SOUTH BRIDGE

ENVIRONMENTAL ASSESSMENT

Colorado Department of Transportation Region 3

October 2013

City of Glenwood Springs

SOUTH BRIDGE
ENVIRONMENTAL ASSESSMENT

CDOT Project Number HPP M535-003 (15864)
Submitted Pursuant to:
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by the
U.S. Department of Transportation, Federal Highway Administration
and
Colorado Department of Transportation

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10/8/13
Date

A federal agency may publish a notice in the Federal Register, pursuant to 23 USC 139(1), indicating that one or more federal agencies have taken final action on permits, licenses, or approvals for a transportation project. If such notice is published, claims seeking judicial review of those federal agency actions will be barred unless such claims are filed within 150 days after the date of publication of the notice, or within such shorter time period as is specified in the federal laws pursuant to which judicial review of the federal agency action is allowed. If no notice is published, then the periods of time that otherwise are provided by the federal laws governing such claims will apply.

VIEWING LOCATIONS

Copies of the Environmental Assessment and the technical reports referenced in this Environmental Assessment are available by request from CDOT Region 3 and at the locations listed below.

CDOT Headquarters
Public Information Office
4021 East Arkansas Street, Room 277
Denver, CO 80222
303-757-9228

CDOT Region 3
222 South 6th Street
Grand Junction, CO 81501
970-683-6251

CDOT, Region 3
Glenwood Residency
202 Centennial Drive
Glenwood Springs, CO 81601
970-384-3332

Glenwood Springs Branch Library
413 9th Street
Glenwood Springs, CO 81601
970-945-5958

FHWA Colorado Division Office
12300 West Dakota Avenue, Suite 180
Lakewood, CO 80228
720-963-3000

ACRONYMS AND ABBREVIATIONS

AMI	Average Median Income
APCD	Air Pollution Control Division
APE	Area of Potential Effect
AVLT	Aspen Valley Land Trust
BMPs	Best Management Practices
BRT	Bus Rapid Transit
AST	Above-ground storage tank
CAA	Clean Air Act
CAG	Community Advisory Group
CCC	Civilian Conservation Corps
CDBG	Community Development Block Grant
CDOT	Colorado Department of Transportation
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CEQ	Council on Environmental Quality
CFS	Cubic Feet per Second
CNHP	Colorado Natural Heritage Program
CPW	Colorado Parks and Wildlife
CO	Carbon Monoxide
COS	Corridor Optimization Study
CWA	Clean Water Act
db(A)	A-weighted decibel
DOLA	Department of Local Affairs
EA	Environmental Assessment
EDR	Environmental Data Resources, Inc.
EPA	U.S. Environmental Protection Agency
ERNS	Emergency Release Notification System
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FACWet	Functional Assessment of Colorado Wetlands
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Map
HHS	Department of Health and Human Services
HUD	U.S. Department of Housing and Urban Development
IRIS	Integrated Risk Information System
LOS	Level of Service
LUST	Leaking underground storage tank
MBO	Minority Business Office
MBTA	Migratory Bird Treaty Act
MGD	Million Gallons per Day
MOA	Memorandum of Agreement
MOE	Measure of Effectiveness
MS4	Municipal Separate Storm Sewer System
MSA	Metropolitan Statistical Area
MSATs	Mobile Source Air Toxics
N/A	Not applicable
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NCHRP	National Cooperative Highway Research Program
NEPA	National Environmental Policy Act
NFA	no further action
NHPA	National Historic Preservation Act
NOX	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
O_3	Ozone
$PM_{2.5}$	Particulate Matter less than 2.5-Microns in diameter

PM_{10}	Particulate Matter less than 10-Microns in diameter
PWG	Project Working Group
RCRA	Resource Conservation and Recovery Act
RFTA	Roaring Fork Transit Authority
RMIA	Rocky Mountain Insurance Advisors
RV	Recreational Vehicle
SB 40	Senate Bill 40
SDWA	Safe Drinking Water Act
SH	State Highway
SHPO	State Historic Preservation Officer
SO_2	Sulfur Dioxide
SPF	Safety Performance Function
SRHP	State Register of Historic Places
SWMP	Stormwater Management Plan
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USC	U.S. Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UST	Underground storage tank
VHT	Vehicle Hours of Travel
VMT	Vehicle Miles of Travel

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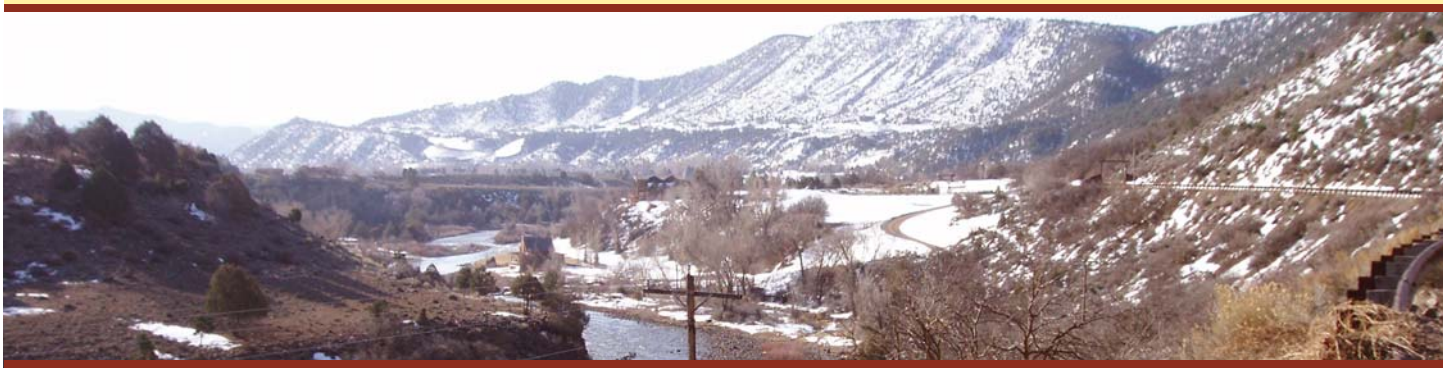
SOUTH BRIDGE
ENVIRONMENTAL ASSESSMENT



EXECUTIVE SUMMARY

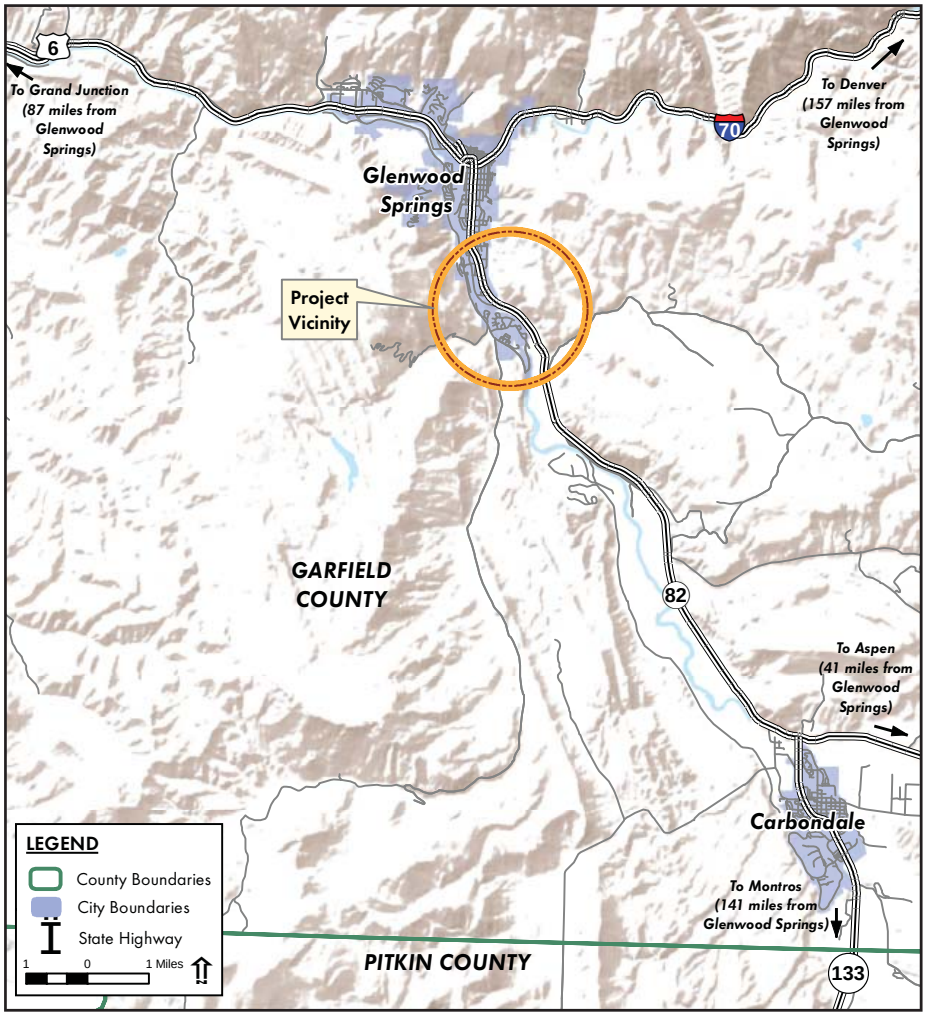
The City of Glenwood Springs and the Federal Highway Administration (FHWA), in coordination with Garfield County and the Colorado Department of Transportation (CDOT), have identified the need for secondary access connecting residents, public uses, and businesses south of Glenwood Springs and west of the Roaring Fork River to State Highway 82 (SH 82). The project vicinity encompasses portions of Glenwood Springs and Garfield County (see **Figure ES-1**) as does the Preferred Alternative (**Figure ES-2**).

The Coal Seam Fire, in 2002, led to an evacuation of areas south and west of Glenwood Springs, affecting over 3,000 residents. This situation highlighted the limited evacuation options for residents living in this area and prompted a congressional earmark for the City of Glenwood Springs to construct a new southern Glenwood Springs off-system bridge (South Bridge project).

The purpose of the South Bridge project is to provide a critical second access between SH 82 and the western side of the Roaring Fork River in the south Glenwood Springs area. For purposes of this study, South Glenwood Springs is the area south of 27th Street. This area includes the Cardiff Glen, Park East and Mount Sopris neighborhoods, Sopris Elementary School, 4-Mile Road land uses and the Glenwood Springs Municipal Airport and surrounding commercial uses. This new route would improve emergency evacuation, emergency service access, and local land use access.

Access, both emergency and local, across the Roaring Fork River is primarily limited to 27th Street or 8th Street. These crossings are north of the Four Mile Road/

Figure ES-1 ***Project Vicinity***

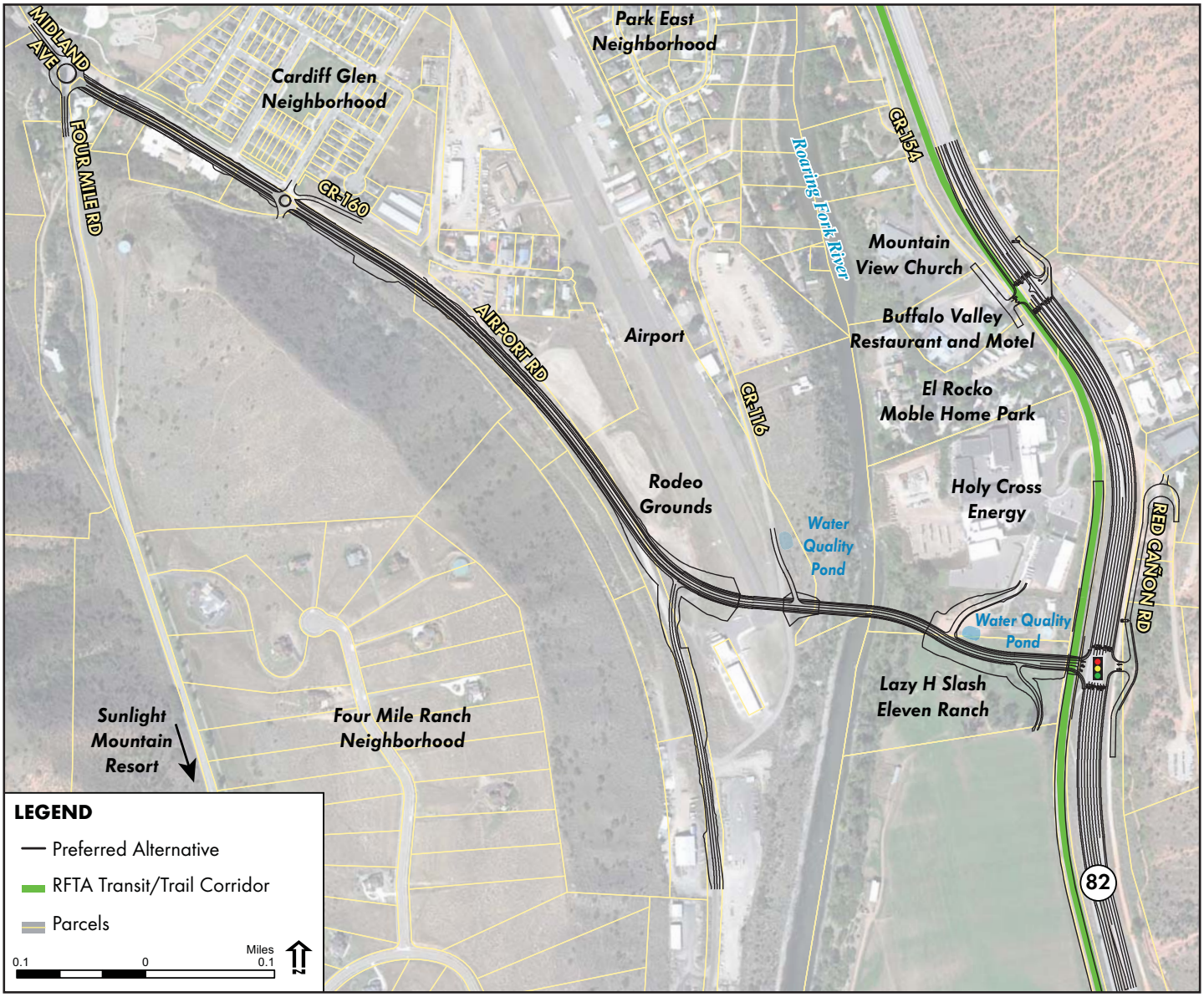


Midland Avenue/Airport Road intersection, a section of Midland Avenue that is susceptible to natural and manmade disasters that could block or inhibit travel along Midland Avenue in case of a catastrophic event, such as a wildfire. The proposed improvements would provide the following:

- Increased local capacity across the Roaring Fork River, to support both emergency vehicle ingress and evacuation egress.
- A secondary access to provide improved transportation redundancy. This secondary access should minimize travel times, minimize out of direction travel, and minimize the likelihood of residents and visitors being stranded if the existing primary access route is cut off due to natural and/or manmade causes.

The South Bridge Environmental Assessment (EA) has been prepared to evaluate the impacts of the proposed improve-

Figure ES-2 ***Preferred Alternative***



ments. The South Bridge project included analysis of 35 alternatives, including a No Action Alternative. These alternatives were screened in a four part process that included input from the general public, elected officials and local, state and federal agencies, culminating in the identification of the Preferred Alternative. The Preferred Alternative includes the following:

- Midland Avenue/Airport Road improvements
- New South Bridge crossing of the Roaring Fork River
- New alignment on the east side of the Roaring Fork River
- A crossing of the Roaring Fork Transit Agency corridor
- SH 82 connection/access
- Bicycle and pedestrian improvements

The alternatives development and screening process is described in **Chapter 2**.

Chapter 3 describes the existing and future transportation conditions for the South Bridge project and presents transportation impacts for the No Action Alternative and the Preferred Alternative. It also discusses transportation plans reviewed, the methodology used to forecast future traffic demand, traffic safety, and pedestrian and bicycle facilities. Future transportation conditions as a result of construction of the Preferred Alternative include:

- Decreased traffic on Midland Avenue between the 27th Street bridge (Sunlight Bridge) and the Midland Avenue/Four Mile Road/Airport Road intersection, as travelers would choose the South Bridge, the shorter route, to access points south along SH 82. Vehicles per day on Midland Avenue are anticipated to be 6,000 to 11,000 vehicles lower than the No Action Alternative.
- Increased traffic on Airport Road as travelers would choose the South Bridge, the shorter route, to access points south along SH 82. Vehicles per day on Airport Road are anticipated to be between 7,000 and 12,000 vehicles higher than the No Action Alternative, contingent upon the level of development and growth in the area.
- A decrease in Vehicle Miles Traveled of approximately 7.5 percent.
- A decrease in Vehicle Hours of Travel of approximately 9.5 percent.

Environmental impacts and mitigation measures associated with the Preferred Alternative are discussed in **Chapter 4**. No significant impacts were identified during the course of this study. Consideration of social, economic, and natural environmental issues was done in cooperation with a number of local, state, and federal agencies and with the public at large. Impacts as a result of the construction and operation of the Preferred Alternative include:

- Acquisition of approximately 11 acres of property for right-of-way, which will not result in the relocation of either residences or businesses.
- An increase in traffic on Airport Road, which is adjacent to Environmental Justice communities.
- Temporary closure of the Glenwood Springs Municipal Airport.
- An approximate increase in impervious surface area of 6.15 acres, but no direct impacts to water resources, such as the Roaring Fork River.
- An increase in noise for 20 noise sensitive receptors.
- Temporary impacts to approximately 0.076 acre of wetlands.

- Temporary impacts to riparian vegetation.
- Change to the visual environment due to the conversion of agricultural land to a transportation use. The bridge would also be visible to anglers and rafters.
- Conversion of 0.05 acre of the former rodeo grounds to a transportation use.
- Temporary detour of the Rio Grande Trail impacting cyclists and pedestrians.
- Temporary construction impacts including noise, dust, detours and access changes.

Mitigation measures for all of these impacts have been identified and are included in **Chapter 4** of the document. These include, but are not limited to, the following:

- Acquisition of private property will be consistent with Uniform Relocation Assistance and Real Property Acquisitions Policies act of 1970 as amended.
- Replace any access points where the existing access is removed by the Preferred Alternative.
- Noise mitigation is recommended in the Cardiff Glen area.
- Use of temporary and permanent water quality best management practices to limit water quality impacts.
- All disturbed areas will be revegetated with native grass and forb species. A 100% success rate of all replaced trees and shrubs will be achieved as measured two years post construction. After two years, all failed replacement trees will be replaced and planted in locations that will provide the highest opportunity for success as determined by a CDOT Landscape Architect or CDOT Regional Biologist.
- One survey (single season) will be done for the Ute-ladies'-tresses orchid prior to construction.
- Joint planning for the development of the rodeo grounds to include both transportation and recreation uses.
- A five-foot landscaped strip is proposed on both sides of Airport Road to reduce visual impacts for users of the bicycle and pedestrian facilities.

Chapter 5 includes an evaluation of transportation uses for historic properties protected under Section 4(f) of the United States Department of Transportation Act of 1966.

Chapter 6 describes the public involvement process. Three public meetings were held during the course of the project, using an "open house" format. In addition, the project team held several small group meetings. The open houses and meetings ensured that interested citizens and businesses along the corridor had an opportunity to learn about and provide input on the project.

A public hearing will be held during the 30-day public review period. The purpose of the hearing is to receive comments from the public on the South Bridge EA.

Prior to the public hearing, copies of the EA will be available for public review at area libraries and agencies. Display ads in local newspapers, radio announcements, and news releases will announce the availability and location of the EA for review, and the date, time, and location of the hearing. This information will also be provided to the public through the project website (http://glenwoodsouthbridge.net).

CHAPTER 1: PURPOSE AND NEED

1.1 Project Context

The City of Glenwood Springs and the Federal Highway Administration (FHWA), in coordination with Garfield County and the Colorado Department of Transportation (CDOT), have identified the need for secondary access connecting residents, public uses, and businesses south of Glenwood Springs and west of the Roaring Fork River to State Highway 82 (SH 82). The project vicinity encompasses portions of Glenwood Springs and Garfield County (see **Figure 1-1**).

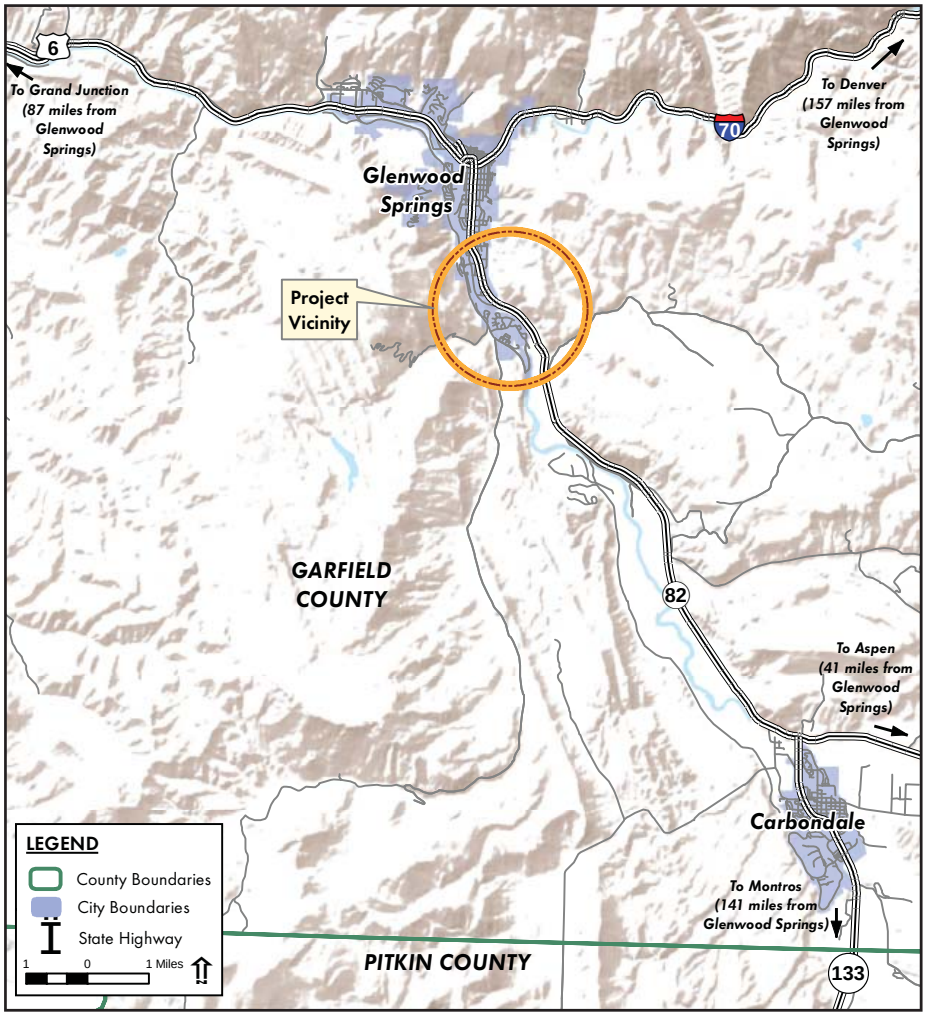
For purposes of this study, South Glenwood Springs is the area south of 27th Street. This area includes the Cardiff Glen, Park East and Mount Sopris neighborhoods, Sopris Elementary School, 4-Mile Road land uses and the Glenwood Springs Municipal Airport and surrounding commercial uses.

1.2 Background

In June 2002, the Coal Seam Fire, a wildland fire in western Colorado, sparked safety concerns for the region; specifically, the rapidly growing southern Glenwood Springs area west of the Roaring Fork River. The fire, named for its origin when an underground coal seam fire ignited drought stricken vegetation, started approximately four miles west of Glenwood Springs. It burned approximately 12,200 acres, destroying 24 homes and causing $6.4 million in insurance losses (RMIA 2008).

The Coal Seam fire required evacuation of the areas south and west of Glenwood Springs, ultimately affecting more than 3,000 residents and visitors. Many evacuees crossing the Roaring Fork River in Glenwood Springs used the 27th Street

Figure 1-1 ***Project Vicinity***



27th Street access crossing the Roaring Fork River

bridge (Sunlight Bridge), the southernmost bridge within Glenwood Springs, to access SH 82. Had the fire been moving from northwest to southeast, in the typical wind direction, it is likely that this access route would have been unable to accommodate the volume of evacuating vehicles due to the speed and location of the fire. Given the typical wind direction, the access route leading to the 27th Street bridge from the south, Midland Avenue, would also likely have been blocked by the fire, leaving many people unable to effectively evacuate the area.

This dangerous situation prompted a congressional earmark for the City of Glenwood Springs to construct a new southern Glenwood Springs bridge (South Bridge). This Environmental Assessment (EA) documents the processes, as set forth by the National Environmental Policy Act (NEPA) of 1969, as well as other associated federal and state environmental requirements, for determining the bridge location.

1.3 Purpose

The purpose of the South Bridge project is to provide a critical second access between SH 82 and the western side of the Roaring Fork River in the south Glenwood Springs area. This new route would improve emergency evacuation, emergency service access, and local land use access.

This secondary access would respond to the congressional earmark for the Glenwood Springs South Bridge (new off-system bridge), Public Law 109-59, 109th Congress.

1.4 Need for Action

The following project needs for the South Bridge project are based on identified transportation problems:

- Emergency access capacity and redundancy of the area located on the west side of the Roaring Fork River in the south Glenwood Springs area is primarily limited to 27th Street or 8th Street. These crossings are north of the Four Mile Road/Midland Avenue/Airport Road intersection, a section of Midland Avenue that is susceptible to natural and manmade disasters that could block or inhibit travel along Midland Avenue in case of a catastrophic event, such as a wildfire.

  "Redundancy" refers to the transportation system's ability to provide more than one independent way in or out of an area. This, in turn allows the transportation system to accommodate variable and unexpected conditions without failure. Emergency evacuation needs include increased local capacity to support both emergency vehicle ingress and evacuation egress. The lack of transportation system redundancy results in longer emergency service provider travel times between SH 82 and the study area. The lack of suitable access redundancy also increases the likelihood of a catastrophic occurrence where residents and visitors could be stranded if the existing primary access route is cut off due to natural and/or manmade causes.

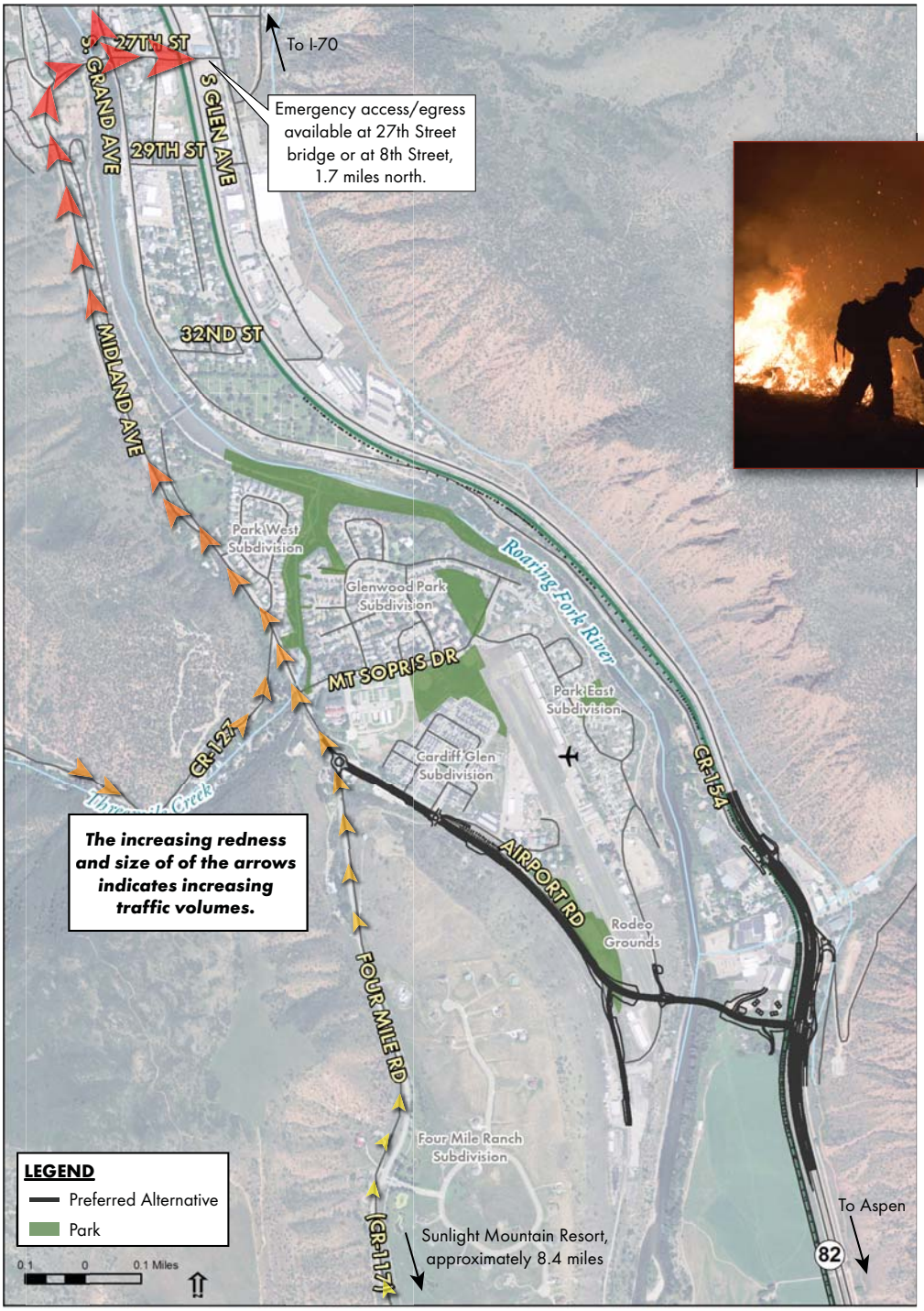
- Local access to the west side of the Roaring Fork River in the south Glenwood Springs area is constrained by existing capacity and a lack of redundancy. Planned growth in this area would bring increasing demand for reasonable access to SH 82, the principal arterial in the Roaring Fork River Valley. Currently, the primary access route is via Midland Avenue and 27th Street, which is vulnerable to natural and manmade incidents, such as rock fall, mudslides, wildfire, vehicle collisions, or heavy congestion during an evacuation event.

See **Figure 1-2** for a map of the area that is affected by limited emergency and local

access. This area is predominantly residential, with commercial and industrial uses located around the Glenwood Springs Municipal Airport.

The mountainous terrain shown in **Figure 1-2** is susceptible to both natural and manmade disasters that could necessitate and at the same time severely limit emergency ingress/egress. This is further exacerbated by increasing traffic congestion and reliance on Midland Avenue and the 27th Street bridge. A secondary access to the south Glenwood Springs area would provide an alternative access to SH 82 in

Figure 1-2 ***Area of Limited Emergency and Local Access/Egress Points***



The 2002 Coal Seam Fire burned over 12,000 acres, destroying 24 homes and causing $6.4 million in insurance losses. Over 3,000 residents south and west of Glenwood Springs were evacuated.

the event of blockage or inhibited passage of Midland Avenue or 27th Street bridge. This redundancy and enhanced access would improve safety and local accessibility to people and businesses located in the south Glenwood Springs area, west of the Roaring Fork River.

To address the emergency and local access needs, the proposed improvements should, at a minimum, provide:

- Increased local capacity across the Roaring Fork River, to support both emergency vehicle ingress and evacuation egress.
- A secondary access to provide improved transportation redundancy. This secondary access should minimize travel times, minimize out of direction travel, and minimize the likelihood of residents and visitors being stranded if the existing primary access route is cut off due to natural and/or manmade causes.

The proposed improvements, at a minimum, provide increased capacity for evacuation egress and emergency services ingress, and improved transportation redundancy.

1.5 Travel Demand Growth

Over the last two decades, residential development has placed more people and demand for trips in the area of limited emergency and local access, shown in **Figure 1-2**. This trend is expected to continue into the future as discussed below.

1.5.1 South Glenwood Springs Area

The *Glenwood Springs Comprehensive Plan* (2011) recommends that the City create a sub-area plan and economic development analyses of the airport. The Comprehensive Plan identifies the 64-acre airport facility for its potential redevelopment into a mixed-use neighborhood, but also recognizes the potential economic impact that aviation may have on the community. It is important to note that this area is identified as a "future study area." There are no plans for redevelopment at this point.

Land uses in this area include residential, including the Park East, Cardiff Glen, Park West and Glenwood Park neighborhoods, the Glenwood Springs Municipal Airport, commercial uses adjacent to the airport, and several parks (**Figure 1-2**).

1.5.2 Four Mile Road Corridor

Per the *Glenwood Springs Comprehensive Plan*, future land use along Four Mile Road includes the expansion of the Glenwood Springs urban growth boundary south along Four Mile Road for approximately 1.75 miles from its intersection with Midland Avenue. Low-density residential uses are currently designated in this area, but Planned Use Developments could be approved upon completion of annexation, increasing the population and trip demand. Pre-annexation agreements are currently in place.

This area also includes the Four Mile Ranch neighborhood. This neighborhood has 57 lots, approximately 20 of which are built out (**Figure 1-2**).

For additional details regarding growth and travel demand along the Four Mile Road Corridor, see **Section 3.2**.

1.5.3 Sunlight Mountain Resort

Sunlight Mountain Resort is located approximately 9 miles south of the city limits of Glenwood Springs, at the end of Four Mile Road in Garfield County.

Although a development proposal was recently denied by the Garfield County Commissioners, future development is expected to occur at the resort. This development would generate additional trips by employees, visitors, and if included in the approved development, residents.

For additional details regarding the growth and travel demand of Sunlight Mountain Resort, see **Section 3.2**.

1.6 Conclusion

A new crossing of the Roaring Fork River would provide necessary redundancy to land uses in areas south of Glenwood Springs and west of the Roaring Fork River. A new bridge would provide critical and needed access for the additional population and resulting trips forecasted in the area of limited emergency and local access.

This EA describes the processes followed to evaluate alternatives and identify a preferred alternative for the South Bridge project, and assesses associated impacts. The alternatives development and evaluation process is described in **Chapter 2**. **Chapter 3** describes the transportation impacts. **Chapter 4** discusses the affected environment and environmental consequences associated with the No Action Alternative and Preferred Alternative, and mitigation measures for the Preferred Alternative. **Chapter 5** discusses impacts to Section 4(f) properties. **Chapter 6** describes the public involvement process.

CHAPTER 2: ALTERNATIVES ANALYSIS

This chapter describes the process used to identify and evaluate alternatives for the proposed South Bridge project.

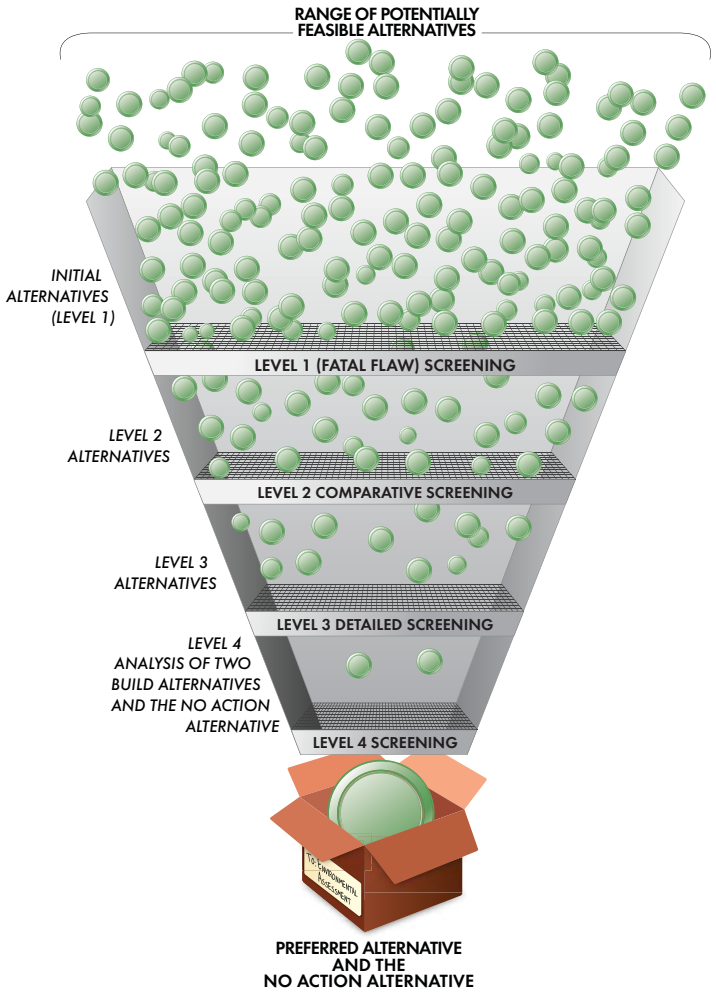
2.1 Alternatives Development and Screening Process

The alternatives development and screening process presented in this chapter was developed based on results of the NEPA scoping process and in coordination with both the Community Advisory Group (CAG) and Project Working Group (PWG). The CAG was comprised of stakeholders from the area and responsibilities included providing input and raising issues to be considered in the evaluation process (see **Section 6.3.1**). The PWG included the consultant team, City of Glenwood Springs, CDOT, FHWA, Garfield County, and the Roaring Fork Transportation Authority (RFTA). Responsibilities included executing the NEPA study process and providing technical analyses (**Section 6.2.2**).

The process used to develop, screen, and refine alternatives is shown on **Figure 2-1** and consisted of the following steps:

- Develop project evaluation criteria and measures of effectiveness (MOE) based on the Purpose and Need, community values, and project goals.
- Identify potentially feasible alternatives based on an assessment of the existing conditions in the study area, project Purpose and Need, and public and agency input.
- Conduct fatal flaw screening to eliminate those alternatives that could not meet the Purpose and Need or are not constructible (Level 1).

Figure 2-1 ***Alternative Development and Screening Process***



- Conduct an initial qualitative comparison screening (Level 2) of the remaining alternatives to identify those alternatives that are most practical or feasible from a technical, economic, and environmental standpoint.

- Evaluate and compare the remaining alternatives with each other through a more detailed comparative and quantitative screening (Level 3).

- Conduct extensive evaluation of two final alternatives to recommend a preferred alternative (Level 4).

2.1.1 Project Goals

Project goals were developed to guide the alternatives development and screening process. While the needs must be addressed by the project, the goals provide a framework by which the proposed improvements can meet or even exceed those requirements. The goals identified for this project were:

- Minimize environmental impacts to scenic, aesthetic, historic, and natural resources.

- Provide a project that is in harmony with the community.

- Provide a practical and financially realistic alternative.

- Minimize private property impacts.

- Safely accommodate traffic on area roadways.

- Provide an alternative that is consistent with local plans, regional plans, and current studies.

- Provide a design that encourages multi-modal travel and does not preclude future multi-modal alternatives in the study area.

2.1.2 Evaluation Criteria and Measures of Effectiveness

The Purpose and Need and the project goals became the evaluation criteria by which potential alternatives were compared. For each criteria MOEs were developed to provide the basis for comparative evaluation of the alternatives. The MOEs were applied to the alternatives using information available at each level of screening. Evaluation criteria and subsequent MOEs are described in **Table 2-1**.

2.2 Alternatives Development and Analysis

Following are the results of the alternatives evaluation process that identified a preferred alternative for evaluation in this EA. Alternative evaluation and elimination of alternatives occurred in a four-step screening process:

- **Level 1**, Fatal Flaw Screening

- **Level 2**, Comparative Analysis Screening

- **Level 3**, Detailed Evaluation and Screening

- **Level 4**, Detailed Analysis of Two Build Alternatives

The first step in the alternatives development process included the development of 34 alternatives. The alternatives were derived from ideas developed during the public and agency scoping process, ideas provided by the CAG and PWG, and project team initiated concepts developed to respond to the project Purpose and Need, goals and community values that had been identified.

The 34 alternatives included various crossings of the Roaring Fork River, tolling concepts and a transportation systems management/transportation demand management alternative. Some of the

Table 2-1 ***Evaluation Criteria and Measures of Effectiveness (MOE)***

Criterion		**Purpose and Need Element #1:** Emergency service access capacity and redundancy
MOE	1	Ability of alternative to provide access redundancy for emergency responders.
	2	Increase in capacity to evacuate land uses in the area.
	3	Ability of alternative to reduce emergency travel time.
Criterion		**Purpose and Need Element #2:** Improves local access to/from in the southern portion of Glenwood Springs west of the Roaring Fork River
MOE	1	Ability of alternative to provide access redundancy for residents and visitors.
	2	Ability of alternative to provide local access if Midland Avenue is affected by natural hazards and automotive crashes.
	3	Improvement in out of direction travel for major traffic generators (Sopris Elementary School, Sunlight Ski Area, others), west of the Roaring Fork River.
Criterion		**Environmental:** Minimizes environmental impacts to scenic, aesthetic, historic and natural resources
MOE	1	Effect on environmental resources, including wetlands, ecological/wildlife habitat, hazardous materials, historical resources, parks and recreation, visual/aesthetics, waterways, Environmental Justice, noise, and air quality.
	2	Potential induced growth or other indirect cumulative effects.
Criterion		**Community:** Is in harmony with the community
MOE	1	Ability of the alternative to minimize neighborhood impacts.
	2	Change in traffic along Midland Avenue and Four Mile Road.
Criterion		**Cost:** Relative cost of the alternative
MOE	1	Cost of the alternative.
Criterion		**Right-of-Way:** Minimize property impacts
MOE	1	Physical impact on property.
	2	Impacts on property access.
Criterion		**Traffic:** Safely accommodates traffic on area roadways
MOE	1	Ability of the alternative to improve traffic safety along SH 82 in the South Bridge intersection area.
	2	Ability of the alternative to meet applicable intersection spacing standards.
Criterion		**Use Planning:** Provides an alternative that is consistent with local plans, regional plans, and current studies
MOE	1	Is the alternative consistent with the goals and objectives of SH 82 corridor optimization study?
	2	Is the improvement consistent with other relevant local and regional plans?
Criterion		**Multi-modal Use:** Provides a design that encourages multi-modal travel and does not preclude future multi-modal alternatives in the study area
MOE	1	Ability of the alternative to provide accommodations for transit riders.
	2	Ability of the alternative to improve north/south, east/west pedestrian and bicycle safety/accessibility.

34 different alternatives were analyzed. The alternatives were derived from input from the general public, local, state and federal agencies, the Community Advisory Group, and the Project Working Group.

Roaring Fork River crossings were improvements to existing crossings. Six of the alternatives involved crossings of the Roaring Fork River located substantially south of the study area, near Carbondale. The alternatives were laid out on aerial photography and discussed with the CAG and PWG.

The four screening levels are explained below. This process was used to evaluate all the alternatives that are shown on **Figure 2-2**. Not included in **Figure 2-2** is the No Action Alternative, which is discussed in **Section 2.3.1**.

2.2.1 Level 1 Screening, Fatal Flaw

The range of possible alternatives was screened to eliminate alternatives with "fatal flaws." Fatally flawed alternatives are those that professional judgment suggests are clearly unrealistic, have no reasonable chance of being implemented, or do not meet the Purpose and Need. Ten alternatives were eliminated from consideration in Level 1 Screening (see **Figure 2-2**). The primary reasons these alternatives were eliminated are detailed in **Table 2-2**.

2.2.2 Level 2 Screening, Comparative Analysis

Level 2 Screening decisions were determined by how well each alternative compared with the evaluation criteria using the MOEs listed in **Table 2-1**. Alternatives that clearly had greater advantages and fewer disadvantages were retained while others were screened out. The remaining alternatives were then carried forward for the more detailed Level 3 Screening.

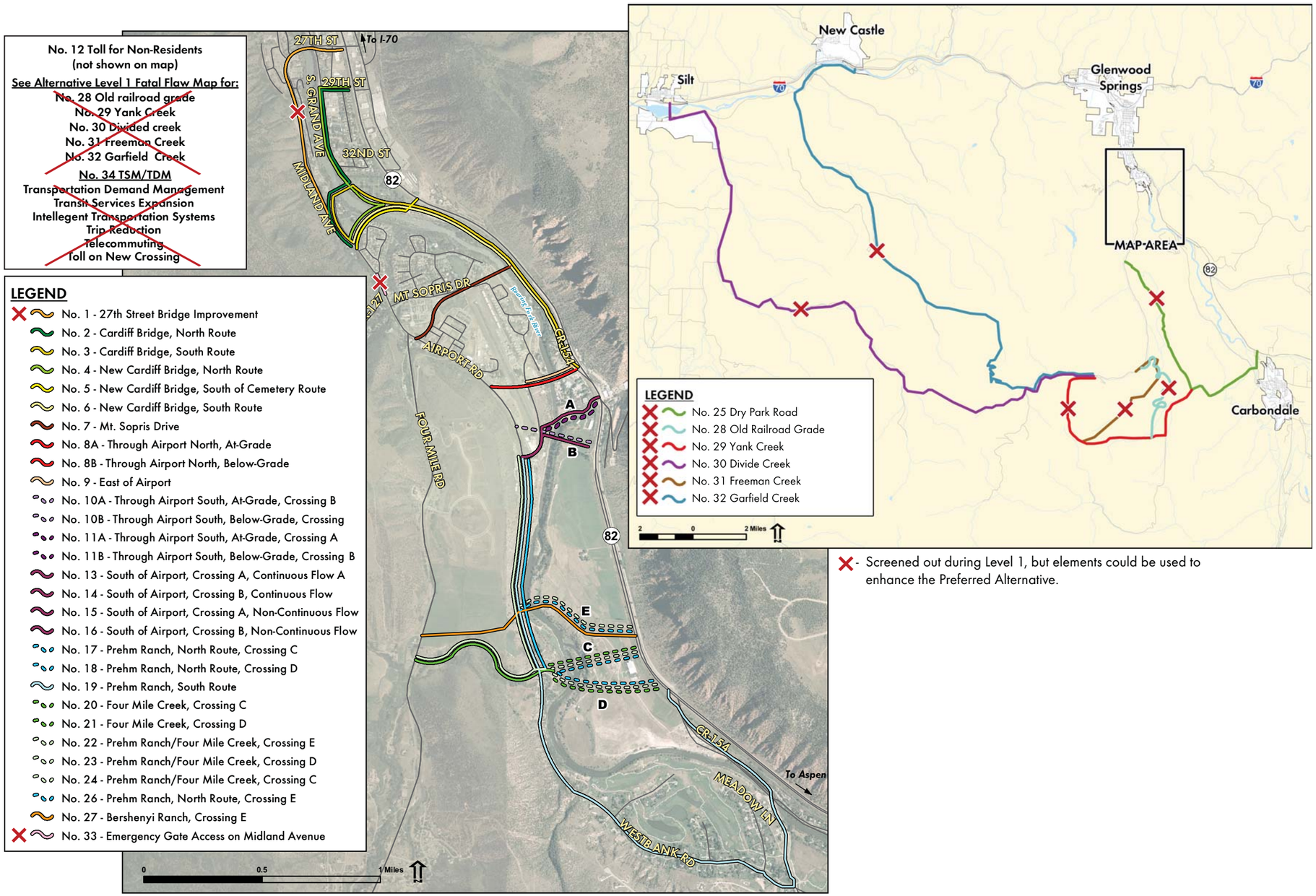
Seventeen alternatives were removed from additional consideration during Level 2 Screening. An overview of alternatives considered is provided in **Figure 2-3** and the primary reasons these alternatives were eliminated are detailed in **Table 2-3**.

2.2.3 Level 3 Alternatives Development, Detailed Evaluation, and Screening

Level 3 Screening included analysis of the remaining ten alternatives. This screening was completed using a greater degree of quantitative information to further evaluate the differences between alternatives. The quantitative data used for this screening step was presented in the *Level 3 Screening White Paper* (Jacobs 2008). This white paper provided quantitative values for a majority of the MOEs shown in **Table 2-1**.

A description of each alternative considered within Level 3 Screening follows. This includes a brief text description, conceptual engineering plan, benefits and issues, and if the alternative was eliminated from further consideration, the reasons for doing so. In addition, **Figure 2-4** provides a summary of the Level 3 Screening alternatives.

Figure 2-2 ***Full Range of Alternatives Considered and Level 1 Screening Results***

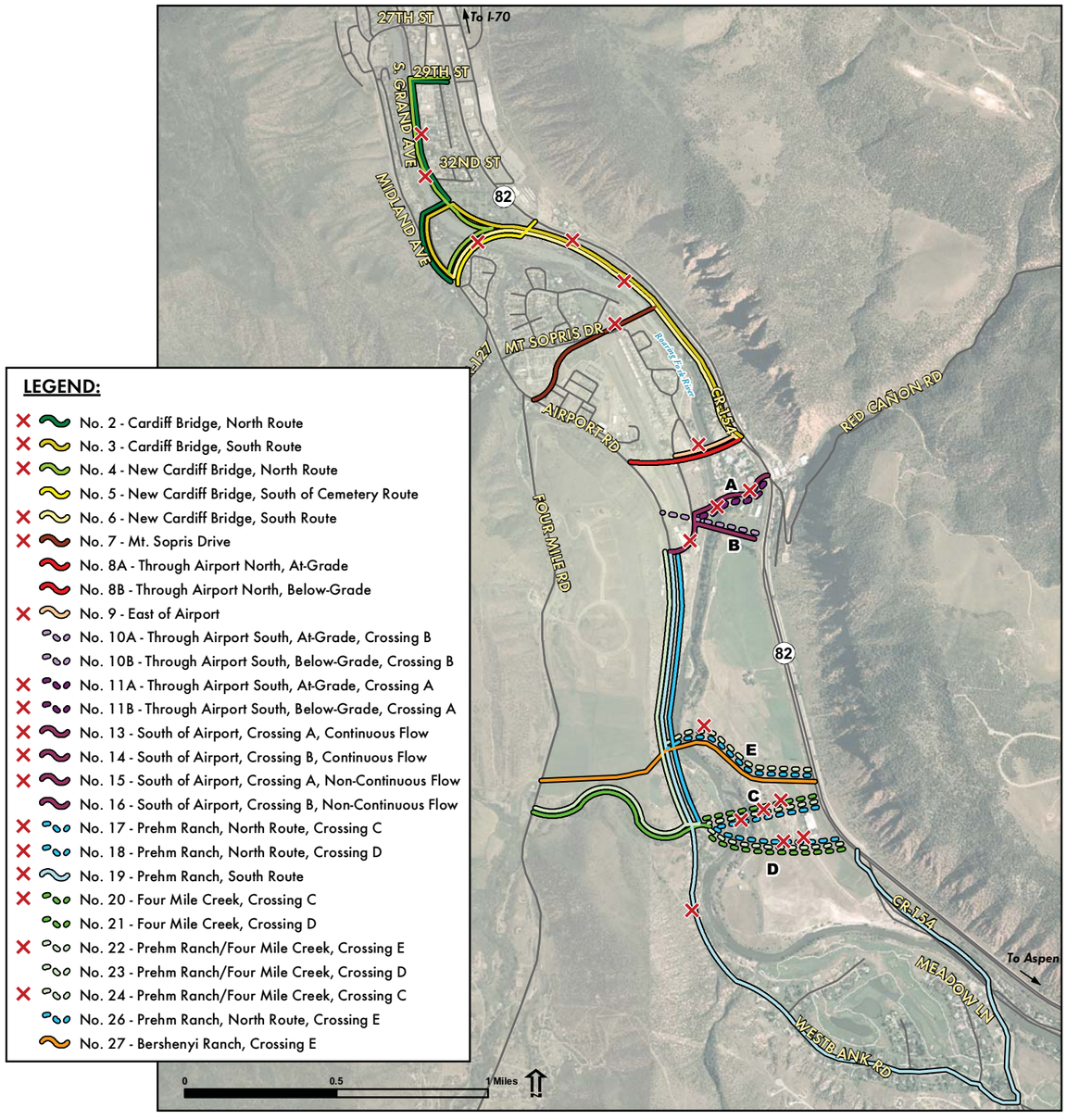


X - Screened out during Level 1, but elements could be used to enhance the Preferred Alternative.

Table 2-2 ***Results of Level 1 Screening***

Alternative	Primary Reasons for Screening
No. 1 27th Street Bridge (Sunlight Bridge) Improvements	Does not provide access redundancy or improve travel time to and from areas in south Glenwood Springs and west of the Roaring Fork River.
No. 12 Tolls for Non-Residents	Does not provide increased capacity. Issues with ability to implement.
No. 25 Dry Park Road **No. 28** Old Railroad Grade **No. 29** Yank Creek **No. 30** Divide Creek **No. 31** Freeman Creek **No. 32** Garfield Creek	Does not provide reasonable access redundancy or improve travel time to and from areas in south Glenwood Springs and west of the Roaring Fork River.
No. 33 Emergency Gate on Midland Avenue (in conjunction with a new South Bridge)	This segments the local population except in case of emergency, as the gate precludes travel other than emergency access. Land owners south of the gate would no longer have access to the 27th Street bridge. Does not provide reasonable redundancy for local access, and does not improve travel time to and from areas in south Glenwood Springs and west of the Roaring Fork River.
No. 34 Transportation Systems Management (TSM)/ Transportation Demand Management (TDM): ■ Transit expansion ■ Intelligent transportation systems ■ Trip reduction ■ Telecommuting ■ Tolls on the new crossing	As a stand-alone alternative, this does not meet Purpose and Need, but could be incorporated as a complementary component of another alternative.

Figure 2-3 ***Results of Level 2 Screening***



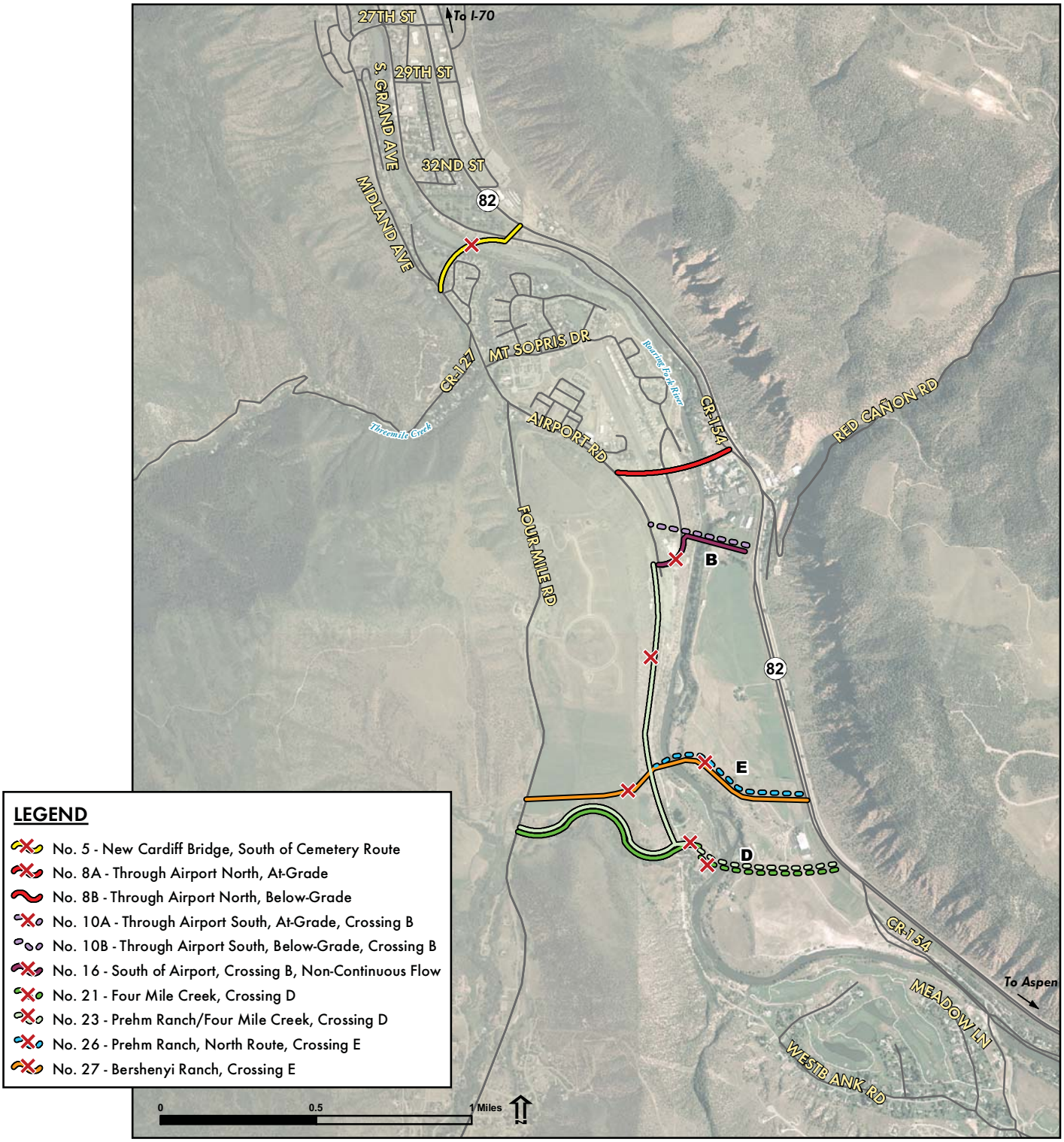
✕ - Screened outduring Level 2

Table 2-3 ***Results of Level 2 Screening***

Alternative	Primary Reasons for Screening
No. 2 Cardiff Bridge, North Route	Reduced ability to meet the Purpose and Need because of limited redundancy due to the shared use of Midland Avenue by this alternative and the existing 27th Street bridge. This alternative would be impacted by the same traffic patterns at the existing 27th Street bridge/Grand Avenue intersection. Compares less favorably than Alternative 5 in terms of accessing SH 82.
No. 3 Cardiff Bridge, South Route	Reduced ability to meet the Purpose and Need because of limited redundancy due the shared use of Midland Avenue by this alternative and the existing 27th Street bridge. Compares less favorably than Alternative 5 in terms of accessing SH 82.
No. 4 New Cardiff Bridge, North Route	Reduced ability to meet the Purpose and Need because of limited redundancy due the shared use of Midland Avenue by this alternative and the existing 27th Street bridge. This alternative would be impacted by the same traffic patterns at the existing 27th Street bridge/Grand Avenue intersection. Compares less favorably than Alternative 5 in terms of accessing SH 82.
No. 6 New Cardiff Bridge, South Route	Reduced ability to meet the Purpose and Need because of limited redundancy due the shared use of Midland Avenue by this alternative and the existing 27th Street bridge. Compares less favorably than Alternative 5 in terms of accessing SH 82.
No. 7 Mt. Sopris Drive	Greater community, right of way and environmental impacts. Developing an alternative with a similar cross section to the Preferred Alternative along this narrow residential street which is surrounded by dense single family residential parcels would result in direct impact to residential properties, much greater noise impacts (more receptors), safety concerns especially because of the adjacency of Sopris Elementary School, and impacts to two parks, the Sopris Ball Field and Glenwood Park.
No. 9 East of Airport	Greater community, right of way and environmental impacts. Developing an alternative with a similar cross section to the Preferred Alternative along this narrow residential street which is surrounded by dense single family residential parcels would result in direct impact to residential properties, much greater noise impacts (more receptors), safety concerns especially because of the adjacency of Sopris Elementary School, and impacts to three parks, the Sopris Ball Field, Conservancy Park and Glenwood Park.

Alternative	Primary Reasons for Screening
No. 11 A Through Airport South, At-Grade, Crossing A **No. 11B** Through Airport South, Below-Grade, Crossing A **No. 13** South of Airport, Crossing A, Continuous Flow	These alignments crossed through the center of the Holy Cross Energy parcel, incurring impacts to a major regional employer. A prohibitively steep grade would be required to travel from the west side of the parcel to SH 82. The connection to SH 82 would not meet CDOT safety and spacing standards.
No. 14 South of Airport, Crossing B, Continuous Flow	This alternative, and alternative 16, were similar in nature, and were merged and analyzed as Alternative 16 during Level 3 screening.
No. 15 South of Airport, Crossing A, Non-Continuous Flow	The alignment crossed through the center of the Holy Cross Energy parcel, incurring impacts to a major regional employer. A prohibitively steep grade would be required to travel from the west side of the parcel to SH 82. The connection to SH 82 would not meet CDOT safety and spacing standards.
No. 17 Prehm Ranch, North Route, Crossing C	On a comparative basis to Crossing D, Crossing C directly impacted active ranch land and a potential historic resource. The SH 82 connection would not meet CDOT safety and spacing standards.
No. 18 Prehm Ranch, North Route, Crossing D **No. 19** Prehm Ranch, South Route	Low ability to meet the Purpose and Need because of significant out of direction travel, especially for those traveling from Four Mile Road.
No. 20 Four Mile Creek, Crossing C	On a comparative basis to Crossing D, Crossing C directly impacted active ranch land and a potential historic resource. The SH 82 connection would not meet CDOT safety and spacing safety standards.
No. 22 Prehm Ranch/ Four Mile Creek, Crossing E	High cost and out of direction travel for those coming from Four Mile Road meant that this alternative compared poorly against the Prehm Ranch/Four Mile Creek, Crossing D. Would cross an existing conservation easement.
No. 24 Prehm Ranch/ Four Mile Creek, Crossing C	On a comparative basis to Crossing D, Crossing C directly impacted active ranch land and a potential historic resource. The SH 82 connection would not meet CDOT safety and spacing standards.

Figure 2-4 ***Results of Level 3 Screening***

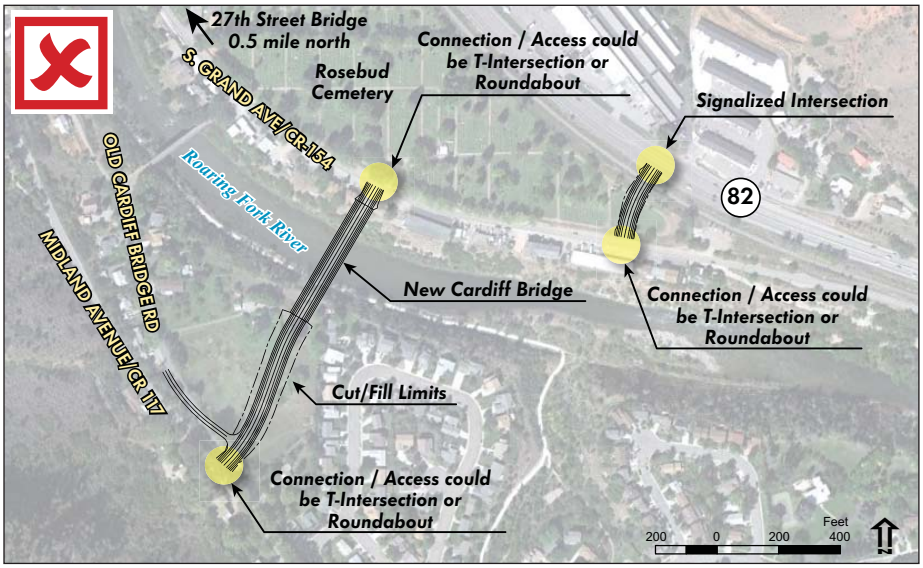


✕ - Screened out during Level 3a

Alternative No. 5, New Cardiff Bridge, South of Cemetery Route

Alternative No. 5 would provide a new roadway and bridge that begins near the existing intersection of Old Cardiff Bridge Road and Midland Avenue. It would intersect with South Grand Avenue and provide a connection to SH 82 at the southern end of the Rosebud Cemetery. This alternative is shown on **Figure 2-5**.

Figure 2-5 ***Alternative No. 5, New Cardiff Bridge, South of Cemetery Route***



Benefits

- Low cost.
- Reduced opportunity for use as an alternate route through Glenwood Springs.
- Few impacts to wetlands and/or riparian areas (0.17 acres).

Issues

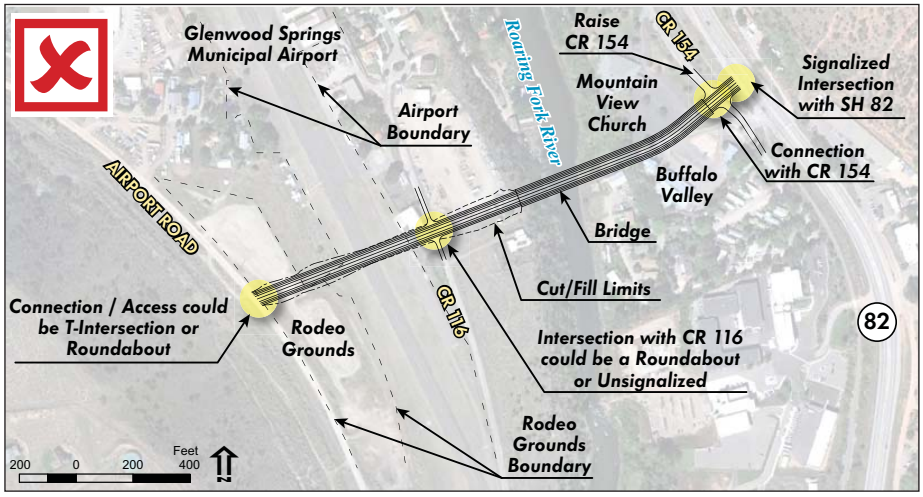
- Large number of noise impacts.
- Reduced redundancy since Midland Avenue is shared by users of both the 27th Street bridge and the new bridge.
- Does not provide direct access to SH 82 for south Glenwood Springs.
- Possible impacts to Rosebud Cemetery, an eligible historic resource.

Eliminated: Alternative No. 5 was eliminated primarily on its limited redundancy. The shared portion of Midland Avenue meant that any event that shutdown the southern portion of Midland Avenue, such as rock fall or an automotive crash, would sever primary access across the Roaring Fork River. In addition, an eligible historic resource, the cemetery, would be impacted.

Alternative No. 8A, Through Airport North, At-Grade

Alternative No. 8A would connect Airport Road with SH 82 by crossing the Glenwood Municipal Springs Airport at-grade and crossing the Roaring Fork River and existing surface parking lots serving Mountain View Church and Buffalo Valley to reach SH 82 north of the existing South Grand Avenue/SH 82 intersection. This alternative is shown on **Figure 2-6**.

Figure 2-6 ***Alternative No. 8A, Through Airport North, At-Grade***



Benefits

- Would use the existing intersection at SH 82 and CR 154, therefore would not add a new intersection to SH 82.

Issues

- Business impacts on the east side of the river.
- Forces closure of the airport.
- Bisects the rodeo grounds property, thereby limiting future use of this property.
- Design constraints for intersection with SH 82.
- Approximately 0.34 acre of impact to potential wetland and/or riparian habitat.

