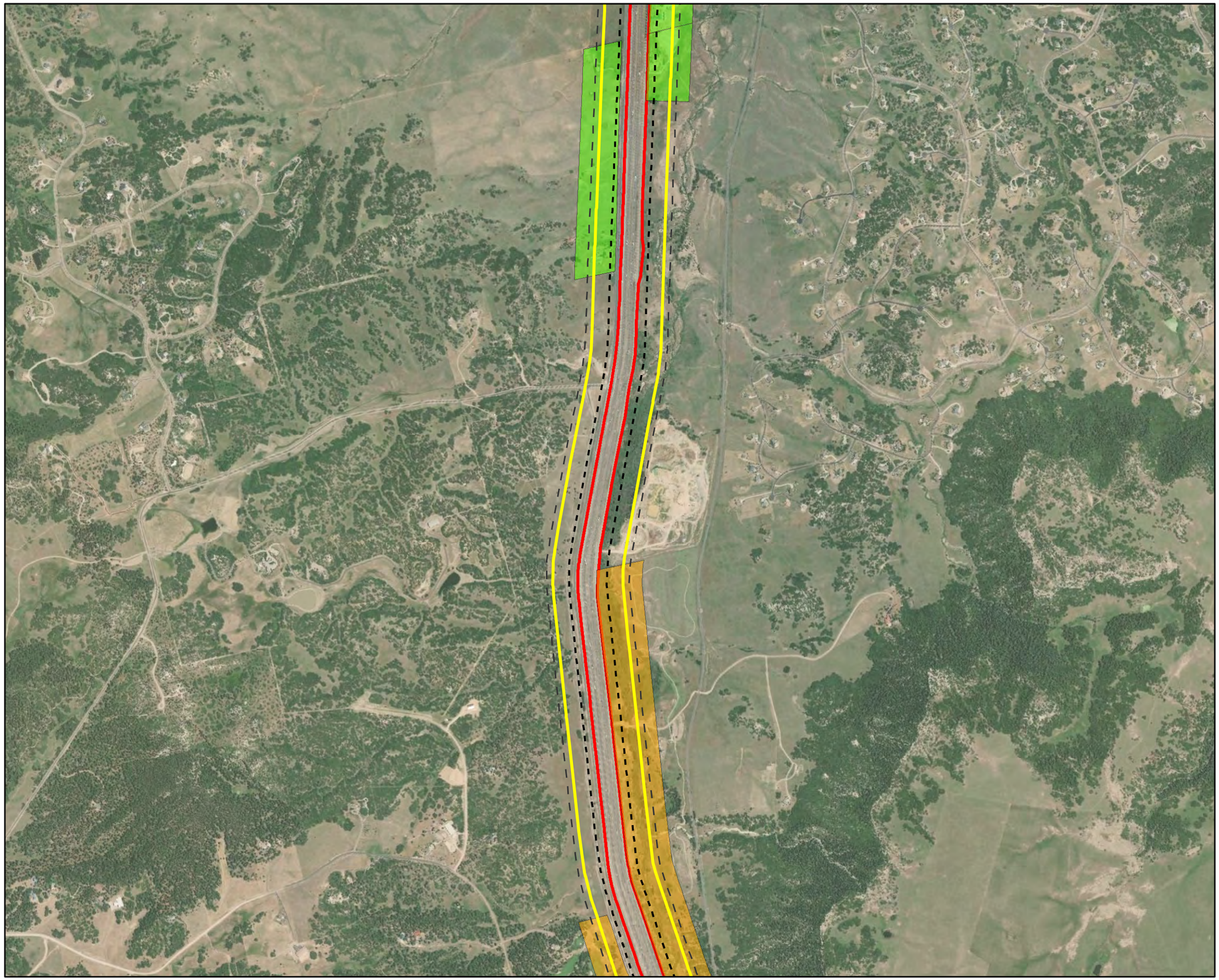
Data Source:
(I-25 PEL Project Team)

0 1
Miles

0 1,000
Feet

FIGURE 6
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation



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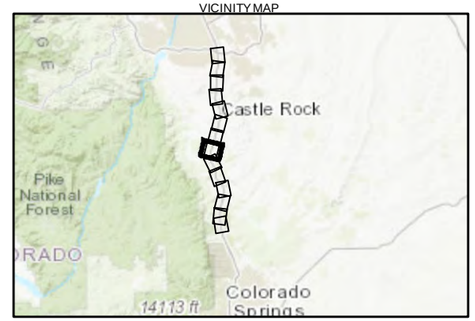


LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

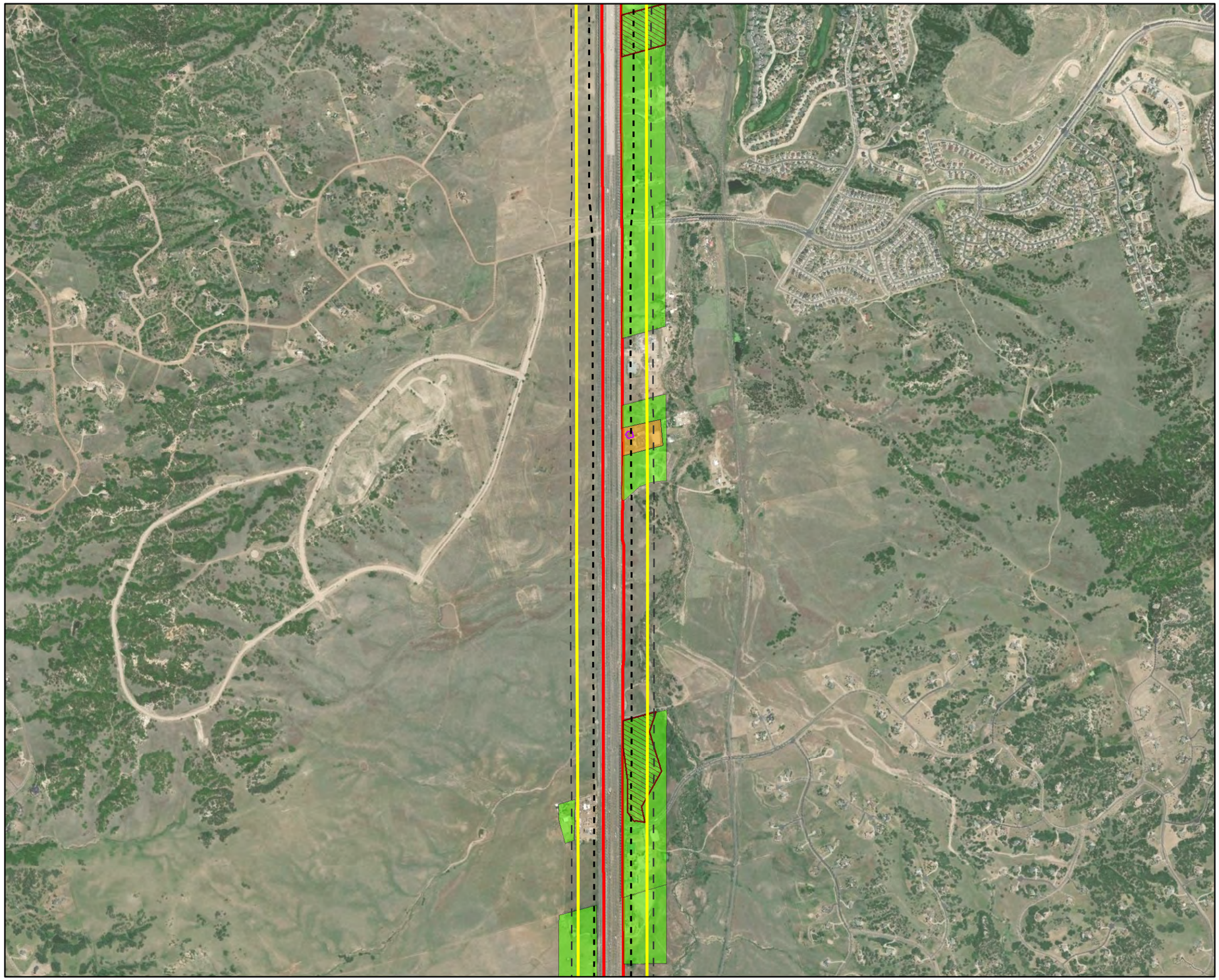
N

0 1
Miles

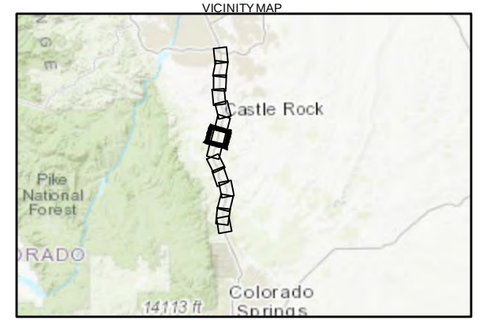
0 1,000
Feet

FIGURE 7
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation



VICINITY MAP



LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

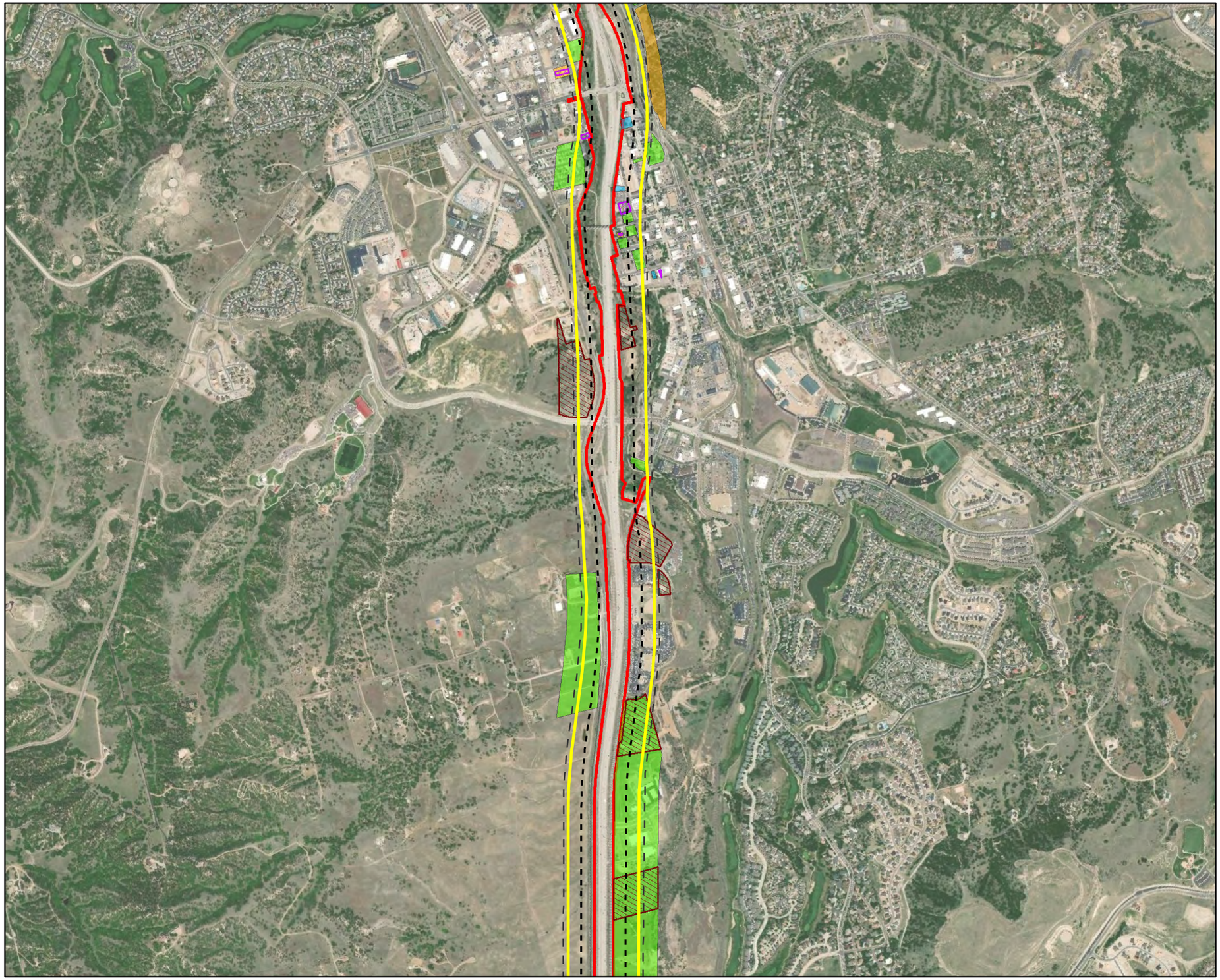
N

0 1
Miles

0 1,000
Feet

FIGURE 8
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation



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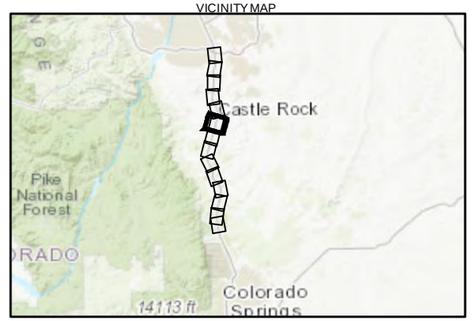


LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

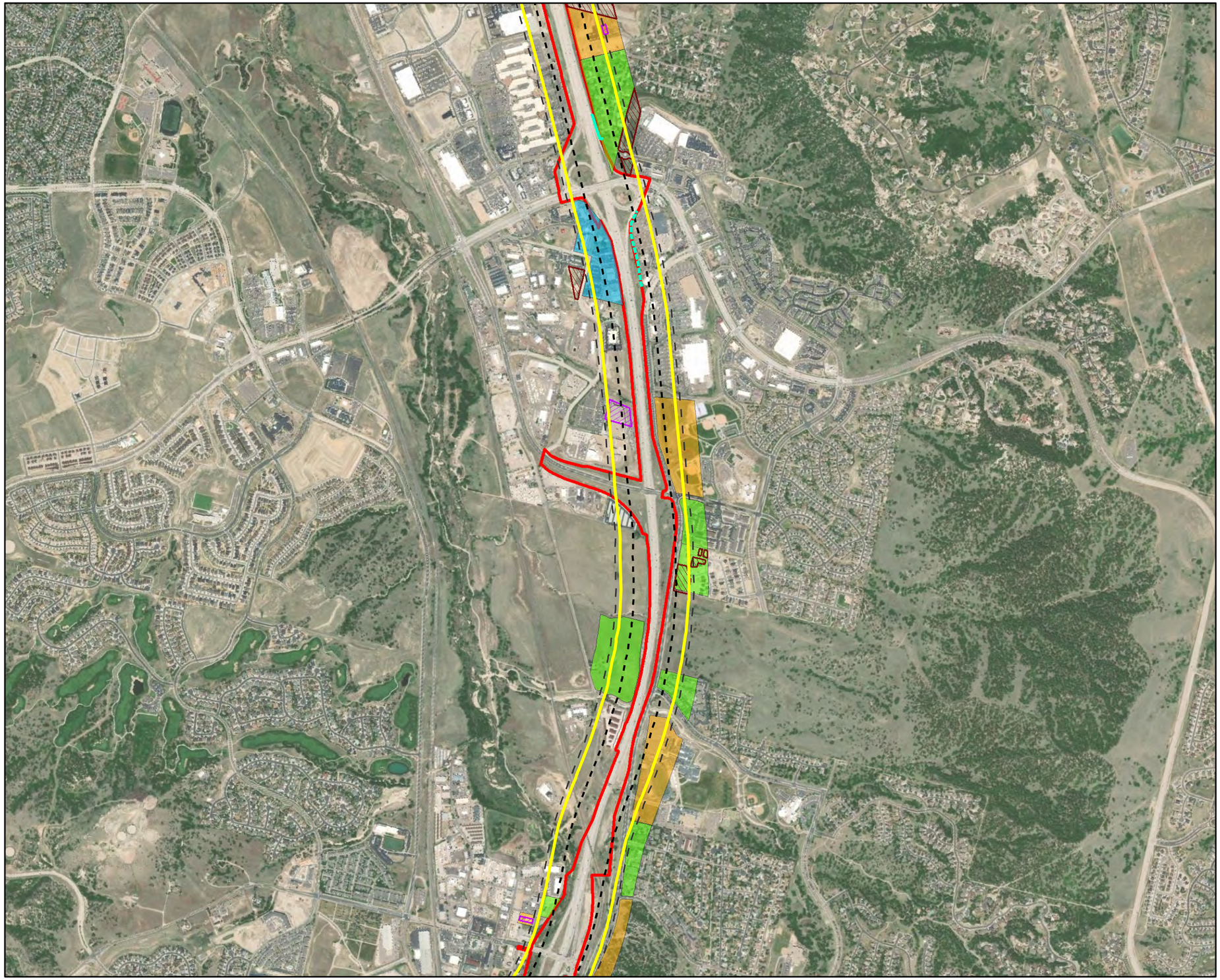
N

0 1
Miles

0 1,000
Feet

FIGURE 9
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation



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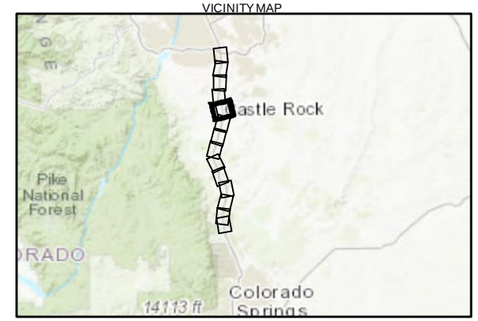


LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

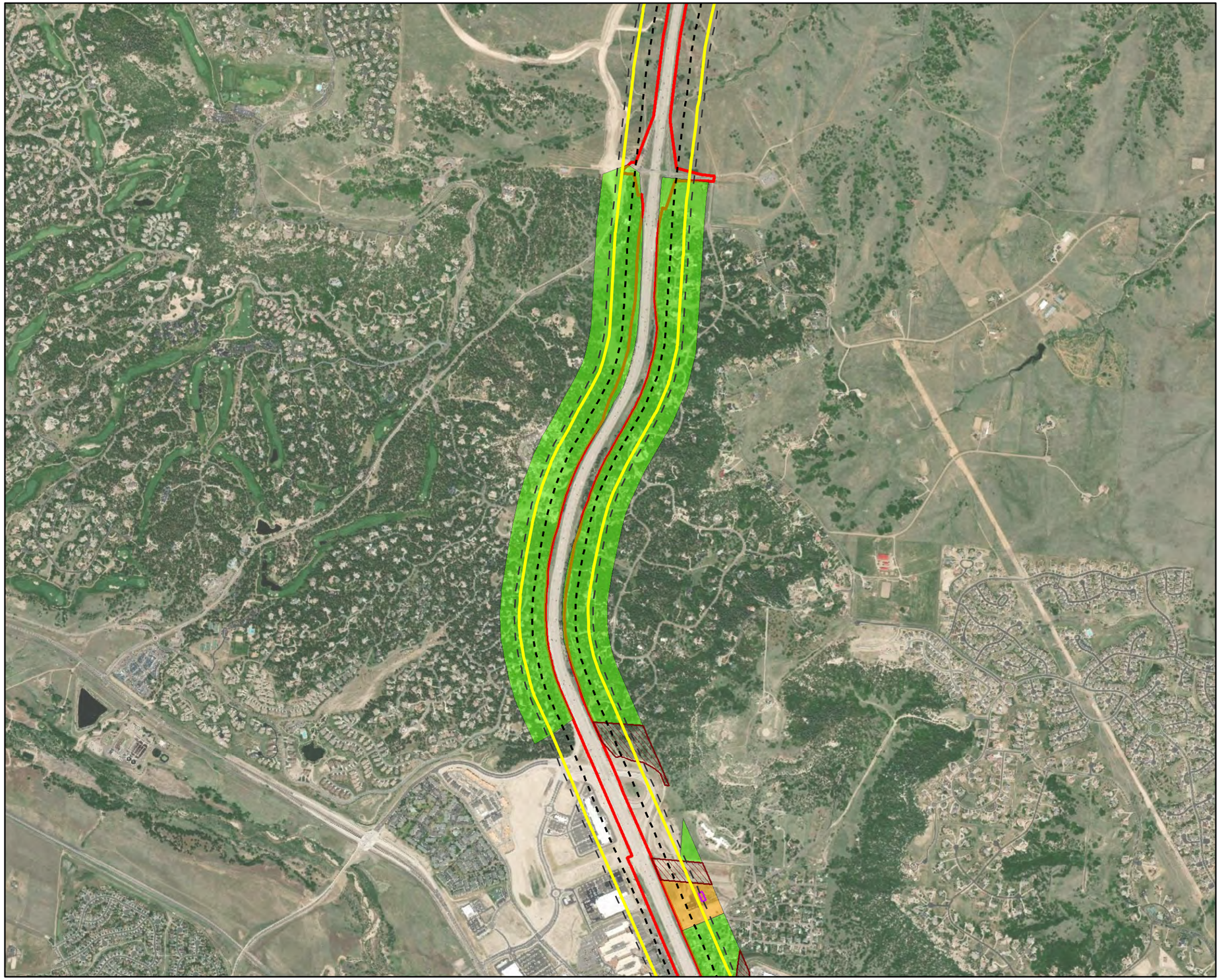
N

0 1
Miles

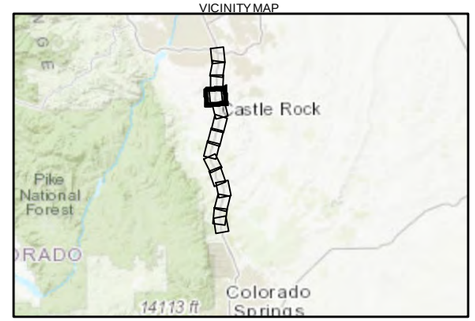
0 1,000
Feet

FIGURE 10
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation



VICINITY MAP



LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

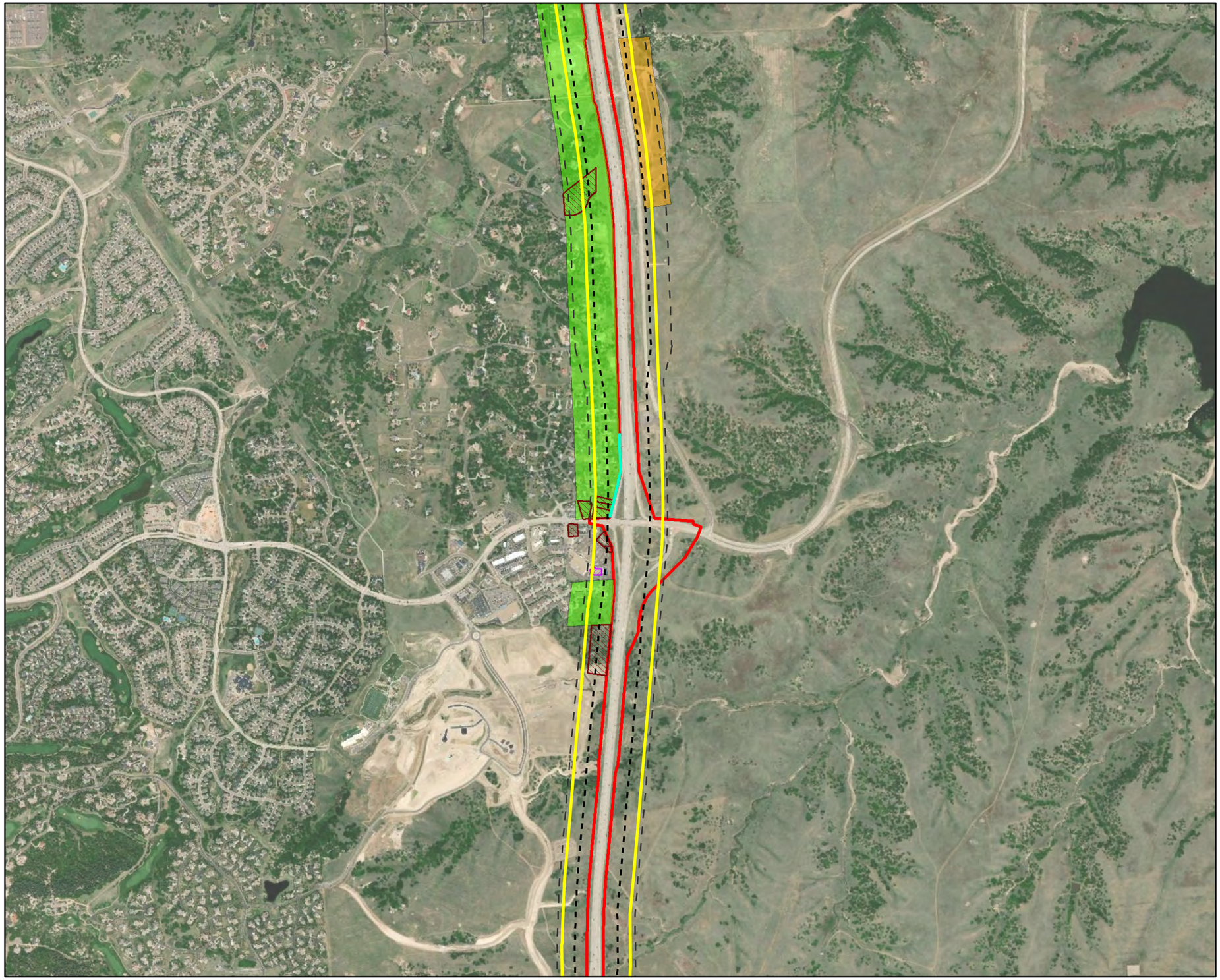
N

0 1
Miles

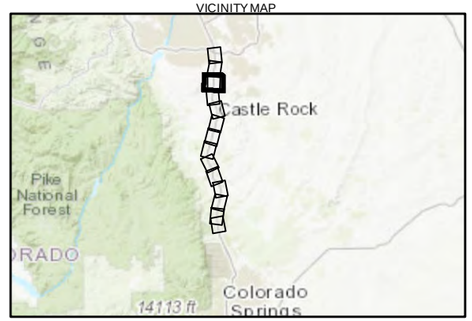
0 1,000
Feet

FIGURE 11
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation



VICINITY MAP



LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

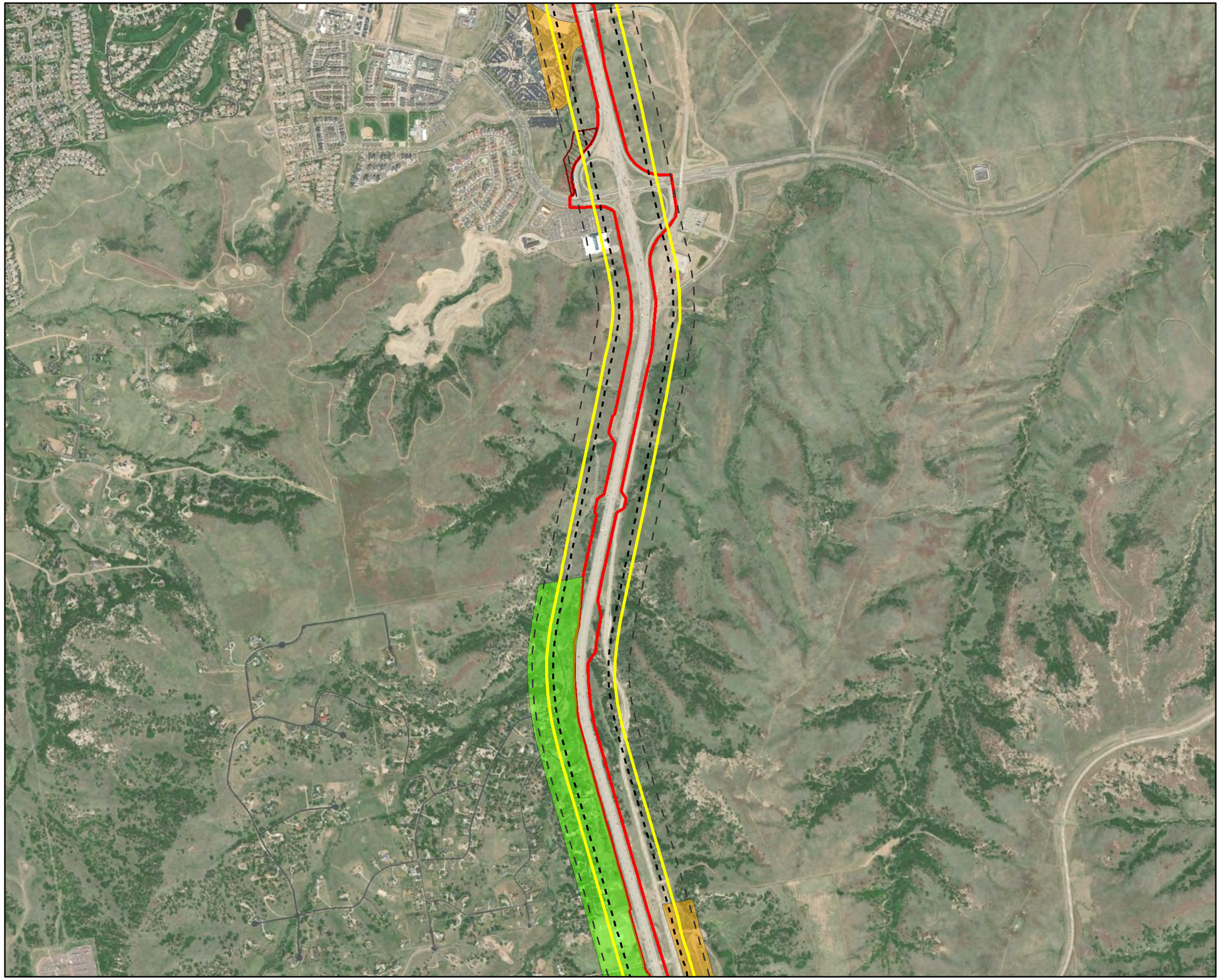
N

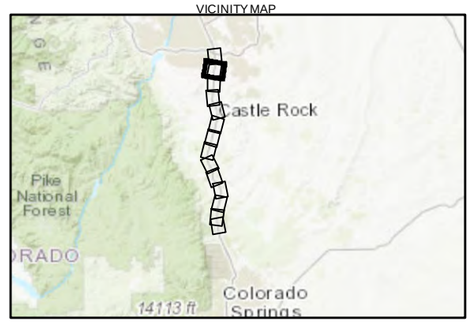
0 1
Miles

0 1,000
Feet

FIGURE 12
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation





LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

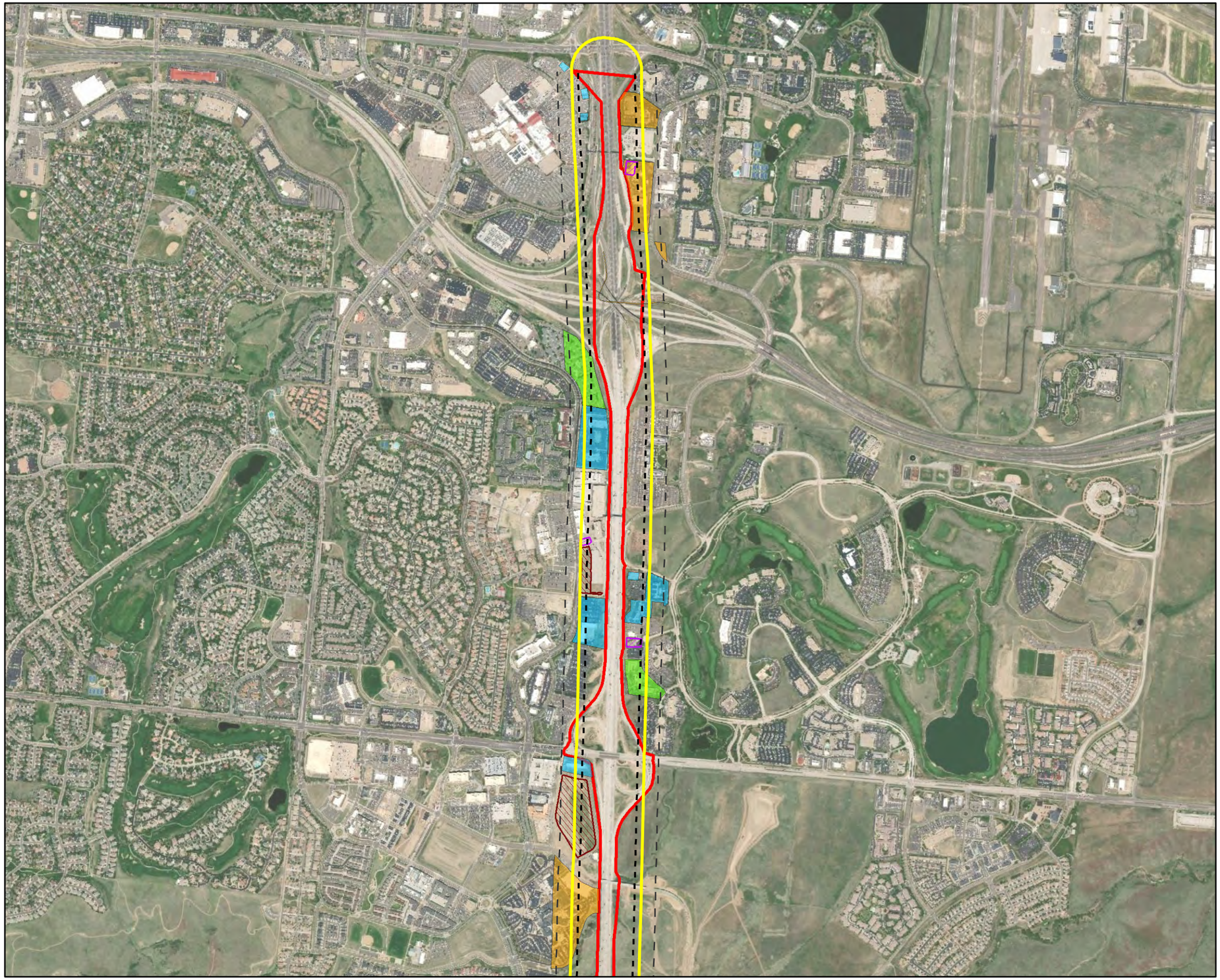
N

0 1
Miles

0 1,000
Feet

FIGURE 13
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO
Department of Transportation



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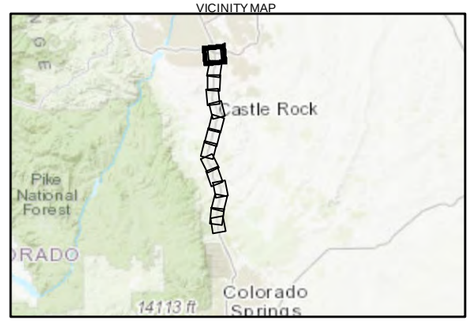


LEGEND

- ROW
- I25 500-foot Buffer
- NAC Activity Category B
- NAC Activity Category C
- NAC Activity Category D
- NAC Activity Category E
- NAC Activity Category G
- Noise Wall
- Noise Berm
- 71 dBA Contour
- 66 dBA Contour

Data Source:
(I-25 PEL Project Team)

N

0 1 Miles

0 1,000 Feet

FIGURE 14
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
October 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Colorado Front Range Trail
- Colorado Front Range Trail (Preferred Alignment)
- Existing Trail
- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

