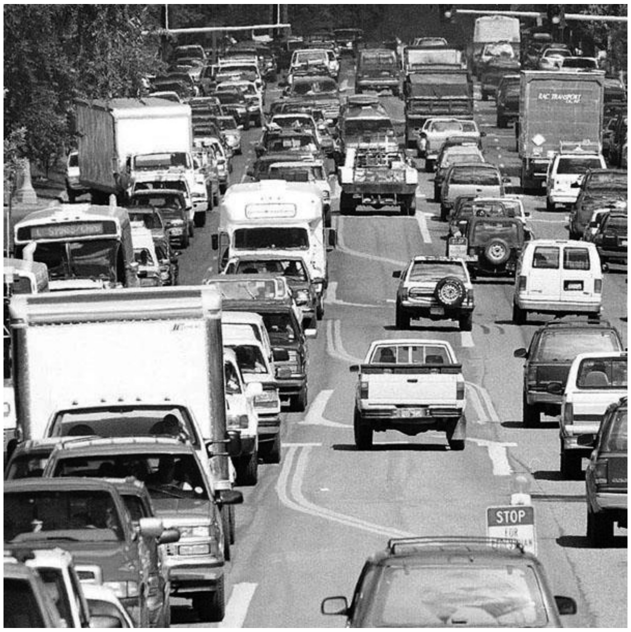

West Glenwood Springs to Aspen Corridor Investment Study

Prepared for

The Roaring Fork Transportation Authority

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Abstract

This Corridor Investment Study (CIS) presents detailed analyses for a No Action/Committed Projects Alternative, a Bus Rapid Transit Alternative with two sub-alternatives, and a Rail Alternative for the West Glenwood Springs to Aspen transportation project. A trail, the new Rio Grande Trail, is proposed for both Build alternatives. Detailed alternative analyses and public involvement programs have been conducted for this project and these results are summarized in this document.

The Project Corridor is located in the Roaring Fork Valley beginning at the West Glenwood I-70 interchange in West Glenwood Springs, Colorado and ending in downtown Aspen, Colorado, a distance of approximately 66.5 kilometers (41.3 miles). The project crosses three counties (Garfield, Eagle, and Pitkin) and interfaces with the communities of Glenwood Springs, Carbondale, Basalt, Snowmass Village, and Aspen.

This CIS documents social, economic, and environmental impacts of the three alternatives. Mitigation measures are identified for any impacts identified. This document also includes a history of project development and financing options available for the implementation of the alternatives.

EXECUTIVE SUMMARY

A. INTRODUCTION

1. What is the CIS and how will it be used by RFTA?

The Corridor Investment Study (CIS) is a long-range planning tool created by the Roaring Fork Transportation Authority (RFTA) in consultation with its member jurisdictions, the Colorado Department of Transportation, (CDOT), the Federal Transit Administration (FTA), and the Federal Highway Administration (FHWA). The CIS is intended to compare long-range transportation alternatives in the RFTA service area through the year 2025 and provide useful information for long-range decision-making. In comparing the alternative futures, simplifying assumptions were made regarding other transportation initiatives in the RFTA service area. These assumptions are the same for all alternatives. Once RFTA selects a preferred alternative for its long-range transit plan, RFTA will work with its member jurisdictions and its partners at CDOT, FTA, and FHWA to develop projects and programs that are consistent with the long-range vision and respectful of the desires of RFTA communities and state and federal policies.

2. How does the CIS relate to the Entrance to Aspen?

The CIS, which commenced in 1998, assumes the findings of the 1998 *State Highway 82 Entrance to Aspen Record of Decision* (*Entrance to Aspen ROD*) for the purpose of comparing long-range alternatives for the future of transit in the RFTA service area. The findings of the ROD are applied the same way for all alternatives in this comparative process. The citizens of Aspen and Pitkin County have expressed their desires regarding the Entrance to Aspen in many advisory and binding votes over the years. RFTA recognizes that since the *Entrance to Aspen ROD* was released in 1998, these votes have indicated a preference by the majority of voters to retain the existing alignment of the Highway.

Once RFTA selects a preferred alternative for its long-range transit plan, RFTA will work with member jurisdictions and its partners at CDOT, FTA, and FHWA to develop projects and programs that support the long-range vision of improved transit, and are respectful of the desires of RFTA communities. This will include working with the City of Aspen, Pitkin County, and CDOT to develop projects and programs within the Entrance to Aspen area that are consistent with the stated desires of the community. All references to the *Entrance to Aspen ROD* should be considered in this context.

3. Project Background

The New York Times, in an article titled "Five commutes that make you feel better about yours," listed the Roaring Fork Valley commute as one of the worst in the country (October 20, 1999). Even with current Highway 82 investments, traffic congestion on the completed four-lane highway will reach Level of Service (LOS) F between 2009 and 2015, according to RFTA and CDOT studies.

The region's growing traffic congestion cannot be solved with just one mode of transportation or by highway expansions alone. Providing transportation choices is a critical part of the solution. The region's multi-modal approach started with the formation of the Roaring Fork Transit Agency in 1983. Since then, transit ridership has reached almost four million annually, and the transit system has become the state's second largest.

In 1997, with assistance from the Colorado Department of Transportation and Great Outdoors Colorado, Valley jurisdictions, joining together as the Roaring Fork Railroad Holding Authority (RFRHA), purchased the Denver and Rio Grande Western Rail line between Glenwood Springs and Aspen to preserve a Valley-wide corridor for transit and trail development. Most recently, in November 2000, Valley residents in seven jurisdictions approved the formation and funding of the Roaring Fork Transportation Authority (RFTA), the state's first Rural Transportation Authority, based on the Colorado Rural Transportation Authority Act passed by the Colorado legislature in 1997. One result of the November 2000 election was the merger of the pre-existing RFRHA into RFTA, which assumed all of RFRHA's responsibilities.

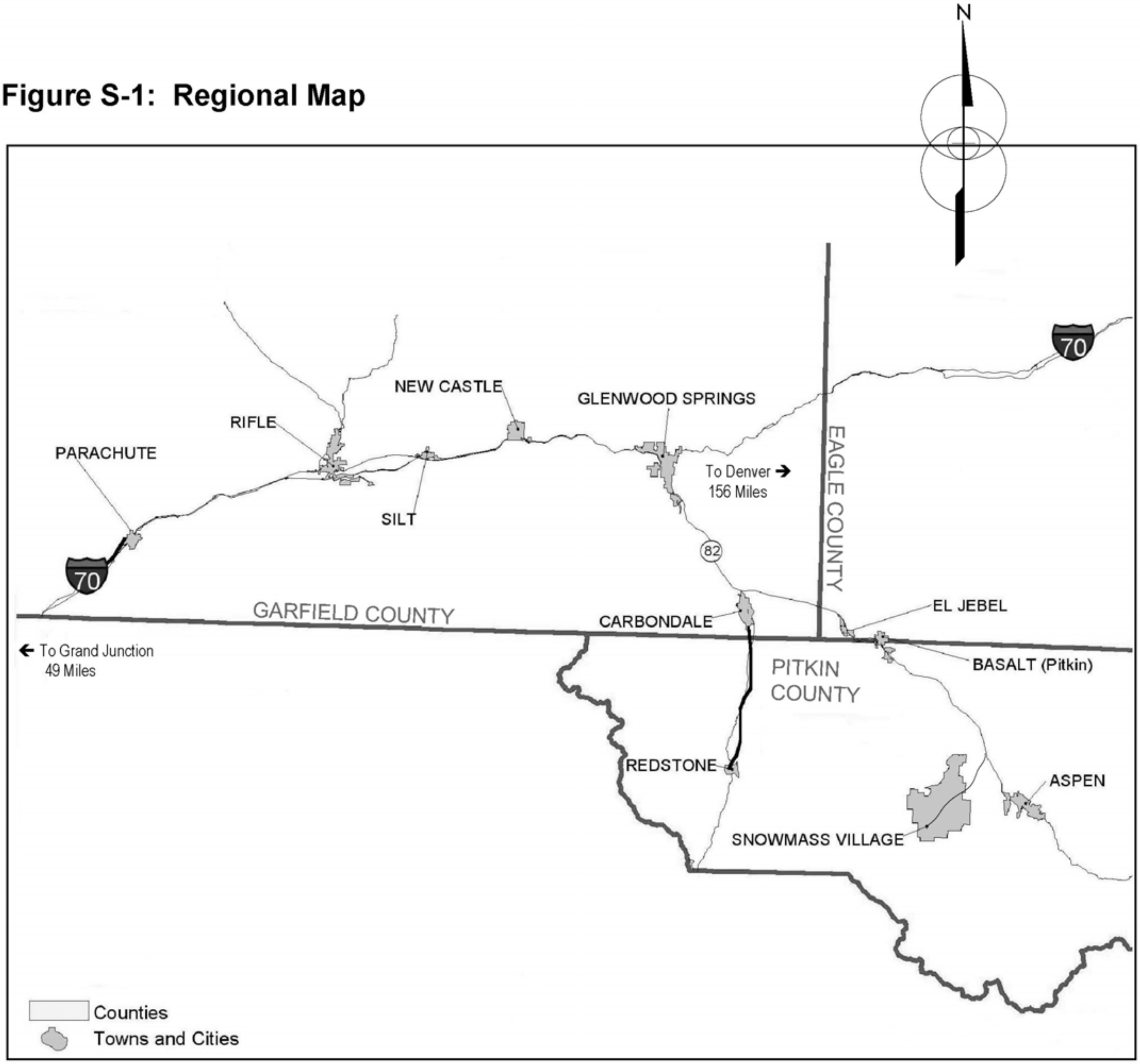
RFTA has the directive to plan and expand mass transit and build a regional trail for both commuter and recreational use. It is also responsible for the completion of the *West Glenwood Springs to Aspen Corridor Investment Study* (CIS), evaluating the region's long-term transportation alternatives, including rail on the Rio Grande Right-of-Way. From 1998 to spring of 2003, the CIS was conducted as a National Environmental Policy Act (NEPA) Environmental Impact Statement process. During the analysis of the alternatives it became apparent that an alternative based upon rail technology would not be available to RFTA within the planning horizon of the project due to funding constraints and that an EIS was inappropriate for the remaining alternatives. RFTA determined through discussions with our partners at the FTA, FHWA, and CDOT that the CIS would be released as a local planning document to provide the local community a comparative analysis of bus and rail technologies, as well as a No Action alternative, to confirm local support for the transit project, and to seek input from the public as the project is refined. While not required, this CIS follows the format of a NEPA-type document.

Many of the options identified early in the CIS process were screened from further consideration using a tiered approach that incorporated a reality check screening and a fatal flaw screening. The result of this process was the development and refinement of the three alternatives for comparative analysis and ultimately the selection of a preferred alternative by the community and the RFTA Board:

- No Action/Committed Projects Alternative (No Action/Committed Projects)
- Bus Rapid Transit (BRT) Alternatives + Trail
  - BRT-Bus sub-alternative uses dedicated busway from Buttermilk to Aspen
  - BRT-LRT sub-alternative uses light rail transit (LRT) from Buttermilk to Aspen
- Rail + Trail

This Executive Summary of the CIS is generally a stand-alone report. However, due to the complexity of the project, references to the expanded discussion in the full document are included in each section below.

Figure S-1: Regional Map



B. PURPOSE AND NEED FOR THE PROPOSED ACTION

- See **Chapter I: Purpose and Need** for additional information.

The purpose of the CIS process is to develop a regional transportation solution that addresses the mobility needs and respects the quality-of-life concerns of the citizens residing within the Project Corridor. The Project Corridor is located in the Roaring Fork Valley of Western Colorado between West Glenwood Springs and Aspen/Snowmass. It extends through Garfield, Eagle, and Pitkin Counties. In addition, communities along Interstate 70 west and east of Glenwood Springs are part of the Corridor "travelshed." The distance from Glenwood Springs to downtown Aspen along Highway 82 is approximately 66.5 kilometers (41.3 miles) (see Figure S-1).

This CIS was conducted for the Roaring Fork Transportation Authority (RFTA). The Federal Transit Administration (FTA), the Federal Highway Administration (FHWA), and the Colorado Department of Transportation (CDOT) advised RFTA during the CIS process and will act as partners with RFTA as the region's preferred transportation plan is developed and implemented.

1. Purpose and Need

1.1 Project Corridor Congestion

Highway 82 is the state's most congested rural highway, with a summer average daily traffic (ADT) volume of over 28,000 vehicles in some locations. Highway congestion within the Project Corridor threatens the economic vitality, environmental health, and character of the larger region.

The location of activity centers at either end of this narrow corridor, with only one through route, results in a commuter pattern similar to highway corridors between the suburbs and the central core city in many metropolitan areas. Commuter traffic flows eastbound on Highway 82 in the morning and westbound on Highway 82 in the evening. Because so many workers live west of Glenwood Springs in the communities of New Castle, Silt, and Rifle, there is a constant flow of traffic between the I-70 corridor and Highway 82, adding substantially to congestion at peak hours.

Within the Project Corridor, Highway 82 operates at LOS C or worse for much of the day during peak summer and winter seasons. Segments in Glenwood Springs and Upvalley from Basalt operate at LOS E or worse during the peak hour. The maximum capacities for several sections of Highway 82 are shown in Table S-1 and are compared with design hour volumes (30th highest peak hour traffic count) used by CDOT for highway design purposes.

Figure S-2: Project Corridor

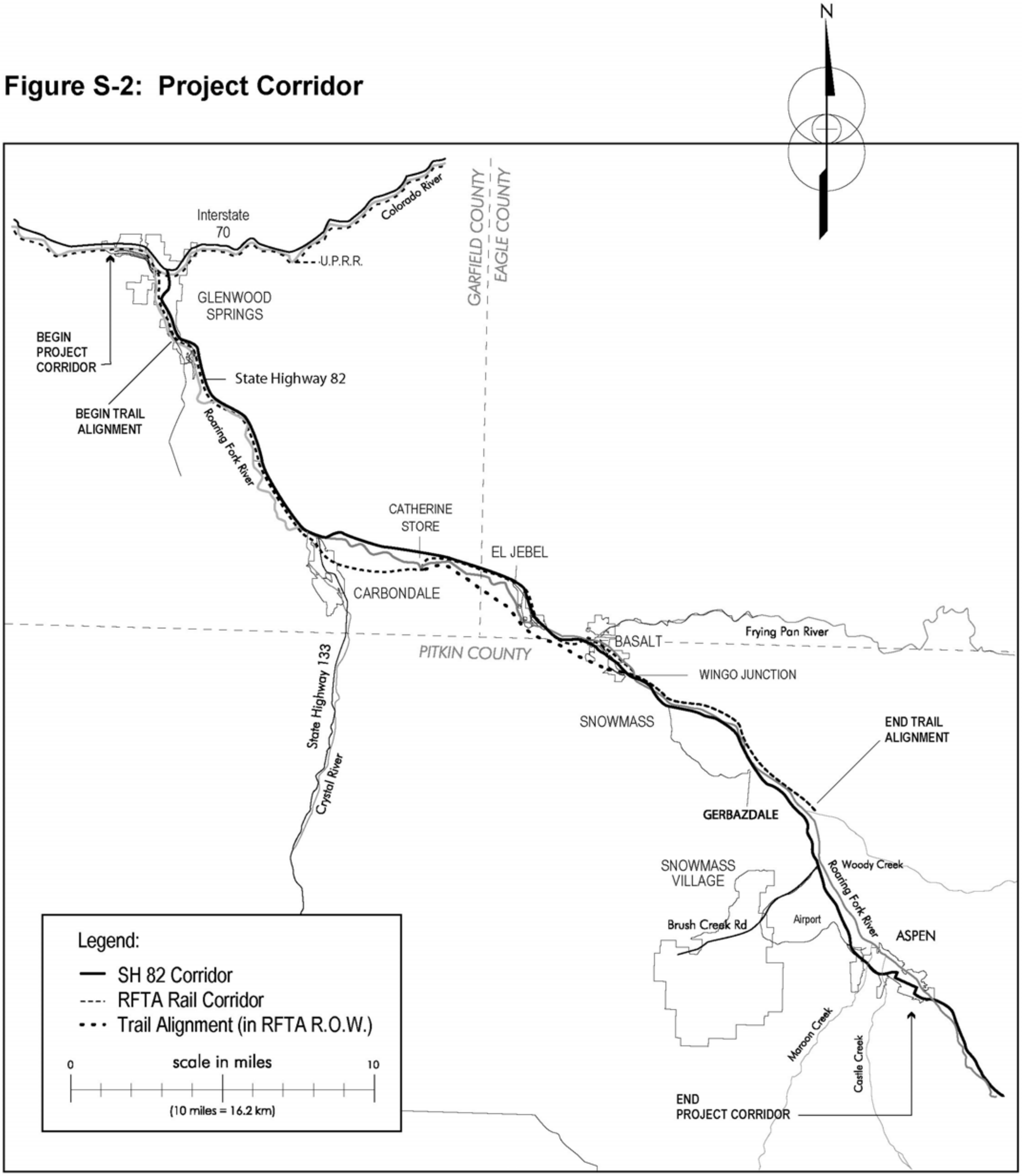


Table S-1
Highway 82 Existing Level of Service
2001 Design Hour Volumes

Location	Design Hour Volume	% No-Passing Zones	Truck Percentage	Maximum Capacity [1]	Level of Service
10th St. in Glenwood Springs	3,294	0%	2.84%	2,280	F
Highway 133 intersection	1,820	0%	2.98%	2,280	C/D
El Jebel Road	2,083	0%	2.04%	2,530	C/D
Basalt	1,798	0%	2.30%	2,530	C
Snowmass Canyon	2,018	65%	2.39%	1,600	F
Pitkin County Airport	1,923	65%	2.24%	2,420	E
Cemetery Lane in Aspen	2,633	65%	1.76%	2,420	F

[1] *Maximum capacity is the hourly flow rate under ideal conditions of LOS E. The definition of capacity assumes good weather and pavement conditions exist. At capacity, no more vehicles can reasonably be expected to traverse a section of roadway during the given time under prevailing roadway, traffic, and control conditions.*

1.2 Committed Transportation Projects Will Not Meet Future Needs

Two significant transportation projects in the Project Corridor have federal approval. Even with the completion of these projects, the forecast transportation needs for the West Glenwood Springs to Aspen Project Corridor will not be met. These projects also make up a large portion of the No Action/Committed Projects Alternative addressed in this CIS. Each is briefly described below.

State Highway 82, East of Basalt to Buttermilk Ski Area Project (Project No. STR 0821-029, STIP No. 4021). In October of 1993 FHWA, in conjunction with CDOT, released the *State Highway 82 East of Basalt to Buttermilk Ski Area Final Environmental Impact Statement (SH 82 Basalt to Buttermilk FEIS)*. The Record of Decision (*Basalt to Buttermilk ROD*) for this project was released in December 1993. The Selected Alternative includes widening Highway 82 from two to four lanes from just east of Basalt to the Buttermilk Ski Area, with two of the four lanes between Basalt and the Buttermilk Ski Area operating as bus/high occupancy vehicle (HOV) lanes during peak travel periods. Construction of this project will be completed by 2005.

Travel demand forecasts conducted for the *SH 82 Basalt to Buttermilk EIS* and for this CIS predict that, without investment in an improved transit system, the new four-lane highway will approach peak-hour gridlock at critical locations as early as the year 2009. CDOT has indicated that funding does not exist to widen the highway to six lanes, even if this were desirable.

State Highway 82 Entrance to Aspen Project (Project No. NH 0821-055, STIP No. 4021). The Selected Alternative described in 1998 in the *Entrance to Aspen ROD* for this project is a combination of highway improvements, transit improvements, and a transportation management program. The highway element consists of a two-lane divided highway that generally follows the existing alignment from Buttermilk Ski Area to 7th and Main Street in Aspen, except across the Marolt-Thomas property.

The Selected Alternative for the Entrance to Aspen Project provides an LRT system from the Aspen Maintenance Facility near the Pitkin County Airport to Rubey Park in downtown Aspen. The LRT alignment is generally parallel to and south of the highway alignment. In the event that Aspen and Pitkin County voters do not approve funding for the LRT system, the *Entrance to Aspen ROD* provides for an interim busway parallel to the highway alignment from Buttermilk to 7th and Main Street.

As a part of the *Entrance to Aspen ROD*, the City of Aspen has agreed to undertake an incremental Transportation Management (TM) program designed to maintain the volume of traffic entering Aspen at 1994 levels. The program includes progressively more aggressive disincentives to automobile use and incentives for transit use in response to measured traffic levels. The program continues to be successful to date.

The Entrance to Aspen project does not address the need to provide service throughout the valley from Glenwood Springs to Snowmass Village, the Airport, and into Aspen, nor does it address travel demand between 2015 and 2025 into downtown Aspen.

2. Opportunities

The linear nature of settlement in the Roaring Fork Valley is ideally suited for transit-oriented development. Historically, Valley communities were located to serve the resource-based economy and were in turn served by the Denver & Rio Grande Railroad. The small block sizes, street grids, storefronts, and mix of housing and commercial activity, all within close proximity, are legacies of the Valley's railroad era. This historic integration of land use and transportation gave today's residents the pedestrian-friendly communities they cherish and hope to preserve and enhance. Additional investment in transit, providing enhanced access within and between town centers, will provide an incentive for investment in the Project Corridor's incorporated areas. This investment, coupled with the transit-supportive land use policies of the local governments within the RFTA service area, should lead to more compact and efficient land use patterns.

The opportunity for an expanded solution to corridor transportation challenges arose when the portion of the Aspen Branch of the Denver and Rio Grande Western Railroad (D&RGW) that remained between Glenwood Springs and Woody Creek Junction (outside of Aspen) became available for purchase as the result of the merger of the Southern Pacific and Union Pacific Railroads. On June 30, 1997, the D&RGW right-of-way corridor was purchased for $8.5 million. The Roaring Fork Railroad Holding Authority (RFRHA) was established to purchase and manage the corridor. The purchase of this right-of-way presented an opportunity to explore both transportation and recreation solutions to Highway 82 congestion and trail connectivity challenges in the Roaring Fork Valley.

As a part of the agreement to purchase the right-of-way in 1997, it was required that a comprehensive plan be prepared that would determine the future uses of the corridor. *A Comprehensive Plan for the Aspen Branch of the Denver and Rio Grande Western Railroad Corridor* was submitted to the RFRHA Board and accepted on November 3, 1999. The plan included the following specific elements:

- Location of a permanent, continuous public recreation trail running along the entire length of the RFRHA right-of-way. This proposed trail will be called the Rio Grande Trail.
- Description of structures and facilities necessary to place and operate a rail transportation system utilizing the RFRHA right-of-way.

It was recognized early in the process that another type of public transportation system might be substituted for, or phased in prior to, a rail transportation system if such a system better met the needs of the Roaring Fork Valley through the year 2025. A Corridor Investment Study (CIS) was initiated by RFRHA to identify the best public transportation solution for the Roaring Fork Valley.

When the Roaring Fork Transportation Authority (RFTA) was approved by voters as a Rural Transportation Authority under Colorado law in November 2000, it absorbed the responsibilities of RFRHA. References in the current document to the RFTA right-of-way refer to the RFRHA right-of-way that was acquired as noted above.

The West Glenwood Springs to Aspen Project is included in the 2020 Statewide Transportation Plan adopted by the State Highway Commission on November 16, 2000. More recently, the CDOT Intermountain Transportation Planning Region has ranked the West Glenwood Springs to Aspen Project as its top priority project in the ongoing CDOT 2003 Strategic Corridor Program. In April 2003 the CDOT Transportation Commission identified the RFTA BRT project as a high priority transit project in the state.

3. Objectives

The nine project objectives described below are the foundation of the alternatives screening and development process, which resulted in the alternatives evaluated in this CIS. These objectives address the purpose and need for this project and support the development of an improved and safe transportation and recreation system while avoiding or minimizing adverse environmental impacts.

1. **Affordability and Economic Viability.** Develop a system that is financially realistic in construction, operation, and maintenance costs with respect to current and expected funding levels and programs.

2. **Community-based Planning.** Provide a system that fits the character of the Roaring Fork and Colorado River Valley communities and is responsive to local community-based planning efforts, including directing growth to appropriate locations.

3. **Environmental Soundness.** Develop a system that avoids, minimizes, and mitigates adverse environmental, social, and economic impacts.

4. **Flexibility.** Provide a system that is flexible in operation and in future transportation options and upgrades.

5. **Increased Transportation Choices.** Provide a multimodal system, with various mode options, that meets the demand of the forecasted person trips.

6. **Integrated Approach to Transportation Planning.** Provide a complete integrated transportation and recreation system.

7. **Livability.** Provide a system that enhances the quality of life for residents and visitors, including linking communities within the Roaring Fork and Colorado River Valleys.

8. **Safety.** Provide a safe transportation and recreation system, including minimizing conflict between various transportation components.

9. **Trails and Recreational Resources**. Provide a system that meets the trail and recreational access demand of the Project Corridor.

4. Transportation Problems the Proposed Build Alternatives Will Address

1. **Highway 82 congestion will continue even after investment in a four-lane platform.** Completion of the East of Basalt to Buttermilk Ski Area and Entrance to Aspen projects will represent an investment of almost $500 million in safety and capacity improvements to Highway 82. Travel demand forecasts predict that, without additional investment in transit, the highway could reach peak-hour capacity as early as 2009, and certainly within the planning horizon of the CIS. Additional investment in transit, coupled with transit-supportive land use policies, would help limit the growth of automobile travel in the Project Corridor.

2. **Additional Highway 82 expansion is constrained by cost and environment.** Highway 82 is located in a steep, narrow mountain valley proximate to the Roaring Fork River. The construction of a four-lane highway platform through portions of the corridor, particularly the Snowmass Canyon and Shale Bluffs areas, has been accomplished at costs exceeding $30 million per highway mile. Approximately 30 years of planning and environmental analysis preceded the construction. Given the financial and environmental constraints, it is unlikely that additional lanes will be added to Highway 82 during the planning horizon of the CIS. Additional investment in transit service is the most cost-effective means of adding transportation capacity to existing facilities in the Project Corridor.