Eliminated: Alternative No. 8A was eliminated as it would bisect the rodeo grounds, limiting potential future uses of that site. Also, right-of-way impacts to local businesses and the airport were greater than other alternatives. This alternative would force the closure of the airport.

Benefits

- Airport remains open.
- Would use the existing intersection at SH 82 and CR 154, therefore would not add a new intersection to SH 82.

Issues

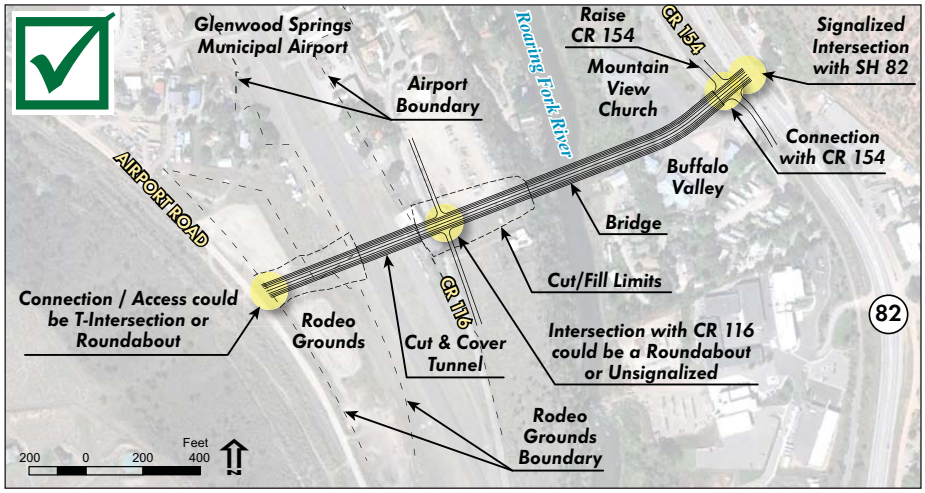
- Business impacts on the east side of the river.
- Bisects the rodeo grounds property. Note: This was subsequently redesigned to only impact a small portion of the rodeo grounds.
- Design constraints for intersection with SH 82.
- Potential hazardous materials impact due to tunneling.
- Approximately 0.34 acre of impact to potential wetland and/or riparian habitat.

Carried Forward: This alternative was carried forward for further evaluation in Level 4 screening.

Alternative No. 8B, Through Airport North, Below-Grade

Alternative No. 8B would connect Airport Road with SH 82 by crossing the Glenwood Municipal Springs Airport below-grade and crossing the Roaring Fork River and existing surface parking lots to reach SH 82 north of the existing South Grand Avenue/SH 82 intersection. This alternative follows the same alignment as Alternative 8A; the difference is the tunnel beneath the runway. This alternative is shown on **Figure 2-7**.

Figure 2-7 ***Alternative No. 8B, Through Airport North, Below-Grade***



Benefits

- Intersection with SH 82 provides opportunity for access consolidation, which improves safety over existing conditions.
- Minimizes impacts to the rodeo grounds property, preserving much of the property for future use.

Issues

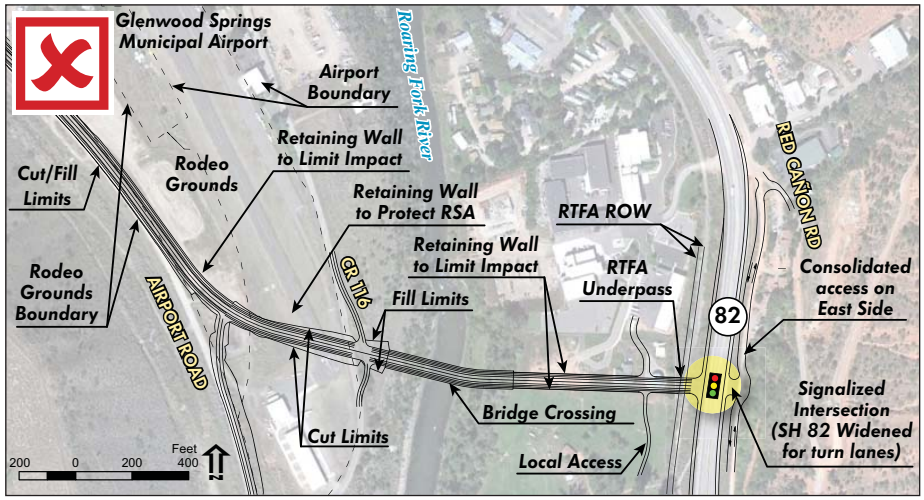
- Forces closure of the airport.
- Approximately 0.32 acre of impact to potential wetland and/or riparian habitat.
- Crosses the northern boundary of an existing conservation easement.

Eliminated: Alternative No. 10A was eliminated because it forced closure of the airport.

Alternative No. 10A, Through Airport South, At-Grade

Alternative No. 10A would create a new connection between Airport Road and SH 82 by crossing the southern end of the Glenwood Municipal Springs Airport at grade and then crossing the Roaring Fork River and agricultural land to reach SH 82 south of the existing Red Cañon Road/SH 82 intersection. This alternative is shown on **Figure 2-8**.

Figure 2-8 ***Alternative No. 10A, Through Airport South, At-Grade***



Alternative No. 10B, Through Airport South, Below-Grade

Alternative No. 10B would create a new connection between Airport Road and SH 82 by crossing the southern end of the Glenwood Municipal Springs Airport at grade and then crossing the Roaring Fork River and agricultural land to reach SH 82 south of the existing Red Cañon Road/SH 82 intersection. This alternative follows the same alignment as Alternative 10A; the difference is the tunnel beneath the runway. The roadway profile and tunnel limits were defined to meet the Runway Safety Area as defined by the FAA for airport safety operations. This alternative is shown on **Figure 2-9**.

Figure 2-9 ***Alternative No. 10B, Through Airport South, Below-Grade***

Benefits

- Intersection with SH 82 provides opportunity for access consolidation, which improves safety over existing conditions.
- Airport remains open.
- Limited number of private property impacts.
- Minimizes impacts to the rodeo grounds property, preserving much of the property for future use.

Issues

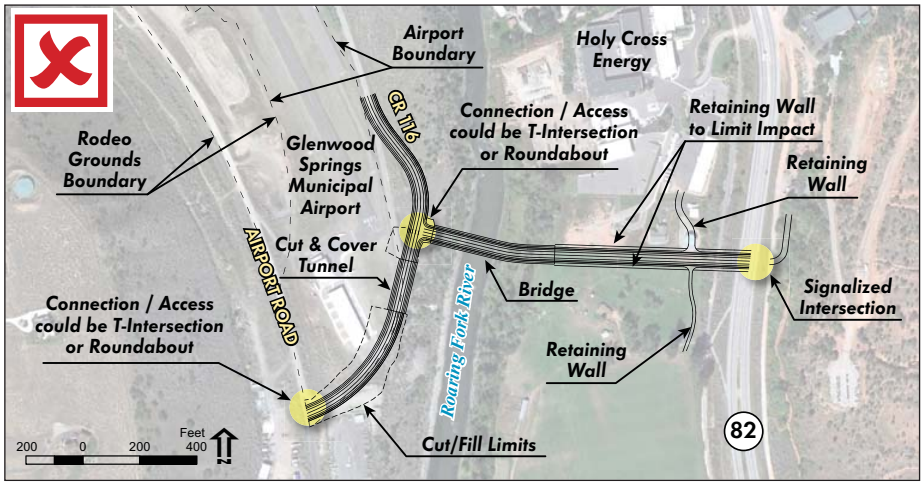
- Potential hazardous materials impact due to tunneling.
- Approximately 0.32 acre of impact to potential wetland and/or riparian habitat.
- Crosses the northern boundary of an existing conservation easement..

Carried Forward: This alternative was carried forward for further evaluation in Level 4 screening.

Alternative No. 16, South of Airport

Alternative No. 16 would follow Airport Road around the southern end of the Glenwood Springs Municipal Airport, crossing the Roaring Fork River and following the property line between Holy Cross Energy and adjacent agricultural lands to reach SH 82. The roadway would be below grade at the southern end of the Glenwood Springs Municipal Airport to avoid the Federal Aviation Administration Safety Area. This alternative is shown on **Figure 2-10**.

Figure 2-10 ***Alternative No. 16, South of Airport***



Benefits

- Airport would remain open.
- Limited number of private property impacts.

Issues

- Perceived out of direction travel may cause motorists to cut through neighborhoods to the north. This affects this alternative's ability to meet Purpose and Need.
- Comparatively increased travel times.
- Approximately 0.32 acre of impact to potential wetland and/or riparian habitat.
- Crosses the northern boundary of an existing conservation easement.

Eliminated: Alternative No. 16 was eliminated based on increased travel times due to perceived out of direction travel, potentially causing motorists to cut through the Park East neighborhood, adding traffic to a residential area with public parks and Sopris Elementary School. This decreases overall access efficiency and may cause motorists to cut through the Park East neighborhood. This would add traffic to a residential street where public parks and Sopris Elementary School are located.

Benefits

- Few noise impacts.
- Meets CDOT access management standards for SH 82.
- Provides direct access to Four Mile Road.
- Airport remains open.

Issues

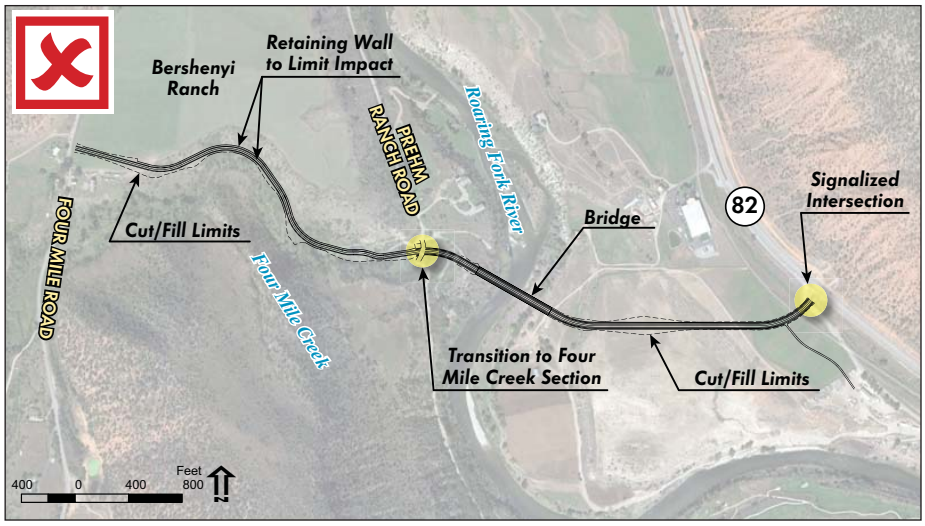
- Large degree of wetland, waterway, wildlife habitat and visual impacts.
- High cost.
- Potential Section 4(f) impacts to Bershenyi Ranch.
- Private property impacts at the base of Four Mile Creek.
- Approximately 0.44 acre of impact to potential wetland and/or riparian habitat.

Eliminated: Alternative No. 21 was eliminated because it provided very limited access improvement to the neighborhoods, including Park East, Cardiff Glen, and Glenwood Park, and the commercial uses near the airport. Alternative No. 21 also had high impacts to waterways, wetlands, wildlife habitat, visual resources, and Section 4(f) properties, as well as a high cost.

Alternative No. 21, Four Mile Creek, Crossing D

Alternative No. 21 would connect Four Mile Road to SH 82 by crossing two parcels of agricultural land and following the Four Mile Creek drainage. This alternative is shown on **Figure 2-11**.

Figure 2-11 ***Alternative No. 21, Four Mile Creek, Crossing D***



Benefits

- Increased access for both south Glenwood Springs and the Four Mile Road corridor.
- Does not add an additional intersection to SH 82.
- Airport remains open.

Issues

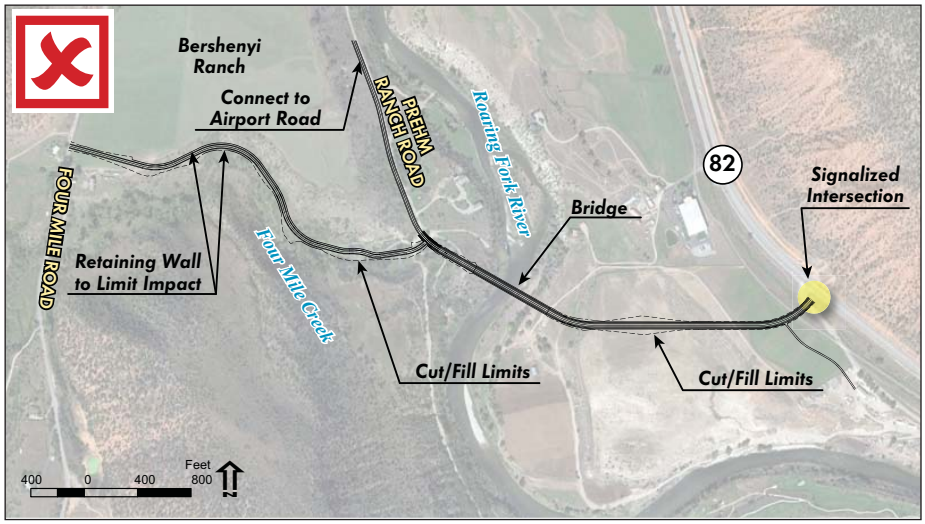
- Large degree of wetland, waterway, wildlife habitat and visual impacts.
- Highest cost.
- Potential Section 4(f) impacts to Bershenyi Ranch.
- Private property impacts at the base of Four Mile Creek.
- Likely the most potential impact to wetlands and riparian areas (0.47 acres).

Eliminated: This alternative was eliminated due to the largest impacts to waterways, wetlands, wildlife habitat, Section 4(f) properties, and visual resources; and highest cost.

Alternative No. 23, Prehm Ranch/Four Mile Creek, Crossing D

Alternative No. 23 was a combination of alternatives No. 18 and No. 21, which would improve the existing Prehm Ranch Road and create a new facility along the Four Mile Creek drainage. This route would then cross the river and agricultural land to tie into SH 82 at the existing signalized intersection with SH 82/CR 154. This alternative is shown on **Figure 2-12**.

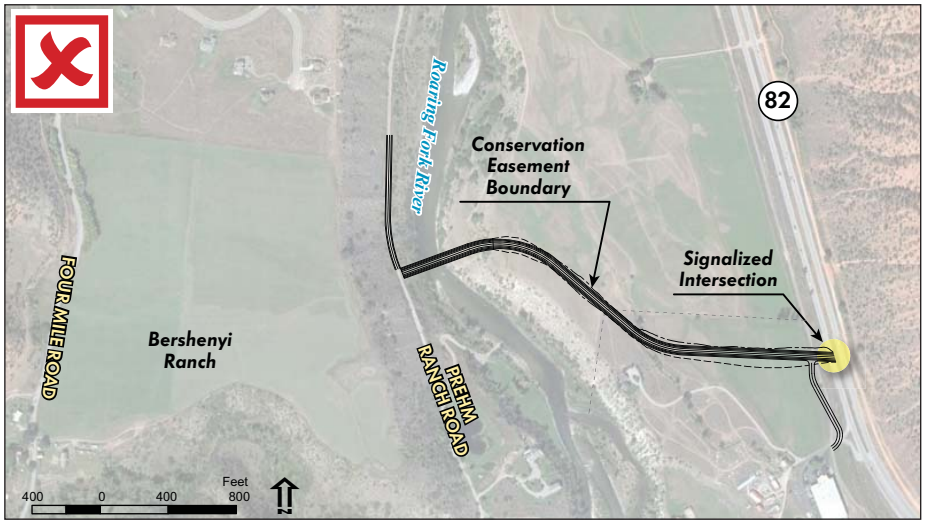
Figure 2-12 ***Alternative No. 23, Prehm Ranch/Four Mile Creek, Crossing D***



Alternative No. 26, Prehm Ranch, North Route, Crossing E

Alternative No. 26 was suggested as an improvement to Alternatives 21 and 23 by reducing the impacts to Four Mile Creek and the private property at the confluence of the creek and the Roaring Fork River. This alternative is the same as Alternative 23 except for the connection between Prehm Ranch Road and SH 82. This connection crosses agricultural land north of the connection used in Alternatives 21 and 23. This alternative is shown on **Figure 2-13**.

Figure 2-13 ***Alternative No. 26, Prehm Ranch, North Route, Crossing E***



Benefits

- Limited number of private property impacts.
- Meets CDOT access management standards.
- Airport remains open.
- Few potential impacts to wetlands and/or riparian areas.

Issues

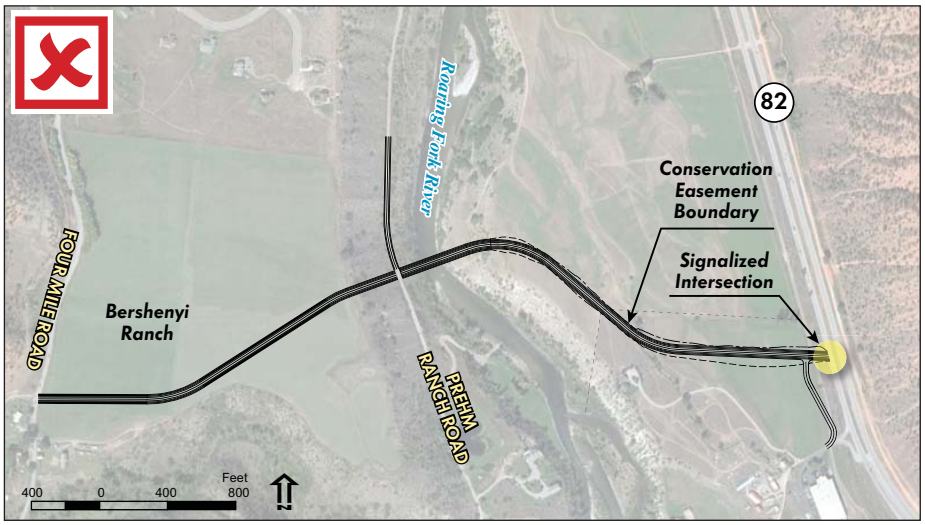
- Bisects an existing conservation easement.
- High cost.
- Visual impacts.
- Out of direction travel compared to Alternatives 21 and 23 for travelers coming from Four Mile Road.

Eliminated: Alternative No. 26 was eliminated based on out-of-direction travel compared to Alternatives 21 and 23, high cost, it bisects the existing conservation easement, and visual impacts, such as retaining walls, associated with improving Prehm Ranch Road.

Alternative No. 27, Bershenyi Ranch, Crossing E

Alternative No. 27 was suggested in an effort to reduce the environmental impacts to Four Mile Creek. This route would travel north of Four Mile Creek and then cross the river and agricultural land to tie into SH 82. This alternative is shown on **Figure 2-14**.

Figure 2-14 ***Alternative No. 27, Bershenyi Ranch, Crossing E***



Benefits

- Eliminates impacts to Four Mile Creek.
- Airport remains open.
- Limited number of private property impacts.
- Few potential impacts to wetlands and/or riparian areas.

Issues

- Bisects an existing conservation easement.
- Very limited access improvement to neighborhoods near Glenwood Springs Airport.
- Comparatively high cost.
- Potential Section 4(f) impacts to Bershenyi Ranch.

Eliminated: Alternative No. 27 was eliminated as it had a high cost, bisected the existing conservation easement, resulted in Section 4(f) impacts to an eligible historic resource, and had visual impacts along a prominent hillside.

2.2.4 Level 4 Screening and Analysis

After a series of meetings with local elected officials, Alternatives 8b and 10b were developed and analyzed to a greater level of detail. Analysis included comparison of potential traffic and environmental impacts and cost, as discussed below. These alternatives are identical between the Midland Avenue and Airport Road intersection and the Glenwood Springs Municipal airport. Therefore analysis focused on the section between the airport and the SH 82 connection.

The general alignments for these two alternatives are shown on **Figure 2-15**. **Figure 2-16** and **Figure 2-17** show greater detail in how the two alternatives connect from Airport Road, across the airport, to SH 82. These figures are focused on this section, as there are no comparable differences between the two alternatives along Airport Road.

Figure 2-15 ***Level 4 Alternatives : General Alignment of Alternatives 8B and 10B***

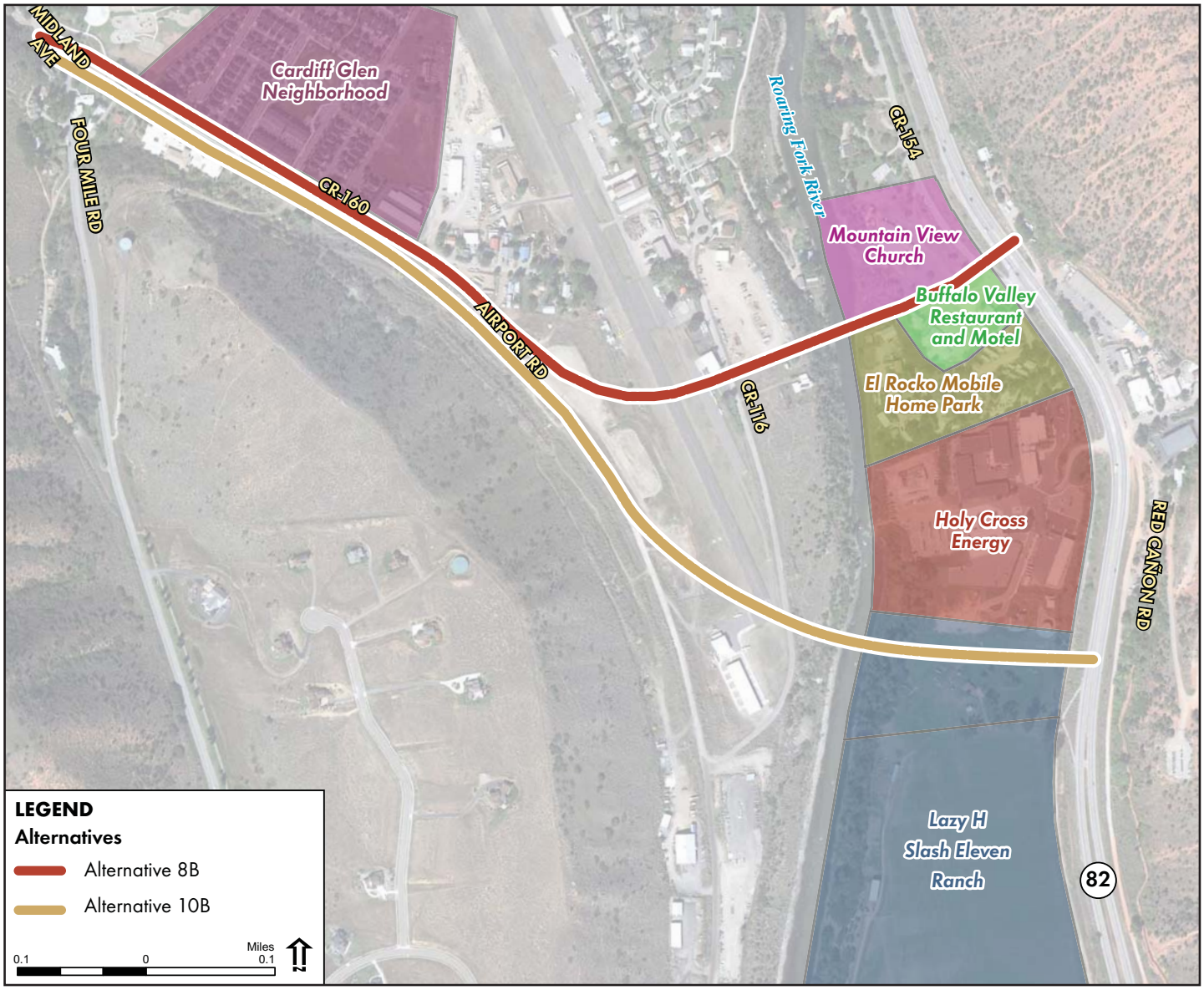


Figure 2-16 ***Alternative No. 8B***

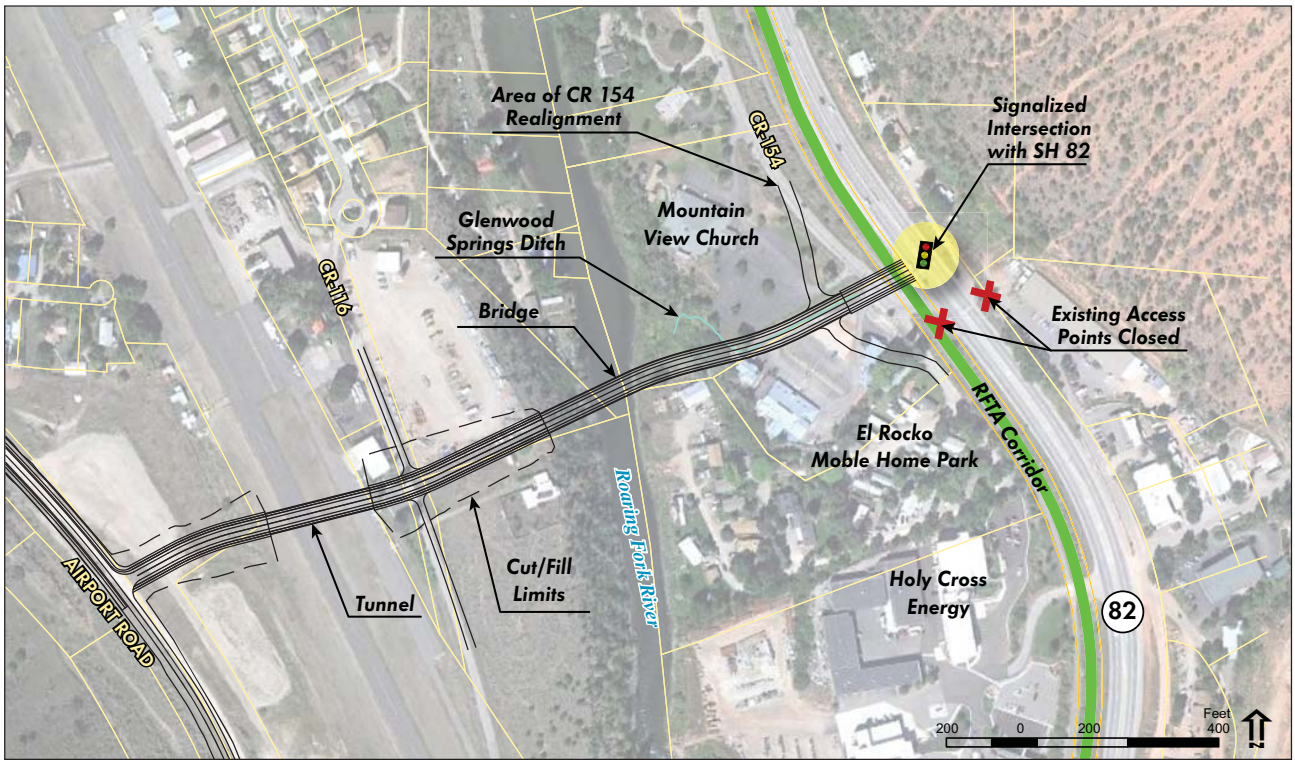
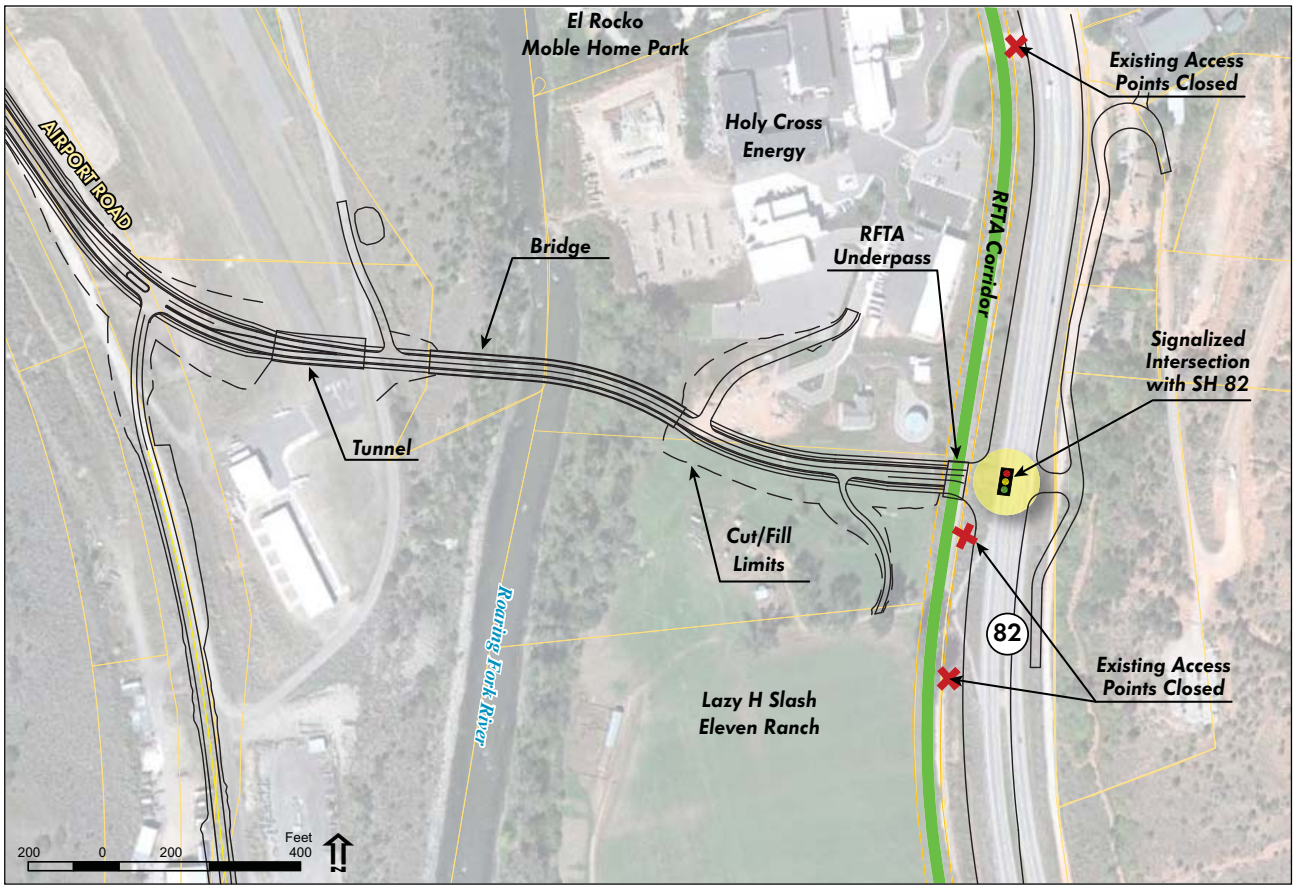


Figure 2-17 ***Alternative No. 10B***



Comparison of Alternatives 8b and 10b

Structure Type

For both Alternatives 8b and 10b, the layout for the new Roaring Fork bridge crossing was developed to minimize wetland impacts. The pier locations for both of the proposed structure alignments are set to span across the Roaring Fork River and the identified wetlands on the east bank of the river. This layout results in a multi-span structure with a center span length of approximately 275 to 300 feet. This span length is longer than typically defined for conventional bridge construction, but can be addressed with alternate structure types, many of which have been used on the Western Slope.

With the presence of the wetlands and logistics of crossing the Roaring Fork River, the bridge superstructure would need to be constructed from above with limited access from below. There are several structure types that can accommodate this method of construction including cast-in-place segmental, precast segmental, and incremental launching. These methods are appropriate for both Alternatives 8b and 10b.

Both alternatives include the roadway passing under the airport runway in a cut-and-cover tunnel. For both alternatives the tunnel is approximately 225 feet long and includes a roadway cut to lower the roadway profile under the runway.

Connection to SH 82

A signalized at-grade connection is the preferred connection to SH 82 for both alternatives, based on cost, access, and consistency with local and state planning.

Alternative 8b would connect with SH 82 just north of the existing SH 82/CR 154 intersection. The existing SH 82/CR 154 intersection would be eliminated. To maintain access for land uses west of SH 82, CR 154 would be realigned to connect to the new South Bridge alignment approximately 180 feet west of SH 82. Because CR 154 would be shifted to the west, it would bisect the parking area at the Mountain View Church and come close to the church building. The conceptual design was adjusted to minimize impacts to church property, such as providing additional parking and maximizing space between the realignment and the church. However, the impacts are great enough that full acquisition of the church property would likely be needed. On the northeast side of SH 82, the new intersection would require a closure of the existing driveway because of steep grades, leading to the relocation of two residences.

Alternative 10b would connect with SH 82 approximately 0.30 mile south of the existing SH 82/CR 154 intersection. West of SH 82 existing highway access points at Holy Cross Energy and Lazy H Slash Eleven ranch would be closed and new access provided to these parcels along the new South Bridge alignment. On the east side of SH 82, Red Cañon Road would be realigned to connect to SH 82 at this new intersection. This access consolidation is more consistent with the function and access category of SH 82 than the existing conditions. This access consolidation requires additional fill and retaining walls, but it improves safety along SH 82.

Right-of-Way and Acquisition Impacts

Both Alternatives 8b and 10b require the purchase of additional right-of way. Right of-way is required from multiple parcels, as shown in **Table 2-4**.

The major right-of-way differences between Alternative 8b and Alternative 10b are the impacts on the east side of the Roaring Fork River. Alternative 8b would require full acquisitions of the Buffalo Valley property and Mountain View Church, as well as full acquisitions of two residenc-

Table 2-4 ***Number of Parcels Impacted by Right-of-Way Acquisition***

Parcel Type	Alternative	
	8b	10b
Residential	6	2
Commercial	8	5
Agricultural	0	1
Church	1	0
Airport	1	1
Other	1	1
Total	**17**	**10**

es immediately east of the church on the opposite side of SH 82. Alternative 10b would impact the Lazy H Slash Eleven property, the northern portion of which was placed in a conservation easement in August 2010.

For Alternative 8b, required right-of-way includes approximately 6.2 acres of partial acquisition of properties along Airport Road, plus approximately 21.8 acres of full acquisition from four properties at the SH 82 connection.

For Alternative 10b, required right-of-way includes approximately 6.2 acres of partial acquisition of properties along Airport Road, plus approximately 1.4 acres of the Lazy H Slash Eleven property.

RFTA Crossing

RFTA, the transit provider in the Roaring Fork Valley, owns a 34-mile rail corridor on the Aspen Branch of the Denver and Rio Grande Railroad. This corridor is currently a multi-use path, but has been preserved for potential future rail transit. A grade-separation of the multi-use path is required. The conceptual design for the South Bridge alignment was expanded to evaluate impacts to the RFTA corridor. The following options for the South Bridge profile were reviewed.

- Profile that goes below the RFTA corridor.
- Profile that goes over the RFTA corridor.
- At-grade connection to SH 82 with respective crossing of the RFTA corridor.

The option of going below the RFTA corridor extends the South Bridge alignment under SH 82 and requires a grade-separated connection with SH 82. This option results in the least impact to the RFTA corridor, as the alignment passes below the corridor, but it does impact surrounding properties and requires substantial additional cost for the SH 82 connection. Space for access ramps to SH 82 is limited, and the existing terrain results in difficult design challenges. This option was screened out in favor of an at-grade connection with SH 82.

The option of going over the RFTA corridor extends the South Bridge alignment over SH 82 and requires a grade-separated connection with SH 82. The connection to SH 82 with an overpass results in the greatest impacts to surrounding properties and requires substantial additional cost. As with the underpass option, this option was screened out in favor of an at-grade connection with SH 82.

The third option is to provide an at-grade connection to SH 82 that crosses the RFTA corridor at grade or slightly above the existing corridor grade. To provide a grade-separated crossing, the RFTA corridor must be lowered accordingly. This option has greater impact to the RFTA corridor, but is the most viable as it limits its impacts to adjacent properties, has less design constraints due to topography, and the lowest cost. The RFTA corridor grade and profile can be adjusted to fit the new South Bridge alignment and provide a grade-separated crossing.

The grade-separated multi-use path crossing of the RFTA corridor requires a maximum grade of less than 5 percent and vertical clearance of 10 feet for pedestrian and bicyclists under the South Bridge alignment. In the future, if rail was provided along the RFTA corridor, a maximum grade of 2 percent must be met, and a vertical clearance of 23 feet and 4 inches under the South Bridge alignment would be needed.

Based on the RFTA corridor profile, adjacent driveways and access, and relative elevation of the RFTA corridor to SH 82 and the South Bridge alignment, the required adjustments to the RFTA corridor

are different for the two alternatives. The amount of cut, retaining wall, and length of the RFTA corridor impacted is greater for Alternative 8b than for Alternative 10b. For both alternatives, the ability to use the RFTA corridor for future rail is preserved. Rail cannot be included as part of this project because the use of the corridor for future rail is speculative at this time.

From a comparative perspective, both alternatives are compatible with the RFTA alignment. Differences in the alternatives as a result of the future RFTA underpass are included in the cost estimates.

Traffic Calming

Traffic calming elements along the South Bridge route (improvements to Airport Road, new bridge crossing, and connection to SH 82) were developed to better show how the roadway fits into the neighborhood and how traffic speed is mitigated. There are no discernible and relevant differences between the alternatives.

Cost

The comparative cost (2012 dollars) for both alternatives is provided in **Table 2-5**. Given the current level of design, it is important to note that these costs are estimates of probable costs. Actual costs cannot be determined until final design. These costs do, however, provide a relative comparison between alternatives.

The conceptual cost estimate for Alternative 8b is considerably higher than that for Alternative 10b. This difference in cost can be attributed primarily to the property acquisitions associated with Alternative 8b.

Evaluation of Both Alternatives

Traffic and Safety

Bypass/alternate route potential: There is no discernible difference between the two alternatives. Both alternatives provide an alternate route through Glenwood Springs south of 27th Street, but SH 82 would still remain the fastest and most direct option. Traffic on Midland Avenue south of 27th Street and traffic on 27th Street would decrease; traffic would increase on Airport Road. Residents who currently live south of 27th Street and travel south on SH 82 would use the South Bridge instead of the 27th Street bridge.

Operational safety at the SH 82 connection: A review of the crash history on SH 82 in the vicinity of the intersections shown as part of Alternatives 8b and 10b reveals that the 10b location has a high proportion of single vehicle crashes and collisions with animals (seven wildlife collisions and five running-off-the-road crashes in seven years). The 8b intersection location shows a high prevalence of collisions involving two vehicles (six broadside crashes, three rear-end crashes, and three sideswipe crashes in seven years). These are likely associated with the existing intersection with CR 154 and adjacent accesses.

Alternative 8b connects the existing CR 154 to the South Bridge alignment approximately 200 feet west of the intersection with SH 82 (see **Figure 2-16**). The closure of the access and the resulting total acquisition of the residences east of SH 82 and the realignment of CR 154 would improve safety performance compared to existing conditions.

Alternative 10b would result in the closure of accesses to the Lazy H Slash Eleven and

Traffic calming consists of engineering and other measures put in place on roads for the intention of slowing down or reducing motor-vehicle traffic. This is done in order to improve the living conditions for residents living along the road, as well as to improve safety for pedestrians and cyclists. These measures include speed humps, curb extensions, and lane narrowing.

Table 2-5 ***Probable Costs (in millions) of Alternatives 8b and 10b based on Conceptual Design***

Element	Alternative 8b	Alternative 10b
Bridge Structure	$11.7	$10.5
Tunnel (cut-and-cover)	$2.0	$2.0
Roadway (reconstruction/new)	$6.1	$6.6
Right-of-Way	$9.2	$2.4
Contingency	$5.2	$4.9
Design/Construction Management	$7.9	$7.4
Total	**$42.1**	**$33.8**

Holy Cross Energy properties from SH 82. New access to these properties would be provided along the South Bridge roadway. Relocation of these driveways would improve safety performance on SH 82 by reducing the number of access points and allow for safer left turns at a single intersection with a traffic signal.

While there are only minor differences in the two alternatives when looking at SH 82 in isolation, the close proximity of CR 154 to SH 82 in Alternative 8b would cause more safety and operational problems. Alternative 10b does not have these issues and is, therefore, a better location for the intersection from operational and safety perspectives.

Neither of the two intersection locations along SH 82 has a high crash history. Safety recommendations include improving the turn geometry at the existing CR 154 intersection and installing wildlife warning signs near the 10b connection. A safety assessment prepared by CDOT Staff Traffic requested that for either alternative, access control and consolidation of nearby intersections be considered and consistent with the alternative improvements.

Access Consolidation: The access consolidation provided by Alternative 10b is more consistent with the function and access category of SH 82 because it would close and consolidate more access points to SH 82. In addition the roads that are closed and consolidated are of higher volume.

Environmental

Wetlands and Other Waters of the U.S.: Delineations of wetlands were done in November 2010 in the vicinity of Alternative 8b. The wetland at Alternative 10b had been delineated previously, in October 2008. Wetlands adjacent to Alternative 8b are generally similar in size as those adjacent to Alternative 10b, but their functional value is not as notable due to the limited plant diversity and actively managed hydrology, which is provided by flows from the Glenwood Springs Ditch. There are no permanent impacts anticipated with either alternative. Temporary wetland impacts at both locations are less than 0.10 acre.

Alternative 8b would require the relocation of a ditch that conveys water from the Glenwood Ditch to the Roaring Fork River. For purposes of analysis, the ditch is assumed to be jurisdictional since it diverts water directly from the Roaring Fork River upstream of the study area. This relocation of the Glenwood Ditch can be performed so as to continue providing the necessary hydrology to the wetlands at 8b on the east bank of the Roaring Fork River. This relocation is approximately 300 feet in length and would likely require an Individual Section 404 permit from the U.S. Army Corps of Engineers. This permit would require analysis of other practicable alternatives before the U.S. Army Corps of Engineers would approve the permit for the impacts to the ditch.

The temporary wetland impacts associated with 10b are anticipated to require a Nationwide Section 404 permit, which requires a much simpler process than an Individual Section 404 permit.

In summary, Alternative 8b requires relocating 300 feet of an existing ditch that connects to the Roaring Fork River. Alternative 10b has no effect to this jurisdictional water of the US. As mentioned above, no permanent impacts are anticipated with either alternative. Temporary wetland impacts at both locations are less than 0.10 acre.

Neighborhood Impacts: Additional evaluation on neighborhood impacts was conducted by determining potential proximity impacts of noise and visual on residences, businesses, and other sensitive land uses, such as Sopris Elementary school and

churches. This evaluation provided information on relative differences between the alternatives, but did not determine noise mitigation eligibility.

The two build alternatives would both have neighborhood impacts. Along Airport Road where the two alternatives share the same alignment, the neighborhood impacts are the same. For the remainder of the alignments, Alternative 8b would likely have more neighborhood impacts because it is closer to the El Rocko Mobile Home Park. At this level of analysis, total proximity impacts of noise and visual could occur to as many as 84 residences, businesses, and other sensitive land uses, such as Sopris Elementary and churches, with Alternative 8b. Alternative 10b could affect approximately 60 such land uses.

Summary of Level 4 Evaluation

Each alternative was examined based on environmental, engineering, and traffic operations criteria to determine if significant differentiators between the two exist.

Visual mitigation opportunities are considered to be the same for both alternatives. Specific visual mitigation will be determined during the design process. Planned traffic calming strategies will provide noise, safety, and visual mitigation for impacts to residential properties, as well.

As a result of the Level 4 evaluation, Alternative 10b was recommended as the Preferred Alternative for the following reasons:

- It has noticeably fewer direct impacts on properties. Alternative 8b affects 17 parcels and almost 27.0 acres. Alternative 10b affects 10 parcels and 7.4 acres.
- It results in fewer noise impacts. Alternative 8b may affect 84 receptors. Alternative 10b may affect 60.
- It has fewer impacts to Waters of the U.S. Alternative 8b requires relocation of the Glenwood Ditch, which is likely protected by the USACE. Alternative 10b only has temporary wetland impacts and no impacts to Waters of the U.S.
- It is less costly. Alternative 8b is anticipated to cost approximately $42.1 million, while Alternative 10b is anticipated to cost approximately $33.8 million.
- It is anticipated to result in fewer operational and safety problems at the SH 82 connection.
- It provides better access consolidation.

2.3 Alternatives Advanced

As a result of the evaluation process and input from the public and other affected stakeholders, Alternative 10B was identified as the Preferred Alternative and advanced, with the No Action Alternative, for detailed analysis in the EA. These alternatives are described below.

2.3.1 No Action Alternative

The No Action Alternative includes committed projects planned by local or state agencies. The No Action Alternative reflects conditions if no improvements are made in conjunction with the South Bridge project. The projects identified in the *City of Glenwood Springs, Long Range 2003-2030 Transportation Plan*, include improvements at the following intersections:

- 23rd Street/Grand Avenue (intersection realignment - north of project area)
- SH 82 Grand Avenue Bridge Project
- Midland Avenue/Four Mile Road (roundabout)
- Midland Avenue safety improvements, including traffic calming and increased pedestrian and bicycle access

Alternative 10b was recommended as the Preferred Alternative because it has less direct impacts to property owners, less noise impacts, a reduced cost, and allows for more access consolidation at the SH 82 connection, when compared to Alternative 8b.

The proposed South Bridge project is also planned as part of the *City of Glenwood Springs Long Range Transportation Plan* (2003). However, it is not assumed as part of the No Action Alternative.

There are no projects identified in the *Statewide Transportation Improvement Program, Fiscal Years 2012-2017* (CDOT 2011) within the study area. The *2035 Intermountain Regional Transportation Plan* (CDOT 2008) includes intersection improvements at SH 82 and Red Canõn Road; these improvements are not assumed as part of the No Action Alternative as they are included in the Preferred Alternative.

2.3.2 Preferred Alternative

The identification of the Preferred Alternative is based on information documented in this EA. The Preferred Alternative and cross-sections are illustrated in **Figure 2-18**.

Elements of the Preferred Alternative

The Preferred Alternative would provide enhanced emergency and local access, improve the safety and efficiency of existing intersections, and provide additional opportunities for bicycle and pedestrian use.

The roadway improvements follow the current Midland Avenue and Airport Road alignment and meet the following design criteria:

- 30 mph design speed (posted speed of 25 mph)
- Maximum vertical grade of 7.0 percent, but improvements will closely match existing conditions of approximately 1.0 percent.

The new alignment beginning at the Glenwood Springs Municipal Airport and connecting to SH 82 meets the following criteria:

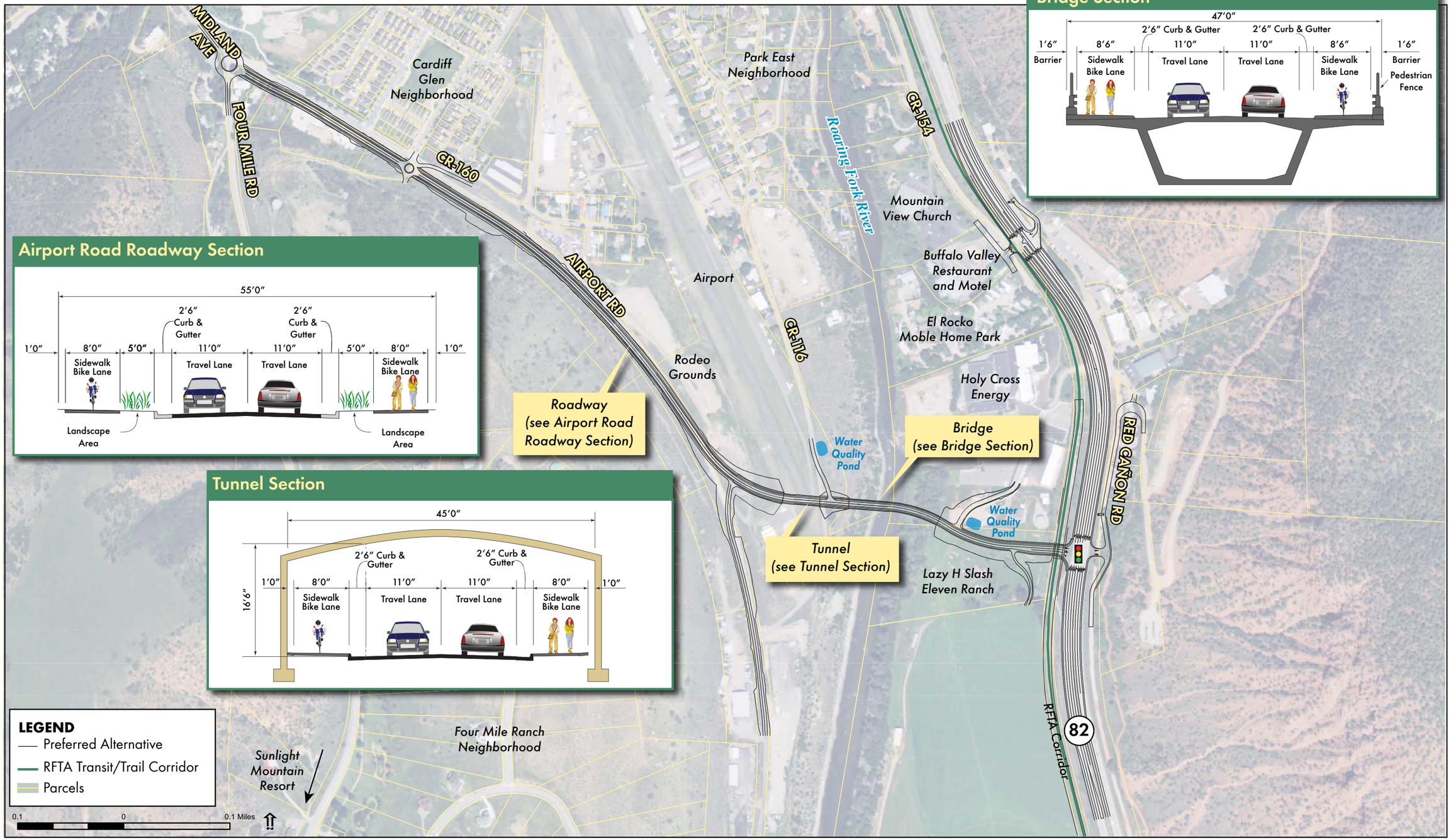
- 35 mph design speed (posted speed of 30 mph)
- Maximum vertical grade of 5.6 percent

Elements of the Preferred Alternative include:

- Midland Avenue and Airport Road improvements include an improved roadway surface, wider travel lanes, and curb and gutter.
- A minimum of 8-foot wide sidewalks on both sides of Airport Road, through the tunnel, and across the new bridge, connecting to the Rio Grande Trail.
- New alignment at the Airport, including a 225-foot long cut-and-cover tunnel. The tunnel would allow for normal airport operations to continue upon completion of tunnel construction.
- South Bridge, which would be approximately 575 feet long, crossing the Roaring Fork River
- New alignment on the east side of the Roaring Fork River
- RFTA crossing
- SH 82 connection/access

The improvements are located on land in both the City of Glenwood Springs and Garfield County. Maintenance of the roadway would be the responsibility of the jurisdiction it is located in.

Figure 2-18 ***Preferred Alternative***



Midland Avenue/Airport Road Improvements

The Preferred Alternative starts at the Midland Avenue/Four Mile Road/Airport Road intersection and travels south along existing Airport Road prior to crossing beneath the Glenwood Springs Municipal Airport and over the Roaring Fork River to connect to SH 82. The Preferred Alternative includes improvements to both Midland Avenue and Airport Road. The improvements include updating the roadway in accordance with City of Glenwood Springs street standards, providing two lanes for traffic, curb and gutter, bike lane, and sidewalk on each side. This cross-section is continued through the Preferred Alternative alignment. With the increased usage, additional improvements and traffic calming consistent with that provided along the north end of Midland Avenue is included with the Preferred Alternative (**Figure 2-19**). These improvements include:

- Roundabout at the intersection of Midland Avenue, Four Mile Road, and Airport Road. The roundabout is sized to accommodate future traffic, including access to Sunlight Ski Area. The center of the roundabout would be landscaped for aesthetic considerations.
- A second landscaped roundabout is included at Airport Road and CR 160 for local neighborhood access and traffic calming. Access to Cardiff Glen neighborhood is consolidated to the one entrance at the roundabout. Access to CR 160 is made south of the roundabout.
- Raised landscaped medians, speed tables (raised speed humps), medians with raised pedestrian crossings, and speed feedback signs for traffic calming.

New Alignment and Tunnel at the Airport

The Preferred Alternative includes a new alignment connecting to Airport Road. The new alignment turns east on the south side of the rodeo grounds and crosses the south end of the Glenwood Springs Municipal Airport. The profile of this alignment is below grade where it crosses under the Glenwood Springs Municipal Airport runway with a grade-separated crossing. The new roadway alignment would cross under the north-south runway with a cut-and-cover tunnel (see **Figure 2-20**).

The roadway profile accommodates the following Federal Aviation Administration (FAA) requirements.

- **Runway Safety Area.** The limits of the cut-and-cover tunnel span the length of the 120-foot Runway Safety Area (60 feet on either side of the runway), which requires a clear, graded surface that is free of objects. Aircraft will have access and be able to use the section of runway that crosses above the tunnel. The alignment crosses the Runway Safety Area at a skew, resulting in a cut-and-cover tunnel length of approximately 225 feet.
- **Runway Object Free Area.** Defined as 400-foot width (200 feet on either side of the runway) and requires that no objects extend above the plane of the runway. The profile is below grade in this area and provides a vertical clearance of 16 feet and 6 inches without projecting above the runway plane within the Runway Object Free Area.
- **Obstacle Free Zone.** A three-dimensional volume of airspace centered above the runway and extended beyond the end of the runway that must be kept clear of objects. The Preferred Alternative alignment and South Bridge crossing are clear of the Obstacle Free Zone.

A water quality pond is located north of the alignment to capture and treat drainage from the roadway and bridge.

Figure 2-19 ***Preferred Alternative Alignment Along Airport Road***

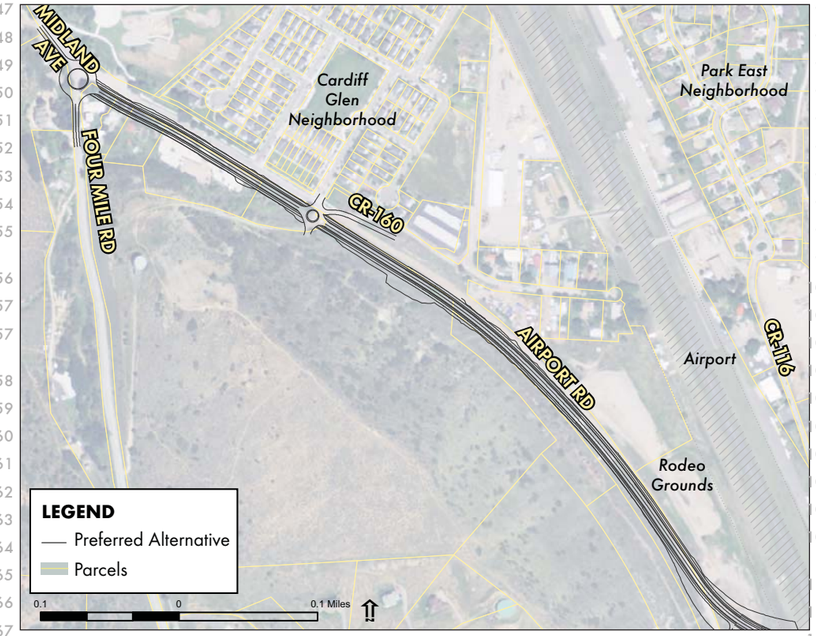
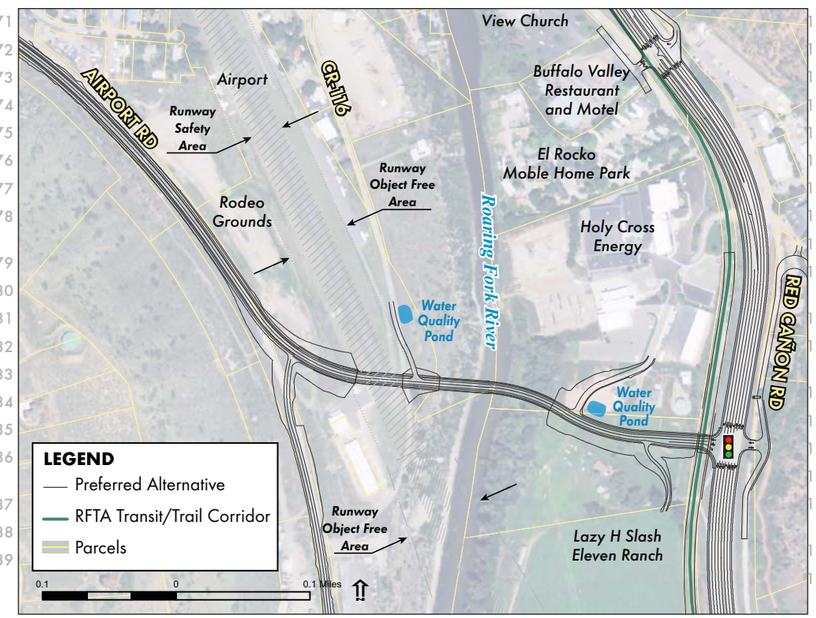


Figure 2-20 ***Preferred Alternative Alignment through the Airport and Across the Roaring Fork River***



South Bridge Crossing of the Roaring Fork River

The Preferred Alternative continues east from the airport and crosses the Roaring Fork River with a bridge structure. The layout and construction for the South Bridge crossing are designed to minimize wetland impacts. The design of the bridge will meet the following requirements: AASHTO LRFD Bridge Manual, CDOT's Drainage Manual for hydraulics and CDOT's Bridge Manual. The piers will be designed as not to affect the main channel for recreation and to minimize wetland impacts during construction of the piers. The bridge construction will most likely require a Corp of Engineers' nationwide permit. The final span lengths, the girder depth and the structure type will be evaluated during the design phase, value engineering and constructability reviews.

To minimize wetland impacts and construct over the deep ravine, a majority of the bridge superstructure is planned to be constructed from above, with limited access from below.

New Alignment on the East of the Roaring Fork River

The Preferred Alternative continues east with an S-curve to minimize property impacts crossing the Holy Cross Electric property on the east bank and transitioning to a straight alignment along the property boundary on the Lazy H Slash Eleven property (see **Figure 2-21**). Components of this alignment include:

- The Preferred Alternative profile is on fill to match the elevation of SH 82.
- Retaining walls along the north side of the alignment are used to minimize impacts to the buildings and land at Holy Cross Electric property, which are located north of the alignment.
- Fill slopes along the south side of the alignment are used to be more consistent with the rural nature of the property.
- An access road to the north with retaining walls on the east and fill slope to the west is provided for Holy Cross Electric access to SH 82.
- An access road to the south on fill slope is provided for access to SH 82 from the Lazy H Slash Eleven property to replace the old access to SH 82.
- A water quality pond is located north of alignment to capture and treat drainage from the roadway alignment to SH 82.

RFTA Crossing

The Preferred Alternative crosses over the RFTA right-of-way (and Rio Grande Trail) with a grade-separated crossing. The crossing would be a short span bridge structure (approximately 50 feet in length) carrying the new alignment over the RFTA corridor.

The existing grade on the Rio Grande Trail would need to be adjusted to provide the proper vertical clearance under the new roadway alignment. Provisions, impacts, and anticipated costs for this adjustment are included in the Preferred Alternative. The Rio Grande Trail would be lowered by ten feet under the new roadway. A maximum grade of five percent would be used. Retaining walls on either side of the trail would be provided for limiting impacts to adjacent properties.

SH 82 Connection/Access

The Preferred Alternative provides a new signalized, full-movement connection to SH 82 with the South Bridge alignment on the west and CR 154 on the east side of SH 82 (see **Figure 2-21**).

The temporary signal currently installed at SH 82 and CR 154, north of the new South Bridge alignment, would be removed and converted into a limited access

unsignalized intersection, with right-in/right-out movements and a northbound-only left turn (see **Figure 2-21**).

The Preferred Alternative includes acceleration and deceleration lanes on SH 82 at the signalized intersection that can double as bus queue bypass lanes. With signal phasing, buses in the deceleration lane on SH 82 at the intersection can proceed before general traffic, using the acceleration lane past the intersection to merge back into traffic.

Local access along SH 82 in this area would be closed and consolidated with the new intersections. The following local accesses would be closed:

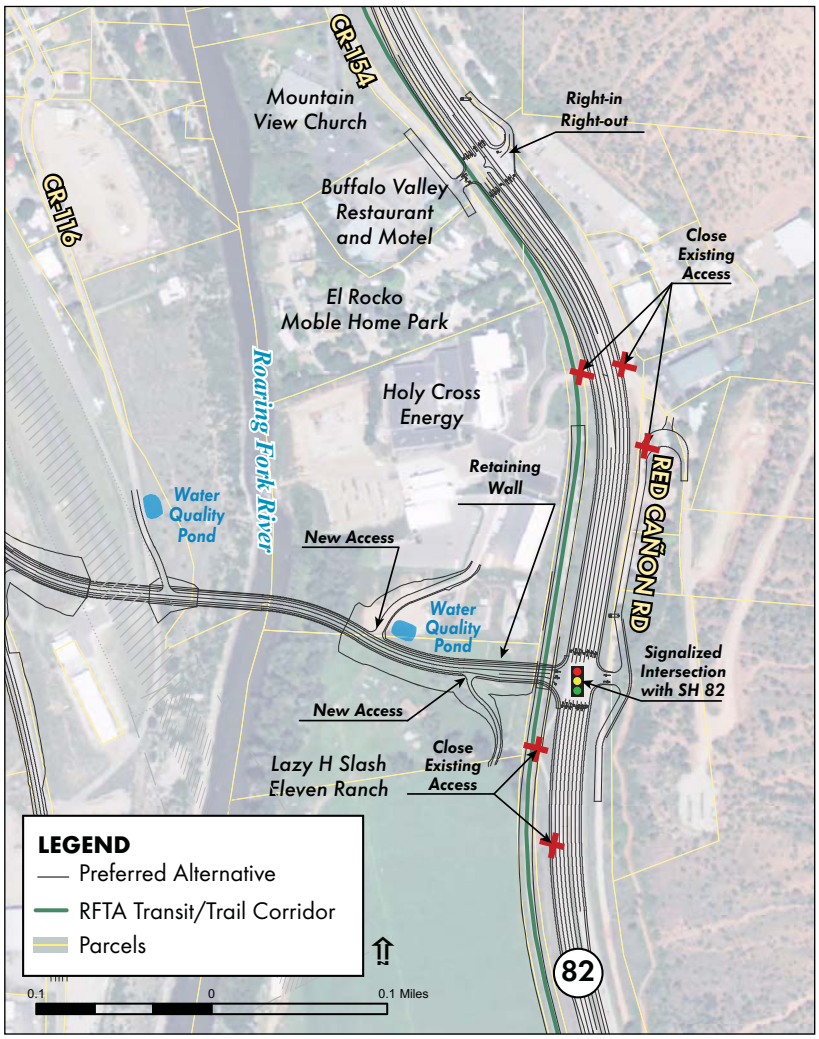
- Between the SH 82/CR 154 intersection and new South Bridge intersection, the Holy Cross Electric property on the west, and two accesses on the east side of SH 82 would be closed.
- South of the new South Bridge intersection, two accesses on the west side of SH 82 to the Lazy H Slash Eleven property would be closed.

The new consolidated access and intersections include the following enhancements to SH 82:

- Right-in/right-out and northbound only left-turn lane intersection at SH 82 and CR 154 .
- Southbound SH 82, right turn lane deceleration lane.
- Right turn out, acceleration lane onto Southbound SH 82.
- Northbound SH 82, right turn lane deceleration lane.
- Northbound SH 82, left turn lane.
- Full movement, signalized intersection with South Bridge alignment, CR 154 and SH 82.
- Southbound SH 82, right turn deceleration lane made continuous with the right-out acceleration lane.
- Southbound SH 82 acceleration lane.
- Southbound SH 82 left turn lane.
- Northbound SH 82, right turn deceleration lane.
- Northbound SH 82, left turn lane, with 400-foot storage.
- Northbound SH 82, acceleration lane, made continuous with the right-in deceleration lane.
- Provisions for a bus queue bypass consistent with RFTA plans.

The Preferred Alternative would provide a grade-separated crossing across the Rio Grande Trail and close three nearby at-grade crossings, thereby improving the bicycle and pedestrian environment.

Figure 2-21 ***Preferred Alternative Alignment on East Side of the Roaring Fork River***



Landscaping

The landscaping for the Preferred Alternative would include the landscaping of the roundabout, the area between the back of curb and the sidewalk, and the disturbed areas behind the back of the curb. The landscaping could include formal landscape design, low-maintenance landscape design, and revegetation of disturbed areas. Formal landscaping could include trees, shrubs, perennials, and annuals that require irrigation and regular maintenance. Low-maintenance design could include shrubs, grasses, and perennials that would have low-water and maintenance requirements. Revegetation could include seeding the disturbed areas with native plant material.

Estimate of Probable Costs

An estimate of probable cost for the Preferred Alternative based on the conceptual design was calculated for screening and planning purposes. The estimate of probable cost is intended to provide a magnitude of cost for the Preferred Alternative and will be refined during preliminary and final design. The estimate was based on unit cost per linear foot, square foot, cubic foot, or acre of the alternative as shown in the conceptual engineering layouts and profiles. This cost estimate includes construction of roadway (reconstruction, improvements, and new alignment), traffic calming elements, signalized intersection with SH 82, identified excavations, fill/embankments, retaining walls, cut-and-cover tunnel, bridge structure, and right-of-way costs. An estimate for adjusting the RFTA corridor (as a pedestrian path and commuter rail corridor) to provide a grade-separated crossing with the Preferred Alternative is included in the cost estimate. The conceptual cost estimate includes a 25 percent contingency to account for construction items not included in the conceptual evaluation. An additional 30 percent for design and construction management is added for delivery of the project (see **Table 2-6**).

2.4 Project Funding

Funding for the Preferred Alternative includes $6.3 million from congressional earmark Law 109-59. These monies pay for the initial study, preliminary engineering, and initial right-of-way acquisition.

Subsequent phases (design and right-of-way acquisition) of the Preferred Alternative are currently in the fiscally constrained 2012-2017 Statewide Transportation Improvement Plan. Approximately $3.2 million has been allocated for these phases. This means that funds have been allocated to allow the project to proceed beyond the NEPA phase. Additional funding will be necessary to construct the Preferred Alternative. The City is considering a variety of funding options, including state funding and local matching funds.