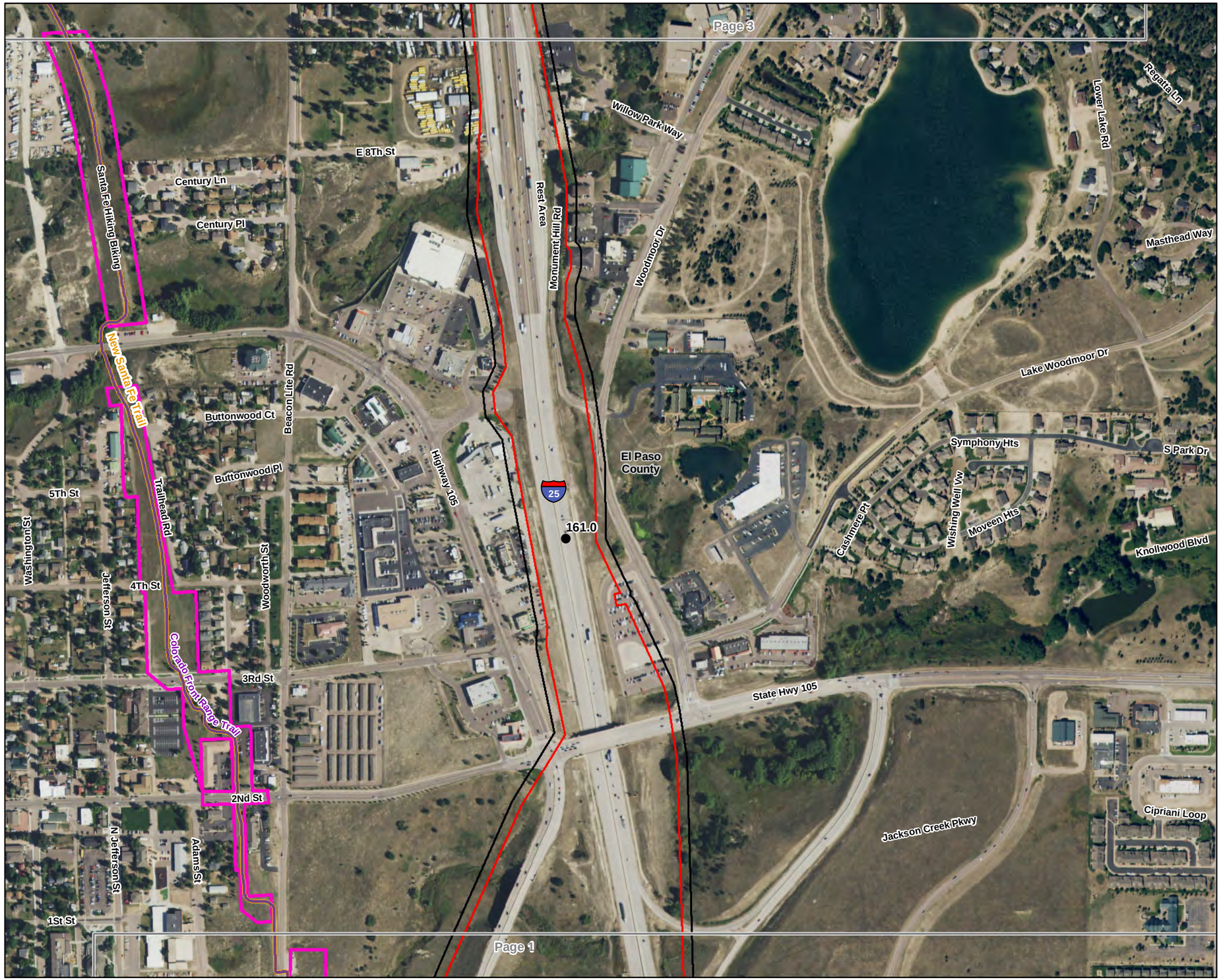
N

0 500

Feet

FIGURE 1
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
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- Colorado Front Range Trail (Preferred Alignment)
- Existing Trail
- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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Feet

FIGURE 2
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Colorado Front Range Trail
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- Existing Trail
- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

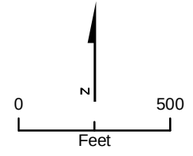
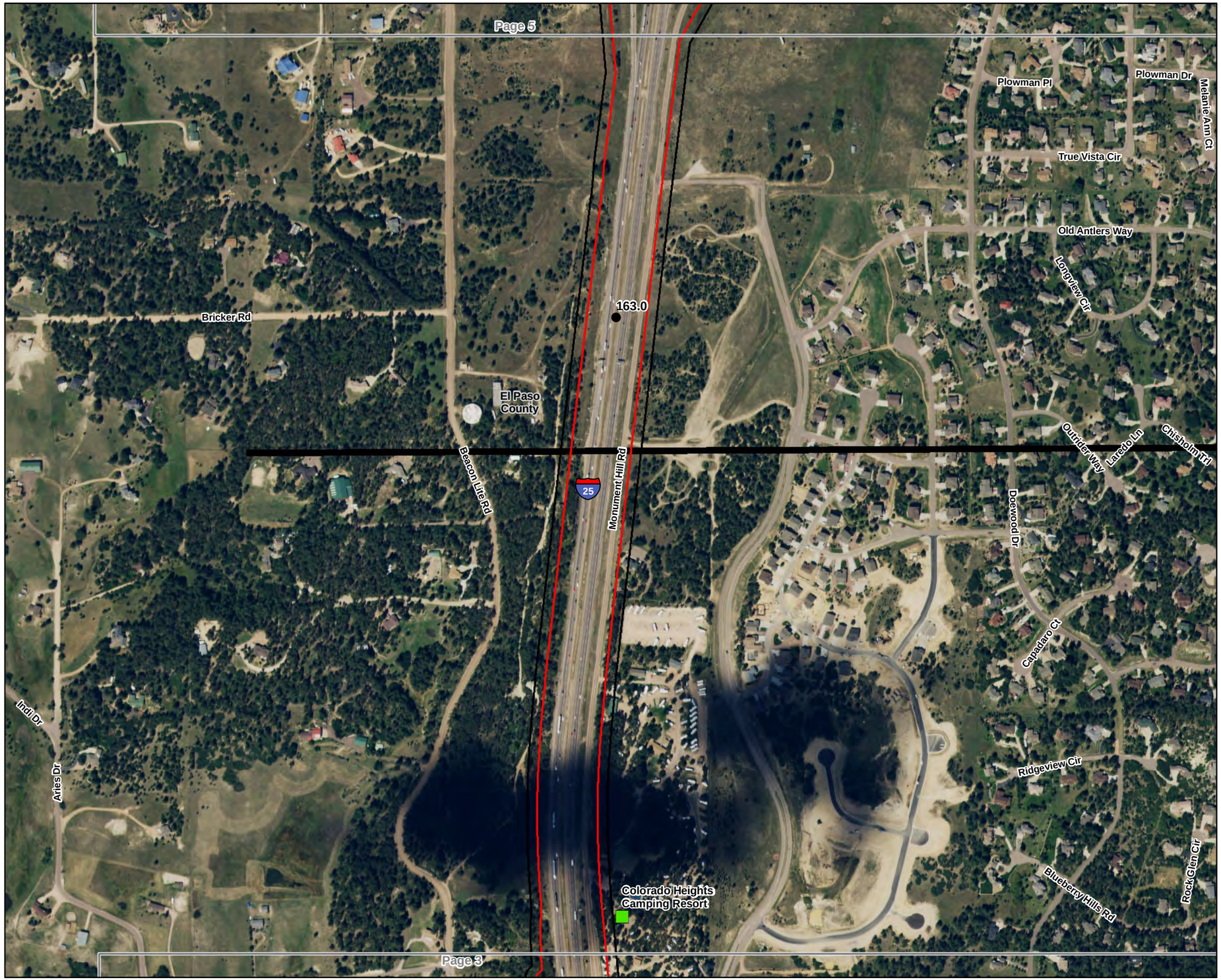


FIGURE 3
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



LEGEND

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- Conservation Easement
- Section 6(f)
- Private Recreation Resources

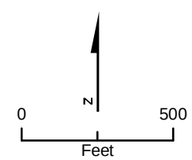

FIGURE 4
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
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- Right-of-Way - 50-ft Buffer
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- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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0 500

Feet

FIGURE 5
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
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- Colorado Front Range Trail
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- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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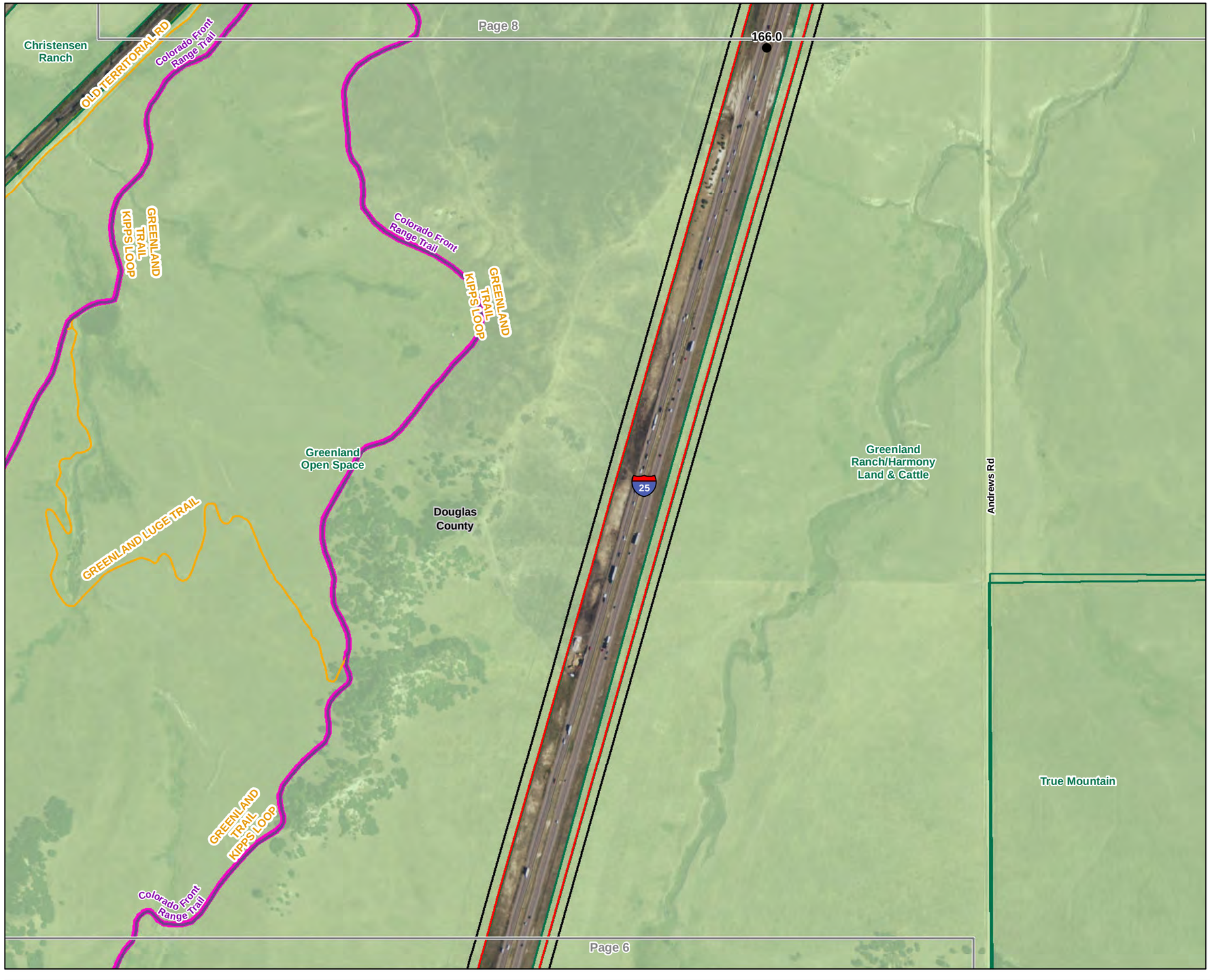
Feet