3. **Lack of mode choice has broad economic impacts on the region and on working families.** Lack of affordable housing has become a regional problem, and in spite of a variety of very aggressive affordable housing programs, a majority of workers in each community must commute from homes further north and west. Aspen, with an average home price in excess of $2 million, houses less than 49 percent of its workforce. Glenwood Springs, with an average home price of $305,000, imports 55 percent of its workers from western Garfield County. The working families that provide this labor force are dependent upon the automobile for transportation from the places they can afford to live to their places of employment. This auto dependency forces many families to maintain multiple automobiles, spending a third or more of their income on automobile and commuting costs. An auto-dependent environment forces these families to forego other investments that would enhance their quality of life. Additional investment in transit would provide a viable alternative to the automobile, reduce the percentage of their household budgets allocated to transportation, and provide the means for investment in housing, education, and recreation.

4. **Growth in transit demand has exhausted the capabilities of traditional bus transit service and infrastructure.** RFTA was originally organized in 1983 to provide local transit service to Aspen and Pitkin County. The agency has grown incrementally since that time to provide regional service to three counties and eight incorporated communities in a 70-mile corridor. A significant investment in transit infrastructure – park-and-ride lots, transit stations, queue bypass lanes, maintenance facilities, information systems, vehicles, and so forth – is required to create the efficiency, quality, and speed needed to keep pace with transit demand. Investment in these facilities would also provide RFTA management the resources needed to consolidate routes and stops, minimize dead-heading of vehicles, and take advantage of the efficiencies available through the use of intelligent transportation system (ITS) technology.

C. PUBLIC INVOLVEMENT

■ See **Chapter IX: Public Involvement** for additional discussion.

The goal of the public involvement process was to identify public issues and priorities at the start, and to provide an opportunity for citizens to participate in resolution of those issues throughout the course of study. For that reason, citizens and local elected officials were involved in establishing project objectives, developing measures for screening alternatives, and assessing the strength of alternatives against the project objectives and measures. The public involvement process allowed for multiple forms of input and addressing new issues as they arose.

Specific groups that participated on an ongoing basis included a staff resource group, four Citizen Task Forces (CTFs) organized by geographic region, a Regional Citizen Task Force (RTF), a Rio Grande Trail Task Force, Policy Committee, RFRHA Board, RFTA Board and local elected boards.

In addition to the efforts outlined above, the public involvement program also included the following techniques:

- Scoping meetings (five community meetings and an agency meeting)
- Open house public meetings and workshops (ten open houses and five workshops)
- Focus group meetings with property owners along the corridor
- City Council and County Commission briefings
- Slide presentations to discuss with community, civic, and business groups
- Hispanic/Latino outreach
  - A Latino outreach survey, door-to-door canvassing in Hispanic/Latino neighborhoods, and an open house specifically for Hispanic/Latino residents in the region
  - Study Team members and interpreters riding on buses to discuss transit with Hispanic/Latino riders
  - Spanish-speaking interpreters on hand at public open houses
- Newspaper inserts and periodic newsletters
- Issue briefs and fact sheets
- Weekly informational columns in valley newspapers
- Ongoing media coverage through numerous local papers, Grass Roots TV (public access), and local radio stations
- One-on-one meetings and e-mail correspondence with interested citizens and organizations
- A regional public opinion survey
- Transit-oriented community design workshops to discuss station location options and integration with local land use plans
- Rio Grande Trail plan open houses

D. SCREENING PROCESS SUMMARY

■ See **Chapter II: Alternatives, B. Screening and Selection Process** for additional discussion.

Many of the alternatives identified early in the *Corridor Investment Study* process were screened from further consideration using a tiered approach that incorporated a reality check screening, a fatal flaw screening, and a comparative screening. The screening process resulted in the three alternatives analyzed in detail in the CIS:

- No Action/Committed Projects Alternative
- Bus Rapid Transit (BRT) Alternative + Trail
  - BRT-Bus, using dedicated busway from Buttermilk to Aspen (BRT-Bus) ***or***
  - BRT-LRT, using light rail transit (LRT) from Buttermilk to Aspen (BRT-LRT)
- Rail Alternative + Trail

Each of the Build alternatives includes the construction of a trail in the RFTA right-of-way. This proposed "Rio Grande Trail" begins at the terminus of the Glenwood Springs River Trail at 23rd Street in Glenwood Springs. It ends 51.5 kilometers (32 miles) east, where it connects to the end of the existing Rio Grande Trail at Woody Creek. The existing Rio Grande Trail provides a connection into Aspen.

1. Screening Process

Four CTFs were established in the Project Corridor. The purpose of these groups was to involve, gather input from, and solicit ideas from Valley residents, and provide recommendations to the RFRHA Policy Committee. The RFRHA Policy Committee, appointed by the RFRHA Board, was made up of a broad range of political and agency representatives from throughout the Project Corridor, and served as the policy-making body for the public involvement process. A total of 92 CTF meetings were held between January 19, 1998 and October 6, 1999. The screening process applied progressively more demanding criteria to a range of potential options through a series of three screening levels: Reality Check, Fatal Flaw and Comparative. At each screening level, options that did not meet the respective criteria were eliminated from further study.

1.1 First Level: Reality Check Screening

The Reality Check Screening was intended to eliminate options that are clearly unrealistic, inappropriate, or unreasonable by applying common knowledge. This screening was qualitative, based on existing data and judgment of the CTF members, the Study Team, and the RFRHA Policy Committee. The options that were eliminated at this level had no realistic chance of being implemented because of physical constraints, funding, public opposition, or technology limitations.

1.2 Second Level: Fatal Flaw Screening

Options that survived the Reality Check Screening continued to the Fatal Flaw Screening level. This screening eliminated options that did not meet one or more of the project objectives as identified and defined by the CTFs and the RFRHA Policy Committee. Screening at this level was a collaborative process that included input from the local communities and other interests. Fatal flaw criteria were developed through the public process based upon the project objectives noted in **Section A. 3** above.

1.3 Third Level: Comparative Screening

The remaining options from each category (i.e. technology, propulsion, station location, and alignment) were combined to form alternatives. These alternatives continued to the Comparative Screening level. This screening eliminated alternatives that, although they appeared to meet the project objectives, did not compare favorably to other available alternatives. Alternatives evaluated at this level underwent a planning-level analysis of key environmental parameters and issues.

2. Options Considered

At each screening level, options that did not meet the respective criteria were eliminated from further study. To simplify the task, the options were categorized into four types:

- Technology
- Propulsion
- Station Location
- Alignment

2.1 Technology

A total of 46 technology alternatives were developed through the public and agency scoping meetings, the CTFs, and Policy Committee meetings. Examples of technology options ranged from dog sleds to airplanes and automobiles to a busway and heavy rail. Two technologies were carried to the end of the screening: self-propelled buses and rail vehicles.

2.2 Propulsion Options

A total of 19 propulsion options were developed. These options were combined with the technology options to create different mode variations. A total of eight propulsion options were retained for a final decision on propulsion to be made in preliminary engineering:

- Diesel
- Gasoline
- Hydrogen internal combustion
- Electric (battery)
- Electric (overhead catenary)
- Electric (hybrid)
- Liquid propane gas
- Natural Gas

2.3 Transit Station Location Options

A total of 16 potential transit station locations were developed. These stations could serve numerous combinations of alignment, technology, and propulsion options. Nine station location options were retained and are included in the Build alternatives that are evaluated in this CIS:

- West Glenwood Springs
- Downtown Glenwood Springs
- Carbondale at Highway 133
- Downtown Carbondale
- El Jebel (Willits or El Jebel Road)
- Basalt
- Brush Creek Road
- Pitkin County Airport
- Downtown Aspen

The *Glenwood Springs to Aspen/Pitkin County Airport Corridor Investment Study, Transit Oriented Community Design Report* (Otak, 2000) determined that 60 percent of the employment and 42 percent of the housing in the Project Corridor is within one-half mile of these nine stations. The BRT alternative added stations at South Glenwood Springs and near the Colorado Mountain College campus to enhance service to these areas.

2.4 Alignment Options

Five rail alignment options were developed through the public and agency scoping meetings, the CTFs, and Policy Committee meetings. These options could be combined with the technology options and potential station locations to create a variety of alternatives. All alignments provided connecting service to Aspen via the LRT transfer points at Brush Creek Road or the Pitkin County Airport. Alignment Alternative C was retained for detailed analysis in this CIS.

3. Conclusion of Screening Process

In November 2000, voters in Aspen, Snowmass Village, Basalt, Carbondale, Glenwood Springs, Pitkin County, and Eagle County voted to approve the formation and funding of the Roaring Fork Transportation Authority (RFTA) as a Rural Transportation Authority under Colorado law. Responsibility for the CIS shifted from RFRHA to RFTA as one result of the RFTA Intergovernmental Agreement and public vote.

After discussion with FTA, FHWA, and CDOT staff, and public outreach including meetings with the CTF members, presentations to local Boards and Commissions, and Open Houses in Glenwood Springs, Carbondale, Basalt, and Aspen, the Study Team recommended that RFTA include a Bus Rapid Transit (BRT) Alternative in the CIS. The BRT Alternative would be developed based upon the analysis conducted earlier in the screening process for the "Improved Bus/TSM (Transportation System Management)" Alternative. The Study Team further recommended that the CIS evaluate a No Action/Committed Projects Alternative, a BRT Alternative, and a Rail Alternative without designating any single alternative as "Locally Preferred." The RFTA Board, in its Resolution 2002-05, concurred with these recommendations.

The alternatives described in subsequent sections of this document make two types of provisions for transit:

- Both the No Action/Committed Projects and BRT alternatives provide for the use of self-propelled buses on the existing Highway 82 corridor. The BRT system proposed for the Project Corridor would operate in general travel lanes with bus signal preference and preemption between Glenwood Springs and Basalt and in peak-hour HOV lanes between Basalt and Aspen. The BRT Alternative combines intelligent transportation systems technology, priority for transit, cleaner and quieter vehicles, rapid and convenient fare collection, and integration with local land use policy.
- The Rail Alternative provides for rail vehicles utilizing portions of the existing RFTA right-of-way and portions of the Highway 82 corridor (Alignment C) in addition to self-propelled buses serving a feeder function for the mainline rail alignment.

E. CIS ALTERNATIVES

■ See **Chapter II: Alternatives, Section C. Definition of Alternatives** for additional discussion.

Table S-2 provides a summary and comparison of alternative physical characteristics: alignments, station locations, park-and-ride facilities, and proposed vehicles. Figure S-2 shows the Rail alignment.

Table S-2
Comparison of CIS Alternatives – Physical Characteristics

ALIGNMENT

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
• Four general-purpose lanes Glenwood Springs to Basalt • Two general-purpose lanes and two peak-hour HOV lanes Basalt to Buttermilk • Two lane parkway from Buttermilk to 7th and Main • Light Rail Transit from Buttermilk to Rubey Park or Busway from Buttermilk to 7th and Main • Four-Mile Connection in South Glenwood Springs • New signals at 7th, 5th, 3rd, and Garmisch • Bike and pedestrian improvements per Basalt to Buttermilk and Entrance to Aspen RODs	• Includes No Action/ Committed Projects with Entrance to Aspen Busway plus: • Traffic signal modification for transit priority • Additional Remote Traffic Microwave Sensor on Highway 82 • Incident Management Program • Variable Message Sign System • Wildlife Warning Reflector System • Video surveillance to monitor traffic conditions • Queue Bypass Lanes for buses	Includes No Action/ Committed Projects with Entrance to Aspen Light Rail plus: • Traffic signal modification for transit priority • Additional Remote Traffic Microwave Sensor on Highway 82 • Incident Management Program • Variable Message Sign System • Wildlife Warning Reflector System • Video surveillance to monitor traffic conditions • Queue Bypass Lanes for buses	Includes No Action/ Committed Projects with Entrance to Aspen Light Rail plus: • Rail on Alignment C - See Figure II-3 • Additional Remote Traffic Microwave Sensor on Highway 82 • Incident Management Program • Variable Message Sign System • Wildlife Warning Reflector System • Video surveillance to monitor traffic conditions

STATION LOCATIONS

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
• Snowmass Village • Rodeo Lot • Brush Creek Road	• West Glenwood Springs • Downtown Glenwood Springs • South Glenwood Springs • CMC (CR 54) • Highway 133 • Downtown Carbondale • El Jebel (El Jebel Road or Willits Lane) • Basalt • Snowmass Village • Rodeo Lot • Brush Creek Road	• West Glenwood Springs • Downtown Glenwood Springs • South Glenwood Springs • CMC (CR 54) • Highway 133 • Downtown Carbondale • El Jebel (El Jebel Road or Willits Lane) • Basalt • Snowmass Village • Rodeo Lot • Brush Creek Road	• West Glenwood Springs • Downtown Glenwood Springs • Highway 133 • Downtown Carbondale • El Jebel (El Jebel Road or Willits Lane) • Basalt • Snowmass Village • Rodeo Lot • Brush Creek Road

Table S-2
Comparison of CIS Alternatives – Physical Characteristics

STATION LOCATIONS, continued

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
• Pitkin County Airport • Buttermilk • Maroon Creek Road • 7th and Main • 3rd and Main • Paepcke Park • Monarch Street Rubey Park	• Pitkin County Airport • Buttermilk • Maroon Creek Road • 7th and Main • Paepcke Park • Rubey Park	• Pitkin County Airport • Buttermilk • Uses LRT stations from Buttermilk to Rubey Park	• Pitkin County Airport • Buttermilk • Uses LRT stations from Buttermilk to Monarch • Main and Galena

PARK-and-RIDE FACILITIES

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
6,700 total spaces proposed[1] in the Project Corridor, including: • 450 spaces - Glenwood Springs • 500 spaces - Carbondale • 500 spaces - El Jebel • 500 spaces - Basalt • 400 spaces - Brush Creek Road • 750 spaces - Buttermilk • 3,600 spaces - Pitkin County Airport [1] Note that the current transportation model shows a need by 2025 of 3,290 spaces.	4,140 total spaces in the Project Corridor, including: • 600 spaces - West Glenwood Springs • 260 spaces - South Glenwood Springs • 800 spaces - Highway 133 • 360 spaces - El Jebel • 440 spaces - Basalt • 140 spaces - Brush Creek Road • 260 spaces - Buttermilk • 1,280 spaces - Pitkin County Airport	3,620 total spaces in the Project Corridor, including • 560 spaces - West Glenwood Springs • 260 spaces - South Glenwood Springs • 630 spaces - Highway 133 • 1,030 spaces - El Jebel • 410 spaces - Basalt • 530 spaces - Brush Creek Road • 30 spaces - Buttermilk • 170 spaces - Pitkin County Airport	4,710 total spaces in the Project Corridor, including: • 940 spaces - West Glenwood Springs • 660 spaces - Highway 133 • 1,140 spaces - El Jebel • 390 spaces - Basalt • 890 spaces - Brush Creek Road • 120 spaces - Buttermilk • 570 spaces - Pitkin County Airport

VEHICLES

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
• 19.8 meter (65-foot) articulated diesel buses • 40-foot diesel buses	• 19.8 meter (65-foot) articulated alternative fuel buses (possibly low-floor)	• 19.8 meter (65-foot) articulated alternative fuel buses (possibly low-floor)	• Diesel Multiple Unit Railcars (Adtranz GTW 4-12 or equivalent) • Up to 4 vehicle consists during peak hours

F. PROJECT IMPACTS

The Project Impacts discussion is divided into three sections: resources considered, major environmental impacts and transportation impacts.

1. Resources Considered

- See **Chapter III: Affected Environment** for further information on all resources.

Social, economic, and physical environment resources were assessed in this study as follows:

Social Environment

- Population
- Demographic characteristics
- Environmental Justice
- Services
- Recreation
- Land use

Economic Environment

- Economic base
- Commercial growth trends
- Employment
- Income
- Housing
- Local government finance

Physical Environment

- Air quality
- Water quality
- Floodplains
- Geology and soils
- Upland and floodplain vegetation
- Wetlands
- Fisheries
- Wildlife
- Wild and scenic rivers
- Threatened, endangered, candidate and other special concern species
- Cultural resources
- Paleontological resources
- Section 4(f) and 6(f) resources
- Farmlands
- Noise and ground-borne vibration
- Visual character
- Potential hazardous waste sites
- Traffic safety
- Energy
- Construction

2. Environmental Impacts

- See **Chapter V: Environmental Consequences** and **Chapter VII: Mitigation Measures** for additional impact and mitigation discussion.

No measurable impacts have been identified for any of the alternatives for 17 of the resources listed. An additional nine resources will require no mitigation after best management practices are implemented.

Significant wildlife and cultural resources exist within the Project Corridor. None of the alternatives, including the trail, are expected to affect wildlife or threatened, endangered, candidate and other special concern species after implementation of best management practices.

A total of 29 cultural resource sites, including the Denver and Rio Grande Western Railroad itself, are included in the Area of Potential Effect. Of these, 12 sites are eligible for the National Register of Historic Places. No Adverse Effects have been identified for any of these resources.

A total of five resources will require impact mitigation. These impacts and mitigation are summarized below.

2.1 Right-of-Way and Relocation

Impacts. No additional right-of-way or relocations are associated with either the No Action/ Committed Projects Alternative or the new Rio Grande Trail for Opening Day or 2025. The BRT Alternative will require additional right-of-way associated with the proposed new transit station and park-and-ride locations, estimated at 11.76 hectares (29.06 acres). No relocations are associated with either BRT Alternative. The Rail Alternative will result in 14 residential and three business relocations. A total of 18.85 hectares (46.57 acres) of additional right-of-way will be required for station and park-and-ride locations, as well as small amounts along the alignment itself. The right-of-way and relocation impacts are all associated with opening day (2008).

Mitigation. The Acquisition and Relocation Program for this project will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources will be available without discrimination to all residents and businesses that are required to relocate.

2.2 Environmental Justice

Impacts. There are no identified disproportionate impacts to minority, low-income, or elderly populations in the opening year or in 2025 for the No Action/Committed Projects Alternative, the BRT Alternatives, or the proposed Rio Grande Trail.

Noise and relocations associated with the Rail Alternative may affect minority, low-income, or elderly populations for Opening Day. Four areas of possible concern were identified for noise impacts: H Lazy F Mobile Home Park (three impacted receivers), Mountain Valley Mobile Home Park (17 homes impacted), Roaring Fork Mobile Home Park (23 homes potentially impacted), and Philips Mobile Home Park (four impacted receivers). Up to 11 mobile homes in the Aspen-Basalt Mobile Home Park along Highway 82 at the intersection with Willits Lane are subject to relocation impacts associated with the Rail Alternative. There are 73 units in the mobile home park, and approximately 90 percent of the units are occupied by members of the Hispanic/Latino public, according to the operator of the park.

Mitigation. Mitigation of noise impacts is discussed under the Noise analysis.

2.3 Wetlands

Impacts. Opening day wetlands impacts are summarized in Table S-3. No additional impacts are expected by 2025.

Table S-3
Estimated Area of Permanent Impact, Roaring Fork Valley Wetlands
(hectares/acres)

Measure	Committed Projects/No Build	BRT[1]	Rail	Rio Grande Trail
Area estimate of filled non-jurisdictional wetlands[2]	0	.02/.05	0.36/.88	0.59/1.45
Area estimate of filled jurisdictional wetlands[2]	0	.004/.01	0.15/.37	0.34/.86
Estimated Total Impact	0	.024/.06	0.51/1.25	0.93/2.31

[1] Wetlands impacts associated with this alternative are for both BRT-Bus and BRT-LRT at the proposed Basalt Station.

[2] Wetland fill estimated from 7.6 m (25 ft) cut and fill boundaries along proposed rail alignment, and a 6.1 m (20 ft) cut and fill projection for the Rio Grande trail alignment. Acreage estimates assume that all bridge impacts at stream/river crossings occur within cut and fill boundaries.

Mitigation. Wetlands evaluations were conducted in 1999 and will need to be redone upon selection of a preferred alternative and construction of the new Rio Grande Trail. Jurisdictional wetlands are subject to the Clean Water Act (CWA), Section 404(b)(1) Guidelines. Per CDOT policy both jurisdictional and non-jurisdictional wetlands are subject to mitigation. Wetland mitigation is identified as avoidance, minimization, and compensatory mitigation.

Avoidance and minimization. Within the constraints of the project, the design of the rail and trail reflect an effort to avoid wetland impacts when practicable, and to minimize the extent of unavoidable impacts. Avoidance and minimization have been accomplished by reducing the size of the footprint and by maximizing the use of existing infrastructure (e.g. the existing rail line).

Wetland replacement. Where practicable, mitigation will occur on site at a replacement ratio of 1:1. Functional replacement of more than 1:1 may be required to allow an adequate margin of safety to reflect the expected degree of success associated with the mitigation. Specific mitigation and monitoring requirements for permanent and temporary impacts will be established as part of CWA Section 404 permits and CDOT requirements for the project. Water rights issues will be considered during the final selection of mitigation sites.

2.4 Noise and Ground-Borne Vibration

Impacts. No noise impacts or mitigation are associated with the new Rio Grande Trail. Except for a receiver site identified in the *SH 82 Entrance to Aspen FEIS*, no noise impact locations have been identified for the No Action/Committed Projects Alternative. No noise impact locations have been identified for the portions of the BRT Alternatives located along Highway 82. Impacts associated with the BRT-LRT Alternative will be the same as for the No Action/Committed Projects Alternative noted above. The BRT-Bus Alternative may use the Entrance to Aspen interim busway in the event voters do not approve funding for the LRT system. Bus noise is expected to be similar to LRT noise and no additional impacts are anticipated. A total of 89 receiver sites were identified that satisfied the criteria of impact or severe impact based on the FTA methodology for the Rail Alternative.

Noise impacts are also possible at the proposed Carbondale and Basalt station locations associated with the BRT and Rail Alternatives.

Except for the Rail Alternative, no ground-borne vibration impacts have been identified. The potential for vibratory impacts was identified at two receiver locations in the Project Corridor. Both of these receivers were identified previously as falling into the severe impact category for airborne noise.

Mitigation. Noise barrier implementation is the result of an analysis for reasonableness and feasibility for each location. Reasonableness is directly related to cost per receptor. Feasibility relates to the potential effectiveness of the mitigation measure, based on the ability to minimize the number of openings in a noise barrier and the ability to provide a noise reduction of at least five decibels.

2.5 Potential Hazardous Waste Sites

Impacts. No additional hazardous waste sites have been identified in association with the No Action/Committed Projects or BRT Alternatives. Two sites may be associated with the construction of the new Rio Grande Trail. For the Rail Alternative, ten sites may require sampling during preliminary engineering, health and safety planning, or mitigation during construction.

Mitigation. Sites associated with the Rio Grande Trail include:

- Site 9: Surficial soil staining at the 4th Street crossing in Carbondale, and
- Site 13: The former lumber yard.

Additional sampling with indicated health and safety planning or mitigation should be performed at Site 9. No right-of-way is needed in the vicinity of Site 13 for the construction of the trail alone; therefore, no additional work is recommended.

Sites associated with the Rail Alternative may include the following recommended actions. Additional sampling with indicated health and safety planning or mitigation should be performed at the following sites:

- Site 1: West Glenwood to Wye rail storage
- Site 9: Surficial soil staining at the 4th Street crossing in Carbondale

Health and safety planning or mitigation should be undertaken for the following sites, if additional property acquisition is necessary:

- Site 3: Fattor Petroleum
- Site 5: Amoco Station at 2205 Grand Avenue, Glenwood Springs
- Site 13: The former lumber yard
- Site 18: The Pitkin County Airport
- Site 19: The RFTA Bus Maintenance Facility
- Site 20: The Aspen Airport Business Center
- Site 21: 435 E. Main Street, Aspen
- Site 22: 506 E. Main Street, Aspen

3. Transportation Impacts

- See **Chapter IV: Transportation Impacts** for additional information.

The transportation impacts chapter presents projected impacts of the alternatives on the overall transportation system. Impacts include changes in transit facilities and service, roadway volumes and level of service, parking patterns related to transit access, and bicycle and pedestrian facilities. Transportation impacts are assessed for both an opening day scenario (2008) and a twenty-year planning horizon (2025).

3.1 Overall Transit Demand

A relatively high portion of transit trips is represented under each option, reflecting the propensity for transit use in the Project Corridor. The portion of transit trips to total trips in 2008 is forecast to range from 5.5 percent for the No Action/Committed Projects Alternative to between 8.6 and 9.0 percent for the BRT and Rail Alternatives. By 2025 this range is forecast to increase to 9.3 percent for the No Action/Committed Projects, and to 10.1 to 11.4 percent for the BRT and Rail Alternatives.

3.2 Annual Boardings

Annual boardings on regional transit services range about 75 percent to 125 percent higher for the Build alternatives compared to the No Action/Committed Projects Alternative. Table S-4 summarizes these findings for 2008 and 2025.

3.3 Transit Parking

Estimates of daily parking demand in the Project Corridor were prepared using the travel demand model. The daily numbers were factored to account for auto occupancy and peak period activity. The Build alternatives all require more parking supply than the No Action/Committed Projects Alternative, ranging from an additional 30 percent for the BRT-LRT Alternative to an additional 70 percent for the Rail Alternative. In terms of total number of spaces, the Build alternatives require 810 to 1,900 more spaces by the year 2025. Total parking space requirements by 2025 are: 2,810 for the No Action/Committed Projects Alternative, 4,140 for BRT-Bus, 3,620 for the BRT-LRT and 4,710 for the Rail Alternative.

Table S-4
Annual Boardings on Regional Transit Services

Alternative	2008	2025
No Action/Committed Projects	1,510,000	3,830,000
BRT-Bus	4,780,000	8,740,000
BRT-LRT	3,890,000	6,730,000
Rail	3,990,000	6,920,000

Note: Boardings for the No Action/Committed Projects Alternative include some select local routes that serve regional as well as local trips along the corridor.

3.4 Roadway Traffic: Vehicle Miles Traveled (VMT) and Projections

All Build alternatives reflect a reduction in regional VMT of about three to four percent in comparison to the No Action/Committed Projects Alternative. The differences between the Build alternatives are slight, varying less than one percent. The BRT-Bus Alternative demonstrates the lowest overall VMT in 2008 and 2025. All of the alternatives provide an average annual growth rate in VMT of about 2.5 percent. By comparison, LRT projects in major cities typically reduce VMT by less than one percent. Table S-5 summarizes winter daily traffic for 2008 and 2025 for various segments of Highway 82. The analysis of the Build alternatives determined that the differences in future roadway volumes were negligible, and therefore an average volume for the Build alternatives is displayed.