Table 2-6 ***Estimate of Probable Costs for the Preferred Alternative***

Element	Estimated Probable Cost (Millions)
Bridge Structure	$10.5
Tunnel (cut-and-cover)	$2.0
Roadway (reconstruction/new)	$6.6
Right-of-Way	$2.4
Rio Grande Trail Improvements	$0.6
Contingency	$4.9
Design/Construction Management	$7.4
Total	**$34.4**

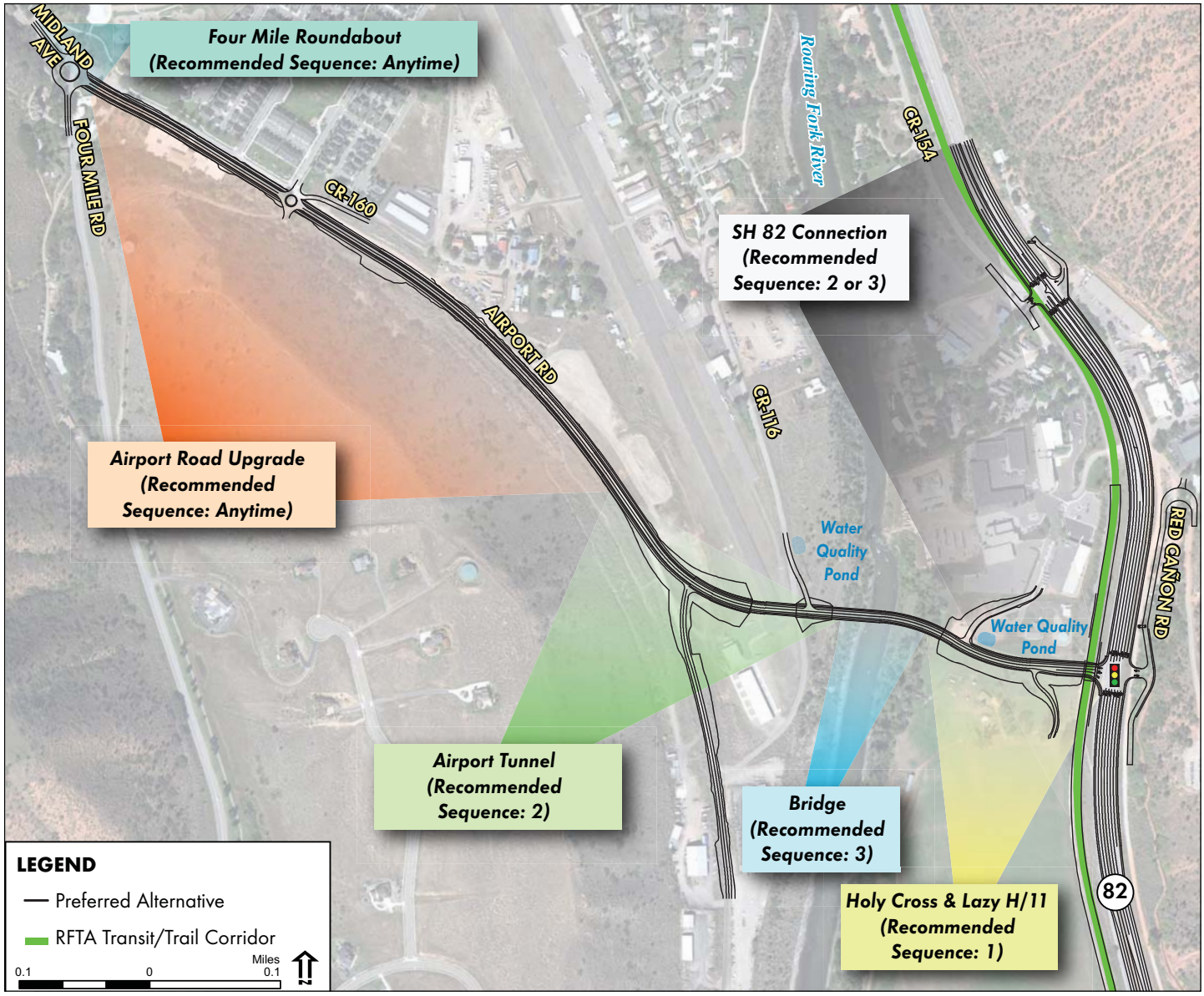
2.4.1 Project Implementation

Once funding is secured for design, right-of-way acquisition and construction of the entire Preferred Alternative, potential phasing (design and construction) could occur as follows:

- SH 82 intersection, Rio Grande Trail separation, and the Holy Cross Energy and Lazy H Slash Eleven Ranch access changes just west of SH 82.
- Construct the Four Mile Road roundabout.
- Improve Airport Road.
- Construct the underpass of the Glenwood Springs Municipal Airport and connect to CR 116.
- Construct the new bridge over the roaring Fork River.

The potential construction phasing of the Preferred Alternative is shown in Figure 2-22.

Figure 2-22 ***Potential Construction Phasing of the Preferred Alternative***



CHAPTER 3: TRANSPORTATION IMPACTS

3.1 Introduction

This chapter describes the existing and future transportation conditions for the South Bridge project and presents transportation impacts for the No Action Alternative and Preferred Alternative. It also discusses transportation plans reviewed, the methodology used to forecast future traffic demand, traffic safety, and pedestrian and bicycle facilities.

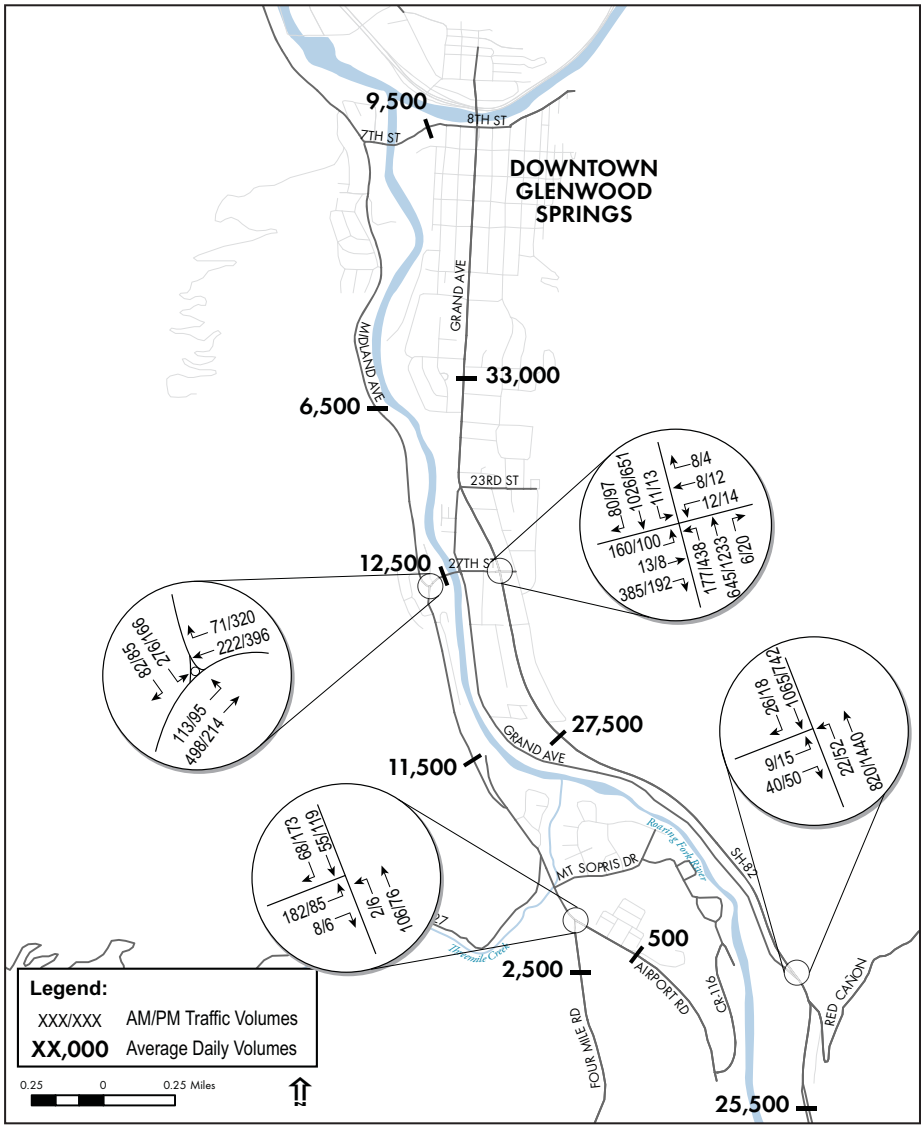
3.2 Existing and Future Traffic

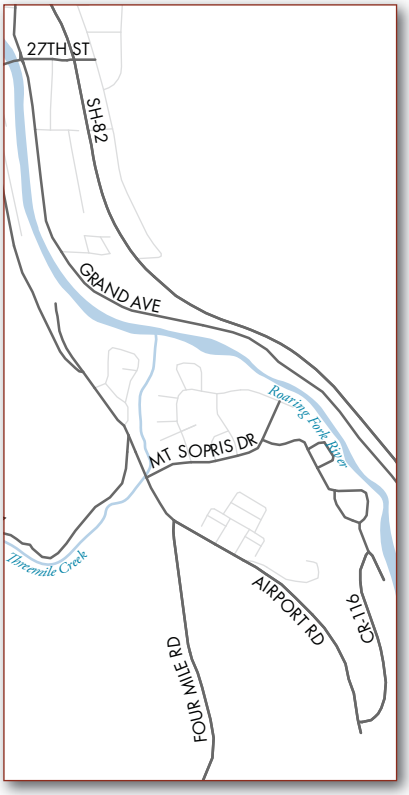
3.2.1 Existing Traffic

Existing traffic was collected for 2008 conditions (see **Figure 3-1**). Year 2011 conditions were reviewed prior to completion of this EA and found to be comparatively the same as or slightly lower than those for 2008 that were due to very minor changes in traffic over the three-year period. 2008 traffic volumes were used as a conservative approach. The following sources of information were used to obtain existing (2008) travel volumes:

- *SH 82 Corridor Optimization Study* (COS) (Glenwood Springs 2007). Numerous (daily and peak hour) counts in the study area. Estimated cut-through trips are also provided.
- City of Glenwood Springs. Roadway daily traffic volumes along several city corridors.
- Garfield County. Daily traffic volumes throughout the county. This includes existing traffic volumes along Four Mile Road.

Figure 3-1 ***Existing (2008) Traffic Volumes***





- CDOT. Traffic estimates and a permanent count station (embedded in the roadway just south of Blake Avenue) near the study area.

Major roadways in the vicinity of the project include:

- **SH 82.** Colorado State Highway 82 is the major north-south regional highway connecting Glenwood Springs to points south, including Carbondale and Aspen.
- **Midland Avenue.** Midland Avenue is the main north-south arterial west of the Roaring Fork River in Glenwood Springs.
- **27th Street.** 27th Street provide the only crossing of the Roaring Fork River in southern Glenwood Springs. The next crossing to the north is at 7th Street at the northern end of the downtown area.
- **Four Mile Road.** Four Mile Road provides access to Sunlight Mountain Resort and other outlying, undeveloped areas.

Existing (2008)[1] daily and peak hour traffic volumes for these major roadways are shown on **Figure 3-1**.

3.2.2 Future Traffic

This section describes the process for projecting future traffic and analyzing roadway operations in the No Action and Preferred Alternatives. Traffic forecasts are estimated for the project design year, which is 2035.

Estimating traffic volumes this far into the future has some inherent uncertainties. Forecasts rely heavily on an extension of historical traffic growth trends and require assumptions related to future land use development in the area.

3.2.3 Understanding Development Potential/Trends

Aside from the Four Mile Road corridor, the study area is largely built out and unable to take on new development without redevelopment of existing parcels. Recent new developments include the Cardiff Glen and Park East neighborhoods (see **Section 4.2.1.4**). Neighborhoods to the north and near the 27th Street bridge (Sunlight Bridge) were built many years before.

The Glenwood Springs Municipal Airport is assumed to continue operation in its current location through the planning horizon of this study.

The Four Mile Road corridor provides the most opportunity for future development. One such development is the Sunlight Mountain Resort, which has plans for major investments in their property in the future. Sunlight Mountain Resort is located approximately nine miles south of the city limits of Glenwood Springs, at the end of Four Mile Road in Garfield County. Although a development proposal was recently denied by the County Commissioners, future development is expected to occur at the resort. This development will generate additional trips by employees, visitors, and if included in the approved development, residents.

Aside from Sunlight Mountain Resort, there is also the Four Mile Ranch subdivision that has approximately 70 remaining lots and many acres of private property between Midland Avenue and Sunlight Mountain Resort that could potentially change to higher-density uses over time.

1 Year 2008 was used as the existing year since the original traffic analysis was conducted at that time. To ensure these traffic volumes were valid for current conditions, the Study Team conducted additional traffic analysis, summarized in the South Bridge Traffic Analysis Memorandum (**Appendix D, Comments and Coordination**). As noted in this document, traffic volumes have decreased on SH 82 between 2008 and 2012. The use of the 2008 traffic volumes is a conservative approach, and regardless of which data is used, 2008 or 2013, the decisions made in this EA would not change.

Since exact development scenarios are uncertain, a range of likely development potentials for 2035 were considered. Staff from the City of Glenwood Springs and Garfield County provided extensive guidance in the formation of these scenarios. This range of development potential and corresponding trip generation is summarized in **Table 3-1**.

This EA utilizes the high-growth scenario for intersection improvements and traffic-related resource impact evaluation. In spite of the recent economic downturn, it is anticipated that the economy will continue to recover, and that the development that is proposed in Garfield County is likely to occur within the planning horizon. Therefore, this EA utilizes the high-growth scenario for intersection improvements and traffic-related resource impact evaluation to provide the most conservative approach to roadway design.

3.2.4 No Action Forecast Traffic

The future traffic volume estimates for Four Mile Road were combined with existing traffic volumes to arrive at a future

Table 3-1 ***Year 2035 Trip Generation Summary Daily Trip Estimates for Four Mile Corridor***

Item	Low Growth Estimates	High Growth Estimates	Occupancy (Lodging)	Persons per Vehicle	Trips Per Day Per Unit	Trips—Low Estimate	Trips—High Estimate
Sunlight Mountain Resort Employees							
Existing Ski Employees	160	160	0	1.25	2	260	260
New Ski Employees	40	80	0	1.25	2	70	130
Sunlight Mountain Resort Visitors (Per Day)							
Existing	200	1,500	0	2.3	1.8	160	1,180
New	500	3,000	0	2.3	1.8	400	2,350
Sunlight Mountain Resort Housing							
Hotel Rooms	60	180	0.8	0	8.9	430	1,290
Condo Units	150	440	0.8	0	5.9	710	2,080
Single-Family Dwellings	125	200	1	0	9.5	1,190	1,900
Service Employees							
0.6 per Hotel Room	35	110	0	1.1	2	70	200
0.4 per Condo	60	175	0	1.1	2	110	320
0.1 per House	15	20	0	1.1	2	20	40
Remainder of Four Mile Corridor							
Existing Single Family Dwellings	290	290	0	0	9.5	2,760	2,760
New Homes on Subdivided but Currently Vacant Lots	50	163	0	0	9.5	480	1,550
New Homes on Suitable Land (2-acre Lots)	140	430	0	0	9.5	1,330	4,090
Total						**8,000**	**18,150**

Notes:

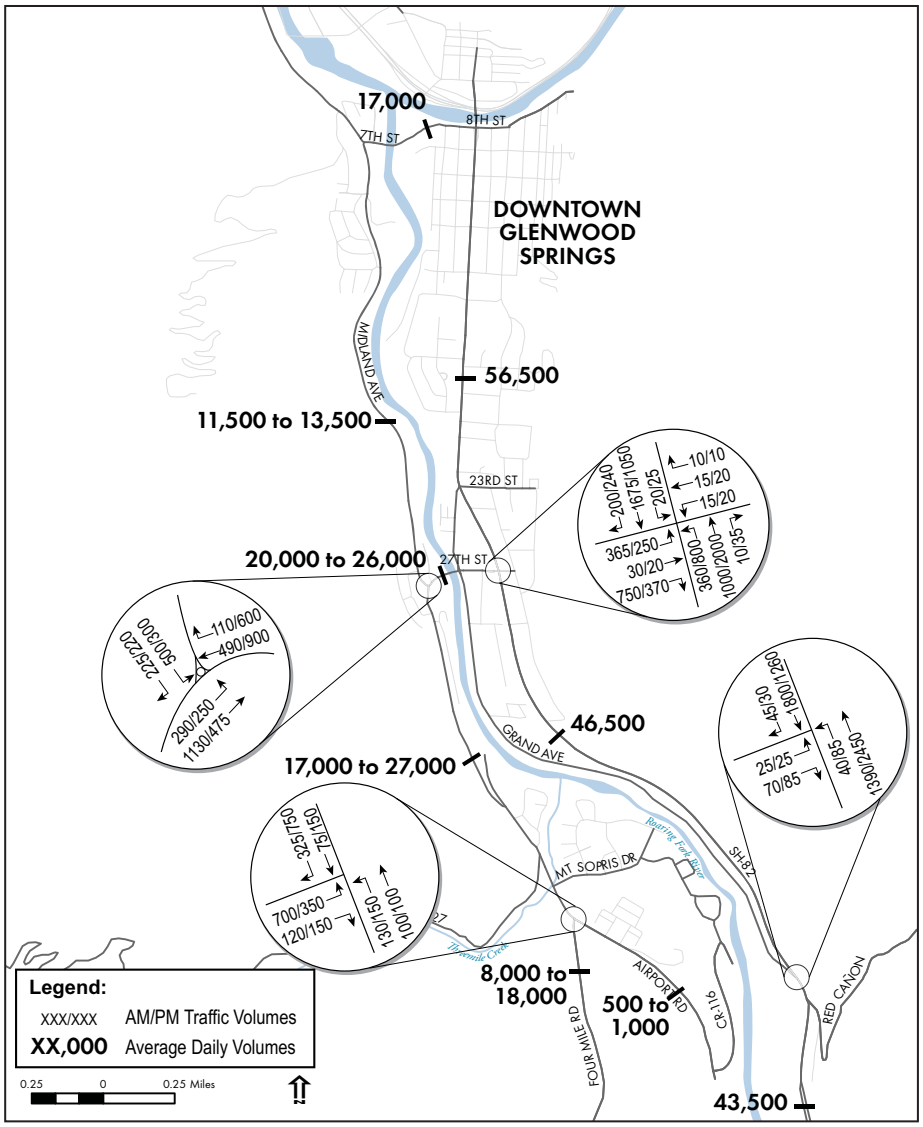
1. Data sources include the Sunlight Mountain Resort PUD Application, an aerial inventory of housing units and subdivisions, and an aerial inventory of suitable land.
2. High-range estimates reflect full build out provided in the Sunlight PUD Application and the full build-out of the remainder of the corridor. Low-range estimates reflect the approximate values used in the Sunlight PUD Application for 2012, and the application of the same high-to-low ratio for the remainder of the Four Mile Corridor. The range of Sunlight Visitors is provided as a range from mid-week (Low) to Friday through Monday (High)
3. Because occupancy at the resort will not always be full, adjustments were made for unit turnover and unoccupied units.
4. Trips per day for Sunlight Mountain Resort Employees, Sunlight Mountain Resort Visitors, and Service Employees were estimated using planning judgment. Others utilize trip rates found in Institute of Transportation Engineers (ITE), Trip Generation 7th Ed.
5. Estimates were reviewed by Garfield County and City of Glenwood Springs staff.

daily traffic estimate. Land use development along the Four Mile Road corridor will result in higher traffic volumes along the Four Mile Road corridor, Midland Avenue, and 27th Street.

Traffic projections along SH 82 and 8th Street are taken from the *SH 82 Corridor Optimization Study*. The SH 82 study includes a thorough investigation of historical patterns and considers regional land use development patterns that will continue to put pressure on this corridor. Historic travel patterns included consideration of travel patterns between areas south of Glenwood Springs (i.e., 'up Valley') and areas east and west of Glenwood Springs.

The combined traffic data was summarized to provide a future No Action daily and peak hour traffic estimate. This information is shown on **Figure 3-2**. In 2035, traffic demand for the land uses currently served by the 27th Street bridge is forecasted to be 20,000 to 26,000 vehicles per day (vpd).

Figure 3-2 ***Year 2035 No Action Traffic Estimate***



3.2.5 Preferred Alternative Forecasted Traffic

The Preferred Alternative is projected to have impacts to traffic along the following roadways:

- Midland Avenue south of 27th Street.
- 27th Street between Midland Avenue and SH 82.
- Airport Road between Midland Avenue and the South Bridge.
- SH 82 between 27th Street and the new intersection.

The following considerations guided the analysis of these impacts:

- **Origin and Destination Travel Patterns.** Midland Avenue traffic south of 27th Street is mostly generated by the developments near the Glenwood Springs Municipal Airport and along Four Mile Road. A majority of this traffic (50 to 70 percent) is estimated to have its origin/destination east and west Glenwood Springs. The remainder of the traffic is to/from areas to the south of Glenwood Springs in the Roaring Fork Valley.
- **Travel Time.** South of 27th Street, SH 82 is a higher speed roadway than Midland Avenue. Midland Avenue and the South Bridge are being constructed with traffic calming measures to deter

high speed travel. Therefore, travel times between areas south of Glenwood Springs and areas north of 27th Street are shorter along routes that utilize SH 82 instead of the South Bridge.

- **Out of Direction Travel.** Drivers are averse to out of direction travel unless it provides a clear and consistent travel time improvement.

With these considerations in mind, traffic circulation patterns would shift by implementation of the Preferred Alternative. It is projected that the Preferred Alternative would provide improved access for trips between the area encompassing developments near the Glenwood Springs Municipal Airport and Four Mile Road and the Roaring Fork Valley south of Glenwood Springs. These trips would shift from the 27th Street bridge to the Preferred Alternative.

The Preferred Alternative would also provide an alternate route for a small percentage of traffic that is currently using SH 82 and 27th Street to access areas west of the river and north of 27th Street. However, the percentage of those travelers that choose to use the Preferred Alternative would be limited by travel time disadvantages. For most of the distance between the proposed South Bridge and 27th Street, SH 82 is a fast, divided highway with speed limits up to 55 mph. While some congestion does occur on this roadway, the travel time advantages provided by the divided highway would remain, especially with the traffic calming measures in place along the Preferred Alternative.

The Preferred Alternative would provide system redundancy for motorists traveling north and south in the Roaring Fork Valley in the event that SH 82, between the new intersection and 27th Street, were closed due to either natural or manmade incidents, such as rock fall, mudslides, wildfire, vehicle collisions, or heavy congestion during an evacuation event.

Figure 3-3 ***Projected Changes in Travel Patterns***

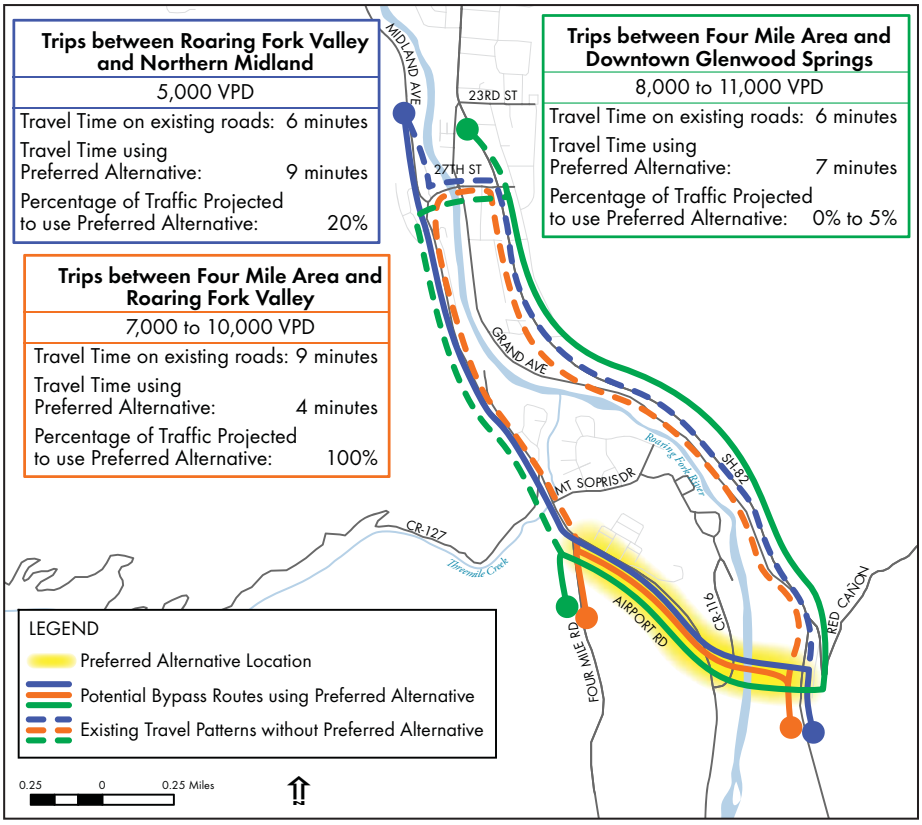


Figure 3-4 ***Projected Changes to 2035 Daily Traffic***

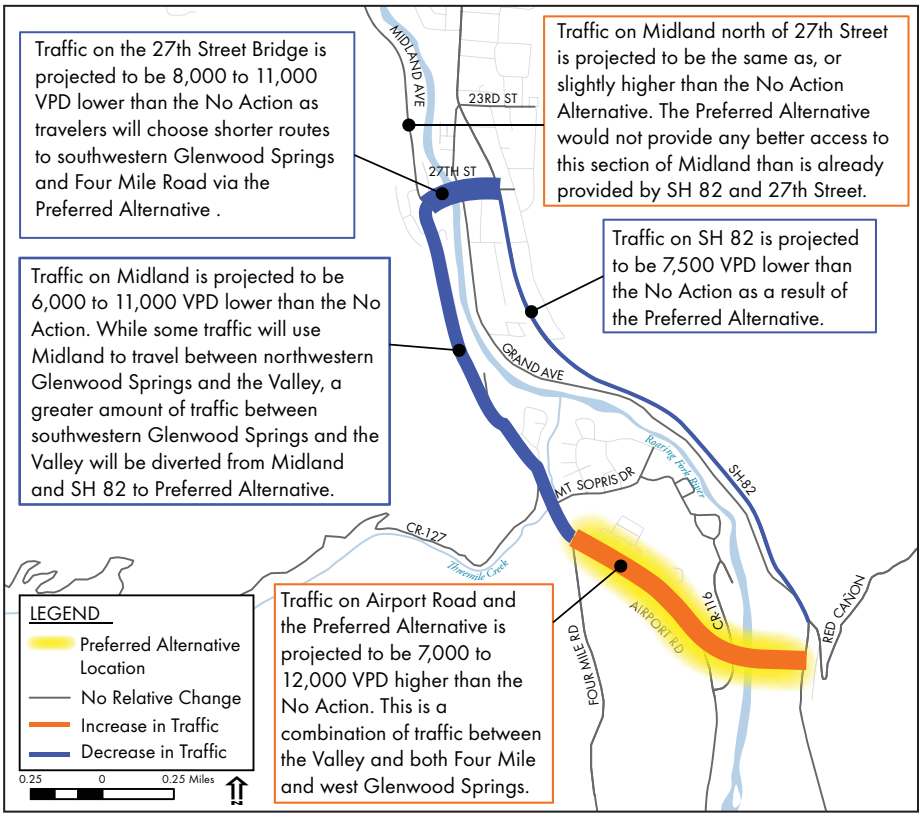
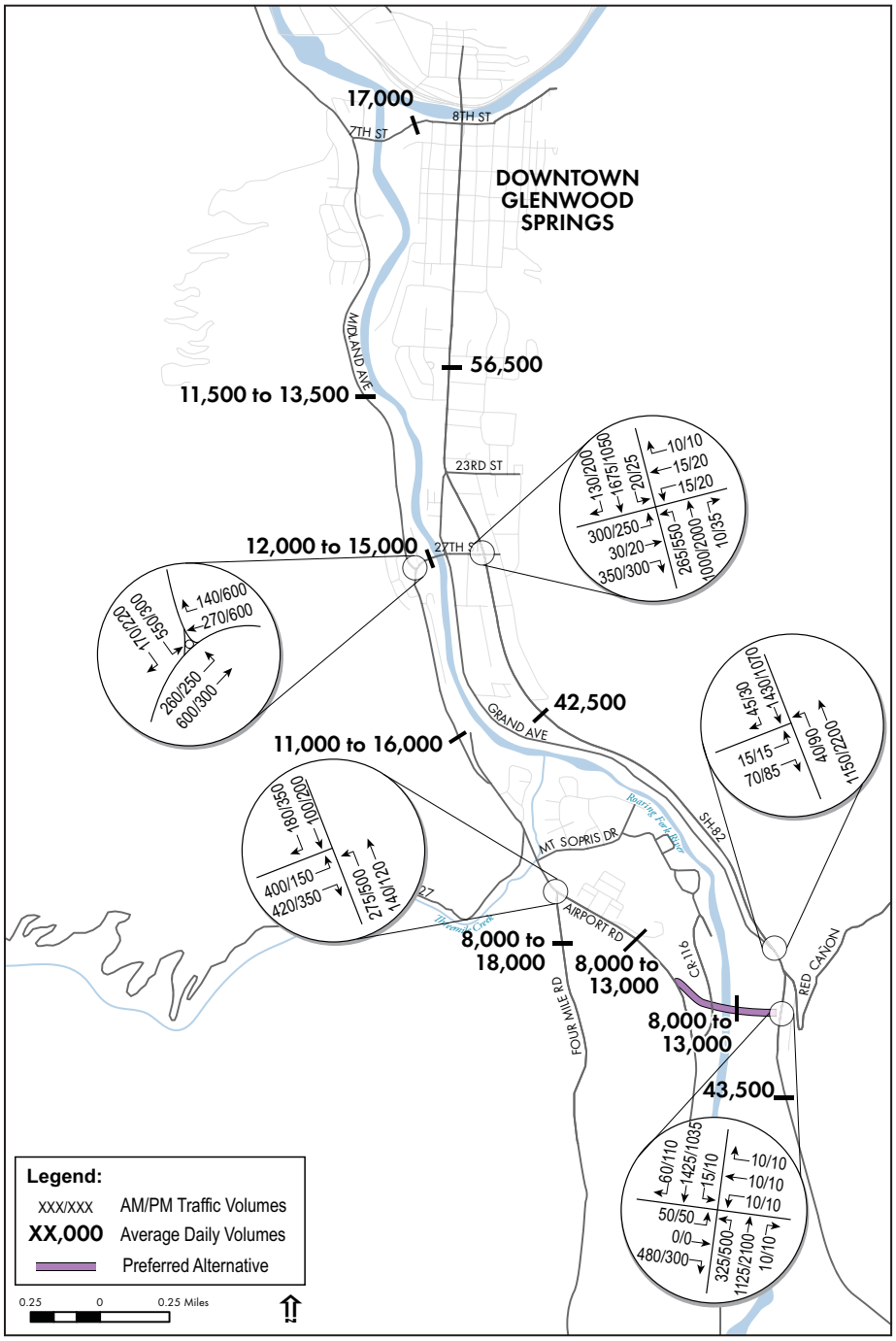


Figure 3-5 ***Year 2035 Preferred Alternative Traffic Forecast***



Other local circulation patterns would remain largely unaffected by the Preferred Alternative. Illustrations of the projected changes to traffic patterns are provided in **Figure 3-3** and **Figure 3-4** while the resulting forecasts are presented in **Figure 3-5**.

3.2.6 Opening Day (Year 2018) Traffic

In addition to the planning horizon year 2035 traffic forecasts, the project team performed an analysis of the traffic conditions at the expected opening day in year 2018. The traffic forecasts for this analysis assumed a two percent annual growth rate during the planning period for the major roadways in the study area. The resulting 2018 traffic forecasts for the No Action Alternative and Preferred Alternative are displayed in **Figure 3-6** and **Figure 3-7**, respectively.

3.3 Vehicle Miles of Travel and Vehicle Hours of Travel

Vehicle Miles of Travel (VMT) and Vehicle Hours of Travel (VHT) provide measures of the amount of travel in terms of total vehicular distance and time. VMT and VHT were calculated for the roads in the study area that are affected by the Preferred Alternative: SH 82 between 27th Street and the new South Bridge, 27th Street between Midland Avenue and SH 82, Midland Avenue between 27th Street and Four Mile Road, Airport Road south of Four Mile Road, and the new road and bridge connecting to SH 82. VMT and VHT are calculated for the existing condition in 2008 and for the No Action and Preferred Alternatives in 2035. The 2035

Table 3-2 ***2035 VMT and VHT***

	2008	2035 No Action Alternative	2035 Preferred Alternative
VMT (Daily)	101,000	185,000	173,000
VHT (Daily)	2,800	5,300	4,800

calculations reflect the High Growth development scenario for impact evaluation.

In general, traffic is forecasted to increase along the key roadways in the study area, with annual growth rates ranging from 2.0 percent per year on SH 82 - based on the COS forecasts - to 7.5 percent per year for Four Mile Road - where development is projected to intensify in the next 20 years and where existing volumes are very low. The VMT in the study area is therefore forecasted to increase over 80 percent from 2008 to 2035 with the No Action Alternative. The Preferred Alternative reduces 2035 VMT by 12,000 VMT per day relative to the No Action Alternative. This reduction of about 6 percent is due to more efficient travel circulation patterns with the Preferred Alternative. VHT is similarly reduced with the Preferred Alternative compared to the No Action Alternative. **Table 3-2** displays the VMT and VHT results.

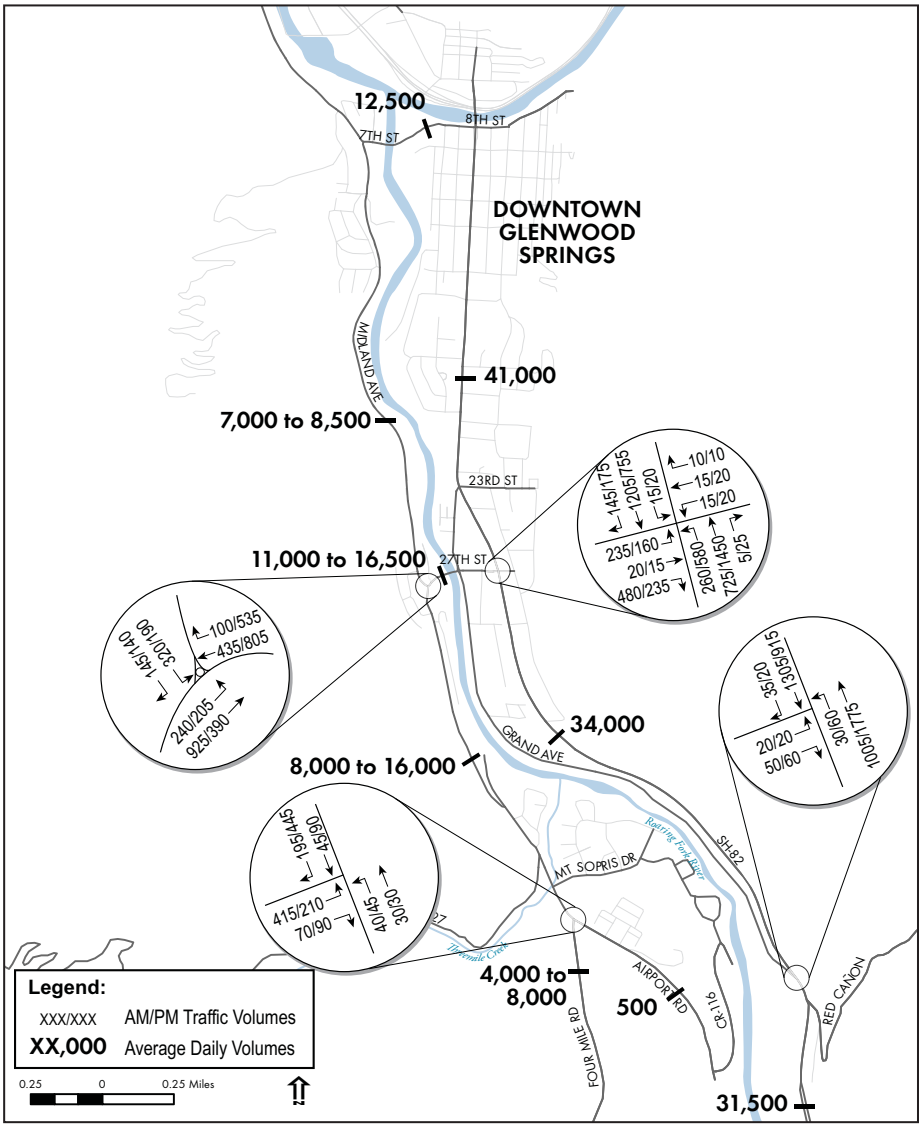
3.4 Changes in Traffic Access

The Preferred Alternative affects the access of some local roads to the regional roadway system, as follows:

- **SH 82 and CR 154.** The intersection is signalized with full access under the No Action Alternative. The Preferred Alternative alters this intersection to unsignalized control with full access from the west with protected left-in and left-out lane pockets. From the east side of SH 82 (which serves two residences), the access is modified to right-in/right-out only.

- **SH 82 and Red Cañon Road.** The No Action Alternative has an unsignalized full access intersection at this location. Under the Preferred Alternative, this intersection is closed. Access from Red Cañon Road on the east is shifted to the new signal at the new South Bridge and SH 82, a distance of about 750 feet from the current access point.

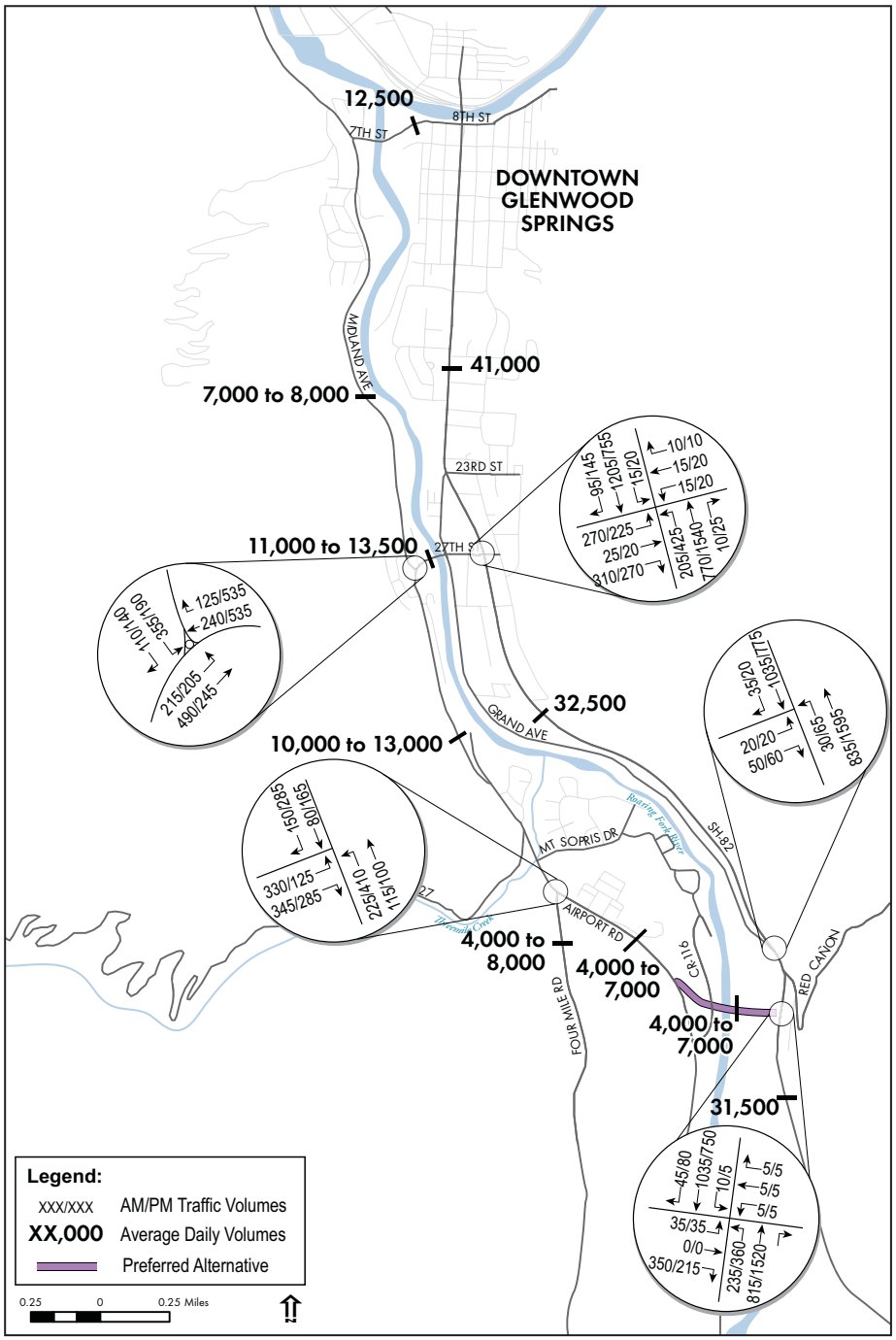
Figure 3-6 ***Year 2018 No Action Alternative Traffic Forecast***



- **CR 116 and new South Bridge Road.** The No Action Alternative has a full access unsignalized intersection at Airport Road. The Preferred Alternative retains this intersection.

- **Holy Cross Electric and Local Ranch Access.** Under the No Action Alternative, Holy Cross Electric has signalized access to SH 82 and the Lazy H Slash Eleven property has unsignalized access to SH 82. Under the Preferred Alternative, access to these properties would be shifted to a "split T" intersection on the new South Bridge Road.

Figure 3-7 ***Year 2018 Preferred Alternative Traffic Forecast***



3.5 Traffic Operations Analysis

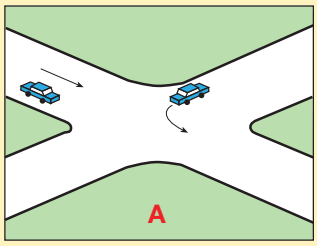
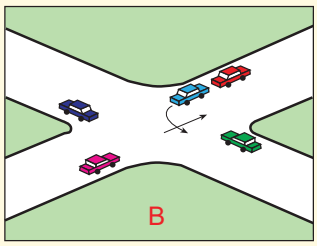
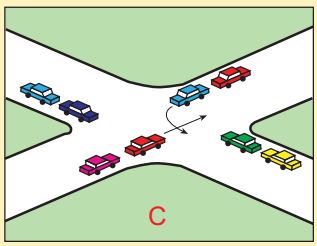
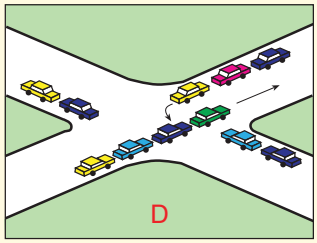
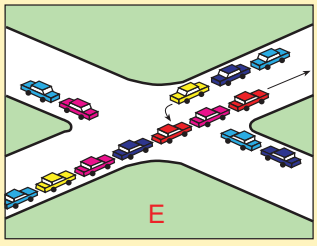
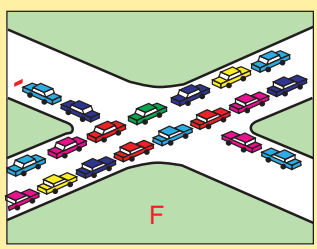
Evaluation of traffic operations is based on level of service (LOS) calculations conducted in accordance with the *Highway Capacity Manual 2000*[1] (Transportation Research Board, December 2000). LOS is a term used to describe the operating performance of an intersection or roadway. The operation is described by a letter designation from "A" to "F," with LOS A representing essentially uninterrupted flow with minimal delays and LOS F representing a breakdown of traffic flow with excessive congestion and delay. Typically, operations at LOS D or better for peak periods are considered to be operating acceptably, while intersections and roadways operating at LOS E or F are in need of improvement. **Table 3-3** shows the LOS categories for signalized and unsignalized intersections.

The following intersections were analyzed:

- **SH 82 and 27th Street.** This intersection is currently signalized and no changes are proposed as part of the Preferred Alternative.
- **SH 82 and CR 154.** This intersection is signalized, but the Preferred Alternative would include the removal of the signal and the construction of an intersection with right-in/right-out movements and a northbound-only left turn lane, where northbound through traffic would be separated from turning conflicts by a barrier.
- **Midland Avenue and 27th Street.** This intersection is currently a roundabout and no changes are proposed as part of the Preferred Alternative.

2 During the development of this study, the Transportation Research Board (TRB) released Highway Capacity Manual 2010 (HCM 2010). It was determined that the enhanced features of HCM 2010 for signalized intersections (mainly signal timing and phasing updates) were either not applicable or were previously considered in the analysis. Also, traffic on SH 82 has not increased between 2008 and 2012. For these reasons HCM 2010 would not result in a notable change in the LOS calculations and the original analysis has been maintained and presented in the EA.

Table 3-3 ***Level of Service Categories***

LOS	Unsignalized Intersections	Signalized Intersections	
A	No delays at intersections with continuous flow of traffic. High frequency of gaps available for turning traffic. No observable queues. AVERAGE VEHICLE DELAY OF 0-10 SECONDS.	No vehicle waits longer than one signal indication. AVERAGE VEHICLE DELAY OF 0-10 SECONDS.	
B	Similar to LOS A, with slightly longer average delays. AVERAGE VEHICLE DELAY OF 10-15 SECONDS.	On a rare occasion, vehicles wait through more than one signal indication. AVERAGE VEHICLE DELAY OF 10-20 SECONDS.	
C	Moderate delays at intersections with satisfactory to good traffic flow. Light congestion; infrequent backups on critical approaches. AVERAGE VEHICLE DELAY OF 15-25 SECONDS.	Intermittently, vehicles wait through more than one signal indication, occasionally backups may develop, traffic flow still stable and acceptable. AVERAGE VEHICLE DELAY OF 20-35 SECONDS.	
D	Probability of delays along every approach. Significant congestion on critical approaches, but intersection functional. Moderate queues observed. AVERAGE VEHICLE DELAY OF 25-35 SECONDS.	Delays at intersections may become extensive, but enough cycles with lower demand occur to permit periodic clearance, preventing excessive backups. AVERAGE VEHICLE DELAY OF 35-55 SECONDS.	
E	Heavy traffic flow condition. Heavy delays probable. Very limited available gaps for cross-street traffic or main street turning traffic. Limit of stable flow. AVERAGE VEHICLE DELAY OF 35-50 SECONDS.	Very long queues may create lengthy delays. AVERAGE VEHICLE DELAY OF 55-80 SECONDS.	
F	Unstable traffic flow. Heavy congestion. Traffic moves in forced flow condition. Average delays greater than one minute highly probable. AVERAGE VEHICLE DELAY OF MORE THAN 50 SECONDS.	Backups from locations downstream restrict or prevent movement of vehicles out of approach creating a "gridlock" condition. AVERAGE VEHICLE DELAY OF MORE THAN 80 SECONDS.	

- **Midland Avenue and Four Mile Road.** This intersection is unsignalized, but the Preferred Alternative would include the construction of a roundabout at this location.

- **SH 82 and South Bridge.** The proposed intersection would include a traffic signal and turn lanes.

Table 3-4 summarizes the results of the LOS analysis for existing conditions, the No Action Alternative, and the Preferred Alternative. As shown, the Preferred Alternative would result in improved operations at most study area intersections compared to the No Action Alternative, at both the opening day (2018) and planning horizon (2035). Specifically, at the planning horizon, the intersection at SH 82 and 27th Street would improve to LOS D in both the AM and PM peak hours, compared to LOS F and LOS E respectively in the No Action Alternative. This is due to the reduction of traffic on 27th Street under the Preferred Alternative. At SH 82 and CR 154, the traffic signal would be removed under the Preferred Alternative, and the intersection would operate at LOS C. The intersection of Midland Avenue and 27th Street operates at LOS F conditions under either alternative, but the overall average vehicle delay is decreased in the Preferred Alternative. The Preferred Alternative, with the construction of a roundabout, improves the LOS from F to B at the intersection of Midland Avenue and Four Mile Road.

The proposed South Bridge intersection at SH 82 would operate acceptably with LOS C and D conditions during the AM and PM peak hours respectively.

The 27th Street bridge between Midland Avenue and SH 82 is rapidly becoming congested. The 2035 traffic forecast at this location under the No Action Alternative is 20,000 to 26,000 vehicles per day. The bridge is narrow and there are currently no plans to widen it. This restricts it to two-lane operations; and based on projected development patterns, 27th Street would be unable to handle the increased demand.

Table 3-4 ***Intersection LOS Results***

LOS Average Vehicle Delay	Existing		2018 No Action		2018 Preferred Alternative		2035 No Action		2035 Preferred Alternative	
Intersection	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**	**AM**	**PM**
SH 82 & 27th Street	C 34.7	C 20.6	D 46.1	C 31.4	C 32.8	C 29.5	F >100	E 65.4	D 52.0	D 50.6
SH 82 & CR 154	A 6.3	A 6.6	A 7.3	A 8.0	C 15.8	B 14.6	A 9.8	B 13.1	C 23.0	C 20.3
Midland Avenue & 27th Street (roundabout)	D	D	F	F	F	F	F	F	F	F
Midland Avenue & Four Mile Road	B 5.1	B 2.3	D 31.2	C 19.5	A	A	F >100	F >100	B	B
SH 82 & South Bridge	-	-	-	-	B 18.0	C 21.6	-	-	C 30.7	D 46.1

Notes:

1. Bold = Signalized intersection.
2. The worst approach is reported for unsignalized intersections.
3. SH 82 and CR 154 is currently signalized, but the signal would be removed as part of the Preferred Alternative. Midland Avenue and 27th Street is unsignalized. The Preferred Alternative includes a roundabout at Midland Avenue & Four Mile Road (currently unsignalized).
4. The *Corridor Optimization Plan* predicted 2030 LOS at Midland Avenue and 27th Street to be C during the AM peak and E and during the PM peak. The South Bridge EA study did additional analysis on land use forecasts for the area served by the South Bridge project. This resulted in both low and high forecasts. The high land use forecast was used to evaluate 2030 LOS. By using the most conservative assumption, the high land use forecast LOS results were worse than those forecasted in the Corridor Optimization Plan.

It is projected that the demand would exceed capacity within the next 15 years, well before the planning horizon, without improvements. With the Preferred Alternative, the 2035 traffic projection for the 27th Street bridge is 12,000 to 15,000 vehicles per day, a reduction of about 40 percent. The Preferred Alternative would alleviate the need for improvements along 27th Street through the horizon year by providing a better option for travel to and from Four Mile Road. While outside the study area, potential improvements to the roundabout intersection at 27th Street and Midland Avenue may be necessary regardless of the proposed project, despite a substantial decrease in overall vehicle delay in 2035 with the Preferred Alternative.

3.6 Compatibility with Existing Plans

3.6.1 No Action Alternative

The No Action Alternative does not implement any of the goals, strategies, or actions identified in the *Glenwood Springs Comprehensive Plan*, March 2011. Similarly, the No Action Alternative does not support the strategies and actions defined in the *Garfield County Comprehensive Plan 2030*, November 2010. The No Action Alternative is also inconsistent with the *City of Glenwood Springs Long Range Transportation Plan 2003-2030*. Each of these plans identifies the need to improve network connectivity and emergency access redundancy, and include the South Bridge project as an implementable project to accomplish these goals.

3.6.2 Preferred Alternative

The *Glenwood Springs Comprehensive Plan*, March 2011, identifies community goals for transportation and mobility. The Preferred Alternative directly supports the specific goal of addressing transportation needs and providing multiple convenient travel choices. The Plan also defines strategies and actions to support transportation and mobility. One of these is to improve interconnectivity of the road network to provide alternative routes through and around town. A specific improvement identified in the Plan is to provide a new bridge and road connecting the City's southern subdivisions to SH 82. The Preferred Alternative would achieve this network improvement. In addition, the Preferred Alternative meets the Plan's strategy of expanding walking and bicycle routes, by constructing new eight-foot multiuse paths on both sides of Airport Road between Four Mile Road and SH 82.

The Preferred Alternative is consistent with the *Garfield County Comprehensive Plan 2030*, November 2010. The Preferred Alternative directly supports the Garfield County Comprehensive Plan strategy of "Assuring the interconnectivity of the county road system, to provide multiple routes to reduce congestion and provide for emergency access."

The Preferred Alternative is also consistent with the CDOT *SH 82 Corridor Optimization Plan*, October 2009, as it does not impact any of the potential strategies identified and evaluated for SH 82.

The Preferred Alternative is consistent with RFTA's *SH 82 Corridor Investment Study*, May 2003, as it provides for the implementation of BRT strategies, consistent with the *VelociRFTA* program.

The Preferred Alternative is consistent with the *City of Glenwood Springs Long Range Transportation Plan 2003-2030*, as that plan includes the South Bridge project.

The Preferred Alternative is included in the *2012-2017 Statewide Transportation Improvement Plan*.

The Preferred Alternative is consistent with the following plans:

- *Glenwood Springs Comprehensive Plan*
- *Glenwood Springs Long-Range Transportation Plan 2003-2030*
- *Garfield County Comprehensive Plan*
- *CDOT SH 82 Corridor Optimization Plan*
- *RFTA SH 82 Corridor Investment Study*

3.7 Safety Analysis

CDOT performed an assessment of the safety impacts of the Preferred Alternative, compared to existing conditions and projected No Action conditions. The complete assessment can be found in **Appen-**

dix A, Safety Assessment; a summary is provided in this section.

3.7.1 Existing Conditions

Over the five-year period from 2004 through 2008, 55 crashes were reported on SH 82 between mileposts (mp) 3.45 and 4.00. Of these, 21 were located at intersections or were intersection-related, 1 was located at a driveway access, and 33 were non-intersection-related including 7 animal-vehicle collisions. Thirteen crashes were located at the CR 154 intersection, and eight occurred at the Red Cañon Road intersection. In addition, eight crashes resulted in injuries and none resulted in a fatality; these rates are below the statewide average for similar facilities. In general, the safety assessment indicates that SH 82 has performed in line with expectations for similar facilities.

At specific intersections, CDOT documented the following:

- **SH 82 and CR 154/Buffalo Valley.** This intersection is signalized, but during most of the five year study period, it was unsignalized with one-way stop control on CR 154. During the five-year period, 13 crashes occurred at or near this intersection, with just 1 occurring after the installation of the signal. CDOT's Safety Performance Functions (SPF) analyses for this intersection indicate that the safety performance level is at the expected level when compared to similar intersections.

- **SH 82 and Red Cañon Road.** During the five-year study period, there were eight crashes at this intersection. SPF analyses indicate the intersection has performed better than expected during that period.

3.7.2 Safety Impacts

No Action Alternative

Based on the projected increase in traffic over the planning horizon described in this chapter, CDOT estimated the expected number of crashes in 2035 with the No Action Alternative. The two intersections analyzed are summarized below:

- **SH 82 and CR 154/Buffalo Valley.** With the signal at this intersection in the No Action Alternative, the number of crashes in 2035 is projected to be three per year.

- **SH 82 and Red Cañon Road.** Without improvements, this intersection is still projected to have a low number of crashes (three per year) in 2035.

- In addition to the intersection-related crashes above, the crash rate along SH 82 would be expected to remain consistent, and the number of crashes would increase along the segment as traffic increases. These rates would still be in line with expectations for similar facilities.

Preferred Alternative

The Preferred Alternative would result in the following changes to the projected No Action Alternative safety conditions:

- **SH 82 and CR 154.** The Preferred Alternative would remove the signal at this intersection and replace it with an intersection with right-in/right-out movements and a northbound-only left turn. This would likely result in a reduction of broadside crashes compared to the unsignalized condition. This could effectively reduce the total number of crashes by 35 percent.

- **SH 82 and Red Cañon Road.** The Preferred Alternative would realign Red Cañon Road to intersect SH 82 at the proposed South Bridge connection at a new four-leg, signalized intersection. Even though turning volumes would be higher with the new South Bridge connection, the proposed geometric improvements (acceleration/deceleration lanes) and safety features (traffic signal) would mitigate the

anticipated increase in volume, and the resulting number of crashes would roughly equal those in the No Action Alternative.

- **Other accesses along SH 82.** The Preferred Alternative includes the consolidation or elimination of two private accesses along SH 82, which could result in a potential reduction of crashes along SH 82 and smoother traffic flow.

- In addition to the safety enhancements at intersections along SH 82, the Preferred Alternative includes the installation of roundabouts and traffic calming measures at intersections along Midland Avenue. CDOT crash data is unavailable along Midland Avenue. However, roundabouts reduce the number of vehicle conflicts and reduce the speed at which vehicles travel through an intersection. It is widely accepted that roundabouts result in reductions in the number of crashes at intersections when compared to both signalized and unsignalized operations.

3.7.3 Safety Mitigation

No mitigation measures are required.

3.8 Transit

3.8.1 Existing Conditions

The Roaring Fork Transit Authority (RFTA) currently operates Valley Bus service on SH 82 between Glenwood Springs and Aspen. RFTA is improving this service to a Bus Rapid Transit (BRT) system, called *VelociRFTA*, in the SH 82 corridor between Glenwood Springs and Aspen. As part of the *VelociRFTA* project, RFTA constructed a BRT station in south Glenwood Springs, near the intersection of SH 82 and 27th Street.

3.8.2 Transit Impacts

No Action Alternative

The No Action Alternative does not impact the South Glenwood local bus route on Midland Avenue, and it does not impact the current or planned RFTA system.

Preferred Alternative

The Preferred Alternative does not impact the South Glenwood local bus route on Midland Avenue.

The Preferred Alternative does not impact the station site of the *VelociRFTA* BRT system. On SH 82, the Preferred Alternative would provide bus signal priority at the new intersection on SH 82 allowing buses to bypass queues at the new signalized intersection, therefore improving bus reliability compared to the existing condition and the No Action Alternative.

Furthermore, the Preferred Alternative avoids impacts to the RFTA right-of-way and would not preclude the potential eventual use of the railroad right-of-way for passenger rail service.

3.8.3 Transit Mitigation

No mitigation measures are required

3.9 Airport Operations

3.9.1 Existing Conditions

The Glenwood Springs Municipal Airport is open to the public and averages 41 flights a day. Of these flights, 81 percent of the flights are local general aviation, 13 percent transient general aviation, and 6 percent air taxi.

3.9.2 Airport Operations Impacts

No Action Alternative

Through the planning horizon of the project, no change to airport operations is anticipated.

Preferred Alternative

The Preferred Alternative would have little to no long-term impact on airport operations. Existing accesses along Airport Road would be rebuilt as part of the Preferred Alternative.

The construction of the tunnel under the runway at the airport would result in the closure of the airport for a period of ap-

proximately three months, temporarily impacting commercial use of the airport. The nearest alternate airports are at Rifle (25 miles west of Glenwood Springs), Eagle (35 miles to the east), and Aspen (40 miles south of Glenwood Springs). These airports could temporarily serve the air transportation need.

The airport is owned by Glenwood Springs and does not have a full time manager. The Glenwood Springs City Council provided input and review on airport impacts. The City Council confirmed the likely impacts as presented in this EA and supported the Preferred Alternative in light of the potential future land use implications that improved access could provide.

3.9.3 Airport Operations Mitigation

CDOT will coordinate with Glenwood Springs Municipal Airport operators and users so that airport closures are communicated in advance of construction.

3.10 Construction

See **Section 4.19** for discussion of construction impacts and mitigation.

CHAPTER 4: AFFECTED ENVIRONMENT, IMPACTS, AND MITIGATION

This chapter describes the existing social, economic, and environmental setting for the study area and the environmental impacts that could occur as a result of implementation of either the No Action Alternative or the Preferred Alternative. Mitigation measures are identified for impacts associated with the Preferred Alternative.

4.1 Land Use

4.1.1 Existing Conditions

Existing Land Use

General land uses within the study area include a mix of residential, commercial, agricultural/ranching, industrial, and public uses. SH 82 extends down the east side of the study area, while Midland Avenue and Four Mile Road extend down the west side. The northern part of the study area is composed mostly of residential neighborhoods, commercial, and light industrial uses.

The Glenwood Springs Municipal Airport is located in the central portion of the study area. Although owned by the City of Glenwood Springs, the airport primarily supports small private planes. Cardiff Glen, a small neighborhood, is located west of the airport off of Airport Road. East of the airport, along SH 82, are Holy Cross Energy and a number of small, local businesses. The southern portion of the study area consists of a conservation easement and open areas.

Existing Zoning

Land within the study area for the South Bridge project is under the jurisdiction of both Glenwood Springs and Garfield County and is zoned for a variety of uses including low- and high-density residential, commercial, light industrial, agricultural, and office. **Figure 4-1** illustrates existing zoning in the study area.

A portion of land in the study area is zoned for Hillside Preservation. As described in the City of Glenwood Springs Municipal Code, the purpose of the Hillside Preservation District is to protect the public health, safety, and welfare by addressing the public hazards of developing on excessive slopes, unstable and changing geology and soils, and within high fire hazard zones.

Due to the varied and steep terrain, densities are slope-appropriate in areas zoned Hillside Preservation. Permitted uses in this zoning designation include public parks, agricultural, horticulture, grazing, forestry, minor home occupation, accessory structures, and building additions.

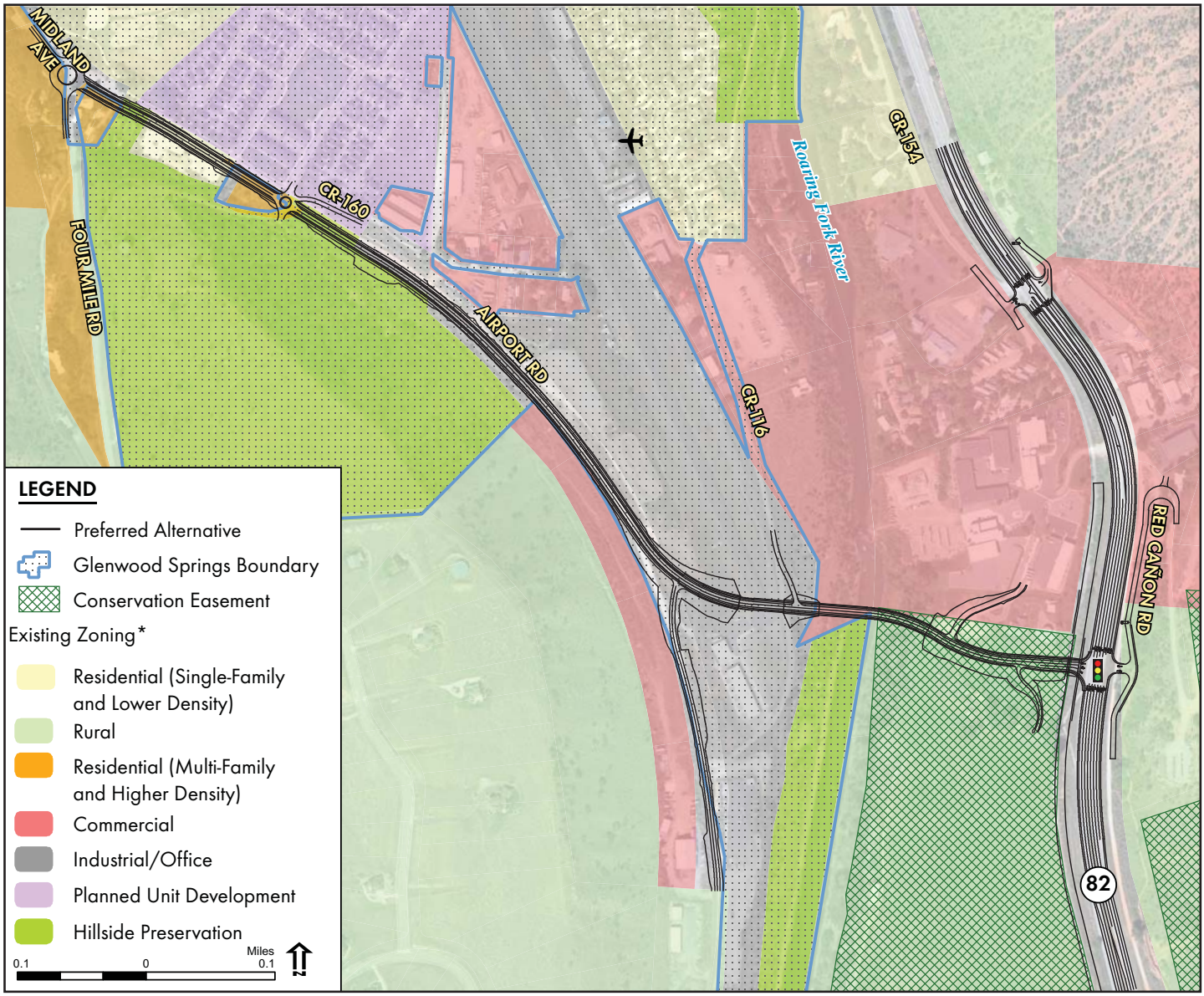
Much of the land in the southern portion of the study area is zoned as Rural. According to the *Garfield County Comprehensive Plan*, Rural zones allow

for a wide range of uses. Uses, such as agriculture and residential, are most common, but such uses as community buildings, resource extraction, and equipment storage are also allowed within this designation.

Immediately adjacent to the Preferred Alternative, the zoning along Airport Road is primarily hillside preservation to the west and residential/planned unit development to the east transitioning to commercial and industrial around the Glenwood Springs Municipal Airport. On the east side of the river, the land to the north of the alignment is zoned commercial and the land to the south of the alignment is zoned rural, with a conservation easement.

The Roaring Fork Transit Authority (RFTA) manages 34 miles of former railroad right-of-way adjacent to SH 82. The Rio Grande multiuse trail is currently located within this corridor. The right-of-way was purchased in 1997 to allow for future transportation solutions to reduce SH 82 congestion and to provide recre-

Figure 4-1 **Zoning**



* For graphical purposes city/county zoning classifications have been grouped into similar land use categories. Sources: City of Glenwood Springs Municipal Code, Title 070 Subdvision, Develpment and Use of Land; Garfield County Zoning Resolution of 1978 with amendments through January 2008.

ational trail connectivity in the Roaring Fork Valley.

Ranchland adjacent to SH 82 in the southern portion of the study area is subject to a conservation easement. The purpose of this easement is to create a southern open space buffer for Glenwood Springs and preserve the valley's scenic beauty. The limit of this conservation easement is shown in **Figure 4-1**.