FIGURE 6
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



VICINITY MAP

LEGEND

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- Right-of-Way
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- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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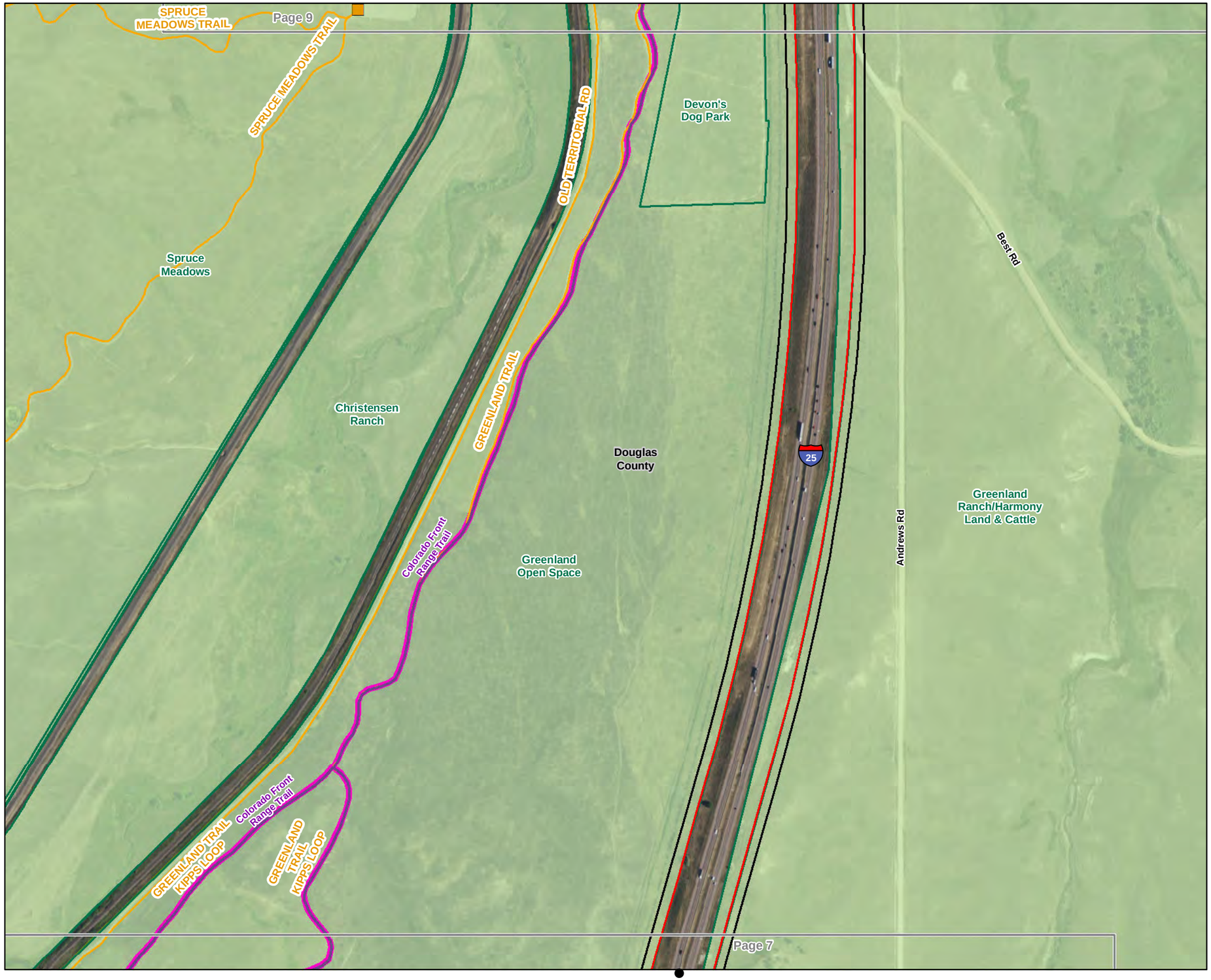
FIGURE 7
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



VICINITY MAP

LEGEND

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- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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Feet

FIGURE 8
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
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- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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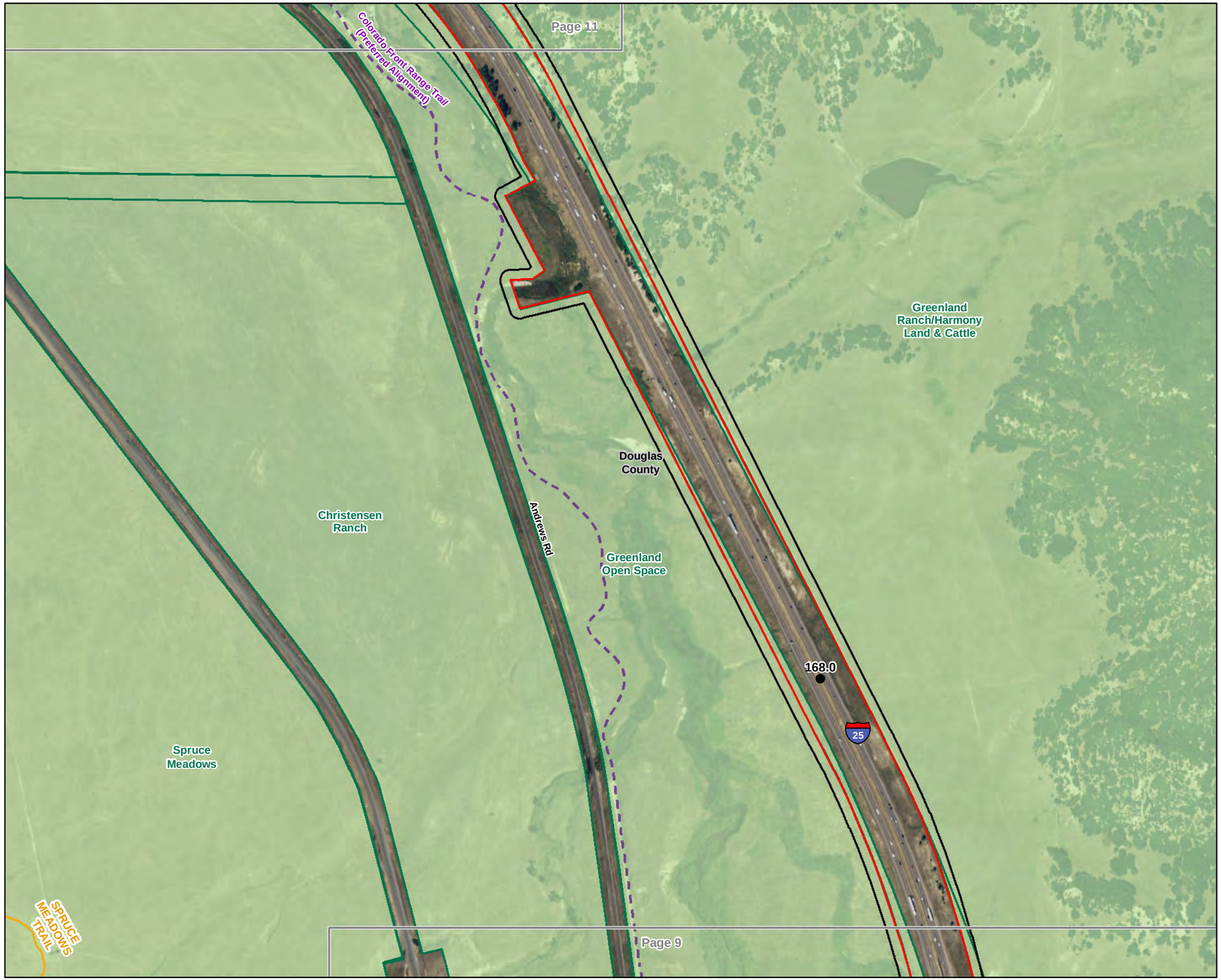
FIGURE 9
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



LEGEND

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- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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Feet

FIGURE 10
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
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- Section 6(f)
- Private Recreation Resources

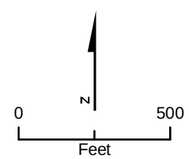
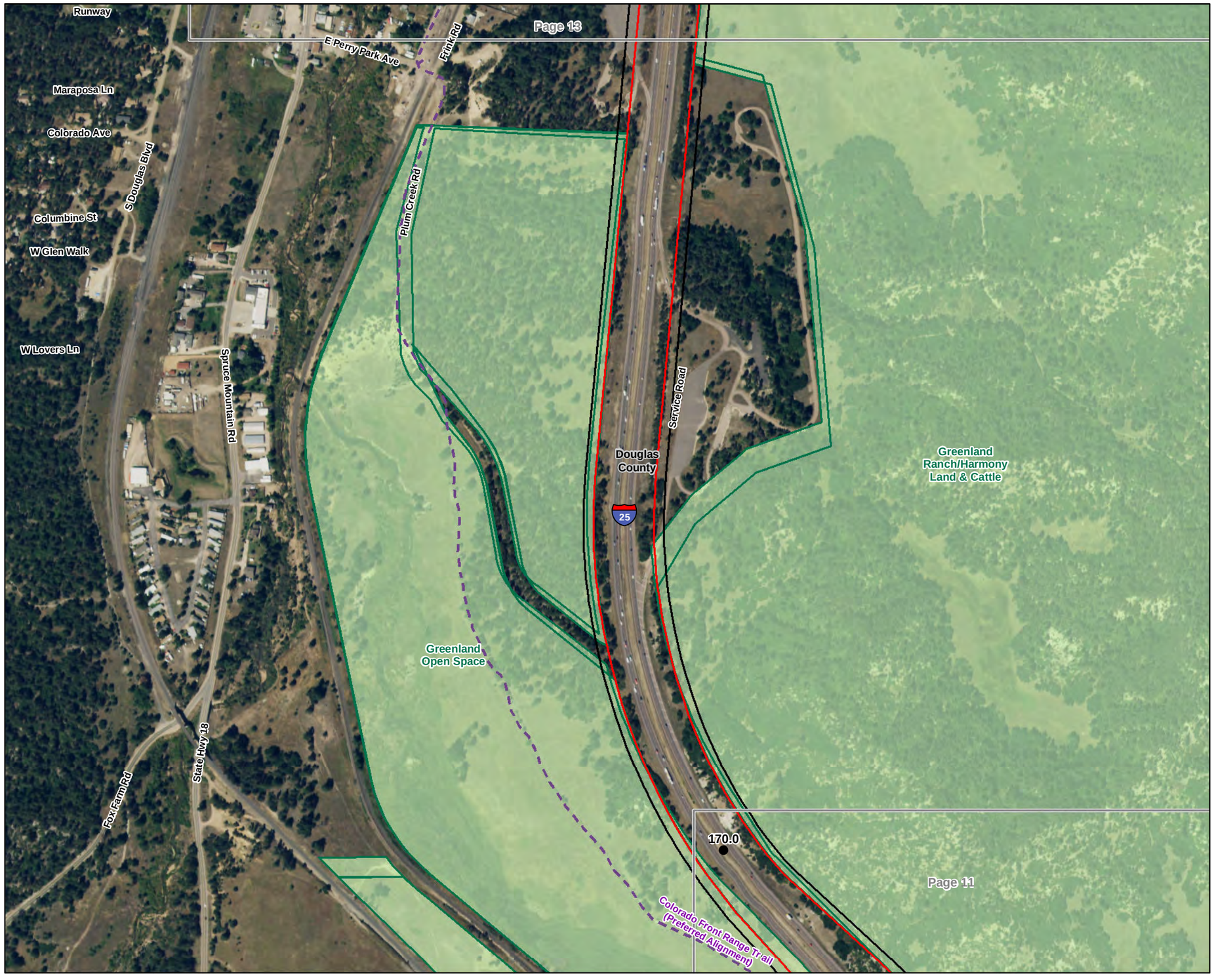


FIGURE 11
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



VICINITY MAP

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- Section 6(f)
- Private Recreation Resources