For comparison, annual average daily traffic for 2001 on Highway 82 was 21,469 south of Glenwood Springs, 17,869 southeast of Carbondale, 16,488 southeast of Basalt, 19,238 at the Pitkin County Airport, and 20,164 in Downtown Aspen (AADT, CDOT Traffic Database, 2001). These numbers are an annual average rather than the winter average shown in Table S-5. Winter numbers will be somewhat higher than the annual average.

Table S-5
Winter Average Daily Traffic

Highway 82 Winter Daily Traffic	2008		2025	
	No Action	Build[1]	No Action	Build
South Glenwood Springs	28,300	28,100	39,400	38,500
Southeast of Carbondale	21,400	20,900	29,400	26,800
Southeast of Basalt	20,200	19,600	28,500	25,200
Pitkin County Airport	20,000	19,100	27,700	23,200
Downtown Aspen	23,500	23,600	26,200	26,500

[1] *The distinction between Build alternatives was negligible, less than one percent; therefore, an average is shown.*

3.5 Station and Maintenance Facility Congestion

Traffic operations at intersections near the proposed transit stations have been analyzed to assess the impact on adjacent roadways for 2008 and 2025. Congestion at the following committed or planned park-and-ride and/or station locations will occur for all alternatives, resulting in poor levels of service for opening day (2008): Carbondale at Highway 133 and El Jebel at Willits Lane. By 2025, each alternative will also result in poor levels of service associated with West Glenwood Springs, Downtown Glenwood Springs, and the CMC areas, as well as Carbondale at Highway 133, both El Jebel locations, Brush Creek Road, the Pitkin County Airport, and Buttermilk. These congestion problems would be mitigated by including new traffic signals at unsignalized intersections adjacent to the station locations. The cost of these signals is included in the cost of each station.

4. Cumulative Impacts

- See **Chapter VI: Cumulative Impacts** for detailed discussion.

Cumulative impacts on the environment result from the incremental effect of adding an action to other past, present, and reasonably foreseeable future actions, regardless of responsible agency or persons. For such an impact to be significant, it should affect a resource to a level that could be measured locally or regionally. No regional level cumulative environmental impacts have been identified. Few measurable cumulative local impacts have been identified for the proposed Build alternatives. Traffic congestion, measurable as poor levels of service, has been identified for a number of station and maintenance facility areas; however, these congestion problems are not specific to the Build alternatives and will occur regardless of their implementation. For the Rail Alternative, the potential loss of low income and minority housing in the form of 11 mobile homes, will add the existing local housing shortage.

G. FINANCING AND IMPLEMENTATION

- See **Chapter VIII: Finance** for additional discussion.

1. Capital Costs

Capital cost estimates for the CIS alternatives have been prepared in accordance with the FTA *Guidance for Transit Financial Plans*, and the *Intelligent Transportation Systems (ITS) Joint Program Unit Cost Database*. Cost estimates are considered to be at the conceptual stage in project development, and will be refined as the project moves into preliminary engineering and final design. Table S-6 identifies costs by alternative.

Costs for the new Rio Grande Trail range between $4.5 million and $30 million, depending on the transit alternative selected. If the Rail Alternative is not selected, the trail could initially be constructed for an estimated $4.5 million. This savings results from a reduction in the total typical section required in the RFTA right-of-way and the elimination of safety considerations for a shared right-of-way. If the Rio Grande Trail were to be constructed in this manner, any future use of the RFTA right-of-way for rail would include the cost of relocating the trail.

2. Operations and Maintenance Costs

Transit Operations and Maintenance (O&M) costs for existing RFTA transit serve as the basis for the O&M cost analysis for the No Action/Committed Projects and BRT alternatives. Budgeted O&M expenses for the 2002 fiscal year include $12.45 million in basic O&M expenses and an additional $481,200 in other operating expenses, for a total of $12.93 million.

Future O&M costs take into account existing and forecasted transit ridership and service level goals. This assumption is important because it takes into account providing sufficient transit service to meet the adopted Aspen/ Town of Snowmass Village/Pitkin County policy goal for the Entrance to Aspen of “limiting vehicles in 2015 to levels at or below those of 1994.”

Annual O&M costs (excluding debt service) at the end of year 2008 are forecast to be $17.9 million for the BRT-LRT Alternative, $20.9 million for the BRT-Bus Alternative, $21.7 million for the No Action/Committed Projects Alternative, and $29 million for the Rail Alternative. Table S-6 also summarizes these costs.

3. Revenue Sources

Many revenues sources have been analyzed for this CIS. The source types include:

- Farebox revenues
- Sales and use taxes dedicated to transit
  - Pitkin County transit sales and use tax
  - RFTA sales and use tax
  - Eagle County 0.5 percent transit sales tax

- Pitkin County bond proceeds (includes debt service)
- Service contracts
- Federal grants, especially FTA Section 5309 New Start grants
- State funding
- Potential Local funding
  - Sales-based activities revenues
  - Additional sales and use tax revenues
  - Increased RFTA sales and use tax
  - Real estate development-based revenues
  - Property value based activities
  - Use or service charge-based activities
  - Other local revenues (including vehicle registration fees, highway users fees, airport passenger facility charges)

4. Financial Feasibility of Alternatives

Forecasted cash flow from expenditures and revenues for each alternative are also summarized in Table S-6.

Based upon the assumptions described in this chapter, it is evident that all of the project alternatives, including the No Action/Committed Projects alternative, would have local cost and financing implications. Additional local funding would be necessary under all of the alternatives.

Annual farebox and service contract revenues currently cover approximately 55 percent of RFTA's annual O&M expenses (excluding debt service). The sales and use tax, combined with RFTA farebox and contract service revenue, currently cover operating expenses, as well as debt service for capital expenses.

Each of the CIS alternatives would require increased levels of authorized local funding. Potential additional local funding sources, including enhanced sales and use tax revenues, a visitor use tax, development impact fees, a property tax levy, development contributions, airport passenger facility charges, vehicle registration fee increase, and other sources have been identified and evaluated as part of the CIS financial analysis. These potential local funding sources, if implemented, could generate an additional $14 to $24 million in annual funding to help address the funding shortfall.

The No Action/Committed Projects Alternative is financially feasible. This alternative is expected to be comparable in local costs to the BRT-LRT Alternative. While federal and state funding requirements would be minimal, additional average annual funding levels of $9.4 million over the 2002 to 2025 time frame would be expected to cover anticipated induced operating and capital requirements.

Assuming federal/state/local capital funding allocations of 50/25/25 percent, both of the BRT alternatives are expected to achieve the highest level of financial viability of the Build alternatives.

The BRT-LRT Alternative is expected to require the lowest amount of additional federal, state and local funding resources. This alternative, which assumes a Downvalley regional bus trunk line with a transfer to LRT at the Pitkin County Airport, is expected to require federal and state funding commitments on the order of $62.8 million and $31.4 million, respectively. Additional average annual local funding levels of $9.4 million would be required over the 2002 to 2025 time frame to cover anticipated operating and capital funding requirements. This local funding requirement does not include the cost of building or operating the Entrance to Aspen LRT system.

The BRT-Bus Alternative is expected to require more bus transit operating hours than the BRT-LRT Alternative, since buses would continue beyond the Pitkin County Airport into Aspen. Increased operating hours combined with slightly higher capital costs (attributed primarily to higher station facility and vehicle costs) is expected to result in slightly greater required funding levels for this alternative. Federal and state funding commitments would need to be approximately $66.1 million and $33 million, respectively. Additional average annual local funding levels of $11.8 million would be required over the 2002 to 2025 time frame to cover anticipated operating and capital funding requirements.

The Rail Alternative is considered to have marginal financial feasibility. It is the most expensive alternative, and is estimated to require federal and state funding commitments of approximately $168.3 million and $84.2 million, respectively. Additional average annual local funding levels of $20.2 million would be required over the 2002 to 2025 time frame to cover anticipated operating and capital funding requirements.

Table S-6
Project Alternative Cost Summary

	No Action/ Committed Projects	Trail	BRT/Bus	BRT/LRT	Rail
2008 CAPITAL COST ELEMENTS (in millions)					
ROW & relocations (main line)	--	--	$0.0	$0.0	$14.6
ROW & relocations (stations)	--	--	$1.2	$1.2	$1.2
Civil construction	--	--	$6.9	$6.9	$128.0
Stations/transit centers/ park-and-ride facilities	--	--	$20.7	$16.6	$20.1
Feeder/collector stops	--	--	$0.5	$0.5	$0.5
Vehicles (main line)	--	--	$39.1	$37.0	$124.9
Vehicles (feeder)	--	--	$2.9	$3.5	$3.2
Maintenance facilities	--	--	$19.3	$18.3	$5.6
ITS applications	--	--	$11.6	$11.6	$8.5
Total	--	**$4.5 - $30**	**$102.2**	**$95.6**	**$306.6**
2008 O&M COSTS (in millions)					
Local Service	$5.3	--	$5.3	$5.3	$5.3
New Local Service	$0.0	--	$4.4	$3.6	$9.4
Regional Service	$14.9	--	$9.7	$7.5	$12.8
Other	$1.5	--	$1.5	$1.5	$1.5
Subtotal O&M	**$21.7**	**--**	**$20.9**	**$17.9**	**$29.0**
Capital (debt)	$3.8	--	$6.0	$5.8	$12.9
Total	**$25.5**	**Not applicable**	**$26.9**	**$23.7**	**$41.9**

Table S-6
Project Alternative Cost Summary

	No Action/ Committed Projects	Trail	BRT/Bus	BRT/LRT	Rail
RFTA NET CASH FLOW BALANCE (in millions in constant 2002 dollars)					
2002-2010	$6.4	--	$46.4	$49.6	$64.8
2010-2015	$8.4	--	$24.9	$42.1	$61.8
2015-2020	$19.9	--	$3.9	$8.6	$39.3
2020-2025	$14.4	--	$2.4	$3.1	$0.8
All Years	$15.9	**Not applicable**	$3.3	$7.5	$8.0

5. Implementation

A detailed implementation and financing plan is premature at this stage in the planning process. Once public comment is received on this CIS and the RFTA Board selects a preferred alternative, an implementation and financing plan will be prepared as a part of preliminary engineering. An outline of project activity from CIS to revenue service will be detailed in this later plan.

5.1 Preliminary Engineering and Environmental Review

The project scope and schedule originally anticipated the preparation of an Environmental Impact Statement due to the potential for environmental consequences and mitigation requirements of the Rail Alternative. However, if the BRT Alternative is selected by the environmental consequences may not be significant and a Categorical Exclusion or an Environmental Assessment (EA) and a Finding of No Significant Impacts (FONSI) from FTA or FHWA may be appropriate.

5.2 Secure Local Funding

All of the alternatives require additional local funding. It is anticipated that this local funding will have to be secured prior to the commitment of state and federal resources for final design, right-of-way acquisition, and construction. This would require voter approval in the jurisdictions that comprise RFTA. This election could occur as early as November 2004.

5.3 Secure State Funding

CDOT has ranked the Valley's transit project as one of the top priority strategic, unfunded, projects in the Intermountain Transportation Planning Region (see **Chapter 1: Purpose and Need**) as part of the 2003 Strategic Project Plan. As part of the Strategic Plan, this project would be eligible at some point for S.B. 97-001 funds. Originally not more than ten percent of the S.B. 97-001 funds could be used for transit purposes; however, H.B. 02-1310 was recently passed by the legislature, requiring that at least ten percent be used for transit or transit-related purposes. The amount of funds generated by this ten percent is estimated to be between $20 million and $30 million per year initially. The state is also allowed per TEA-21 to flex federal highway dollars to transit.

5.4 Secure Federal Funding

This project is authorized as a New Start project in the Transportation Equity Act for the 21st Century (TEA-21). Congress has appropriated federal funding for planning, environmental analysis, and preliminary engineering, and to date RFTA has expended both federal and local resources on planning and environmental analysis. RFTA is currently required to secure permission from FTA to enter into preliminary engineering prior to obligating federal funds for preliminary engineering. A Request to Enter Preliminary Engineering will be submitted in 2003. Once environmental clearances have been secured, RFTA will request FTA approval to enter into Final Design. During the Final Design process, RFTA will negotiate a Full Funding Grant Agreement (FFGA). RFTA is working with its partners at the FTA, FHWA, and CDOT to determine the feasibility of streamlining the funding process in the event the BRT Alternative is selected by the RFTA Board.

5.5 Final Design, Right-of-Way Acquisition, Procurement and Construction

Once RFTA has obtained environmental clearances, the agency can commence right-of-way acquisition. Final design will commence upon FTA approval. Procurement of vehicles and other equipment and construction would commence upon a FFGA with the FTA.

5.6 Initiation of Revenue Service

Assuming the completion of construction in 2007, RFTA would initiate revenue service on the selected alternative. The first full year of revenue service is currently anticipated in 2008.

5.7 Possible Future Phases

While it is premature to anticipate the selection of an alternative, if the BRT Alternative is selected RFTA would have the opportunity to anticipate possible future phases to transit service in the Project Corridor.

Depending on the decisions of voters in Pitkin County and Aspen, the BRT Alternative could provide regional bus service into downtown Aspen or connect to the Entrance to Aspen LRT system. If light rail were not in place in the short term, the construction of the rail system from downtown to Brush Creek Road would be a logical next step if, and only if, the citizens of Aspen and Pitkin County decide to take that step. Incremental extension of rail from Brush Creek Road to Basalt, El Jebel, Carbondale, and Glenwood Springs could occur as need, funding availability, and public support warrant.

5.7.1 Trigger points. The decision to move from bus to rail would be made by the voters of the Roaring Fork Valley. This commitment was made when the governments of the Valley approved the Intergovernmental Agreement that led to the Valley-wide vote on the creation of RFTA. Once the voters decide to pursue rail, it will be up to RFTA, local governments, and the State of Colorado to secure the federal funding to implement that decision.

There are differing views on the implementation of rail transit in the Roaring Fork Valley. Proponents of rail want some certainty that BRT is a first phase towards rail. Others are reluctant to commit to a schedule for building a rail system, desiring some certainty that rail would be needed if built. Rather than a schedule, RFTA has developed the concept of "trigger points" – measurable conditions that would trigger consideration of the next phase in transit development. The following are suggested for adoption by the RFTA Board after public comment on the CIS document:

<u>A vote of the people.</u> "The Authority shall not finance rail construction unless and until the electors of the Authority, or of the area of the Authority in which the funding is to be generated, specifically approve such financing." (*Roaring Fork Transportation Authority Intergovernmental Agreement*, September 12, 2000).

Highway capacity. It is reasonable to assume, for reasons of cost and Valley character, that Highway 82 can not be expanded beyond four lanes. As a bus system would be impacted by highway congestion, rail should be considered between points that are connected by a section of Highway 82 that has a volume-to-capacity ratio of 1.0 or higher in the peak hour or peak three hours of the day. The volume-to-capacity ratio is the relationship between the designed capacity of a section of highway in vehicles per hour and the actual traffic volume in vehicles per hour.

Best one-way peak trip time. Best one-way trip times forecast for BRT and rail service do not take into account weather, mechanical breakdown, or accidents. RFTA can gather data related to actual (vs. forecast) trip times that would factor in these considerations, as well as actual rather than predicted levels of traffic congestion. Rail should be considered when the best one-way trip times from each community increase by ten percent over 2003 levels.

I. PURPOSE AND NEED

A. INTRODUCTION

1. What is the CIS and how will it be used by RFTA?

The Corridor Investment Study (CIS) is a long-range planning tool created by the Roaring Fork Transportation Authority (RFTA) in consultation with its member jurisdictions, the Colorado Department of Transportation, (CDOT), the Federal Transit Administration (FTA), and the Federal Highway Administration (FHWA). The CIS is intended to compare long-range transportation alternatives in the RFTA service area through the year 2025 and provide useful information for long-range decision-making. In comparing the alternative futures, simplifying assumptions were made regarding other transportation initiatives in the RFTA service area. These assumptions are the same for all alternatives. Once RFTA selects a preferred alternative for its long-range transit plan, RFTA will work with its member jurisdictions and its partners at CDOT, FTA, and FHWA to develop projects and programs that are consistent with the long-range vision and respectful of the desires of RFTA communities and state and federal policies.

2. How does the CIS relate to the Entrance to Aspen?

The CIS, which commenced in 1998, assumes the findings of the 1998 *State Highway 82 Entrance to Aspen Record of Decision* (*Entrance to Aspen ROD*) for the purpose of comparing long-range alternatives for the future of transit in the RFTA service area. The findings of the *Entrance to Aspen ROD* are applied the same way for all alternatives in this comparative process. The citizens of Aspen and Pitkin County have expressed their desires regarding the Entrance to Aspen in many advisory and binding votes over the years. RFTA recognizes that since the *Entrance to Aspen ROD* was released in 1998, these votes have indicated a preference by the majority of voters to retain the existing alignment of the Highway.

Once RFTA selects a preferred alternative for its long-range transit plan, RFTA will work with member jurisdictions and its partners at CDOT, FTA, and FHWA to develop projects and programs that support the long-range vision of improved transit, and are respectful of the desires of RFTA communities. This will include working with the City of Aspen, Pitkin County, and CDOT to develop projects and programs within the Entrance to Aspen area that are consistent with the stated desires of the community. All references to the *Entrance to Aspen ROD* should be considered in this context.

3. Project Background

The purpose of the *West Glenwood Springs to Aspen – Corridor Investment Study* (CIS) process is to develop a regional transportation solution that addresses the mobility needs and respects the quality-of-life concerns of the citizens residing within the Project Corridor. The Project Corridor is located in the Roaring Fork Valley of Western Colorado between West Glenwood Springs and Aspen. The distance from Glenwood Springs to downtown Aspen along Highway 82 is approximately 66.5 kilometers (41.3 miles) (see Figure I-1).

This CIS was conducted for RFTA. The FTA, FHWA, and CDOT advised RFTA during the CIS process and will act as partners with RFTA as the preferred alternative is implemented. From 1998 to spring of 2003, the CIS was conducted as a National Environmental Policy Act (NEPA) Environmental Impact Statement process. During the analysis of the alternatives it became apparent that an alternative based upon rail technology would not be available to RFTA within the planning horizon of the project due to funding constraints and that an EIS was inappropriate for the remaining alternatives. RFTA determined through discussions with our partners at the FTA, FHWA, and CDOT that the CIS would be released as a local planning document to provide the local community a comparative analysis of bus and rail technologies, as well as a No Action alternative, to confirm local support for the transit project, and to seek input from the public as the project is refined. While not required, this CIS follows the format of a NEPA-type document.

B. NEED FOR TRANSPORTATION IMPROVEMENTS

1. Description of the Project Corridor

1.1 Physical Features

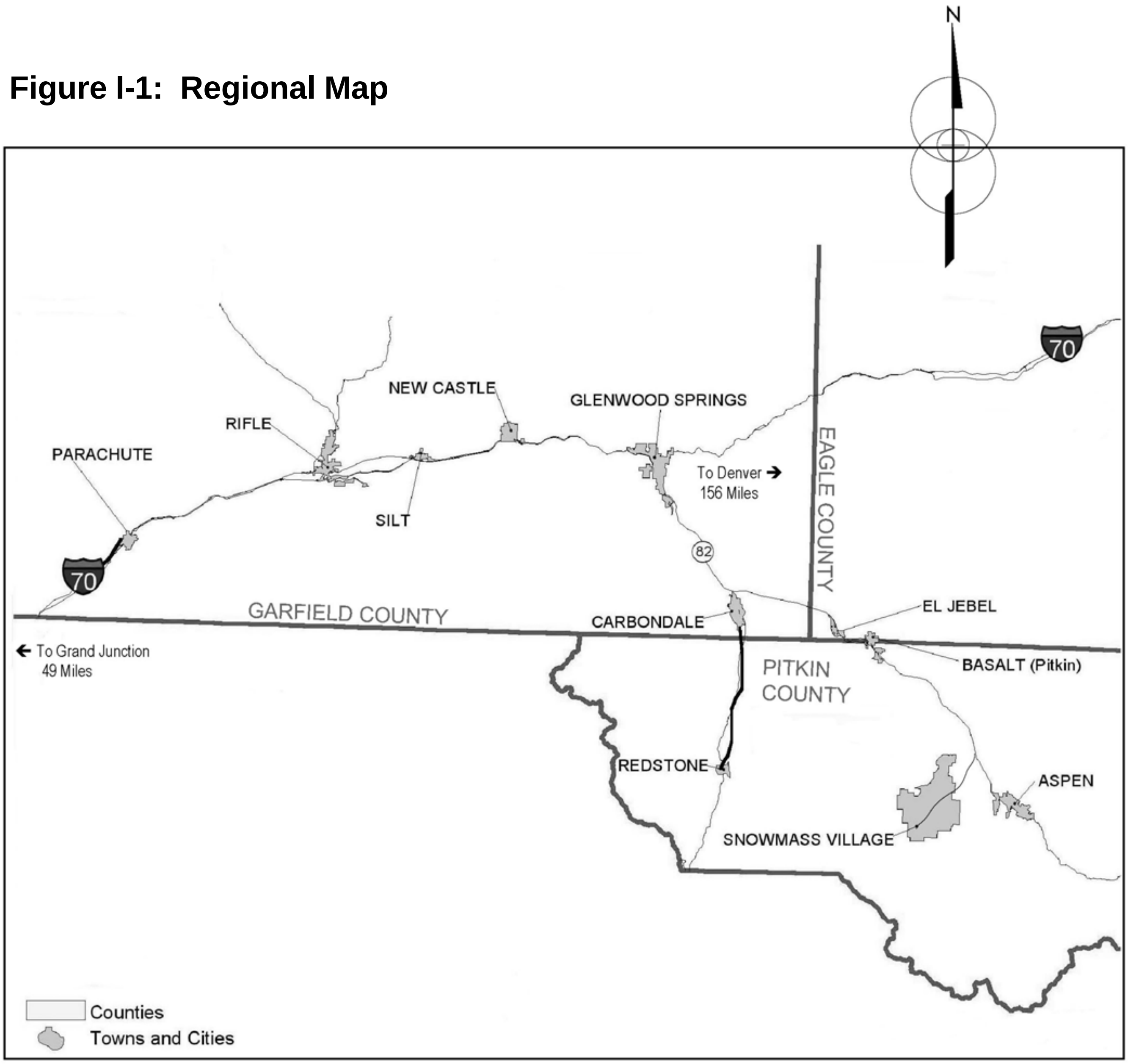
The Project Corridor is located in Western Colorado. A place of unparalleled beauty and recreational opportunity, the region attracts millions of visitors each year. These visitations support tens of thousands of jobs and provide significant tax revenues to local communities and to the State of Colorado. The region includes eight municipalities, three counties, and numerous unincorporated villages.

The Roaring Fork River watershed that defines the corridor encompasses 3,758 square kilometers (1,451 square miles) and has a perimeter of 293 kilometers (182 miles). The headwaters of the River are located in high alpine terrain where elevations can exceed 4,267 meters (14,000 feet). Approximately 80.5 kilometers (50 miles) in length, the Roaring Fork River joins the Colorado River at Glenwood Springs, elevation 1,743 meters (5,720 feet).

Most of the Project Corridor is federal land managed by the US Forest Service and Bureau of Land Management. Federal land comprises 80, 81, and 60 percent of Pitkin, Eagle, and Garfield Counties, respectively. Most private developed or developable land is located in a narrow corridor on the Valley floor adjacent to the Roaring Fork River.

The linear nature of settlement in the Roaring Fork Valley is ideally suited for transit-oriented development. Historically, Valley communities were located to serve the resource-based economy and were in turn served by the Denver & Rio Grande Railroad. The small block sizes, street grids, storefronts, and mix of housing and commercial activity, all within close proximity, are legacies of the Valley's railroad era. This historic integration of land use and transportation gave today's residents the pedestrian-friendly communities they cherish and hope to preserve and enhance.

Figure I-1: Regional Map



1.2 Location of Activities

While the region encompasses a larger area bounded by the cities of Rifle, Eagle, and Aspen that is accessed via Interstate 70 and Highway 82, a majority of the employment and recreational opportunities are within the Project Corridor. The Project Corridor extends from I-70 in Glenwood Springs along Highway 82 to its terminus in downtown Aspen at Hunter Street. The Project Corridor is further defined by the Roaring Fork River and the historic Aspen Branch of the Denver and Rio Grande Western Railroad grade, both of which roughly parallel Highway 82. The railroad originally connected Glenwood Springs with Aspen. The railroad right-of-way between Woody Creek and Aspen is presently owned by Pitkin County and accommodates the existing Rio Grande Trail.

Highway 82 is the state's most congested rural highway, with a summer average daily traffic (ADT) volume of over 28,000 vehicles. Highway congestion within the Project Corridor threatens the economic vitality, environmental health, and character of the larger region.

Employment opportunities are concentrated in Aspen and Glenwood Springs, at either end of the Project Corridor. Almost 80 percent of the population resides in Garfield and Eagle Counties, in the western portion of the Project Corridor. Winter recreation is concentrated in Aspen and Snowmass Village, while summer recreation opportunities are dispersed throughout the Project Corridor.

The Project Corridor provides access to significant federal and state holdings, including the White River National Forest, the Maroon Bells/Snowmass, Hunter/Frying Pan and Holy Cross Wilderness areas, numerous Bureau of Land Management parcels, the Christine State Wildlife Area, three Colorado Wildlife Management Units, and the Roaring Fork and Frying Pan Rivers (both Colorado Gold Medal fisheries).

See **Chapter III, Affected Environment**, for a more thorough discussion of demographics and the recreational activities that make the Project Corridor an international destination.