Planned Land Use

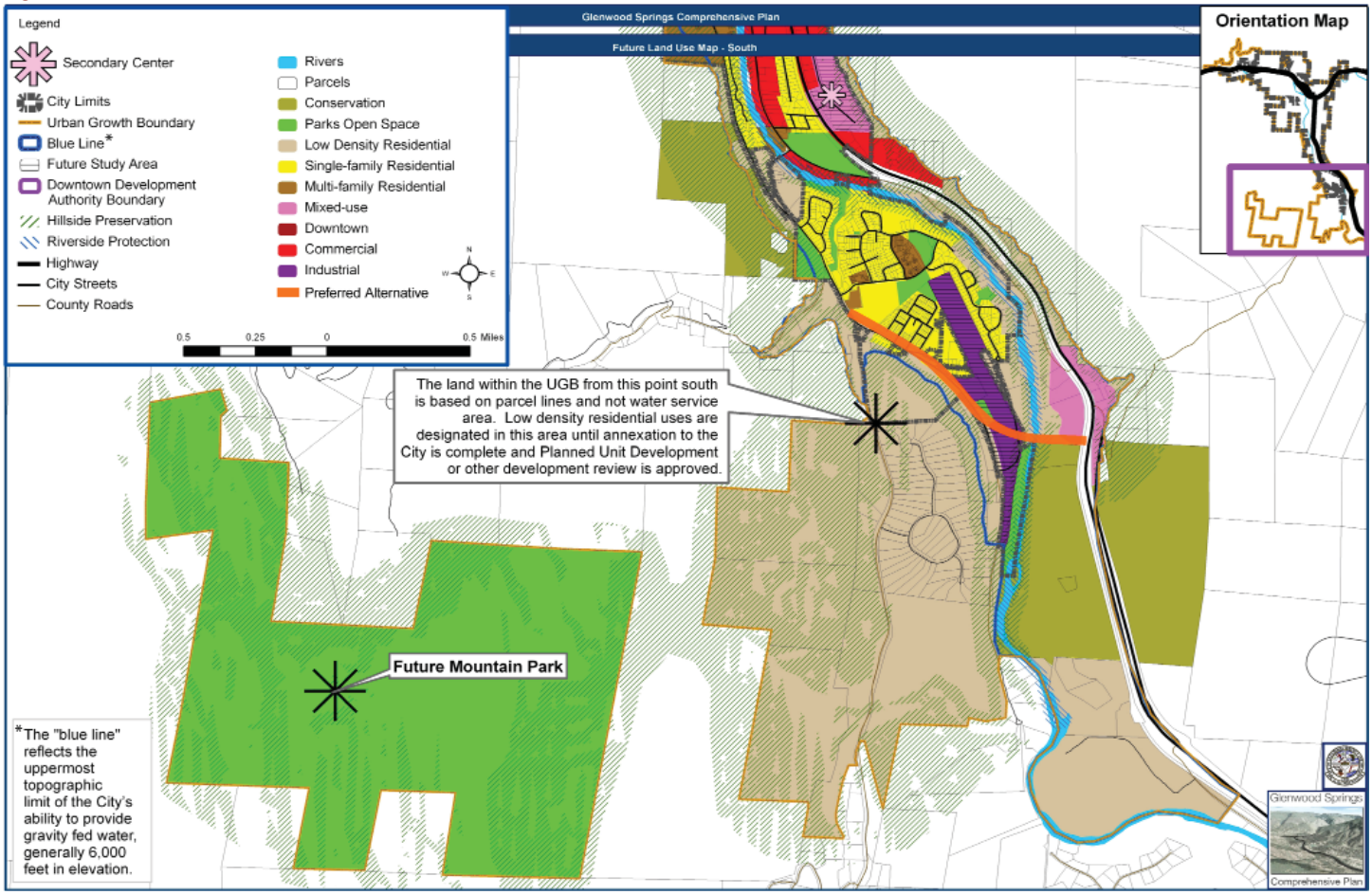
The study area for the South Bridge project is located within the City of Glenwood Springs and Garfield County. The primary adopted land use plans providing general guidance for future development and growth in the study area are the *Glenwood Springs Comprehensive Plan* (2011) and the *Garfield County Comprehensive Plan* (2010).

The *Glenwood Springs Comprehensive Plan* (2011) encourages balanced growth to preserve small town character. Because of physical constraints, Glenwood Springs' ability to grow is limited which places a higher emphasis on infill and redevelopment—growing in and up, instead of out. Glenwood Springs and Garfield County have established an Urban Growth Boundary (shown on **Figure 4-2**).

The boundary represents an area that can support urban-level development. The study area is located within the urban growth boundary.

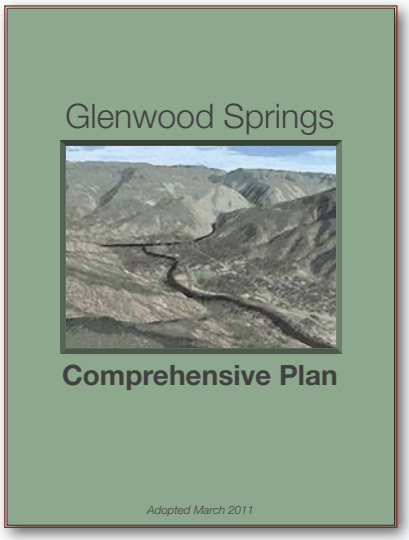
The *Glenwood Springs Comprehensive Plan* (2011) identifies the 64-acre Glenwood Springs Municipal Airport facility for its potential redevelopment into a mixed-use neighborhood, but also recognizes the potential economic impact that the loss of

Figure 4-2 ***Planned Land Use Plan***



aviation may have on the community. The plan recommends additional economic analysis for redevelopment of this area.

The plan recommends preservation of areas along the Roaring Fork River and along hillsides. Development is discouraged in these areas, unless it is done with little physical and visual impact. Preservation areas are shown on **Figure 4-2**.



According to the *Glenwood Springs Comprehensive Plan* (2011), the vision for transportation in Glenwood Springs is an integrated and balanced multi-modal transportation system— one that supports regional travel needs but not to the extent that it compromises a healthy, dynamic downtown, economic viability, pedestrian-orientation, and easy access to the city core (2010). The plan includes a recommended transportation connection from Airport Road to SH 82 to form a more efficient network of streets and bridges. It also states that any new roadway should be multi-modal—designed for driving, transit, walking, and biking. It should generally take the form of narrow local and collector streets of no more than two lanes with speed limits of 35 miles per hour or slower.

The *Garfield County Comprehensive Plan* (2010) was developed to provide direction for planning in unincorporated Garfield County. Future land uses in the southern portion of the study area are designated as Medium Density Residential with 6 to less than 10 units per acre.

4.1.2 Land Use and Zoning Impacts

No Action Alternative

The No Action Alternative would not impact existing land uses in the study area. Under the No Action Alternative, limited to no development is anticipated within the hillside preservation area, the riverside preservation area, and the conservation area identified by the City and County. Growth and development is anticipated to occur on the land around the Glenwood Springs Municipal Airport, as well as potential redevelopment of the 64-acre Glenwood Springs Municipal Airport. Additional growth is anticipated along Four Mile Road. Businesses and residents located on the west side of the Roaring Fork River would continue to access SH 82, the regional transportation route via Midland Avenue and 27th Street. The No Action Alternative would not preclude the implementation of the long-term vision of the *Glenwood Springs Comprehensive Plan* (2011). However, the circuitous transportation route and limited accessibility for land uses in the south Glenwood Springs area could act as a deterrent for planned growth in this area.

Preferred Alternative

Construction of the Preferred Alternative would result in the direct conversion of 10.87 acres of commercial, residential, rural, hillside preservation, and municipal property into road right-of-way. Only partial acquisition of parcels would be required, and no relocations would be necessary. This impact is further discussed in **Section 4.4**.

The Preferred Alternative is located adjacent to land zoned primarily as planned unit development, industrial/office or commercial. It is compatible with these uses, but not compatible with the hillside preservation zoning. The Preferred Alternative is compatible with future land use as identified in the *Glenwood Springs Comprehensive Plan* and the *Garfield County Comprehensive Plan*. It would provide planned infrastructure identified in the plans. The design of the transportation facility is consistent with the guidance for roadway facilities and includes one lane in each direction, as well as pedestrian and bicycle facilities. The roadway also improves conditions for transit, with a bus queue jump lane on SH 82.

The Preferred Alternative would improve accessibility to the southwest portion of

Glenwood Springs, which could result in accelerated growth and development. Based on existing zoning and future land uses identified in the *Glenwood Springs Comprehensive Plan*, the likely uses could include a mix of residential and commercial development. The *Glenwood Springs Comprehensive Plan* supports additional development around the Glenwood Springs Municipal Airport and redevelopment of the Glenwood Springs Municipal Airport property. Land use policies are in place by the City and County that would limit growth outside the urban growth boundary, within the hillside and riverside preservation areas, and in the conservation area.

4.1.3 Land Use Mitigation

The Preferred Alternative is consistent with existing zoning and planned land uses, and no mitigation measures are necessary. See **Section 4.4.3**, for mitigation measures associated with the acquisition of property.

4.2 Social Conditions and Environmental Justice

4.2.1 Existing Conditions

Social Conditions

Located in the Roaring Fork Valley on the western slope of Colorado, Glenwood Springs provides a home for approximately 9,600 people (U.S. Census Bureau, 2010). In this section, population and housing statistics for Glenwood Springs and Garfield County are discussed. Also included is a detailed discussion of community facilities in and around the study area. Information for this section was derived from the U.S. Census Bureau, Colorado Department of Local Affairs (DOLA), the City of Glenwood Springs, Garfield County, *Garfield County Land Values and Solutions Study* (2006), the *Garfield County Housing Assessment* (2006), and the *Garfield County Socio-Economic Impact Study* (2007).

General Population Characteristics

Between 2000 and 2010, Garfield County grew by approximately 12,000 people. The population of the County grew from 43,791 to 56,389, representing an increase of 28.8 percent over the 10- year period. This growth in population, consisting mostly of single men or young families, could be attributed to the attraction of new resident workers needed to fill the expanding natural resource based economy (*Garfield County Comprehensive Plan*, Community Profile, January 2010).

In addition, as resort and recreation development activity increased, Garfield County continued to serve as a residential community for Eagle and Pitkin County residents and workers (*Garfield County Socio-Economic Impact Study*, 2007). The flourishing resort and real estate economies of these nearby counties stimulated associated economic activity in Garfield County (*Garfield County Socio-Economic Impact Study*, 2007).

The unincorporated areas of the County grew more slowly than local towns. Unincorporated area residents shrank from 57 percent of all County residents in 1990 to 44 percent of the County population in 2009. However, the City of Glenwood Springs has physical constraints to its expansion, and generally can only add population by adding density (*Garfield County Comprehensive Plan*, Community Profile, January 2010). An overview of population statistics for Colorado, Garfield County, and the City of Glenwood Springs is provided in **Table 4-1**.

According to population forecasts prepared by the Colorado DOLA—State Demography Office, Garfield County is expected to grow to 131,081 people by

Table 4-1 **Population Growth**

Locality	1990	2000	2010	% Change 1990-2010
Colorado	3,294,394	4,301,261	5,029,196	52.7
Garfield County	29,974	43,791	56,389	88.1
Glenwood Springs	6,561	7,736	9,614	46.5

Source: U.S. Census Bureau, 2000 and 2010.

2035. Estimates are not available for Glenwood Springs.

General Housing Characteristics

According to the 2010 Census, there were 4,113 housing units in Glenwood Springs. Of these, approximately 92 percent are occupied. An overview of housing characteristics for Glenwood Springs and Garfield County is found in **Table 4-2**.

Construction of new housing in Glenwood Springs, like much of the US, has declined in recent years. **Table 4-3** shows the trends in privately owned residential building permit activity in Glenwood Springs and Garfield County between 2000 and 2012. Of the 3,959 residential building permits issued in Garfield County, 396 were in Glenwood Springs, accounting for ten percent of such permit activity (US Census). In the Study Area, no building permits were issued in 2012, and only one in 2011 and two in 2010. Much of the construction occurred from 2005 and 2008, fueled by a strong housing market and land availability. As expected, as the Study Area has built out, construction activity has slowed.

Countywide, housing values have grown about 30 percent between 2000 and 2009 and remain considerably above the current statewide median home value (*Garfield County Comprehensive Plan*, Community Profile, January 2010). Specifically, Glenwood Springs and Carbondale, located closest to the resort communities in Eagle, Summit, and Pitkin Counties, have the highest median home values within Garfield County. The 2009 median home values for Glenwood Springs ($325,610) and Carbondale ($350,446) were both greater than the median home value for the state of Colorado ($211,510) (*Garfield County Comprehensive Plan*, Community Profile, January 2010). However, these high home values may make it difficult for new workforce residents to afford housing in Garfield.

A large number of residences are located within the study area. Many of these homes are found in the northern and central sections of the study area. Neighborhoods within the study area include Park West, Park East, Glenwood Park, Cardiff Glen, and Four Mile Ranch (see **Figure 4-3**). A small cluster of houses is also located east of the Roaring Fork River, while other houses are scattered throughout the study area and are interspersed with commercial uses. A mobile home park, El Rocko is located just south of the Buffalo Valley Motel off of SH 82. Holy Cross Energy is currently constructing employee housing on the southern end of their property.

Table 4-2 ***Housing Characteristics***

	Garfield County 2000	Glenwood Springs 2010
Occupied	16,229	3,778
- Owner Occupied	10,576	N/A
- Renter Occupied	5,653	N/A
Vacant	1,107	335
Housing Units	**17,336**	**4,113**

Source: U.S. Census Bureau, 2000 and 2010.

Table 4-3 ***Residential Building Permit Activity***

Year of Permit	Garfield County	Glenwood Springs
2000	540	68
2001	515	41
2002	455	48
2003	338	45
2004	428	28
2005	372	32
2006	579	80
2007	353	24
2008	205	20
2009	67	5
2010	35	0
2011	33	1
2012	39	4

Source: US Census, Bureau 2010.

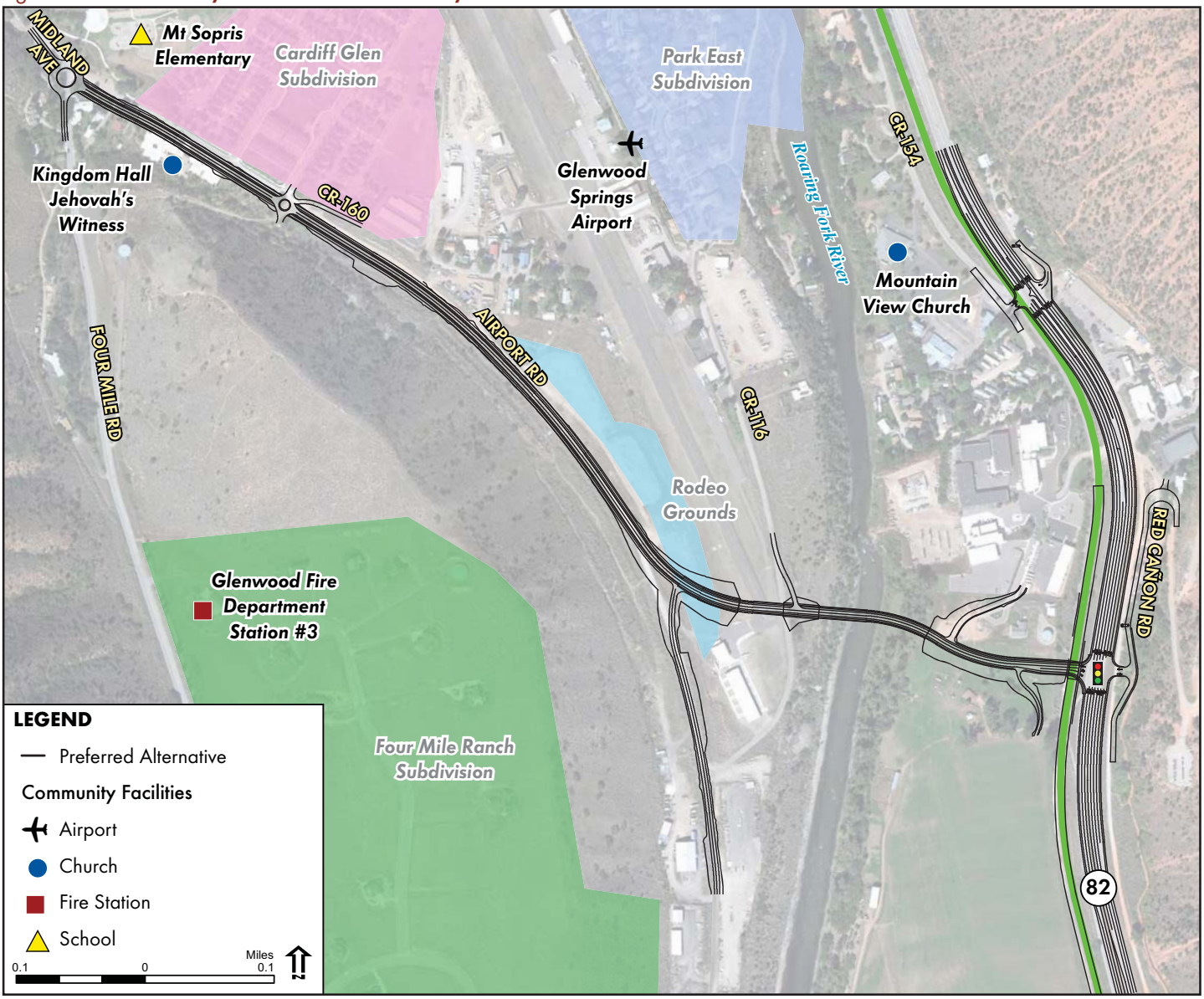
Community Facilities

Community facilities found within the study area include the Kingdom Hall – Jehovah's Witness located on Airport Road; the Mountain View Church on SH 82; Sopris Elementary School on Mt. Sopris Drive; the former site of the rodeo grounds, which has been demolished and now serves as an informal open space; and the Glenwood Springs Municipal Airport, located in the very center of the study area. See **Figure 4-3** for Community Facilities within the study area.

The Glenwood Springs Fire Department Station #3 is located just southwest of the study area proposed improvements (see **Figure 4-3**). According to the *Glenwood Springs Fire Department 2007 Year-end Report*, the fire department experienced an increase of 13 percent in calls for service from 2004 to 2007.

Both Terry Wilson (Glenwood Springs Police Chief) and Mike Piper (Glenwood Springs Fire Chief) agreed that a secondary access to SH 82 could facilitate movement of traffic and could reduce emer-

Figure 4-3 **Community Facilities within the Study Area**



gency services response times if there were an incident between the new access and the 27th Street bridge (Sunlight Bridge) (South Bridge Environmental Assessment Emergency Response Provider Meeting, February 11, 2008).

Similarly, in an interview with Sergeant Conrad of the Garfield County Sherriff's Office, the Sergeant confirmed that he believed a new all-weather access would be desirable and beneficial to emergency access needs. He identified three points of access in the area that, in his opinion, are marginal, especially in the winter months:

- Midland Avenue via 27th Street bridge
- Dry Park Road
- The Haystack Mountain route from Silt.

4.2.2 Impacts to Social Resources

No Action Alternative

The No Action Alternative would not affect population growth, housing development, or community facilities near the study area. However, emergency and local access would not improve with the No Action Alternative.

Preferred Alternative

While implementation of the Preferred Alternative would not notably change population growth trends or development patterns within the study area, the proposed improvements would provide a critical second access point between SH 82 and the western side of the Roaring Fork River in the south Glenwood Springs area that could be used for emergency residential evacuation and emergency provider access. Additionally, a secondary access point would reduce travel times for ingress/egress to the area. For example, travel times between the Four Mile Area and the Roaring Fork Valley would decrease from nine minutes to four minutes with construction of the Preferred Alternative.

The Preferred Alternative would result in changes to travel patterns within the study area. Airport Road would see an increase in traffic with a combination of traffic from travelers from Four Mile Road and south of 27th Street that would use the South Bridge to get to southbound SH 82. By increasing traffic along Airport Road, access into and out of Kingdom Hall – Jehovah's Witness (located on Airport Road) could be more challenging. Traffic on 27th Street would decrease, as travelers would choose shorter routes to southwestern Glenwood Springs and Four Mile Road via the South Bridge. Similarly, Midland Avenue traffic would decrease because, while some traffic would use Midland Avenue to travel between northwestern Glenwood Springs and the Valley, a greater amount of traffic between southwestern Glenwood Springs and the Valley would be diverted from Midland Avenue and SH 82 to the Preferred Alternative. Because most of the traffic to and from Sopris Elementary School (located on Mt. Sopris Drive) from the north travels along Midland Avenue, this would reduce congestion at the access for the school. For travel to and from the school and southern parts of the study area, traffic on Airport Road would increase, causing more congestion. For more detail on changes to travel patterns, see **Chapter 3**.

Community cohesion, which is defined as the degree to which residents have a "sense of belonging" to their neighborhood or a strong attachment to neighbors, groups or institutions, would potentially be impacted by the Preferred Alternative. The Preferred Alternative minimizes this potential impact in a number of ways. The majority of the alignment follows an existing roadway corridor and would not require any residential or business relocations. The alignment does not bisect any of the five established neighborhoods in the study area (Park West, Park East, Glenwood Park, Cardiff Glen, and Four Mile Ranch). Four Mile Ranch, which is

a sparsely populated, low-density residential subdivision, is the only neighborhood to the south of the Preferred Alternative. Implementation of the Preferred Alternative would introduce a wider paved area and increased traffic along Airport Road between Four Mile Ranch and the other four neighborhoods in the study area. The impact to community cohesion would be negligible because this neighborhood is already separated from the other four by the existing roadway, by distance, and by topography. There are some existing informal pedestrian connections between Four Mile Ranch and Airport Road. These informal connections would not be removed or impeded by the Preferred Alternative.

The provision of continuous pedestrian and bicycle facilities along both sides of the alignment would improve pedestrian and bicycle circulation in the study area. Sidewalk and bike lanes would be provided on both sides of the alignment (from Four Mile Road, along Airport Road, and across the South Bridge), varying in width from eight feet to eight feet, six inches (see **Section 4.16** for more details). Although traffic along Airport Road would increase, these improvements would benefit cyclists and pedestrians along Airport Road, which currently has sidewalks only on portions of the north side of the roadway.

4.2.3 Environmental Justice

Environmental justice was first identified as a national policy in 1994 when President Clinton issued Executive Order 12898 (E.O. 12898), *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*. The purpose of E.O. 12898 is to ensure that minority and low-income communities do not receive disproportionately high and adverse human health or environmental impacts as a result of federal actions.

E.O.12898 was enacted to reinforce Title VI of the Civil Rights Act of 1964, which states, "No person in the United States shall, on the grounds 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." Subsequent Orders at the state and federal level, including Department of Transportation (DOT) Order 5610.2 *Order To Address Environmental Justice in Minority Populations and Low-Income Populations* (U.S. DOT 1997) and Federal Highway Administration (FHWA) Order 6640.23A *Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (FHWA 1998), have reinforced the legislation outlined in Executive Order 12898.

On May 27, 2005, the Colorado Department of Transportation (CDOT) issued *CDOT's Title VI and Environmental Justice Guidelines for NEPA Projects*—Rev.3 to assist in interpreting Environmental Justice mandates. The guidance outlines the process for Environmental Justice analysis, including data collection, public involvement, impact analysis, and mitigation requirements. The analysis that follows was prepared in accordance with this and all other applicable guidance for addressing Environmental Justice.

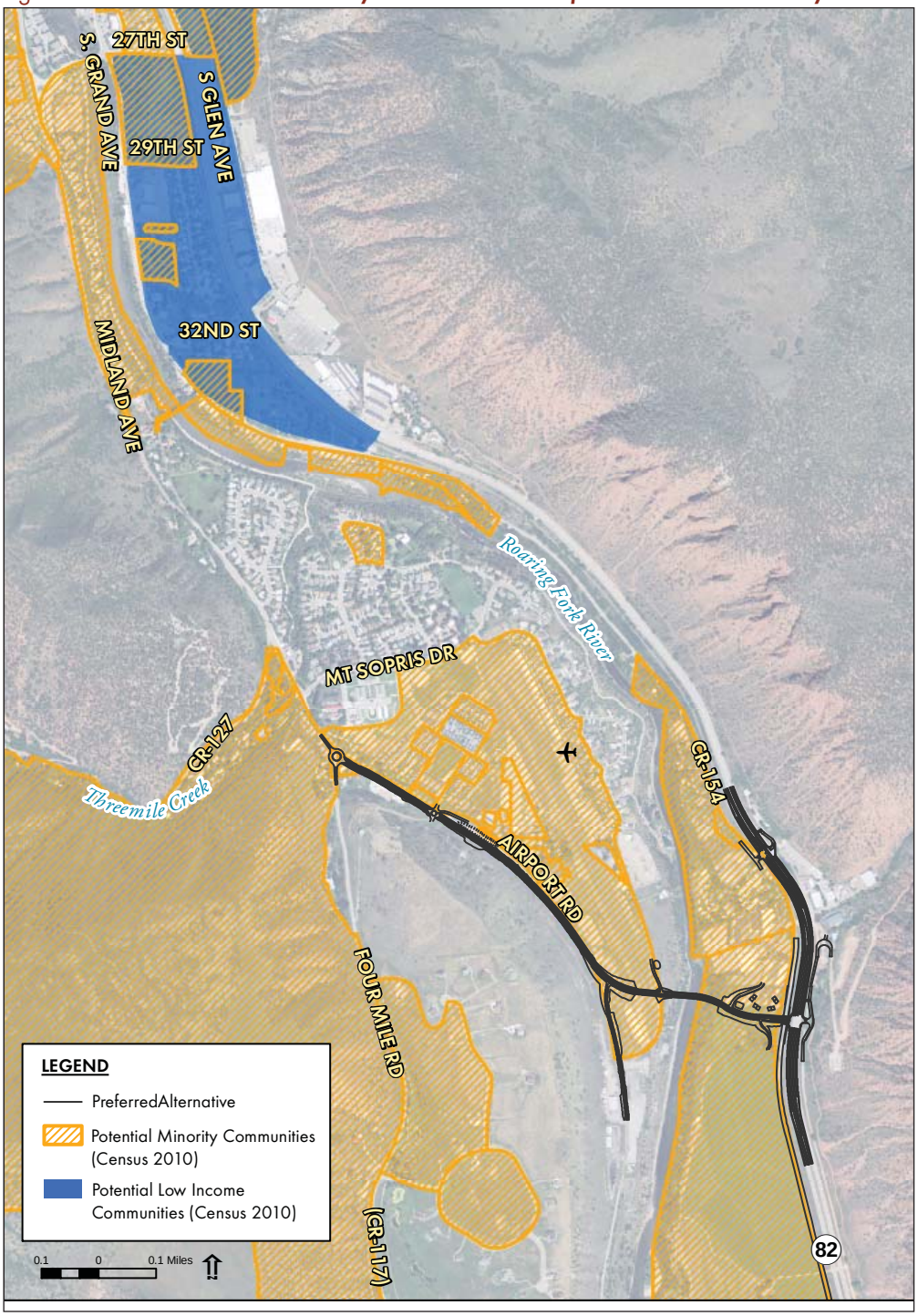
Minority Populations and Minority-Owned Businesses

The discussion of minority populations begins with the analysis of 2010 Census data at the block level. Minority populations comprise ethnic and/or racial minorities. As defined in FHWA Order 6640.23, a minority is a person who is Black, Hispanic, Asian American, or American Indian or Alaskan Native. It is important to note that 2010 Census data does not list Hispanic as a racial category. Instead, Hispanic or Latino heritage is considered an ethnicity; a person of Hispanic of Latino origin can identify with any racial group. To avoid double counting, the total White, Non-Hispanic population of a geographic area is subtracted from the total popula-

tion to generate the total minority population. The percentage of minorities is then compared to the city or county average. Any blocks with a higher percentage of minorities than the county average will be considered in this analysis.

Garfield County has a minority population of 31.2 percent (2010 Census). Thirty-one Census blocks that are either partially or wholly contained within the study area contain minority populations above the county average (see **Figure 4-4**). Of these blocks, 5 have less than 10 people living in

Figure 4-4 ***Census-Identified Minority and Low-Income Populations within the Study Corridor***



them. Six of the minority-identified Census blocks have more than 100 people.

However, three of these large blocks are only partially located within the study area. Further, one of the large blocks has less than 10 residences located within the study area.

The Colorado Minority Business Office (MBO) maintains a listing of minority business enterprises throughout Colorado. According to the MBO at the time of this writing, one registered minority business listed in Glenwood Springs is located in the vicinity of the study area. However, through further investigation, it was found that the business (Colorado Sitters) is no longer in service.

In summary, minority populations as defined by CDOT guidance are present within the study area. These populations will be evaluated for disproportionately high and adverse effects.

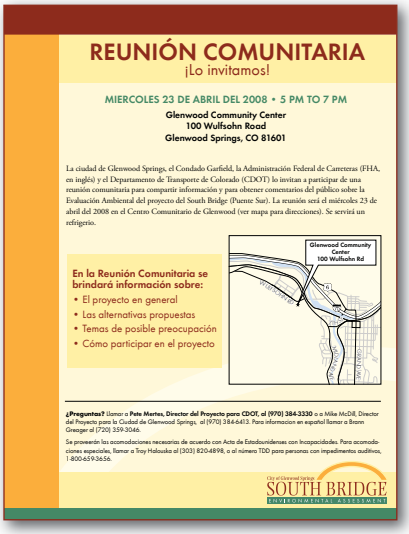
Low-Income Populations

For purposes of privacy, the Census block group is the most detailed level of data that displays income information. FHWA Order 6640.23 defines low-income as "…a household income at or below the Department of Health and Human Services (HHS) poverty guidelines." A different threshold (e.g., U.S. Census Bureau poverty threshold or U.S. Department of Housing and Urban Development Community Development Block Grant income thresholds) may be utilized as long as it is not selectively implemented and is inclusive of all persons at or below the HHS poverty guidelines.

CDOT's recommended approach in determining low-income populations is to derive the low-income threshold from a combination of Census average household size data and the income thresholds set annually by the U.S. Department of Housing and Urban Development (HUD) for the distribution and allocations of Community Development Block Grant (CDBG) funds. HUD thresholds are developed for counties (or in some cases, Metropolitan Statistical Areas [MSA]) by household size up to an eight-person household. The thresholds are based upon household income as a percentage of median household income (in this case, 30 percent of the Median Family Income). These thresholds are then adjusted to reflect the average household size of the city or county where the project is located.

Census income data for 2010 were not available at the time of writing this document. It should be noted that "income" was not a question included on the census data questionnaire for 2010, but income and poverty averages at the block group level are available for 1, 3, and 5-year periods between 2006 and 2010. These income parameters from the American Community Survey are based on 2000 Census geography. The median household income in Garfield County is $64,902 (2006-2010 American Community Survey) and the average household size is 2.65 persons (U.S. Census Bureau, 2000). The income limits for 30 percent of average median income (AMI) for a household size of 2.65 persons, is $16,617. Since Census income statistics are divided into increments of $5,000, the income threshold of $20,000 is used. In Garfield County, 14.2 percent of households fall below the $20,000 threshold. Any Census block groups within the study area where more than 14.2 percent of households fall below the $20,000 threshold were considered in this analysis.

Six block groups encompass the study area, which include over 2,319 households. Of these, one contains a higher percentage of low-income households than the County. This block group extends beyond the study area. Block groups with low-income populations are shown by location in **Figure 4-4**.



In summary, low-income populations as defined by CDOT guidance are present within the study area. These populations will be evaluated for disproportionately high and adverse effects.

4.2.4 Specialized Outreach

Public involvement was conducted throughout the development of this EA to ensure widespread public awareness of the project and to provide opportunities for timely public input to project decision-making (see **Chapter 6.0**). Participants included interested citizens, property owners, and business owners and operators.

Special efforts were made to encourage the participation of low-income and minority populations within the study area. Specifically, there was special outreach conducted for Spanish speakers. A telephone information line for the project was available for Spanish speakers, and announcements for public open houses were printed and posted in both English and Spanish. Further, flyers announcing the times and locations of public open houses were placed throughout the study area with targeted outreach to high traffic locations, as well as low-income and minority populations.

A public hearing will be held during the 30-day public review period. The purpose of the hearing is to receive comments from the public on the South Bridge EA and the Preferred Alternative identified in the EA. Prior to the hearing, copies of the EA will be made available for public review at local community facilities. Display ads in local newspapers, news releases, and a postcard mailing will announce the availability of the EA for review and the date, time, and location of the hearing.

4.2.5 Environmental Justice Impacts

The Environmental Justice analysis evaluated the Preferred Alternative to determine whether there is a potential for disproportionately high and adverse impacts to minority or low-income populations when compared to populations that are not minority or not low-income in the study area. According to *CDOT's Title VI and Environmental Justice Guidelines for NEPA Projects, Rev. 3* (CDOT, 2005b) a disproportionately high or adverse impact is defined by FHWA as one that is:

- Predominantly borne by a minority and/or low-income population, or
- Suffered by the minority and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that would be suffered by the non-minority/non-low-income population.

An adverse impact may include, but is not limited to:

- Bodily impairment, infirmity, illness, or death.
- Air, noise, water pollution, or soil contamination.
- Destruction or disruption of man-made or natural resources.
- Destruction or diminution of aesthetic values.
- Destruction or disruption of community cohesion or a community's economic vitality.
- Destruction or disruption of the availability of public and private facilities and services.
- Vibration.
- Adverse employment effects.
- Displacement of persons, businesses, farms, or nonprofit organizations.

No Action Alternative

Traffic congestion and safety hazards would worsen in the study area, hindering access to housing, businesses, and community facilities and services for minority and low-income populations, as well as the overall community. While there would be no displacement of minority or low-in-

come residents, businesses, or employees, these communities would be impacted by increased traffic and congestion. Specifically, land use development along the Four Mile Road corridor would result in higher traffic volumes along the Four Mile Road corridor, Midland Avenue and 27th Street. Further, the level of service (LOS) at the intersection of SH 82 and 27th Street would substantially decrease (from existing LOS C to LOS F in 2035).

Noise impacts at six receptors would meet or exceed the NAC under the No Action Alternative. These receptors are located off SH 82, Airport Road, and Four Mile Road. Although noise impacts would occur under the No Action Alternative, noise abatement was not considered because no improvements are proposed.

Preferred Alternative

As most of the study area encompasses low-income and minority communities impacts are predominately borne by these EJ communities. Of all the resources analyzed, noise and visual would have the greatest impact. All the impacted noise receivers were located in Census identified minority communities. Visual changes adjacent to these communities are primarily related to proposed noise barriers. Detailed information on resource impacts can be found in the following sections:

- **Section 4.2.2.2**, *Impacts to Social Resources*
- **Section 4.6.4.2**, *Noise Impacts*
- **Section 4.12.2.2**, *Visual Impacts*

The Preferred Alternative, however, would provide many benefits to minority and low-income populations that would offset any disproportionate effects. Benefits, such as improvements to emergency evacuation routes, emergency service access, and local land use access, would substantially benefit Environmental Justice communities. Emergency service access for services such as fire would be enhanced. Additionally, the inclusion of sidewalks would enhance walking and bicycling amenities for the overall community. Employment benefits during construction would benefit minority and low-income populations. In addition, both vehicle miles traveled (VMT) and vehicle hours of travel would be less, which would result improved air quality and improved mobility. Mitigation efforts for visual and construction impacts, as well as benefits received from the Preferred Alternative, would improve conditions for minority and low-income communities.

The Preferred Alternative would not create a disproportionately high and adverse effect on minority or low-income populations.

4.2.6 Social and Environmental Justice Mitigation

Mitigation for noise and visual resources would address the anticipated community impacts for both EJ and non-EJ communities. Detailed information on resource specific mitigation can be found in the following sections:

- **Section 4.6.7**, *Noise Mitigation*
- **Section 4.12.3**, *Visual Mitigation*

In totality, when considering benefits and mitigation, the noise, visual, and community cohesion impacts to the low-income and minority communities are not considered disproportionately high and adverse.

4.3 Economic Conditions

4.3.1 Existing Conditions

Economic conditions are generally described for Glenwood Springs and Garfield County. Local business and economic activities are discussed to provide an understanding for the economic workings of the area. Economic trends for Glenwood Springs and Garfield County are presented in **Table 4-4**.

As **Table 4-4** shows, both Glenwood Springs and Garfield County have experienced strong economic growth since 1990. Population growth trends in the City have been fairly consistent, while growth in the County slowed between 2000 and 2010 as compared with the prior 10-year period. Median household income increased

dramatically in the City and County between 1990 and 2000. Median household income also increased between 2000 and 2010, but at a lower rate.

The labor force in Garfield County has grown substantially over the last 20 years as shown in **Table 4-4**. Unemployment in the City and the County went down between 1990 and 2000, reflecting a strong local economy. Unemployment in the City has remained relatively low since 2000, but has increased considerably in the County between 2000 and 2010.

Originally based in silver mining (Frontier Historical Society, Glenwood Springs), employment in the City of Glenwood Springs is supplied by tourism and regional services, as well as the gas and oil industry. Strong educational and health services, as well as construction and retail industries exist in the City as well (U.S. Census Bureau, 2000). According to the *Glenwood Springs Fiscal and Economic Policy Guide*, the City is the retail hub for Garfield County. Glenwood Springs has traditionally served as a regional retail and services center for west central Colorado, including Eagle, Rio Blanco, and Pitkin Counties (*Garfield County Socio-Economic Impact Study*, 2007. This is consistent with the fact that Glenwood Springs is a regional service provider; therefore, much of the commercial and public development in the City serves the region as a whole.

The Policy Guide also indicates that the Glenwood Springs economy is less diversified compared to the County and State of Colorado as a whole. Fewer blue collar jobs exist in Glenwood Springs, including jobs in the fields of utilities, construction, manufacturing, wholesale trade, transportation and warehousing, and administrative, and waste services. This is due in part to the lack of affordable and available industrial and light industrial properties (*Glenwood Springs Fiscal and Economic Policy Guide*, 2010).

SH 82 is an important corridor that connects cities south of I-70 along the Roaring Fork River. For the study area, which is in the southern part of the City of Glenwood Springs, SH 82 is the primary access north to I-70 and the only effective access south to cities such as Carbondale, Basalt, Snowmass, and Aspen. There are a number of commercial and light industrial businesses located along both sides of SH 82 in the vicinity of the proposed project's eastern terminus. A cluster of businesses located on the east side of SH 82 north of Red Cañon Road provides services, including manufacture of thermoplastics, appliance repair, security, and gunsmithing. The Holy Cross Energy headquarters is located on the west side of SH 82 and is accessed at Red Cañon Road. Holy Cross Energy is an electric service cooperative with 165 employees providing service to 5 counties in western Colorado.

The south Glenwood Springs area on the west side of the Roaring Fork River is a mix of mostly residential and commercial land uses that surround the Glenwood Springs Municipal Airport. The Glenwood Springs Municipal Airport is open to the public and averag-

Table 4-4 ***Economic Trends 1990-2010***

	Glenwood Springs			Garfield County		
	1990	2000	2010	1990	2000	2010
Population	6,561	7,736	9,614	29,974	43,791	56,389
% change in 10-year period	–	17.9%	24.3%	–	46.1%	28.8%
Per Capita Income	$14,732	$23,449	$32,729	$13,086	$21,341	$28,457
% change in 10-year period	–	59.2%	39.6%	–	63.1%	33.3%
Median Household Income (Dollars)	$28,715	$43,934	$53,882	$29,176	$47,016	$64,902
% change in 10-year period	–	53.0%	22.6%	–	61.1%	38.0%
Labor Force	3,880	4,499	6,086	16,025	23,562	31,668
% change in 10-year period	–	15.9%	36.0%	–	47.0%	34.4%
% of Labor Force Unemployed	3.6%	2.5%	2.6%	4.7%	2.7%	5.6%

Source: U.S. Census Bureau, 1990, 2000, 2010, and 2006-2010 American Community Survey.

es 41 flights a day. The Glenwood Springs Municipal Airport area is identified in the Glenwood Springs Fiscal and Economic Policy Guide as one of the few areas designated for industrial or heavy commercial use in Glenwood Springs (2010).

According to the *Glenwood Springs Comprehensive Plan* (2011), the City supports continued aviation operation at the Glenwood Springs Municipal Airport for the near term. The City recognizes that the Glenwood Springs Municipal Airport provides some economic benefit to the community; however, any facility expansion is constrained both financially and physically, so its long-term viability may be limited (Glenwood Springs 2010). The plan suggests creation of a redevelopment plan for the Glenwood Springs Municipal Airport property. Over the last several years, there have been a number of residential and commercial developments constructed around the Glenwood Springs Municipal Airport, and there are plans for continued development along Four Mile Road in Garfield County.

4.3.2 Economic Impacts

No Action Alternative

No land acquisitions or business relocations in the study area would result from the No Action Alternative. Businesses located on the west side of the Roaring Fork River, around the Glenwood Springs Municipal Airport would continue to access SH 82, the regional transportation route, via Midland Avenue and 27th Street. This circuitous route with limited accessibility could act as a deterrent for planned growth in this area.

Preferred Alternative

The Preferred Alternative would provide additional connectivity to the south Glenwood Springs area, including more direct access to the local Glenwood Springs Municipal Airport and the commercial area around the Glenwood Springs Municipal Airport, strengthening Glenwood Springs as a regional center for employment and services.

Some accesses along both sides of SH 82 would change to improve safety and protect the free flow of the highway. Businesses on the east side of SH 82 that currently access SH 82 where Red Cañon Rd and County Road 154 meet would access SH 82 slightly farther south at a new signalized intersection. These businesses include Airgas Intermountain, Highline Autoworks, Parafon Technology Group, Glenwood Appliance Center, Fiberforge Corp, Go Rentals, Colorado Gunsmithing, and others. CR 154 would act as a frontage road for all of the properties. Similarly, the current signalized intersection of CR 154 and SH 82 farther to the north would be eliminated but businesses on the west side of SH 82 would still have full access to SH 82 at this location. These uses include Mountain View Church, Buffalo Valley Motel and Restaurant, and other businesses along County Road 154, and the El Rocko Mobile Home Park. A new access to the Holy Cross Energy Headquarters would tie into the Preferred Alternative south of the existing building, and the existing direct access to SH 82 would be closed. These changes would improve safety and are not expected to impact business operations since access would be replaced in a nearby location. Overall, the Preferred Alternative would provide increased mobility and access, generally improving business access and viability.

Small portions of several commercial properties would be acquired (see **Section 4.4**). However, none of these acquisitions are expected to impact the business function of the properties or require relocation of the existing use. The tunnel under the Glenwood Springs Municipal Airport runway would require acquisition of 2.2 acres of property, and result in the closure of the airport for approximately 3 months during construction. This would temporarily impact commercial use of the airport. The

nearest alternate airports are at Rifle (25 miles west of Glenwood Springs), Eagle (35 miles to the east), and Aspen (40 miles south of Glenwood Springs). These airports could temporarily serve the air transportation need.

Road construction would provide temporary employment for construction crews. It is estimated that construction could employ as many as 851 employees. The number of construction employees based on 30.6 million dollar construction cost, and an assumed one job supported for every $35,941 in spending on highway and bridge improvements (New England Council 2008). Construction is anticipated to be phased with each phase lasting one construction season (early spring to late fall). The provision of jobs would be beneficial to the community, even though not all jobs would employ local workers, as these workers would buy goods and local services, thereby supporting the local economy.

During construction, temporary detours, out of direction travel, access changes, and construction-related noise would impact businesses along the proposed alignment. These changes would be temporary and would have only minor effects to overall business operations.

4.3.3 Economic Mitigation

Access will be maintained to businesses during construction. New access will be provided for properties where the existing access is removed by the Preferred Alternative. To avoid disruption of business activities during construction, the new access will be provided before the existing access is removed. For additional information regarding access impacts during construction see **Section 4.19**.

CDOT will coordinate with Glenwood Springs Municipal Airport operators and users so that airport closures are communicated in advance of construction.

4.4 Right-of-Way/Relocation

4.4.1 Existing Conditions

The existing uses of the proposed right-of-way were analyzed using current parcel mapping obtained from Garfield County and construction limits for the Preferred Alternative. The proposed right-of-way is currently used for a variety of residential, commercial, municipal, undeveloped, and agricultural uses.

4.4.2 Right-of-way Impacts

No Action Alternative

The No Action Alternative would not require any new right-of-way, property acquisitions, or business and residential relocations in the study area.

Preferred Alternative

The Preferred Alternative would require the acquisition of 10.87 acres of new right of way from 27 parcels (see **Table 4-5** and **Figure 4-5**). Most of the acquisitions come from seven parcels, of which only four are not owned by the City. Most of the acquisitions would be 0.15 acre or less. There would be no displacement of residents, neighborhoods, public facilities, non-profit organizations, or businesses.

Narrow strips of right-of-way, averaging 10 feet wide, would be required along Airport Road from the intersection of Midland Avenue, Four Mile Road, and Airport Road to the south end of the Glenwood Springs Municipal Airport for a new roundabout and bicycle and pedestrian facilities along the alignment.

The Lazy H Slash Eleven owns 292 acres of land adjacent to SH 82 in the southern portion of the study area. A conservation easement upon the northern 7.58 acres of the property was conveyed to the Aspen Valley Land Trust (AVLT). The ranch remains in private ownership; but, by conveying a conservation easement, the owners have created a southern open space buffer between Glenwood Springs and the developing residential subdivisions in unincorporated Garfield County. Substantial

efforts were undertaken during the NEPA process to minimize impact to this conservation easement. The required right-of-way for the Preferred Alternative (1.65 acres) would constitute a small portion of the overall conservation easement and would not jeopardize the overall function or purpose of the conserved area, which is primarily for riverfront and riparian habitat conservation.

4.4.3 Right-of-Way Mitigation

For any person(s) whose real property interests may be impacted by the proposed project, the acquisition of those property interests will comply fully with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended, (Uniform Act). The Uniform Act is a federally mandated program that applies to all acquisitions of real property or displacements of persons resulting from federal or federally assisted programs or projects. It was created to provide for and ensure the fair and equitable treatment of all such persons. To further ensure that the provisions contained within the act are applied uniformly, CDOT requires Uniform Act compliance on any project for which it has oversight responsibility regardless of the funding source. Additionally, the Fifth Amendment of the United States Constitution provides that private property may not be taken for a public use without payment of "just compensation." All impacted property owners will be provided notification of the acquiring agency's intent to acquire an interest in their property including a written offer letter of just compensation specifically describing those property interests. A Right-of-Way Specialist will be assigned to each property owner to assist them with this process. All property owners will be fairly compensated, and should be able to continue the existing use of the property.

All reasonable opportunities to avoid relocations and minimize the impacts of acquisition have been taken in the concep-

Table 4-5 ***Estimates of Right-of-Way Acquisitions***

Map ID #	Property Owner	Approx. Acreage	Existing Land Use	Type of Impact
1	Lazy H Slash Eleven (AVLT conservation easement)	1.65	Agriculture	Partial Acquisition/No Relocation
2	Lazy H Slash Eleven (AVLT conservation easement)	0.02	Agriculture	Partial Acquisition/No Relocation
3	Holy Cross Energy	1.52	Commercial	Partial Acquisition/No Relocation
4	Holy Cross Energy	0.46	Commercial	Partial Acquisition/No Relocation
5	Spencer Charles Holding	0.48	Commercial	Partial Acquisition/No Relocation
6	JLM Holdings	0.11	Commercial	Partial Acquisition/No Relocation
7	Red Cañon Plaza	0.03	Commercial	Partial Acquisition/No Relocation
8	VCP LLC	0.12	Commercial	Partial Acquisition/No Relocation
9	Christopher & Astrid Janusz	0.11	Residential	Partial Acquisition/No Relocation
10	Mountain View Church	0.07	Commercial	Partial Acquisition/No Relocation
11	Buffalo Valley	0.23	Commercial	Partial Acquisition/No Relocation
12	El-Rocko Mobile Home Park	0.01	Residential	Partial Acquisition/No Relocation
13	CLH Properties	0.38	Undeveloped	Partial Acquisition/No Relocation
14	Glenwood Springs Municipal Airport	2.22	Municipal	Partial Acquisition/No Relocation
15	City of Glenwood Springs	1.96	Municipal	Partial Acquisition/No Relocation
16	Silver Sage Preserve	0.74	Undeveloped	Partial Acquisition/No Relocation
17	Mark Iddings	0.23	Residential	Partial Acquisition/No Relocation
18	Kingdom Hall – Jehovah's Witness	0.08	Commercial	Partial Acquisition/No Relocation
19	Heather McGregor & Steven Smith	0.02	Residential	Partial Acquisition/No Relocation
20	John & Roxanne Christner	0.02	Residential	Partial Acquisition/No Relocation
21	Steven & Marty Ochko	0.04	Residential	Partial Acquisition/No Relocation
22	Debra Rivera & Thomas Morton	0.09	Residential	Partial Acquisition/No Relocation
23	Not Known	0.03	Undeveloped	Partial Acquisition/No Relocation
24	Richard Backe Jr.	0.06	Residential	Partial Acquisition/No Relocation
25	Eric & Jean Duncan	0.04	Commercial	Partial Acquisition/No Relocation
26	Raymond & Elisabeth Vath	0.09	Commercial	Partial Acquisition/No Relocation
27	View Point LLC	0.05	Commercial	Partial Acquisition/No Relocation
	Total Acreage	**10.87**		

tual design of the Preferred Alternative. The largest right-of-way requirements result from the new road aligned through the southern portion of the Glenwood Springs Municipal Airport and on undeveloped commercial and agricultural properties. The redesigned accesses along SH 82 have been adjusted to minimize property impacts, while addressing traffic and safety needs.

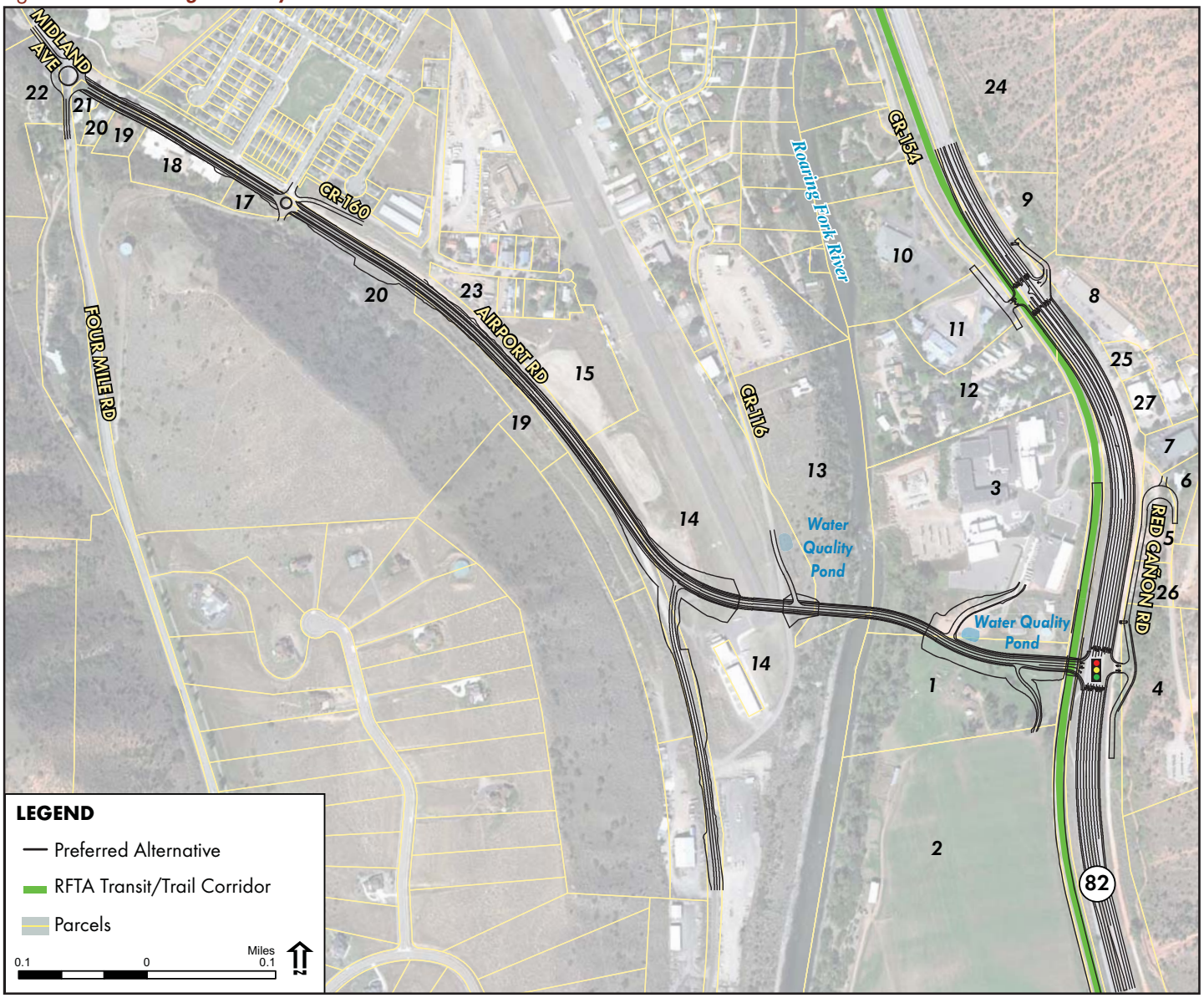
The conservation easement owned by AVLT contains specific stipulations to be followed if any portion of the easement is subject to condemnation. These stipulations will be adhered to if those conditions apply.

4.5 Air Quality

4.5.1 National Ambient Air Quality Standards

The Clean Air Act of 1970, which was last amended in 1990, requires the U.S. Environmental Protection Agency (EPA) to set national ambient air quality standards (NAAQS) for the following pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2),

Figure 4-5 ***New Right-of-Way***



particulate matter (PM_{10} and $PM_{2.5}$), and lead. The State of Colorado has adopted the NAAQS for the above criteria pollutants. **Table 4-6** summarizes the NAAQS.

Areas can be classified as non-attainment, attainment, or maintenance. Geographic areas that exceed a particular NAAQS for a criteria pollutant are considered "non-attainment" areas for that pollutant. Conversely, areas that are below a criteria pollutant standard are considered "attainment." Maintenance areas are defined as previously exceeding the NAAQS (non-attainment) for a criteria pollutant, but are presently attaining that standard. Maintenance areas are required to develop a maintenance plan outlining steps for continued attainment over the maintenance period.

The study area within Garfield County is currently in an attainment area for all criteria pollutants.

4.5.2 Transportation Conformity

The CAA requires that regionally significant and federally funded transportation projects in non-attainment or maintenance areas must meet the transportation conformity regulations. However, since Garfield County is in attainment for all criteria pollutants, the conformity provisions of the Clean Air Act (CAA) do not apply.

4.5.3 Air Quality Monitoring

The Air Pollution Control Division (APCD) at the Colorado Department of Public Health and Environment (CDPHE) monitors criteria pollutant concentrations for the State of Colorado and maintains three ambient monitoring sites in Garfield County. Ozone, $PM_{2.5}$ and PM_{10} are currently monitored in Rifle, while PM_{10} is monitored in Parachute. The Garfield County Board of Health operates and is planning programs monitoring volatile organic hydrocarbons (VOCs), oil industry related emissions and Mobile Source Air Toxics (MSATs) emissions. There are five monitoring stations within Garfield County located in Parachute, Rifle, Silt, Rulison, and Battlement Mesa. According to the Garfield County 2010 Monitoring Report, there have been no exceedances of the NAAQS. In addition, low concentration levels were recorded at a PM_{10} monitoring station in Glenwood Springs during a two-year monitoring program. In 2008, this monitoring station was closed.

4.5.4 Air Quality Impacts

No Action Alternative

Between existing conditions (2008) and the design year (2035), traffic is projected to increase substantially (approximately 70 percent) along SH 82. In addition, VMT would be higher for this alternative compared to the Preferred Alternative since there would be no secondary access over the Roaring Fork River (see **Table 4-7**). The lack of a secondary access results in out of direction travel for drivers, thus increasing VMT. The only access to the west side of the Roaring Fork River is at the 27th Avenue bridge which is north of the study area.

Table 4-6 ***National Ambient Air Quality Standards***

Pollutant	Averaging Time	Primary	Secondary
Ozone	1 hour*	0.12 ppm**	0.12 ppm
Ozone	8 hour	0.075 ppm	0.075 ppm
Carbon Monoxide	1 hour	35 ppm	N/A
Carbon Monoxide	8 hour	9 ppm	N/A
Nitrogen dioxide	1 hour	100 ppb*	N/A
Nitrogen dioxide	Annual	53 ppb	53 ppb
Sulfur Dioxide	1 hour	75 ppb	N/A
Sulfur Dioxide	3 hour	N/A	0.5 ppm
Sulfur Dioxide	24 hour	0.14 ppm	N/A
Sulfur Dioxide	Annual	0.03 ppm	N/A
Particulate Matter (PM_{10})	24 hour	150 ug/m3+	150 ug/m3
Particulate Matter ($PM_{2.5}$)	24 hour	35 ug/m3	35 ug/m3
Particulate Matter ($PM_{2.5}$)	Annual	15 ug/m3	15 ug/m3
Lead	Rolling 3-Month Average	0.15 µg/m3	0.15 µg/m3

* the 1-hour ozone standard has been revoked
**ppm=parts per million by volume; ppb=parts per billion; ug/m3=micrograms per cubic meter.

The Preferred Alternative would not result in the exceedance of any air quality standards.

Congestion due to increased traffic with fewer roadway linkages to facilitate smooth traffic flow crossing over the river will likely cause congestion in the No Action scenario, resulting in deteriorating air quality. However, emissions of hydrocarbons (HC), nitrogen oxides (NOx), PM_{10}, and CO are expected to decrease in the future due to lower emissions rates resulting from stricter EPA engine and fuel standards.

Preferred Alternative

The study area within Garfield County is designated as an attainment area for all criteria pollutants. Therefore, transportation conformity provisions of the CAA do not apply to this project, and project-level CO and PM hot spot analyses (modeling) are not required.

The Preferred Alternative would have a decrease in VMT compared to the No Action Alternative because the proposed South Bridge would provide a shorter route between SH 82 to the west side of the Roaring Fork River (see **Table 4-7**). In addition, there would also be a decrease in the vehicle hours traveled (VHT) due to the secondary access and the alleviation of congestion on other roadways resulting from traffic diverting to the secondary access. This decrease in VMT and VHT would result in decreases in PM_{10}, HC, CO and NOx emissions. In addition, decreases in congestion as a result of travel efficiencies with the Preferred Alternative would tend to reduce concentrations of all air pollutants. Since there would be a decrease in VMT as well as VHT compared to the No Action Alternative, no exceedances of the NAAQS are expected to occur with the Preferred Alternative.

However, proposed improvements along Airport Road would move traffic closer to the residents in the Cardiff Glen Subdivision. In addition, a new alignment (South Bridge) would be constructed near the residents on the Holy Cross Electric property. Therefore, localized emissions of air pollutants are expected near these areas.

Although localized emissions of air pollutants are expected due to increased traffic and alignment shifts, there have been no exceedances of the NAAQS within Garfield County, including the study area. Therefore, exceedances of NAAQS are not anticipated from the project.

Fugitive Dust and Colorado Regulations 1 & 3

Fugitive dust from construction activities is likely to occur during construction. This would be of more concern in the construction areas adjacent to residential or other sensitive areas. The project would be subject to the fugitive dust permitting and control requirements of the Colorado Air

Table 4-7 ***Daily Traffic Volumes, VMT, and VHT***

Roadway	Segment	Length (miles)	2035 No Action			2035 Preferred Alternative		
			Daily Traffic	Daily VMT	Daily VHT	Daily Traffic	Daily VMT*	Daily VHT
27th Street	West of SH 82	0.3	26,000	7,800	312	15,000	4,500	180
Midland Avenue	North of 27th Street	0.3	13,500	4,050	162	13,500	4,050	162
Midland Avenue	North of Four Mile Road	1.3	27,000	35,100	1,404	16,000	20,800	832
Midland Avenue	South of Four Mile Road	0.8	1,000	800	32	13,000	14,300	416
Four Mile	South of Midland Avenue	0.3	18,000	5,400	216	18,000	5,400	216
SH 82	North of 27th Street	0.3	56,500	16,950	424	56,500	16,950	424
SH 82	North of Buffalo Valley	2.2	46,500	102,300	2,558	39,000	93,500	2,338
SH 82	South of Buffalo Valley	0.3	43,500	13,050	237	43,500	13,050	237
	Total	**5.8**		**185,450**	**5,345**		**172,550**	**4,805**

*The segment of Midland south of Four Mile Road includes the 0.3-mile extension for the South Bridge.

Quality Control Commission (CAQCC) Regulation 1 (Emission Control Regulation for Particulate Matter, Smoke, Carbon Monoxide, and Sulfur Oxides for the state of Colorado, effective August 30, 2007) and Regulation 3 (Air Contaminant Emissions Notices, effective January 30, 2009). A Land Development Permit Application, Fugitive Dust Control Plan and appropriate Air Pollutant Emission Notices will need to be prepared and submitted to CDPHE, APCD.

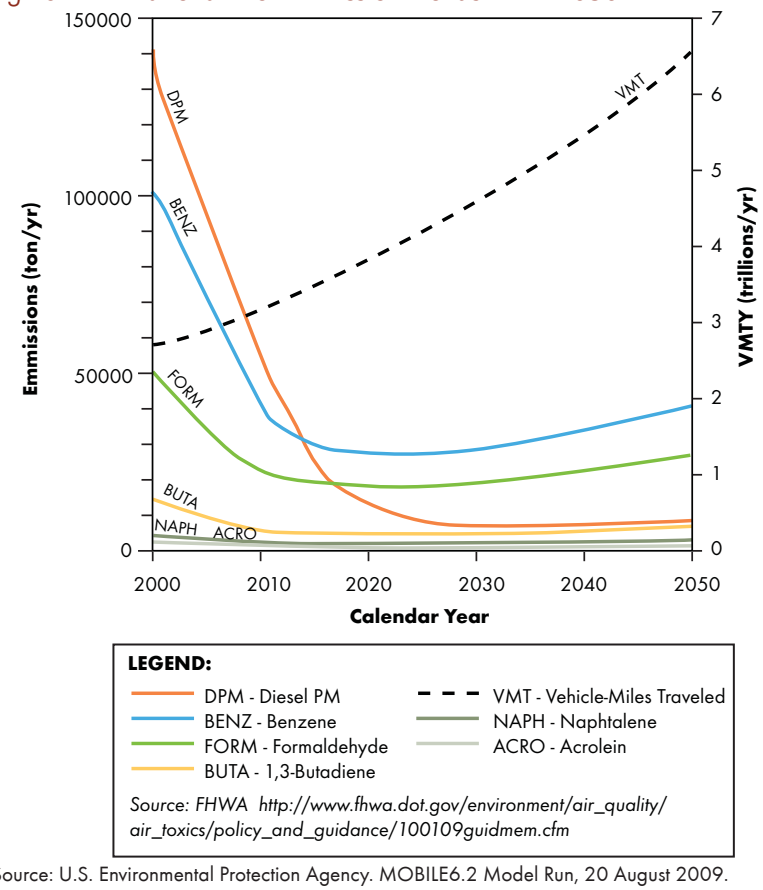
4.5.5 Mobile Source Air Toxics—Compliance with 40 CFR 1502.22

Controlling air toxic emissions became a national priority with the passage of the Clean Air Act Amendments of 1990, whereby Congress mandated that the EPA regulate 188 air toxics, also known as hazardous air pollutants. The EPA has assessed this expansive list in their latest rule on the Control of Hazardous Air Pollutants form Mobile Sources (Federal Register, Vol. 72, No.37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS) (http://www.epa.gov/ncea/iris/index.html). In addition, EPA identified seven compounds with significant contributions from mobile sources that are among the national and regional-scale cancer risk drivers from their *1999 National Air Toxics Assessment* (http://www.epa.gov/ttn/atw/nata1999/). These are acrolein, benzene, 1,3-butadiene, diesel particulate matter plus diesel exhaust organic gases (diesel PM), formaldehyde, naphthalene, and polycyclic organic matter. While FHWA considers these the priority mobile source air toxics, the list is subject to change and may be adjusted in consideration of future EPA rules. The 2007 EPA rule mentioned above requires controls that will dramatically decrease Mobile Source Air Toxics (MSAT) emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE 6.2 model, even if vehicle activity (VMT) increase by 145 percent is assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050, as shown in **Figure 4-6**.

Unavailable Information for Project-Specific MSAT Impact Analysis

In FHWA's view, information is incomplete or unavailable to credibly predict the project-specific health impacts due to changes in MSAT emissions associated with a proposed set of highway alternatives. The outcome of such an assessment, adverse or not, would be influenced more by the uncertainty introduced into the process through assumption and speculation rather than any genuine insight into the actual health impacts directly attribut-

Figure 4-6 ***National MSAT Emission Trends 1999-2050***



Source: U.S. Environmental Protection Agency. MOBILE6.2 Model Run, 20 August 2009.

1. Annual emissions of polycyclic organic matter are projected to be 561 tons/year for 1999, decreasing to 373 tons/year for 2050.
2. Trends for specific locations may be different, depending on locally derived information representing VMT, vehicle speeds, vehicle mix, fuels, emission control programs, meteorology, and other factors.

able to MSAT exposure associated with a proposed action.

The EPA is responsible for protecting the public health and welfare from any known or anticipated effect of an air pollutant. They are the lead authority for administering the Clean Air Act and its amendments, and they have specific statutory obligations with respect to hazardous air pollutants and MSAT. The EPA is in the continual process of assessing human health effects, exposures, and risks posed by air pollutants. They maintain IRIS, which is "a compilation of electronic reports on specific substances found in the environment and their potential to cause human health effects" (EPA, http://www.epa.gov/ncea/iris/index.html). Each report contains assessments of non-cancerous and cancerous effects for individual compounds and quantitative estimates of risk levels from lifetime oral and inhalation exposures with uncertainty spanning perhaps an order of magnitude.

Other organizations are also active in the research and analyses of the human health effects of MSAT, including the Health Effects Institute (HEI). Two HEI studies are summarized in Appendix D of FHWA's *Interim Guidance Update on Mobile source Air Toxic Analysis in NEPA Documents*. Among the adverse health effects linked to MSAT compounds at high exposures are cancer in humans in occupational settings; cancer in animals; and irritation to the respiratory tract, including the exacerbation of asthma. Less obvious is the adverse human health effects of MSAT compounds at current environmental concentrations (HEI, http://pubs.healtheffects.org/view.php?id=282) or in the future as vehicle emissions substantially decrease (HEI, http://pubs.healtheffects.org/view.php?id=306).