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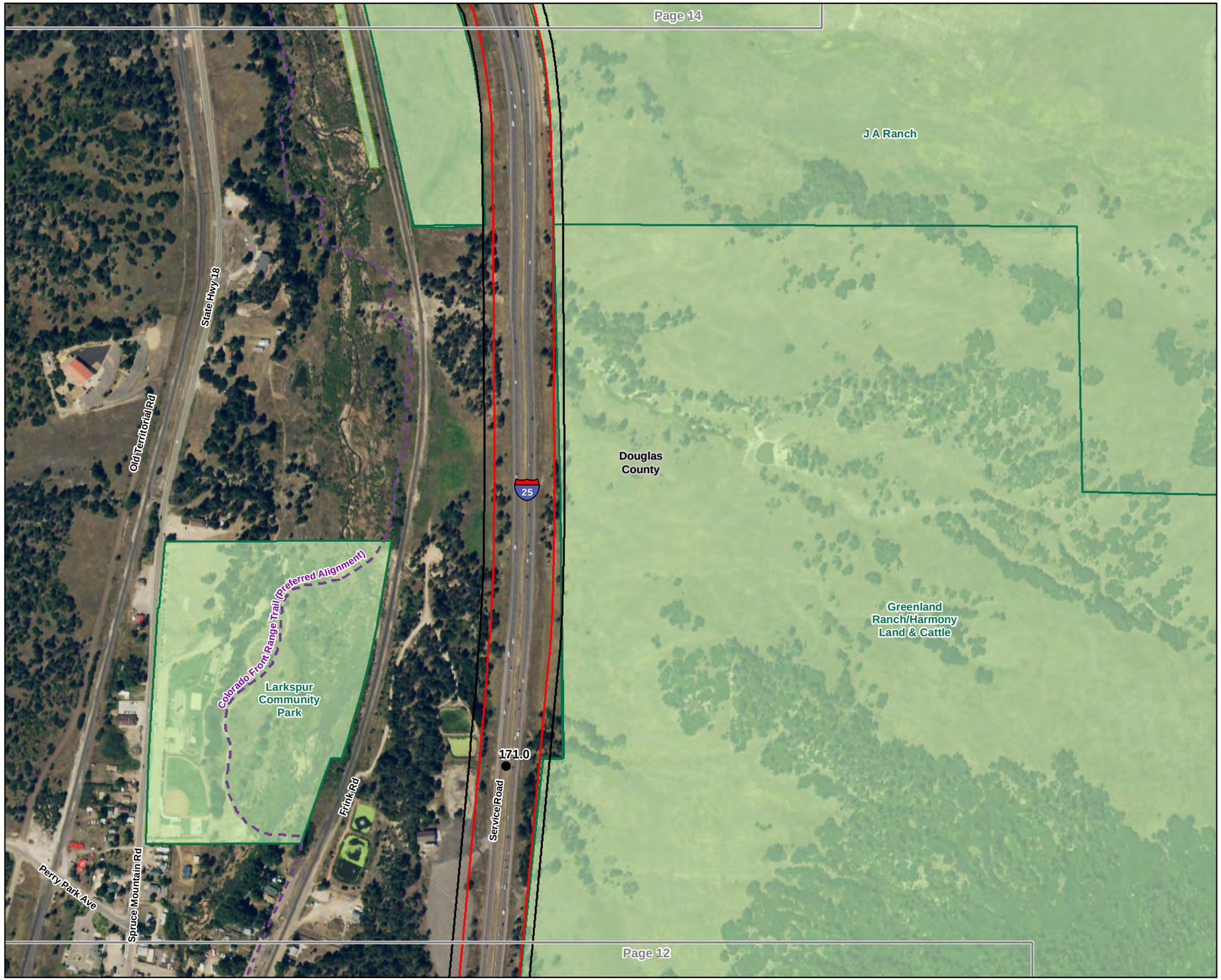
FIGURE 12
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



LEGEND

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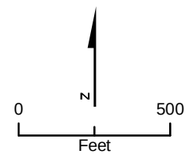
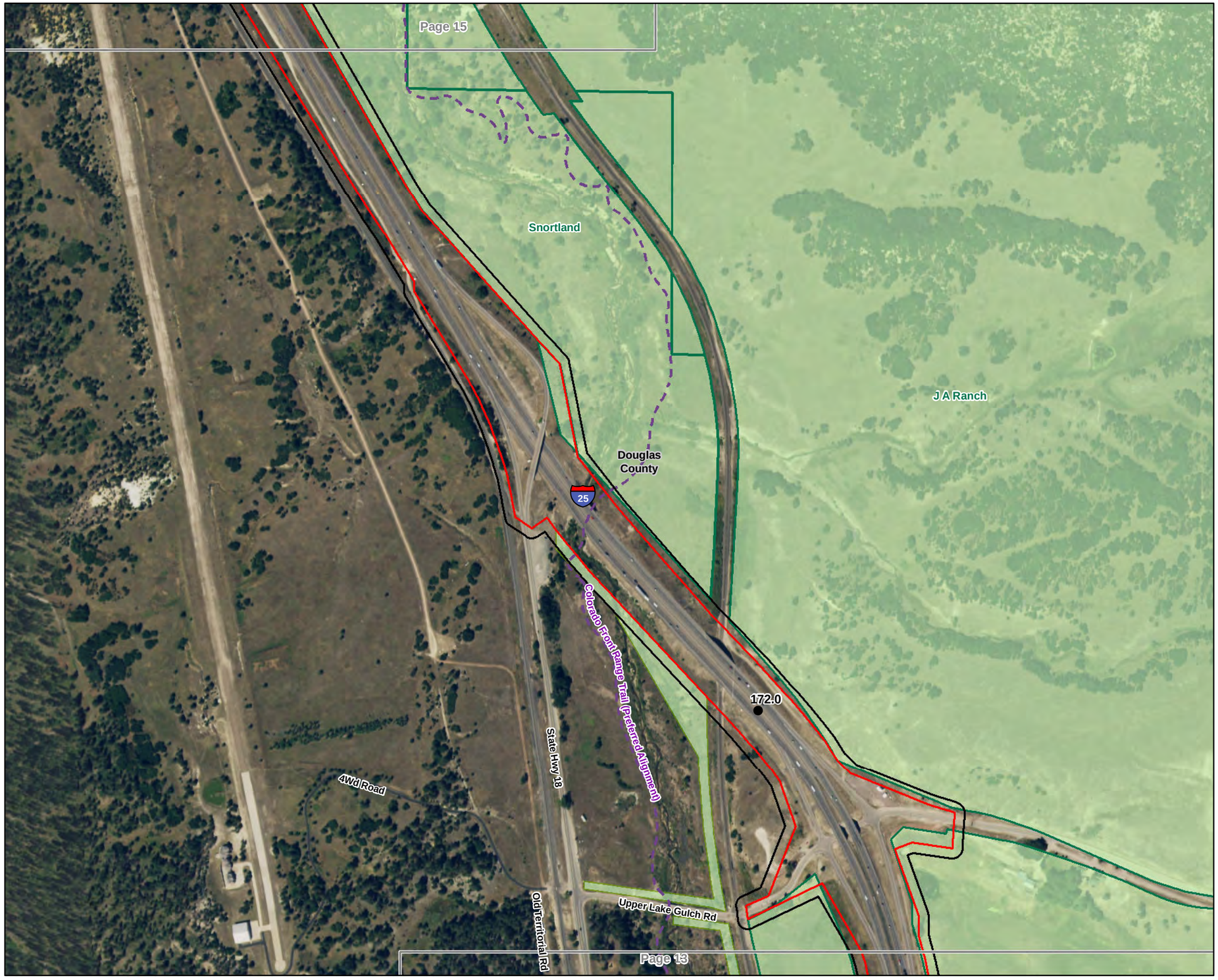


FIGURE 13
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



LEGEND

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- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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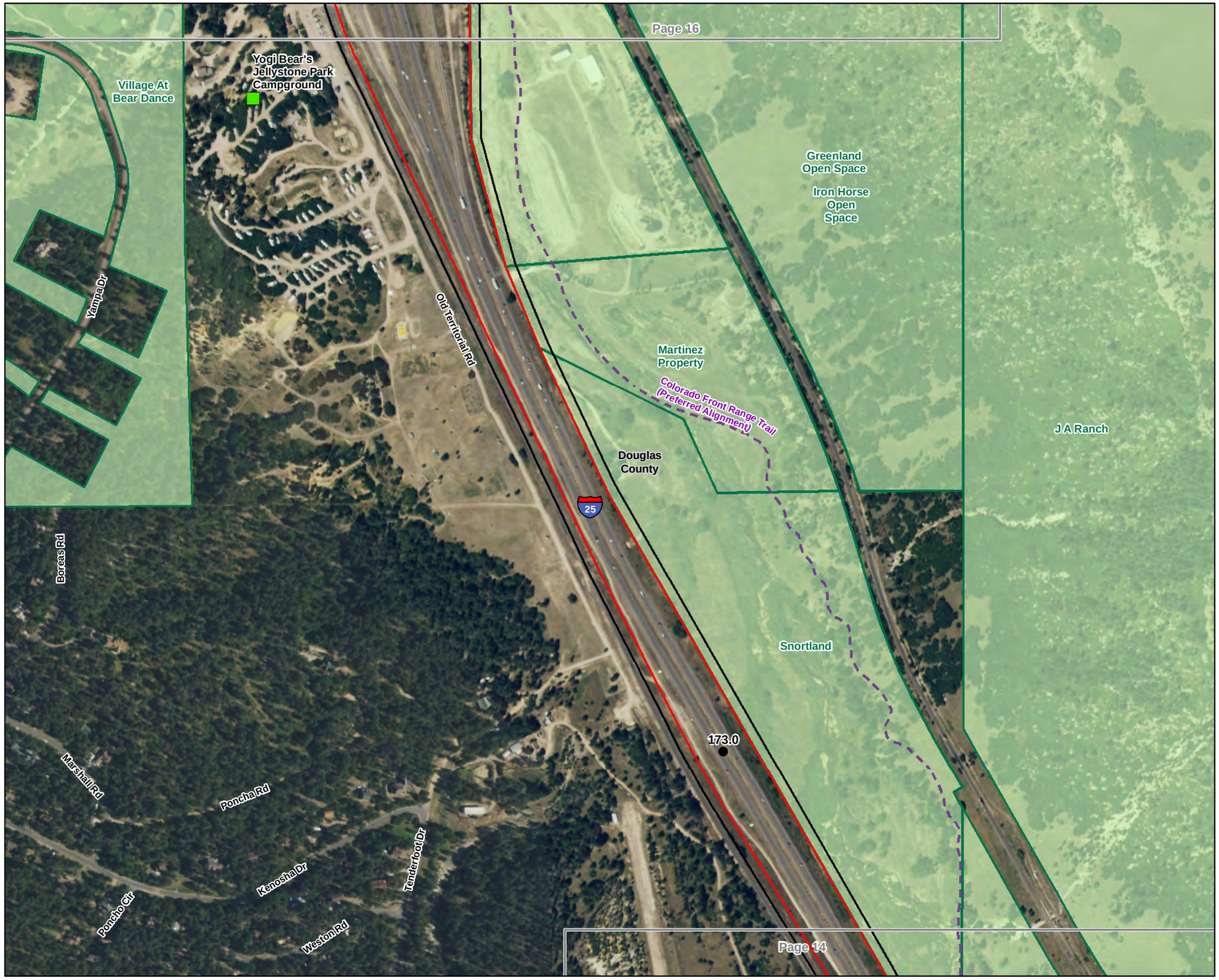
Feet

FIGURE 14
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



VICINITY MAP

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- Existing Trail Access
- Proposed Trail Tie In
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- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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FIGURE 15
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
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- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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FIGURE 16
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

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VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Colorado Front Range Trail
- Colorado Front Range Trail (Preferred Alignment)
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- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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FIGURE 17
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
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- Existing Trail Access
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- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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Feet

FIGURE 18
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

Page 20

Page 18

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
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- Existing Trail
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- Existing Trail Access
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- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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FIGURE 19
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
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- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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Feet

FIGURE 20
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
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- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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Feet

FIGURE 21
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
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- Conservation Easement
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- Private Recreation Resources

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Feet

FIGURE 22
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

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- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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Feet