1.3 Travel Patterns

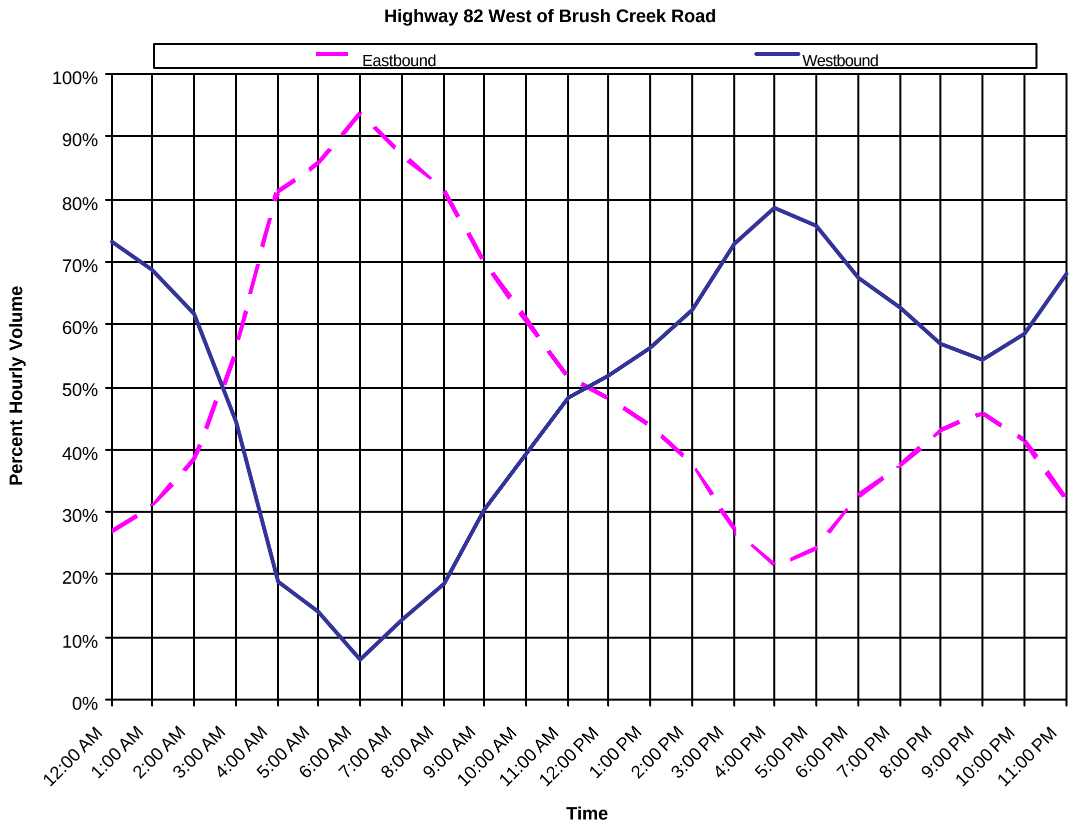
The location of activity centers at either end of a narrow corridor with only one through route results in a commute pattern similar to highway corridors between the suburbs and the central city in many metropolitan areas. Commuter traffic flows eastbound on Highway 82 in the morning and westbound on Highway 82 in the evening (See Figure I-2). Because so many workers live west of Glenwood Springs in the communities of New Castle, Silt, and Rifle, there is a constant flow of traffic between the I-70 corridor and Highway 82, adding substantially to congestion at peak hours.

As many winter visitors fly to the Project Corridor, most winter tourist traffic occurs between the Pitkin County Airport, Aspen and Snowmass Village. Summer tourist traffic is dispersed throughout the Project Corridor, with many tourists driving to the Project Corridor from points east and west.

1.4 Growth and Development Trends

The economy of the Roaring Fork Valley is based upon tourism, recreation, land development, and related commerce. This activity supports tens of thousands of jobs and provides significant tax revenues to local communities and to the State of Colorado. Access to tourist venues for visitors, employees, and suppliers is critical to sustaining and enhancing economic conditions.

Figure I-2
Direction Distribution, Highway 82 at Brush Creek Road
(Average Winter Day 2002)



Currently, there are approximately 37,000 jobs in the Project Corridor during the summer months and 38,000 jobs during the winter months. Forty-three percent of the summer jobs are in Garfield County, 14 percent are in Eagle County, and the remaining 43 percent are in Pitkin County. In the winter the employment distribution is 37 percent, 14 percent, and 49 percent in Garfield, Eagle, and Pitkin Counties, respectively. Approximately 50 percent of the jobs in the Project Corridor are in the service industry. Employment in the Project Corridor is anticipated to grow at a compound annual rate of 2.4 percent at least through the year 2025. Additional information on employment is available in **Chapter III.B.3: Employment**.

The year-round population of the Project Corridor exceeds 65,000 persons. An additional 4,600 part-time residents (second homeowners) and 21,000 visitors are found in the Project Corridor on a typical summer day, and 5,500 part-time residents and 13,000 visitors on a typical winter day. 53 percent of the resident population resides in Garfield County, at the northwest end of the Project Corridor, 24 percent reside in Eagle County in the central portion, and the remaining 23 percent reside in Pitkin County at the southeast end of the Project Corridor. Current annual population growth is forecast to be 2.3 percent, 2.7 percent, and 1.8 percent in Garfield, Eagle, and Pitkin Counties, respectively. **Chapter III.A.1: Population** includes additional population information.

The preponderance of service employment, coupled with high housing costs in Pitkin County and to an increasing degree throughout the Project Corridor, result in a large commuter population. Some workers commute to Aspen from as far away as Rifle and Silt. Median single-family home prices in the Project Corridor range from $208,000 in Glenwood Springs up to more than $2 million in Aspen, only 66.5 kilometers (41.3 miles) southeast. Despite the efforts of Roaring Fork Valley communities to develop affordable housing, the trend points to a continuation of an imbalance between jobs and affordable housing in the Project Corridor, particularly in Pitkin County. Commuters will increasingly rely on Highway 82 for access to employment. See **Chapter III.A: Social Environment**, for additional discussion on demographics.

2. Transportation Facilities and Services in the Corridor

Transportation systems are no longer considered to include only roadways. Within the Project Corridor there are roadways, transit systems, rail systems, airports, and trails (see Figure I-3).

2.1 Roadway Links

Highway 82 runs the length of the Roaring Fork Valley, connecting Glenwood Springs to Snowmass Village and Aspen and, seasonally, to U.S. Highway 24 and the Arkansas River Valley. It is the only through highway in the Project Corridor, carrying most of the highway and transit traffic, and providing access to all of the local communities.

The primary interstate access to the Roaring Fork Valley is Interstate 70, via an interchange at the northwestern terminus of Highway 82 at downtown Glenwood Springs. Interstate 70 runs east and west through Colorado, passing through cities such as Denver, Vail, and Grand Junction. Persons with jobs in the Roaring Fork Valley who live in or near the Colorado River Valley towns of Eagle, Gypsum, Rifle, Parachute, Silt, or New Castle use Interstate 70 to access the Project Corridor. Annual average daily traffic (AADT) for Interstate 70 at the West Glenwood interchange was 19,733 in 2001, and the AADT for Interstate 70 at the Highway 82 interchange in downtown Glenwood Springs was 16,287.

Highway 82 connects to Highway 133 at Carbondale. This route accesses the southern part of the state, including Delta and Montrose. It also provides a connection to McClure Pass. In 2001, AADT on Highway 133 just south of Highway 82 was 16,720.

The southeastern end of Highway 82 travels over Independence Pass. Due to heavy snow accumulation, Independence Pass is closed, on average, seven months of the year. During these months, Aspen becomes the terminus to Highway 82. When the pass is open, Highway 82 connects to Highway 24, which accesses Leadville and Buena Vista. During the summer months Independence Pass does not serve as a major access route for the Roaring Fork Valley because of its steep, narrow roadway and curved alignment. The AADT between Aspen and Balltown on U.S. Highway 24 is 1,470.

2.2 Transit Service

One tool the region uses in its struggles with increasing congestion and traffic is the transit service historically provided by RFTA. Established in 1983, RFTA is the second-largest bus transit system in Colorado; only the Regional Transit District (RTD) in Denver is larger (see Figure I-4).

Figure I-3: Project Corridor

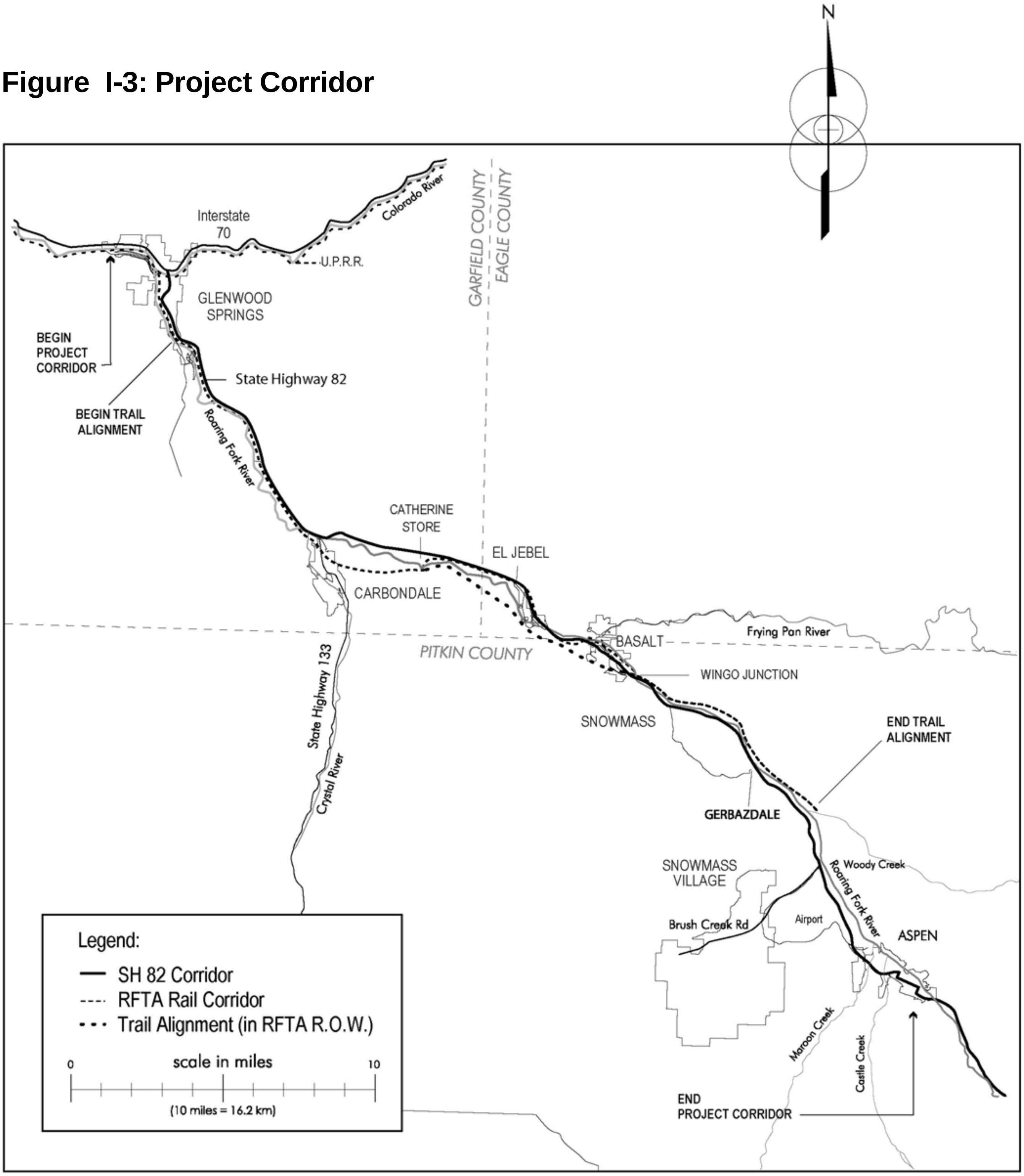


Figure I-4 Passengers line up to board RFTA buses

The RFTA service area extends along the I-70 transportation corridor from Glenwood Springs west through New Castle and Silt to Rifle, as well as throughout the Roaring Fork Valley along Highway 82 between Glenwood Springs and Aspen/Snowmass Village. The agency operates up to 60 buses per hour on seven bus routes during peak periods, with approximately 900 buses entering and leaving Aspen on a typical winter day (City of Aspen, 1999). These routes include regional service to Basalt, Carbondale, and Glenwood Springs, Rifle to Glenwood Springs service, Aspen to Snowmass service, Highlands Ski Area service, Maroon/Castle Creek service, Cemetery Lane service, and Buttermilk Ski Area service.

RFTA operates the local Ride Glenwood Springs and City of Aspen service under contract with the respective cities. The Town of Snowmass Village operates its own local shuttle service. RFTA and Snowmass Village ridership totals in 2001 were 3,567,921 and 652,806, respectively, for a total of 4,220,727. (The ridership forecasts shown in Tables S-4 and IV-8 for the Build alternatives is for regional routes only and does not include local service to Aspen, Snowmass Village, and Glenwood Springs, or skier service noted above.)

In the year 2000, voters in Aspen, Snowmass Village, Pitkin County, Basalt, Eagle County, Carbondale and Glenwood Springs approved formation of and funding for a Rural Transportation Authority (RTA) in the project corridor. The RTA was named the Roaring Fork Transportation Authority (RFTA) and provision was made to transfer the responsibilities of the existing Roaring

Fork Transit Agency to the new RFTA. Under state law a multi-jurisdictional RTA has the ability to ask voters within the RTA for a tax base of up to 1.0 percent. Current RTA tax rates in the RFTA district vary from 0 to 0.5 percent.

The RFTA system has a very high level of annual ridership, which increases during peak tourist seasons. RFTA carries almost four million bus riders a year, including almost two million on routes west of Brush Creek Road. RFTA bus ridership on these routes grew by 124 percent between 1991 and 1996. Ridership on RFTA's skier shuttles increased 23 percent within the same time period to 964,000 passengers.

2.3 Rail Links

An Amtrak Station is located off 7th Street in Glenwood Springs. Two California Zephyr trains stop in Glenwood Springs daily. These trains run between Chicago, Illinois and Oakland, California, with stops in Illinois, Iowa, Nebraska, Colorado, Utah, Nevada, and California. Experienced rail travelers regard this as the most beautiful route in all of North America. The train travels through narrow canyons and towering peaks of the Rockies, follows the Colorado River through a mountain wilderness, and climbs over Donner Pass.

2.4 Air Travel

The Pitkin County Airport (Sardy Field) is located in the Roaring Fork Valley, approximately 7.2 kilometers (4.5 miles) northwest of downtown Aspen. Three commercial airlines service the Pitkin County (Aspen) Airport: United Express (Air Wisconsin), America West (Mesa), and Northwest Airlines. In 2001 there were 187,622 enplanements and 186,774 deplanements. United Express serviced approximately 85 percent of the total enplanements/deplanements.

Pitkin County Airport averages 125 take-offs and landings per day. Fifty-seven percent of these flights are transient general aviation, 24 percent commercial, ten percent air taxi, and nine percent general aviation.

The Glenwood Springs Municipal Airport is located on Airport Road, between County Road 113 and County Road 116, just south of Glenwood Springs. The airport currently has no scheduled commercial flights arriving or departing. Private airplane owners are the primary users, though some charter service is available and corporate jets occasionally use the facility.

Glenwood Springs Municipal Airport averages 38 take-offs and landings per day. Seventy-nine percent of these flights are local general aviation, 14 percent transient general aviation, and six percent air taxi.

2.5 Trail Systems and Pedestrian/Bicycle Routes

One of the main attractions of the Roaring Fork Valley is the beautiful mountain scenery and natural setting. Many people access these attractions by using the existing trail system to walk, jog, bike, rollerblade, cross-country ski, or engage in other recreational activities. Numerous trails are currently scattered throughout the Valley. Sixteen trails intersect the Project Corridor.

At the northwestern end of the Project Corridor is the 23.3 kilometer (14.5 mile) Glenwood Canyon Trail. This trail runs on the south side of Interstate 70 along the Colorado River, crossing over to the north side of Interstate 70 just before it enters Glenwood Springs. The concrete-surfaced trail is approximately 2.4 meters (eight feet) wide. Connected to this trail via 6th Street and the Interstate 70 interchange, the Glenwood Springs River Trail follows the former Denver and Rio Grande Western (D&RGW), now RFTA, right-of-way, 2.4 kilometers (1.5 miles) south to 23rd Street.

At the southeast end of the Project Corridor near Aspen, the existing Rio Grande Trail extends 11.8 kilometers (7.3 miles) from Woody Creek to Rio Grande Park in downtown Aspen along a portion of the old D&RGW right-of-way that was purchased by Pitkin County. This trail is approximately 2.4 meters (eight feet) wide and asphalt paved.

Implementation of a continuous regional recreation trail is needed to connect these trail systems currently located at opposite ends of the Project Corridor.

2.6 Committed Transportation Projects

Completion of the Highway 82 improvements called for in the *State Highway 82 East of Basalt to Buttermilk Record of Decision (Basalt to Buttermilk ROD)* (CDOT, 1993) will include HOV lanes between Basalt and Buttermilk for use in the primary direction of traffic flow during the peak hours. These lanes will enhance the efficiency of RFTA service and provide the platform for the Bus Rapid Transit (BRT) alternatives being evaluated in the current CIS. This construction project should be complete by 2005. This highway improvement will not meet future travel demand as early as 2009. For additional discussion, see Section 4.1.1 below.

The Selected Alternative in the *Entrance to Aspen ROD* includes a two-lane parkway between the Buttermilk Ski Area and 7th and Main in Aspen and a light rail transit (LRT) system from the Pitkin County Airport to Rubey Park in downtown Aspen. The City of Aspen, Pitkin County, and the Town of Snowmass Village have passed a resolution recommending the extension of the system to Brush Creek Road. The proposed LRT system provides access to destinations including the Town of Snowmass Village, Pitkin County Airport, Buttermilk Ski Area, Maroon Creek/Castle Creek Roads, and downtown Aspen. In the absence of voter approval of local funding for LRT, the *Entrance to Aspen ROD* provides for an interim two-lane busway along Highway 82 from Buttermilk to 7th and Main in Aspen.

The Entrance to Aspen Selected Alternative is designed to provide needed transportation capacity for the forecasted person trips in the year 2015, while meeting the policy goal of Aspen, Pitkin County, and the Town of Snowmass Village to maintain 1993 traffic volumes on Highway 82 at the Castle Creek Bridge in Aspen. To meet this goal, the City of Aspen has adopted an incremental Transportation Management (TM) program designed to provide appropriate disincentives to automobile use and incentives for transit use. The LRT system is expected to support this goal by carrying 24,800 transit riders per peak winter day by the year 2015. While the highway element of the Entrance to Aspen is not currently funded for construction, the project is the top regional priority of the CDOT Strategic Corridor Program.

2.7 Levels of Service

2.7.1 General Description. Traffic operations are affected by roadway type, number of vehicles, ability to pass slow-moving vehicles, percentage of trucks, vehicle speed, terrain type, and weather. Traffic operations vary by location, season, time of day, and travel direction. The *Highway Capacity Manual* (Transportation Research Board, 1998) expresses highway traffic congestion in terms of Level of Service (LOS), a letter code ranging from A to F. Each letter represents progressively worse traffic conditions. Completely free-flowing conditions with no restrictions caused by traffic conditions are described as LOS A, excellent; and a breakdown or forced flow of traffic is represented by LOS F, unsatisfactory. Descriptions of LOS values are found in Figure IV-4 in **Chapter IV: Transportation Impacts**.

Within the Project Corridor, Highway 82 operates at LOS C or worse during peak summer and winter seasons for much of the day. Segments in Glenwood Springs and Upvalley from Basalt operate at LOS E or worse during the peak hour. The maximum capacities for several sections of Highway 82 are shown in Table I-1 and are compared with design hour volumes (30th highest peak hour traffic count) used by CDOT for highway design purposes.

Existing average winter peak hour volumes are typically slightly lower than summer volumes but can result in poorer levels of service due to frequent snowstorms. During the winter, poor weather, accidents, and darkness often lead to stop-and-go traffic on the more congested portions of Highway 82.

Table I-1
Highway 82, Existing Levels of Service
2001 Design Hour Volumes

Location	Design Hour Volume	Percent No-Passing Zones	Truck Percentage	Maximum Capacity [1]	Level of Service
10th Street in Glenwood Springs	3,294	0%	2.84%	2,280	F
Highway 133 intersection	1,820	0%	2.98%	2,280	C/D
El Jebel Road	2,083	0%	2.04%	2,530	C/D
Basalt	1,798	0%	2.30%	2,530	C
Snowmass Canyon	2,018	65%	2.39%	1,600	F
Pitkin County Airport	1,923	65%	2.24%	2,420	E
Cemetery Lane in Aspen	2,633	65%	1.76%	2,420	F

[1] Maximum capacity is the hourly flow rate under ideal conditions of LOS E. The definition of capacity assumes good weather and pavement conditions exist. At capacity, no more vehicles can reasonably be expected to traverse a section of roadway during the given time under prevailing roadway, traffic, and control conditions.

2.7.2 Existing Congested Highway Facilities. The congested four-mile segment of Highway 82 between Pitkin County Airport and 7th and Main Street in Aspen, known as the Entrance to Aspen, is a major traffic bottleneck (see Figure 1-5). 2001 average annual daily traffic between the Pitkin County Airport and downtown Aspen ranged between 19,000 and 20,000 vehicles per day. (AADT, CDOT Database, 2001). CDOT released the *Entrance to Aspen ROD* in August 1998, identifying a combined new two-lane parkway, light rail or busway transit platform, and TM program as the solution to congestion and safety problems for this segment of the highway.

At the northwestern end of the Project Corridor, Grand Avenue, as Highway 82 is called through downtown Glenwood Springs, is another major area of congestion (see Figure I-6). The annual average daily traffic volume (AADT) on Grand Avenue just east of Interstate 70 exceeds 30,000 vehicles. Traffic in 2001 just south of Glenwood Springs was 21,469 vehicles per day (AADT, CDOT Database, 2001). The citizens of Glenwood Springs have implemented TM techniques and are currently studying an alternative highway route to remove through traffic from the downtown area.

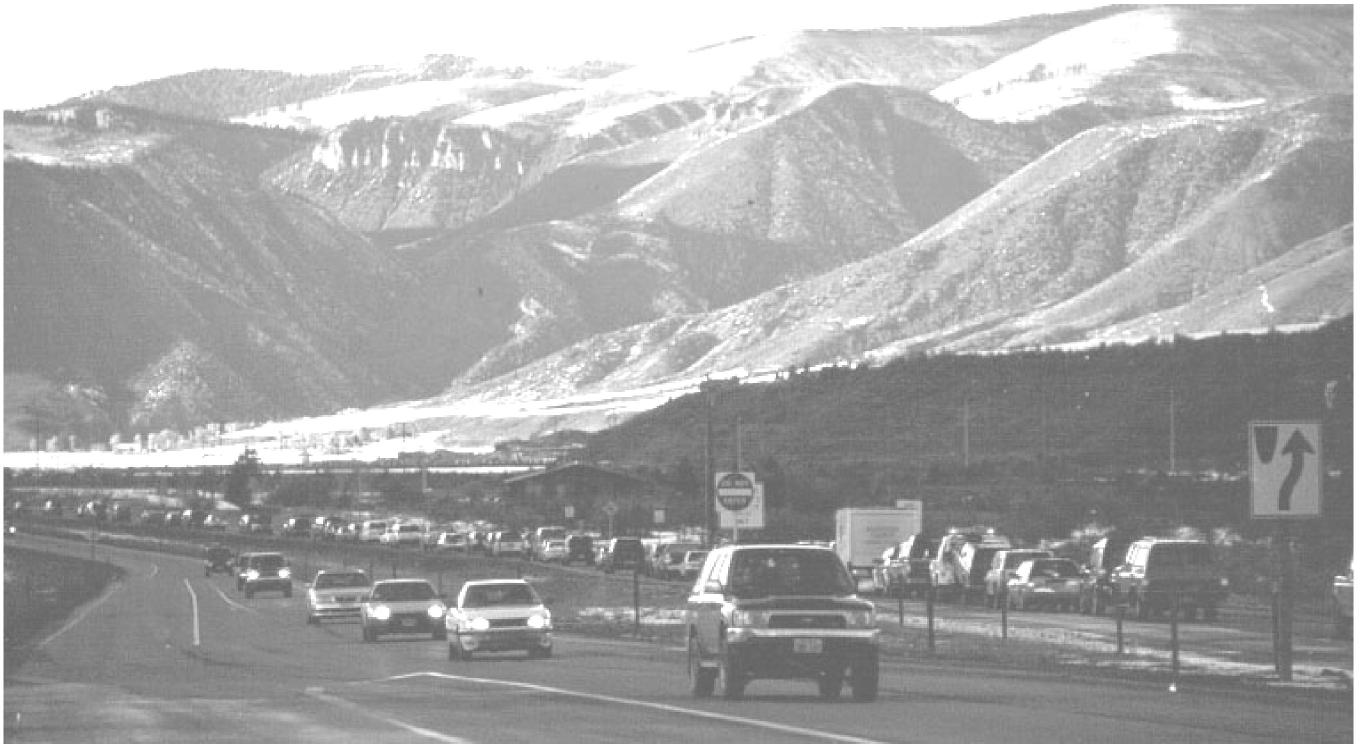


Figure I-5
Traffic along Highway 82 from Aspen Airport Business Center into downtown Aspen

Figure I-6
Rush hour traffic in downtown Glenwood Springs, looking south

Other communities in the Project Corridor are also experiencing increased congestion, with even more traffic forecast for the future (see Figure I-7). Recent planning by Eagle County for its Mt. Sopris Tree Farm Community Center and Recreation Area in El Jebel indicated a need for as many as ten traffic lanes on Highway 82 in some areas of the mid-valley to mitigate anticipated traffic congestion tied to new development. Current traffic south of Carbondale is 17,869 and south of Basalt was recorded at 19,238 (AADT, CDOT Database, 2001).

2.7.3 Highway Congestion Will Slow Transit Service. The results of a 2000 RFTA survey showed 64 percent of passengers had a car available for their trip but instead chose the bus.

While the increase in all ridership is forecast to continue, congestion on Highway 82 may begin to limit this growth since the buses share the congested lanes between Glenwood Springs and Aspen. When combined with accidents and frequent winter storms that interrupt service, reliability and convenience are expected to deteriorate. Routes impacted by Highway 82 congestion include those connecting Aspen with Snowmass Village, Basalt, El Jebel, Carbondale, and Glenwood Springs

3. Goals and Objectives

This section includes a description of transportation agencies, and associated projects and plans, together with project goals and objectives. The process that has supported the development of this project includes a complex chronology of events. These events and or associated documents are listed in further detail in two locations in this CIS. A separate chapter, Chapter X: Availability of Technical Reports, includes a listing and location of the technical documents specifically associated with the creation of CIS.