The methodologies for forecasting health impacts include emissions modeling, dispersion modeling, exposure modeling, and then final determination of health impacts. Each step in the process building on the model predictions obtained in the previous step. All are encumbered by technical shortcomings or uncertain science that prevents a more complete differentiation of the MSAT health impacts among a set of project alternatives. These difficulties are magnified for lifetime assessments (i.e., 70 years), particularly because unsupportable assumptions would have to be made regarding changes in travel patterns and vehicle technology (which affects emissions rates) over that time frame, since such information is unavailable. The results produced by the EPA's MOBILE6.2 model, the California EPA's Emfac2007 model, and the EPA's DraftMOVES2009 model in forecasting MSAT emissions are highly inconsistent. Indications from the development of the MOVES model are that MOBILE6.2 significantly underestimates diesel particulate matter emissions and significantly overestimates benzene emissions.

Regarding air dispersion modeling, an extensive evaluation of EPA's guideline CAL3QHC model was conducted in a National Cooperative Highway Research Program study (http://www.epa.gov/scram001/dispersion_alt.htm#hyroad), which documents poor model performance at ten sites across the country(three where intensive monitoring was conducted plus an additional seven with less intensive monitoring). The study indicates a bias of the CAL3QHC model to overestimate concentrations near highly congested intersections and underestimate concentrations near uncongested intersections. The consequence of this is a tendency to overstate the air quality benefits of mitigating congestion at intersections. Such poor model performance is less difficult to manage for demonstrating compliance with NAAQS for relatively short time frames than it is for forecasting individual exposure over an entire lifetime, especially given that some information needed for estimating 70-year lifetime exposure

is unavailable. It is particularly difficult to reliably forecast MSAT exposure near roadways, and to determine the portion of time that people are actually exposed at a specific location.

There are considerable uncertainties associated with the existing estimates of toxicity of the various MSAT, because of factors such as low-dose extrapolation and translation of occupational exposure data to the general population, a concern expressed by HEI (http://pubs.healtheffects.org/view.php?id=282). As a result, there is no national consensus on air dose-response values assumed to protect the public health and welfare for MSAT compounds, and in particular for diesel PM. The EPA (http://www.epa.gov/risk/basicinformation.htm#g) and the HEI (http://pubs.healtheffects.org/getfile.php?u=395) have not established a basis for quantitative risk assessment of diesel PM in ambient settings.

There is also the lack of a national consensus on an acceptable level of risk. The current context is the process used by the EPA as provided by the Clean Air Act to determine whether more stringent controls are required in order to provide an ample margin of safety to protect public health or to prevent an adverse environmental effect for industrial sources subject to the maximum achievable control technology standards, such as benzene emissions from refineries. The decision framework is a two-step process. The first step requires EPA to determine a "safe" or "acceptable" level of risk due to emissions from a source, which is generally no greater than approximately 100 in a million. Additional factors are considered in the second step, the goal of which is to maximize the number of people with risks less than one in one million due to emissions from a source. The results of this statutory two-step process do not guarantee that cancer risks from exposure to air toxics are less than one in one million in some cases, the residual risk determination could result in maximum individual cancer risks that are as high as approximately 100 in a million. In a June 2008 decision, the U.S. Court of Appeals for the District of Columbia Circuit upheld EPA's approach to addressing risk in its two-step decision framework. Information is incomplete or unavailable to establish that even the largest of highway projects would result in levels of risk greater than safe or acceptable.

Because of the limitations in the methodologies for forecasting health impacts described, any predicted difference in health impacts between alternatives is likely to be much smaller than the uncertainties associated with predicting the impacts. Consequently, the results of such assessments would not be useful to decision-makers who would need to weigh this information against project benefits, such as reducing traffic congestion, crash rates, and fatalities plus improved access for emergency response, that are better suited for quantitative analysis.

MSAT Project-Level Comparative Analysis

For the two alternatives analyzed, the amount of MSATs emitted would be proportional to the VMT, assuming that other variables such as fleet mix are the same for each alternative. The VMT estimated for the Preferred Alternative is lower than that for the No Action Alternative. Therefore, higher levels of regional MSATs would occur with the No Action Alternative, when compared to the Preferred Alternative. A reduction in VMT would result along Midland Avenue north of Four Mile Road, and along SH 82 north of CR 154, as a result of the new alignment for South Bridge. Currently, 27th Avenue is the only access over the Roaring Fork River. Construction of South Bridge would provide another access across the river, relieving congestion in the study area. Further, emissions would likely be lower than present levels in the design year (2035) as a

result of EPA's national control programs that are projected to reduce annual MSAT emissions by 72 percent between 1999 and 2050. Local conditions may differ from these national projections in terms of fleet mix and turnover, VMT growth rates, and local control measures. However, the magnitude of the EPA-projected reductions is so great (even after accounting for VMT growth) that MSAT emissions in the study area are likely to be lower in the future with either the No Action Alternative or the Preferred Alternative.

The additional auxiliary lanes proposed along SH 82 would have the effect of moving some traffic closer to nearby homes and businesses. In addition, traffic would move closer to nearby residents and a school along Midland Avenue and Airport Road as a result of the proposed roundabouts and near residents on the Holy Cross Energy property. Therefore, there may be localized areas where ambient concentrations of MSATs could be higher with the Preferred Alternative than the No Action Alternative. However, the magnitude and the duration of these potential increases compared to the No Action Alternative cannot be reliably quantified due to incomplete or unavailable information in forecasting project-specific MSAT health impacts. On a regional basis, EPA's vehicle and fuel regulations, coupled with fleet turnover, would over time cause substantial reductions that, in almost all cases, would cause regionwide MSAT levels to be significantly lower than today.

4.5.6 Air Quality Mitigation

Air Quality Mitigation during Construction

Fugitive dust will be controlled by watering, stabilization, or other measures, as needed. See **Table 4-8** for BMPs to be used during construction.

MSAT Mitigation Strategies

Lessening the effects of MSATs should be considered for projects with substantial construction-related MSAT emissions that are likely to occur over an extended building period, and for post-construction scenarios where the NEPA analysis indicates potentially meaningful MSAT levels. Such mitigation efforts should be evaluated based on the circumstances associated with individual projects, and they may not be appropriate in all cases. However, there are a number of available mitigation strategies and solutions for countering the effects of MSAT emissions.

Mitigation for Construction MSAT Emissions

Construction activities may generate a temporary increase in MSAT emissions. Project-level assessments that render a decision to pursue construction emission mitigation will benefit from a number of technologies and operational practices that should help lower short-term MSATs. In addition, the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users has emphasized a host of diesel retrofit technologies in the law's Congestion Mitigation and Air Quality program provisions - technologies that are designed to lessen a number of MSATs.

Table 4-8 ***Potential Air Quality Control Measures***

Fugitive Dust Source	Possible Control Measures
Haul roads	Watering and application of chemical stabilizers as necessary. Speed limit signs will be posted.
Disturbed areas	Watering, soil compaction, and revegetation will be employed as needed and appropriate for given conditions.
Active construction areas	Watering will be employed as appropriate. Under extreme wind or dust conditions, temporary curtailment of earthmoving activity may be necessary.
Haul trucks	Haul trucks will be covered as needed and appropriate to reduce dust. Haul truck speed will be limited on unpaved road sections.

Source: Colorado Air Quality Control Commission

Project construction mitigation includes, but is not limited to, the following strategies designed to reduce engine activity or reduce emissions per unit of operating time.

- Develop construction truck routing and hauling plan to reduce the number of trips and periods of avoidable extended idling;
- Encourage use of lower emissions vehicles and technology retrofitted equipment such as particulate matter traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions;
- Assuring well maintained equipment; and
- Ensure the use of clean fuels, such as ultra-low sulfur diesel, biodiesel, or natural gas.

Post-Construction Mitigation for Projects with Potentially Significant MSAT Levels

Significant MSAT levels are not anticipated post-construction. Therefore, project specific mitigation after the project is constructed is not required. However, post-construction programmatic mitigation would include the introduction of Engines Off! Colorado, an idling reduction program offered to local schools and communities to help educate parents, school bus drivers and students about the health benefits of engine idling emissions reduction at a grass roots level. The program has been initiated in several Garfield County schools in 2012 in cooperation with Garfield County Department of Public Health, CDOT, EnCana Natural Gas, and Clean Energy Economy for the Region (CLEER).

4.6 Noise

4.6.1 Noise Abatement Criteria

The FHWA Noise Abatement Criteria (NAC) defines noise levels for land activity categories. The CDOT has adopted these NAC and defines noise levels that if approached (1 dBA less than the FHWA NAC) or exceeded, require noise abatement consideration (see **Table 4-9** for various land use categories). FHWA guidelines also state that noise abatement should be considered when the noise levels substantially exceed the existing noise levels (23 CFR 772). This criterion is defined by CDOT as increases in the Leq of 10.0 dBA or more above existing noise levels.

Based on CDOT's noise guidance, noise barriers and barrier/berms were evaluated at four locations and determined both feasible and reasonable at three locations.

4.6.2 Methodology

The methodology employed for this analysis is consistent with CDOT guidelines for

Table 4-9 ***CDOT Noise Abatement Criteria, Hourly A-Weighted Sound Level Decibels (dBA)***

Activity Category	Activity Leq(h)*	Evaluation Location	Description of Activities
A	56	Exterior	Lands on which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B1	66	Exterior	Residential
C1	66	Exterior	Active sport areas, amphitheaters, auditoriums, campgrounds, cemeteries, day care centers, hospitals, libraries, medical facilities, parks, picnic areas, places of worship, playgrounds, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, recreation areas, Section 4(f) sites, schools, television studios, trails, and trail crossings.
D	51	Interior	Auditoriums, day care centers, hospitals, libraries, medical facilities, places of worship, public meeting rooms, public or nonprofit institutional structures, radio studios, recording studios, schools, and television studios.
E1	71	Exterior	Hotels, motels, offices, restaurants/bars, and other developed lands, properties or activities not included in A–D or F.
F	N/A	N/A	Agriculture, airports, bus yards, emergency services, industrial, logging, maintenance facilities, manufacturing, mining, rail yards, retail facilities, shipyards, utilities (water resources, water treatment, electrical), and warehousing.
G	N/A	N/A	Undeveloped lands that are not permitted for development.

Source: Colorado Department of Transportation, Noise Analysis and Abatement Guidelines, June 2011 (Updated February 2013).
1Includes undeveloped lands permitted for this activity category.
* = Hourly A-weighted sound level in dBA, reflecting a 1-dBA approach value below 23CFR772 values.
N/A = Not applicable.

analyzing traffic noise. FHWA's approved Traffic Noise Model (TNM 2.5) was used for this analysis. The basic inputs to noise modeling include roadway network layout, site characteristics, traffic volume projections, fleet mix, and vehicular operating speeds. Roadway and receptor geometry was included based on a civil design CAD file and aerial photography. The files used for this analysis were based on UTM datum; and x, y, and z coordinates were input into the TNM. All input and output files for TNM 2.5 are included in the *South Bridge Environmental Assessment Noise Technical Report* (Jacobs 2011).

Sensitive Receptors

CDOT noise policy requires a noise analysis to include all receptors within a study area that are likely to be impacted by noise, typically defined within a minimum 500-foot "halo" from any of the proposed project's roadway or areas likely to experience NAC levels of noise. Noise sensitive receptors within the study area include a motel, places of worship, a mobile home park, school, recreation area, and residential development. The noise sensitive receptors are listed below and depicted on **Figure 4-7**. Noise sensitive receptors are those areas where frequent outdoor human use would occur that may be impacted by existing and/or future transportation conditions. Noise receptors include:

- Single Family Residential Dwellings located off Mt Sopris Drive (R1 – R3)
- Single Family Residential Dwellings located off Midland Avenue (R4 – R6)
- Single Family Residential Dwellings located off Four Mile Road (R7 – R11)
- Single Family Residential Dwellings located off Airport Road (R12 – R14)
- Kingdom Hall – Jehovah's Witness (R15)
- Sopris Elementary School (R16)
- Cardiff Glen Subdivision (R17 – R54)
- Single Family Residential Dwellings located off CR160 (R55 – R66)
- Mountain View Church (R67)
- Buffalo Valley Motel (R68 – R70)
- Single Family Residential Dwellings located off CR 116 (R71 – R73)
- El-Rocko Mobile Home Park (R74 – R103)
- Single Family Residential Dwellings located on Holy Cross Energy Property (R104 – R112)
- Single Family Residential Dwellings located on Lazy H Slash Eleven Ranch Property (R113)
- Single Family Residential Dwellings located off SH 82 (R114 and R115)
- Rio Grande Trail Crossing located near CR 154 and the proposed South Bridge connection (R116 and R117)

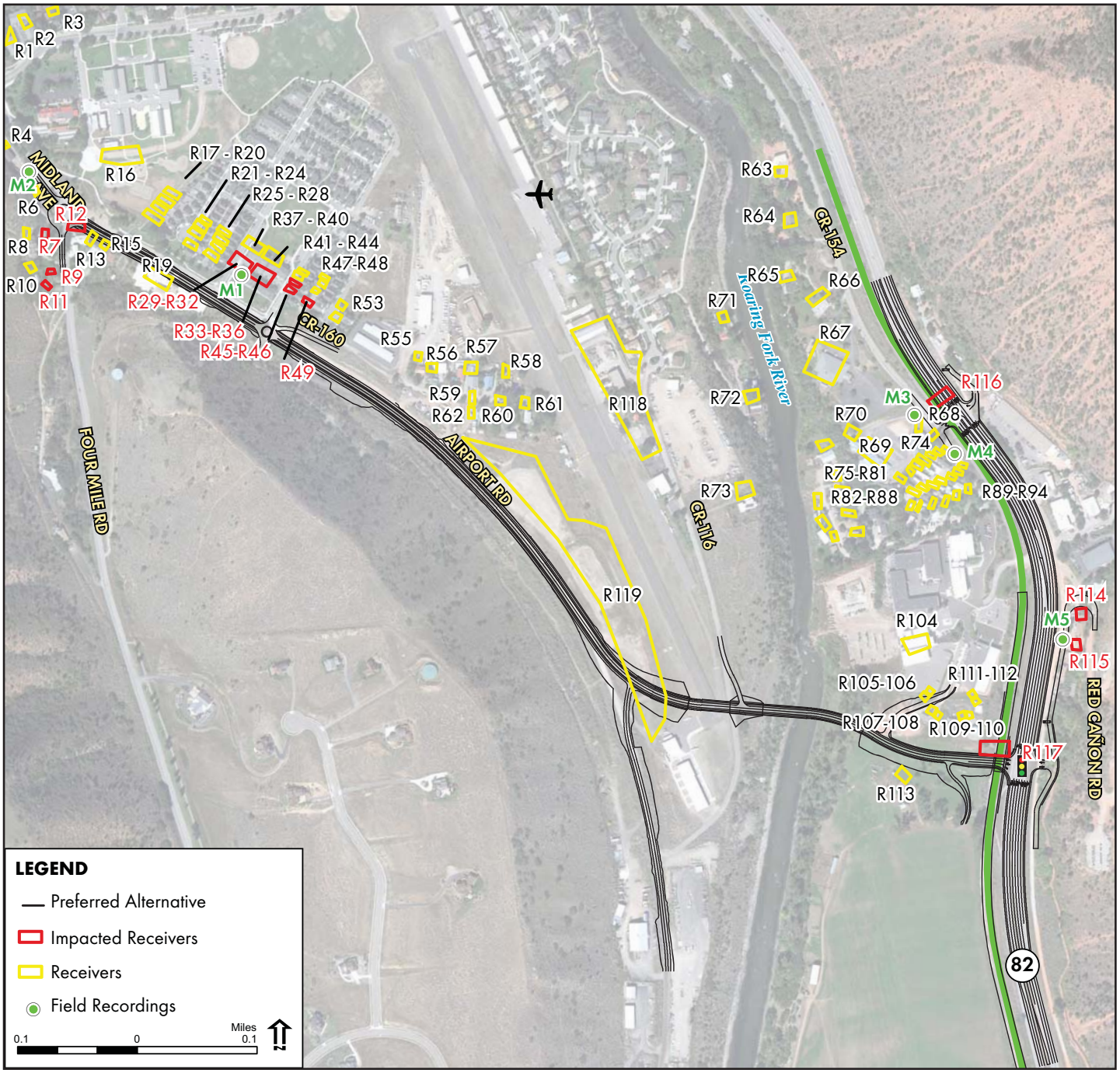
Although the following receptors would normally not be included in the noise analysis, they have been included for the following reasons based on discussions with CDOT:

- **Airport offices and buildings (historic sites) located off Airport Road (R118)** - even though there is no frequent human outdoor use at the airport offices and buildings, they have been included in the noise analysis because they are eligible for listing on the National Register of Historic Places.
- **Rodeo Grounds/Future Park (currently vacant) located off Airport Road (R119)** – this site is planned for a future park, but future parks are not included in the 2011 noise policy. The future park was treated as "joint planning" and exempt from Section 4(f). However, based on discussions with

CDOT, the future park was included in the noise analysis to verify future noise levels.

There were no category A land use activities identified within the study area. Category D activities (indoor noise levels) were not considered since exterior outdoor uses exist on the properties which would be considered a category B or C activity and are listed above. Category E activities, such as Holy Cross Energy, were identified within the study area. However, frequent outdoor uses were not identified at these sites and therefore not included in this analysis. Category F activities, such as airports, industrial, and utilities, were identified within the study area. However, these

Figure 4-7 ***Noise Sensitive Receptors***



activities are not considered noise sensitive sites and were therefore not included in the noise analysis.

Historic sites, including the coke ovens and railroad corridor, were identified in the study area. However, the coke ovens are listed for their significance associated with the manufacturing industry which is not considered a noise sensitive site and therefore not included in the noise analysis. In addition, the railroad corridors do not have frequent human outdoor use and therefore were not considered a noise sensitive site and were not included in the noise analysis.

Noise Measurements

In January 2008 and August 2010, noise measurements were taken at five locations within the study area to determine ambient noise levels. Locations of the field measurements are depicted on **Figure 4-7**. The difference between the field recordings and the model predicted noise levels was 3 A-weighted decibels (dBA) or less, which is considered validated. Three decibels is relevant because the human ear can detect change over 3 dBA. Detailed information on the noise measurements and model validation can be found in the *South Bridge Environmental Assessment Noise Technical Report* (Jacobs 2011).

Noise levels would increase on Airport Road because of increased traffic volumes. Noise abatement, including noise barriers, has been recommended in this area.

4.6.3 Prediction of Existing and Future Noise Levels

Under existing conditions, three noise-sensitive receptors (R114, R115, and R116) are impacted by traffic noise within the study area.

The Glenwood Springs Municipal Airport is located within the study area. However, the TNM software does not account for aircraft noise. Therefore, the modeled noise levels represent traffic noise only. It is anticipated that existing noise levels would be higher than the modeled noise levels shown in **Table 4-10** due to aircraft noise.

The modeled noise levels for the Existing, No Action future and the Preferred Alternative future conditions are presented in **Table 4-10**.

4.6.4 Noise Impacts

No Action Alternative

There would be no improvements under the No Action Alternative. However, as shown in **Table 4-10**, eight receptors (R6, R7, R9, R12, R114, R115, R116, and R117) would meet or exceed the NAC under the No Action Alternative. These receptors are located off SH 82, Airport Road, and Four Mile Road.

Although noise impacts would occur under the No Action Alternative, noise abatement was not considered because no improvements are proposed.

Preferred Alternative

There would be a substantial increase (approximately 40 percent) over existing traffic volumes within the study area, especially along Airport Road, since travelers would be using Airport Road and South Bridge to access SH 82. In addition, traffic would be moving closer to receptors as a result of the proposed roundabouts along Midland Avenue and Airport Road and the auxiliary and turn lanes along SH 82. Therefore, noise levels are anticipated to increase in the future within the study area.

Eight noise sensitive receptors (R7, R9, R11, R12, R114, R115, R116, and R117) would meet or exceed the NAC as a result of the Preferred Alternative. In addition, there are 14 noise sensitive receptors (R9, R11, R29 - R36, R44 - R46, and R49) that would experience a substantial noise increase (10 dBA or more) over existing conditions. Of these 14 noise sensitive receptors, 2 (R9 and R11) also meet or exceed the NAC. Impacted receptors are located throughout the study area (see **Figure 4-7**). Noise abatement was considered for all impacted receptors.

Table 4-10 ***Modeled Noise Levels***

Receptor #	# of Receptors By Activity	NAC	Existing (dBA)	No Action Alternative (dBA)	Preferred Alternative (dBA)	Difference Between Future and Existing Noise Level (+ or -)(dBA)	Build Impact
Receptors off Mt. Sopris Drive							
R1 – R3	3 - SF	66	50	55	53	+3	No
Receptors off Midland Avenue							
R4 - R5	2 - SF	66	59	64	61	+2	No
R6	1 - SF	66	60	66	64	+4	No
Receptors off Four Mile Road							
R7	1 - SF	66	62	69	70	+8	Yes
R8	1 - SF	66	55	61	62	+7	No
R9	1 - SF	66	61	67	71	+10	Yes
R10	1 - SF	66	53	60	62	+9	No
R11	1 - SF	66	58	65	68	+10	Yes
Receptors off Airport Road							
R12	1 - SF	66	63	70	72	+9	Yes
R13 - R14	2 - SF	66	57	62	65	+8	No
R15	1 - PW	66	51	56	59	+8	No
R16	1 - S	66	52	58	58	+6	No
R118	1 – H	66	52	54	56	+4	No
R119	1 – P	66	54	58	61	+7	No
Receptors in Cardiff Glen Subdivision							
R17 - R28	12 - SF	66	52	57	60	+8	No
R29 - R36	8 - SF	66	49	54	59	+10	Yes
R37 - R43	8 - SF	66	44	48	52	+8	No
R44 - R46	3 - SF	66	44	47	54	+10	Yes
R47 - R48	2 - SF	66	47	50	55	+8	No
R49	1 - SF	66	50	54	60	+10	Yes
R50 - R54	5 - SF	66	47	51	56	+9	No
Receptors off CR 160							
R55 - R66	12 - SF	66	49	53	55	+6	No
R67	1 - PW	66	55	57	57	+2	No
R68 - R70	3 - M	71	61	63	63	+2	No
R71 – R73	3 - SF	66	49	51	52	+3	No
Receptors in El-Rocko Mobile Home Park							
R74 - R103	29 -MHP	66	61	63	63	+2	No
Receptors on Holy Electric Property							
R104 - R112	9 - SF	66	55	58	58	+3	No
Receptor on Lazy H Slash Eleven Ranch Property							
R113	1 - SF	66	54	56	57	+3	No
Receptors off Highway 82							
R114	1 - SF	66	67	69	69	+2	Yes
R115	1 – SF	66	67	69	69	+2	Yes
R116	1 – TC	66	68	70	71	+3	Yes
R117	1 – TC	66	64	66	66	+2	Yes

SF = Single Family Resident PW = Place of Worship MHP = Mobile Home Park M = Motel H=Historic Property
P=Park TC=Trail Crossing S=School

4.6.5 Noise Abatement and Mitigation Analysis

Impacted areas have been evaluated for abatement according to CDOT Noise Analyses and Abatement Guidelines (2011). Noise Abatement Determination worksheets (Form 1029) are required to be completed for all impacted noise sensitive receptors within the study area and are included in the *South Bridge Environmental Assessment Noise Technical Report* (Jacobs 2011).

The following four noise abatement measures were considered for this project: alteration of the vertical or horizontal roadway alignment, noise buffers by acquisition of undeveloped land, traffic management, and noise barriers. The *South Bridge Environmental Assessment Noise Technical Report* (Jacobs 2011) provides further information on these noise abatement measures. Noise barriers were the only measure analyzed for this project. A summary of why the other measures were not considered or analyzed for this project is included in the *South Bridge Environmental Assessment Noise Technical Report* (Jacobs 2011).

According to CDOT guidelines, all locations that are projected to experience noise impacts must consider the "feasibility and reasonableness" of mitigation. The feasibility analysis of mitigation considers such factors as the effectiveness of a barrier to achieve at least a 5-dBA noise reduction in predicted future noise levels, in addition to constructability, engineering, maintenance, or other design issues. The barrier cannot create a safety or unacceptable maintenance problem or engineering fatal flaw such as reduction of line-of-sight, accessibility deficiencies, icing, or other notable roadway maintenance concerns.

Noise mitigation is considered reasonable if it meets the following criteria:

- Noise reduction design goal of 7 dBA.
- The cost benefit index of $6,800 or less per receptor per decibel noise reduction.
- A majority of benefited receptors' desire for a noise barrier, as identified through a Benefited Receptor Survey of occupants and/or owners. A benefited receptor is one that receives a 5 dBA or more noise reduction resulting from the noise barrier. This includes any benefited receptor whether impacted or not.

Noise barriers were not modeled for the individual residential receptors adjacent to Four Mile Road and at the trail crossings since gaps would be required for access points rendering the barriers ineffective. Further, placing walls close to access points would result in inadequate sight distance, which would be a safety concern, and therefore would not meet the feasibility criteria for construction.

The mitigation analysis identified two areas where noise barriers could meet these criteria. The *South Bridge Environmental Assessment Noise Technical Report* (Jacobs 2011) provides detailed information on the mitigation analysis. In addition, the Noise Abatement Determination worksheets summarize the mitigation recommendations and identify additional decision criteria used to evaluate the feasibility and reasonableness of the noise barriers. See the *South Bridge Environmental Assessment Noise Technical Report* (Jacobs 2011).

The following summarizes the mitigation analysis for each area.

Residences Adjacent to Airport Road and CR 160 (Cardiff Glen Subdivision)

Noise barriers, combination barrier/berms, and earthen berms were considered for the residences in this area. The noise abatement measures were modeled within the existing public road right-of-way (approximately 15 feet east of the proposed sidewalk).

Noise Barriers

Noise barriers (Barriers 1a-1c) were modeled at heights ranging from 12 feet to 14 feet tall within the Airport Road and CR 160 rights-of-way adjacent to the residences in the Cardiff Glen Subdivision. The noise barriers were also modeled with wing walls near access points and at appropriate setbacks (approximately 10 feet) from adjacent roadways to avoid sight distance constraints.

The noise barriers meet the 5 dBA feasible noise reduction criteria for at least one receptor and the reasonable noise reduction criteria of at least 7 dBA for at least one receptor. The cost per benefited receptor with a 12-foot-tall barrier is $6,387, which meets CDOT's cost reasonable criteria of $6,800. Therefore, a 12-foot-tall noise barrier would be feasible and reasonable for the noise receptors in this area.

Figure 4-8 shows the location and cross-section of the noise barrier.

Combination Barrier/Berms

A combination noise barrier/berm was modeled on top of a three foot fixed height earthen berm (Combination Barrier 1a-1b). The berm was modeled on a 3:1 slope. The combination mitigation was modeled in heights ranging from twelve feet to fourteen feet tall (nine to eleven foot tall barrier on top of a three foot tall berm) within the Airport Road right-of-way adjacent to the residences in the Cardiff Glen Subdivision. A combination barrier/berm was not modeled for the residences adjacent to CR 160 in the Cardiff Glen Subdivision due to limited space between the roadway and the receptors (Barrier 1c). However, a twelve foot tall noise barrier was modeled for these residences.

Figure 4-9 shows the location and cross-section of the noise barrier/berm.

The combination barrier/berm (Combination Barrier 1a-1b) meets the 5 dBA feasible noise reduction criteria for at least

Figure 4-8 ***Location and Cross-Section of Noise Barriers***

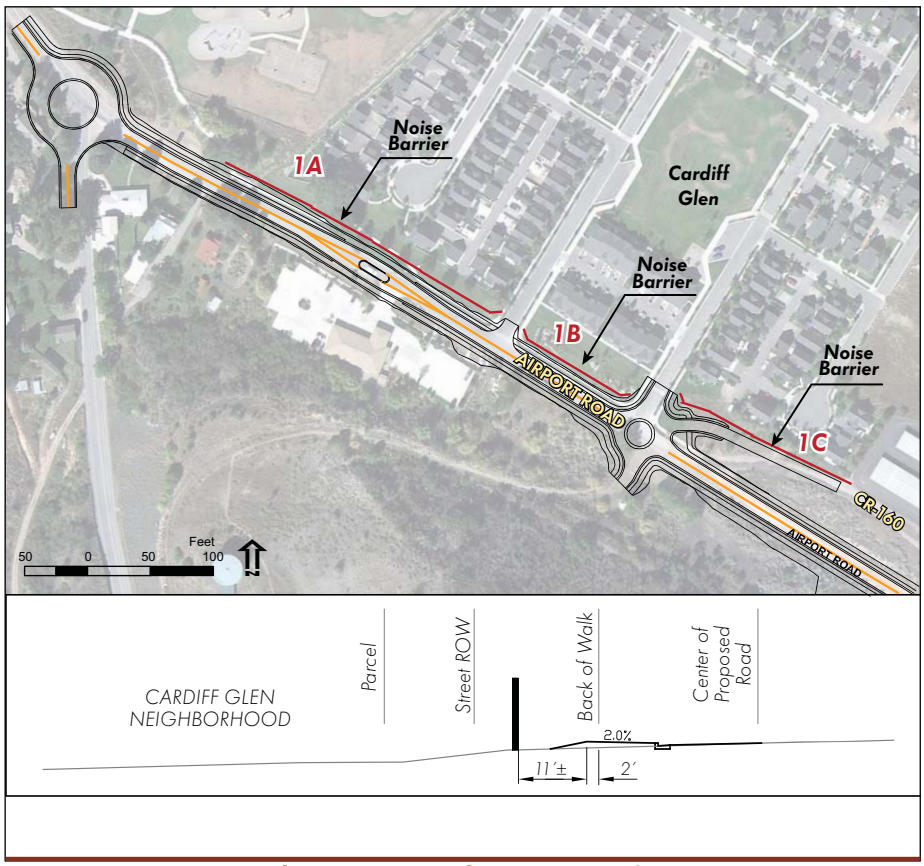
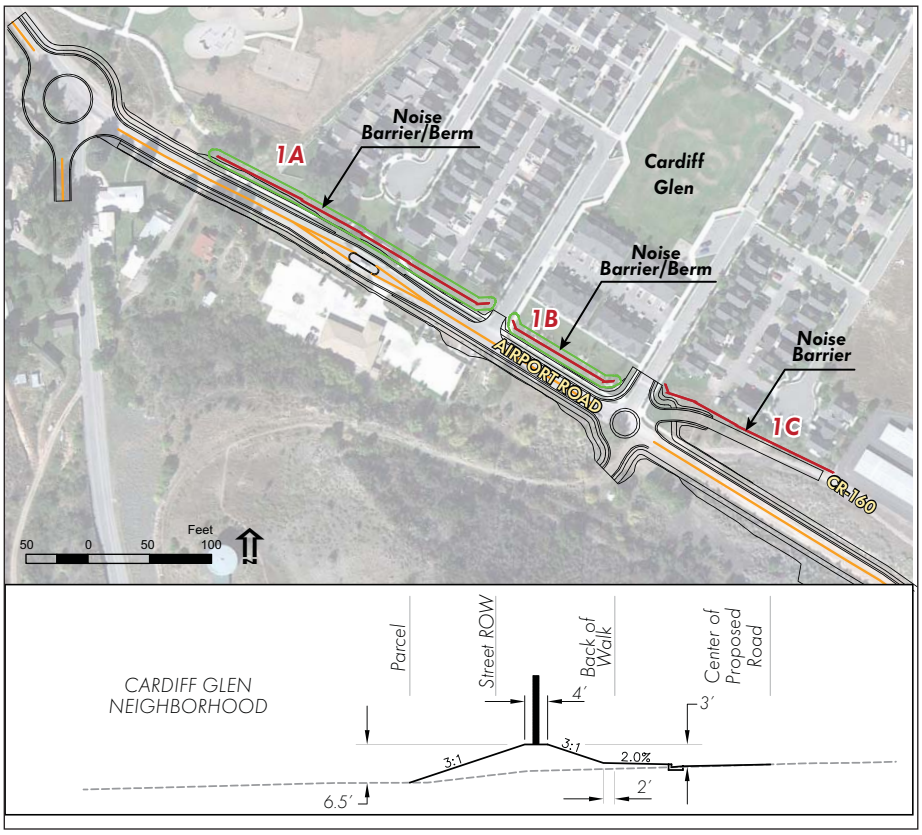


Figure 4-9 ***Location and Cross-Section of Noise Barrier/Berms***



A Benefitted Receptors Survey allows CDOT to solicit current residential occupants and property owners' opinions to build or to not build noise abatement measures recommended for a project.

one receptor and the reasonable noise reduction criteria of at least 7 dBA for at least one receptor. The cost per benefited receptor with a combination barrier/berm is $6,170 which is below CDOT's cost reasonable criteria of $6,800. Therefore, a combination barrier/berm would be feasible and reasonable for the noise receptors in this area.

Earthen Berms

Earthen Berms (Barriers 1a-1b) were considered within the Airport Road right-of-way adjacent to the residents in the Cardiff Glen Subdivision. However, a berm of at least 12 feet tall would be required, which is not feasible because of limited space in between the receptors and the roadway. An earthen berm would also not be feasible for the residences adjacent to CR 160 in the Cardiff Glen Subdivision because of limited space between the roadway and the receptors (Barrier 1c).

Residences Adjacent to SH 82 and Frontage Road

A noise barrier (Barrier 2) was modeled at heights ranging from 12 feet to 16 feet tall within the CDOT right-of-way for the receptors adjacent to SH 82 and the frontage road. **Figure 4-10** shows the location of modeled Barrier 2.

Earthen berms were considered, but deemed infeasible because of topographic constraints, as well as limited widths between the proposed improvements and the receptors (berms would need to be placed in between the roadway and the receptors). In addition, placement of mitigation outside of the CDOT right-of-way would result in gaps in the wall due to access constraints rendering the barrier ineffective.

The noise barrier (Barrier 2) meets the 5 dBA feasible noise reduction criteria for at least one receptor and the reasonable noise reduction criteria of at least 7 dBA for at least one receptor. However, the cost per benefited receptor is $25,961, which exceeds CDOT's cost reasonable criteria of $6,800. Therefore, a noise barrier would not be feasible and reasonable for the noise receptors in this area.

4.6.6 Construction Noise

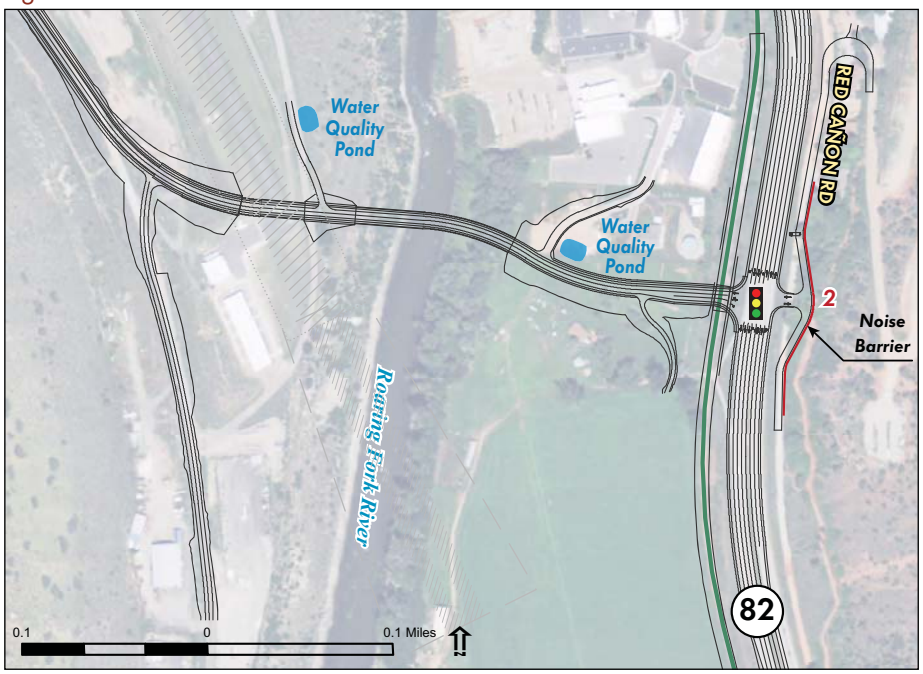
Construction noise would be temporary and generated from diesel-powered earth-moving equipment, such as dump trucks and bulldozers, back-up alarms on certain equipment, compressors, pile drivers, and potential rock-blasting activities.

4.6.7 Noise Mitigation

At this time, the evaluated noise barriers (Barriers 1a-1c) and combination barrier/berms (Barriers 1a-1b) meet the feasible and reasonable criteria. Therefore, noise mitigation is recommended for the impacted receptors in the Cardiff Glen Subdivision.

Benefited Receptor Surveys will be conducted at the time of final design of the construction project for the recommended noise walls to assess the desires of the benefited residents and owners. Noise barriers will only be constructed if more than 50% of the respondents want the noise barriers.

Figure 4-10 ***Location of Noise Barrier***



If future substantial changes are made to design elements of the project from what has been analyzed for this project, the noise analysis will be reassessed to evaluate the impact of those changes.

Construction-related activities will adhere to local ordinances. Mitigation for construction-related noise impacts include limiting construction activities, to the extent practicable, to daytime hours when higher ambient noise levels are more tolerable, using noise blankets or other muffling devices on equipment and quiet-use generators at noise sensitive receptors, using well-maintained equipment and having equipment inspected regularly, and locating haul roads away from noise-sensitive receptors.

4.7 Water Resources and Water Quality

Regionally, the study area lies within the Colorado River Basin, which supplies water to over 27 million people in the southwestern U.S., as well as irrigating 3.5 million acres of farmland. The headwaters of the Colorado River are in Rocky Mountain National Park and the river and its tributaries drain an area of 246,000 square miles covering portions of seven states.

Locally, the study area lies within the Roaring Fork Watershed, which covers an area of 1,451 square miles. (United States Geological Survey [USGS] hydrological unit #14010004). The majority of stream flow originates as snowmelt, creating high flow conditions from May to July, with peak flows in June, and low flows from October to March. Some water from the Roaring Fork River is diverted upstream from the study area and is transported via pipeline to communities along the Front Range. Two of the five largest transbasin diversion projects in Colorado, the Twin Lakes Transmountain Diversion System and the Fryingpan-Arkansas Project, divert 8 percent of the water from the watershed to the Arkansas River Basin on the eastern side of the Continental Divide.

This section summarizes the existing conditions of, and potential impacts to, water resources in the study area. Several facets of water resources were evaluated, including water quality (physical, chemical, and biological integrity), water supply, and stormwater management. A watershed-based approach was used to assess the affected environment, impacts, and mitigation strategies. The watershed-based approach is increasingly being used to manage water resources in the State of Colorado. This management philosophy is consistent with directives and guidance developed by CDPHE and EPA.

4.7.1 Existing Conditions

Surface Water

Glenwood Springs is located at the confluence of two major surface water bodies, the Colorado River and Roaring Fork River.

The Roaring Fork River is a "Gold Medal Water", which means it is a high quality cold-water habitat and has the capability to produce many quality size (14 inches or longer) trout.

Roaring Fork River

The Roaring Fork River, stretching from its headwaters at Independence Pass to its confluence with the Colorado River, runs directly through the study area (see **Figure 4-11**). The river is monitored by a USGS stream gauge upstream and downstream of the study area for discharge and stream flow regimes.

At the downstream monitoring station, 1.5 miles below the study area, the annual mean discharge is 458 cubic feet per second (cfs) (USGS station #09085000).

The CDPHE has classified the segment of the Roaring Fork River and its tributaries that drain into the study area with the following designations:

- **Class I Cold Water Aquatic Life.** These are waters that currently are capable of sustaining a wide variety of cold water biota, including sensitive species; or could sustain such biota but for correctable water quality conditions. Waters shall be considered

capable of sustaining such biota where physical habitat, water flows or levels, and water quality conditions result in no substantial impairment of the abundance and diversity of species.

- **Recreation.** These surface waters are used for primary contact recreation or have been used for such activities since November 28, 1975.
- **Domestic Water Supply.** These surface waters are suitable or intended to become suitable for potable water supplies. After receiving standard treatment (defined as coagulation, flocculation, sedimentation, filtration, and disinfection with chlorine or its equivalent), these waters will meet Colorado drinking water regulations and any revisions, amendments, or supplements thereto.
- **Agriculture.** These surface waters are suitable or intended to become suitable for irrigation of crops usually grown in Colorado and which are not hazardous as drinking water for livestock.

Figure 4-11 ***Water Resources Within the Study Area***

Landis Creek, a perennial tributary to the Roaring Fork River, drains into the Roaring Fork River, having flowed adjacent to Red Cañon Road.

The Thompson Glen Ditch Company, formerly the Glenwood Ditch Company, operates an irrigation ditch which terminates within the study area. The ditch, originally decreed in 1900, diverts water from the Crystal River, located approximately 5.5 miles upstream of the study area. Historically, the ditch delivered irrigation water from its diversion to Glenwood Springs. Presently, the ditch, which receives a flow rate of 50 cfs, is now maintained only from its headwaters until Holy Cross Electric, with most return flows entering the Roaring Fork River via Cattle Creek, approximately four miles south of the study area.

Colorado River

The Colorado River lies approximately 2.5 miles downstream from the study area at its confluence with the Roaring Fork River. Whereas it is not within the study area limits, it is possible that the construction and maintenance of the Preferred Alternative could indirectly impact the water quality of the river or impact the water quality control structures designed to protect the river.

The Colorado River is monitored by USGS, in conjunction with the Colorado River Water Conservation District, to assess discharge and flow regimes downstream from Glenwood Springs. The annual mean discharge between 1967 and 2008 is 1420 cfs as measured 0.6 mile downstream from the confluence with the Roaring Fork River (USGS station #09085100). The typical highest stream flows occur during the spring runoff period from May to June, and the typical low flow periods occur during the winter months.

The segment of the Colorado River between Roaring Fork River and Parachute Creek (between the City of Glenwood Springs and the Town of Parachute) has the same designations as the Roaring Fork River within the study area, Class I Cold Water Aquatic Life, Agriculture, Recreation, and Domestic Water Supply.

Groundwater

Groundwater, while present in the study area, does not see intensive use since surface waters meet the drinking water demand. Glenwood Springs is underlain by the eastern edge of the Colorado Plateau, specifically the Uinta-Animas Aquifer and Dakota-Glen Aquifer. Both of these aquifers primarily consist of permeable, moderately to well-consolidated sedimentary rocks (USGS Groundwater Atlas of the U.S., http://capp.water.usgs.gov/gwa/ch_c/C-text8.html, accessed on 4/14/08).

Water Quality

The Federal Clean Water Act (CWA) of 1972 is the primary regulation established to protect and restore the quality of the nation's navigable waters. The CWA requires states to classify the intended uses (designated uses) of all surface water bodies and to develop criteria to protect the designated uses of these water bodies. Within Colorado, the CDPHE has established regulations that identified the designated uses and water quality standards. Colorado currently has five designated uses for surface water bodies: agriculture, water supply, recreational, aquatic life, and wetlands.

The CWA requires states to publish an annual list of water bodies that are not meeting their beneficial uses because of excess pollutants; these pollutants can be naturally occurring or a result of human activity. The list, known as the Section 303(d) list, is based on violations of water quality standards and is organized by watersheds, which are further divided into stream segments.

The following stream segments within the study area are impaired. The CDPHE

Water Quality Control Division defines pollutants that are the main cause for impairment, describes the portion of the segment for which the impairment applies, and assigns clean-up priority to each segment. The tributaries to the Colorado River, including the Roaring Fork River, have been listed as impaired because of increased selenium concentrations. Selenium is a naturally occurring trace element. Selenium can be very mobile in the environment and this mobility can be accelerated by irrigation. As irrigation water is applied to soils containing selenium, the element is leached from soils and into surface and groundwater. Selenium can be toxic to fish and wildlife.

The Safe Drinking Water Act (SDWA) is a major federal regulation governing the protection of the public drinking water supply (systems serving more than 25 people), which includes lakes, rivers, reservoirs, springs, and groundwater drinking water sources. Under SDWA, national health-based standards for drinking water have been devised for contaminants that the EPA and/or Congress specify as having known adverse effects. Within the State of Colorado, the CDPHE has established regulations that identify the designated uses and establish groundwater quality standards. The Colorado Basic Standards for Groundwater were established pursuant to the Colorado Water Quality Control Act. These standards establish a system for classifying groundwater to protect existing and potential beneficial uses of groundwater in the state, such as agriculture and domestic drinking water usage.

Drinking water for residents in the study area is provided mainly from municipal sources. The City of Glenwood Springs operates the Red Mountain Water Treatment Plant, located approximately 2.5 miles north-northwest of the study area. The treatment plant has a capacity of 8.6 million gallons per day (MGD), and provides a daily annual average of 5.0-5.5 MGD to serve municipal needs.

Water is diverted from the No Name Creek, Grizzly Creek, and the Roaring Fork River into the treatment plant. No Name Creek and Grizzly Creek, located along the Colorado River upstream from the confluence with the Roaring Fork River, are the primary sources of drinking water. The Roaring Fork Pumping Station serves as a backup in the event that the primary raw water systems are inoperable. The overall water quality is good, with sediment loading during peak snowmelt (May to July) the only impacts to existing water quality.

Wastewater for the study area is treated at the Glenwood Spring Wastewater Treatment Facility. The facility is located approximately 2.5 miles downstream from the study area, near the confluence of the Roaring Fork River and the Colorado River. The facility has a maximum treatment capacity of 2.3 MGD and has a current treatment demand of approximately 1.0 MGD. Outfalls from the treatment facility are located downstream from the study area.

The Roaring Fork River is a prized angling destination, and the segment from the Crystal River to the Colorado River in Glenwood Springs has been designated as a Gold Medal Water. The Colorado Parks and Wildlife (CPW) defines a Gold Medal Water as a lake, river, or stream that supports a trout standing stock of at least 60 pounds per acre, and contains an average of at least 12 trout that measure 14 inches or longer.

CPW is responsible for managing these waters, including promotion of the preservation and protection of the waters through cooperation with local, state, and federal agencies. CPW also states in their management guidelines that loss or degradation of Gold Medal waters will necessitate mitigation efforts.

4.7.2 Water Resources and Water Quality Impacts

No Action Alternative

The No Action Alternative would result in no new impacts to water resources and water quality. Indirect impacts of continued growth and development throughout the study area would, however, occur. This growth and development would result in additional impervious surface and runoff.

Preferred Alternative

Stormwater runoff from the new bridge, via curb, gutter and inlets, and the new roadway is designed to drain into two permanent water quality sediment ponds. As a result, there would be no direct drainage from the Preferred Alternative into the Roaring Fork River.

The amount of stormwater runoff carrying pollutant loads and non-point source pollutants would increase proportionately with the amount of impervious surface. The Preferred Alternative would increase the impervious surface in the study area by approximately 6.15 acres.

There is the potential for a short-term increase in sediment levels during bridge construction. However, these impacts would be avoided and /or minimized by the use of BMPs during construction.

Capacity and mobility improvements associated with the Preferred Alternative could result in indirect impacts as a result of accelerated development in the study area and an increase in impervious surfaces (secondary roads, parking lots, etc.); however, increased growth and development are projected to occur regardless of construction of the Preferred Alternative. The potential increase in impervious surface area from surrounding development and from the Preferred Alternative could lead to more runoff and increased sedimentation. However, the existing and proposed water quality ponds would detain and treat sediment and other pollutants prior to discharging runoff to surface water.

4.7.3 Water Resources and Water Quality Mitigation

The proposed project is located outside of the Phase I and Phase II areas under CDOT's Municipal Separate Storm Sewer System (MS4) permit. However, in order to meet water quality standards, and to reduce impacts from sediments, two permanent water quality ponds will be constructed.

The use of standard erosion and sediment control BMPs in accordance with *Erosion Control and Storm Water Quality Guide*, CDOT, 2002, or the latest revision, will be included in the final design plans. All work on this project will be in conformity with Section 107.25 (Water Quality Control) and Section 208 (Erosion Control) of the *CDOT Standard Specifications for Road and Bridge Construction*.

The following specific BMPs from the Erosion Control and Storm Water Quality Guide will be applied during construction to reduce construction-related and/or long-term operation impacts to water resources and water quality as appropriate:

- All disturbed areas will be revegetated with native grass and forb species. Seed, mulch, and mulch tackifier will be applied in phases throughout construction.
- Where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months), disturbed areas will have mulch and mulch tackifier applied to prevent erosion.
- Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes will be roughened at all times and concrete washout contained.
- Temporary erosion control blankets will have flexible natural fibers.

- Erosion logs, silt fence, or other sediment control device will be used as sediment barriers and filters adjacent to wetlands, surface waterways, and at inlets where appropriate.
- Storm drain inlet protection will be used where appropriate to trap sediment before it enters the cross-drain.
- Check dams will be used where appropriate to slow the velocity of water through roadside ditches and in swales.
- Work areas will be limited as much as possible to minimize construction impacts to vegetation.
- Temporary detention ponds (during construction) will be used to allow sediment to settle out of runoff before it leaves the construction area. These ponds may be combined with permanent detention ponds.
- Structural BMPs will be used, and may include extended detention basins with sediment forebays, grass swales, and grass buffers to retain sediment and roadway pollutants resulting from winter sanding, chemical deicing, and normal traffic operations.
- Non-structural BMPs will include litter and debris control, and landscaping and vegetative practices.
- Measures will be taken to avoid excess application and introduction of chemicals into the aquatic ecosystem. While temporary fill is needed for construction projects, fill will be utilized that avoids an increase in suspended solids or pollution.
- Adherence to City of Glenwood Springs hydraulic design criteria for major and minor storm drainage.

4.8 Floodplains

Floodplains are defined as areas subject to flooding or inundation from a natural watercourse resulting from a major storm, spring snow melt, or flood event. Executive Order 11988, Floodplain Management, requires federal agencies to avoid direct or indirect support of development in floodplains whenever a practical alternative exists. The base flood (100-year flood) is the regulatory standard used by federal agencies and most states to administer floodplain management programs. Floodplains provide natural and beneficial values serving as areas for fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural flood moderation, water quality maintenance, and groundwater recharge.

Runoff generated from a storm event across any part of the drainage basin is usually the primary source of flooding. Intense rainfall across a highly developed basin with large amounts of impervious surfaces will generate high runoff and subsequent high flooding. Conversely, the same rainfall intensity across an undeveloped basin with permeable surface will allow greater infiltration of water into the soil and, therefore, less runoff, decreasing the flood risk. The flood frequencies normally associated with a floodplain are the 100-year and 500-year frequency. A 100-year flood frequency is based on a probability that the event has a 1 percent chance of occurrence for any given year. Likewise, a 500-year flood event is based on a probability that the event has a 0.20 percent chance for occurrence in any given year.

The 100-year flood is calculated to be the level of flood water expected to be equaled or exceeded every 100 years on average. The 100-year flood can also be referred to as the 1 percent flood, since it is a flood that has a 1 percent chance of being equaled or exceeded in any single year.

4.8.1 Existing Conditions

A review of Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Maps (FIRM) indicated three FEMA regulated 100-year floodplains located within the study area. All 100-year floodplains, as illustrated in **Figure 4-12**, are immediately adjacent to the Roaring Fork River and its two tributaries in the study area—Three Mile Creek and Four Mile Creek.

4.8.2 Floodplain Impacts

No Action Alternative

The No Action Alternative would result in no new encroachment on the 100-year floodplain.

Preferred Alternative

The Preferred Alternative would be on a bridge over the Roaring Fork River, spanning the 100-year floodplain. No encroachment of the floodplain would occur. There would be no risk to upstream or downstream land uses, except for a short time during construction.

4.8.3 Floodplain Mitigation

No mitigation required as no encroachment of the floodplain is anticipated to occur.

4.9 Wetlands

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to sup-

Figure 4-12 ***100-Year Floodplain***

Sources FEMA-FIRM Panel No. 0802051453B, dated January 3, 1986; Panel No. 0802051434B, dated January 3, 1986; and Panel No. 0802051465B, dated January 3, 1986.

port, and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetland delineations for areas of anticipated impacts within the study area were conducted in accordance with the U.S. Army Corps of Engineers (USACE) *1987 Wetland Delineation Manual* (Environmental Laboratory 1987), the *2008 Western Mountains, Valleys and Coast Region Supplement* (USACE 2008), and Executive Order 11990. Information on soils, hydrology, and plant species was recorded on September 25, 2009, as well as the determination of the wetland boundary. The actual delineation was performed on November 6, 2009; then, the boundary was flagged and GPS surveyed, and flagging was removed. Wetland determination was based on the presence of hydrophytic vegetation, hydric soils, and wetland hydrology. Wetland areas were also evaluated using the CDOT's Functional Assessment of Colorado Wetlands (FACWet) methodology.

4.9.1 Existing Conditions

As shown on **Figure 4-13**, there are two wetland sites totaling 0.87 acre within the study area. **Table 4-11** provides a summary of existing wetland conditions. All wetlands delineated within the study area were located adjacent to and abutting the Roaring Fork River (on the east and west banks). Detailed information on the existing wetlands in the study area is presented in the *South Bridge Environmental Assessment Wetland Delineation Report* (Jacobs 2011) and *South Bridge Environmental Assessment Wetland Functional Assessment* (Jacobs 2011) in **Appendix C, Wetlands and Waters of the US**. The wetland areas on the east and west banks of the Roaring Fork River varied considerably and are discussed below.

East Bank Wetland

The east bank of the Roaring Fork within the study area is dominated by numerous seeps, a spring, and a large riparian/wetland complex. A defined spring, dominated by watercress (*Nasturtium officinale*), bisects the wetland and discharges to the Roaring Fork River. In addition, seeps are present along or just down gradient of the wetland boundary. The wetland area on the east bank is primarily an emergent system, with a diverse herbaceous community (dominated by grasses and sedges) and supported primarily by groundwater. A few shrubs, including sandbar willow (*Salix exigua*), dogwood (*Cornus stolonifera*), and alder (*Alnus tennifola*) also occur within the wetland boundary. Soils in the upper reaches of the wetland were soft and often "quaking" (a characteristic shared with fens). However, numerous soil samples failed to locate any organic soils or a histic epipedon. A Rapid Ecological Assessment of the wetland and riparian areas within the study area was performed by the Colorado Natural Heritage Program (CNHP 2008). This assessment noted that the herbaceous seep wetland (i.e., east bank wetland) was the most unique aspect of the riparian/wetland plant communities surveyed within the assessment area (CNHP 2008). A complete list of species documented within the east bank wetland can be found in **Appendix C, Wetlands and Waters of the US**.

West Bank Wetland

In contrast to the large wetland/riparian complex on the east bank, the west bank of the Roaring Fork River within the study area is characterized by sparse vegetation (primarily sandbar willow), cobble substrate, and hydrology entirely dependent on overbank flows from the river. This wetland area occupies a narrow strip along the west bank within the active floodplain of the river. Vegetation (only 50 percent coverage) primarily consists of sandbar willow, redtop (*Agrostis alba*), reed canary grass (*Phalaris arundinacea*), scour rush (*Equisetum laevigatum*), and in some locations sedges (*Carex sp.*).

Figure 4-13 ***Wetlands***

Table 4-11 ***Wetlands***

Site ID	Acres within the Study Area	USACE Jurisdictional?	Wetland Type	Comments
Wetland 1 (East Bank)	0.60 Acre (26,224 square feet)	Yes	Emergent and Scrub-Shrub	Unique slope wetland primarily supported by groundwater. Located along the east bank of the Roaring Fork River within the study area.
Wetland 2 (West Bank)	0.27 Acre (11,765 square feet)	Yes	Emergent and Scrub-Shrub	Riverine wetland located on west bank of the Roaring Fork River on cobble substrate.

Functional Assessment of Colorado Wetlands (FACWet) Method

FACWet is a rapid assessment methodology that rates wetland conditions through evaluation of ecological stressors that drive wetland functions. Each state variable is rated on a scaled of 0.0 to 1.0 (non-functioning to reference standard or essentially pristine, respectively). The FACWet method was utilized to evaluate the general condition of the delineated wetlands that occur along the east and west banks of the Roaring Fork River within the study area. Based on this methodology, both wetlands were rated at the lower end of the highest (reference standard) functional category. This score is based on the following seven criteria listed in **Table 4-12**.

The natural hydrology, diverse vegetation community, and limited disturbance lend to the high rating for both wetland areas, with most adverse effects to function resulting from adjacent land use changes and loss of habitat connectivity, impairing the interaction with adjacent wetland and riparian habitats. Both wetlands areas are functioning near the reference standard capacity, but isolated from other areas of similar habitat.

4.9.2 Wetland Impacts

No Action Alternative

No wetlands would be impacted by the No Action Alternative.

Table 4-12 ***FACWet Score Card***

Functional Capacity Indices (FCI)	East Bank Wetland Variable Score	West Bank Wetland Variable Score
Support of characteristic wildlife habitat	.80	.81
Support of characteristic fish/aquatic habitat	.97	.94
Flood attenuation	.95	.93
Short- and long-term water storage	.98	.98
Nutrient/toxicant removal	.98	.98
Sediment retention/shoreline stabilization	.89	.92
Production export/food chain support	.92	.92
Composite FCI score (out of 100)	**93**	**92**

Preferred Alternative

Wetland impacts can be defined as direct, indirect, and temporary. Both direct and indirect impacts could result in the permanent loss of wetlands. Temporary wetland impacts generally occur from the short-term disturbance necessary for activities like construction access.

With the presence of wetlands and logistics of crossing the Roaring Fork River, the bridge superstructure would be constructed from above with limited access from below. This construction method would limit, but not completely avoid, temporary direct impacts to wetlands along the east and west banks of the Roaring Fork River during construction. To construct the pier column and bridge, a temporary access road and work area adjacent to the pier column would be required. The pier construction pad would accommodate a level area measured 40 feet by 50 feet for each corner of the pier to set up a crane. As a result, the west bank platform would be 80 feet by 148 feet, and the east platform would be 137 feet by 80 feet, including the cut and fill slopes to create a level construction platform. The fill slope would temporarily fill 3,290 square feet (0.076 acre) of wetlands on the east and west banks of the Roaring Fork River. No direct permanent impacts to wetlands are anticipated. However, additional groundwater studies on the east bank wetland area could be warranted during preliminary design of the bridge to determine subsurface groundwater conditions.

The effects of shading from a new bridge over the Roaring Fork River would indirectly cause a change in vegetation structure and complexity. Based on shading analysis performed for the Preferred Alternative, approximately 1,100 square feet (0.025 acre) of existing wetlands on the east and west banks of the Roaring Fork River would be permanently shaded by the new structure. Wetland plants that prefer full or partial sun would be replaced by more

shade-tolerant species. Since the shade-tolerant species now growing in these wetlands are grasses or ground covers, the sun-loving shrub and tree structure could be naturally replaced within a couple growing seasons. The area now occupied by willow species could be replaced with redtop, scouring rush, canary reedgrass, bluegrass, or invasive plant species. The diverse vegetation structure of grasses, shrubs, and trees provides habitat in support of wildlife production and bank protection from seasonal flood events. When the introduction of shade changes the vegetation types, the function of bank stabilization would be weakened and bank soil erosion could occur. In addition, the potential exists for increased erosion downgradient from the naturally occurring spring because vegetation cover would be diminished, and the opportunity for soil entrainment would increase.

The change in existing plant composition could temporarily impair the ability of the wetland to provide soil stabilization, but would not result in removing the wetlands from its current classification as a wetland. Eventual recolonization by shade-tolerant and partial shade-tolerant wetland plant species, either through natural processes or manual planting, would enable the wetland to regain this function.

4.9.3 Avoidance and Minimization

The preliminary layout of the South Bridge crossing was designed to avoid and minimize impacts to wetlands along the Roaring Fork River. The pier locations for the proposed structure alignment have been set to span the entire length of the river. This layout would result in a three-span structure with a center span length of approximately 350 feet. This span length is longer than typically defined for conventional bridge construction. As a result, the actual pier column placement is located on dry upland areas and avoids any direct permanent impacts to wetlands along the east and west banks of the Roaring Fork River. With the presence of the wetlands and logistics of crossing the Roaring Fork River, the bridge superstructure would need to be constructed from above with limited access from below. There are several structure types that could accommodate this method of construction, including cast-in-place segmental, precast segmental, and incremental launching.

The Preferred Alternatives would result in no permanent impacts to wetlands and approximately 0.08 acre of temporary impacts.

4.9.4 Wetland Mitigation

The use of CDOT-approved BMPs will be used to offset the extent and duration of any temporary impacts. Appropriate BMPs to prevent and minimize temporary impacts to wetlands will be applied during construction. These BMPs could include, but are not limited to:

- In designated temporary work areas, riparian shrubs (primarily willows) will be trimmed to the ground level (not grubbed), and then covered with a geo-textile fabric and an additional layer of straw. These areas (including wetlands) will then be covered with a minimum of two feet of clean fill. As soon as possible, all temporary fill will be removed to an upland area location to protect riparian shrub rootstock and wetland seed banks. If possible, temporary fill of wetlands will occur during periods when plants are dormant or toward the end of the growing season.
- Wetland areas not temporarily impacted by the proposed project will be protected from construction activities by temporary and/or construction limit fencing.
- Sediment control measures will be installed where needed to prevent sediment filling wetlands.
- Fertilizers or hydro-mulching will not be allowed within 50 feet of a wetland.
- All disturbed areas will be revegetated with native grass and forb species. Seed, mulch, and mulch tackifier

will be applied in phases throughout construction.

- Where permanent seeding operations are not feasible because of seasonal constraints (e.g., summer and winter months), disturbed areas will have mulch and mulch tackifier applied to prevent erosion.
- A stormwater management plan will be developed with BMPs to minimize adverse effects to water quality.
- Erosion logs, silt fence, or other sediment control device will be used as sediment barriers and filters adjacent to wetlands, surface waterways, and at inlets where appropriate.
- Construction staging areas will be located at a distance of greater than 50 feet from adjacent stream/riparian areas to avoid disturbance to existing vegetation, avoid point source discharges, and to prevent spills from entering the aquatic ecosystem, including concrete washout.
- Temporary impacts to Waters of the U.S. and adjacent habitat will be reclaimed with native plant and shrubs. In addition, this project will require a Senate Bill 40 (SB 40) Certification from CPW for impacts to riparian habitat and impacts to seeps and springs which feed a Gold Medal Water. This will mandate replacement of trees and shrubs impacted during construction along the Roaring Fork River.
- Mitigation will include planting shade tolerant native wetland species in areas (approximately 1,100 square feet (0.025 acre)) that will be permanently shaded by the new bridge crossing.
- Additional groundwater studies are recommended during preliminary design of the bridge to determine subsurface groundwater conditions. Additional alteration to the bridge design could be necessary to ensure hydrology remains unaltered by the placement of pier columns on upland areas adjacent to the east bank of the Roaring Fork River. Moreover, groundwater monitoring wells could be utilized to monitor changes during and after construction.

With proper use and management of BMPs for stormwater and construction disturbances, minimal sediment should reach wetland areas along the Roaring Fork River. All new construction will be stabilized with appropriate BMPs.

During final design, Section 404 permitting requirements will be discussed with the USACE. No permanent impacts to wetlands are anticipated. However, 3,290 square feet (0.076 acre) of wetlands along the Roaring Fork River would be temporarily filled during construction activities. A Section 404 Nationwide Permit #14 would likely be required, and verified by USACE during final design.

4.10 Vegetation and Noxious Weeds

The South Bridge study area is located within the Southern Rockies Ecoregion, Sedimentary Mid-Elevation Forests subecoregion. Although the region is characterized mostly by coniferous forests, the mid-elevation ranges have a greater variety of vegetation types, including Aspen forests, Douglas fir, and juniper-oak woodlands. Precipitation in this ecoregion averages 20 to 32 inches per year.

4.10.1 Existing Vegetation Conditions

Biological resource data for the study area were collected from existing sources, such as maps, databases, publications, and agency information. This information was used to provide context of the resource in the region and to assist in assessing direct, indirect, and cumulative effects in the study area. Field studies were conducted in the

study area and provide the basis for assessing common species present. According to the Colorado Gap Analysis Program, spatial data mapping vegetative communities and other land use types in Colorado, these three vegetative communities are represented within the study area: Pinyon—Juniper type, Deciduous oak type, and irrigated crop type.

- Pinyon-Juniper type communities are forested areas dominated by a mixture of pinyon pine (*Pinus edulis*) and one or more species of juniper (*Juniperus monosperma, Juniperus osteosperma, or Juniperus scopulorum*). This type forms the transition from grassland to montane conifer forests, usually ponderosa pine. The understory vegetation in this type varies greatly.
- Deciduous oak type communities are scrub oak communities where Gambel oak (*Quercus gambelii*) comprises more than 25 percent of the total vegetative cover and is the dominant shrub.
- Irrigated crop type communities include most row crops, irrigated pastureland and hay fields and associated farm or ranch facilities.

In addition to the vegetative communities described in the GAP Analysis, riparian vegetation communities are present in the study area along the banks of the Roaring Fork River, Threemile Creek, Fourmile Creek, and Landis Creek. These transitional zones between aquatic and upland environments are characterized by narrowleaf cottonwood (*Populus angustifolia*), sandbar willow (*Salix exigua*), alder (*Alnus tennifolia*), red osier dogwood (*Cornus stolonifera*), hawthorne (*Crataegus sp.*), woods rose (*Rosa woodsii*), chokecherry (Prunus virginiana), saskatoon (*Amelanchier alnifolia*), and Queen Anne's lace (*Daucus carota*).

There is also urban, built-up land in the study area, with areas of intensive use and much of the land covered by commercial and residential structures. These developed areas primarily contain landscaping of turf grasses and cultivated forbs, grasses, shrubs, and trees.

Scientists with Jacobs conducted a vegetation survey in late May 2008 to verify the extent of the vegetation communities present within the study area. **Table 4-13** shows the common vegetation observed in the study area.