FIGURE 23
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
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- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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FIGURE 24
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
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- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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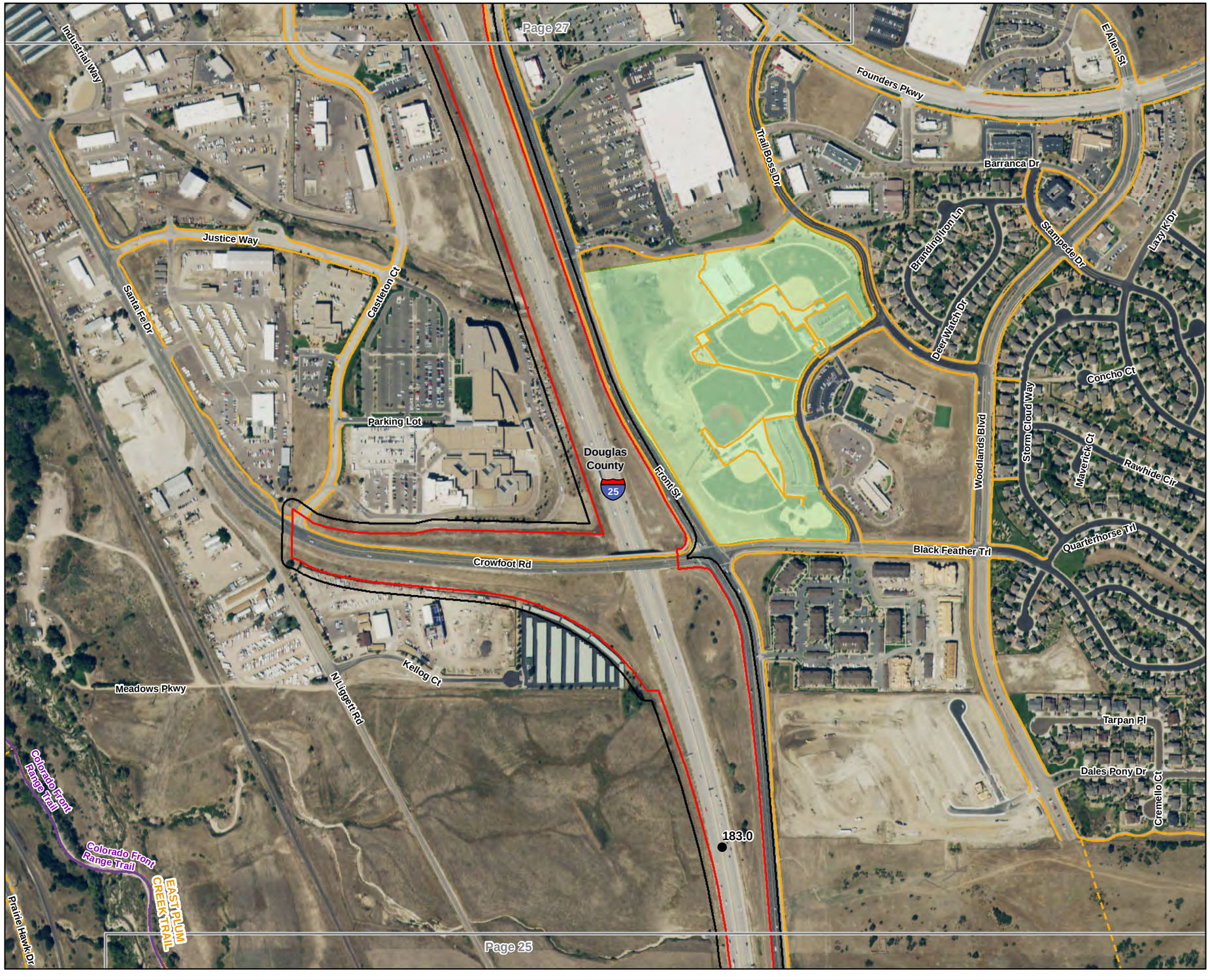
FIGURE 25
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



LEGEND

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- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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Feet

FIGURE 26
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

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VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
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- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

0 500 Feet

FIGURE 27
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
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- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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FIGURE 28
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

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- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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FIGURE 29
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

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- Private Recreation Resources

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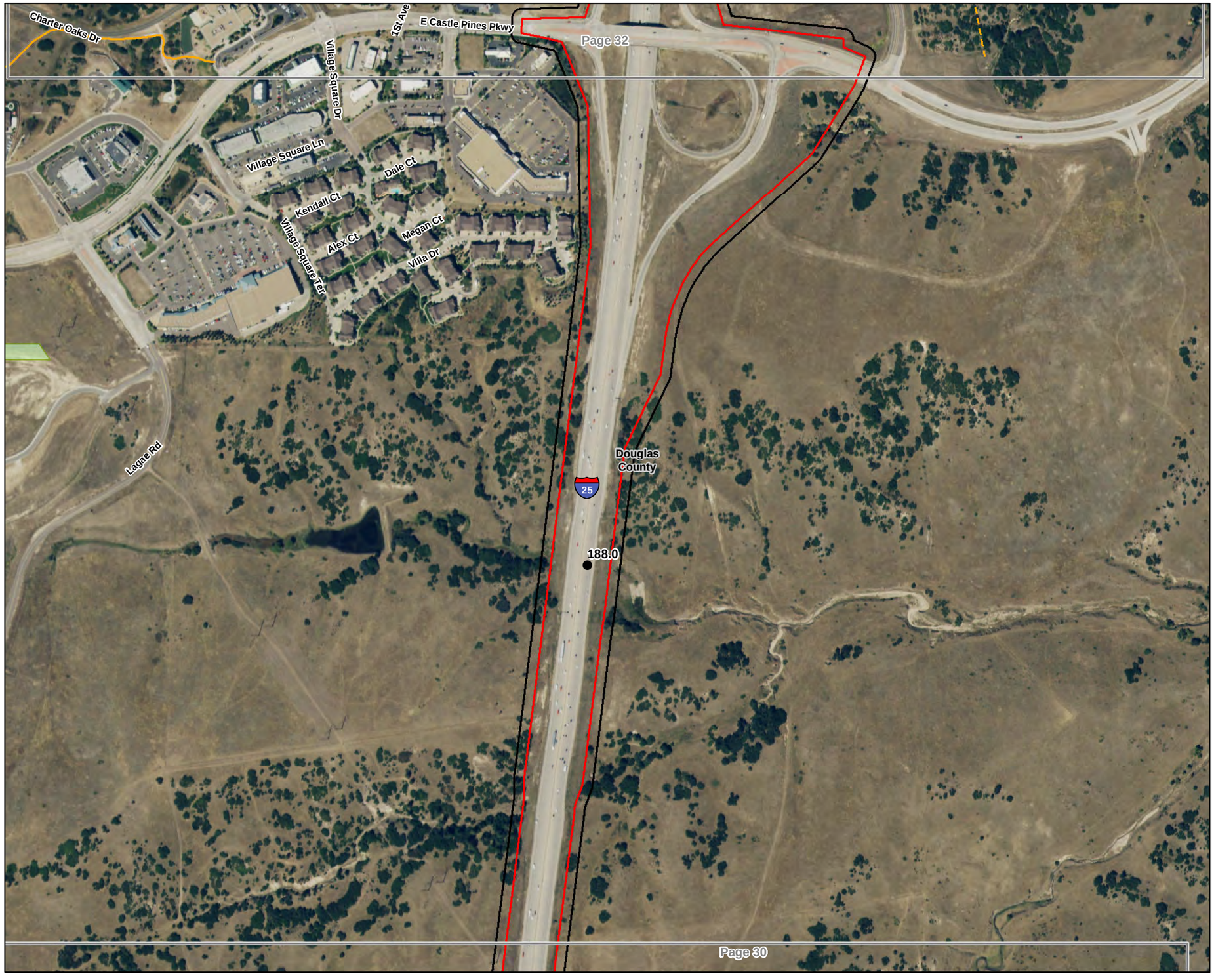
FIGURE 30
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



LEGEND

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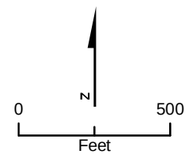

FIGURE 31
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

VICINITY MAP

LEGEND

- Milepost
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- Conservation Easement
- Section 6(f)
- Private Recreation Resources

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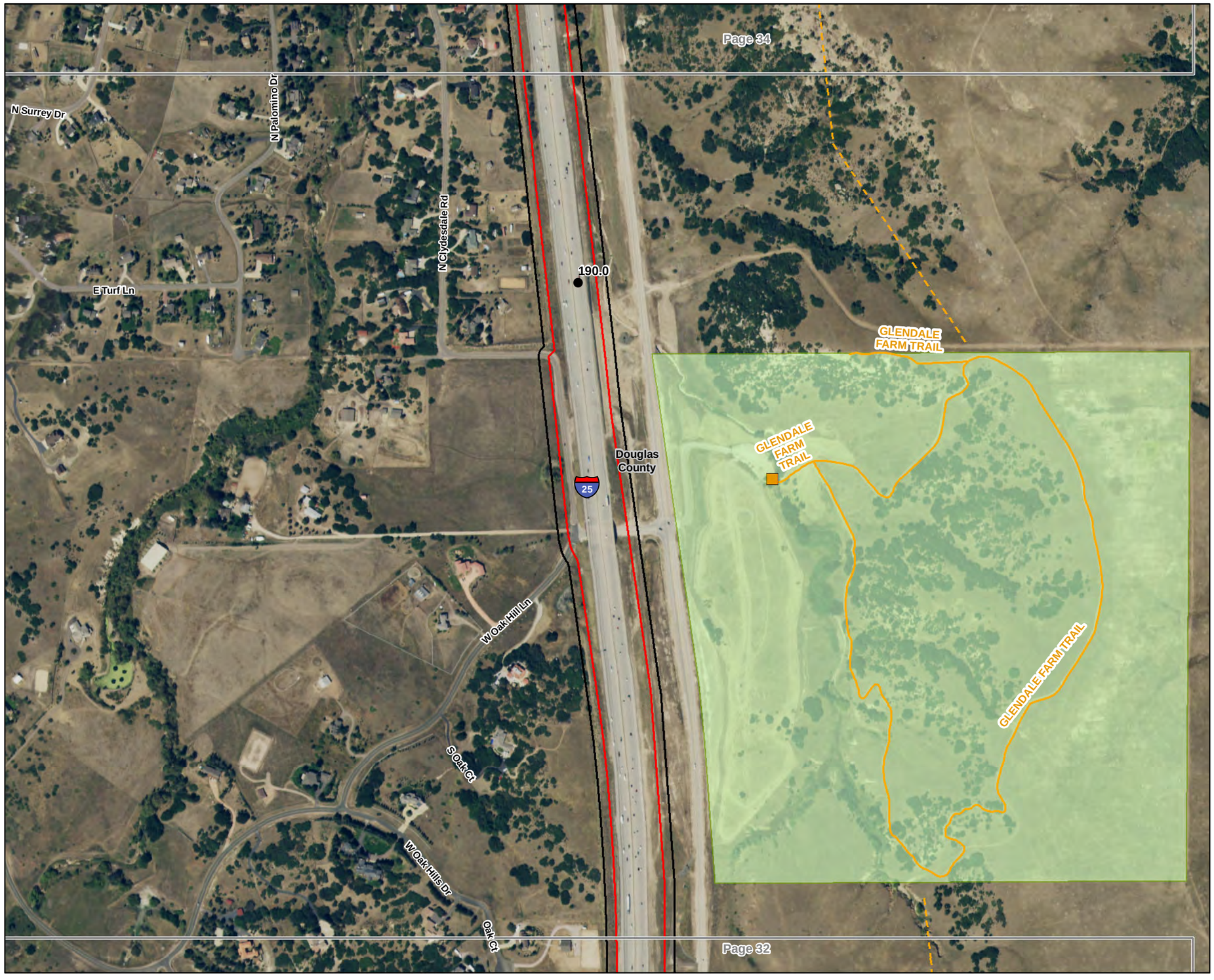
Feet

FIGURE 32
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



VICINITY MAP

LEGEND

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- Conservation Easement
- Section 6(f)
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Feet

FIGURE 33
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

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0 500

Feet

FIGURE 34
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Colorado Front Range Trail
- Colorado Front Range Trail (Preferred Alignment)
- Existing Trail
- Proposed Trail
- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