3.1 Project Corridor Transportation Agencies and Plans

3.1.1 Roaring Fork Railroad Holding Authority. In September of 1991, the eight local governmental entities resolved to purchase the portion of the Aspen Branch of the Denver and Rio Grande Western Railroad that remained between Glenwood Springs and Woody Creek Junction (outside of Aspen) from the Southern Pacific Transportation Company to preserve the corridor as a public asset. In December of 1994, these local governments signed an Intergovernmental Agreement to purchase the property. The urgency of the purchase was realized when the merger of the Southern Pacific and Union Pacific railroads was announced. With the dissolution of Southern Pacific, Union Pacific could have abandoned the rail corridor and the land might have reverted to residential and commercial development. The result would have been the loss of the corridor and any opportunity to preserve it for recreation and transportation use.

On June 30, 1997, the D&RGW Railroad right-of-way corridor was purchased for $8.5 million. The Roaring Fork Railroad Holding Authority (RFRHA) was established to purchase and manage the corridor. After the Roaring Fork Transportation Authority was formed on September 12, 2000, it merged with and absorbed the responsibilities of RFRHA. References in the current document to the RFTA right-of-way refer to the RFRHA right-of-way that was acquired as noted above.

The purchase of this right-of-way has presented an opportunity to explore transportation and recreation solutions to Highway 82 congestion and trail connectivity challenges in the Roaring Fork

Figure I-7
Traffic on Highway 133 at Carbondale waits to enter Highway 82

Valley. As a part of the agreement to purchase the right-of-way in 1997, it was required that a comprehensive plan be prepared that would determine the future uses of the corridor. *A Comprehensive Plan for the Aspen Branch of the Denver and Rio Grande Western Railroad Corridor*, was submitted to the RFRHA Board and accepted on November 3, 1999. The plan included the following specific elements:

- Location of a permanent, continuous public recreation trail running along the entire length of the RFRHA right-of-way. This proposed trail will be called the Rio Grande Trail.
- Description of structure and facilities necessary to place and operate a rail transportation system utilizing the RFRHA right-of-way.

It was recognized early in the process that another type of public transportation system might be substituted for, or phased in prior to, a rail transportation system if such a system worked better for the Roaring Fork Valley. A Corridor Investment Study (CIS) would be needed to determine the best public transportation solution for the Roaring Fork Valley.

3.1.2 Roaring Fork Transportation Authority

3.1.2.1 Roaring Fork Transportation Authority Intergovernmental Agreement. This agreement, dated September 12, 2000, provided for the creation of RFTA as a Rural Transportation Authority pursuant to the Colorado Rural Transportation Authority Law (Title 43, Article 4, Part 6, Colorado Revised Statutes, as amended). The parties to the Intergovernmental Agreement (IGA) submitted ballot questions on the formation and funding of RFTA to their voters at the November 7, 2000 election. The measures passed in all seven jurisdictions.

The IGA identifies specific responsibilities of RFTA, including providing for regional transit services, regional transportation planning, maintenance of the Denver & Rio Grande right-of-way, and construction and maintenance of trails.

The IGA establishes baseline funding for RFTA, consisting of sales and use tax revenues from Glenwood Springs, Carbondale, Basalt, Eagle County, and Pitkin County. The IGA grants RFTA the authority, within the limits of the RTA law and subject to voter approval, to raise additional sales and visitor benefit taxes and to issue bonds for capital projects. RFTA is also tasked with pursuing federal, state, and other sources of grant funding.

Section 8.03 of the IGA transfers responsibility for completing the CIS from RFRHA to RFTA. Section 6.03 of the IGA states that "the Authority shall not finance rail construction unless and until the electors of the Authority, or of the area of the Authority in which the funding is to be generated, specifically approve such financing."

3.1.2.2 Resolution No. 2002-05 Adopting a Long-Term Transit Development Strategy. This resolution, adopted by the RFTA Board of Directors on February 14, 2002, outlines the long-term transit development strategy for the agency. RFTA has adopted Bus Rapid Transit (BRT) as a near-term goal and a rail system with a feeder bus system as the long-term transit investment strategy for the Roaring Fork Valley. RFTA's resolution directs staff to complete the CIS, to address the phasing of transit improvements, and to develop information upon which to develop decisions to implement future phases of transit improvements. The RFTA Board indicated it would revisit the issue and select an alternative to advance to preliminary engineering after receiving public comment on the CIS.

3.1.3 Colorado Department of Transportation

3.1.3.1 Regional Transportation Plan/State Transportation Improvement Plan (Roaring Fork Valley CIS, Project No. 0821-049, STIP No. IN5 493 and LO1). Regional Transportation Plans in Colorado establish the transportation priorities for each Transportation Planning Region (TPR) based on a region's vision, values, goals, and strategies. These plans, updated every six years, identify those projects necessary to maintain regional mobility over the next 20 years by identifying issues, compiling pertinent information, examining alternatives, and selecting a desired course of action based upon the region's vision, values, goals, and strategies.

The Roaring Fork Valley is located in the Intermountain Transportation Planning Region (ITPR), which consists of Garfield, Eagle, Pitkin, Lake, and Summit Counties. The West Glenwood Springs to Aspen project is recognized as a priority project necessary to maintain future mobility in the region.

Regional Transportation Plans are also used in the development of statewide transportation plans. The West Glenwood Springs to Aspen Project is included in the 2020 Statewide Transportation Plan adopted by the State Highway Commission on November 16, 2000. More recently, the ITPR has ranked the West Glenwood Springs to Aspen Project as its top priority project in the ongoing CDOT 2003 Strategic Corridor Program.

3.1.3.2 State Highway 82 Entrance to Aspen Project (Project No. NH 0821-055, STIP No. 4021). The Selected Alternative described in 1998 in the *Entrance to Aspen ROD* for this project is a combination of highway improvements, transit improvements, and a TM program. The highway element consists of a two-lane divided highway that generally follows the existing alignment from Buttermilk Ski Area to 7th and Main Street in Aspen, except across the Marolt-Thomas property. The major highway improvements and modifications include a new Maroon Creek Bridge north of the existing bridge, realignment of the highway across the Marolt-Thomas property using a cut-and cover-tunnel, and a roundabout at Maroon Creek Road.

The ETA Preferred Alternative provides an LRT system from the Aspen Maintenance Facility near the Pitkin County Airport to Rubey Park in downtown Aspen. The LRT alignment is generally parallel to and south of the highway alignment. In the event that Aspen and Pitkin County voters do not approve funding for the LRT system, the Record of Decision provides for an interim busway parallel to the highway alignment from Buttermilk to 7th and Main Street.

As a part of the Record of Decision, the City of Aspen has agreed to undertake an incremental TM program designed to maintain traffic levels entering Aspen at 1994 levels.[1] The program includes progressively more aggressive disincentives to automobile use and incentives for transit use in response to measured traffic levels. The program continues to be successful to date.

The roundabout portion of the highway element was constructed in 1999 and 2000 with CDOT, Pitkin County, and Aspen resources. A portion of the highway between Buttermilk and the Maroon Creek Bridge, including the relocation of Owl Creek Road and a new traffic signal at Buttermilk, was constructed with CDOT funds in 2001 as an addition to a construction contract related to the East of Basalt to Buttermilk project. A portion of the highway between the Maroon Creek Bridge and the roundabout was constructed in 2001 by the City of Aspen as a part of its renovation and expansion of the Aspen Golf Course and Truscott Affordable Housing complex.

The remaining highway elements are an unfunded project in the CDOT "7th Pot" Strategic Investment Program and the top priority project for funding in the Intermountain Transportation Planning Region for the CDOT 2003 Strategic Corridor Program funding. The transit element of the project remains unfunded, although Pitkin County continues to reserve revenues from its 0.5 percent transit sales tax for expenditure on future transit capital improvements. The current CIS assumes that the Entrance to Aspen project is constructed as a part of the No Action/Committed Projects Alternative. (Please see sections **I.A.2** for more information on this assumption.) Bus passengers in the BRT Alternative would transfer to LRT at Buttermilk or use the interim busway to directly access downtown Aspen. Rail passengers in the Rail alternative would use the LRT trackway to directly access downtown Aspen.

3.1.3.3 State Highway 82 East of Basalt to Buttermilk Ski Area Project (Project No. STR 0821-029, STIP No. 4021). In October 1993 CDOT, in conjunction with the FHWA, released the *State Highway 82 East of Basalt to Buttermilk Ski Area Final Environmental Impact Statement (Basalt to Buttermilk FEIS)*. The Record of Decision for this project was released in December 1993. The Selected Alternative includes widening Highway 82 from two to four lanes from just east of Basalt to

[1] All references in this document will be to 1994 levels. The *Entrance to Aspen ROD* (CDOT, 1998) makes this statement regarding the objective: "This objective sets the goal of limiting year 2015 traffic volumes to levels at or below those in 1994. However, throughout this document the traffic volumes are referred to as levels at or below those in 1993. Levels are set at 1993 because the traffic model for the Entrance to Aspen EIS was based on 1993 volumes. The difference between 1993 and 1994 volumes is minimal."

the Buttermilk Ski Area, with two of the four lanes between Basalt and the Buttermilk Ski Area operating as bus/high occupancy vehicle (HOV) lanes during peak travel periods. Other improvements include a bicycle/pedestrian/recreational trail that parallels the Highway 82 corridor, park-and-ride lots, provision for a future fixed guideway transit envelope along the corridor, and other transportation commitments.

Most of the East of Basalt to Buttermilk Ski Area project has been constructed. The remaining project, the widening of Highway 82 through Snowmass Canyon, is under construction. Project completion is anticipated in 2004-2005.

This CIS assumes that the East of Basalt to Buttermilk Ski Area project is constructed as a part of the No Action/Committed Projects Alternative. Bus passengers in the BRT Alternative would use the HOV lanes from Basalt to Buttermilk. Rail passengers in the Rail Alternative would use the fixed guideway transit envelope provided by the project for travel between Gerbazdale and Pitkin County Airport.

3.1.4 Local Plans. The communities along the project corridor have adopted land use and transportation plans that specifically reference and/or impact the CIS. Many of these plans incorporate transit-supportive land use regulations or guidelines. Adopted plans include:

- *2000 Aspen Area Community Plan Update* (City of Aspen and Pitkin County, 2000)
- *Brush Creek Valley Corridor Transportation Study* (Otak, et al, 2000)
- *Pitkin County Trails Plan* (Pitkin County, 1991)
- *Pitkin County Down Valley Plan* (Pitkin County, 1987)
- *Town of Basalt Master Plan* (TJ Malloy Consulting, Otak, and Town of Basalt, 2000)
- *Model Transit Oriented Development Program* (Charlier Associates, 1998)
- *Eagle County Open Space Plan* (Eagle County, 1979)
- *Mid Valley Community Master Plan* (Design Workshop, 1991)
- *Eagle County Master Plan* (Alan Richman Planning Services, 1996)
- *Town of Carbondale Comprehensive Plan* (Otak, 1999)
- *City of Glenwood Springs Long Range Transportation Plan* (City of Glenwood Springs, 1999)
- *Glenwood Springs Downtown Plan, White Paper on Transportation Issues and Alternatives* (Charlier Associates, et al, 1998)
- *Garfield County Zoning Resolution – Transit PUD Regulations* (Garfield County, 2002)

3.2 Local Goals and Objectives

The primary purpose of the CIS process is to develop solutions that will improve transportation and safety along the project corridor while avoiding or minimizing adverse environmental effects. The project objectives are based on the needs, values, and goals of the local communities. The objectives were developed through Citizen Task Force (CTF) meetings and public scoping meetings with input and review from elected officials, affected agencies, and staff of area governments. **Chapter IX: Public Involvement** summarizes this process.

The nine project objectives described below are the foundation of the alternatives screening and development process, which resulted in the alternatives evaluated in this CIS. These objectives address the purpose and need for this project and support the development of an improved and safe transportation and recreation system while avoiding or minimizing adverse environmental impacts. These objectives are not prioritized and are listed in alphabetical order:

3.2.1 Affordability and Economic Viability. Develop a system that is financially realistic in construction, operation, and maintenance costs with respect to current and expected funding levels and programs. Public officials have a responsibility to ensure that public funds are spent efficiently and prudently. There are always more needs than available funds. At the same time, RFTA has exhausted its ability to continue growing the existing transit system without substantial new investment. The cost of maintaining, operating, and using the system must also be considered. Citizens in the Project Corridor desire to identify the point at which an investment in a separate transit corridor was economically viable.

3.2.2 Community-based Planning. Provide a system that fits the character of the Roaring Fork and Colorado River Valley communities and is responsive to local community-based planning efforts, including directing growth to appropriate locations. Local governments have done extensive work in preparing plans for the future of their communities and jurisdictions, including transit orientation. It is important and necessary to consider these plans and the input of the community to create a project that optimizes the linkages between land use and transit improvements, a project the community can be proud of, and one that is consistent with community-based, long-range planning goals. The system needs to honor the aesthetics and community character of the Project Corridor and individual communities.

3.2.3 Environmental Soundness. Develop a system that avoids, minimizes, and mitigates adverse environmental, social, and economic impacts. The environment of the Project Corridor is highly regarded for its beauty and uniqueness. The essence and primary economic functions of the region depend upon retaining these qualities. The system must be environmentally sound to be effective in providing service to the communities of the Project Corridor.

3.2.4 Flexibility. Provide a system that is flexible in operation and in future transportation options and upgrades. With new technologies arising, planning for transportation systems can no longer concentrate only on roadways. The transportation system must integrate autos, transit, non-motorized, disabled, and pedestrian needs. The transportation system must remain flexible for new and upcoming technologies. The system must be compatible with other systems, present and future, that may exist in the Project Corridor.

3.2.5 Increased Transportation Choices. Provide a multimodal system, with various mode options, that meets the demand of the forecasted person trips. Many types of users (residents, employees, visitors, recreationists, etc.) currently use Highway 82. A project goal is to provide a multimodal system that creates various options for each type of user.

3.2.6 Integrated Approach to Transportation Planning. Provide a complete integrated transportation and recreation system. It is important that each component of the system (highway, transit, trails, etc.) is efficient by itself as well as compatible with the other components. The system developed must be complete and solve long-term transportation problems. In order to meet the region-wide goal of minimizing the impact of the automobile and the specific goal of maintaining traffic levels into Aspen, a system goal was to show a reduction of traffic on Highway 82. The project would have the greatest impact if it provided service within walking distance of residential and employment centers.

3.2.7 Livability. Provide a system that enhances the quality of life for residents and visitors, including linking communities within the Roaring Fork and Colorado River Valleys. Strong linkages between transit and communities improve the quality of life for all communities in the region. This system must preserve and enhance the character of the local communities. Transit systems which provide pedestrian access to mainline service and appropriately-sized parking facilities are more likely to be used.

3.2.8 Safety. Provide a safe transportation and recreation system, including minimizing conflict between various transportation components. Increasing the number of components within a system increases the potential for conflict between those components. It is important that the transportation and recreational system maximizes safety for all users of the corridor by minimizing this conflict.

3.2.9 Trails and Recreational Resources. Provide a system that meets the trail and recreational access demand of the Project Corridor. The Project Corridor has a very unique physical and social environment. It is centered in an outdoor recreational mecca largely dependent upon the exceptional scenery and numerous recreational facilities. It is important to improve and enhance the existing recreational resources in the Project Corridor.

These nine objectives characterize the purpose and need for this project and form the basis for determining the alternatives that were evaluated during the three-level alternative level screening process described in **Chapter II: Alternatives**.

3.3 Relationship to Previously-Approved USDOT-FHWA Project

The relationship of the current project to the previously-approved *Entrance to Aspen FEIS* (August 1997) and *ROD* (August 1998) project is two-fold. First, the previously-approved project is contained within the No Action/Committed Projects Alternative for this project. As such, analyses contained in the 1997 and 1998 documents are not repeated in the current document. Second, the previously-approved project corridor overlaps the current project BRT and Rail Alternatives between the Pitkin County Airport and Monarch Street in Aspen. As such, some analyses are included in the previous project and are only referenced in this current document. This combination of projects also permits flexibility in funding options. Please see section **I.A.2: How does this CIS relate to the Entrance to Aspen?**

The findings of the *Entrance to Aspen FEIS* and *ROD* are hereby incorporated into the current study by reference. As such, elements of the previously-approved project are also considered to be included in the current project.

4. Specific Transportation Problems in the Corridor

4.1 Transportation Objectives Not Met by Current Committed Highway and Transit Efforts.

4.1.1 Highway 82 Level of Service. CDOT has invested almost $500 million in reconstructing Highway 82 between Glenwood Springs and the Buttermilk Ski Area just west of Aspen as a four-lane facility. Travel demand forecasts conducted for the *Basalt to Buttermilk EIS* (CDOT, 1993) and for this CIS predict that, without investment in an improved transit system, the new four-lane highway will approach peak hour gridlock at critical locations as early as the year 2009. CDOT has indicated that funding does not exist to widen the highway to six lanes, even if this were desirable.

4.1.2 RFTA Level of Service. The RFTA Transit Development Plan (TDP) foresees a continuation of the current transit route structure and service hours and an enhancement of headways on some

Valley routes. It is assumed that transit capacity will expand on the routes identified in the TDP to meet demand, within the financial constraint of RFTA's taxing capacity. With the exception of bus replacement, no significant capital investments are planned. Absent capital investment to provide for operating efficiency and service enhancement, RFTA is close to capacity and unable to provide additional service to counter traffic and congestion growth.

4.1.3 Entrance to Aspen Level of Service. This project focuses on the travel demand between the Pitkin County Airport and downtown Aspen. At full implementation, the ETA LRT system is expected to provide needed transportation capacity for the forecasted person trips through the year 2015. This project is intended to identify a combination of travel modes, alignments, and transportation management actions to continue the community of Aspen's goal of limiting the number of vehicles in the year 2015 to levels at or below those in 1994. (*Entrance to Aspen ROD, 1998*). In lieu of the LRT, an interim busway would be used to provide for forecasted person trips. This project does not address the need to provide service throughout the Valley from Glenwood Springs to the Airport and into Aspen, nor does it address travel demand between 2015 and 2025 into downtown Aspen.

4.2 Transportation Problems the Proposed Build Alternatives Will Address

4.2.1 Highway 82 congestion, even after investment in a four-lane platform. Completion of the East of Basalt to Buttermilk Ski Area and Entrance to Aspen projects will represent an investment of almost $500 million in safety and capacity improvements to Highway 82. Travel demand forecasts predict that, without additional investment in transit, the highway will reach peak-hour capacity as early as 2009, and certainly within the planning horizon of the CIS. Additional investment in transit, coupled with transit-supportive land use policies, would help limit the growth in automobile travel in the Project Corridor.

4.2.2 Additional Highway 82 expansion constrained by cost and environment. Highway 82 is located in a steep, narrow mountain valley proximate to the Roaring Fork River. The construction of a four-lane highway platform through portions of the corridor, particularly the Snowmass Canyon and Shale Bluffs areas, has been accomplished at costs exceeding $30 million per highway mile. Approximately 30 years of planning and environmental analysis preceded the construction. Given the financial and environmental constraints, it is unlikely that additional lanes will be added to Highway 82 during the planning horizon of the CIS. Additional investment in transit service is the most cost-effective means of adding transportation capacity to the Project Corridor.

4.2.3 Lack of mode choice, which has broad economic impacts on the region and on working families. Lack of affordable housing has become a regional problem, and in spite of a variety of very aggressive affordable housing programs, a majority of workers in each community must commute from homes further north and west. Aspen, with an average home price in excess of $2 million, houses less than 49 percent of its workforce. Glenwood Springs, with an average home price of $305,000, imports 55 percent of its workers from western Garfield County. The working families that provide this labor force are dependent upon the automobile for transportation from the places they can afford to live to their places of employment. This auto dependency forces many families to maintain multiple automobiles, spending a third or more of their income on automobile and commuting costs. An auto-dependent environment forces these families to forego other investments that would enhance their quality of life. Additional investment in transit would provide a viable alternative to the automobile, reduce the percentage of their household budgets allocated to transportation, and provide the means for investment in housing, education, and recreation.

4.2.4 Growth in transit demand has exhausted the capabilities of traditional bus transit service and existing infrastructure. RFTA was originally organized in 1983 to provide local transit service to Aspen and Pitkin County. The agency has grown incrementally since that time to provide regional service to three counties and eight incorporated communities in a 70-mile corridor. A significant investment in transit infrastructure – park-and-ride lots, transit stations, queue bypass lanes, maintenance facilities, information systems, vehicles, etc. – is required to create the efficiency, quality, and speed needed to keep pace with transit demand. Investment in these facilities would also provide RFTA management the resources needed to consolidate routes and stops, minimize dead-heading of vehicles, and take advantage of the efficiencies available through the use of intelligent transportation system (ITS) technology.

II. ALTERNATIVES

A. INTRODUCTION

This chapter presents the options and alternatives that were evaluated in the CIS. At the inception of the project, public scoping sessions were employed to identify a universe of options that should be considered to improve the transportation system in the Project Corridor. The Project Corridor extends 66.5 Kilometers (41.3 miles) from the West Glenwood Springs interchange at I-70 to downtown Aspen. Alternatives were identified for technology, propulsion, alignment, and transit station locations. In all, 46 separate technology options, 19 separate propulsion options, 16 transit station locations, and five alignment options were identified.

Many of the options identified early in the CIS process were screened from further consideration using a tiered approach that incorporated a reality check screening, a fatal flaw screening, and a comparative screening. The result of this process was the development and refinement of the three alternatives evaluated in this CIS:

- No Action/Committed Projects Alternative (No Action/Committed Projects)
- Bus Rapid Transit (BRT) Alternatives + Trail
  - BRT-Bus sub-alternative uses dedicated busway from Buttermilk to Aspen
  - BRT-LRT sub-alternative uses light rail transit (LRT) from Buttermilk to Aspen
- Rail + Trail

Each of the Build alternatives includes the construction of a trail in the RFTA right-of-way. One-third of the interim trail has already been constructed. This proposed "Rio Grande Trail" begins at the terminus of the Glenwood Springs River Trail at 23rd Street in Glenwood Springs. It ends 51.5 kilometers (32 miles) east, where it connects to the end of the existing Rio Grande Trail at Woody Creek. The Rio Grande Trail provides a connection into Aspen. The trail is described in further detail in the document *Aspen Branch Denver & Rio Grande Western Railroad: Recreational Trails Plan Glenwood Springs to Aspen CIS/DEIS/CP* (Land Plan, 1999).

This section discusses the potential components of the Valley-wide transportation system, the screening analysis used by the Study Team, an interdisciplinary group of consultants and agency personnel, to narrow the range of alternatives, and the alternatives evaluated in the CIS process.

B. SCREENING AND SELECTION PROCESS

1. Summary of the Screening Process

This section discusses the process and results of the Corridor Investment Study in the Project Corridor. The results of this screening process were developed into the alternatives studied in this CIS. **Chapter X: Availability of Technical Reports**, references applicable support documents.

Four Citizen Task Forces (CTFs) were established in the Project Corridor. The purpose of these groups was to involve, gather input, and solicit ideas from Valley residents, and provide recommendations to the RFRHA Policy Committee. The RFRHA Policy Committee, appointed by the RFRHA Board, was made up of a broad range of political and agency representatives from throughout the Project Corridor and served as the policy-making body for the public involvement process. See **Chapter X: Public Involvement**, for a more detailed description of the public involvement process.

The screening process applied progressively more demanding criteria to a range of potential options through a series of three screening levels: Reality Check, Fatal Flaw, and Comparative. The screening criteria were developed through CTF meetings and then ratified by the RFRHA Policy Committee. At each screening level, options that did not meet the respective criteria were eliminated from further study. To simplify the task, these options were categorized into four types:

- Technology
- Propulsion
- Station Location
- Alignment

During scoping sessions at the outset of the study the public, the CTFs, the Study Team, and the RFRHA Policy Committee identified a total of 46 potential technology options, 19 potential propulsion options, 16 potential station locations, and five potential alignment options. Following the screening of potential options, those that remained were combined to form alternatives to be evaluated further. The process was designed to result in alternatives that are reasonable, viable, and have community support.

1.1 First Level - Reality Check Screening

The Reality Check Screening was intended to eliminate options that are clearly unrealistic, inappropriate, or unreasonable by applying common knowledge. This screening was qualitative, based on existing data and judgment of the CTF members, the Study Team, and the RFRHA Policy Committee. The options that were eliminated at this level had no realistic chance of being implemented because of physical constraints, funding, public opposition, or technology limitations.

1.2 Second Level - Fatal Flaw Screening

Options that survived the reality check screening continued to the Fatal Flaw Screening level. This screening eliminated options that did not meet one or more of the project objectives as identified and defined by the CTFs and the RFRHA Policy Committee. Screening at this level was a collaborative process that included input from the local communities and other interests. Fatal flaw criteria were developed through the public process based upon the project objectives listed **Chapter I: Purpose and Need**.

The following is a list of the fatal flaw criteria used:

- Does the option have the capacity to carry all person trips beyond those expected at LOS C on Highway 82 in 2020?
- Does it eliminate the need for any additional highway lanes beyond what is existing or committed, except the potential Glenwood Springs bypass?

- Does it allow for a continuous non-motorized trail from Glenwood Springs to Aspen?
- Does it accommodate future transit and trail connections and/or extensions to Aspen and the I-70 corridor?
- Does it use technologies or combinations of technologies that are in revenue service in similar settings and not preclude low-risk future technology alternatives? Note: dual-propulsion systems using proven technologies and/or propulsions are acceptable.
- Does it allow for transportation of passengers and goods?
- Are the capital costs less than $10 million per mile?
- Is the Express/feeder system accessible within one-half mile of incorporated downtown areas?
- Does it allow for 15-minute headways during peak hours?
- Does it have the ability to make an Express trip between Glenwood Springs and the Pitkin County Airport in one hour or less?