The boundaries of the natural vegetation communities described above were hand drawn on aerials showing the study area and then digitized using GIS overlays. **Figure 4-14** shows the extent of natural vegetation communities in the study area. It includes the pinyon-juniper, deciduous oak, and riparian vegetation communities. Urban areas and irrigated croplands were not mapped. In addition, disturbed habitat adjacent to existing roadways and developments within the study area is generally characterized by kochia (*Kochia scoparia*), prickly lettuce (*Lactuca serriola*),

Table 4-13 ***Common Vegetation within the Study Area***

Common Name	Scientific Name*
Big sagebrush	*Artemesia tridentata*
Cheatgrass (downy brome)	*Bromus tectorum*
Chokecherry	*Prunus virginiana*
Common rabbitbush	*Chrysothamnus nauseosus*
Gambel oak	*Quercus gambelii*
Mountain mahogany	*Cercocarpus montanus*
Northern bedstraw	*Gallium boreale*
Oneseed juniper	*Juniperus monosperma*
Parry's rabbitbush	*Chrysothamnus parryii*
Pinyon pine	*Pinus edulis*
Queen Anne's lace	*Daucus carota*
Saskatoon	*Amelanchier alnifolia*
Narrowleaf cottonwood	*Populus angustifolia*
Sandbar willow	*Salix exigua*
Manna Grass	*Glyceria strata*
Sedge	*Carex utriculata*

* Plant nomenclature derived from the USDA Plants database (http://plants.usda.gov/index.html), accessed September 29, 2008.

dandelion (*Taraxacum officinale*), little mallow (*Malva parviflora*), Johnsongrass (*Sorghum halepense*), barnyard grass (*Echinochloa crus-galli*), smooth brome (Bromus inermis), Kentucky blue grass (*Poa pratensis*), and slender wheatgrass (*Elymus trachycaulum*) with scattered patches of big sagebrush, rabbitbrush, and Gambel oak.

4.10.2 Vegetation Impacts

No Action Alternative

The No Action Alternative would not involve any changes to the study area, and no vegetation would be impacted.

Preferred Alternative

Construction of the Preferred Alternative would result in loss of vegetation in terms of cover and species composition. Direct impacts to existing roadside vegetation and shrub/grassland communities within the Preferred Alternative would result in the removal of vegetation and increase in impervious surface where transportation improvements are proposed. A total of 10.87 acres of vegetation would be removed as a result of improvements to Midland Avenue/Airport Road, the new alignment at the Glenwood Springs Municipal Airport,

Figure 4-14 ***Vegetation Communities Within the Study Area***

the crossing of the Roaring Fork River, the new alignment east of the Roaring Fork River, and connection access improvements to SH 82. The majority of these improvements would affect rangeland/irrigated cropland. However, approximately 11,305 square feet (.26 acre) of riparian habitat adjacent to the Roaring Fork River would be temporarily impacted, and 375 square feet (0.009 acre) of riparian would be permanently impacted by construction of the bridge. **Table 4-14** summarizes permanent impacts to vegetation communities within the study area.

The construction of the Preferred Alternative would increase impervious surfaces, thereby increasing runoff and exposing the surrounding vegetation to higher levels of pollutants. Soil disturbance from construction equipment would also create favorable conditions for noxious weeds to introduce and establish, or to further spread. Other direct impacts include the decrease or elimination of upland tree and/or shrub buffers between the bridge crossing and areas adjacent to the Roaring Fork River. Buffers filter pollutants before they reach wetlands, streams, and lakes, as well as provide habitat for wildlife.

4.10.3 Vegetation Mitigation

- To the extent possible, disturbance to existing trees, shrubs, and vegetation will be avoided.
- In designated temporary work areas adjacent to the Roaring Fork River, riparian shrubs (primarily willows) will be trimmed to the ground level (not grubbed), and then covered with a geo-textile fabric and an additional layer of straw. These areas (including wetlands) will then be covered with a minimum of two feet of clean fill. As soon as possible, all temporary fill will be removed to an upland area location. This would protect riparian shrub rootstock and wetland seed banks. If possible, temporary fill of wetlands will occur during periods when plants are dormant or toward the end of the growing season.
- Trees and shrubs removed during construction will be replaced as stipulated in CDOT's Guidelines for SB 40 Wildlife Certification, which state that trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of two inches or greater. Shrubs removed during construction, whether native or non-native, will be replaced based on their preconstruction areal coverage. In all cases, all such trees and shrubs will be replaced with native species.
- The trees replaced after construction will be monitored for two years. Any replacement trees that have failed will be replaced and planted in locations that will provide the highest opportunity for success.

Table 4-14 ***Permanent Vegetation Impacts***

Vegetation Community Type	Acres of Impact
Rangeland/irrigated cropland and disturbed roadside habitat	10.87
Riparian	0.009
Total Impacted Acreage	**10.9**

Source: South Bridge Environmental Assessment Site Assessment (Jacobs 2011).

4.10.4 Existing Noxious Weeds Conditions

Noxious weeds are invasive, non-native plants introduced to Colorado by accident or which spread after being planted for another purpose resulting in lands with decreased economic and environmental value. The Colorado Noxious Weed Act of 2003 (35-5.5-101 through 119, C.R.S.) recognizes that, "certain undesirable plants constitute a present threat to the continued economic and environmental value of the lands of the state, and if present in any area of the state must be managed." The legislation places all public and private lands in Colorado under the jurisdiction of local governments to manage noxious weeds. According to the Act, a noxious weed meets one or more of the following criteria:

- Aggressively invades or is detrimental to economic crops of native plant communities.

- Is poisonous to livestock.
- Is a carrier of detrimental insects, diseases, or parasites.
- Has direct or indirect effects that are detrimental to the environmentally sound management of natural or agricultural ecosystems.

Under the Noxious Weed Act, the State of Colorado Noxious Weed Lists are categorized by control priority:

- **High Priority (List A).** Rare noxious weeds and all County noxious weeds in dispersal conduits. High-priority species are targeted for eradication or suppression.
- **Medium Priority (List B).** Well-established noxious weeds with discrete statewide distributions.
- **Low Priority (List C).** Extensive, well-established infestations for which control is recommended but not required.

Garfield County maintains a list of noxious weed species designated for management.

The surrounding land use within the study area is dominated by irrigated croplands and urban development. Scientists from Jacobs performed a reconnaissance of the study area during a vegetation survey in May 2008. Weedy and noxious species are present throughout much of the study area. **Table 4-15** shows noxious weed species from the Garfield County, CDOT, and state lists, which were present at the time of the vegetation survey.

Table 4-15 ***Noxious Weed Species Identified in the Study Area***

Common Name	Scientific Name*	Garfield County Weed List	State Noxious Weed List
Canada Thistle	*Cirsium arvense*	X	B
Cheatgrass	*Bromus tectorum*	X	C
Common Mullein	*Verbascum thapsus*		C
Diffuse Knapweed	*Acosta diffusa*	X	B
Leafy Spurge	*Euphorbia esula*	X	B
Musk Thistle	*Carduus nutans*	X	B
Russian Olive	*Elaeagnus angustifolia*	X	B
Salt cedar	*Tamarix spp.*	X	B

* Plant nomenclature derived from the USDA Plants database (http://plants.usda.gov/index.html), accessed September 29, 2008.

4.10.5 Noxious Weeds Impacts

No Action Alternative

The No Action Alternative would not involve any changes to the study area, thus would not remove vegetation and make additional areas available to the spread of noxious weed species. Noxious weeds do exist in the study area and have spread under current management practices. This would likely continue, possibly into undesirable locations.

Preferred Alternative

The Preferred Alternative would create a new connection between Airport Road and SH 82 by crossing the southern end of the Glenwood Municipal Springs Airport below grade and then crossing the Roaring Fork River and agricultural land to reach SH 82 south of the existing South Grand Avenue/SH 82 intersection.

The Preferred Alternative would result in the direct removal of vegetation where transportation improvements are proposed. Surface disturbance associated with construction, transport of soil, accidental introduction of noxious weed seeds and failure to successfully revegetate with native species could affect vegetation indirectly by introducing noxious and invasive species. Noxious and invasive species often thrive on disturbed sites and out-compete more desirable native plant species. The potential for weeds to occur or spread (especially in relatively undisturbed riparian habitat adjacent to the Roaring Fork River) would increase with surface disturbing activities and construction of the bridge.

4.10.6 Noxious Weed Mitigation

- During the design phase, detailed weed mapping of the study area will be con-

ducted by a weed specialist. Mapping will be included in the construction documents along with appropriate control methods for noxious weeds.

- Following noxious weed mapping and inventory by a weed specialist, the potential for spread of identified noxious weeds due to disturbance by construction activities will be analyzed including potential for noxious weeds to spread into wetlands and agricultural areas. This analysis will be included in the Integrated Noxious Weed Management Plan and best practices will be implemented to reduce the likelihood of noxious weed spread or introduction.
- Identification of all existing noxious weed infestations within the roadway right-of-way will occur during the design phase. Roadway right-of-way will periodically be inspected by the City of Glenwood Springs or its consultants during construction and during post-construction weed monitoring for invasion of noxious weeds.
- An Integrated Weed Management plan will be required prior to construction, and will be implemented by the contractor. Use of herbicides will include selection of appropriate herbicides and timing of herbicide spraying and use of a backpack sprayer.
- Certified weed-free hay and/or mulch will be used in all revegetated areas.
- Where practical, equipment staging will occur in areas that have not been heavily infested by noxious weeds. All equipment will be cleaned before offloading at the project site. Project staging areas will be mowed and cleared of noxious weeds prior to construction.
- Project design and construction engineers will coordinate with the Garfield County weed supervisor, local governing bodies, and landowners to assure proper noxious weed management activities.
- No fertilizers will be used on the project site.
- Supplemental weed control measures, if needed, will be added during the design and construction planning.

4.11 Wildlife and Aquatic Resources

A wildlife assessment for the study area was completed in June 2008. The purpose of this assessment was to evaluate plant communities and other habitat features within and adjacent to the study area to determine the wildlife species likely to occur. Particular attention was focused on potential impacts to federally and state endangered, threatened, and candidate species; State Species of Special Concern; and culturally/economically important species such as mule deer (*Odocoileus hemionus*) and Rocky Mountain elk (*Cervus elaphus*). In addition, the area was surveyed for the presence of any raptor nests, heronries, and other special wildlife attributes.

4.11.1 Existing Conditions

Riparian, wetland, and native montane shrubland (big sagebrush), pinyon-juniper, and deciduous oak habitats provide the primary food, shelter, and movement corridors for wildlife in the study area. A large portion of habitat within the study area has been disturbed by human activity. In general, urban (residential subdivisions, schools, commercial development, and an airport) and agricultural developments comprise the northern half of the study area. The southern portion of the study area is characterized by steep, native montane shrubland, big sagebrush shrublands, irrigated hayfields (hay and alfalfa), and riparian/wetland habitat adjacent to the Roaring Fork River, Fourmile Creek, Threemile Creek, and Landis Creek (all perennial tributaries to the Roaring Fork

River). The Lazy H Slash Eleven property, adjacent to SH 82 in the southern portion of the study area, is subject to a conservation easement held by the Aspen Valley Land Trust. The purpose of this easement is to create a southern open space buffer for Glenwood Springs and preserve the valley's scenic beauty.

The riparian habitat and associated cottonwood woodlands in the study area are the most important habitat for wildlife because of the numbers and richness of wildlife they support and their value as a general wildlife movement corridor. Wildlife within the study area can be broken into the following categories: big game, predators and other small mammals, fisheries, and birds. These categories are described below.

Big Game

Two big game species, mule deer and elk, utilize the study area during winter months (summer range for both species is generally located east and west of the study area). Mule deer and elk occupy higher elevations, usually forested habitat, during the summer and then migrate to lower elevation sagebrush dominant ridges and south facing slopes in the winter. The study area is considered overall range for both species (CPW 2010). These three seasonal ranges are designated by the CPW as occurring with the study area for mule deer: winter range, critical winter range, and winter concentration (CPW 2010). Only one seasonal range occurs within the study area for elk—winter range. Critical winter range for elk is located just outside the study area, west of SH 82 and east of Four Mile Road. One elk migration corridor parallels Fourmile Creek (at the very southern end of the study area). Mule deer and elk seasonal activity areas within the study area are shown in **Figure 4-15**.

The entirety of the study area is considered overall range of the black bear (*Ursus americanus*). Moreover, there are mapped fall concentrations areas for black bear in the southeast portion of the study area (generally, habitat south of Airport Road and adjacent to and east of the Roaring Fork River).

Fall concentration areas for black bear are generally defined as the overall black bear range occupied from August 15 until September 30 for the purpose of ingesting large quantities of mast and berries to establish fat reserves for the winter hibernation period. No summer concentrations have been mapped within the study area (CPW 2010). The owners of the Lazy H Slash Eleven Ranch have reported sightings of black beasrs on their property.

Predators and Small Mammals

There is suitable forage habitat within the study area for several common predator species that are habituated to human presence. These species include coyote (*Canis latrans*), gray fox (*Vulpes vulpes*), bobcat (*lynx rufus*) raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*). In addition, mountain lions (*Felis concolor*) are found throughout the region in areas that support populations of deer and elk. Common small mammal species include ground squirrels, mice, chipmunks, and rabbits.

Fisheries

The Roaring Fork River within the study area is a prized angling destination. The segment from the Crystal River to the Colorado River in Glenwood Springs has been designated as a Gold Medal Water. The CPW defines a Gold Medal Water as a lake or stream that supports a trout standing stock of at least 60 pounds per acre and contains an average of at least 12 trout that measure 14 inches or longer.

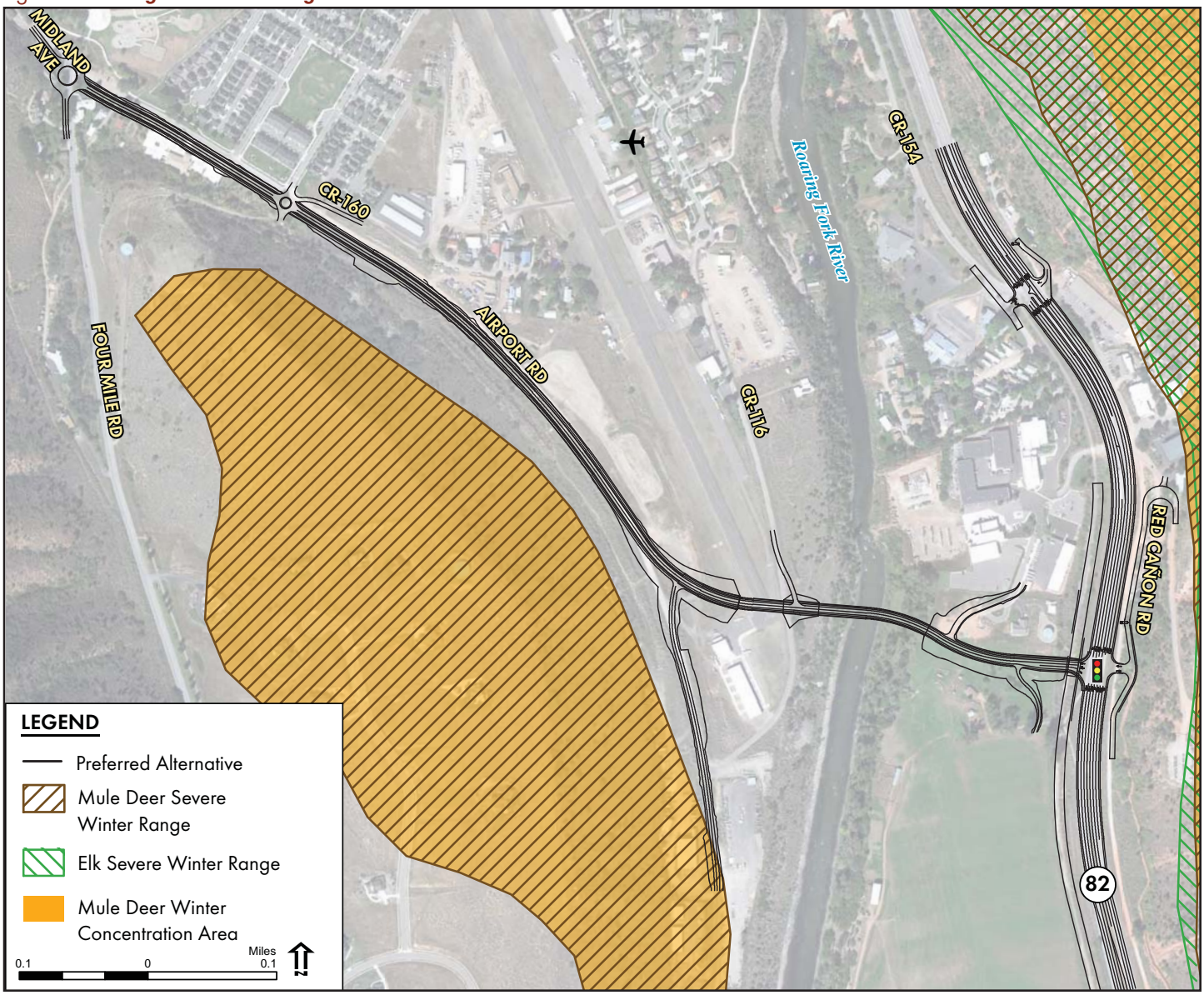
Historically, the native fishery in the Roaring Fork River comprised Colorado River cutthroat trout (*Oncorynchus clarki pleuriticus*), mottled sculpin (*Cottus bairdi*), and bluehead sucker (*Catostomus discobolus*). Currently, the fishery within the study area

comprises nonnative brown trout (*Salmo trutta*) and rainbow trout (*Oncorhynchus mykiss*). Moreover, there are no known populations of naturally reproducing Colorado River cutthroat trout in the Roaring Fork River within the study area. The closest known naturally reproducing population occurs in Cattle Creek, just above the confluence with the Roaring Fork River (Ross 2008). Other Colorado native fish that have been found in the lower Roaring Fork River include flannelmouth sucker, bluehead sucker, mottled sculpin, and mountain whitefish (although it is important to note that mountain whitefish are native to the Upper Colorado Basin and not indigenous to the Roaring Fork drainage) (Ross 2008). Spawning areas for rainbow and brown trout on the Roaring Fork River are located just north/downstream of the study area (CPW personal communication).

Birds

The Migratory Bird Treaty Act (MBTA), passed in 1918, protects raptors and other migratory birds and their active nest sites. The MBTA provides that it is unlawful to

Figure 4-15 ***Large Mammal Range***



pursue, hunt, take, capture or kill; attempt to take, capture or kill; possess, offer to or sell, barter, purchase, deliver or cause to be shipped, exported, imported, transported, carried, or received any migratory bird, part, nest, egg, or product, manufactured or not. In Colorado, most birds, except for the European starling (*Sturnus vulgaris*), house sparrow (*Passer domesticus*), rock dove (*Columbia livia*) (Pigeon), and common grouse/pheasant species (*Order Galliformes*) are protected under the MBTA. The Migratory Bird Permit memorandum issued in April 2003 stipulates that there is no prohibition against destruction of inactive nests as long as the breeding season is avoided (approximately April 1 through August 31). Additionally, any disturbance to these nesting areas must follow the stipulations outlined in the MBTA.

In addition to the MBTA, the Bald and Golden Eagle Protection Act provides for the protection of the bald eagle (*Haliaeetus leucocephalus*) and the golden eagle (*Aquila chrysaetos*) by prohibiting the taking, possession, and use of these two species for commerce except under certain specified conditions. The definition of "take" includes the following: pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb.

The sagebrush, pinyon-juniper, deciduous oak, and riparian habitat found within the study area provides both foraging and nesting habitat for a variety of migratory birds that summer, winter, or migrate through the area. The blue-gray gnathcatcher (*Polioptila caerulea*), pinyon jay (*Gymnorhinus cyanocephalus*), and black throated gray warbler (*Dendroica nigrescens*) are characteristically found in pinyon/juniper woodlands, and the Brewer's sparrow (*Spizella breweri*) is found within sagebrush habitats. Riparian and wetland areas adjacent to the Roaring Fork River and associated tributaries within the study area provide excellent habitat for a variety of avian species. The cottonwood woodlands provide nest and roost sites for a variety of raptor species.

Great Blue Herons are common to the Roaring Fork River valley during spring and fall migration periods and during summer breeding months. Great blue herons feed mainly on shorelines of rivers, streams, ponds, lakes, and reservoirs, but as wading birds they also have the capacity to forage in deeper waters. Herons generally nest in trees close to open water features, such as wetlands. No mapped foraging habitat, active, or historic nest sites occur within the study area. However, CPW has mapped foraging habitat for great blue herons just south of the study area (along the Roaring Fork River). In addition, there is one mapped great blue heron rookery (colony of more than 25 active nests) located approximately 2.5 miles south of the study area.

Raptor Species

The majority of habitat adjacent to the Roaring Fork River within the study area is considered foraging areas for osprey (*Pandion haliaeutus*) (CPW 2010); one active nest site is located approximately 2.8 miles from the study area. Bald eagles are known to winter along the Roaring Fork River, and designated winter range and winter foraging areas mapped by the CPW occur within the majority of study area (CPW 2010). Because the bald eagle is a State Species of Special Concern, it is discussed further in **Section 4.11.5**.

4.11.2 Wildlife and Aquatic Resources Impacts

No Action Alternative

No wildlife or aquatic resources would be impacted by the No Action Alternative. Indirect impacts of continued growth and development throughout the study area would, however, occur. This growth and development would result in additional impacts to wildlife habitat.

Preferred Alternative

Effects to wildlife were identified based on the potential for disruption and loss of existing habitats and movement corridors due to construction activities associated with the Preferred Alternative. Short-term effects include temporary habitat loss, construction noise disturbance, and restrictions on wildlife movement. Long-term wildlife effects generally include habitat fragmentation, road mortality, permanent loss of habitat, and disruption of movement corridors.

The Preferred Alternative would impact wildlife foraging and nesting habitat. Approximately 10.87 acres of habitat would be disturbed as a result of the Preferred Alternative. However, the majority of habitat that would be converted to impervious surface is already degraded because of its roadside location and surrounding land use (commercial, light industrial, and residential developments). The direct disturbance of wildlife habitat would slightly reduce habitat availability for a variety of common small mammals, birds, and their predators. However, these impacts are considered minimal based on the current level of development in the vicinity of Midland Avenue/Airport Road and SH 82.

The majority of impacts to wildlife habitat associated with the Preferred Alternative would occur in the vicinity of the Roaring Fork River. The duration of impacts to wildlife habitats would depend, in part, on the success of mitigation and reclamation efforts. Species that are sensitive to indirect human disturbance (noise and visual disturbance) would be impacted most during the duration of construction. However, these impacts would be localized. No long-term impact or disruption of movement or migration corridors is anticipated in the vicinity of the South Bridge crossing because the preliminary layout is set to span the entire length of the Roaring Fork River with piers located above the river's edge, therefore allowing for wildlife movement.

General Wildlife and Big Game

The direct disturbance of wildlife habitat from the Preferred Alternative could result in some direct mortality to small mammals, birds, and their predators and displacement of songbirds from construction activity. Construction activities would temporarily affect wildlife resources due to disturbance from construction noise and increased human presence. It is anticipated that wildlife would return to the habitats once construction is completed. No direct permanent impacts to big game (mule deer or elk) migration corridors or winter range, critical winter range, and winter concentration areas would result from the construction of the Preferred Alternative. However, construction of the Preferred Alternative (in the vicinity of the Roaring Fork River) would have short-term effects on large and small mammal movement due to construction noise and vegetation removal.

Fisheries

Impacts to fish species (primarily rainbow or brown trout) would potentially result from construction-related impacts in the vicinity of the Roaring Fork River, which could increase sedimentation, turbidity, and streambank erosion. The pier locations for the structure alignment have been set to span the entire length of the river. This layout would result in a three-span structure with a center span length of approximately 350 feet. This span length is longer than typically defined for conventional bridge construction. As a result, the actual pier column placement is located on dry upland areas and avoids any direct permanent impacts to the Roaring Fork River or wetland areas located on the east and west banks. The use of CDOT-approved BMPs will be used to offset the extent and duration of any temporary impacts (see **Section 4.7.3**).

Birds

Based on the distance to known nesting sites for osprey and great blue heron (see **Table 4-16**) no direct or indirect impacts to breeding or rearing activities are anticipated. However, direct temporary disturbance of 0.26 acres (11,305 square feet) of riparian habitat (and tree removal) would occur in the vicinity of the proposed South Bridge crossing over the Roaring Fork River. Construction of this alignment along the Roaring Fork River would result in short-term effects to bird species due to construction noise and temporary removal of vegetation. The permanent removal of riparian vegetation adjacent to the Roaring Fork River (375 square feet) could affect some bird species by eliminating future nesting sites. However, trees and shrubs removed during construction would be replaced (see **Section 4.11.4**).

4.11.3 Avoidance and Minimization

The preliminary layout of the South Bridge crossing was designed to avoid and minimize impacts to the Roaring Fork River and associated wetland habitat. The pier locations for the proposed structure alignment have been set to span the entire length of the river. This layout would result in a three-span structure with a center span length of approximately 350 feet. This span length is longer than typically defined for conventional bridge construction. As a result, the actual pier column placement is located on dry upland areas and avoids any direct permanent impacts to the Roaring Fork River or wetlands along the east and west banks. The use of CDOT-approved BMPs will be used to offset the extent and duration of any temporary impacts (see **Section 4.7.3**).

Table 4-16 ***Distance to Active Nest Sites from the Bridge Crossing of the Roaring Fork River***

Species	Description	Distance (Miles) from the Bridge Crossing of the Roaring Fork River
Bald Eagle	Active Nest	5.4
Great Blue Heron Rookery	Colony of >25 active nests	3.9
Osprey	Active Nest	4.1

4.11.4 Wildlife and Aquatic Resources Mitigation

- CDOT BMPs and revegetation guidelines will be employed to minimize habitat impacts associated with vegetation removal (see **Section 4.10.3**).
- Existing state law and a Memorandum of Agreement (MOA) between CDOT and CPW requires attention to projects affecting streams and riparian habitat. Stream realignments, bank stabilization activities, and in-stream encroachment require SB 40 Certification. The Preferred Alternative will follow the stipulations and general conditions as part of the Certification requirements.
- Trees and shrubs removed during construction will be replaced as stipulated in CDOT's *Guidelines for Senate Bill 40 Wildlife Certification*, which state that trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of two inches or greater. Shrubs removed during construction, whether native or non-native will be replaced based on their preconstruction areal coverage. In all cases, all such trees and shrubs will be replaced with native species.
- To ensure compliance with the MBTA and the Bald and Golden Eagle Protection Act, project biologists will coordinate with the CPW on additional survey requirements/roosting locations to ensure any late fall or winter construction activity would have the least amount of impact on bald eagles in the vicinity of the Roaring Fork River.
- Additional surveys for raptors and active nests will be required prior to

any construction activities to positively identify raptor species in the area. If unavoidable impacts to raptor nests would occur as a result of the project construction, coordination with CPW and U.S. Fish and Wildlife Service (USFWS) will occur.

- If construction is to commence between April 1 and August 31, to avoid impacts to nesting birds in accordance with the MBTA, a qualified biologist will conduct a nest survey prior to construction. If active nests are found, coordination with CPW and USFWS will be required to determine an appropriate course of action, which could include, but is not limited to, monitoring or a delay in construction to avoid the breeding season.
- Bear-resistant trash receptacles shall be utilized near construction areas to eliminate conditions that could attract bears.
- Wetland/riparian areas not temporarily impacted by the project will be protected from construction activities by temporary and/or construction limit fencing.
- CDOT approved BMPs will be employed to offset the extent and duration of any temporary impacts to the Roaring Fork River (see **Section 4.7.3**).
- Construction staging areas will be located at a distance of greater than 50 feet from adjacent stream/riparian areas to avoid disturbance to existing vegetation, avoid point source discharges, and to prevent spills from entering the aquatic ecosystem, including concrete washout.
- If any in-stream construction were to occur within the Roaring Fork River, coordination with CPW will be initiated to ensure protection of brown trout and rainbow trout spawning areas. This could include seasonal construction restrictions.

4.11.5 Threatened, Endangered, and Sensitive Species

Animal and plant species determined by the USFWS to be threatened or endangered are protected under the Endangered Species Act (ESA) of 1973 (as amended 16 United States Code [USC] 1531 et seq.). Under the ESA, the term "endangered species" is defined as a species in danger of extinction throughout all or a significant portion of its range; and "threatened species" are likely to become endangered species in the foreseeable future throughout all or a significant portion of their range. Significant adverse effects to a federally listed species or its habitat require consultation with the USFWS under Section 7 of the ESA.

Sensitive Species include "State Listed Species" and "State Species of Special Concern." State Listed Species are species that CPW considers threatened or endangered within the state of Colorado. Colorado State statute 33-2-105 states that, "…it is unlawful for any person to take, possess, transport, export, process, sell or offer for sale, or ship and for any common or contract carrier to knowingly transport or receive for shipment any species or subspecies of wildlife appearing on the list of wildlife indigenous to this state determined to be endangered or threatened within the state…." Although not tied to a statutory category, State Species of Special Concern include state rare species identified by the Colorado Natural Heritage Program Natural Heritage Database (CNHP-NHD) as declining in all portions of their ranges. CNHP tracks and ranks Colorado's rare and imperiled species and habitats and provides information and expertise to promote the conservation of Colorado's valuable biological resources.

4.11.6 Existing Conditions- Threatened, Endangered, and Sensitive Species

In correspondence dated July 2, 2008, the USFWS identified nine federally endangered and threatened listed species, two candidate species, and two proposed species with the potential to occur in Garfield County (**Appendix D, Comments and Coordination**). Since that time wolverine presence has been confirmed in Colorado and is therefore included for analysis. **Table 4-17** provides a list of federally listed species that could occur in Garfield County.

Table 4-17 ***Federally Listed Species Potentially Found in Garfield County***

Species	Status	Suitable Habitat Present/Potential to Occur in the Study Area
Mammals		
Canada Lynx *Lynx canadensis*	FT	No–Lack of suitable habitat and prey species, as well as the proximity of residential and commercial development indicate that Canada lynx would not be present in the study area.
North American wolverine *Gulo gulo luscus*	FC	No– Lack of suitable habitat and prey species, as well as the proximity of residential and commercial development indicate that wolverine would not be present in the study area.
Birds		
Greater Sage-Grouse *Centrocercus urophasianus*	FC	No–Southern portion of the study area is considered historic range. However, viable populations have not occurred in five years or more (CPW 2010). No additional seasonal activities for sage grouse occur in the study area due to lack of suitable habitat.
Mexican Spotted Owl *Strix occidentalis lucida*	FT	No–The Mexican spotted owl occurs in mixed conifer forests and rocky canyons. No suitable habitat for the owl occurs within the study area.
Yellow-Billed Cuckoo *Coccyzus americanus*	FC	Yes–Transitory during migration and utilizes clearings and dense, scrubby vegetation in riparian areas. However, this species is considered extremely rare in western Colorado and is unlikely to occur in the study area.
Fish		
Bonytail *Gila elegans*	FE	No–But known populations occur in the Colorado River System.
Colorado Pikeminnow *Ptychocheilus lucius*	FE	No–But known populations occur in the Colorado River System.
Greenback Cutthroat Trout *Oncorhynchus clarki stomias*	FT	No–Recent genetic tests identified a cutthroat trout population as greenback linage, therefore, consultation is an interim measure until genetic and taxonomic issues are resolved. Suitable habitat is present. However, there are no known populations of naturally reproducing cutthroat trout within the study area.
Humpback Chub *Gila cypha*	FE	No–But known populations occur in the Colorado River System.
Razorback Sucker *Xyrauchen texanus*	FE	No–But known populations occur in the Colorado River System.
Plants		
Colorado Hookless Cactus *Sclerocactus glaucus*	FT	No–No suitable habitat present. Unlikely to occur in the study area.
DeBeque Phacelia *Phaecelia submutica*	FP	No–No suitable habitat present. Unlikely to occur in the study area.
Parachute Beardtongue *Penstemon debilis*	FP	No–No suitable habitat present. Unlikely to occur in the study area.
Ute Ladies'-Tresses Orchid *Spiranthes diluvialis*	FT	Yes–Suitable habitat present within wetland habitat adjacent to the east bank of the Roaring Fork River. Annual surveys within the study area have been conducted for this species.

Source: USFWS, CNHP, and CPW.
FE = Federal Endangered FT = Federal Threatened FC = Federal Candidate FP= Federal Proposed

Analysis of the vegetation communities, soil layers, reported occurrences of federally listed species in the surrounding area, and communication with USFWS indicates that suitable habitat within the study area exists for only one federally listed species, the Ute-ladies'-tresses orchid.

Little is known about the occurrence of Ute-ladies'-tresses orchid in the Roaring Fork Valley. This rare orchid wasn't known to occur on the western slope of Colorado until a recent discovery was made in the Roaring Fork Valley near the town of Carbondale (south of the study area). Since then two additional populations have been discovered. One near Cattle Creek and the other at the confluence of the Roaring Fork River and Colorado River.

Suitable habitat for the Ute-ladies'-tresses orchid is present within the study area along the east bank of the Roaring Fork River at the confluence with Landis Creek. The east bank of the Roaring Fork River within the study area is dominated by numerous seeps, a spring, and a large riparian/wetland complex. A defined spring, dominated by watercress (Nasturtium officinale), bisects the wetland and discharges to the Roaring Fork River. The wetland area on the east bank is primarily an emergent system with a diverse herbaceous community (dominated by grasses and sedges) and supported primarily by groundwater. No suitable habitat for the Ute-ladies'-tresses orchid occurs on the sparsely vegetated west bank. Based on the presence of suitable habitat along the east bank and the recent confirmed occurrence of Ute-ladies'-tresses orchid in the Roaring Fork Valley, formal surveys per USFWS 1992 interim guidelines have been conducted by CDOT environmental staff in areas of suitable habitat. In a letter dated February 18, 2009, USFWS acknowledged the 2008 survey report and concurred with the recommendation of two additional years of surveys. This species was not observed during the three consecutive years of surveys within the study area (**Appendix D, Comments and Coordination**).

State-Listed Threatened, Endangered, and Species of Concern

The CPW tracks and lists species as threatened or endangered. A formal letter was submitted to the CPW to request a list of state threatened and endangered species, plus species of special concern with the potential to occur within the study area. In a letter dated July 16, 2008, CPW provided a list of state threatened and endangered species, plus species of special concern with the potential to occur in the study area (based on a review of their records and field observations) (**Appendix D, Comments and Coordination**). This list indicated that the only species with habitat within the study area is the bald eagle, which is listed as state species of special concern.

Bald eagles are known to winter along the Roaring Fork River, and designated winter range and winter foraging areas mapped by the CPW occur within the majority of study area (CPW 2010). In general, bald eagles are present within the study area from mid-November to mid-April, and large mature cottonwood trees along the Roaring Fork River are used as roosting and perching sites. Moreover, the river corridor provides the main food sources of fish and waterfowl. No active bald eagle nest sites or documented communal roosts are located within the study area. The closest known active nest site occurs approximately four miles south of the study area (CPW 2008).

4.11.7 Threatened, Endangered, and Sensitive Species Impacts

No Action Alternative

No federally listed or sensitive species would be impacted by the No Action Alternative.

Preferred Alternative

Federally threatened, endangered, candidate, or proposed species would not be affected by the Preferred Alternative because these species are not present or unlikely to occur in the study area because of lack of suitable habitat, or they were not located in recent surveys.

Based on the distance to known nesting sites for bald eagle, no direct or indirect impacts to breeding or rearing activities are anticipated. However, temporary disturbance of 0.26 acres (11,305 square feet) of riparian habitat (and tree removal) would occur in the vicinity of the South Bridge crossing over the Roaring Fork River. Approximately 375 square feet of riparian habitat would be permanently impacted by the Preferred Alternative. This riparian habitat is designated winter foraging habitat for bald eagles. Disruption, destruction, or obstruction of roosting and foraging areas could negatively affect bald eagles. Disruptive activities in or near eagle foraging areas could interfere with feeding, reducing chances of survival. Existing trees would be preserved to the greatest extent possible and trees removed during construction, whether native or non-native would be replaced at a 1:1 ratio.

4.11.8 Avoidance and Minimization

The preliminary layout of the South Bridge crossing was designed to avoid and minimize impacts to the Roaring Fork River and associated riparian and wetland habitat. The pier locations for the proposed structure alignment have been set to span the entire length of the river. This layout would result in a three-span structure with a center span length of approximately 350 feet. This span length is longer than typically defined for conventional bridge construction. As a result, the actual pier column placement is located on dry upland areas, and avoids any direct permanent impacts to the Roaring Fork River or wetlands along the east and west banks.

The use of CDOT-approved BMPs would be used to offset the extent and duration of any temporary impacts.

4.11.9 Threatened, Endangered, and Sensitive Species Mitigation

- CDOT BMPs and revegetation guidelines will be employed to minimize habitat impacts associated with vegetation removal (see **Section 4.10.3**).

- Trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of two inches or greater. Shrubs removed during construction whether native or non-native will be replaced based on their preconstruction areal coverage. In all cases, all such trees and shrubs will be replaced with native species.

- Wetland/riparian areas not temporarily impacted by the project will be protected from construction activities by temporary and/or construction limit fencing.

- All disturbed areas will be revegetated with native grass and forb species, including species associated with the Ute-ladies'-tresses orchid. Seed, mulch, and mulch tackifier will be applied in phases throughout construction.

- One survey (single season) will be done for the Ute-ladies'-tresses orchid prior to construction. If present, Section 7 consultation with USFWS will be reinitiated.

- A 100% success rate of all replaced trees will be achieved as measured two years post construction. After two years, all failed replacement trees will be replaced and planted in locations that will provide the highest opportunity for success as determined by a CDOT Landscape Architect.

- Existing state law and an MOA between CDOT and CPW require attention to projects affecting streams and riparian habitat. Stream realignments, bank stabilization activities, and in-stream encroachment require SB 40 Certification. The Preferred Alternative will follow the stipulations and general conditions as part of the Certification requirements.

4.12 Visual Resources

The study area can be characterized as "mixed-use" which includes residential and commercial development, agricultural/ranching, light industrial uses, and public uses.

SH 82 extends down the east side of the study area, while Midland Avenue and Four Mile Road extend down the west side. The northern portion of the study area has mostly residential development along Midland Avenue and commercial and light industrial uses along SH 82. The southern portion of the study area has a conservation easement, open areas, and scattered residential dwellings. The Glenwood Springs Municipal Airport is located in the central portion of the study area. Although owned by the City of Glenwood Springs, the airport primarily supports small private planes.

The Preferred Alternative was assessed for its feature and/or panoramic important views. Important visual features surrounding the study area include Mount Sopris, Historic Coke Ovens, Red Cliffs, and Lazy H Slash Eleven property. In addition, the Roaring Fork River flows north to south in between Midland Avenue/Airport Road and SH 82 within the City of Glenwood Springs.

4.12.1 Existing Conditions

This section provides an overview of existing visual conditions by segment. Since the topography varies throughout the study area, there is no one visual characteristic that is representative of the area. Below is a description of the views moving west to east in the study area.

Segment 1—Midland Avenue

Midland Avenue is a narrow two-lane roadway located west of the Roaring Fork River. Viewers along this segment are primarily motor vehicle users. Because of the vast majority of residential development to the east and a steep rock face to the west, views along this segment are limited to the foregrounds. Residents in the adjacent neighborhoods would have limited views to the surrounding area and to the rest of the study area because of the topography and dense vegetation.

Traveling southeast to the intersection of Midland Avenue/Four Mile Road/Airport Road, the views open up with the Red Cliffs which fill the background, while the Sopris Elementary School can be viewed in the midground. There is a recreational vehicle (RV) park located northwest of this intersection. The elevation of the park increases from east to west. Views are limited to the foregrounds within the park because of dense vegetation and the surrounding topography.

Figure 4-16 depicts the views along Midland Avenue.

Figure 4-16 ***Looking East from the Midland Avenue/Airport Road Intersection***

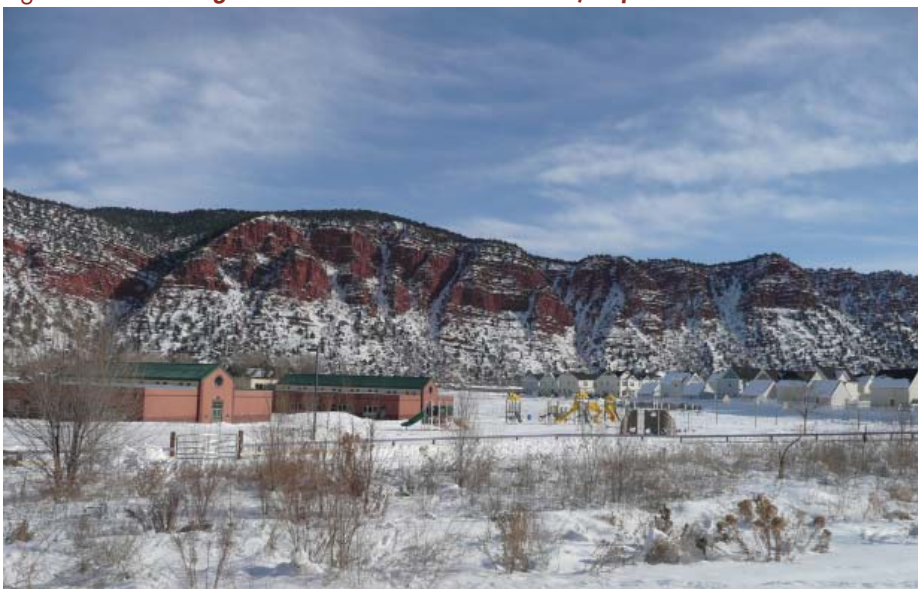


Figure 4-17 ***Looking East from Airport Road***

Figure 4-18 ***Historic Coke Ovens***

Figure 4-19 ***Looking Southwest Along SH 82***

Segment 2—Airport Road

Midland Avenue becomes Airport Road south of the intersection at Four Mile Road. The typical section for Airport Road is a two-lane roadway. Land use along this segment is a mixture of residential and commercial development, recreational uses, and an airport. Traveling south on Airport Road, the Cardiff Glen Subdivision can be viewed in the foregrounds to the east, as well as the historic coke ovens to the west. The coke ovens were used during the late 1800s to early 1900s. Many residents within the Cardiff Glen Subdivision have a direct view of the historic coke ovens and the study area. Traveling further south, the view to the east consists of the Glenwood Springs Municipal Airport in the foreground with the Red Cliffs in the background. **Figure 4-17** and **Figure 4-18** depict the views along Airport Road.

Within the center portion of the Airport Road segment, the foreground view is sparse, characterized by commercial and residential development. Background views consist of Mount Sopris to the south and the Red Cliffs to the east. The southern portion of the Airport Road segment is unpaved and is situated on an elevated berm.

Segment 3—SH 82

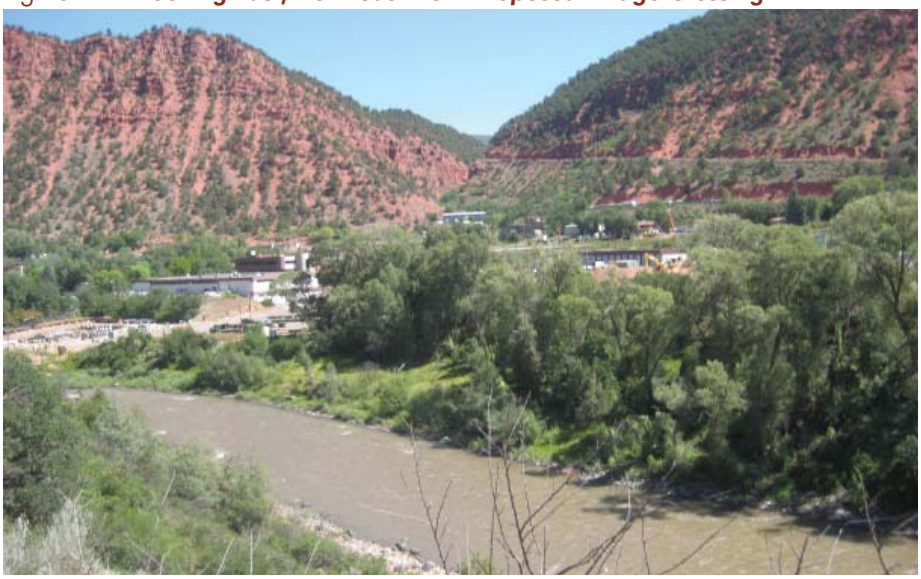
Land uses along SH 82 are mostly commercial and industrial uses, residential development, and undeveloped land. Traveling south on SH 82, there is a steep rock face to the east limiting the view to midground, while the view to the west is more of background because of a significant change in topography.

Approaching the southern end of the study area, the Lazy H Slash Eleven property can be viewed in the foreground to the west. The Rio Grande Trail, located on the RFTA corridor runs north and south on the west side of SH 82. **Figure 4-19** depicts the views along SH 82.

Segment 4—Area Where New South Bridge Alignment Will be Constructed (between Airport Road and SH 82)

The river is situated at a lower elevation than the surrounding land uses. From Airport Road looking east, the view to the northeast consists of the river in the foreground, residential and commercial development in the midground, and the Red Cliffs in the background (see **Figure 4-20**). The view to the south consists mostly of the Lazy H Slash Eleven property in the foreground and Mount Sopris in the background.

Figure 4-20 ***Looking East/Northeast from Proposed Bridge Crossing***



4.12.2 Visual Impacts

No Action

The No Action Alternative would result in no impact to the existing visual character.

Preferred Alternative

Short-term and long-term visual impacts are anticipated as a result of the Preferred Alternative.

Short-term visual impacts associated with construction of the Preferred Alternative include construction equipment and excavated material, dust and debris, traffic congestion, and removal of vegetation.

Long term-visual impacts are summarized below for each segment.

Segment 1—Midland Avenue

A roundabout is proposed at the intersection of Midland Avenue/Airport Road/ Four Mile Road. In addition, traffic would move slightly closer to existing residents and the school near this intersection. Although additional pavement would be required to construct the roundabout, impacts to foreground views from the Cardiff Glenn Subdivision would be negligible because of existing dense vegetation that limits views of the surrounding area. The project cannot be viewed by residences in the RV park.

Segment 2—Airport Road

Pedestrian and bicycle facilities are proposed along both sides of Airport Road. A roundabout is proposed at the Airport/ CR 160 intersection and access to CR 160 would be shifted east, closer to the residents in Cardiff Glen Subdivision, to provide access to the roundabout. These elements of the Preferred Alternative would be largely obscured from the view of Cardiff Glenn Subdivision residents because of the noise barriers proposed along the east side of Airport Road and CR 160. The hills and bluff west of Cardiff Glen Subdivision would still be visible.

Motorists, pedestrians, and bicyclists along Airport Road would also experience changes in foreground views associated with the noise barriers, the new roadway and pedestrian/bicycle elements, and higher traffic volumes. Landscaping is proposed on both sides of Airport Road, which would improve the visual quality of the roadway.

Segment 3—SH 82

Traveling along SH 82, the motorists' foreground view would vary from existing conditions since there would be an increase in pavement width, approximately 24 feet, to accommodate for the auxiliary lanes and turn lanes. This would be perceived as a change in the visual character,

with more extensive foreground views of pavement.

New access would be required for the Frontage Road east of SH 82 at the South Bridge intersection for safety improvements. Foreground views would be impacted by construction of additional pavement.

Two 12-foot noise barriers are proposed on the west side of SH 82 in the following locations:

- Between the new connection of the South Bridge alignment and SH 82 north to CR 154.
- Extending north from the intersection of SH 82 and CR 154, approximately 1,200 feet.

Motorists on SH 82 would experience a change in foreground views due to the presence of the noise barrier. Views to the west, especially for travelers in the southbound lanes, would be obscured by the noise barrier, limiting and/or eliminating, the existing views of bluffs and hills. Trail users on the Rio Grande Trail would have similar impacts, except views to the red mesas on the east side of SH 82 would be limited or eliminated and views to the west unaffected. For residences along CR 154, the noise barrier would be visible in the foreground.

Segment 4—New South Bridge Alignment Between Airport Road and SH 82

The new South Bridge alignment between Airport Road and SH 82 would be elevated to cross over the Roaring Fork River, which would create a visual barrier approximately 80 feet in length between the residents and businesses to the north and Lazy H Slash Eleven property to the south.

Recreational users of the Rio Grande Trail would be visually impacted by the new South Bridge alignment and the proposed retaining walls (ranging in heights up to 12 feet) along the trail and under the new South Bridge alignment because of the topography. Currently, there is a clear view of the Lazy H Slash Eleven property, Mount Sopris, and portions of the river. Travelers that utilize the Rio Grande trail corridor would have limited foreground views of the project since South Bridge is elevated above the trail. Traveling north along the trail and north of CR 154, the project cannot be viewed since SH 82 is elevated from the surrounding land uses.

Recreational uses of the river, including anglers and rafters, would be visually impacted by the project. Views from the river would be limited by the construction of the new bridge and roadway since they would act as a barrier blocking views of Lazy H Slash Eleven property and Mount Sopris.

Residents' views at the western edge of El-Rocko mobile home park, nearest the Roaring Fork River, would be impacted as the bridge would be visible, interrupting the currently unbroken view upstream.

New access would be required for Holy Cross Energy and Lazy H Slash Eleven property, which would impact the foreground views with the construction of additional pavement.

The new South Bridge alignment would provide additional views for travelers in this area. Mount Sopris and the Red Cliffs would be viewed in the background. However, motorists' view of the river would be impacted by short (three- to four-foot) retaining walls along the roadway shoulders.

4.12.3 Visual Mitigation

- To the extent possible, disturbance to existing trees, shrubs, and vegetation will be avoided.
- A weed management plan will be implemented.

- Temporary and permanent erosion control measures will be implemented.
- Erosion control blankets will be used on steep newly planted slopes.
- Disturbed areas will be revegetated with native grass and forb species.
- Rock cuts will be analyzed prior to final design to produce a form and texture consistent with existing visual conditions.
- Retaining walls and noise walls will be designed to meet local design and aesthetic standards.

4.13 Historic Preservation

Legislation at the state and federal levels requires that governmental agencies assess the impacts of proposed projects on historic and archaeological resources before undertaking a project. The federal legislation that protects historic and archaeological resources includes Section 106 of the National Historic Preservation Act of 1966 (NHPA as amended) and Section 4(f) of the U.S. Department of Transportation Act. Section 106 of the NHPA requires that federal agencies or other agencies that use federal funds consider the effects of their actions on historic properties. An historic property is defined as any prehistoric or historic site, district, structure, building, object or archaeological resource included on or eligible for inclusion on the National Register of Historic Places (NRHP).

The Section 106 process includes steps to: 1) identify and evaluate historic properties; 2) assess the impacts of an undertaking on the historic properties; and 3) consult with appropriate agencies for techniques to avoid, minimize, or mitigate any adverse effects. The process for complying with the state legislation is similar. This section addresses the requirements of Section 106 of the NHPA and the Colorado statutes protecting historic resources.

Four main criteria are commonly used to determine if a property is eligible for inclusion on the NRHP:

- **Criterion A.** The property is associated with events that have made a significant contribution to the broad pattern of our history;
- **Criterion B.** The property is associated with the lives of persons significant in our past;
- **Criterion C.** The property embodies the distinctive characteristics of a type, period, or method of construction; or represents the work of a master; or possesses high artistic values; or represents a significant and distinguishable entity whose components may lack individual distinction; or
- **Criterion D.** The property has yielded or may be likely to yield information important in history or prehistory.

4.13.1 Existing Conditions

Historic properties were evaluated for the study area and the defined Area of Potential Effect (APE), as shown in **Figure 4-21**. The boundaries of the APE were agreed to by the State Historic Preservation Officer (SHPO) in a letter dated September 17, 2010 (see **Appendix D, Comments and Coordination**).

Activities undertaken to identify historic properties in the APE included a file search at the Office of Archaeology and Historic Preservation, a review of the NRHP and State Register of Historic Places listings, a review of any local landmark listings, review of previous historical property assessments in the general area, and an intensive level field survey to identify historic properties.

There were 13 properties identified as historic-age resources. Six properties were recommended as eligible for the NRHP. Of these six, three were recommended as non-supporting elements of a larger

Section 106 requires agencies to determine an Area of Potential Effect, identify historic properties within the Area of Potential Effect, identify effects to historic properties, and mitigate adverse effects in coordination with consulting parties.

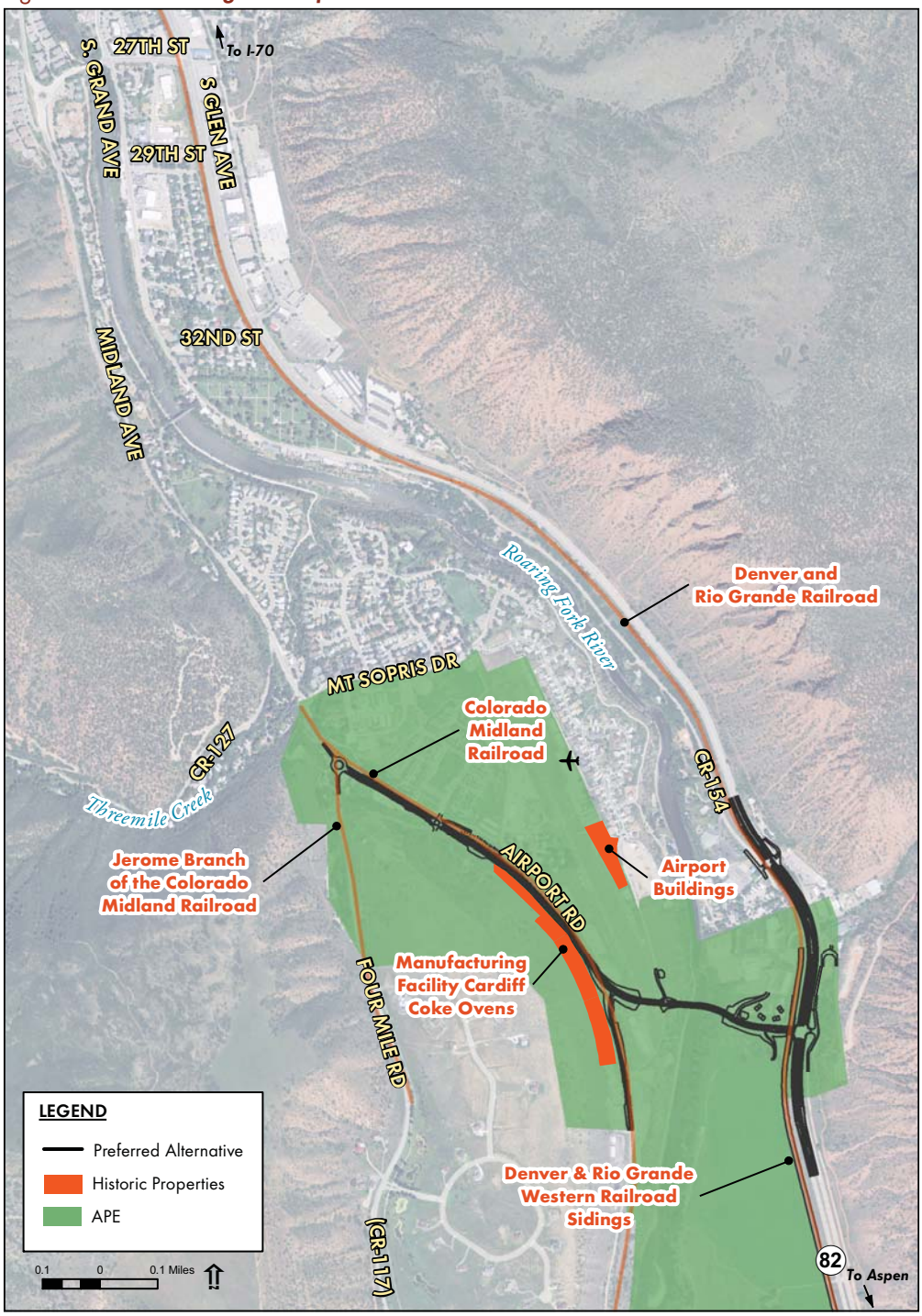
NRHP-eligible property. Seven properties were recommended as not eligible for the NRHP. The six eligible and/or listed properties are detailed in **Table 4-18** and shown in **Figure 4-21**. For additional information regarding see the *South Bridge Environmental Assessment Cultural Resources Report*.

Following is a brief description of these properties.

Manufacturing Facility/Cardiff Coke Ovens (5GF.461)

The Cardiff Coke Ovens were built between 1887 and 1889 and used in the

Figure 4-21 **NRHP-Eligible Properties in the APE**



manufacture of coke, which itself is used as fuel in the smelting of iron ore. The coke ovens listed on the NRHP on November 15, 1996, and rerecorded in 1997. The coke ovens are significant under Criterion A for their association with the industrial history of the Lower Roaring Fork Valley. The resource is also significant under Criterion D for its potential to yield information.

Jerome Park Branch of the Colorado Midland Railroad (5GF469.2)

The Jerome Park Branch of the Colorado Midland Railroad (5GF469) was built in the late 1800's and was used to haul coal to the Cardiff Coke Ovens. The Jerome Branch was determined eligible for the NRHP by the Colorado SHPO in 2005 under Criterion A for its association with the industrial history of the Lower Roaring Fork Valley.

However, the segment that is located in the APE has been paved over by Four Mile Road. Therefore, that segment (5GF.469.2) is recommended as a non-supporting element of the larger NRHP eligible property.

Denver and Rio Grande Western Railroad (5GF1661.3)

The Denver and Rio Grande Western Railroad was built in the 1880s, providing rail access to the mining areas around Aspen, Colorado. The railroad grade (5GF.1661) was determined eligible by SHPO in 1988 under Criterion A for its association with the industrial history of the Lower Roaring Fork Valley. However, the segment in the APE (5GF.1661.3) has been converted to a multiuse path and is recommended as a non-supporting element of the larger NRHP eligible property.

Colorado Midland Railroad (5GF1663.1)

The Colorado Midland Railroad was built in the 1880s and provided service to the Cardiff Coke Ovens. The railroad grade (5GF.1663) was recommended as eligible to the NRHP, although no official determination was made. However, the segment in the APE lacks physical integrity and is recommended as a non-supporting element of the larger NRHP eligible property.

Denver & Rio Grande Western Railroad Siding (5GF.3009)

The Denver and Rio Grande Western Railroad was built in the 1880s, providing rail access to the mining areas around Aspen, Colorado. The site lies in the southeastern portion of the APE. It was initially recorded as Feature 43 of the Denver and Rio Grande Western Railroad (5GF.1661) by Chambellan and Mehls (2000) but was given a separate site number in 2002. The siding and switching stands were recommended eligible for inclusion in the NRHP under Criterion A.

Table 4-18 ***Historic Properties***

Site Number	Site Type/Name	NRH Recommendation
5GF.461	Manufacturing Facility/Cardiff Coke Ovens	Listed (Criteria A, C, and D)
5GF469.2	Jerome Park Branch of the Colorado Midland Railroad	Eligible (this segment is non-supporting)
5GF.3009	Rail-Related/Denver & Rio Grande Western Railroad Siding	Field Eligible (Criterion A)
5GF1661.3	Denver and Rio Grande Western Railroad	Eligible (this segment is non-supporting)
5GF1663.1	Colorado Midland Railroad	Eligible (this segment is non-supporting)
5GF.4265 (A & B)	Airport Office and Apartment/ Office Buildings	Field Eligible (Criteria A and C)

Airport Office and Apartment/ Office Buildings (5GF.4265 A & B)

The Glenwood Springs Municipal Airport was built in 1937 using both local and federal Works Progress Administration (WPA) funding. The Glenwood Springs Municipal Airport is still in use today. Two of the original buildings remain, including the original office 5GF.4265 (Building A) and the apartment/office building, 5GF.4265 (Building B) built by Civilian Conservation Corps (CCC) workers stationed in Glenwood Springs.

Building A is significant under NRHP Criterion A on a statewide level for its association with the WPA and CCC and for its association with the development and expansion of air transportation in Colorado prior to WWII as an important link in the north-south air route on Colorado's western slope—a mountainous and inconvenient area. Building A is significant under NRHP Criterion A for its association with the WPA and CCC and for its association with the development and expansion of air transportation in Colorado prior to World War II. It is also significant under Criterion C as an example of the National Park Service Rustic Style.

Building B is also significant for its association with the WPA and CCC and as an example of the National Park Service Rustic Style.

4.13.2 Historic Property Impacts

No Action Alternative

The No Action Alternative would result in no new impacts to historic properties.

Preferred Alternative

There is no right-of-way acquisition required from any historic properties in the APE. Most impacts, direct, indirect and temporary, are due to changes in access, noise levels, and the visual environment.

Access at the coke ovens is currently via an unimproved (dirt) u-shaped road that is approximately 175 feet in length. This access would be improved with the inclusion of a parking bumpout along the western edge of the improved Airport Road. Construction of a retaining wall along Airport Road would require a temporary construction easement within the boundary of the coke ovens. This easement, approximately 500 feet long and 5 feet wide (2,500 square feet), would provide construction access for small equipment and construction personnel. The retaining wall would not be visible from the coke ovens.

The Rio Grande Trail, located on the Denver and Rio Grande Western Railroad grade, would be lowered to pass beneath the new roadway. Lowering the multi-use path would alter the visual characteristics by removing SH 82 from the field of vision, adding an overcrossing (the new roadway) above the path, and the inclusion of retaining walls. Construction in this location would require a temporary construction easement approximately 350 feet long and 50 feet wide (17,500) within the boundary of the railroad grade.

Retaining walls and intersection improvements at CR 154 and SH 82 would require a temporary construction easement of approximately 13,800 square feet within the boundary of the historic property. Retaining walls, with a maximum height of 2.25 feet, would extend north and south from the intersection of CR 154 and SH 82. The retaining walls would be only intermittently visible from the Rio Grande Trail because of their low height and existing vegetation. The retaining walls would require a temporary construction easement approximately 880 feet long and 10 feet wide (8,800 square feet). The intersection improvements, all occurring within the existing roadway, would require a temporary construction easement 100 feet long and 50 feet wide (5,500 square feet).

All resources would experience a change in the visual environment due to new and widened roadways and landscaping. Noise

levels are anticipated to increase due to increasing traffic volumes.

SHPO, in letters dated April 5, 2012, September 14, 2012, October 12, 2012, and February 14, 2013 concurred with the effects determination shown in **Table 4-19**. Referenced correspondence can be found in **Appendix D, Comments and Coordination**.

Additional information regarding impacts and effects determination is included in **Appendix D, Comments and Coordination**.

4.13.3 Summary of Coordination

Coordination with SHPO, the Glenwood Springs Historic Preservation Commission, and the Frontier Historical Society occurred from 2008 to 2013. Copies of all Section 106 correspondence are included in **Appendix D, Comments and Coordination**.

4.13.4 Native American Consultation

Section 106 of the National Historic Preservation Act (NHPA as amended) and the Advisory Council on Historic Preservation regulations (36 CFR 800.2[c][2][ii]) mandate that federal agencies coordinate with interested Native American tribes in the planning process for federal undertakings. Consultation with Native American tribes recognizes the government-to-government relationship between the United States government and sovereign tribal groups. In that context, federal agencies must acknowledge that historic properties of religious and cultural significance to one or more tribes may be located on ancestral, aboriginal, or ceded lands beyond modern reservation boundaries.

Consulting tribes are offered the opportunity to identify concerns about cultural resources and comment on how the project might affect them. If it is found that the project will impact properties that are eligible for inclusion on the NRHP and are of religious or cultural significance to one or more consulting tribes, their role in the consultation process may also include participation in resolving how best to avoid, minimize, or mitigate those impacts. By describing the proposed undertaking and the nature of any known cultural sites, and consulting with the interested Native American community, FHWA and CDOT strive to effectively protect areas important to American Indian people.

In September 2008, FHWA contacted the following three federally recognized tribes with an established interest in Garfield County and invited them to participate as consulting parties (**Appendix D, Comments and Coordination**):

- Southern Ute Indian Tribe (Colorado)
- Ute Mountain Ute Tribe (Colorado)
- Ute Tribe of the Uintah and Ouray Agency (Utah)

None of the tribes elected to reply; therefore, no tribal governments participated in the project under the auspices of the NHPA. As a result of these actions, FHWA has fulfilled its legal obligations for tribal consultation under federal law.

Table 4-19 ***Effects Determination for Historic Properties***

Historic Property	Effects Determination
Manufacturing Facility/Cardiff Coke Ovens (5GF.461)	No adverse effect
Jerome Park Branch of the Colorado Midland Railroad (5GF469.2)	No historic properties affected
Rail-Related/Denver & Rio Grande Western Railroad Siding (5GF.3009)	No historic properties affected
Denver and Rio Grande Western Railroad (5GF1661.3)	No adverse effect
Colorado Midland Railroad (5GF1663.1)	No historic properties affected
Airport Office and Apartment/ Office Buildings (5GF.4265)	No historic properties affected

4.13.5 Historic Properties Mitigation

No direct impacts to historic properties are anticipated; however, the following measures will be implemented to further minimize the risk of impacts:

- On-street parking will be installed on the west side of Airport Road to maintain access to the Cardiff coke ovens located on the parcel owned by the Frontier Historical Society.
- Flagging or high visibility fencing will be placed along the boundaries nearest Airport Road at the Manufacturing Facility/Cardiff Coke Ovens (5GF.461) and the Industry/Cardiff Coke Manufacturing Equipment (5GF.4261) to avoid construction impacts.
- All disturbed areas will be revegetated with native shrubs, grasses, and forbs.
- If subsurface cultural remains are exposed during any phase of construction, all work in the vicinity of the find will cease and the CDOT Senior Staff Archaeologist will be contacted immediately to evaluate the materials for eligibility to the NRHP. Work will not resume in the area until appropriate interagency consultation has been completed and authorization to continue has been issued by the archaeologist.

4.14 Paleontological Resources

4.14.1 Existing Conditions

In April and May 2008, a paleontological field survey was conducted by Rocky Mountain Paleontology. The field survey consisted of a foot survey of the study area. Prior to the surveys, literature and museum record searches were conducted to assess the paleontological sensitivity of the area.

The study area is underlain by 11 geological units, from oldest to youngest, as follows:

- Middle Pennsylvanian Eagle Valley Formation
- Pennsylvanian and early Permian Maroon Formation
- Middle Pleistocene Oldest terrace alluvium
- Middle Pleistocene Older terrace alluvium
- Late Pleistocene Intermediate terrace alluvium
- Late Pleistocene Younger terrace alluvium
- Pleistocene Old debris-flow deposits
- Holocene and late Pleistocene stream-channel, flood-plain and low terrace deposits
- Holocene and latest Pleistocene colluvium
- Holocene and latest Pleistocene undivided alluvium and colluvium
- Holocene Artificial fill

Few fossils have been reported from the Maroon Formation, but any additional discoveries would be of scientific importance. The Eagle Valley Formation locally contains fossil marine invertebrates. These units are considered to have moderate paleontological sensitivity. Pleistocene-age surficial deposits in Colorado, especially alluvium, are known to contain fossils, but fossils are typically scarce and poorly preserved within them and they are considered to have moderate paleontological sensitivity. Holocene-age surficial deposits are too young to contain in-situ fossils and have low paleontological sensitivity.

No fossils were observed within the study area during the field survey; no reports of fossils from within the study area were found in the literature reviewed for this study; and no records of fossils from with-

in the study area were found during the museum record searches conducted for this study.