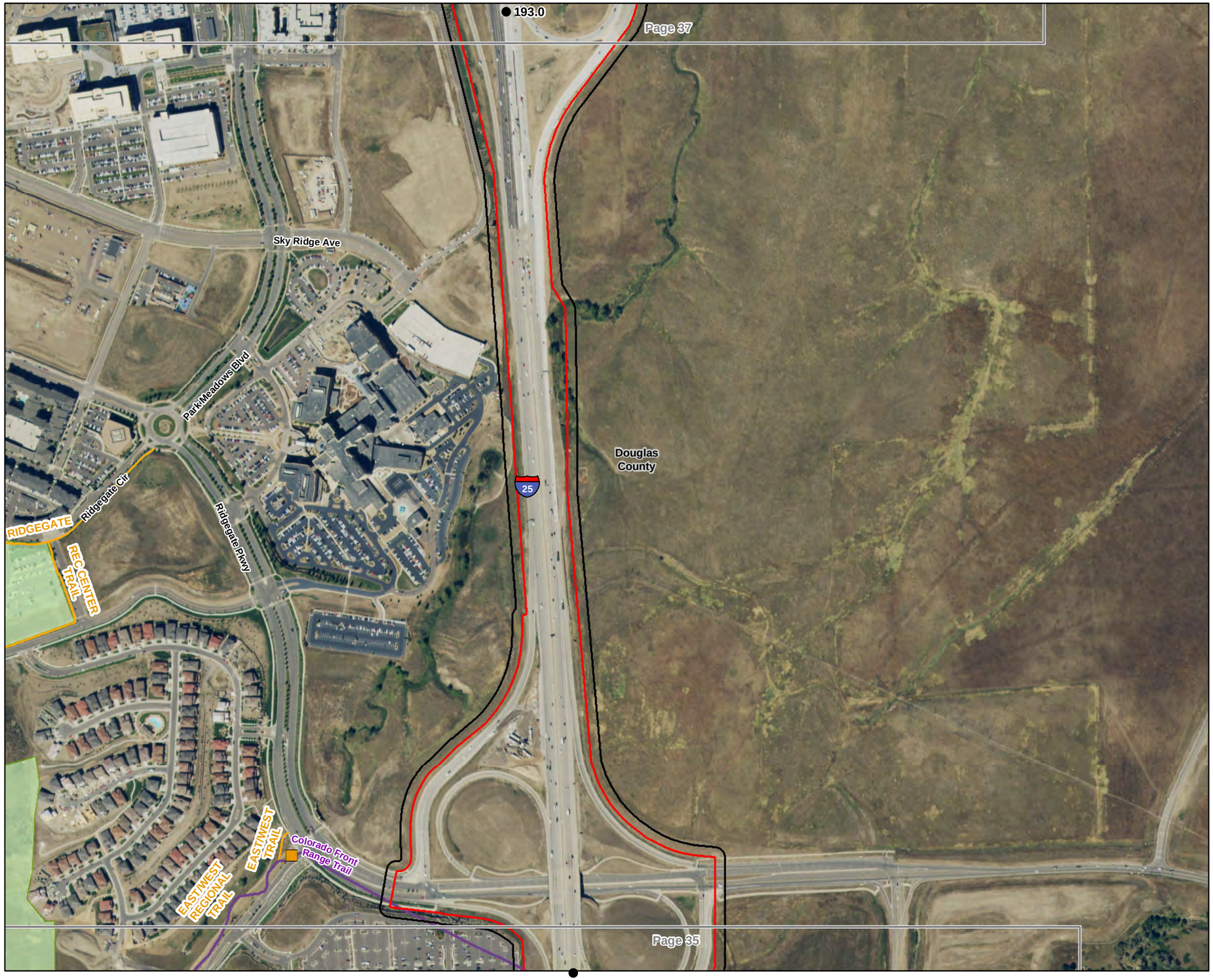
N

0 500

Feet

FIGURE 35
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
- Match Line
- Colorado Front Range Trail
- Colorado Front Range Trail (Preferred Alignment)
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- Section 6(f)
- Private Recreation Resources

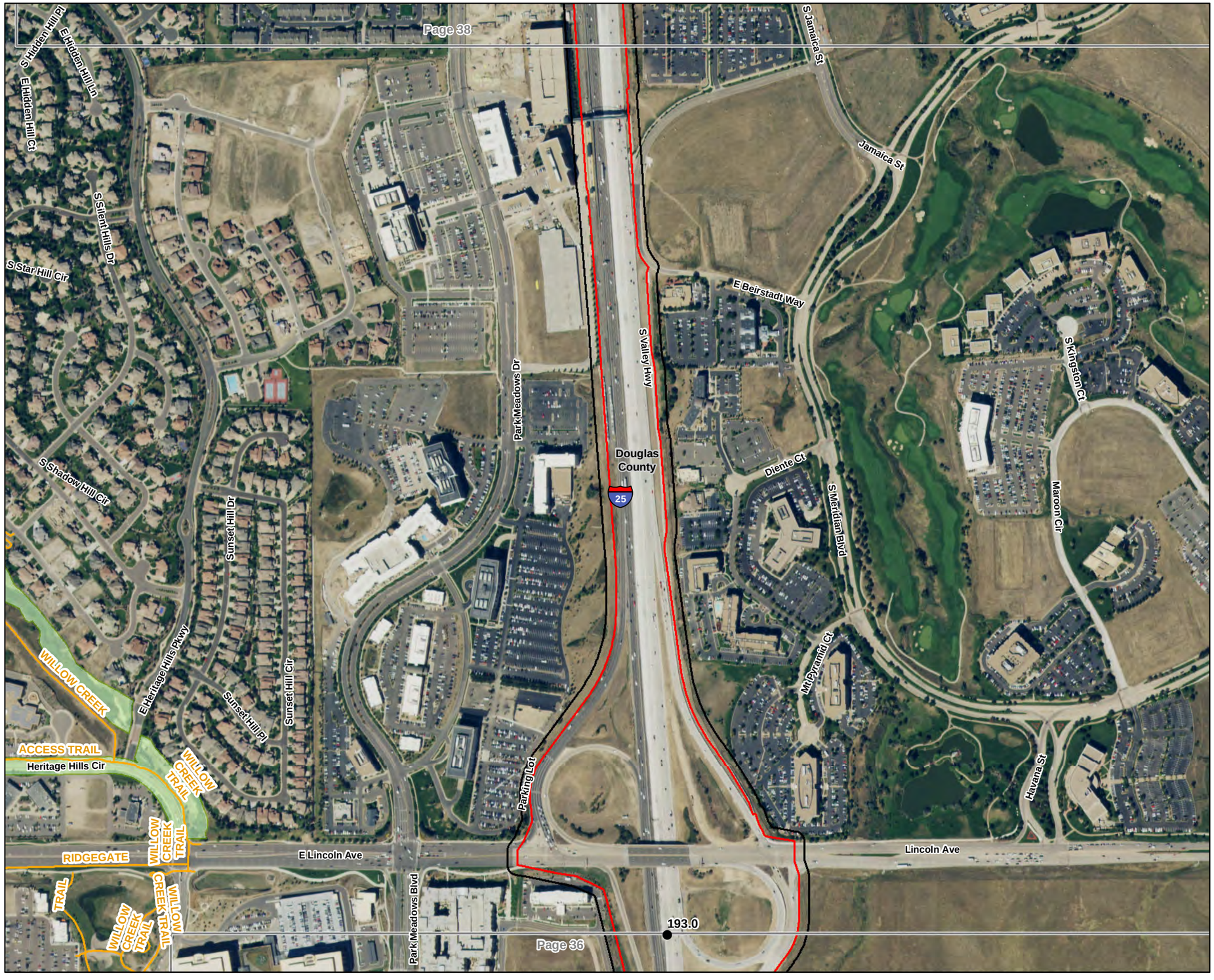
N

0 500

Feet

FIGURE 36
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



LEGEND

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- Existing Trail Access
- Proposed Trail Tie In
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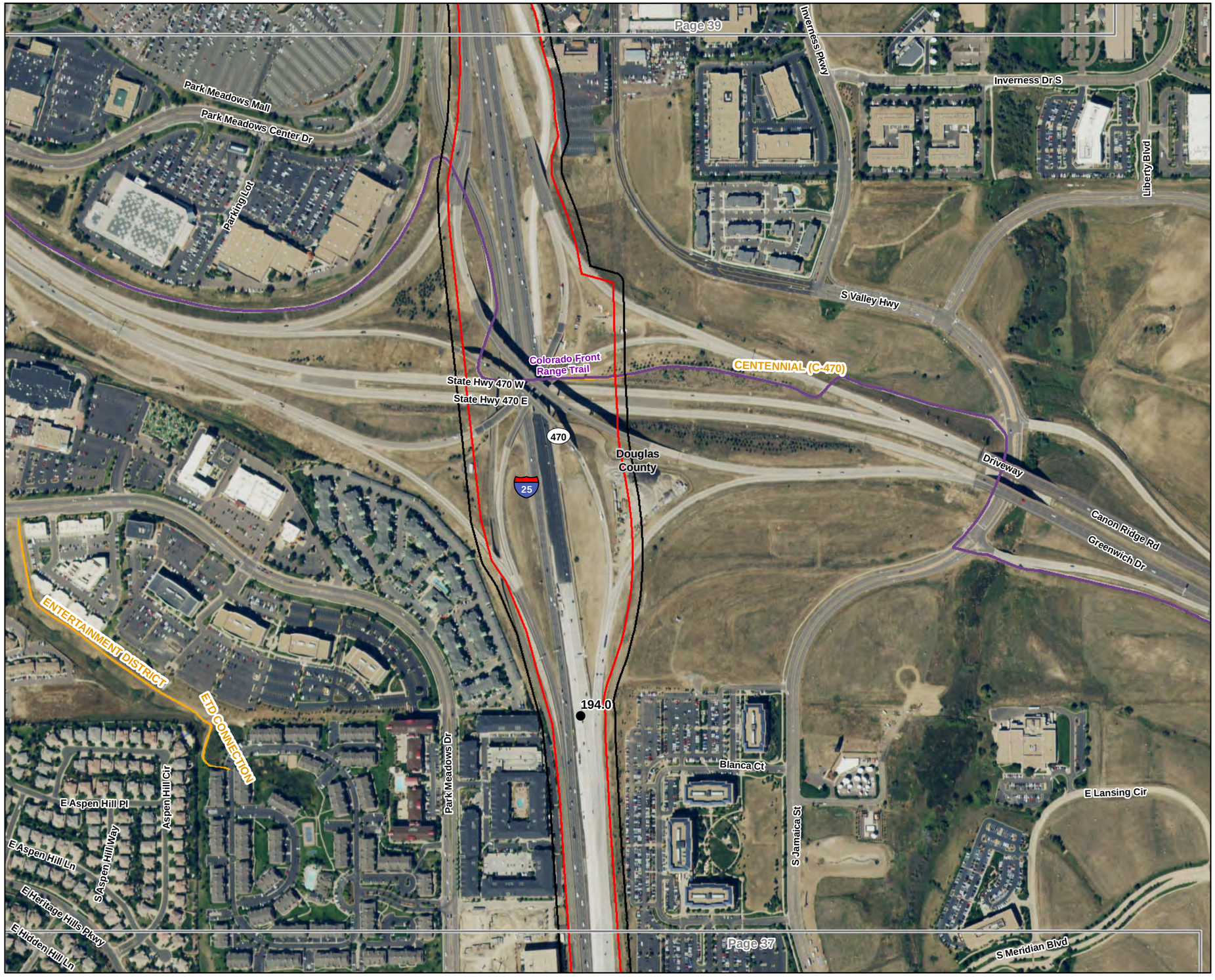
- Section 6(f)
- Private Recreation Resources

0 500
N
Feet

FIGURE 37
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation



VICINITY MAP

LEGEND

- Milepost
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- Colorado Front Range Trail (Preferred Alignment)
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- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

0 500 Feet

FIGURE 38
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation

LEGEND

- Milepost
- Right-of-Way
- Right-of-Way - 50-ft Buffer
- County Boundary
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- Colorado Front Range Trail (Preferred Alignment)
- Existing Trail
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- Existing Trail Access
- Proposed Trail Tie In
- Parks / Open Space
- Conservation Easement
- Section 6(f)
- Private Recreation Resources

0 500 Feet

FIGURE 39
Recreation Map Book
Environmental Resources
I-25 PEL: CO Springs Denver South Connection
September 2018

COLORADO Department of Transportation