1.3 Third Level - Comparative Screening

The remaining options from each category (i.e. technology, propulsion, station location, and alignment) were combined to form alternatives. These alternatives continued to the Comparative Screening level. This screening eliminated alternatives that, although they appeared to meet the project objectives, did not compare favorably to other available alternatives. Alternatives evaluated at this level underwent a planning-level analysis of key environmental parameters and issues.

The Comparative Screening analysis was performed by first establishing a matrix of criteria based on the nine project objectives. Criteria that were incorporated into the comparative evaluation matrix were used in order to identify specific differences among the remaining alternative alignments and technologies. Additional discussion and the matrix are found in documents referenced in Chapter **X.A.2: Alternative Evaluation**.

The result of the multi-tiered screening was a set of alternatives for continued evaluation. The alternatives that survived the comparative screening received a more detailed comparative analysis of environmental, social, and economic considerations.

2. Options Considered

Options considered for this Corridor Investment Study were divided into four general categories: technology, propulsion, station locations, and alignment. The following sections include lists and descriptions of all options that were considered for each of the four categories.

2.1 Technology Options

A total of 46 technology options were developed through the public and agency scoping meetings, the CTFs, and Policy Committee meetings. These options are described below.

1. **Aerobus.** This concept consists of a suspended, self-propelled vehicle that runs along a horizontal track. Suspension cables similar to those used on suspension bridges (i.e. the Golden Gate Bridge) support the track.

2. **Airplanes.** Air transportation is available in every major city around the country. There are airports in Glenwood Springs and close to Aspen in Pitkin County.

3. **Automated Guideway Transit.** This technology consists of fully automated, small vehicle systems operating without drivers on an exclusive guideway. These systems typically have high platforms and use third rail power.

4. **Automobiles on Existing Lanes.** This technology option represents all non-transit vehicles including passenger cars or trucks using Highway 82 in its present configuration

5. **Automobiles on Flatbeds.** This concept loads automobiles on a flatbed truck and transports them to a destination where they are unloaded. A similar operation is currently used in Whittier, Alaska where automobiles are loaded onto rail flatbed cars as the only means of access to Anchorage.

6. **Automobiles on New Lanes.** This would be similar to the automobiles on existing lanes option, but would add lanes to Highway 82 or use a paved alignment through the existing rail corridor as a bypass.

7. **Automobiles on Reversible Lanes.** A reversible lane is a traffic lane that may be used for one direction during part of the day and the other direction during a different part of the day. Reversible lanes are effective when travel patterns are predominantly in one direction in the morning and the reverse in the evening. This creates an opportunity to use the same lane to add extra capacity in the major direction during peak traffic times.

8. **Bicycling.** The use of bicycles is popular throughout the valley for both recreational and transportation use.

9. **Bikes in Tube.** This concept creates an enclosed, covered path for bicycle use. One concept provides airflow (wind) in the direction of travel.

10. **Bullet Train.** The bullet train is a high-speed rail option used for long distance travel. The system operates in an exclusive right-of-way with a minimal number of stops.

11. **Buses on Busway.** This technology consists of a roadway designed exclusively for buses on a separate facility other than Highway 82.

12. **Buses on Existing Lanes.** This technology consists of developing the best alternative utilizing a bus system on Highway 82 in its configuration as defined by No-Action/Committed Projects.

13. **Buses on New Lanes.** This is an option to add additional lanes to Highway 82 and designate those lanes for buses only.

14. **Cog System.** Most rail systems provide traction via steel wheels on steel track technology. Cog or rack systems provide alternate traction using a cog gear that runs in the gear track. This allows for operation on very steep grades.

15. **CyberTran.** This technology consists of a passenger and light cargo system using small, light-weight, computer controlled, steel-wheeled vehicles operating on an elevated guideway. Similar to Personal Rapid Transit, the CyberTran technology could have several hundred cars that could be stored in and around stations, ready for use.

16. **Dog Sled.** Dog sled operations exist in the valley as a form of recreation.

17. **Electric Automobiles.** Automobiles powered by electricity are becoming more popular around the country as a viable alternative to automobiles powered by gasoline.

18. **Equestrian.** Horseback riding is a popular form of recreation and a technology option for the corridor.

19. **Ferries.** Ferries are used in coastal areas to transport people and vehicles across bodies of water. This option would use ferries along the Roaring Fork River for transportation.

20. **Funicular.** A funicular is a wire rope system that pulls passenger vehicles (similar to cable cars) in a loop type system. They are generally used for steep grades.

21. **Golf Carts.** Golf carts are small, motorized vehicles prevalent at golf courses.

22. **Gondola.** Gondolas are wire rope-type systems and are used mostly at ski areas.

23. **Guided Busway (Obahn).** This technology consists of a busway that uses rubber-tired buses running in a narrow track. Guidance wheels that follow the edges of the track control steering. An operator is responsible for stops, acceleration, deceleration, and doors. The buses on the busway can also travel on conventional streets as normal buses.

24. **Heavy Rail (Diesel, at-grade).** This technology consists of passenger cars pushed or pulled by a locomotive in a primarily at-grade right-of-way. This technology is similar to commuter rail.

25. **Heavy Rail (Electrified/ grade separated).** This technology is a high-speed, high-capacity system that operates over a fully grade-separated right-of-way using electrical propulsion.

26. **Helicopters.** Helicopters are propeller-driven vehicles that travel in the air. They require small areas with relatively flat grade to take-off and land.

27. **High Occupancy Vehicles (HOVs) on New Lanes**. This is an option to add additional lanes to Highway 82 and designate those lanes for use only by automobiles with two or more occupants, vanpools, buses, and carpools.

28. **Hitchhiking.** People are picked up along the roadway by automobile drivers going in the same direction or to the same destination.

29. **Hy-Rail Bus.** This technology consists of bus vehicles that can attach to tracks and ride on rails similar to a train car, and can disconnect from the rails and travel on conventional streets as normal buses.

30. **Jet Boats.** Jet boating is a popular form of recreation on lakes and reservoirs. This option would use jet boats along the Roaring Fork River for transportation.

31. **Jet Pack.** Personal backpacks with jet motors travel through the air.

32. **Jitneys.** A jitney is a small bus or vehicle used in a similar fashion to a taxi, but it typically carries more than one passenger.

33. **Light Rail Transit.** This technology consists of a medium-capacity rail system that can operate in exclusive, semi-exclusive, or shared right-of-way.

34. **Magnetic Levitation.** This technology consists of train cars levitated, guided, and propelled by electromagnetic forces in an exclusive right-of-way either above or below grade. This is a new and emerging technology that provides high-speed service.

35. **Monorail.** This technology consists of a fully grade-separated transit system supported on or suspended from a single beam. The most popular monorail system is at Disney World.

36. **Pedestrians.** Walking is popular throughout the valley for both recreational and transportation use.

37. **People Mover.** This option is similar to the moving walkways that are present in many airports.

38. **Personal Rapid Transit.** These systems are generally characterized as being fully automated vehicles that seat from two to six people. These systems provide high-frequency service between many locations without stops or transfers and run on a fixed guideway.

39. **Rickshaw.** Rickshaws are carriages attached to the back of bicycles or motorbikes to move people around the city. These are used in many parts of the world.

40. **Rubber-Tired Train.** This technology consists of passenger vehicles pulled by a tractor in an at-grade right-of-way.

41. **Subway.** A subway is an underground system that can operate with or without drivers. It uses rail technology and is used in many large cities.

42. **Suspended Light Rail.** This technology is similar to light rail transit that operates over a fully grade-separated right-of-way.

43. **Taxis.** The use of taxis is evident in most major metropolitan areas as a means of on-demand transport from point to point.

44. **Tram.** This can be described simply as a San Francisco cable car. It is pulled along a cable from point to point.

45. **Van Systems**. A van system follows the idea of transporting a small number of people from one destination to another in a system of small buses and/or vans.

46. **Water Gondola**. This technology option would use vehicles pulled along the Roaring Fork River by a cable system.

2.2 Propulsion Options

A total of 19 propulsion options were developed through the public and agency scoping meetings, the CTFs, and RFRHA Policy Committee meetings. These options can be combined with the technology options to create different mode variations. Not all propulsion options are applicable to all technology options. Each option, along with a brief description, is presented below.

1. **Animal Power.** This propulsion option uses animals as a power source. This relates to the equestrian and dog sled technology alternatives.

2. **Coal.** Coal used to be the major fuel source for trains. It is not often used as a direct power supply for transportation.

3. **Diesel.** Diesel is a common use of fossil fuel. It is used in automobiles, trucks, buses, and locomotives. This option can be used with automobile, bus, and rail technologies.

4. **Electric (Battery).** Battery power is used in most automobiles, trucks, and buses. Certain light rail systems use battery power for propulsion.

5. **Electric (Hybrid).** The use of multiple forms of power, such as a combination of overhead catenary and diesel power, is a viable option for propulsion. The vehicle would actually be set up to operate using either power source.

6. **Electric (Overhead Catenary).** Overhead electric power is typically used for light rail technology, but can also be used for buses and heavy rail systems. This option transfers power from lines above the system to the actual cars.

7. **Human Power.** This propulsion option uses human power as its source. This relates to the pedestrian and bicycling technology alternatives.

8. **Gasoline.** Gasoline is the most common fossil fuel used to power automobiles. Buses and trucks can also be powered using gasoline. This option can be used with automobile, bus, and rail technologies.

9. **Jet Fuel.** Jet fuel is limited to use in airplanes, has high-energy output, and is very expensive.

10. **Hydrogen Fuel Cell.** Hydrogen fuel cells use a complex chemical process to extract power from hydrogen base compounds. These are typically used to power batteries.

11. **Hydrogen Internal Combustion.** Hydrogen gas can be used to power internal combustion engines in a process similar to gasoline powered engines.

12. **Linear Induction.** This can be defined simply as an electric motor laid out flat.

13. **Liquid Propane Gas.** Liquid propane gas is commonly used in rural areas for heating and appliances. It has been used as a power source for buses and fleet vehicles.

14. **Methane Fuel Cell.** Similar to hydrogen fuel cells, methane fuel cells use different compounds in the power extraction process.

15. **Natural Gas.** Natural gas is commonly used in households for stoves and other appliances. Many buses use natural gas as a means of propulsion because it burns cleaner than gasoline or diesel.

16. **Nuclear Reactor.** The use of nuclear power is normally associated with power generators; however, it has been used to power submarines and warships.

17. **Solar.** Solar technologies capture the energy of the sun. Solar power is used in some households, roadside telephones, and commercially. Solar power has been used experimentally as a power source for automobiles.

18. **Steam Turbine.** Steam turbines are used primarily in power plants. They use high-pressure steam to drive a turbine engine.

19. **Wind Power.** The use of wind to generate power is common around the world in the form of windmills and sails. This option uses wind to power sails on land based vehicles.

2.3 Transit Station Location Options

A total of 16 potential transit station locations were developed through the public and agency scoping meetings, the CTFs, and RFRHA Policy Committee meetings. These stations could serve numerous combinations of alignment, technology, and propulsion options.

1. **Aspen Village.** Aspen Village is located at the south end of Snowmass Canyon. This station would be for residents of Old Snowmass, Gerbazdale, and Aspen Village. This location would best serve alignments that cross the Roaring Fork River prior to Aspen Village and run along Highway 82.

2. **Brush Creek Road**. The station location at Highway 82 and Brush Creek Road has been designated by the City of Aspen, the Town of Snowmass Village, and Pitkin County as a possible site for the beginning of the light rail system into Aspen. If the Brush Creek Road location is not determined to be the beginning for the light rail system, it is still a potential station location for transfers to Snowmass Village.

3. **Downtown Aspen.** For the Rail Alternative, the station would be located on the south side of Main Street between Spring Street and Hunter Street. The existing Rubey Park Transit Center site could serve as the terminus for the BRT Alternatives.

4. **Downtown Carbondale.** This station location near the Town Hall could serve an alignment within the RFTA right-of-way or serve as a terminus for bus routes originating in Carbondale and using the Highway 82 alignment.

5. **Emma.** The RFTA right-of-way and the Highway 82 corridors are in close proximity at Emma. This station location could serve both El Jebel and Basalt.

6. **Downtown Glenwood Springs.** This station location could be either at the existing Amtrak station or near the wye. This station could serve alignment options along Highway 82 or within the RFTA right-of-way.

7. **High School (Basalt).** This station location is near the new high school south of downtown Basalt, and could serve an alignment option in the RFTA right-of-way.

8. **Highway 133 (Carbondale).** This location is on Highway 133 at Delores Way in Carbondale proximate to where the RFTA right-of-way crosses Highway 133. This station could serve alternatives along Highway 82 or in the RFTA right-of-way.

9. **Hooks Spur (Eagle County).** A station location south of El Jebel proximate to the RFTA right-of-way is viable for alignments in the RFTA right-of-way. This station location is south of the Willits development just west of the Hooks Lane crossing of the Roaring Fork River.

10. **Midland Avenue (Basalt).** A station in Basalt could be located near the Midland Avenue extension to Highway 82 in Basalt. This location is not proximate to the RFTA right-of-way.

11. **Old Snowmass**. There may be a need for a station on Highway 82 at Lower River Road and Snowmass Creek Road.

12. **Pitkin County Airport**. The Pitkin County Airport is the proposed terminus for the light rail system into Aspen (*Entrance to Aspen ROD*). The transit system evaluated in this project must connect to the system going into Aspen either at the airport or Brush Creek Road.

13. **South Glenwood Springs**. There may be a need for stations between Glenwood Springs and Carbondale which could serve an alignment option along Highway 82 or in the RFTA right-of-way.

14. **West Glenwood Springs.** The station is located near the I-70 interchange in West Glenwood Springs, and could serve alignment options along Highway 82 or within the RFTA right-of-way.

15. **Willits Lane.** This station location option in El Jebel is near the City Market southwest of El Jebel, and could serve an alignment option along the Highway 82 corridor through El Jebel.

16. **Woody Creek.** The Woody Creek area has potential for a station if the alignment stays within the RFTA right-of-way through Woody Creek. The location could also serve as a feeder system pickup and drop-off point to service the main system.

2.4 Alignment Options

A total of five alignment options were developed through the public and agency scoping meetings, the CTFs, and Policy Committee meetings. These options could be combined with the technology options and potential station locations to create a variety of alternatives. The potential alignment options are shown in Figures II-1 through II-5. All alignments provided connecting service to Aspen via the LRT transfer points at Brush Creek Road or the Pitkin County Airport.

Alignment A: RFTA Right-of-way with Brush Creek Road Crossing. This alignment option begins in West Glenwood Springs in the southeast quadrant of the West Glenwood/I-70 interchange. It then parallels the Union Pacific Railroad corridor along the south side to the RFTA right-of-way in downtown Glenwood Springs. It then follows the RFTA right-of-way from Glenwood Springs to a location north of Brush Creek Road, where it crosses the Roaring Fork River to Highway 82 near the Brush Creek Road intersection. At Brush Creek Road, the alignment connects with the LRT alignment along the south side of Highway 82 to Monarch Street in Aspen and continues on new track along Main Street (Highway 82) to Hunter Street. Alignment A is shown in Figure II-1.

Alignment B: RFTA Right-of-way with Gerbazdale Crossing. This alignment option begins in West Glenwood Springs in the southeast quadrant of the West Glenwood/I-70 interchange. It then parallels the Union Pacific Railroad corridor along the south side to the RFTA right-of-way in downtown Glenwood Springs. It then follows the RFTA right-of-way from Glenwood Springs to a location west of Gerbazdale (near Stutsman-Gerbaz, Inc.) where it crosses the Roaring Fork River to Highway 82. Two crossing alternatives were considered, both of which were evaluated in the *Glenwood-Aspen Rail Corridor Feasibility Study* (CDOT, 1995). During the screening process, the alternative that is the furthest west was chosen by the RFRHA Policy Committee for further evaluation and study. The alignment then connects to the LRT alignment and continues into Aspen as described for Alignment A. Figure II-2 illustrates Alignment B.

Alignment C: RFTA Right-of-way to Catherine Store and Highway 82 Corridor to Wingo Junction. This alignment option begins in West Glenwood Springs in the southeast quadrant of the West Glenwood I-70 interchange. It then parallels the Union Pacific Railroad corridor along the south side to the RFTA right-of-way in downtown Glenwood Springs. This option then follows the RFTA right-of-way from Glenwood Springs to an area near Catherine Store and then crosses to the Highway 82 corridor. Two options for crossing the Roaring Fork River near Catherine Store were evaluated. One option (CS1) followed County Road 100 and the second option (CS2) crossed the river approximately 1.2 kilometers (.75 miles) east where the RFTA right-of-way and Highway 82 are at their closest proximity. It then followed the Highway 82 corridor to the Wingo Junction area where it returns to the RFTA right-of-way. From the Wingo Junction area this option would use either Alignment A or B to cross the Highway 82 corridor to connect with the LRT alignment at the Airport. The remainder of the alignment into Aspen is as described for Alignment A. Figure II-3 shows Alignment C.

Alignment D: RFTA Right-of-way to Emma and Highway 82 Corridor to Wingo Junction. This alignment option begins in West Glenwood Springs in the southeast quadrant of the West Glenwood/ I-70 interchange. It then parallels the Union Pacific Railroad corridor along the south side to the RFTA right-of-way in downtown Glenwood Springs. It then follows the RFTA right-of-way from Glenwood Springs to Emma. At Emma, this option follows the Highway 82 corridor to the Wingo Junction area where it returns to the RFTA right-of-way. This alignment option would use either Alignment A or B to continue into Aspen. Figure II-4 illustrates Alignment D.

Alignment E: RFTA Right-of-way to Carbondale and Highway 82 Corridor to Wingo Junction. This alignment option begins in West Glenwood Springs in the southeast quadrant of the West Glenwood/I-70 interchange. It then parallels the Union Pacific Railroad corridor along the south side to the RFTA right-of-way in downtown Glenwood Springs. This option then follows the RFTA right-of-way from Glenwood Springs to the area near Highway 133. From this point, the alignment option follows the Highway 82 corridor to the Wingo Junction area where it returns to the RFTA right-of-way. This alignment option would use either Alignment A or B to continue into Aspen. At Highway 133, this option crosses from the RFTA right-of-way to the Highway 82 corridor just west of the Highway 82/Highway 133 intersection. Another option follows the RFTA right-of-way to its intersection with Highway 133. It then follows the Highway 133 corridor north to the Highway 82 corridor. Alignment E is shown in Figure II-5.