4.14.2 Paleontological Impacts

No Action Alternative

There would be no impact to paleontological resources as a result of the No Action Alternative.

Preferred Alternative

No paleontological resources were identified during field surveys and the probability of impacts to previously unidentified resources is low. However, reports of fossils from the Eagle Valley Formation, Maroon Formation, and Pleistocene surficial deposits from elsewhere in Colorado were found in the scientific literature and/or museum records, indicating the potential for fossil occurrences within the study area. These fossils, if present, would be disturbed or destroyed by excavation activities.

4.14.3 Paleontological Mitigation

If any subsurface bones or other potential fossils are found anywhere within the study area during ground disturbance, the CDOT Staff Paleontologist will be notified immediately to assess their significance and make further recommendations.

4.15 Parks and Recreation

4.15.1 Existing Conditions

Parks

The City of Glenwood Springs has a well-developed park system with approximately 20 parks, including both developed and undeveloped lands, as well as the Glenwood Spring Whitewater Activity Area. The City has approximately 105 acres of developed parks and over 3,400 acres of undeveloped park lands. There are five parks located within the study area (see **Figure 4-22**).

The characteristics of each park within the study are detailed in **Table 4-20**.

Recreation Trails

Within the study area is a mix of on- and off-street pedestrian and bicycle facilities. Off-street facilities include both paved and unpaved trails suitable for pedestrians and cyclists. They are found in Three Mile Park, east of the Glenwood Springs Municipal Airport adjacent to the western bank of the Roaring Fork River and along the Rio Grande Trail. Old Cardiff Bridge, spanning the Roaring Fork River, is used solely by pedestrians and cyclists and provides an alternative to the 27th Avenue bridge (see **Section 4.16.1** for more information on existing sidewalks and bicycle facilities).

River-Based Recreation

The Roaring Fork River is a Gold Medal Water, the highest classification of water for fishing in Colorado, throughout its entirety within the study area. Anglers can access the river at multiple points within the study area, including Three Mile Park, Westbank Bridge, and points east of the Glenwood Springs Municipal Airport, where private property owners access the river on the east side. The City maintains the river property at Park East, and there is an informal path down to the water's edge for anglers. In addition to fishing, the lower reaches of the Roaring Fork River are used for rafting, kayaking, and canoeing by both private and commercial entities.

Planned Parks and Recreation Resources

The City is planning to convert the previously used rodeo grounds to a future park at some point, as noted in the 2011 *Glenwood Springs Comprehensive Plans*. The City has set aside a future transportation corridor for the South Bridge project across the southern corner of the previously used rodeo grounds property. Because of this joint planning, the future use of this property for the South Bridge project is not a Section 4(f) use. See **Appendix D, Comments and Coordination** 67 for communication between FHWA and the

City of Glenwood Springs dated June 13, 2011, regarding joint planning.

4.15.2 Parks and Recreation Impacts

No Action Alternative

There would be no impact to parks and recreation facilities or mobility as a result of the No Action Alternative.

Figure 4-22 ***Parks Located in the Study Area***

Preferred Alternative

Approximately 0.05 acre of the rodeo grounds would be converted to transportation use.

Once construction of the Preferred Alternative is complete, the new bridge over the Roaring Fork River would be visible to river-based recreationists.

The inclusion of pedestrian and bicycle facilities along the alignment would improve multimodal access to the rodeo grounds once it is developed as a park.

4.15.3 Parks and Recreation Mitigation

The City of Glenwood Springs will participate in joint planning for the development of the rodeo grounds to include both transportation and recreation uses.

4.16 Pedestrian and Bicycle Facilities

4.16.1 Existing Conditions

Glenwood Springs has a developed trail system serving both pedestrians and cyclists. According to the Glenwood Springs Bike and Trail Map, the majority of the urban trail system can be found in the northern part of the city, both downtown and along the Colorado River extending both east and west of the city.

Table 4-21 provides details of the characteristics of the pedestrian and bicycle facilities located in the study area. **Figure 4-23**, shows the trails detailed in **Table 4-21**, which are identified by the corresponding Map ID number.

Sidewalks are prevalent within the neighborhoods located in the study area. However, major thoroughfares, such as Midland Avenue, Four Mile Road and Grand Avenue, either lack sidewalks or the sidewalks are discontinuous.

4.16.2 Pedestrian and Bicycle Facility Impacts

No Action Alternative

There would be no impact to pedestrian and bicycle facilities or mobility as a result of the No Action Alternative.

Preferred Alternative

Pedestrian and bicycle circulation in the study area would be improved with the inclusion of pedestrian and bicycle facilities along the alignment. Sidewalk/bike lanes would be provided on both sides of the alignment, varying in width from eight feet to eight feet, six inches.

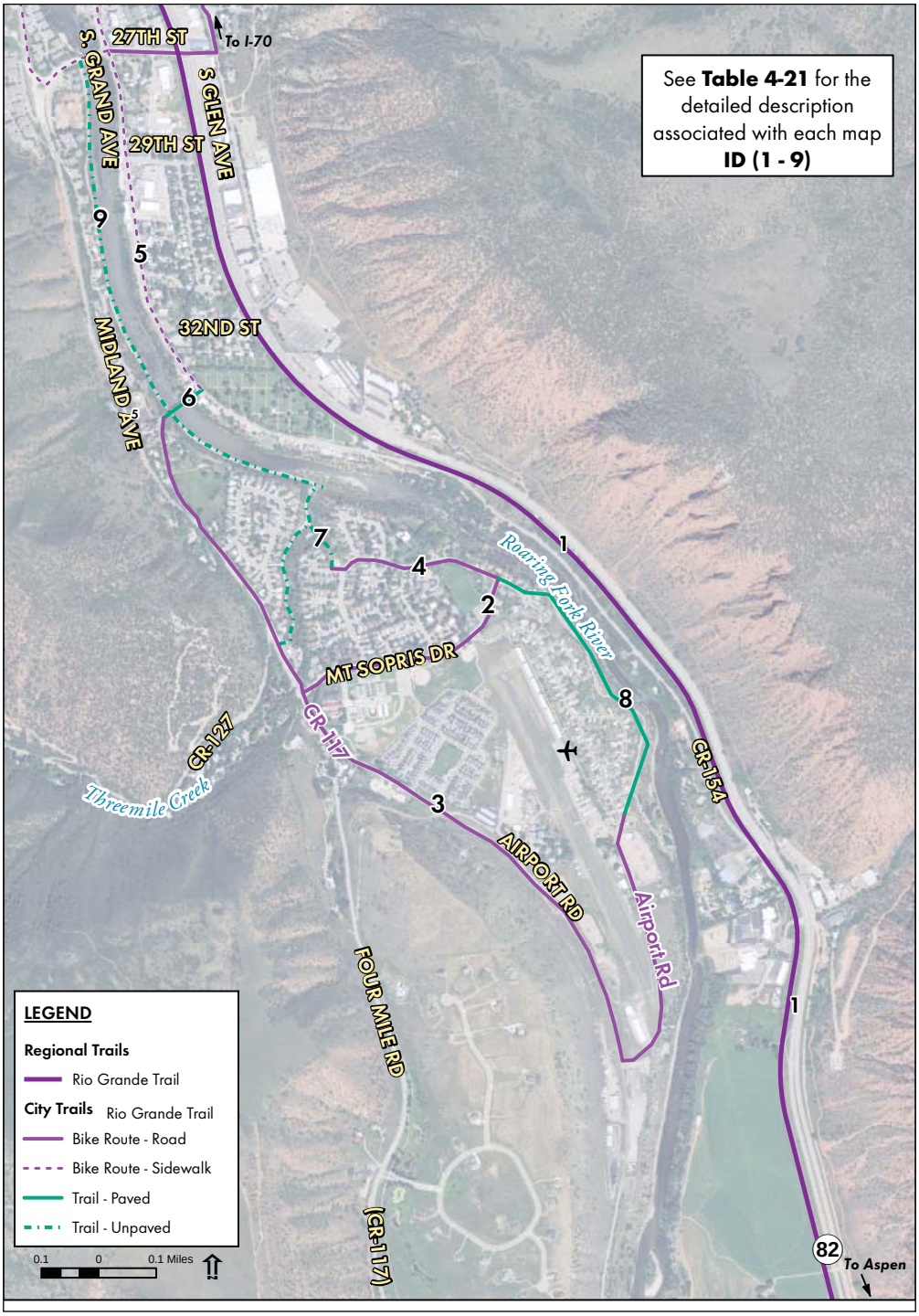
Table 4-20 ***Park Characteristics***

Park Name	Size (acres)	Description
River Corridor/ Three Mile Park	9.90	A neighborhood park with open space, picnic areas, a sand volleyball court, playground and a series of soft surface trails.
Glenwood Park	3.78	Adjacent to Sopris Elementary School with open space, soccer field, basketball court, restrooms, and picnic areas.
Conservancy Park	1.51	Located in the Park East neighborhood, this parcel is served by limited street parking and is undeveloped, providing open space for the immediate community, as well as access to the Roaring Fork River and the Park East Trail.
Sopris Park	6.28	One of the City's newest parks with two ball fields, soccer field, and a playground located at the adjacent Sopris Elementary School.
Rodeo grounds (future park)	~7.0	The Rodeo grounds, which are City park land, have been cleared and currently serve no formal recreational purpose.

Source: GWS, Colorado, *Parks and Recreation Comprehensive Master Plan*, (November 2006).

The Rio Grande Trail crosses the Preferred Alternative at the point where it crosses the railroad corridor. The Rio Grande Trail would be lowered at this point so it would cross the Preferred Alternative in a grade separated condition. The impact to the trail would be temporary, while the grade separation is being built and a detour would be provided. The temporary impacts would be minor, there would be no anticipated permanent impacts, and the land being temporarily impacted would be fully restored.

Figure 4-23 ***Pedestrian and Bicycle Facilities***



4.16.3 Pedestrian and Bicycle Facility Mitigation

- Signage will be provided along the Rio Grande Trail to inform users of upcoming construction disturbance and direct them to a safe detour. The detour will use the existing SH 82 shoulder, which will be widened to accommodate trail users and be protected by a concrete barrier. The detour will be approximately .25-mile in length and will not result in out of direction travel.

- Bicycle traffic on Airport Road will be maintained the same as automobile traffic. Bicycles will be allowed with maintenance of traffic throughout the duration of the construction.

- The land that has been temporarily disturbed adjacent to the Rio Grande Trail will be restored and planted.

4.17 Hazardous Waste

Hazardous waste may be encountered during the construction of a transportation project. Therefore, it is important to identify properties that may contain contamination prior to right-of-way acquisition and construction. Hazardous waste is defined as any waste product that is considered flammable, corrosive, reactive, or toxic, as defined by EPA regulations or is specifically listed as a hazardous waste by the EPA. Hazardous waste can be found in various forms and can originate from a variety of sources. Examples of potential sites that may contain hazardous waste include landfills, service stations, industrial areas, railroad corridors, and mine sites. When developing a transportation project, it is important to be aware of known hazardous waste sites so they can be avoided or their impacts minimized.

A Phase I Environmental Site Assessment was prepared for this project. This section is based on information obtained from a review of environmental regulatory records, historical topographic maps, and an on-site inspection.

4.17.1 Existing Conditions

Land use within the study area consists of highway right-of-way, residential and commercial development, light industrial uses, recreational uses, and open land. According to the Colorado Oil and Gas

Table 4-21 ***Description of Trails***

Map ID # (for use with Figure 4-23)	Trail Location and Description
1	Rio Grande Trail, a "rails to trails" project. This 10-foot paved path extends from Glenwood Springs to Aspen and is located adjacent to SH 82 within the study area. It was purchased with funds from CDOT and is owned, managed, and maintained by RFTA, so is primarily a transportation facility.
2	Mt. Sopris Drive, a designated on-street bicycle facility. It does not have striped bicycle lanes.
3	Airport Road (CR 116), a designated on-street bicycle facility, It does not have striped bicycle lanes.
4	Mountain Drive, a designated on-street bicycle facility. It does not have striped bicycle lanes.
5	Grand Avenue (CR 154), a designated on-sidewalk bicycle facility. It follows a wide sidewalk along Grand Avenue, providing connectivity with the pedestrian/bicycle-only Old Cardiff Bridge.
6	Old Cardiff Bridge, a pedestrian and cyclist bridge. It provides increased east-west connectivity across the Roaring Fork River.
7	Three Mile Park has a system of soft surface trails, allowing access to picnic areas and the Roaring Fork River for both pedestrian and cyclists.
8	Park East Trail, located east of the airport. It is a paved multiuse path adjacent to the Roaring Fork River.
9	Atkinson Trail, an off-road alternative to Midland Avenue. It is a component of the Rivertrail Master Plan.

Source: Glenwood Springs Bike and Trail Map, 2003.

Conservation Commission, there are no oil and gas wells located within the study area.

Historical topographic maps were reviewed for 1961, 1982, and 1987. Within the immediate study area, historically this area consisted of agricultural land and residential and commercial development. Over the past half-century, residential development has increased within the surrounding area. All of the current major roadways and the Glenwood Springs Municipal Airport are present on the 1961 map. The surrounding areas to the east and west have remained undeveloped, consisting of mountainous terrain.

Recognized environmental conditions are the presence or likely presence of hazardous substances, hazardous waste, or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any such substances into structures on the property or into the ground, groundwater, or surface water of the property.

Environmental Data Resources, Inc. (EDR) maintains federal, state, and local regulatory databases for registered sites. A report was generated to locate potential recognized environmental conditions, defined as the presence or likely presence of hazardous substances, hazardous wastes, or petroleum products, within 0.5-mile of the study area, centered on Airport Road within the Glenwood Springs Municipal Airport boundary. The report revealed 27 listed sites within the area search. However, a site may be listed in several different databases. In addition, there were seven sites observed during the site reconnaissance which were not included in the EDR report, but may or may not have the possibility to impact the study area.

Table 4-22 summarizes all of the sites located in or near the study area that were listed in the EDR report and observed during the field reconnaissance. For more detail about each site, see Section 5.0 of the Phase I Environmental Site Assessment. The relative degree of risk (none, low, moderate, or high) is based on the distance of documented Recognized environmental conditions from the proposed project, type of contamination, and likelihood of the condition being encountered during construction.

After evaluating the likelihood that contamination from each of the listed and observed sites, if present, would impact the project, the list of sites of concern was reduced to five sites. **Figure 4-24** depicts the *recognized environmental condition* sites that pose some risk to the study area. The remaining sites are not located adjacent to the proposed improvements, have been granted no further action (NFA) by the Colorado Department of Labor and Employment, Division of Oil and Public Safety, or do not have any reported violations.

4.17.2 Hazardous Materials Impacts

No Action Alternative

The No Action Alternative would have no impact on hazardous waste sites.

Preferred Alternative

The Preferred Alternative would result in partial acquisitions of properties. Shallow depths of excavation and repaving would be required for the proposed improvements, but contamination or major erosion problems that could potentially impact waterbodies in the study area are not anticipated.

Further investigation is recommended, which could include a Phase II Environmental Site Assessment being performed for the following *recognized environmental condition* sites prior to commencement of construction activities: **EDR Map ID #2 and A5: Glenwood Aviation at 1172 Airport Road:** Evidence of petroleum contamination was observed, but all samples came back below detection limits. There-

Table 4-22 ***Summary of EDR-Listed Sites and Observed Sites***

Site Name	Site Address	Data-base	Status	Risk
EDR-Listed Sites				
Glenwood Aviation	1172 Airport Road	ERNS and LUST	One closed UST; One in-service UST of gasoline; NFA; adjacent to proposed improvements	Low
Orrison Distributing	4919 SH 82	LUST	Three closed USTs of gasoline and diesel; One in-service UST of a multi compound of gasoline and diesel; NFA; located over ½ mile south from proposed improvements	None
Holy Cross Electric Association	3799 SH 82	LUST	Three closed USTs of gasoline and diesel; Two in-service USTs of gasoline and diesel. NFA for closed tanks and no reported violations for in-service tanks. Adjacent to proposed improvements	Low
Waste Management/ Security Leasing	3766 SH 82	LUST	Three closed USTs; NFA; located approximately 550 feet east from proposed improvements	None
Mountain Market (Conoco)	3950 Mid-land Avenue	UST and AST	Three in-service USTs of gasoline and diesel; One closed liquified petroleum gas (LPG) AST; NFA; located approximately 550 feet east from proposed improvements	None
KN Energy/ Kinder Morgan (Source Gas)	96 CR 160	RCRA	Large quantity non-generator; adjacent to proposed improvements; non-generator of hazardous waste	None
USFS White River Admin Site	1168 Road 116	RCRA	Conditionally small quantity non-generator; adjacent to proposed improvements; non-generator of hazardous waste	None
Red Cañon Auto Body Inc. (Mountain Pest Control)	3758 SH 82	RCRA	Adjacent to proposed improvements; Non-generator of hazardous waste	None
Mountain Valley Developmental	700 Mt. Sopris Drive	RCRA	Adjacent to proposed improvements; Non-generator of hazardous waste	None
Observed Sites				
Meyers Boiler Property	Airport Road	N/A	Hazardous materials may be associated with the ASTs and rusted equipment. Proposed improvements would be constructed adjacent to this site.	Low
Little Engine Shop/Rising Sun Mechanical	CR 160	N/A	No reported violations. Groundwater flow assumed to be east, towards the Roaring Fork River and away from the proposed improvements.	None
Glenwood Aviation/ Phillips 66	CR 116 (Airport Center Road)	N/A	No reported violations. This facility is located east of the airport and approximately 650 feet east from the proposed improvements. Groundwater flow assumed to be east, towards the Roaring Fork River and away from the proposed improvements.	None
U-Haul	CR 116 (Airport Center Road)	N/A	No reported violations. This facility is located east of the airport and approximately 650 feet east from the proposed improvements. Groundwater flow assumed to be east, towards the Roaring Fork River and away from the proposed improvements.	None
Pitkin Corp	Airport Road	N/A	Hazardous materials may be associated with this structural and architectural steel company. Proposed improvements would be constructed adjacent to this site.	Low
City Storage	Airport Road	N/A	Hazardous materials may be associated with the storage tanks and equipment on site. Proposed improvements would be constructed adjacent to this site.	Low
Auto Garage	El-Rocko Mobile Home Park	N/A	No reported violations. This facility is located east of the airport and approximately 850 feet east from the proposed improvements. Groundwater flow is assumed to be to the west, towards the Roaring Fork River and away from the proposed improvements.	None

AST = Above-ground storage tank ERNS = Emergency Release Notification System N/A = Not applicable UST = Underground storage tank
LUST = Leaking underground storage tank NFA = No further action RCRA = Resource Conservation and Recovery Act of 1976

fore, the contaminated soil was managed onsite. Per OPS letter dated 03/25/1999 no further remedial action is required. This facility is located adjacent to the proposed improvements. Therefore, this site was rated as a *low* risk to the study area since contamination could still be present on site.

EDR Map ID #12: Holy Cross Electric Association at 3799 Highway 82: Evidence of hydrocarbon contamination beneath one UST. Contamination was believed to be from a 50 gallon overfill. Additional excavation indicated no additional contamination. All detection levels were below state cleanup standards. Contaminated soil was removed, aerated, and then used as fill. Per OPS letter dated 03/09/1994, no further remedial actions are required. The two in-service USTs have no reported violations. This facility is located adjacent to the proposed improvements. Therefore, this site was rated as a low risk to the study area since contamination could still be present.

- **Observed Site: Meyers Boiler Property—Airport Road.** This site is not listed in any regulatory databases as

Figure 4-24 ***Potential Recognized Environmental Conditions Sites***

having any reported violations. However, proposed improvements would be constructed adjacent to this site. Therefore, this site was rated as a low risk to the study area.

- **Observed Site: Pitkin Corp—Airport Road.** This site is not listed in any regulatory databases as having any reported violations. However, proposed improvements would be constructed adjacent to this site. Therefore, this site was rated as a low risk to the study area.

- **Observed Site: City Storage—Airport Road.** This site is not listed in any regulatory databases as having any reported violations. However, proposed improvements would be constructed adjacent to this site. Therefore, this site was rated as a low risk to the study area.

Construction personnel need to be trained to recognize signs of possible contamination in soil such as odors and staining. If contamination is encountered, work shall stop and procedures established in Section 250 of the CDOT *Standard Specifications for Road and Bridge Construction* shall be followed (CDOT 2011). Any contaminated soils or landfill material shall be properly handled and sampled prior to disposal.

In addition, owners of subsurface utilities should be contacted in areas where excavation is to be conducted in order to assess whether any of the utilities are contained in Transite™ asbestos pipe. If subsurface utilities are determined to be housed in Transite™ asbestos pipe and the utilities need to be relocated for the project, special handling, and possibly asbestos abatement, would be required.

There are several properties adjacent to the right-of-way that have structures. The buildings and structures were not inspected for the possible presence of asbestos-containing materials, lead-based paint, or petroleum hydrocarbons in soil. Only partial property acquisitions are proposed for the project, and it is unlikely that structures would be impacted. However, if final design of the project indicates that demolition of any structures is required, inspections for asbestos-containing materials and lead-based paint are recommended.

4.17.3 Hazardous Waste Mitigation

- The project will adhere to Section 250 "Environmental Health and Safety Management" of the CDOT *Standard Specifications for Road and Bridge Construction* (CDOT 2011) to provide for the protection of the environment, persons, and property from contaminants and includes special requirements for addressing hazardous waste, if encountered.

- Further investigation of Recognized environmental conditions will be performed which could include a Phase II ESA being performed.

- Precautions will be taken and construction personnel need to be trained to recognize signs of possible contamination in soil, such as odors and staining.

- Construction debris or asbestos utility lines will be inspected by appropriate professionals and handled in accordance with CDPHE regulations pertaining to asbestos waste management (6CCR 1007-2, Part 1, Section 5).

- The conditions of the CDOT Section 211 Dewatering specification will be adhered to and construction personnel trained to recognize possible contamination.

4.18 Farmlands

The Farmland Protection Policy Act of 1981 protects land identified as prime farmland, unique farmland, and land (other than prime or unique) of statewide or local importance, as identified by the

U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS). The purpose of this Act is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. It also assures that federal programs are administered in a manner that, to the extent practicable, will be compatible with government and private programs and policies to protect farmland.

Prime Farmland is defined as soil 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. Unique farmland includes land that possesses the above characteristics, but is being used to produce livestock and timber. It does not include land already in or committed to urban development or water storage.

4.18.1 Existing Conditions

All geographic and farmland classification data are available through the Soil Survey Geographic Database. This annually updated database provides all soil classifications, including Prime, Unique, Statewide, and Local. According to this data, soils in the study area are identified as farmland of statewide importance and prime farmland if irrigated.

Approximately 895.7 acres of farmlands fall within the study area. However, much of the study area falls under land identified as urban area (U.S. Census Bureau) (see **Figure 4-25**). Because the Farmland Protection Policy Act does not cover projects proposed on land already committed to urban development, this area of farmland (609.1 acres) does not qualify as either farmland of statewide importance or prime farmland if irrigated. The remaining 286.6 acres of farmland found within the study area, but outside of Census-identified urban areas, are identified as farmlands of statewide importance.

Land use north of the proposed bridge is currently under development, while the area south of the bridge is used for agricultural purposes.

4.18.2 Farmland Impacts

No Action Alternative

The No Action Alternative would have no direct or indirect impacts to farmland of statewide importance or prime farmland in the study area.

Preferred Alternative

As discussed in existing conditions, 286.6 acres of farmlands located within the study area, but outside of Census-identified urban areas, are identified as farmlands of statewide importance. Approximately 1.7 acres of these farmlands fall within the Preferred Alternative alignment and would be impacted by the proposed improvements.

While the Preferred Alternative would not bisect any ranching or farming operations, highway access for the properties north and south of the Preferred Alternative would change slightly (see **Figure 4-26**). Currently, highway access from these properties leads directly from the properties to SH 82. Access consolidation associated with the Preferred Alternative would remove this direct connection. With the construction of the Preferred Alternative, access from both the north and south properties would lead to the new roadway which, in turn, would access SH 82. These access changes would not negatively impact any agricultural resources because access is maintained. Further, the consolidation of access points would provide safer entry and exits points, and they would result in safer transportation conditions.

The small area of impacted farmland along Four Mile Road was identified by the NRCS as having soils that comprise farmland of statewide importance. However, this area is not used for agricultural pur-

poses. Therefore, no agricultural resources would be impacted.

Coordination with the NRCS field office in Garfield County was conducted to complete the Farmland Conversion Impact Rating Form (see **Appendix D, Comments and Coordination**). The impact rating score for the Preferred Alternative is 75, out of a possible 260 points. Because this score does not exceed the 160-point criteria indicating substantial impact, it was determined that the proposed improvements would not substantially impact farmlands within the study area.

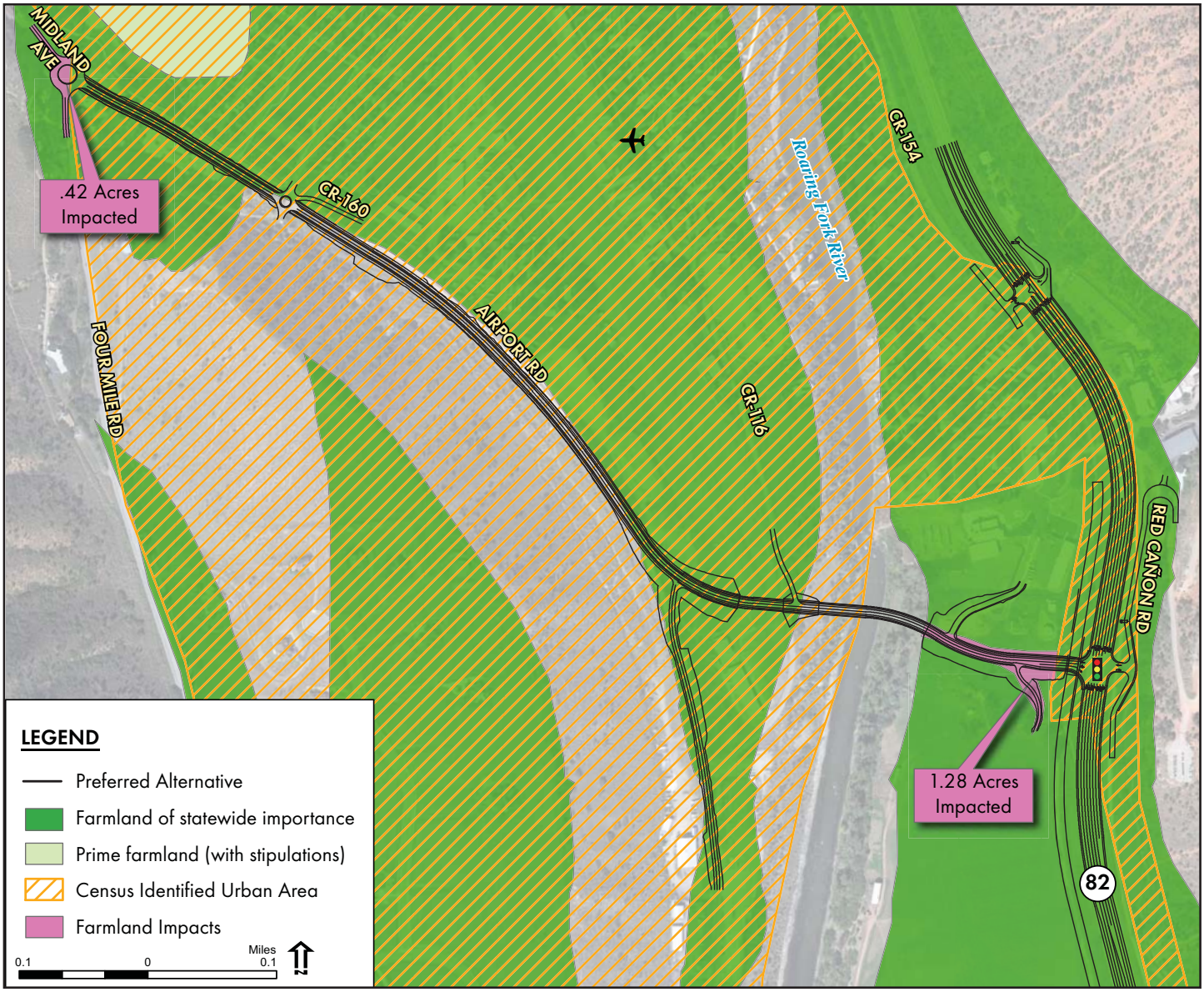
4.18.3 Farmland Mitigation

No mitigation measures are necessary.

4.19 Construction

The method of construction would be evaluated and determined during the development of the final design and construction plans. Input from the City of Glenwood Springs, Garfield County, and CDOT, along with contractor(s) and suppliers would be incorporated into the final

Figure 4-25 ***Farmlands***

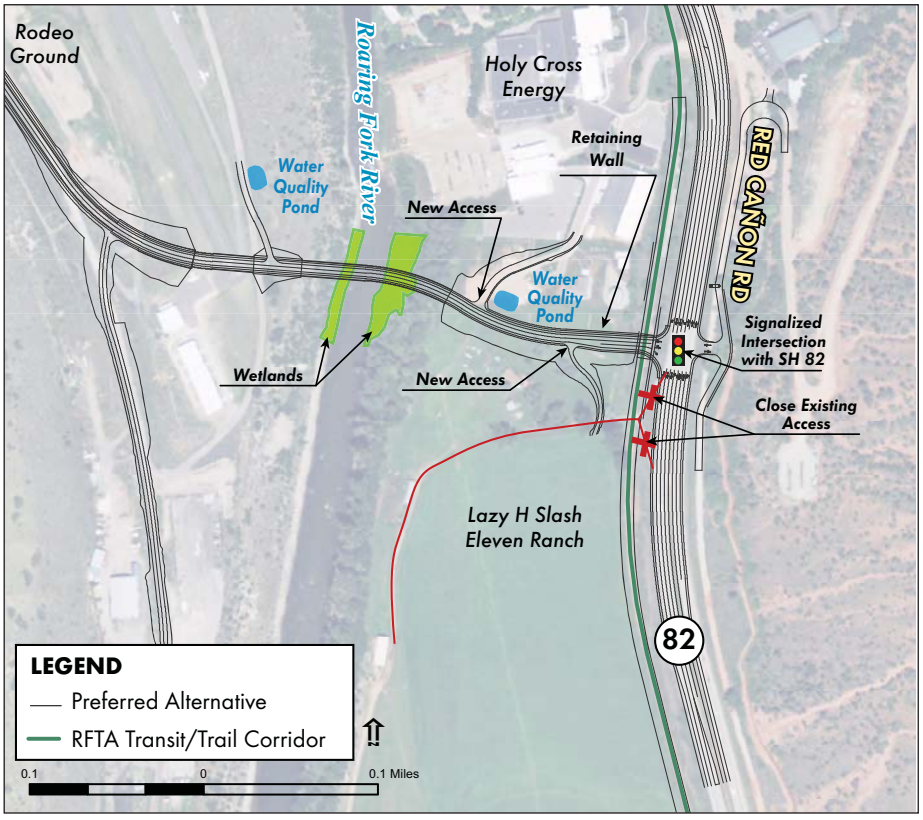


design to minimize impacts and to provide economy and efficiency during construction.

In general, roadway construction for the Preferred Alternative could involve excavation and grading, utility adjustments, storm sewers, curb and gutter, paving, installation of retaining walls (cast-in-place concrete or mechanically-stabilized-earth), fill, and landscaping.

The Preferred Alternative includes a grade-separated crossing at the south end of the runway at the Glenwood Springs Municipal Airport. The Preferred Alignment will pass under the runway through a short tunnel. Construction of the tunnel is anticipated to include excavation, grading, installation of precast or cast-in-place concrete tunnel structure, and backfilling for a cut-and-cover tunnel structure. It is anticipated that the Glenwood Springs Municipal Airport would need to be closed during portions of this construction.

Figure 4-26 ***Preferred Alternative Access Changes***



The Preferred Alternative includes a bridge crossing over the Roaring Fork River. Access from both the west and east end of the bridge will be required for construction. Construction of the bridge structure could involve excavation, grading, drilling and caisson installation, pile driving, substructure construction, and superstructure erection. The superstructure could include precast concrete elements, cast-in-place elements, and steel girders. Because of limited access from below and to minimize impacts to the wetlands and the Roaring Fork River, the method of construction will include erecting the superstructure from above. The method of construction for the superstructure could include cranes, overhead gantry, form travelers for casting concrete pieces, and launching (pushing the bridge structure) from one abutment to the other.

The earliest that any construction activities could begin on the proposed project would be the fall of 2012.

4.19.1 Construction Impacts

No Action Alternative

The No Action Alternative would involve no additional construction over what is currently programmed, approved, and funded. Therefore, the No Action Alternative would not result in project-related construction impacts.

Preferred Alternative

Construction of the Preferred Alternative would create various temporary impacts within the study area.

Transportation

Construction of the Preferred Alternative would require construction phasing, staging areas, and detours, as well as temporary interruption of traffic within southern Glenwood Springs and along SH 82. Construction delays are expected to create short-term impacts to local and regional traffic circulation and congestion. Delays to the traveling public and emergency ser-

vice vehicles, as well as inconvenience to study area residents and businesses, would occur. Reduced speed limits on SH 82, short-term travel on unpaved surfaces, and temporary lane closures on SH 82 are to be expected during construction activities. Temporary lane closures and delays would place additional pressure on alternate routes , when available, and could result in short-term economic impacts. Temporary lane closures may occur at various times throughout the day during construction.

Air Quality

Without mitigation, excavation, grading, and fill activities associated with construction could increase local fugitive dust emissions. Fugitive dust is airborne particulate matter, generally of a relatively large size (greater than 100 microns in diameter). Because of their large size, these soil particles typically settle within 30 feet of their source. Smaller particles could travel as far as hundreds of feet, depending on winds.

Construction activity would increase emissions from additional traffic and detouring. Also, construction would require the disturbance of soil, which would produce fugitive dust or particulate pollution. Construction-related activities that may cause soil material to become airborne include the following:

- Digging and dumping of soil and discarded construction materials (asphalt, concrete, etc.)
- Material hauling
- Wind erosion over exposed construction sites
- Re-entrainment of construction dirt deposited on local streets by vehicular traffic on the streets

The amount of airborne dust generated and the airborne concentration of particulate matter that human receptors would be exposed to would depend on a variety of factors and would vary from day to day, depending on site and climate conditions. Factors influencing fugitive dust emissions include:

- Soil type
- Area of exposed soil
- Location of construction activities relative to potential receptors
- Volume of dirt/material to be moved
- Wind speed and direction
- Soil moisture
- Time of day
- Season of the year

The length of time that any particular receptor would be exposed to construction-related dust would be relatively short, lasting only during construction activities. Construction vehicles and equipment would generate the same exhaust emissions as motor vehicles on area roadways. The emissions contribution of these vehicles would be short term and minor when compared to usual emission levels from day-to-day traffic in the study area.

Exhaust emissions could temporarily impact sensitive receptors located adjacent to the areas of construction.

Noise

Construction noise would present the potential for short-term impacts to receptors located along the existing rights-of-way and near the designated construction areas. The primary source of construction noise would be heavy equipment, such as trucks, earth-moving machinery, and demolition equipment.

Pile driving could be the loudest of the construction operations. Piles could be required at the bridge installation and could have both noise and vibration impacts.

Visual

Short-term, construction-related visual impacts would likely occur as a result of the Preferred Alternative. These impacts would include the presence of construction equipment and material storage, temporary barriers, guardrail, detour pavement and signs, temporary shoring and retaining walls, lighting for night construction, and removal of existing vegetative cover in the construction zone. Residential areas near construction activities could experience visual impacts resulting from construction activities.

Stormwater Runoff/Erosion Control

During construction, stormwater runoff could present the potential for violations of water quality standards if discharge occurs without the application of BMPs. Without mitigation measures, stormwater runoff could cause erosion and sedimentation and transport spilled fuels or other hazardous materials off the construction site. Because the Preferred Alternative crosses the Roaring Fork River, groundwater could be encountered during relocation of deep utilities, excavation, and construction of tunnels and below-grade roadways. Dewatering and treatment could be required where groundwater is present.

4.19.2 Construction Mitigation

Mitigation for direct impacts will include implementation of the following measures during construction:

- Development of traffic management plans.
- Keep as many lanes open as possible during peak travel times by temporarily shifting these lanes within the existing framework of the roadway.
- Coordinate detour routes, if available, with CDOT, Garfield County, and Glenwood Springs to avoid overloading local streets with detour traffic, where possible.
- Coordinate with emergency service providers to minimize delays and ensure access to properties.
- Use signage, television, and radio announcements to announce and advertise timing of road closures.
- Use noise blankets on equipment.
- Reroute truck traffic away from residential areas as much as possible.
- Combine noisy operations to occur during the same period.
- Conduct high-noise activities during daytime construction where possible.
- Suppress dust through watering or dust palliative.
- Monitor idling times for construction equipment to prevent excessive exhaust emissions.
- Require low-sulfur fuels for diesel construction equipment.
- Evaluate low emissions equipment and clean engine technologies for diesel construction equipment prior to construction.
- Provide construction fencing to protect pedestrians and bicyclists from construction areas.
- Use signage to direct pedestrians and bicyclists to temporary sidewalks.
- Implement temporary and permanent BMPs for erosion control, sediment control, and drainageway protection, as required by local and state permitting requirements.
- CDOT will review construction plans and play an oversight role after development of the construction plans. The contractor will apply for a permit from CDOT for any lane or shoulder closure. CDOT may require different construction staging to avoid lane clo-

sures. Glenwood Springs will provide public information services as needed.

4.20 Cumulative Impacts

Cumulative impacts result when the impacts of an action are added to or interact with the impacts from other actions in the same geographic area over time. It is the combination of these impacts, and any resulting environmental degradation, that is the focus of this cumulative impact analysis. Cumulative impacts are defined by the CEQ as:

> "the impact on the environment which results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions" (40 CFR 1508.7).

Cumulative impact analysis is resource-specific and is generally performed for environmental resources directly impacted by a federal action and/or identified through scoping as being key resources of concern. The following local, state, and federal agencies were contacted to identify cumulative issues they consider to be of concern in relation to the South Bridge project:

- Federal Agencies
  - EPA
  - USACE
  - U.S. Department of Energy
  - USDA Forest Service
  - USFWS
  - Bureau of Land Management
  - Federal Railroad Administration
- State Agencies
  - CDPHE
  - CDOT - Aeronautics Division
  - CDOT - Transit Program
  - CPW
  - Colorado Division of Natural Resources—Colorado State Parks
  - Colorado Historical Society—Office of Archaeology and Historic Preservation
- Local and Regional Agencies
  - Frontier Historical Society
  - Garfield County
  - Carbondale and Rural Fire Protection District
  - Glenwood Springs Rural Fire Protection District
  - Glenwood Springs Fire Department
  - Glenwood Spring Parks and Recreation
  - RFTA

Agency scoping and coordination identified four resources of concern to be evaluated for cumulative impacts. All social, economic, and environmental resources were considered before identifying the important issues within the study area. The identified areas of particular concern within the study area are water resources, wetlands, wildlife and greenhouse gases (see **Section 4.20.2**).

The geographic area to be used for the cumulative impacts analysis is based on the resources of concern and the potential impacts to these resources under a build alternative. This area is defined by the Roaring Fork River watershed, with an emphasis on the Garfield County portion of the watershed.

The time frame established for the analysis extends from 1882 to 2035. These dates capture the beginning of coke production in the study area, construction of the

Glenwood Springs Municipal Airport and the establishment of the Red Mountain and Sunlight (then called Holiday Hill) Ski Areas and carry the analysis through the project horizon. This timeframe captures the period in which land uses in the area began to convert from industrial uses to the predominant mix of commercial and residential uses seen today.

Data for this analysis were derived from readily available sources that included:

- *City of Glenwood Springs Long Range Transportation Plan*, 2003-2030
- *City of Glenwood Springs Land Use Plan*, 1996-2010
- *Frontier Historical Society*, web based historical data
- *Garfield County Comprehensive Plan*, 2000
- *Roaring Fork Watershed Management Plan*, 2002

4.20.1 Past, Present, and Reasonably Foreseeable Future Actions

Past, present, and reasonably foreseeable future actions are considered in the analysis to identify whether the environment has been previously degraded and to what extent, whether ongoing activities are causing impacts, what the trends are for activities and impacts in the area, and whether the environment will be degraded in the foreseeable future.

Past Actions

Past actions in the study area are described below. The purpose of this discussion is to provide a historic context for the cumulative analysis and identity the actions that have had or are having a substantial impact on the environment.

Glenwood Springs was established in 1882 and incorporated as a city in 1888. The city's proximity to the Colorado Midland Railroad, Colorado River, and Roaring Fork River made it a center for industry and commerce. Early development was heavily influenced by tourism and silver mining. Tourism was largely related to the natural hot springs in the area and was the impetus for early development within the town.

In 1887, the Grand River Coal and Coke Company selected a site south of Glenwood Springs (presently the Cardiff Glenn subdivision) for the establishment of its coal coking operations. Coal coking involved "cooking" coal at extremely high temperatures to produce a hotter and cleaner burning fuel for smelting silver and manufacturing steel. The demand for coked coal declined with silver mining. By 1915, the coke ovens were shut down, and in the 1930s the houses and buildings that supported the workers were removed or demolished.

In 1904, the Denver & Rio Grande Railroad built a depot on the riverfront, bringing travelers and increasing the need for hotels and restaurants. By the 1930s much of the central part of Glenwood Springs had already been developed. In 1937, the Glenwood Springs Municipal Airport was opened. The Glenwood Springs Municipal Airport has a 3,300-foot-long, 50-foot-wide paved runway.

Historically dominated by ranching activities, the Roaring Fork River watershed has more recently experienced substantial development as a result of recreation and population growth. Active ranches in the study area include the Lazy H Slash Eleven Ranch and Prehm Ranch. Much of the Lazy H Slash Eleven Ranch (292 acres) was protected through several conservation easements over the past 10 years. Ski areas in the Roaring Fork Valley include Aspen Mountain, Aspen Highlands, Buttermilk/ Tiehack, Snowmass, and Sunlight. The Sunlight ski area is closest to the proposed project. This resort opened for business in1966 on 420 acres of private land and 2,081 acres of U.S. Forest Service

land. Plans to expand the resort are currently being proposed. Developments that have more recently influenced environmental resources in the area include the Glenwood Meadows, Cardiff Glenn, and Four Mile Ranch developments.

Construction of the 175 single-family residential units that make up the Cardiff Glenn subdivision began in 1998 and has now been completed. The Cardiff Glenn subdivision is located in south Glenwood Springs along Midland Avenue near the Glenwood Springs Municipal Airport.

The Four Mile Ranch subdivision is a development south of Glenwood Springs along Four Mile Road that consists of 57 residential lots on 132 acres.

Present and Reasonably Foreseeable Future Actions

Planned transportation and development projects in the vicinity of the study area are described below. Although some of these projects have not been approved, they are included because they are identified in regional plans and represent considerable community planning efforts.

- **Fixed Rail/Regional Trail.** RFTA owns and manages the Denver—Rio Grande Rail Corridor from 8th Street near City Hall, south to Woody Creek in Pitkin County. The RFTA Board has established policies governing actions related to the rail corridor in its *Corridor Comprehensive Plan* with a focus on preserving the corridor for a fixed rail system in the long term. Until this fixed rail is implemented, RFTA is constructing a regional trail which was completed by 2010. The width of the rail corridor right-of-way ranges from 50 to 200 feet by location.

- **Bus Rapid Transit.** RFTA has plans to implement a regional Bus Rapid Transit (BRT) project by 2017, as recommended by the *Corridor Investment Study* and endorsed by the Board of Directors. The first phase of the BRT system would include the provision of new facilities, such as stations in Glenwood Springs (27th Avenue and SH 82).

- **Midland Avenue Safety Improvements.** Midland Avenue is a two-lane vehicular path with limited shoulders and pedestrian amenities. Proposed safety and traffic calming improvements include widening the road to include shoulders and pedestrian amenities, such as sidewalks, crosswalks and appropriate pedestrian safety measures.

- **27th Street Bridge.** The 27th Street bridge spans the Roaring Fork River and connects SH 82 to Midland Avenue allowing access to the Four Mile Corridor. The bridge was resurfaced in 2001 by the City of Glenwood Springs. The surface treatment applied was designed for 10 to 15 years, and it is anticipated that another surface treatment and/or reconstruction will be needed in the next 30 years. The reconstruction is dependent upon the completion of the South Bridge project. If the South Bridge project is completed, then the 27th Street bridge will not need added capacity to handle the increased traffic in south Glenwood Springs and up the Four Mile Corridor, and a resurfacing most likely will be appropriate.

- ***SH 82 Corridor Optimization Plan*, 2007.** The purpose of this study is to develop alternatives that will address the regional travel and local mobility needs of SH 82. Alternatives include the addition of a bridge south of Glenwood Springs and Midland Avenue as an alternative route.

- **Sunlight Mountain Resort.** Although a development proposal was denied by the Garfield County Commissioners in 2008, future development is expected

The study area began as an industrial hub, but over the last century has morphed into a predominately residential area, with commercial uses surrounding the airport, and ranching and agricultural uses located between SH 82 and the Roaring Fork River.

to occur at the resort. This development will generate additional trips by employees, visitors, and if included in the approved development, residents.

- **Glenwood Meadows.** Approximately 50 acres of land south of the Glenwood Meadows shopping center approved for 475 housing units, at least 71 of which would be affordable.

- **Glenwood Springs Municipal Airport.** The *Glenwood Springs Comprehensive Plan* recommends that the City create a sub-area plan and economic development analyses of the airport. The identifies the 64-acre Glenwood Springs Municipal Airport facility for its potential redevelopment into a mixed-use neighborhood, but also recognizes the potential economic impact that the loss of aviation may have on the community (Glenwood Springs 2011).

- **I-70 Mountain Corridor Improvements.** The *I-70 Mountain Corridor EIS* Preferred Alternative included a potential interchange modification at the I-70/ SH 82/Grand Avenue interchange (milepost 116).

- **Grand Avenue Bridge Replacement.** This bridge spans the Colorado River and serves as a gateway to the central business district of Glenwood Springs and the Roaring Fork Valley. CDOT is studying options to address the bridge's functional deficiencies and bring it up to current standards for a four-lane bridge.

4.20.2 Evaluation of Cumulative Impacts

As the various transportation and other land development projects are constructed, the continued transition of land uses in south Glenwood Springs, particularly around the Glenwood Springs Municipal Airport and along the Four Mile Corridor, is expected. This transition would result in more residential and commercial uses. This Preferred Alternative would support this planned development by increasing capacity and improving mobility. Since the Preferred Alternative would support community planning goals identified in land use and transportation plans, it would not result in effects that would cause an unacceptable level of change within the community.

Additionally, conservation easements, hillside preservation areas, and riverside protection areas have been established to control and prevent growth in sensitive areas and to protect open space, ridgelines, and water quality. These policies would help prevent growth induced impacts on sensitive natural resources.

Additional cumulative impact analysis for water resources, wetlands, and wildlife is discussed below.

Water Resources

The potential increase in impervious surface area from surrounding development and from the Preferred Alternative could lead to more runoff and increased sedimentation. However, the existing and proposed water quality basins are expected to intercept a majority of the sedimentation and pollutants contained in the runoff. The cumulative increase in sedimentation and pollutants is expected to be minor and would not affect overall water quality.

Wetlands and Other Waters of the U.S.

The Preferred Alternative would have no permanent impacts to wetlands and approximately 3,300 square feet (0.08 acre) of temporary impacts. Ongoing development, including residential, commercial, and complementary infrastructure, would continue to have the potential to impacts wetlands and other waters of the U.S. However, riverside protection areas would help to control and prevent growth in sensitive areas. The Preferred Alternative would have a negligible contribution to

the cumulative loss of wetlands and Waters of the U.S.

Wildlife

The Preferred Alternative would result in the loss of 10.87 acres of marginal wildlife habitat. Continuing development in south Glenwood Springs would continue to degrade the quality and quantity of wildlife habitat. However, conservation easements, hillside preservation areas, and riverside protection areas would help to control and prevent growth in sensitive areas and to protect wildlife habitat. Additionally, wildlife habitat is abundant outside of the Glenwood Springs urban growth boundary, and the Preferred Alternative would have a negligible contribution to the cumulative loss of wildlife habitat.

Global Climate Change Cumulative Effects Discussion

The issue of global climate change is an important national and global concern that is being addressed in several ways by the federal government. The transportation sector is the second largest source of total greenhouse gases (GHGs) in the U.S. and the greatest source of carbon dioxide (CO_2) emissions—the predominant being GHG. In 2004, the transportation sector was responsible for 31 percent of all U.S. CO_2 emissions. The principal anthropogenic (human-made) source of carbon emissions is the combustion of fossil fuels, which account for approximately 80 percent of anthropogenic emissions of carbon worldwide. Almost all (98 percent) of the transportation sector emissions result from the consumption of petroleum products, such as gasoline, diesel fuel, and aviation fuel.

Recognizing this concern, FHWA is working nationally with other modal administrations through the DOT Center for Climate Change and Environmental Forecasting to develop strategies to reduce transportation's contribution to greenhouse gases—particularly CO_2 emissions—and to assess the risks to transportation systems and services from climate changes.

At the state level, there are also several programs underway in Colorado to address transportation GHGs. The Governor's Climate Action Plan, adopted in November 2007, includes measures to adopt vehicle CO_2 emissions standards and to reduce vehicle travel through transit, flex time, telecommuting, ridesharing, and broadband communications. CDOT issued a policy Directive on Air Quality in May 2009. This Policy Directive was developed with input from a number of agencies, including the CDPHE, the EPA, the FHWA, the Federal Transit Administration (FTA), the Denver Regional Transportation District (RTD), and the Denver Regional Air Quality Council (RAQC). This Policy Directive addresses unregulated mobile source air toxics (MSAT) and greenhouse gases (GHG) produced from Colorado's state highways, interstates, and construction activities.

Because climate change is a global issue and the emissions changes due to project alternatives are very small compared to global totals, the GHG emissions associated with the alternatives were not calculated. Because GHGs are directly related to energy use, the changes in GHG emissions would be similar to the changes in energy consumption presented in **Section 4.5** of this document. The relationship of current and projected Colorado highway emissions to total global CO_2 emissions is presented in the table below. Colorado highway emissions are expected to increase by 4.7 percent between now and 2035. The benefits of the fuel economy and renewable fuels programs in the 2007 Energy Bill are offset by growth in VMT; the draft 2035 Statewide Transportation Plan predicts that Colorado VMT will double between 2000 and 2035. **Table 4-23** illustrates the size of the project corridor relative to total Colorado travel activity.

4.20.3 Cumulative Impacts Mitigation

As a part of CDOT's commitment to addressing MSATs and GHGs, some of CDOT's programwide activities include:

- Continuing to research pavement durability opportunities with the goal of reducing the frequency of resurfacing and/or reconstruction projects.
- Developing air quality educational materials specific to transportation issues for citizens, elected officials, and schools.
- Offering outreach to communities to integrate land use and transportation decisions to reduce growth in VMT, such as smart growth techniques, buffer zones, transit-oriented development, walkable communities, access management plans, etc.
- Committing to research additional concrete additives that would reduce the demand for cement.
- Expanding Transportation Demand Management (TDM) efforts statewide to better utilize the existing transportation mobility network.
- Continuing to diversify the CDOT fleet by retrofitting diesel vehicles; specifying the types of vehicles and equipment contractors may use; purchasing low-emission vehicles, such as hybrids; and purchasing cleaner burning fuels through bidding incentives where feasible. Incentivizing is the likely vehicle for this.
- Funding truck parking electrification (mostly via exploring external grant opportunities).
- Researching additional ways to improve freight movement and efficiency statewide.
- CDOT uses ultra-low sulfur diesel (ULSD) and biodiesel where available for on-road and non-road equipment statewide.
- Developing a low-VOC-emitting tree landscaping specification.

The City of Glenwood Springs commits to continuing to investigate the use of conservations easements, hillside preservation areas, and riverside protection areas to preserve wildlife habitat.

4.21 Permits Required

The following permits and coordination activities may be required to support the construction of the Preferred Alternative:

- **Colorado Discharge Permit System (CDPS).** EPA issues stormwater regulations under the National Pollution Discharge System (NPDES). For Colorado, EPA's authority to issue NPDES permits has been delegated to a state regulatory agency, CDPHE. CDPHE implements and enforces the NPDES programs through the CDPS program.

  A CDPS General Permit for Stormwater Discharges Associated with Construction Activity, commonly called a Stormwater Construction Permit, is required for all CDOT projects that impact one acre of land, or are part of a larger project. Prior to commence-

Table 4-23 ***Colorado Highway Emissions Growth Projections***

Global CO2 Emissions, 2005 (Million Metric Tons [MMT])[1]	Colorado Highway CO2 Emissions, 2005 (MMT)[2]	Projected Colorado 2035 Highway CO2 Emissions (MMT)[2]	Colorado Highway Emissions (% of Global Total [2005]) [2]	Project Corridor VMT (% of Statewide VMT [2005])
27,700	29.9	31.3	0.108	0.0004

[1] EIA, International Energy Outlook 2007.

[2] Calculated by FHWA Resource Center.

ment of construction, a Stormwater Construction Permit will be obtained. Under the permit stipulations, CDOT will prepare a site-specific Stormwater Management Plan (SWMP) that ensures that the water quality of receiving waters is protected during construction. CDOT will prepare a SWMP that outlines in detail the specific BMPs in the project plan for implementation in the field. Included in the SWMP are such aspects as BMP locations, monitoring requirements, seed mix, concrete wash-out provisions, and other relevant information that is provided to the contractor.

This project is located outside of the Phase I and Phase II areas under CDOT's MS4 permit. However, in order to meet water quality standards and to reduce impacts from sediments, permanent BMPs will be implemented.

- **Section 402 Permit.** A Section 402 Permit would be required for dewatering of construction areas, if necessary. The following activities would require the acquisition of a 402 Permit:
  - Construction dewatering operations associated with activities such as utility excavation, bridge pier installation, foundation or trench digging, or other subsurface activities.
  - If discharge is expected to occur from a point source discharge from mechanical wastewater treatment plants, vehicle washing, or industrial discharges.
- **Section 404 Permit.** A Section 404 Permit issued by USACE is required whenever construction projects or maintenance activities require filling to occur below the ordinary high-water line in any body of water considered a water of the United States. Based on the conceptual design conducted to date, a nationwide permit is likely to be required.
- **Senate Bill (SB) 40 Certification.** An SB 40 Certification will be required by the CPW for stream crossings or adjacent streambanks to avoid adverse effects to waterways and adjacent riparian vegetation.
- **Fugitive Dust Permit**. A Fugitive Dust Permit is required if more than 25 acres of land are impacted and/or project construction lasts longer than six months.
- **Construction Access Permit.** Construction Access Permits would be required for temporary access needs outside the project limits.
- **State Access Permit.** A State Access Permit is required for all new or modified access to SH 82. Any existing accesses adversely affected by the Preferred Alternative will be notified of the proposed changes.
- **Other Local Permits.** Other permits required by the City of Glenwood Springs or Garfield County, as needed, such as building, utility, or survey permits needed to support project construction requirements.

4.22 Summary of Direct Impacts

Table 4-24 provides a summary of the impacts associated with the No Action Alternative and the Preferred Alternative, as evaluated in **Chapters 3** and **4**.

Table 4-24 ***Summary of Impacts***

Resource	No Action Alternative	Preferred Alternative
Traffic		■ Would result in a shift of traffic from the 27th Street Bridge to the Preferred Alternative.
VMT and VHT	■ VMT would increase over 80 percent between 2008 and 2035. ■ VHT would increase nearly 90 percent between 2008 and 2035.	■ Would reduce VMT by 12,000 (6%) per day relative to the No Action Alternative (2035). ■ Would reduce VHT by 500 (9%) per day relative to the No Action Alternative (2035).
Traffic Access	■ No changes.	■ Would change intersection of SH 82 and CR 154 from signalized with full access to unsignalized with full access from the west. ■ Residential access on east side of SH 82 is changed to right-in/right-out. ■ Would shift access from Red Cañon Road on the east to new signal at the new South Bridge Road and SH 82 intersection. ■ Would change access for Holy Cross Electric and the Lazy H Slash Eleven Ranch.
Traffic Operations	■ Reduced LOS at four intersections relative to existing conditions	■ Would improve LOS at two intersections and reduce LOS at one intersection relative to the No Action Alternative.
Safety	■ The number of crashes is expected to increase as traffic increases.	■ Implementation of right-in/right-out access and roundabouts would reduce crashes in the study area.
Transit	■ No impacts.	■ No impacts.
Airport Operations	■ No change to airport operations.	■ Would have little to no long-term impacts on airport operations. ■ Would require temporary closure of the airport for three months during construction.
Land Use	■ The No Action Alternative would not preclude the implementation of the long-term vision of the *Glenwood Springs Comprehensive Plan*. However, the circuitous transportation route and limited accessibility for land uses in the south Glenwood Springs area could act as a deterrent for planned growth in this area.	■ Direct conversion of 10.87 acres of commercial, residential, rural, hillside preservation, and municipal to transportation uses. Compatible with existing zoning and future land use as identified in the *Glenwood Springs Comprehensive Plan* and the *Garfield County Comprehensive Plan*.
Social Conditions and Environmental Justice	■ Limited accessibility may impede access to community facilities and hinder emergency egress and evacuation. ■ The circuitous transportation route and limited accessibility for land uses in the south Glenwood Springs area could act as a deterrent for planned growth in this area.	■ Six noise-sensitive receptors would meet or exceed the NAC. Fourteen noise sensitive receptors would experience a substantial noise increase (10 dBA or more) over existing conditions. ■ During construction, temporary detours, out of direction travel, construction dust, and construction-related noise would impact residents throughout the study area. ■ Benefits residents in the study area by improving accessibility, safety, and pedestrian and bicycle facilities.
Economic Conditions	■ No land acquisitions or business relocations in the study area would result from the No Action Alternative. Businesses located on the west side of the Roaring Fork River, around the airport would continue to access SH 82, the regional transportation route, via Midland Avenue and 27th Avenue. This circuitous route with limited accessibility could act as a deterrent for planned growth in this area.	■ The Preferred Alternative would provide additional connectivity to the south Glenwood Springs area, including more direct access to the local airport and the commercial area around the airport, strengthening Glenwood Springs as a regional center for employment and services. ■ During construction, temporary detours, out of direction travel, access changes, and construction-related noise would impact businesses along the proposed alignment. These changes would be temporary and would not affect overall business operations.

Table 4-24 ***Summary of Impacts***

Resource	No Action Alternative	Preferred Alternative
Right-of-Way/ Relocation	■ No new right-of-way required.	■ Requires 10.87 acres of new right-of way. No residential or business displacements. 1.65 acres of an existing conservation easement would be converted to a transportation use.
Air Quality	■ Congestion would continue to increase due to increasing traffic, leading to an increase in VMT and VHT.	■ Local emissions of air pollutants near residential uses on Airport Road and the Holy Cross Energy property. ■ A 7% reduction in VMT and 10% in VHT compared to the No Action Alternative.
Noise	■ Six noise-sensitive receptors would meet or exceed the NAC.	■ Eight noise-sensitive receptors would meet or exceed the NAC. Fourteen noise-sensitive receptors would experience a substantial noise increase (10 dBA or more) over existing conditions. Of these 14 noise sensitive receptors, 2 also meet or exceed the NAC.
Water Resources and Water Quality	■ Increased growth and development are projected to occur regardless of construction of the Preferred Alternative, leading to an increase in impervious surface.	■ No direct impact to water resources. Increase in impervious surface and associated runoff of 6.15 acres. ■ Capacity and mobility improvements associated with the Preferred Alternative could result in indirect impacts as a result of accelerated development in the study area and an increase in impervious surfaces (secondary roads, parking lots, etc.);
Floodplains	■ No new encroachment on the 100-year-old floodplain.	■ No new encroachment on the 100-year-old floodplain.
Wetlands	■ No impacts.	■ No permanent impacts and approximately 0.076 acre of temporary impacts. Shade impacts of approximately 0.025 acre would alter vegetation regime.
Vegetation and Noxious Weeds	■ No removal of vegetation or ground disturbance to make additional areas available to the spread of noxious weeds.	■ 10.87 acres of rangeland, irrigated cropland, and roadside habitat would be removed. 0.009 acre of riparian habitat would be removed. ■ Construction activities would disturb soil, creating potential habitat for noxious weeds and may cause additional accidental introduction or spread of noxious weeds.
Wildlife and Aquatic Resources	■ Planned growth would decrease the amount of available of habitat.	■ 10.87 acres of land would be converted to transportation use. This land does provide habitat, but impacts are minimal because of the degree of development in the study area.
Visual Resources	■ No impacts.	■ Foreground views would be impacted by the increase in traffic volumes along Airport Road and additional pavement. The proposed bridge would be visible to recreationists on the Roaring Fork River.
Historic Preservation	■ No impacts.	■ Access changes at the Cardiff Coke Ovens and the lowering of the Denver and Rio Grande Western Railroad grade.
Paleontological Resources	■ No impacts.	■ No impacts.
Parks and Recreation	■ No impacts.	■ Approximately 0.05 acre of the rodeo grounds would be converted to a transportation use. ■ Once construction of the Preferred Alternative is complete, the new bridge over the Roaring Fork River would be visible to river-based recreationists. ■ The inclusion of pedestrian and bicycle facilities along the alignment would improve multimodal access to the rodeo grounds once it is developed as a park.

Table 4-24 ***Summary of Impacts***

Resource	No Action Alternative	Preferred Alternative
Pedestrian and Bicycle Facilities	■ There would be no improvements to the discontinuous nature of the sidewalks in the study area. There would be no southern connection across the Roaring Fork River for bicyclists and pedestrians.	■ Temporary detour of the Rio Grande Trail during construction. Improvements would include a continuous sidewalk from the intersection of Airport Road and Midland Avenue to the new connection with SH 82.
Hazardous Waste	■ No impacts on known hazardous material sites.	■ Construction to occur adjacent to three known following recognized environmental condition sites. Routine possibility of discovering asbestos utility pipes.
Farmlands	■ No impacts.	■ Conversion of 1.7 acres of farmland to transportation use.
Section 4(f)	■ No Section 4(f) use.	■ No Section 4(f) use.
Construction	■ No impacts.	■ Temporary delays, lane closures, detour routes, reduced speed limits, temporary access changes, dust, and noise likely during construction.
Cumulative Effects	■ Impacts associated with reasonably foreseeable future projects.	■ Continued change in land use in the study area. Does not result in effects that would cause an unacceptable level of change within the community. Consistent with the community's vision for the future as identified in land use plans. ■ Negligible contribution to the cumulative loss of wetlands and other Waters of the U. S. and wildlife habitat. ■ Project represents 0.0004% of the statewide VMT.