Figure II-1: Alignment A

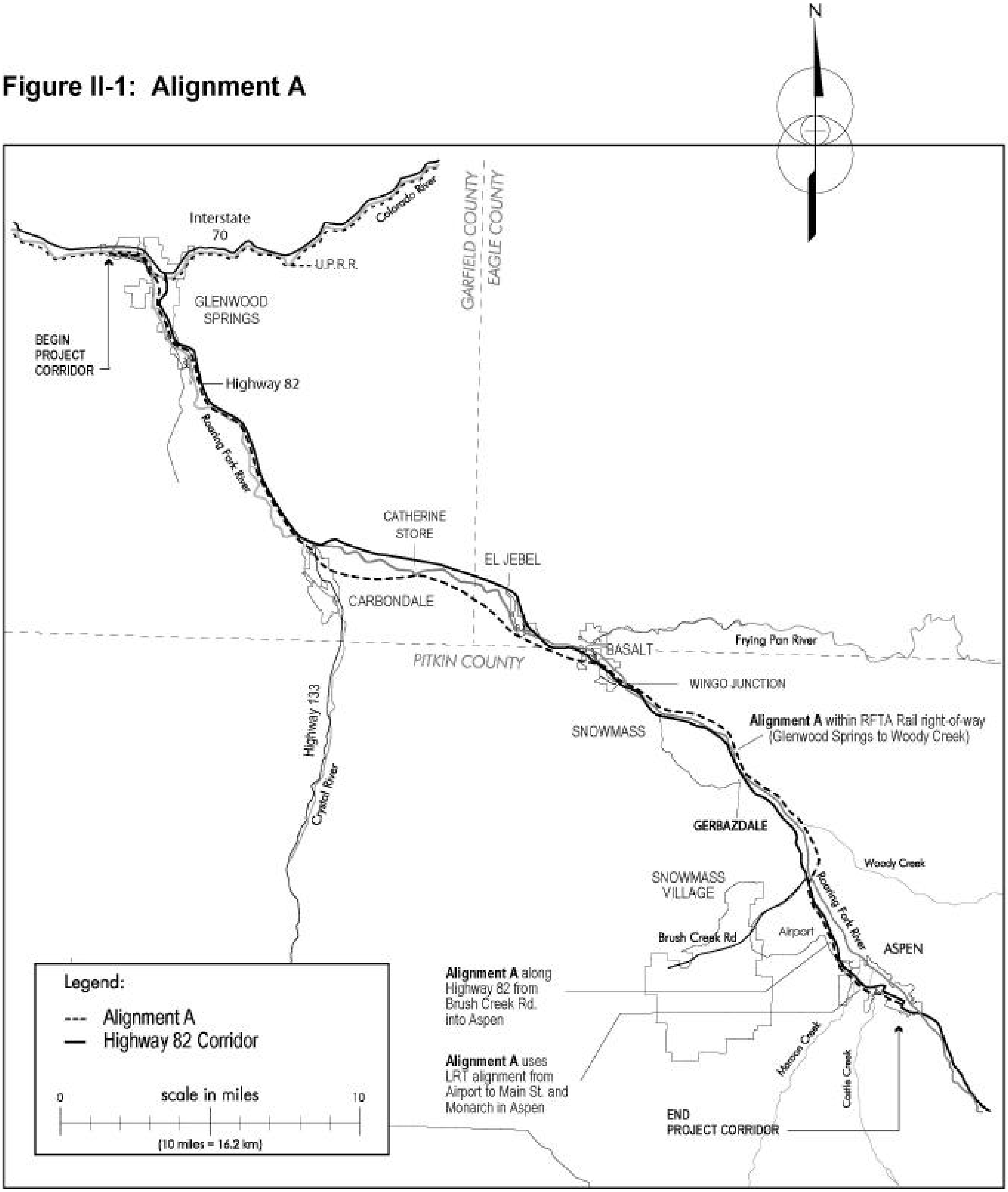


Figure II-2: Alignment B

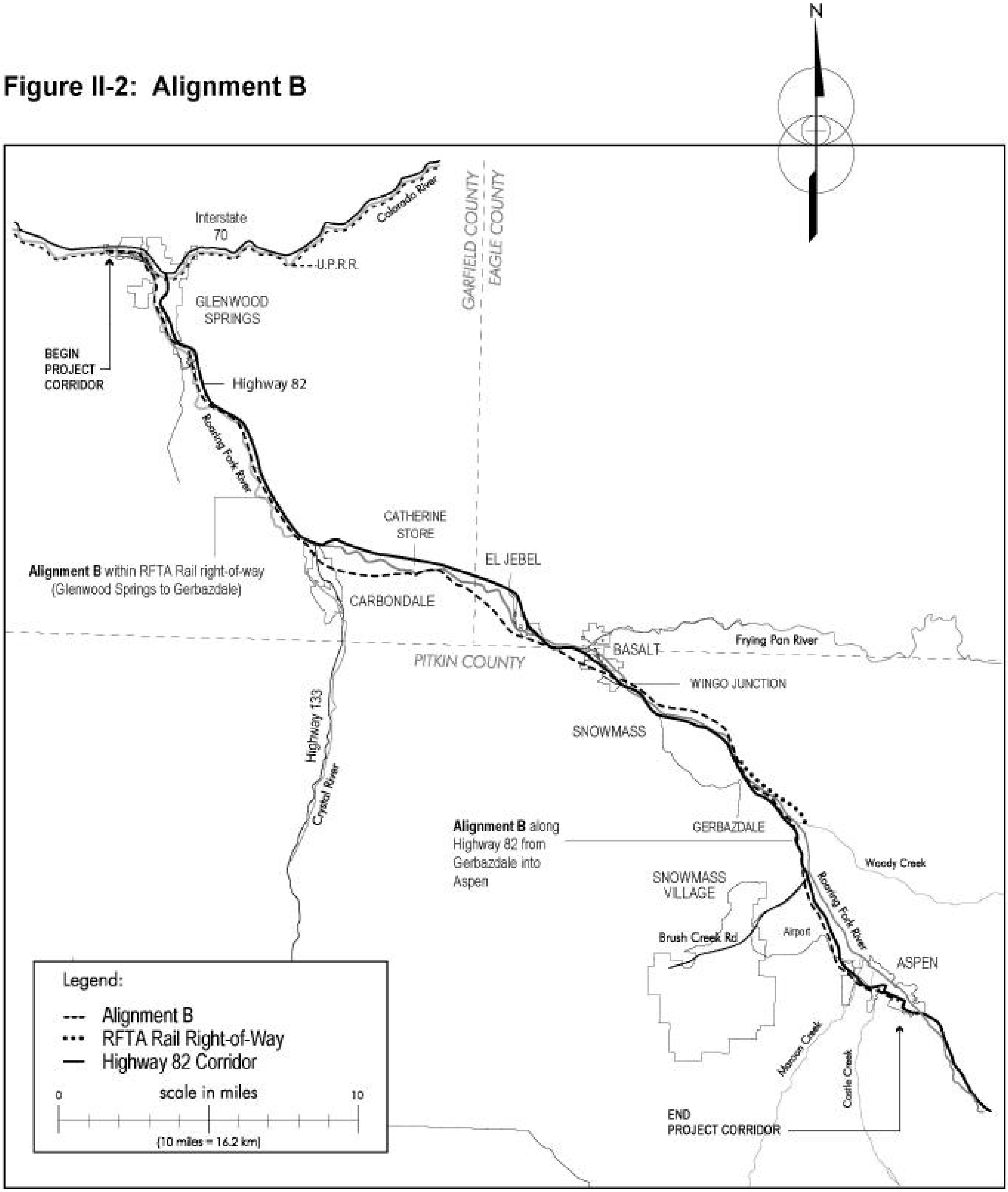


Figure II-3: Alignment C

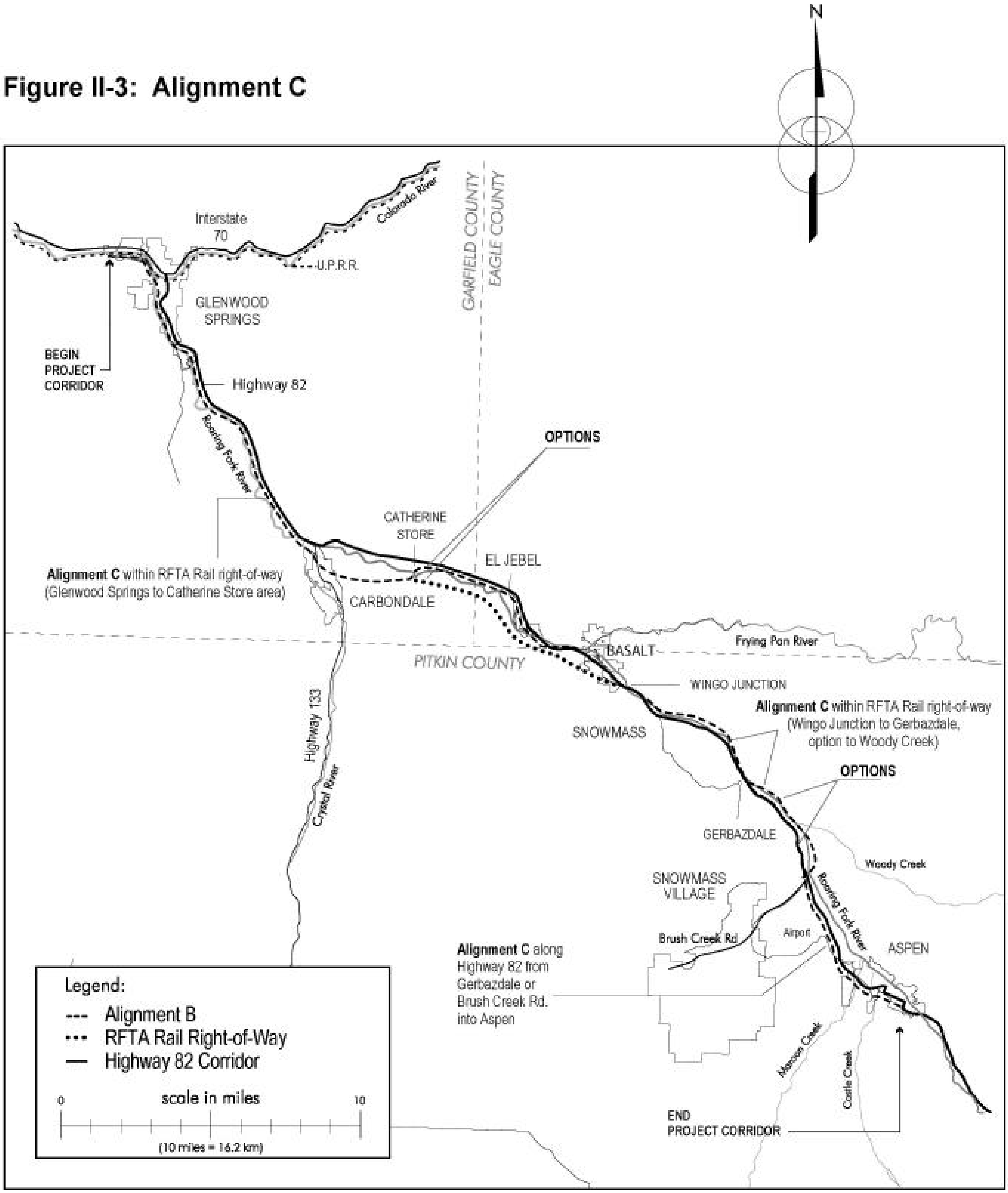


Figure II-4: Alignment D

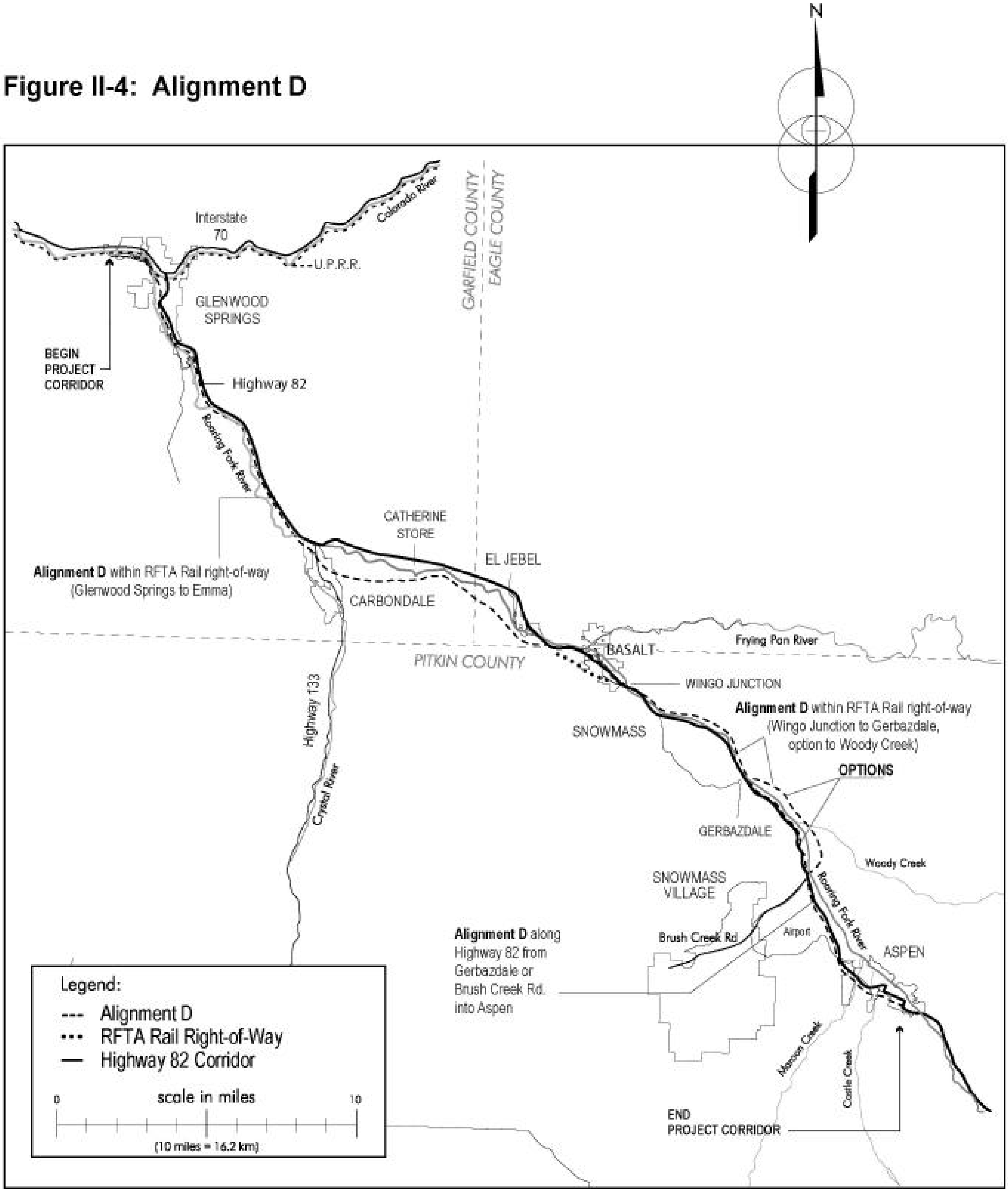
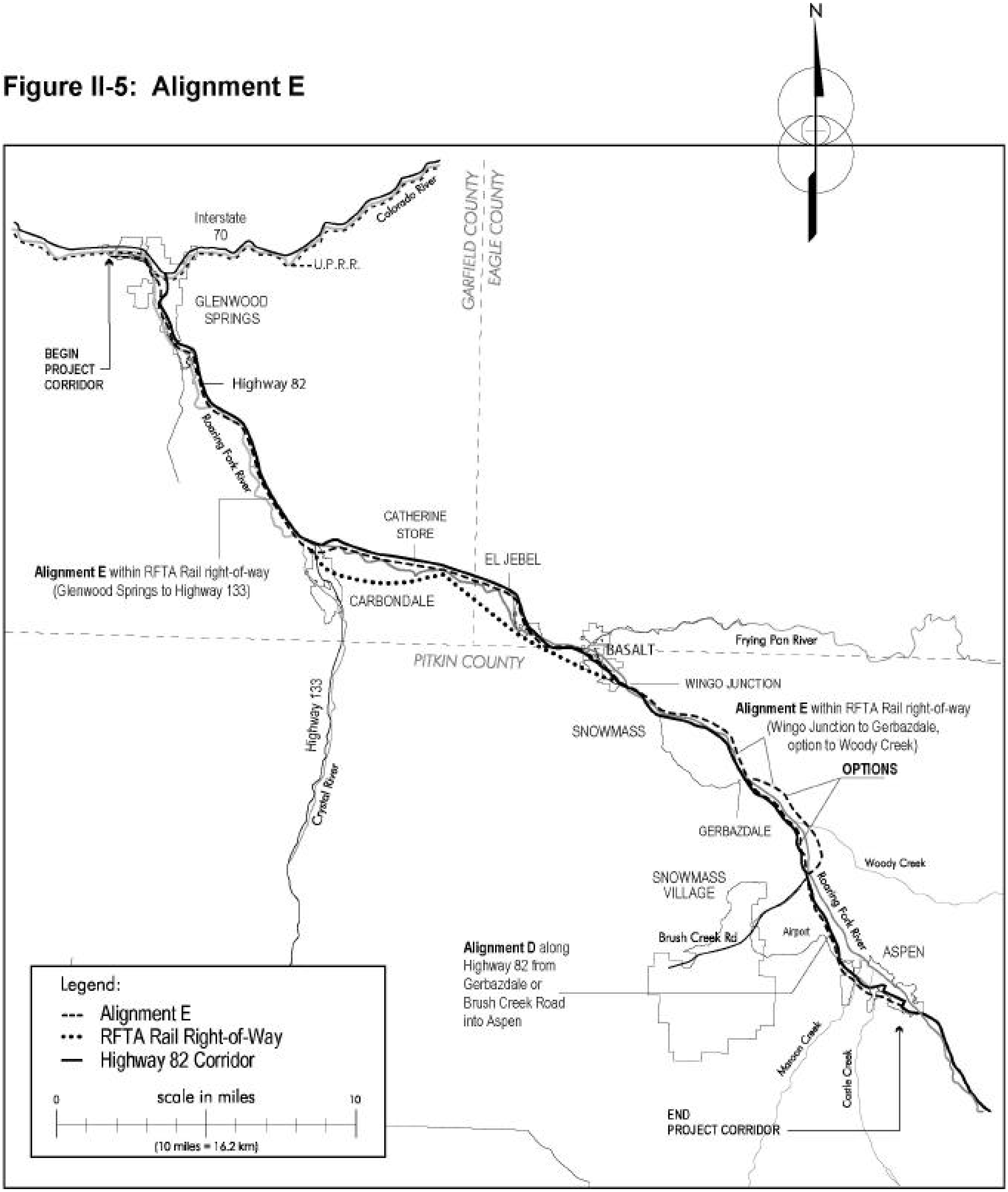


Figure II-5: Alignment E



3. Selection of a Small Set of Promising Alternatives

The following discussion presents the results of the first three levels of screening conducted in the CIS. Readers seeking more detail on the rationale for elimination of potential technologies, propulsion methods, station locations, and alignments should refer to the *Glenwood Springs to Aspen CIS/DEIS/CP Phase 1 Alternatives Screening Report* (MK Centennial and DeLeuw Cather, September 10, 1998), and the *Glenwood Springs to Aspen CIS/DEIS/CP Phase 2 Alternatives Screening Report* (MK Centennial and DeLeuw Cather, May 3, 1999) as referenced in Chapter X: Availability of Technical Reports.

3.1 First Level - Reality Check

Based on the project objectives, 31 technology options and eight propulsion options were screened out as being unrealistic or unacceptable alternatives for the Project Corridor as part of the reality check, or first level of screening. Eliminated options are listed in Table II-1. None of the station location options or the alignment options were eliminated.

Table II-1
Screening Level I: Reality Check
Options Eliminated

Technology Options		Propulsion Options
• Pedestrians	• Jitneys	• Human Power
• People Mover	• Van Systems	• Animal Power
• Hitchhiking	• Personal Rapid Transit	• Coal
• Jet Pack	• Funicular	• Steam Turbine
• Bicycling	• Cog System	• Wind Power
• Rickshaw	• Bullet Train	• Jet Fuel
• Bikes in Tube	• Subway	• Methane Fuel Cell
• Equestrian	• Gondola	• Nuclear Reactor
• Golf Carts	• Aerobus	
• Dog Sled	• Tram	
• Automobiles on Existing Lanes	• Water Gondola	
• Automobiles on New Lanes	• Jet Boats	
• Automobiles on Reversible Lanes	• Ferries	
• Electric Automobiles	• Helicopters	
• Automobiles on Flatbeds	• Airplanes	
• Taxis		

Following the completion of the reality check screening, 16 technology options, 11 propulsion options, 16 station location options, and five alignment options remained, as listed in Table II-2:

Table II-2
Screening Level I: Reality Check
Options Retained

Technology Options	Propulsion Options	Station Options	Alignment Options
• HOV on new lanes • Buses on existing lanes • Buses on new lanes • Buses on busway • Guided busway (Obahn) • Hy-Rail bus • Automated guideway transit • Light rail transit • Suspended light rail • Rubber tired train • Heavy Rail (electrified/elevated) • Heavy Rail (diesel, at grade) • CyberTran • Magnetic levitation • Monorail	• Solar • Diesel • Gasoline • Hydrogen internal combustion • Linear induction • Electric (battery) • Electric (overhead catenary) • Electric (hybrid) • Liquid propane gas • Natural Gas • Hydrogen fuel cell	• Aspen Village • Brush Creek Road • Downtown Aspen • Downtown Carbondale • Emma • Downtown Glenwood Springs • High School (Basalt) • Highway 133 (Carbondale) • Hooks Spur (Eagle County) • Midland Avenue (Basalt) • Old Snowmass • Pitkin County Airport • West Glenwood Springs • South Glenwood Springs • Willits Lane • Woody Creek	• A: RFTA ROW with Brush Creek Road Crossing • B: RFTA ROW with Gerbazdale Crossing • C: RFTA ROW to Catherine Store; Highway 82 corridor to Wingo Junction • D: RFTA ROW to Emma; Highway 82 corridor to Wingo Junction • E: RFTA ROW to Carbondale; Highway 82 corridor to Wingo Junction

3.2 Second Level - Fatal Flaw Screening

Eleven technology options and three propulsion options were screened out during the fatal flaw screening process, as shown in Table II-3.

Table II-3
Screening Level II: Fatal Flaw
Options Eliminated

Technology Options		• Propulsion Options
• HOV on new lanes • Buses on new lanes • Suspended light rail • Rubber tired train • Hy-Rail buses	• Automated guideway transit • Heavy Rail (electrified/elevated) • Cyber train • Magnetic levitation • Monorail	• Linear induction • Hydrogen fuel cell • Solar

All 16 station locations and all five alignment options survived the fatal flaw screening. Following the completion of the fatal flaw screening, five technology options and eight propulsion options remained, as listed in Table II-4.

Table II-4
Screening Level II: Fatal Flaw
Options Retained

Technology Options	Propulsion Options	Station Options	Alignment Options
• Buses on existing lanes • Buses on busway • Guided busway (Obahn) • Light rail transit • Heavy Rail (diesel, at grade)	• Diesel • Gasoline • Hydrogen internal combustion • Electric (battery) • Electric (overhead catenary) • Electric (hybrid) • Liquid propane gas • Natural Gas	• Aspen Village • Brush Creek Road • Downtown Aspen • Downtown Carbondale • Emma • Downtown Glenwood Springs • High School (Basalt) • Highway 133 (Carbondale) • Hooks Spur (Eagle County) • Midland Avenue (Basalt) • Old Snowmass • Pitkin County Airport • West Glenwood Springs • South Glenwood Springs • Willits Lane • Woody Creek	• A: RFTA ROW with Brush Creek Road Crossing • B: RFTA ROW with Gerbazdale Crossing • C: RFTA ROW to Catherine Store; Highway 82 corridor to Wingo Junction • D: RFTA ROW to Emma; Highway 82 corridor to Wingo Junction • E: RFTA ROW to Carbondale; Highway 82 corridor to Wingo Junction

Following the conclusion of the fatal flaw screening process, the CTFs recommended that the guided busway (Obahn) technology option be eliminated from further study. They reasoned that the Obahn technology is expensive, would require a great deal of access control, and would be difficult to operate during periods of heavy snowfall. The RFRHA Policy Committee accepted this recommendation. Also, rail technologies were placed into a single category for the purposes of the comparative and CIS evaluations.

➔ **Additional Technology Alternative Eliminated:** Guided Busway (Obahn)

3.3 Level 3 - Comparative Screening

At this screening level, technology, alignment, and station options that passed both the reality check and fatal flaw analyses were compared against each other to determine the most reasonable alternatives for further evaluation. The Study Team elected to retain all remaining propulsion alternatives through the CIS. Consistent with the Project Objectives listed in **Chapter I: Purpose and Need**, the CTFs and RFRHA Policy Committee indicated a strong preference for alternative fuel vehicles. As the remaining propulsion options are available to the remaining technology options, a final decision on propulsion is to be made in preliminary engineering. Although eight propulsion options were retained, the CIS analyzes a self-propelled diesel multiple unit (DMU) for the Rail Alternative. The Comparative Screening was based on a matrix that was developed to assess how well each alternative addressed the nine project objectives.

The busway technology option was eliminated during the Comparative Screening process because the required cross-section raised the cost of the busway above that of rail. The CTFs also believed that the busway cross-section, which was wider than the rail cross-section, had the potential for additional impacts in the narrow RFTA right-of-way.

➔ **Comparative Screening, Technology Option Eliminated:** Buses on busway

During the comparative screening process, a series of workshops and public meetings was held to make recommendations on the best configuration and locations of stations. This included earlier input from the CTFs on general station locations. This process resulted in a report titled *Glenwood Springs to Aspen/Pitkin County Airport Corridor Investment Study, Transit Oriented Community Design Report* (Otak, February 2000) which included proposed station locations, proposed station layouts, and relationships of stations with surrounding land use. Nine transit stations or stops were identified, as listed in Table II-5.

Table II-5
Screening Level III: Comparative
Options Retained

Technology Options	Propulsion Options	Station Options	Alignment Options
• Buses on existing lanes • Rail transit	• Diesel • Gasoline • Hydrogen internal combustion • Electric (battery) • Electric (overhead catenary) • Electric (hybrid) • Liquid propane gas • Natural Gas	• West Glenwood Springs • Downtown Glenwood Springs • Carbondale at Highway 133 • Downtown Carbondale • El Jebel (Willits or El Jebel Road) • Basalt • Brush Creek Road • Pitkin County Airport • Downtown Aspen	• A: RFTA ROW with Brush Creek Road Crossing • B: RFTA ROW with Gerbazdale Crossing • C: RFTA ROW to Catherine Store; Highway 82 corridor to Wingo Junction • D: RFTA ROW to Emma; Highway 82 corridor to Wingo Junction • E: RFTA ROW to Carbondale; Highway 82 corridor to Wingo Junction

The Brush Creek Road and Pitkin County Airport stations had already been identified as part of earlier planning efforts and were not documented further in the report. The downtown Aspen site was identified as a stop only (uses only existing street right-of-way) and was added subsequent to the report. The bus technology alternatives also required transit stations at South Glenwood Springs near Holy Cross Electric and at the Colorado Mountain College traffic signal at the intersection of Highway 82 and County Road 154.

The CTFs and the RFRHA Policy Committee debated rail alignment options at length. The debate centered on the need to serve developed areas of Basalt and El Jebel that were not on the existing rail right-of-way and the extra cost of providing service. Alignment Alternative C was selected because it allowed better and easier transit access from existing communities and would not promote development in rural areas along the existing rail right-of-way.

➔ **Comparative Screening, Selected Alignment Alternative:** Alignment C

Prior to the Comparative Screening, Alignment Alternative C included a number of alignment sub-alternatives. A decision was made by the RFRHA Policy Committee during screening to eliminate the Woody Creek (Brush Creek Road crossing) and the eastern Gerbazdale crossing options based on a number of factors from the comparative decision matrix, ranging from environmental to land use issues.

Both sub-alternatives in the Catherine Store area were retained after screening. Option CS1 follows County Road 100 between Highway 82 and the existing rail corridor. Option CS2 crosses between Highway 82 and the rail corridor approximately 1.2 kilometers (.75 miles) south of County Road 100.

Following the completion of the comparative evaluation matrix, each of the CTFs was asked to make a recommendation on the technology and alignment alternative to be further evaluated as the "Locally Preferred Alternative" in the CIS process. Each of the four CTFs voted to recommend rail technology on Alignment C with a crossing at Catherine Store using County Road 100 (Option CS1). This recommendation was accepted by the RFRHA Policy Committee and subsequently endorsed by the RFRHA Board in late 1999.

Table II-6
CTF Final Recommendation*

- Rail technology
- Alignment C using County Road 100 to Catherine Store

**Adopted by RFRHA Board – 1999*

3.4 Conclusion of Screening Process

In November 2000 voters in Aspen, Snowmass Village, Basalt, Carbondale, Glenwood Springs, Pitkin County, and Eagle County voted to approve the formation of the Roaring Fork Transportation Authority (RFTA) as a Rural Transportation Authority under Colorado law. Responsibility for the CIS shifted from RFRHA to RFTA as one result of the RFTA Intergovernmental Agreement and public vote.

After discussion with FTA, FHWA, and CDOT staff and public outreach including meetings with the CTF members, presentations to local Boards and Commissions, and Open Houses in Glenwood Springs, Carbondale, Basalt, and Aspen, the Study Team recommended that RFTA include a Bus Rapid Transit (BRT) Alternative in the CIS. The BRT Alternative would be developed based upon the analysis conducted earlier in the screening process for the "Improved Bus/TSM" Alternative. The Study Team further recommended that the CIS evaluate a No Action/ Committed Projects Alternative, a BRT Alternative, and a Rail Alternative without designating any Alternative as "Locally Preferred." The RFTA Board, in its Resolution 2002-05, concurred with these recommendations.

In conclusion, two general transit technologies were carried forward from the screening process. Those two technologies are:

- Self-propelled buses
- Rail vehicles

The alternatives described in subsequent sections of this document make two types of provisions for transit:

- Both the No Action/Committed Projects and Bus Rapid Transit (BRT) alternatives provide for the use of self-propelled RFTA buses on the existing Highway 82 corridor.
- The Rail Alternative provides for rail vehicles utilizing portions of the existing RFTA right-of-way and portions of the Highway 82 corridor in addition to self-propelled buses serving a feeder function for the rail alignment.

C. DEFINITION OF CIS ALTERNATIVES

The following is a detailed description of each of the three alternatives evaluated in this CIS. Unless otherwise identified, all the alternatives include "committed" or currently approved transportation projects in the Project Corridor between now and the year 2025. Table II-7, Build Alternatives – Locations and Lengths (following page), provides an overview of the location of each alternative in the Project Corridor. Appendix B contains a detailed series of Project Corridor maps identifying the proposed trail locations, the Rail Alternative (Alignment C), Highway 82 (location for BRT Alternative), and new station locations.

1. No Action/Committed Projects Alternative

This alternative assumes that only "committed" or currently approved transportation projects are constructed in the corridor between now and the year 2025.

The CIS, which commenced in 1998, assumes the findings of the 1998 *Entrance to Aspen ROD* for the purpose of comparing long-range alternatives for the future of transit in the RFTA service area. The findings of the *Entrance to Aspen ROD* are applied the same way for all alternatives in this comparative process. The citizens of Aspen and Pitkin County have expressed their desires regarding the Entrance to Aspen in many advisory and binding votes over the years. RFTA recognizes that since the *Entrance to Aspen ROD* was released in 1998, these votes have indicated a preference by the majority of voters to retain the existing alignment of the Highway.

Once RFTA selects a preferred alternative for its long-range transit plan, RFTA will work with member jurisdictions and its partners at CDOT, FTA, and FHWA to develop projects and programs that support the long-range vision of improved transit, and are respectful of the desires of RFTA communities. This will include working with the City of Aspen, Pitkin County, and CDOT to develop projects and programs within the Entrance to Aspen area that are consistent with the stated desires of the community. All references to the *Entrance to Aspen ROD* should be considered in this context.

1.1 Physical Characteristics

1.1.1 Alignment. The No Action/Committed Projects Alternative assumes continuation of transit service per the RFTA Transit Development Plan (TDP). The highway platform used by RFTA assumes the following:

1. Four general-purpose lanes on Highway 82 from Glenwood Springs to Basalt.

2. Construction of two additional lanes from Basalt to Buttermilk Ski Area with one eastbound lane used for high occupancy vehicles (HOVs) during the a.m. peak and one westbound lane used for HOVs during the p.m. peak hours per the *Basalt to Buttermilk ROD.*
3. Construction of a two-lane parkway from the Buttermilk Ski Area to the intersection of 7th Street and Main Street in Aspen per the *Entrance to Aspen ROD.*
4. Construction of light rail transit from the Pitkin County Airport to Rubey Park in Aspen **<u>or</u>** construction of a dedicated two-lane busway if light rail is not funded by the local governments per the *Entrance to Aspen ROD*.
5. Construction of a new bridge over the Roaring Fork River in South Glenwood Springs. Environmental impact analysis has been completed for the Glenwood Springs Alternate Route, also known as the South Glenwood Connector. The City and CDOT have constructed the road, Midland Avenue, in segments. This bridge and segment are undergoing final design.
6. Placement of New Traffic Signals at 7th Street, 5th Street, 3rd Street, and Garmisch Street per the *Entrance to Aspen ROD*.
7. Improvements to various bicycle and pedestrian trails between Basalt and Aspen per the *Basalt to Buttermilk ROD* and *the Entrance to Aspen ROD*.