4.23 Summary of Mitigation Measures

Table 4-25 provides a summary of mitigation measures for the Preferred Alternative as discussed in **Chapters 3** and **4.**

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
1	Airport Operations	Temporary airport closure	CDOT will coordinate with Glenwood Springs Municipal Airport operators and users so that airport closures are communicated in advance of construction.	Project Engineer	Final design and pre-construction
2	Social Resources	Community cohesion	Impacts to community cohesion will be minimized by predominantly following an existing road corridor, preserving existing informal pedestrian connections south of Airport Road, and providing new pedestrian bicycle improvements along both sides of the proposed roadway.	Project Engineer	Final design
3	Environmental Justice Communities	Noise	Mitigation for noise impacts (see mitigation commitments 18-20) will address the anticipated community impacts for both EJ and non-EJ communities.	See mitigation commitments 18-20	See mitigation commitments 18-20
4	Environmental Justice Communities	Visual	Mitigation for visual impacts (see mitigation commitments 80-86) would address the anticipated community impacts for both EJ and non-EJ communities.	See mitigation commitments 80-86	See mitigation commitments 80-86

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
5	Economics	Access	Access will be maintained to businesses during construction. New access will be provided for properties where the existing access is removed by the Preferred Alternative. To avoid disruption of business activities during construction, the new access will be provided before the existing access is removed. See Mitigation Commitments 100-104 for specific mitigations for maintaining access during construction	Project Engineer	Final design and construction
6	Economics	Airport operations	CDOT will coordinate with Glenwood Springs Municipal Airport operators and users so that airport closures are communicated in advance of construction.	Project Engineer	Final design and pre-construction
7	Right-of-Way	Property acquisition (Commercial and residential)	For any person(s) whose real property interests may be impacted by the proposed project, the acquisition of those property interests will comply fully with the Uniform Relocation Assistance and Real Property Acquisition Policy Act of 1970, as amended.	Right-of-Way Agent	FIR/ROW
8	Right-of-Way	Property acquisition (Conservation easement)	The conservation easement owned by AVLT contains specific stipulations to be followed if any portion of the easement is subject to condemnation. These stipulations will be adhered to if those conditions apply.	Right-of-Way Agent	FIR/ROW
9	Air Quality	Particulate matter released during construction	For haul roads watering and application of chemical stabilizers as necessary. Speed limit signs will be posted and limits will be enforced.	Project Engineer	Final design and construction
10	Air Quality	Particulate matter released during construction	For disturbed areas watering, soil compaction, and revegetation will be employed as needed and appropriate for given conditions.	Project Engineer	Final design and construction
11	Air Quality	Particulate matter released during construction	For active construction areas watering will be employed as appropriate. Under extreme wind or dust conditions, temporary curtailment of earth-moving activity may be necessary.	Project Engineer	Construction
12	Air Quality	Particulate matter released during construction	Haul trucks will be covered as needed and appropriate to reduce dust. Haul truck speed will be limited on unpaved road sections.	Project Engineer	Construction
13	Air Quality	MSAT emissions during construction	Develop construction truck routing and hauling plan to reduce the number of trips and periods of avoidable extended idling.	Project Engineer	Pre-construction
14	Air Quality	MSAT emissions during construction	Encourage use of lower emissions vehicles and technology retrofitted equipment such as particulate matter traps, oxidation catalysts, and other devices that provide an after-treatment of exhaust emissions.	Project Engineer	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
15	Air Quality	MSAT emissions during construction	Assuring well maintained equipment.	Project Engineer	Final design and construction
16	Air Quality	MSAT emissions during construction	Ensure the use of clean fuels, such as ultra-low sulfur diesel, biodiesel, or natural gas.	Project Engineer	Final design and construction
17	Air Quality	Post-construction MSAT emissions	Post-construction programmatic mitigation will include the introduction of Engines Off! Colorado, an idling reduction program offered to local schools and communities to help educate parents, school bus drivers and students about the health benefits of engine idling emissions reduction at a grass roots level.	Air Quality Manager	Post-construction
18	Noise	Increase in noise due to traffic	Benefited Receptor Surveys will be conducted at the time of final design of the construction project for the recommended noise walls to assess the abatement desires of the benefited residents and owners. Noise walls are recommended at the following locations: ■ Rio Grande Trail, twelve foot tall noise barriers (Barriers 3A and 3B) meets the feasible and reasonable criteria, therefore noise mitigation is recommended. ■ Cardiff Glen Subdivision, the evaluated noise barriers (Barriers 1a-1c) and combination barrier/berm (Barriers 1a-1b) meet the feasible and reasonable criteria, therefore noise mitigation is recommended.	Environmental Manager	Final design and construction
19	Noise	Design changes	If future substantial changes are made to design elements of the project from what has been analyzed for this project, the noise analysis will be reassessed to evaluate the impact of those changes.	Environmental Manager	Final design
20	Noise	Construction noise	Construction-related activities will adhere to local ordinances. Mitigation for construction-related noise impacts include limiting construction activities to workday off-peak hours, using noise blankets or other muffling devices on equipment and quiet-use generators at noise sensitive receptors, using well-maintained equipment and having equipment inspected regularly, and locating haul roads away from noise-sensitive receptors.See Mitigation Commitments 100-104 for specific mitigations for maintaining access during construction	Project Engineer	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
21	Water Quality	Stormwater runoff due to increase in impervious surface	The proposed project is located outside of the Phase I and Phase II areas under CDOT's Municipal Separate Storm Sewer System (MS4) permit. However, in order to meet water quality standards, and to reduce impacts from sediments, two permanent water quality ponds will be constructed.	Project Engineer, Water Pollution Control Manager	Final design and construction
22	Water Quality	Temporary erosion and sediment impacts during construction.	The use of standard erosion and sediment control BMPs in accordance with Erosion Control and Storm Water Quality Guide, CDOT, 2002, or the latest revision, will be included in the final design plans. All work on this project will be in conformity with Section 107.25 (Water Quality Control) and Section 208 (Erosion Control) of the CDOT Standard Specifications for Road and Bridge Construction.	Water Pollution Control Manager, Project Engineer	Final design and construction
23	Water Quality	Temporary erosion and sediment impacts during construction.	All disturbed areas will be revegetated with native grass and forb species. Seed, mulch, and mulch tackifier will be applied in phases throughout construction.	Water Pollution Control Manager, Landscape Architect	Final design and construction
24	Water Quality	Temporary erosion and sediment impacts during construction.	Where permanent seeding operations are not feasible due to seasonal constraints (e.g., summer and winter months), disturbed areas will have mulch and mulch tackifier applied to prevent erosion.	Water Pollution Control Manager, Landscape Architect	Final design and construction
25	Water Quality	Temporary erosion and sediment impacts during construction.	Erosion control blankets will be used on steep, newly seeded slopes to control erosion and to promote the establishment of vegetation. Slopes will be roughened at all times and concrete washout contained.	Water Pollution Control Manager, Landscape Architect	Final design and construction
26	Water Quality	Temporary erosion and sediment impacts during construction.	Temporary erosion control blankets will have flexible natural fibers.	Water Pollution Control Manager, Landscape Architect	Final design and construction
27	Water Quality	Temporary erosion and sediment impacts during construction.	Erosion logs, silt fence, or other sediment control device will be used as sediment barriers and filters adjacent to wetlands, surface waterways, and at inlets where appropriate.	Water Pollution Control Manager, Project Engineer	Final design and construction
28	Water Quality	Temporary erosion and sediment impacts during construction.	Storm drain inlet protection will be used where appropriate to trap sediment before it enters the cross-drain.	Water Pollution Control Manager, Project Engineer	Final design and construction
29	Water Quality	Temporary erosion and sediment impacts during construction.	Check dams will be used where appropriate to slow the velocity of water through roadside ditches and in swales.	Water Pollution Control Manager, Project Engineer	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
30	Water Quality	Temporary erosion and sediment impacts during construction.	Work areas will be limited as much as possible to minimize construction impacts to vegetation.	Water Pollution Control Manager, Landscape Architect	Final design and construction
31	Water Quality	Temporary erosion and sediment impacts during construction.	Temporary detention ponds (during construction) will be used to allow sediment to settle out of runoff before it leaves the construction area. These ponds may be combined with permanent detention ponds.	Project Engineer, Water Pollution Control Manager	Final design and construction
32	Water Quality	Temporary erosion and sediment impacts during construction.	Structural BMPs may include extended detention basins with sediment forebays, grass swales, and grass buffers to retain sediment and roadway pollutants resulting from winter sanding, chemical deicing, and normal traffic operations.	Water Pollution Control Manager, Project Engineer	Final design and construction
33	Water Quality	Temporary erosion and sediment impacts during construction.	Non-structural BMPs may include litter and debris control, and landscaping and vegetative practices.	Water Pollution Control Manager, Project Engineer	Final design and construction
34	Water Quality	Temporary erosion and sediment impacts during construction.	Measures will be taken to avoid excess application and introduction of chemicals into the aquatic ecosystem. While temporary fill is needed for construction projects, fill will be utilized that avoids an increase in suspended solids or pollution.	Project Engineer, Water Pollution Control Manager	Final design and construction
35	Water Quality	Temporary erosion and sediment impacts during construction.	Adherence to City of Glenwood Springs hydraulic design criteria for major and minor storm drainage.	Hydraulics Engineer, Project Engineer	Final design and construction
36	Wetlands	Temporary impacts during construction	In designated temporary work areas, riparian shrubs (primarily willows) will be trimmed to the ground level (not grubbed), and then covered with a geo-textile fabric and an additional layer of straw. These areas (including wetlands) will then be covered with a minimum of two feet of clean fill. As soon as possible, all temporary fill will be removed to an upland area location to protect riparian shrub rootstock and wetland seed banks. If possible, temporary fill of wetlands will occur during periods when plants are dormant or toward the end of the growing season.	Wetlands Biologist, Landscape Architect, Project Engineer	Final design and construction
37	Wetlands	Temporary impacts during construction	Wetland areas not temporarily impacted by the proposed project will be protected from construction activities by temporary and/or construction limit fencing.	Wetlands Biologist, Project Engineer	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
38	Wetlands	Temporary impacts during construction	Sediment control measures will be installed where needed to prevent sediment filling wetlands.	Wetlands Biologist, Water Pollution Control Manager, Project Engineer	Final design and construction
39	Wetlands	Temporary impacts during construction	Fertilizers or hydro-mulching will not be allowed within 50 feet of a wetland.	Wetlands Biologist, Landscape Architect, Project Engineer	Final design and construction
40	Wetlands	Temporary impacts during construction	All disturbed areas will be revegetated with native grass and forb species. Seed, mulch, and mulch tackifier will be applied in phases throughout construction.	Water Pollution Control Manager, Landscape Architect	Final design and construction
41	Wetlands	Temporary impacts during construction	Where permanent seeding operations are not feasible because of seasonal constraints (e.g., summer and winter months), disturbed areas will have mulch and mulch tackifier applied to prevent erosion.	Water Pollution Control Manager, Landscape Architect	Final design and construction
42	Wetlands	Temporary impacts during construction	A stormwater management plan will be developed with BMPs to minimize adverse effects to water quality.	Water Pollution Control Manager	Final design and construction
43	Wetlands	Temporary impacts during construction	Erosion logs, silt fence, or other sediment control device will be used as sediment barriers and filters adjacent to wetlands, surface waterways, and at inlets where appropriate.	Water Pollution Control Manager	Final design and construction
44	Wetlands	Temporary impacts during construction	Construction staging areas will be located at a distance of greater than 50 feet from adjacent stream/riparian areas to avoid disturbance to existing vegetation, avoid point source discharges, and to prevent spills from entering the aquatic ecosystem, including concrete washout.	Water Pollution Control Manager, Project Engineer	Final design and construction
45	Wetlands	Temporary impacts during construction	Temporary impacts to Waters of the U.S. and adjacent habitat will be reclaimed with native plant and shrubs. In addition, this project will require a Senate Bill 40 (SB 40) Certification from CPW for impacts to riparian habitat and impacts to seeps and springs which feed a Gold Medal Water. This will mandate replacement of trees and shrubs impacted during construction along the Roaring Fork River.	Environmental Manager, Landscape Architect	Final design and construction
46	Wetlands	Vegetation impacts due to shading	Mitigation will include planting shade tolerant native wetland species in areas (approximately 1,100 square feet (0.025 acre)) that will be permanently shaded by the new bridge crossing.	Landscape Architect, Wetlands Biologist	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
47	Wetlands	Hydrology impacts due to bridge construction	Additional groundwater studies are recommended during preliminary design of the bridge to determine subsurface groundwater conditions. Additional alteration to the bridge design could be necessary to ensure hydrology remains unaltered by the placement of pier columns on upland areas adjacent to the east bank of the Roaring Fork River. Moreover, groundwater monitoring wells could be utilized to monitor changes during and after construction.	Hydraulics Engineer	Final design
48	Vegetation	Vegetation removal due to construction activities	To the extent possible, disturbance to existing trees, shrubs, and vegetation will be avoided.	Landscape Architect, Project Engineer	Final design and construction
49	Vegetation	Vegetation removal due to construction activities	In designated temporary work areas adjacent to the Roaring Fork River, riparian shrubs (primarily willows) will be trimmed to the ground level (not grubbed), and then covered with a geo-textile fabric and an additional layer of straw. These areas (including wetlands) will then be covered with a minimum of two feet of clean fill. As soon as possible, all temporary fill will be removed to an upland area location. This would protect riparian shrub rootstock and wetland seed banks. If possible, temporary fill of wetlands will occur during periods when plants are dormant or toward the end of the growing season.	Wetlands Biologist, Landscape Architect	Final design and construction
50	Vegetation	Vegetation removal due to construction activities	Trees and shrubs removed during construction will be replaced as stipulated in CDOT's Guidelines for SB 40 Wildlife Certification, which state that trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of two inches or greater. Shrubs removed during construction, whether native or non-native, will be replaced based on their preconstruction areal coverage. In all cases, all such trees and shrubs will be replaced with native species.	Environmental Manager, Landscape Architect	Final design and construction
51	Vegetation	Vegetation removal due to construction activities	A 100% success rate of all replaced trees will be achieved as measured two years post construction. After two years, all failed replacement trees will be replaced and planted in locations that will provide the highest opportunity for success.	Environmental Manager, Landscape Architect	Post-construction
52	Noxious Weeds	Establishment of noxious weeds	During the design phase, detailed weed mapping of the study area will be conducted by a weed specialist. Mapping will be included in the construction documents along with appropriate control methods for noxious weeds.	Environmental Manager, Landscape Architect	Final design

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
53	Noxious Weeds	Establishment of noxious weeds	Following noxious weed mapping and inventory by a weed specialist, the potential for spread of identified noxious weeds due to disturbance by construction activities will be analyzed including potential for noxious weeds to spread into wetlands and agricultural areas. This analysis will be included in the Integrated Noxious Weed Management Plan and best practices will be implemented to reduce the likelihood of noxious weed spread or introduction.	Environmental Manager, Landscape Architect	Final design
54	Noxious Weeds	Establishment of noxious weeds	Identification of all existing noxious weed infestations within the roadway right-of-way will occur during the design phase. Roadway right-of-way will periodically be inspected by the City of Glenwood Springs or its consultants during construction and during post-construction weed monitoring for invasion of noxious weeds.	Environmental Manager, Landscape Architect	Final design and construction
55	Noxious Weeds	Establishment of noxious weeds	An Integrated Weed Management plan will be required prior to construction, and will be implemented by the contractor. Use of herbicides will include selection of appropriate herbicides and timing of herbicide spraying and use of a backpack sprayer.	Environmental Manager, Landscape Architect	Final design and construction
56	Noxious Weeds	Establishment of noxious weeds	Certified weed-free hay and/or mulch will be used in all revegetated areas.	Landscape Architect, Project Engineer	Final design and construction
57	Noxious Weeds	Establishment of noxious weeds	Where practical, equipment staging will occur in areas that have not been heavily infested by noxious weeds. All equipment will be cleaned before off-loading at the project site. Project staging areas will be mowed and cleared of noxious weeds prior to construction.	Project Engineer, Landscape Architect	Final design and construction
58	Noxious Weeds	Establishment of noxious weeds	Project design and construction engineers will coordinate with the Garfield County weed supervisor, local governing bodies, and landowners to assure proper noxious weed management activities.	Project Engineer, Landscape Architect	Final design
59	Noxious Weeds	Establishment of noxious weeds	No fertilizers will be used on the project site.	Project Engineer, Landscape Architect	Final design and construction
60	Noxious Weeds	Establishment of noxious weeds	Supplemental weed control measures, if needed, will be added during the design and construction planning.	Project Engineer, Landscape Architect	Final design and construction
61	Wildlife	Habitat loss due to vegetation removal	CDOT BMPs and revegetation guidelines will be employed to minimize habitat impacts associated with vegetation removal.	Landscape Architect	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
62	Wildlife	Vegetation removal due to construction activities	Trees and shrubs removed during construction will be replaced as stipulated in CDOT's Guidelines for Senate Bill 40 Wildlife Certification, which state that trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of two inches or greater. Shrubs removed during construction, whether native or non-native will be replaced based on their preconstruction areal coverage. In all cases, all such trees and shrubs will be replaced with native species.	Environmental Manager, Landscape Architect	Final design and construction
63	Wildlife	Nest loss due to tree removal and/or abandonment due to proximity of construction activity	To ensure compliance with the MBTA and the Bald and Golden Eagle Protection Act, project biologists will coordinate with the CPW on additional survey requirements/roosting locations to ensure any late fall or winter construction activity would have the least amount of impact on bald eagles in the vicinity of the Roaring Fork River.	Environmental Manager	Final design
64	Wildlife	Nest loss due to tree removal and/or abandonment due to proximity of construction activity	Additional surveys for raptors and active nests will be required prior to any construction activities to positively identify raptor species in the area. If unavoidable impacts to raptor nests would occur as a result of the project construction, coordination with CPW and U.S. Fish and Wildlife Service (USFWS) will occur.	Environmental Manager	Final design
65	Wildlife	Nest loss due to tree removal and/or abandonment due to proximity of construction activity	If construction is to commence between April 1 and August 31, to avoid impacts to nesting birds in accordance with the MBTA, a qualified biologist will conduct a nest survey prior to construction. If active nests are found, coordination with CPW and USFWS will be required to determine an appropriate course of action, which could include, but is not limited to, a delay in construction to avoid the breeding season.	Environmental Manager	Final design
66	Wildlife	Acclimation of bears to human provided food sources.	Bear-resistant trash receptacles shall be utilized near construction areas to eliminate conditions that could attract bears.	Project Engineer	Final design and construction
67	Wildlife	Temporary impacts during construction	Wetland/riparian areas not temporarily impacted by the project will be protected from construction activities by temporary and/or construction limit fencing.	Wetlands Biologist, Project Engineer	Final design and construction
68	Aquatic Resources	Temporary erosion and sediment impacts during construction.	CDOT approved BMPs will be employed to offset the extent and duration of any temporary impacts to the Roaring Fork River.	Water Pollution Control Manager, Project Engineer	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
69	Aquatic Resources	Temporary erosion and sediment impacts during construction.	Construction staging areas will be located at a distance of greater than 50 feet from adjacent stream/riparian areas to avoid disturbance to existing vegetation, avoid point source discharges, and to prevent spills from entering the aquatic ecosystem, including concrete washout.	Water Pollution Control Manager, Project Engineer	Final design and construction
70	Aquatic Resources	Sedimentation and stream bed disturbance	If any in-stream construction were to occur within the Roaring Fork River, coordination with CPW will be initiated to ensure protection of brown trout and rainbow trout spawning areas. This could include seasonal construction restrictions.	Environmental Manager	Final design and construction
71	Threatened, Endangered, and Sensitive Species	Vegetation removal due to construction activities	CDOT BMPs and revegetation guidelines will be employed to minimize habitat impacts associated with vegetation removal (see Mitigation Commitments 50-53).	Water Pollution Control Manager, Landscape Architect, Project Engineer	Final design and construction
72	Threatened, Endangered, and Sensitive Species	Vegetation removal due to construction activities	Trees and shrubs removed during construction will be replaced as stipulated in CDOT's Guidelines for Senate Bill 40 Wildlife Certification, which state that trees removed during construction, whether native or non-native, shall be replaced with a goal of 1:1 replacement based on a stem count of all trees with diameter at breast height of two inches or greater.	Environmental Manager, Landscape Architect	Final design and construction
73	Threatened, Endangered, and Sensitive Species	Temporary impacts during construction	Wetland/riparian areas not temporarily impacted by the project will be protected from construction activities by temporary and/or construction limit fencing.	Wetlands Biologist, Project Engineer	Final design and construction
74	Threatened, Endangered, and Sensitive Species	Vegetation removal due to construction activities	All disturbed areas will be revegetated with native grass and forb species, including species associated with the Ute-ladies'-tresses orchid. Seed, mulch, and mulch tackifier will be applied in phases throughout construction.	Landscape Architect, Project Engineer	Final design and construction
75	Threatened, Endangered, and Sensitive Species	Vegetation removal due to construction activities	One survey (single season) will be done for the Ute-ladies'-tresses orchid prior to construction. If present, Section 7 consultation with USFWS will be reinitiated.	Environmental Manager	Final design
76	Threatened, Endangered, and Sensitive Species	Vegetation removal due to construction activities	A 100% success rate of all replaced trees will be achieved as measured two years post construction. After two years, all failed replacement trees will be replaced and planted in locations that will provide the highest opportunity for success as determined by a CDOT Landscape Architect.	Landscape Architect	Post-construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
77	Threatened, Endangered, and Sensitive Species	Vegetation removal due to construction activities	Stream realignments, bank stabilization activities, and in-stream encroachment require SB 40 Certification. The Preferred Alternative will follow the stipulations and general conditions as part of the Certification requirements.	Environmental Manager, Landscape Architect, Project Engineer	Final design and construction
78	Visual	Vegetation removal due to construction activities	To the extent possible, disturbance to existing trees, shrubs, and vegetation will be avoided.	Landscape Architect, Project Engineer	Final design and construction
79	Visual	Establishment of noxious weeds	An Integrated Weed Management plan will be implemented.	Landscape Architect	Final design and construction
80	Visual	Temporary erosion and sediment impacts during construction.	Temporary and permanent erosion control measures will be implemented.	Water Pollution Control Manager, Project Engineer	Final design and construction
81	Visual	Temporary erosion and sediment impacts during construction.	Erosion control blankets will be used on steep newly planted slopes.	Water Pollution Control Manager, Project Engineer	Final design and construction
82	Visual	Vegetation removal due to construction activities	Disturbed areas will be revegetated with native grass and forb species.	Landscape Architect, Project Engineer	Final design and construction
83	Visual	Inconsistent visual form	Rock cuts will be analyzed prior to final design to produce a form and texture consistent with existing visual conditions.	Landscape Architect, Project Engineer	30% design
84	Visual	Inconsistent visual form	Retaining walls and noise walls will be designed to meet local design and aesthetic standards.	Landscape Architect, Project Engineer	Final design and construction
85	Historic	Loss of access	On-street parking will be installed on the west side of Airport Road to maintain access to the Cardiff coke ovens located on the parcel owned by the Frontier Historical Society.	Project Engineer	Final design and construction
86	Historic	Direct impacts to historic properties	Flagging or high visibility fencing will be placed along the boundaries nearest Airport Road at the Manufacturing Facility/Cardiff Coke Ovens (5GF.461) and the Industry/Cardiff Coke Manufacturing Equipment (5GF.4261) to avoid construction impacts.	Environmental Manager, Project Engineer	Final design and construction
87	Historic	Disturbance of historic sites	All disturbed areas will be revegetated with native shrubs, grasses, and forbs.	Staff Archaeologist, Landscape Architect	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
88	Historic	Disturbance of archeological sites	If subsurface cultural remains are exposed during any phase of construction, all work in the vicinity of the find will cease and the CDOT Senior Staff Archaeologist will be contacted immediately to evaluate the materials for eligibility to the NRHP. Work will not resume in the area until appropriate interagency consultation has been completed and authorization to continue has been issued by the archaeologist.	Project Engineer, Staff Archaeologist	Final design and construction
89	Paleontology	Disturbance of paleontological sites	If any subsurface bones or other potential fossils are found anywhere within the study area during ground disturbance, the CDOT Staff Paleontologist will be notified immediately to assess their significance and make further recommendations.	Project Engineer, Staff Paleontologist	Final design and construction
90	Parks and Recreation		The City of Glenwood Springs will participate in joint planning for the development of the rodeo grounds to include both transportation and recreation uses.	Environmental Manager, Project Engineer	Final design
91	Pedestrian and Bicycles	Pedestrian and bicycle access during construction	Signage will be provided along the Rio Grande Trail to inform users of upcoming construction disturbance and direct them to a safe detour. The detour will use the existing SH 82 shoulder, which will be widened to accommodate trail users and be protected by a concrete barrier. The detour will be approximately .25-mile in length and will not result in out of direction travel.	Project Engineer	Final design and construction
92	Pedestrian and Bicycles	Pedestrian and bicycle access during construction	Bicycle traffic on Airport Road will be maintained the same as automobile traffic. Bicycles will be allowed with maintenance of traffic throughout the duration of the construction.	Project Engineer	Final design and construction
93	Pedestrian and Bicycles	Vegetation removal due to construction activities	The land that has been temporarily disturbed adjacent to the Rio Grande Trail will be restored and planted.	Landscape Architect, Project Engineer	Final design and construction
94	Hazardous Materials	Exposure to potentially hazardous materials	The project will adhere to Section 250 "Environmental Health and Safety Management" of the CDOT Standard Specifications for Road and Bridge Construction (CDOT 2011) to provide for the protection of the environment, persons, and property from contaminants and includes special requirements for addressing hazardous waste, if encountered.	Environmental Manager, Project Engineer,	Final design and construction
95	Hazardous Materials	Exposure to potentially hazardous materials	Further investigation of recognized environmental conditions will be performed which could include a Phase II ESA being performed.	Environmental Manager,	Final design

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
96	Hazardous Materials	Exposure to potentially hazardous materials	Precautions will be taken and construction personnel need to be trained to recognize signs of possible contamination in soil, such as odors and staining.	Project Engineer, Environmental Manager	Final design and construction
97	Hazardous Materials	Exposure to potentially hazardous materials	Construction debris or asbestos utility lines will be inspected by appropriate professionals and handled in accordance with CDPHE regulations pertaining to asbestos waste management (6CCR 1007-2, Part 1, Section 5).	Project Engineer, Environmental Manager	Final design and construction
98	Hazardous Materials	Exposure to potentially hazardous materials	The conditions of the CDOT Section 211 Dewatering specification will be adhered to and construction personnel trained to recognize possible contamination.	Project Engineer, Environmental Manager, Water Pollution Control Manager	Final design and construction
99	Construction	Access and mobility	Develop traffic management plans.	Project Engineer	Final design and construction
100	Construction	Temporary access and mobility impacts during construction	Keep as many lanes open as possible during peak travel times by temporarily shifting these lanes within the existing framework of the roadway.	Project Engineer	Final design and construction
101	Construction	Temporary access and mobility impacts during construction	Coordinate detour routes, if available, to avoid overloading local streets with detour traffic, where possible.	Project Engineer	Final design and construction
102	Construction	Temporary access and mobility impacts during construction	Coordinate with emergency service providers to minimize delays and ensure access to properties.	Project Engineer	Final design and construction
103	Construction	Temporary access and mobility impacts during construction	Use signage, television, and radio announcements to announce and advertise timing of road closures.	Public Involvement, Project Engineer	Final design and construction
104	Construction	Temporary noise impacts during construction	Use noise blankets on equipment.	Project Engineer	Final design and construction
105	Construction	Temporary noise impacts during construction	Reroute truck traffic away from residential areas as much as possible.	Project Engineer	Final design and construction
106	Construction	Temporary noise impacts during construction	Combine noisy operations to occur during the same period.	Project Engineer	Final design and construction
107	Construction	Temporary noise impacts during construction	Conduct high-noise activities during daytime construction where possible.	Project Engineer	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
108	Construction	Temporary air quality impacts during construction	Suppress dust through watering or dust palliative.	Project Engineer	Final design and construction
109	Construction	Temporary air quality impacts during construction	Monitor idling times for construction equipment to prevent excessive exhaust emissions.	Project Engineer	Final design and construction
110	Construction	Temporary air quality impacts during construction	Require low-sulfur fuels for diesel construction equipment.	Project Engineer	Final design and construction
111	Construction	Temporary air quality impacts during construction	Evaluate low emissions equipment and clean engine technologies for diesel construction equipment prior to construction.	Project Engineer	Final design
112	Construction	Temporary access, mobility, and safety impacts during construction	Provide construction fencing to protect pedestrians and bicyclists from construction areas.	Project Engineer	Final design and construction
113	Construction	Access, mobility, and safety	Use signage to direct pedestrians and bicyclists to temporary sidewalks.	Project Engineer	Final design and construction
114	Construction	Temporary erosion and sediment impacts during construction.	Implement temporary and permanent BMPs for erosion control, sediment control, and drainageway protection, as required by local and state permitting requirements.	Water Pollution Control Manager, Project Engineer	Final design and construction

Table 4-25 ***Summary of Mitigation Measures***

Mitigation Commitment #	Mitigation Category	Impact	Mitigation Commitment	Responsible Branch	Timing
115	Cumulative Impacts	Sustainability	As a part of CDOT's commitment to addressing MSATs and GHGs, some of CDOT's program-wide activities include: ■ Developing air quality educational materials specific to transportation issues for citizens, elected officials, and schools. ■ Offering outreach to communities to integrate land use and transportation decisions to reduce growth in VMT, such as smart growth techniques, buffer zones, transit-oriented development, walkable communities, access management plans, etc. ■ Continuing to research pavement durability opportunities with the goal of reducing the frequency of resurfacing and/or reconstruction projects. ■ Committing to research additional concrete additives that would reduce the demand for cement. ■ Expanding Transportation Demand Management (TDM) efforts statewide to better utilize the existing transportation mobility network. ■ Continuing to diversify the CDOT fleet by retrofitting diesel vehicles; specifying the types of vehicles and equipment contractors may use; purchasing low-emission vehicles, such as hybrids; and purchasing cleaner burning fuels through bidding incentives where feasible. Incentivizing is the likely vehicle for this. ■ Funding truck parking electrification (mostly via exploring external grant opportunities). ■ Researching additional ways to improve freight movement and efficiency statewide. ■ CDOT uses ultra-low sulfur diesel (ULSD) and biodiesel where available for on-road and non-road equipment statewide. ■ Developing a low-VOC-emitting tree landscaping specification.	CDOT DTD	Ongoing
116	Cumulative Impacts	Sustainability	The City of Glenwood Springs commits to continuing to investigate the use of conservations easements, hillside preservation areas, and riverside protection areas to preserve wildlife habitat.	Glenwood Springs	Ongoing

CHAPTER 5: SECTION 4(F) RESOURCES

5.1 Introduction

Section 4(f) was created when the United States Department of Transportation (USDOT) was formed in 1966 (Section 4(f) of the USDOT Act of 1966). It is codified in Title 49 United States Code (U.S.C.) Section 303 and Title 23 U.S.C. Section 138. Section 138 states: "The Secretary [of Transportation] shall not approve any program or project … which requires the use of any publicly owned land from a public park, recreation area, or wildlife and waterfowl refuge of national, State, or local significance as determined by the Federal, State, or local officials having jurisdiction thereof, or any land from an historic site of national, State, or local significance as so determined by such officials unless (1) there is no feasible and prudent alternative to the use of such land, and (2) such program includes all possible planning to minimize harm to such park, recreational area, wildlife and waterfowl refuge, or historic site resulting from such use."

Land will be considered permanently incorporated into a transportation project, or used, when it has been purchased as right-of-way or sufficient property interests have been otherwise acquired for the purpose of project implementation. For example, a "permanent easement" that is required for the purpose of project construction or that grants a future right of access onto Section 4(f) property, such as for the purpose of routine maintenance by the transportation agency, would be considered a permanent incorporation of land into a transportation facility.

There is an exception to the definition of use codified in 49 U.S.C. 303 (d). Under the FHWA/FTA regulations (23 CFR 774.13(d)), a temporary occupancy of property does not constitute a use of a Section 4(f) property when the following conditions are satisfied:

- The occupancy must be of temporary duration (i.e., shorter than the period of construction) and not involve a change in ownership of the property.
- The scope of work must be minor, with only minimal changes to the protected property.
- There are no permanent adverse physical effects to the protected property, nor will there be temporary or permanent interference with activities, features or attributes of the property.
- The land being used must be fully restored to a condition that is at least as good as that which existed prior to the proposed project.
- There must be documented agreement of the officials with jurisdiction over the Section 4(f) property regarding the above conditions.

This chapter evaluates the imapcts of this project on Section 4(f) properties, which includes publicly owned parks, recreation areas, wildlife and waterfowl refuges, or public and private historic properties.

If temporary impacts do not meet the temporary occupancy requirements, the result is a temporary use of the Section 4(f) property and the requirements of Section 4(f) apply.

5.2 Section 4(f) Properties

The study area includes both historic and recreation properties protected by Section 4(f), as follows:

- Historic properties:
  - Manufacturing Facility/Cardiff Coke Ovens (5GF.461)
  - Jerome Park Branch of the Colorado Midland Railroad (5GF469.2)
  - Rail-Related/Denver & Rio Grande Western Railroad Siding (5GF.3009)
  - Denver and Rio Grande Western Railroad (5GF1661.3)
  - Colorado Midland Railroad (5GF1663.1)
  - Airport Office and Apartment/ Office Buildings (5GF.4265 A&B)
- Recreation facilities:
  - River Corridor/Three Mile Park
  - Glenwood Park
  - Conservancy Park
  - Sopris Park
  - Rodeo grounds (future park)
  - Park East Trail
  - Atkinson Trail

The Rio Grande Trail, which follows the Denver and Rio Grande Western Railroad grade, is located on RFTA right-of-way that is preserved for future transportation use; therefore, the Rio Grande Trail qualifies as an exception to Section 4(f) per 23 CFR 774.13(f)(4).

For additional information regarding historic properties see **Section 4.13**. For additional information regarding recreation resources see **Section 4.15** and **Section 4.16**.

5.3 Use of Section 4(f) Properties

The Preferred Alternative would not result in the use of any Section 4(f) properties. Two Section 4(f) properties would experience temporary occupancy and a third Section 4(f) property would be jointly planned as a park and transportation facility, as discussed below.

5.3.1 Temporary Occupancy

Temporary occupancy would occur as a result of construction at three locations, affecting two Section 4(f) properties, as described below.

The Denver and Rio Grande Western Railroad, a historic property, would be affected at two following locations:

- West of the intersection of SH 82 and the new roadway, the Rio Grande Trail, which is located on the railroad grade, would be lowered to pass beneath the new roadway. Lowering the multi-use path would alter the visual characteristics by removing SH 82 from the field of vision, adding an overcrossing (the new roadway) above the path, and the inclusion of retaining walls. These improvement would require a temporary construction easement approximately 350 feet long and 50 feet wide (17,500 square feet) within the boundary of the historic property.
- Retaining walls and intersection improvements at CR 154 and SH 82 would require a temporary construction easement of approximately 13,800 square feet within the boundary of the historic property. The retaining walls would require a temporary construction easement approximately 880 feet long and 10 feet wide (8,800 square

feet). The intersection improvements, all occurring within the existing roadway, would require a temporary construction easement 100 feet long and 50 feet wide (5,500 square feet).

The Manufacturing Facility/Cardiff Coke Ovens would be affected by the construction of a retaining wall near the northeast boundary of the historic property. Construction of the retaining wall would require a temporary construction easement approximately 500 feet long and 5 feet wide (2,500 square feet), within the boundary of the historic property.

Impacts to these resources meet the requirements for temporary occupancy described in **Section 5.1**. Letters requesting concurrence from the officials with jurisdiction, SHPO, are included in **Appendix D, Comments and Coordination**.

5.3.2 Joint Planning

The rodeo grounds, which is a future planned park at the location of the previously used rodeo grounds, is being jointly planned as a park and a transportation facility, pursuant to 23 CFR 774.11(i). See **Appendix D, Comments and Coordination** for communication between FHWA and the City of Glenwood Springs dated June 13, 2011, regarding this joint planning. Because of this joint planning, the future use of this property for the Preferred Alternative is not a Section 4(f) use.

5.4 Coordination/Consultation

FHWA and CDOT have coordinated with the SHPO throughout the Section 106 process, regarding APE definition, eligibility of resources, and effects. CDOT invited several agencies and organizations to participate as Section 106 consulting parties (see **Section 4.13**). The Glenwood Springs Historic Preservation Commission and Frontier Historical Society, as consulting parties, were contacted in March 2012 and February 2013, regarding these determinations. The consulting parties did not comment on these letters within the 30-day comment period.

For all referenced correspondence, see **Appendix D, Comments and Coordination**.

CHAPTER 6: COMMENTS AND COORDINATION

6.1 Introduction

This chapter describes the integrated program of agency and public coordination and involvement activities conducted during the development of the South Bridge Environmental Assessment (EA). These activities were specifically conducted to be open, inclusive, and ongoing throughout the National Environmental Policy Act (NEPA) process. The objectives of the agency and public involvement program were:

- To provide opportunities for timely public comment and input to project decision-makers.
- To develop wide-ranging public support for the project.

The activities of the agency and public involvement program included agency and public scoping meetings, three public open houses, Community Advisory Group (CAG) meetings, Project Working Group (PWG) meetings, Glenwood Springs City Council briefings, Garfield County Commissioner briefings, small group and business meetings, newsletters, mailings, press releases, a project website, and a formal public hearing that will be scheduled during the EA review period.

6.2 Agency Coordination

Coordination with local, state, and federal agencies occurred throughout the project to ensure compliance with agency policies and procedures, NEPA requirements, and accurate resource identification and impact evaluation. Agency coordination included project scoping, regular meetings and briefings with agency staff, and agency review of the EA. For more information see **Appendix D, Comments and Coordination**.

6.2.1 Agency Scoping

As part of the NEPA process, project scoping meetings were held with agencies early on. The purpose of the scoping process was to identify agency concerns, define the important environmental issues including the elimination of non-significant issues, and identify any additional requirements.

Agency scoping meetings were held both in Denver and Glenwood Springs, on January 30, 2008, and February 7, 2008, respectively. Attendees of these meetings included the City of Glenwood Springs, Garfield County, the Colorado Department of Transportation (CDOT), the Federal Highway Administration (FHWA), the Colorado Parks and Wildlife (CPW), the Glenwood Springs River Commission, and the Frontier Historical Society.

Agency representatives who could not attend the scoping meetings were asked to identify any concerns related to the project and communicate them to the project team. These comments were received via U.S. Mail, e-mail, and telephone conversations. During the initial alternatives development, the study area was expanded, leading to a follow-up mailing to each of

the agencies. This mailing occurred on May 6, 2008, and solicited comments on the larger study area. A copy of the scoping letters and comments received can be found in **Appendix D, Comments and Coordination**. Agencies contacted and major concerns include:

- Carbondale and Rural Fire Protection District
- City of Glenwood Springs
- Colorado Department of Public Health and Environment
- Colorado Division of Natural Resources
- Colorado Division of Wildlife
  - Noted the need for seasonal restrictions on construction should in-channel work be required because of the presence of spawning trout, the need to survey for bald eagle habitat and other migratory birds, and the desire for no piers to be placed in the river.
- Colorado Historical Society
  - Expressed a concern that the structural integrity and access to the coke ovens be maintained and the airport be surveyed for historical significance.
- Colorado Public Utility Commission
- Colorado State Parks
- Federal Railroad Administration
- Garfield County
  - The County noted that final cost would be a concern.
- Glenwood Springs River Commission
  - Stated a preference for any bridge to span the river with no piers in the waterway.
- U.S. Army Corps of Engineers
- U.S. Department of Agriculture—Forest Service
- U.S. Department of the Interior—Bureau of Land Management
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
  - Identified the presence of Ute Ladies'-Tresses Orchid near the study area.

Other agency coordination was conducted through PWG meetings, as described in **Section 5.2.2** and **Section 5.2.3**.

6.2.2 Project Working Group

This group included the consultant team, City of Glenwood Springs, CDOT, FHWA, Garfield County, and the Roaring Fork Transit Authority (RFTA). Responsibilities included executing the NEPA study process and providing technical analyses to aid in the development of project alternative recommendations. The PWG solicited input from the CAG, as well as the general public, before finalizing recommendations.

PWG meetings were held throughout the life of the project to brief agency stakeholders on the progress and to involve them in key decisions. The dates of each PWG meeting are shown below (see **Table 6-1**) along with the major issues covered at each meeting.

Table 6-1 ***Project Working Group Meetings***

Meeting #	Meeting Date	Topics Covered
1	December 14, 2008	■ Kickoff meeting, project overview, roles and responsibilities, protocols, expectations, project issues
2	January 22, 2008	■ Discussion of projects goals, project needs, public involvement program and environmental documentation

Table 6-1 ***Project Working Group Meetings***

Meeting #	Meeting Date	Topics Covered
3	February 8, 2008	■ Review of the public scoping meeting and first CAG meeting ■ Discussion of initial alternatives development ■ Review of transportation planning ■ Review of measures of effectiveness
4	February 29, 2008	■ Project status update of major tasks ■ Summary of other project related meetings ■ Alternatives development, including Level 1 Screening (fatal flaw)
5	March 18, 2008	■ Project status update ■ Summary of other project related meetings ■ Discussion of the upcoming public meeting ■ Level 2 alternatives evaluation
6	April 10, 2008	■ Project status update ■ Review of CAG recommendations regarding Level 2 Screening ■ Public meeting preparation
7	April 29, 2008	■ Project status update ■ Public meeting debrief ■ Level 2 screening
8	May 22, 2008	■ Project status update ■ Discussion of Section 4(f) impacts ■ Right-of-entry for field surveys ■ Level 2 screening summary
9	July 1, 2008	■ Project status update ■ Discussion of right-of-entry progress and field work ■ Plans for an upcoming field trip with both PWG and CAG members
-	July 30, 2008	■ A joint field trip with CAG members to view alternatives.
10*	September 16, 2008	■ Project status update ■ Discussion of CAG input ■ Level 3 screening (detailed)
11	October 23, 2008	■ Project status update ■ Public meeting debrief
12	July 7, 2009	■ Project status update ■ Glenwood Springs City Council and Garfield County Board of County Commissioners joint workshop debrief
13	November 5, 2009	■ Project status update
14	May 5, 2010	■ Project status update ■ Discussion of analyzing two alternatives in the EA
15	August 20, 2010	■ Project status update ■ Update on the revised scope of work and methodologies.
16	October 16, 2010	■ Project status update ■ City Council meeting debrief
17	April 15, 2011	■ Project status update ■ Review refinements to Alternative 10b and confirm Preferred Alternative
18	TBD	■ Public Hearing preparation
19	TBD	■ Public Hearing debrief

* Per their request, interested CAG members, as well as other interested citizens, were in attendance at PWG meeting #10. They were present to observe; comments were limited to the extent practicable.

6.2.3 Elected Officials Meetings

Meetings were held with the City of Glenwood Springs City Council, Garfield County Board of County Commissioners and the RFTA Board of Directors (although appointed, comprised of elected officials). These meetings were conducted as part of the regularly scheduled council or board meetings and were open to the public.

After the final public open house and prior to the selection of the Preferred Alternative, multiple joint meetings and workshops with the Garfield Board of County Commissioners and Glenwood Springs City Council were convened. These joint Council/Commission meetings allowed City and County representatives to discuss the project on a local and regional level. The dates of each elected officials meeting are shown below (see **Table 6-2**) along with the major issues covered at each meeting.

Table 6-2 ***Elected Officials Meetings***

Agency	Meeting Date	Topics Covered
Glenwood Springs City Council	March 6, 2008	■ Project update ■ Review of other projects in the region ■ Purpose and Need ■ Initial alternatives development
RFTA Board of Directors	July 10, 2008	■ Project update ■ Alternatives development ■ Discussion of potential impacts on RFTA corridor ■ Questions and answers
Garfield County Commissioners	July 21, 2008	■ Project update ■ Alternatives development ■ Questions and answers
RFTA Board of Directors	November 13 , 2008	■ Project update ■ Present recommended alternatives ■ Discussion of potential impacts on RFTA corridor
Garfield County Commissioners	January 12, 2009	■ Present recommended alternative ■ Questions and answers ■ Public input
Glenwood Springs City Council	January 15, 2009	■ Present recommended alternatives ■ Questions and answers ■ Public input
Garfield County Commissioners and Glenwood Springs City Council	February 19, 2009	■ Joint workshop to discuss Preferred Alternative ■ Public input
Garfield County Commissioners	March 3, 2009	■ Preferred Alternative discussion ■ Public input
Glenwood Springs City Council	March 19, 2009	■ Preferred Alternative discussionPublic input
Garfield County Commissioners and Glenwood Springs City Council	May 27, 2009	■ Joint meeting to discuss elected officials recommendations ■ Public input
Garfield County Commissioners and Glenwood Springs City Council	September 16, 2009	■ Joint workshop to discuss elected official recommendations
Garfield County Commissioners and Glenwood Springs City Council	November 5, 2009	■ Discussion of determining alternatives ■ Council motion to forward Alternative 8b and 10b into EA failed by vote of 3 to 3 ■ Commissioners moved to recommend halting the study and find other non-federal alternatives, motion passed

Table 6-2 ***Elected Officials Meetings***

Agency	Meeting Date	Topics Covered
Glenwood Springs City Council	December 17, 2009	■ Workshop to discuss various options to complete the study based on motions of 11/05/09 meeting
Glenwood Springs City Council	January 7, 2010	■ Council discussion of options to complete study (follow-up of 12/17/09 meeting)
Glenwood Springs City Council	April 1, 2010	■ Resolution 2010-9 passed identifying Alternatives 8b and 10b for study in the EA.
Glenwood Springs City Council	May 20, 2010	■ Workshop to discuss proposed approach for the examination of two alternatives, 8b and 10b, and how they would be incorporated into the EA
Glenwood Springs City Council	October 21, 2010	■ Project update ■ Preliminary comparative analysis of Alternatives 8b and 10b
RFTA Board of Directors	November 11, 2010	■ Discuss options for crossing of the Rio Grande Corridor
Glenwood Springs City Council	January 6, 2011	■ Project update ■ More detailed comparative analysis of Alternatives 8b and 10b
Garfield County Commissioners	February 8, 2011	■ Project update ■ More detailed comparative analysis of Alternatives 8b and 10b
Garfield County Commissioners	February 15, 2011	■ Approved moving forward into Environmental Assessment with Alternative 10b as the Preferred Alternative
Glenwood Springs City Council	March 3, 2011	■ Passed resolution to carry Alternative 10b into the Environmental Assessment as the Preferred Alternative
Garfield County Commissioners	October 17, 2011	■ Project update

6.3 Public Involvement Activities

Public involvement was conducted throughout the development of this EA to ensure widespread public awareness of the project and to provide opportunities for timely public input to project decision-making. Participants included interested citizens, property owners and business owners, and operators. Special effort was made to encourage the participation of the low-income and minority populations within the study area through project mailings, flyers, and notices at community facilities (see **Section 6.3.3** and **Appendix E, Public Involvement**).

6.3.1 Community Advisory Group

The CAG was comprised of stakeholders from the area, such as local citizens, elected officials, property owners, business owners, and neighborhood representatives who expressed interest in the project. Responsibilities included providing input and raising issues to be considered in the evaluation process. The CAG also provided recommendations regarding project alternatives for consideration to the PWG.

CAG meetings were convened at regular intervals throughout the life of the project, as well as scheduled as needed as project milestones warranted. The dates of each CAG meeting are shown below (see **Table 6-3**), along with the major issues covered at each meeting.

6.3.2 Public Meetings/Open Houses

Three public meetings were held during the course of the project, using an "open house" format. The open house format does not have a formal presentation. This allows attendees to review all the information, to ask questions in a non-public setting, and to have flexible arrival and departure times for those who cannot attend the entire meeting; however, project staff members were on hand to take com-

Table 6-3 ***Community Advisory Group Meetings***

Meeting #	Meeting Date	Topics Covered
1	January 22, 2008	■ Kickoff meeting ■ Review of schedule, purpose and need, study area and roles and responsibilities
2	February 11, 2008	■ Debrief of public scoping meeting ■ Review measures of effectiveness ■ Discussion of Purpose and Need ■ Initial alternatives development
3	February 28, 2008	■ Purpose and Need update ■ Level 1 screening (Fatal Flaw)
4	March 17, 2008	■ Discussion and action regarding the Level 2 Screening (Comparative analysis)
-	March 31, 2008	■ Site field trip
5	April 7, 2008	■ Continuation of the Level 2 Screening
6	April 21, 2008	■ Continuation of the Level 2 Screening ■ Refinements of screening criteria per PWG request
7	May 5, 2008	■ Public Meeting debrief ■ PWG debrief ■ Completion of Level 2 Screening
8	May 21, 2008	■ Review of Level 3 Screening (Detailed) alternatives, including conceptual engineering
9	June 30, 2008	■ Meeting truncated as project team members could not reach Glenwood Springs due to an accident on I-70 ■ Project update given as well as discussion of an upcoming online alternatives survey
10	July 28, 2008	■ Distribution of the Level 3 Detailed Evaluation white paper ■ Instructions for online survey
-	July 30, 2008	■ A joint field trip with PWG members to view alternatives
11	August 11, 2008	■ Survey results ■ Level 3 Screening
12	August 13, 2008	■ Continuation of Level 3 Screening
13	August 25, 2008	■ Discussion of No Action Alternative ■ Conclusion of Level 3 Screening
14	October 25, 2010	■ Project update ■ Preliminary comparative analysis of Alternatives 8b and 10b

ments, answer questions, and address concerns. The information presented at the public meetings was posted on the project website (www.glenwoodsouthbridge.net) immediately after the public meeting occurred. The dates on which public meetings were held are listed below along with the issues covered:

■ **Public Open House #1 (Scoping)**
Thursday, February 7, 2008
Glenwood Springs Community Center
100 Wulfsohn Road
Glenwood Springs, CO

A public scoping meeting was held to review the project's Purpose and Need, the study area, and transportation and environmental issues, and to provide information to the public on how they could be involved as the project progresses. This first meeting provided the public an opportunity to comment on the project and identify issues of concern from the viewpoint of area residents and businesses.

During the open house, information was displayed for public review and comment. This included a project background, the Purpose and Need, and an overview of the environmental process.

A total of 69 people attended the meeting, and several submitted comments. Representative comments included concerns about the possibility of the South Bridge being used as a bypass to SH 82, negative impacts to the Roaring Fork River, impacts to private property and businesses, relationship to the *SH 82 Corridor Optimization Plan* and urgency for something to be constructed.

- **Public Open House #2**
  Wednesday, April 23, 2008
  Glenwood Springs Community Center
  100 Wulfsohn Road
  Glenwood Springs, CO

An open house was held to review the alternatives development and screening process and to obtain input from the public on the alternatives remaining.

During the open house, information was displayed for public review and comment. This included a project background, the Purpose and Need, a summary of the Level 1 Screening process and an overview of the environmental process.

A total of 39 people attended the meeting, with approximately 19 submitting comments. There was no consensus on the alternatives presented, with positive and negative comments received for all alternatives.

- **Public Open House #3**
  Wednesday, October 22, 2008
  Sopris Elementary School
  1150 Mt. Sopris Drive
  Glenwood Springs, CO

  With the CAG and PWG having determined recommended alternatives, a third public open house was held to gather additional input. This meeting presented the results of the Level 3 Evaluation and Screening by the CAG and PWG in determining recommended alternatives for evaluation within the EA.

  During the open house, information was displayed for public review and comment. This included a project history to date and a summary of the screening process and conceptual engineering.

  A total of 97 people attended the meeting, with 34 comments submitted. Over 50 percent of the comments received directly addressed a preference for a specific alternative, as detailed in **Table 6-4**.

The remaining comments had no stated preference, but did address a range of concerns including the following: keeping the airport open, closure of the airport, additional stoplights on SH 82, funding, and following the CAG recommendations.

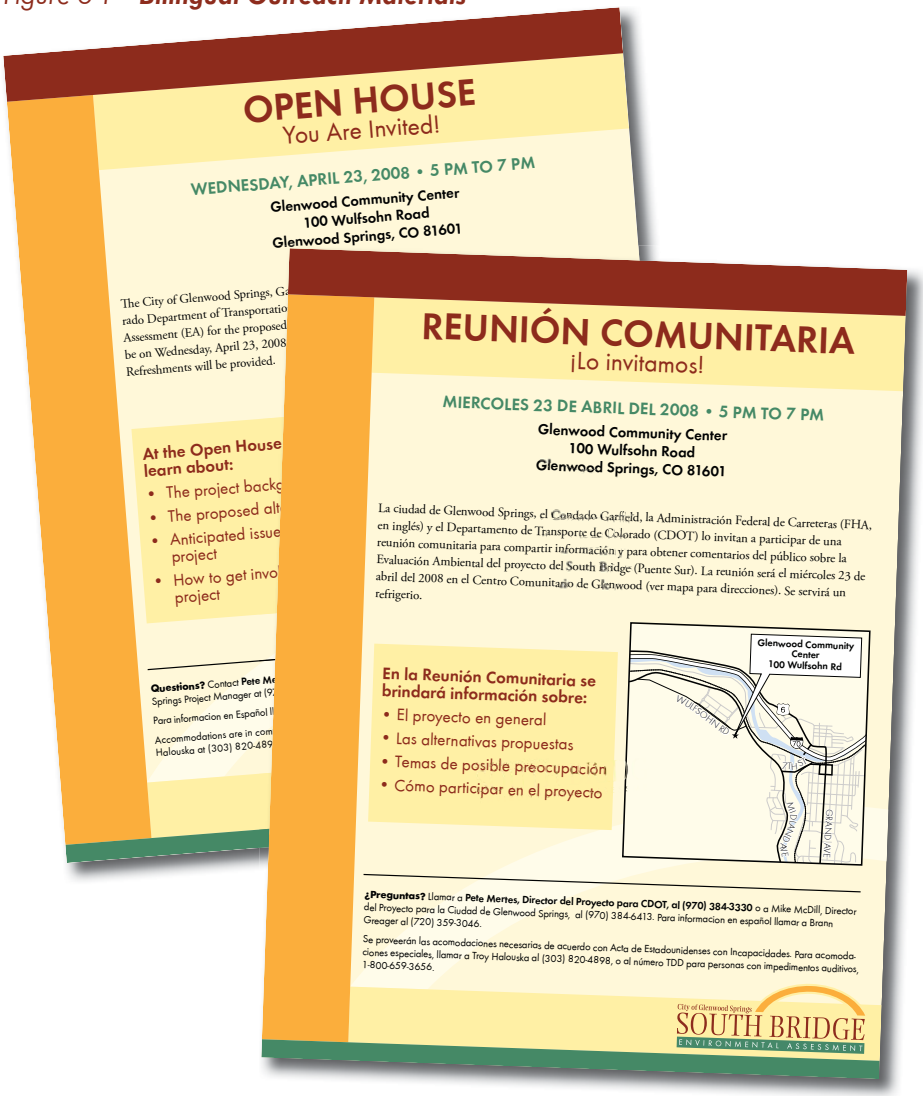
Table 6-4 ***Comment Results***

Open House Alternative Preference		
Alternative		**Comments Received**
#5:	New Cardiff Bridge	1
#8B:	Through Airport North, Below-Grade	1
#10A:	Through Airport South, At-Grade	1
#10B:	Though Airport South, Below-Grade	8
#10A OR #10B:		4
#16:	South of Airport, Crossing B	4
	No Action	3

6.3.3 Specialized Environmental Justice Outreach

Analysis of U.S. Census Bureau data indicated that low-income and minority populations were spread throughout the study area. It was expected that some of the residents and businesses in this area would receive project information through traditional communications (newspapers, television, radio) and through project mailings (newsletters and meeting announcements); however, additional efforts were made to ensure an increased level of project awareness and participation in the project by these groups that, in the past, have often been left out of the planning process.

Figure 6-1 ***Bilingual Outreach Materials***



Specialized outreach to Environmental Justice populations included the following:

- **Special Spanish Outreach**
  The project maintained a telephone information line for Spanish speakers. This was available from the project's inception, and contact information was included with all meeting announcements, newsletters and flyers. Additionally, the announcements for the February 7, 2008, and April 23, 2008, public meetings were printed and posted in English and Spanish (see **Figure 6-1**).

- **Flyers/Announcements**
  Flyers announcing the time and locations of public open houses were placed throughout the study area, targeting high-traffic locations and Environmental Justice populations. Locations of announcements included the Glenwood Springs Community Center, Glenwood Springs City Hall, the Garfield County Courthouse, churches, local businesses stores, and Sunlight Mountain ski resort.

6.3.4 Specialized Business Outreach

The project team held several meetings with small businesses and individual landowners in the study area. These were generally conducted by request of the business owners or landowners and included the following:

- RFTA staff
- Holy Cross Energy
- Mountain View Church
- Buffalo Valley
- CLH Properties, LLC

In addition, a CAG member affiliated with the Glenwood Springs Chamber of Commerce regularly forwarded Chamber

members updates on project status and CAG meeting materials.

6.3.5 Small Group Meetings

The project team held several small group meetings with interested citizens located along Midland Avenue, Airport Road, and SH 82. These meetings were typically convened at the request of citizens and often focused on project status and potential impacts to private property.

6.3.6 Project Web Site

A project website (www.glenwoodsouthbridge.net) was accessible throughout the length of the project. In addition to project information, it included updated public meeting materials, announcements for upcoming meetings, information on how to contact project representatives, and a comment sheet with an automatic email link to a project staff member (see **Figure 6-2**). This email link provided the public an opportunity to submit comments and contact information online.

6.3.7 Media Outreach

A variety of activities were implemented to engage the media and provide coverage of the project. These outreach activities included news releases, ads in the local newspaper, and radio spots, all announcing upcoming project open houses.

For each open house, quarter-page newspaper display ads were published as follows:

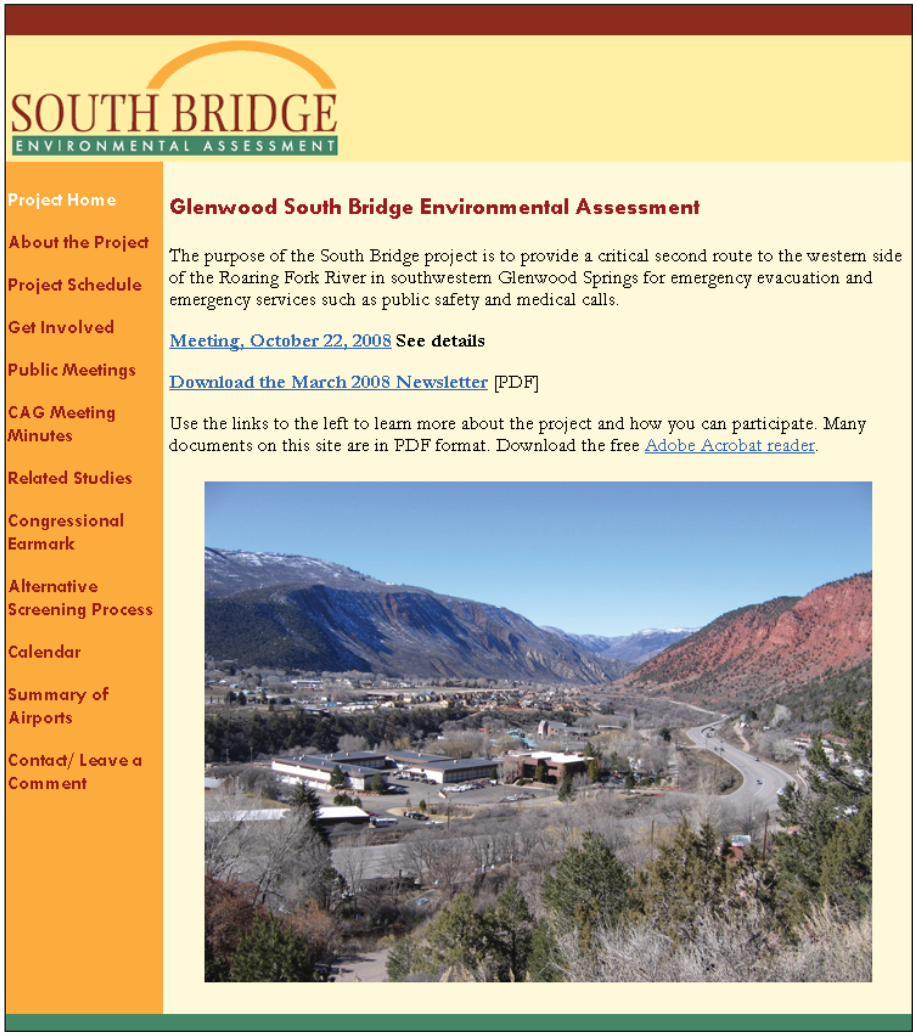
- **Open House #1**
  Post Independent, an ad was run January 25, 2008, 11 days before the meeting.

- **Open House #2**
  Post Independent, an ad was run April 18, 2008, five days before the meeting. In addition, a newspaper insert with project information was included in the Post Independent the week of April 14, 2008.

- **Open House #3**
  Post Independent, an ad was run October 15, 2008, seven days before the meeting and again October 21, 2008, the day before the meeting.

Radio announcements were aired by KMTS, the local radio station. These announcements provided additional information to the public. Announcements to each of the open house meetings were aired on the day of the meeting. In addition, there was also a summary of the October 22, 2008, open house played on the October 23, 2008, morning news segment.

Figure 6-2 ***Project Web Site***



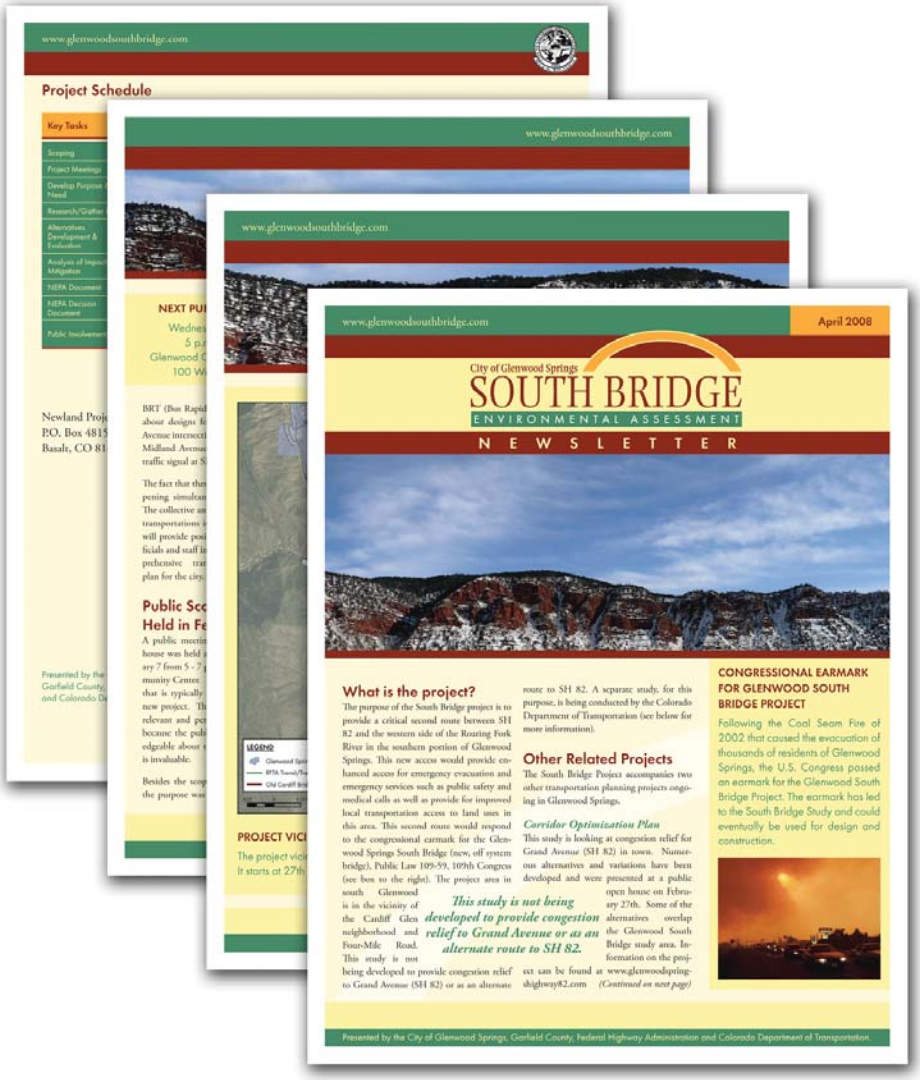
6.3.8 Mailings and Notices

Meeting notifications and information regarding the project and its progress were mailed to property owners, residents and businesses in the study area prior to each public meeting. The project contact database was developed by capturing all mailing addresses within the study area. This was then supplemented by public meeting attendees and contacts who requested to be added to the mailing list through the project Web site.

Newsletters providing the project status and background were mailed on April 14, 2008, (see **Figure 6-3**) and September 1, 2011. These newsletters included an overview of the study, the process to select a preferred alternative and a discussion of what's next, including environmental analysis, review process, and the opportunity for continued public involvement.

In addition to mailings, open house announcements were distributed at key locations in the community to maximize outreach potential. Locations of announcement flyers included the Glenwood Springs Community Center, Glenwood Springs City Hall, and the Garfield County Courthouse.

Figure 6-3 ***Project Newsletter***



6.3.9 Comments and Responses

The project team provided various opportunities for the public to submit comments from the inception of the project. All public comments were captured and recorded and reviewed by the project team. After each public meeting, the PWG met to discuss public comments. Opportunities to submit comments included:

- Project Web site: www.glenwood-southbridge.net.
- Comment sheets available at all public meetings/open houses.
- Comments to the project team by contacting representatives listed on advertisements and newsletters.
- Public hearing.

To date, 48 comments have been received through the opportunities listed above. Requested project information has been mailed or emailed to individuals. All comments received by the project team were considered in developing the Preferred Alternative. Common concerns cited in the comments included the following:

- Minimize the impacts to local residents and businesses.
- Changes in traffic volumes and how that would affect local neighborhoods.

- Comments regarding the alignment varied greatly, with an interest in a northern alignment to minimize impacts to agricultural lands, and a southern alignment to minimize relocations.

- Comments included the need to keep the airport open, as well as the need to close the airport for potential redevelopment.

6.4 Public Hearing

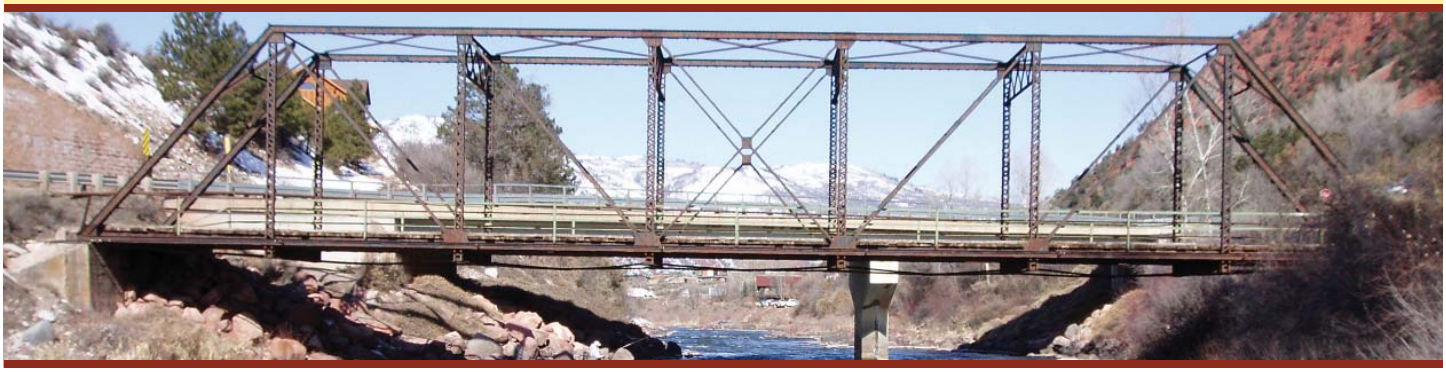
A public hearing will be held during the 30-day public review period. The purpose of the hearing is to receive comments from the public on the South Bridge EA and the Preferred Alternative identified in the EA. Prior to the hearing, copies of the EA will be made available for public review. Display ads in local newspapers, news releases, and a postcard mailing will announce the availability of the EA for review and the date, time, and location of the hearing.

6.5 Public Involvement Activities Summary

Table 6-5 summarizes all public involvement and specialized outreach activities provided throughout the duration of the South Bridge project.

Table 6-5 ***Public Involvement Summary***

Public Involvement Activity	Date
General Public Outreach	
Project website goes live	January 25, 2008
Project newsletter mailed	April 14, 2008
Right-of-Entry Permission Letters mailed	June 2, 2008
CAG meetings	See Table 6 3
Small business meetings	As requested, see **Section 5.3.4**
Small group meetings	As requested, see **Section 5.3.5**
Agency Outreach	
Agency scoping meeting	January 30, 2008
Agency scoping meeting	February 7, 2008
Elected officials meetings	See **Table 6-2**
PWG meetings	See **Table 6-1**
Public Open House #1	
Announcement flyers posted for Public Open House #1	January 25, 2008
Announcement posted on website for Public Open House #1	January 25, 2008
Postcard mailing for Public Open House #1	January 25, 2008
Newspaper ad posted for Public Open House #1	January 27, 2008
Meeting material posted on the Web site	February 7, 2008
Public Open House #1	February 7, 2008
Public Open House #2	
Public Open House #2	April 23, 2008
Announcement flyers posted for Public Open House #2	April 18, 2008
Newspaper ad posted for Public Open House #2	April 18, 2008
Postcard mailing for Public Open House #2	April 18, 2008
Newspaper insert for Public Open House #2	April 14, 2008
Announcement posted on website for Public Open House #2	April 14, 2008
Public Open House #3	
Announcement flyers posted for Public Open House #3	October 15, 2008
Announcement posted on website for Public Open House #3	October 15, 2008
Postcard mailing for Public Open House #3	October 15,2008
Newspaper ad posted for Public Open House #3	October 15, 2008 and October 21, 2008
Public Open House #3	October 22, 2008
Meeting material posted on the Web site	October 22, 2008



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