Table II-7
Build Alternatives - Locations and Lengths

Location	Highway 82 Milepost	RFTA Mile Marker	Description	Trail Location	BRT Location	Rail Location
West Glenwood Springs	--	--	Rail Alternative begins: UPRR ROW, Midland Avenue South of I-70	--	--	UPRR ROW
Glenwood Springs	0	--	Highway 82 begins at I-70	--	Highway 82 ROW	UPRR ROW
Downtown Glenwood Springs	--	360.4	RFTA ROW begins in Wye	--	Highway 82 ROW	RFTA ROW
Downtown Glenwood Springs	1.4	361.7	Trail Begins	Begins 23rd St	Highway 82 ROW	RFTA ROW
Catherine Store	15.4	376.1	Catherine Store Area	RFTA ROW	Highway 82 ROW	Shift to Highway 82 ROW via CR 100
Wingo Junction	24.7	385.0	Wingo Area	RFTA ROW	Highway 82 ROW	Return to RFTA ROW
Gerbazdale	30.2	391.2	Gerbazdale Area	RFTA ROW	Highway 82 ROW	Return to Highway 82 ROW
Woody Creek	33.4	393.7	Trail ends	Ends Woody Creek	Highway 82 ROW	Highway 82 ROW
Pitkin County Airport	37.3	--	BRT and Rail use LRT ROW	--	LRT ROW	LRT ROW
Downtown Aspen	--	--	BRT Alternative ends on LRT Line via Monarch – Durant	--	LRT ROW	--
Downtown Aspen	41.289	--	Rail Alternative ends: Main Street & Hunter	--	--	Return to Highway 82 ROW

Length of Corridor Segments by Type

Union Pacific Railroad Right-of-Way	3.2 km (2 miles)
RFTA Right-of-Way	53.6 km (33.3 miles)
Highway 82 (Glenwood Springs to Aspen)	66.5 km (41.3 miles)
New Rio Grande Trail	51.5 km (32 miles)
Rail Alternative, total length	72.7 km (45.1 miles)

Rail Alternative, consecutive segments, Glenwood Springs to Aspen

• Union Pacific Railroad	3.2 km (2 miles)
• RFTA	25.3 km (15.7 miles)
• County Road 100	1 km (0.6 miles)
• Highway 82	15 km (9.3 miles)
• RFTA	10 km (6.2 miles)
• Highway 82	11.4 km (7.1 miles)
• LRT	6.4 km (4 miles)
• Main Street (Highway 82)	.3 km (.2 miles)

1.1.2 Access Control. Access control to Highway 82 is the responsibility of CDOT and is governed by the *State Highway Access Code* (CDOT, 1998). Within the city limits of Glenwood Springs and Aspen, Highway 82 is designated as a "Non-Rural Arterial (NR-B)." The rest of the highway is designated "Rural Regional Highway (R-A)." *The Roaring Fork Railroad Access Control Plan* (Otak, 1999) provides more detail on access control in the Project Corridor.

1.1.3 Typical Sections. Highway 82 is a four-lane highway with either a center median or a continuous left-turn lane, depending upon location. Committed improvements to Highway 82 are listed under **1.1.1 Alignment** above.

1.1.4 Station Locations and Conceptual Design. The No Action/Committed Projects Alternative does not include any new transit station locations other than those addressed in the Basalt to Buttermilk or Entrance to Aspen projects.

1.1.5 Vehicles. The No Action/Committed Projects Alternative assumes the use of the existing RFTA bus fleet and additional buses purchased by RFTA per the TDP. Cleaner and more environmentally friendly alternative propulsion technologies will be implemented when feasible.

1.1.6 Park-and-Ride Facilities. A total of 6,700 park-and-ride spaces were proposed in the No Action/Committed Projects Alternative per the *Basalt to Buttermilk* and *Entrance to Aspen RODs*. The spaces were allocated as follows:

- 450 spaces at Glenwood Springs (new)
- 500 spaces at Carbondale (new)
- 500 spaces at El Jebel (125 existing, 375 new)
- 500 spaces at Basalt (101 existing, 399 new)
- 400 spaces at Brush Creek Road (200 existing, 200 new)
- 750 spaces at Buttermilk (new)
- 3,600 spaces at Pitkin County Airport (150 existing; 3,450 new)

It is apparent from the parking space allocation that planning for these projects assumed that most drivers would drive as far east as possible before transferring to transit to complete their trip into Aspen. Transportation modeling for the current project forecasts that a greatly reduced number of park-and-ride spaces – 3,290 – will be needed by 2025 for the No Action/Committed Projects Alternative. See **Chapter IV.C.4: Transportation Transit Parking** for additional information. Regardless, the spaces noted above have been committed and adjustments can be made as needed at a future date.

1.1.7 Storage and Maintenance Facilities. The No Action/Committed Projects Alternative includes the existing bus maintenance and storage facilities in Glenwood Springs, Carbondale, and Aspen.

1.2 Operating Characteristics

1.2.1 HOV Policies. Highway 82 includes directional peak-hour HOV lanes between Basalt and Buttermilk. The outer eastbound lane operates as a two-passenger HOV lane between 6:00 and 9:00 a.m. Monday through Friday. The outer westbound lane operates as a two-passenger HOV lane between 3:00 and 6:00 p.m. Monday through Friday. The outer (right) lanes are designated HOV lanes to provide for convenient access to transit stops along the highway.

The *Entrance to Aspen ROD* calls for construction of light rail transit from the Pitkin County Airport to Rubey Park in Aspen **or** construction of a dedicated two-lane busway if light rail is not funded by the local governments. The busway would be designated for RFTA buses only at all hours.

1.2.2 Guideways (Hours, Roadways, Speed). RFTA bus services as described in the RFTA Transit Development Plan (TDP) would operate on Highway 82, city streets, and county roads. It is assumed that transit capacity will expand on the routes identified in the TDP to the extent that RFTA's current bus fleet can accommodate demand. Demand that cannot be accommodated by RFTA's current bus fleet is assumed to use other available modes. If light rail is constructed per the *Entrance to Aspen ROD*, Downvalley bus passengers would transfer to/from light rail at the Buttermilk Transit Station. RFTA currently operates both 12.2 meter (40-foot) standard diesel coaches and 19.8 meter (65-foot) articulated diesel coaches. Buses run at highway speeds, subject to congestion, accidents, and inclement weather. Table II-8 describes service frequency for various routes.

Table II-8
Year 2025 No Action/Committed Projects
Transit Route Definition

Description	Service Frequency (peak/off-peak)
Rifle to Glenwood Springs	60/---
Glenwood Springs to Buttermilk Express	60/60
Glenwood Springs to Buttermilk	30/30
El Jebel to Buttermilk Express	30/30
El Jebel to Buttermilk	30/30
Carbondale to Buttermilk Express	30/30
Carbondale to Buttermilk	30/30
Basalt to Buttermilk Express	30/30
Basalt to Buttermilk	30/30
LRT (Aspen Airport to Rubey Park)	15/30
LRT (Rubey Park to Aspen airport)	15/30

1.2.3 Feeder Bus Operations. The No Action/Committed Projects Alternative does not include any feeder bus service. RFTA routes do interact with local bus service in Glenwood Springs Snowmass Village, and Aspen.

1.2.4 Background Bus Service. The bus service described in the TDP is the background bus service for the Project Corridor.

1.2.5 Fare Policy/Pricing. The fare policies and pricing of the TDP apply to the No Action/Committed Projects Alternative. Implementation of incremental Transportation Management (TM) in Aspen to maintain traffic at 1994 levels per the *Entrance to Aspen ROD* may impact local investment in transit service and/or the cost of driving a single occupant vehicle to/from Aspen.

1.2.6 Transportation Management Program. The No Action/Committed Projects Alternative includes the incremental TM program identified for Aspen in the *Entrance to Aspen ROD*. This program is designed to meet the local "Quality of Life Goal" of maintaining traffic entering the City of Aspen at 1994 levels. Managed by the City of Aspen, the program includes disincentives for use of the single-occupant automobile such as paid parking, and incentives for the use of transit such as public investment in transit operations. The TM program is incremental in that traffic volumes are measured monthly, and incrementally more aggressive TM measures are applied as traffic levels increase. Through proactive management of parking, investment in transit, and partnerships with the private sector, the City has been able to meet its policy goal of no growth in traffic since 1994.

The other two alternatives assume the No Action/Committed Projects Alternative as a starting point. In other words, all of the No Action/Committed Projects Alternative improvements are assumed to be constructed, as well as the additional improvements described in the alternative. However, portions of the No Action/Committed Projects Alternative may not be necessary because of other improvements proposed in the Build alternatives. For example, some park-and-rides may be unnecessary, or smaller than those committed in the No Action/Committed Projects Alternative.

2. Bus Rapid Transit (BRT) Alternative + Trail

What is Bus Rapid Transit? *(Excerpt from the Bus Rapid Transit website, sponsored by the United States Federal Transit Administration [FTA] Office of Research, Demonstration, and Innovation)* Low-cost investments in infrastructure, equipment, operational improvements, and technology can provide the foundation for Bus Rapid Transit systems that substantially upgrade bus system performance. Conceived as an integrated, well-defined system, BRT would provide for significantly faster operating speeds, greater service reliability, and increased convenience, matching the quality of rail transit when implemented in appropriate settings. Improved bus service would give priority treatment to buses on urban roadways and would be expected to include some or all of the following features:

- **Bus lanes.** A lane on an urban arterial or city street is reserved for the exclusive or near-exclusive use of buses.
- **Bus streets and busways.** A bus street or transit mall can be created in an urban center by dedicating all lanes of a city street to the exclusive use of buses.
- **Bus signal preference and pre-emption.** Preferential treatment of buses at intersections can involve the extension of "green time" or actuation of the green light at signalized intersections upon detection of an approaching bus. Intersection priority can be particularly helpful when implemented in conjunction with bus lanes or streets, because general-purpose traffic does not intervene between buses and traffic signals.
- **Traffic management improvements.** Low-cost infrastructure elements that can increase the speed and reliability of bus service include bus turnouts, bus boarding islands, and curb realignments.
- **Faster boarding.** Conventional on-board collection of fares slows the boarding process, particularly when a variety of fares is collected for different destinations and/or classes of passengers. An alternative would be the collection of fares upon entering an enclosed bus station or shelter area prior to bus arrivals. This system would allow passengers to board through all doors of a stopped bus. A self-service or "proof-of-payment" system also would allow for boarding through all doors, but poses significant enforcement challenges. Prepaid "smart" cards providing for automated fare collection would speed fare transactions, but would require that boarding remain restricted to the front door of the bus.

  Changes in bus or platform design that could provide for level boarding through the use of low-floor buses, raised platforms, or some combination thereof, could make boarding both faster and easier for all passengers.

- **Integration of transit development with land use policy.** BRT and compact, pedestrian-oriented land use development are mutually supportive. The clustering of development has the additional benefit of conserving land and promoting the vitality of neighborhoods and urban commercial centers. BRT can be most effective when integrated within a broader planning framework encompassing land use policies, zoning regulations, and economic and community development.

- **Improved facilities and amenities.** The operational and travel time benefits resulting from the separation of buses from general-purpose traffic can be augmented with improved amenities such as bus shelters and stations. These facilities provide protection from the elements and can also be equipped to furnish information such as printed routes and schedules or electronically transmitted real-time schedule data. Space can also be leased to commercial convenience services.

The BRT system proposed for the Project Corridor would operate in general travel lanes with bus signal preference and pre-emption between Glenwood Springs and Basalt and in peak-hour HOV lanes between Basalt and Aspen. The BRT Alternative combines intelligent transportation systems technology, priority for transit, cleaner and quieter vehicles, rapid and convenient fare collection, and integration with local land use policy.

There are two BRT Alternatives:

- **BRT-Bus.** The BRT-Bus Alternative assumes that bus routes to/from the rest of the Project Corridor would operate between Buttermilk and Aspen on a dedicated two-lane busway enhanced with ITS technology. These bus routes would terminate at the Rubey Park Transit Station in downtown Aspen.
- **BRT-LRT.** The BRT-LRT Alternative assumes a cross-platform transfer to the Entrance to Aspen light rail system at the Buttermilk Transit Station if light rail is funded by the local government(s). Bus routes under the BRT-LRT Alternative would terminate at the Buttermilk Transit Station. Passengers would use light rail to access the Rubey Park Transit Station in downtown Aspen.

2.1 Features

Note: Super Express bus service is only associated with the BRT alternatives.

1. Direct, non-stop, peak-hour Super Express bus and all-day Express bus service between Aspen and other communities in the Project Corridor. Super Express buses load at the transit stations in each downvalley community and proceed nonstop to Aspen. For example, the Carbondale Super Express would load at the downtown Carbondale transit station and at the Highway 133 transit station and then proceed nonstop to Aspen. Express buses would provide service primarily in the Highway 82 corridor. Express buses would only stop at the transit centers in West Glenwood Springs, downtown Glenwood Springs, South Glenwood Springs, Colorado Mountain College, Highway 133, El Jebel, Basalt, Brush Creek, Pitkin County Airport, Buttermilk, and downtown Aspen. Patrons would access the transit centers by walking, using the park-and-rides described below, or via local circulator bus service described below.
2. New or enhanced transit stations (heating, bathrooms, etc.) at Aspen, Snowmass Village, Rodeo Lot, Brush Creek, Basalt, El Jebel, Carbondale, Highway 133, Colorado Mountain College, South Glenwood Springs, downtown Glenwood Springs, and West Glenwood Springs.

3. State-of-the-art ITS technology, including signal pre-emption, queue bypass lanes, incident management, system/operator information, real-time traveler information systems, platform fare collection, smart card system.
4. New alternative fuel and, where appropriate, low-floor vehicles for Express and feeder service.
5. New or enhanced maintenance facilities.
6. Valley-wide transportation management program, including carpool/vanpool program, employer outreach, advertising, user incentives, and public information.
7. New feeder bus service in El Jebel, Basalt, Carbondale, Glenwood Springs and to the west in the I-70 corridor.

2.2 Physical Characteristics

2.2.1 Alignment. Buses would operate on Highway 82 in mixed traffic between Glenwood Springs and Basalt and on the peak-hour HOV lanes between Basalt and Buttermilk. Construction of queue bypass lanes for buses is proposed at five signal locations (Colorado Mountain College, Highway 133, El Jebel Road, Two Rivers Road, and Brush Creek Road) to optimize bus transit in the existing Highway 82 alignment.

Additional enhancements to the Highway 82 alignment include:

1. Queue bypass lanes for buses.
2. Modification of traffic signals to provide and respond to real-time traffic information and to provide transit vehicle priority.
3. Installation of one new Remote Traffic Microwave Sensor (RTMS) along Highway 82 to provide traffic volumes, travel speeds, and occupancy.
4. Development of an incident management program that establishes policies and procedures, agency responsibilities and communication, and identifies various technologies and strategies to decrease time to clear incidents.
5. A Variable Message Sign system to alert motorists to changing conditions in the Project Corridor.
6. A Wildlife Warning Reflector System with reflectors that direct the headlights of approaching vehicles at animals desiring to cross the road
7. Video Surveillance to monitor traffic conditions to alert enforcement agencies and provide information to the RFTA website.

2.2.2 Access Control. The BRT Alternative provides for the development with CDOT of an Access Control Plan to minimize conflicts with Highway 82 traffic by limiting the number of access points to Highway 82 from local roads. *The Roaring Fork Railroad Access Control Plan* (Otak, 1999) provides more detail on access control in the Project Corridor.

2.2.3 Typical Sections. The BRT Alternative will operate on the Highway 82 platform described in the No Action/Committed Projects Alternative as modified above under **2.2.1 Alignment**. No change in typical section is proposed.

2.2.4 Station Locations and Conceptual Design. New transit stations are proposed at West Glenwood Springs, downtown Glenwood Springs, South Glenwood Springs, Colorado Mountain College, Highway 133, downtown Carbondale, El Jebel, and Basalt. Enhancement or replacement of transit stations at Brush Creek Road and the Rodeo Lot, Snowmass Village, is also proposed. Replacement or enhancement of Aspen's Rubey Park station is proposed for BRT-Bus only. Stations would be designed to incorporate platform fare collection, fast-loading platforms, and real-time traveler information systems. Figure II-6 illustrates locations for transit stations and park-and-ride lots for this alternative. See Table II-9 for a complete listing of transit station locations for all alternatives Figures II-7 through II-16 illustrate representative station designs for the entire Project Corridor.

Table II-9
West Glenwood Springs to Aspen CIS - Transit Station Locations

Location	Hwy 82 Milepost	RFTA Mile Marker	Entrance to Aspen Station	BRT Station Location	Rail Station Location
● West Glenwood - Midland South of I-70	--	--	--	Yes	Yes
● Downtown - wye & 8th	--	361.4	--	Yes	Yes
● South Glenwood Springs - (just East of Holy Cross Electric)	3.7	364.0	--	Yes	No
● Colorado Mtn College - at Highway 82 and CR 54	6.7	367.0	--	Yes	No
● Carbondale at Highway 133	--	372.2	--	Yes	Yes
● Carbondale at 4th & Colorado	--	373.0	--	Yes	Yes
● El Jebel - El Jebel Road *Or* El Jebel - Willits Lane	19.0 *or* 19.5	--	--	Yes	Yes
● Basalt at Midland Avenue (just West of Texaco)	23.0	--	--	Yes	Yes
■ Snowmass Village Transit Center at the Snowmass Mall	--	--	TOSV [1]	Replace/ Enhance	Replace/ Enhance
■ Brush Creek Road Station	35.2	--	Buttermilk to Basalt [2]	Replace/ Enhance	Replace/ Enhance
■ Rodeo Lot at Brush Creek/ Owl Creek Intersection	38.4	--	TOSV [3]	Replace/ Enhance	Replace/ Enhance
◆ Pitkin County Airport Station	37.3	--	Yes	Yes	Yes
◆ Buttermilk Station	38.8	--	Yes	Yes	Yes
◆ Maroon Creek Road	39.8	--	Yes	Yes	Yes
◆ 7th and Main	40.5	--	Yes	Yes	Yes
◆ 3rd and Main	40.7	--	Yes	Yes	Yes
■ Main Street at Paepcke Park	41.0	--	Pre-ETA [4]	Replace/Enhance BRT-Bus only	No
◆ Monarch	41.1	--	Yes	BRT-LRT only	No
● Main Street - Galena to Spring	41.2	--	No	No	Yes
◆ Rubey Park	--	--	Yes	Yes	No

● New stations studied in detail in the current CIS

■ Stations existing prior to *Entrance to Aspen ROD*, to be replaced or enhanced.

◆ Stations identified in the *Entrance to Aspen ROD*

[1] *Not in* Entrance to Aspen ROD, *but a project proposed and partially funded by the EOTC and considered a component of the project.*
[2] *Existing transit station cleared in* Basalt to Buttermilk ROD, *with an added station building.*
[3] *Not in* Entrance to Aspen ROD. *A project identified in the* Brush Creek Corridor Study*, Otak, 2000*
[4] *Existing pre-Entrance to Aspen transit stop requested by RFTA for BRT-Bus*

The stations between Buttermilk and Rubey Park will be bus stations for BRT-Bus and LRT stations for BRT-LRT. If the Entrance to Aspen LRT is built, these stations will be constructed as a part of that project. If not, the Buttermilk, 7th & Main, 3rd & Main, and Rubey Park stations will be built as a part of the BRT-Bus Alternative.

Figure II-6: Transit Stations and Park-and-Ride Locations for the Bus Rapid Transit Alternative

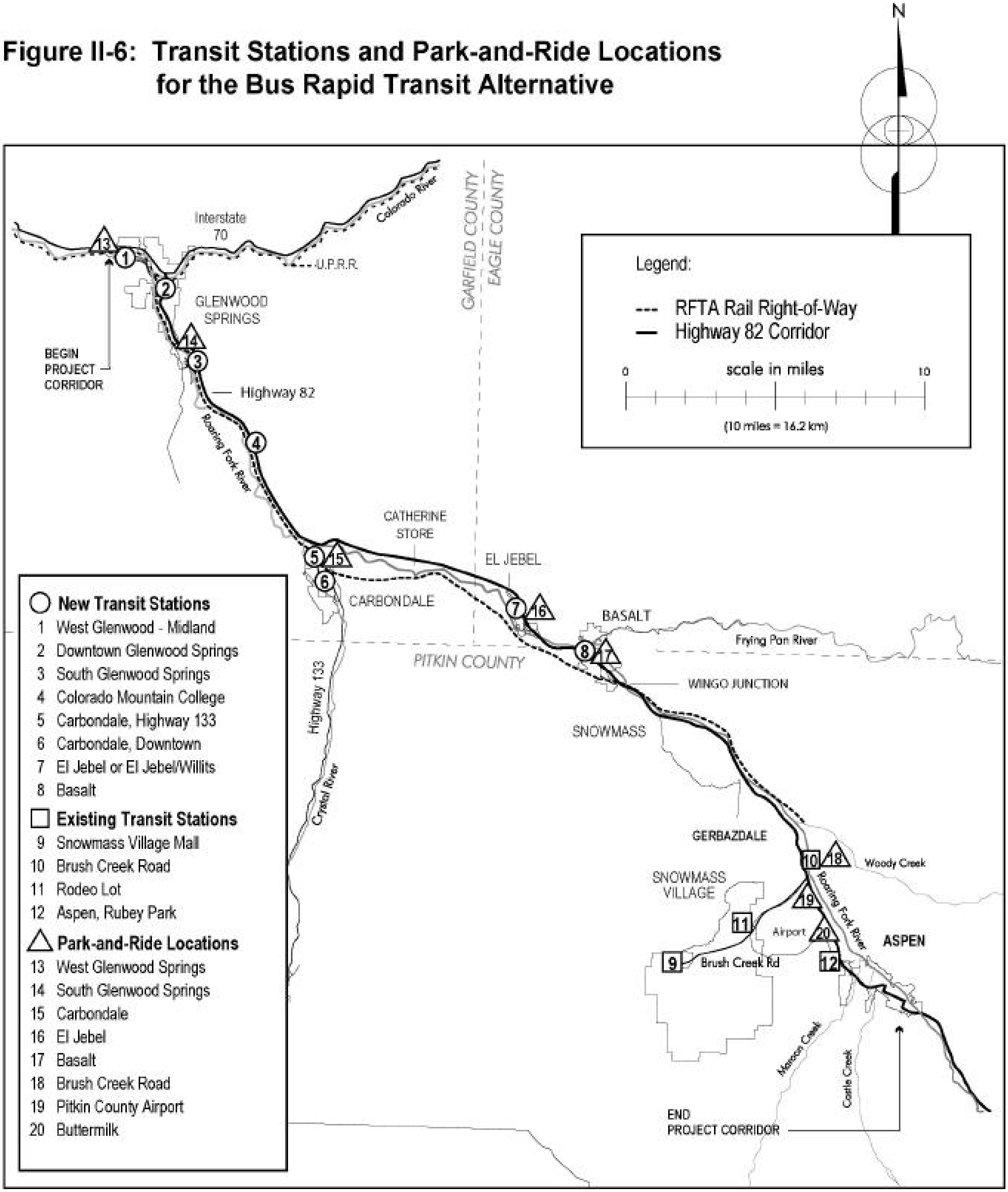


Figure II-7
West Glenwood Springs Station Concept

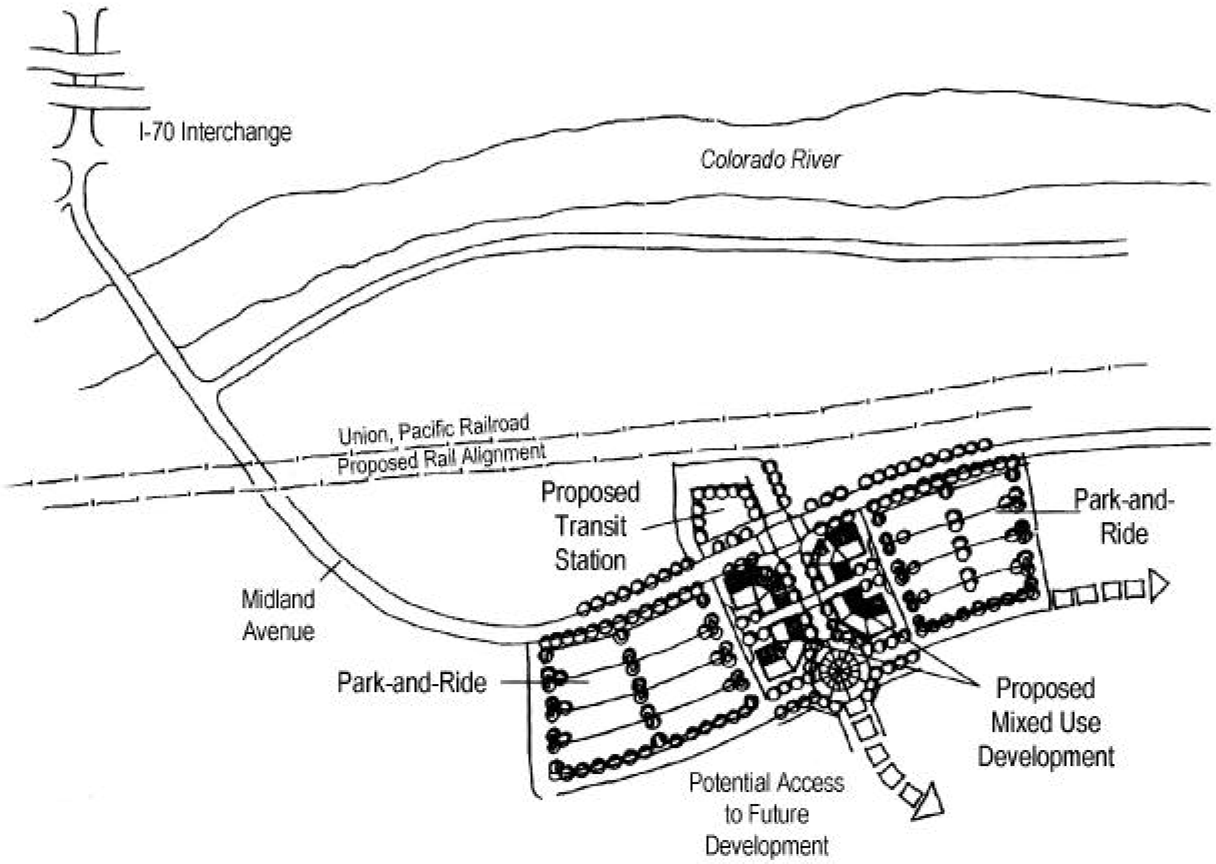


Figure II-8
Downtown Glenwood Springs Station Concept

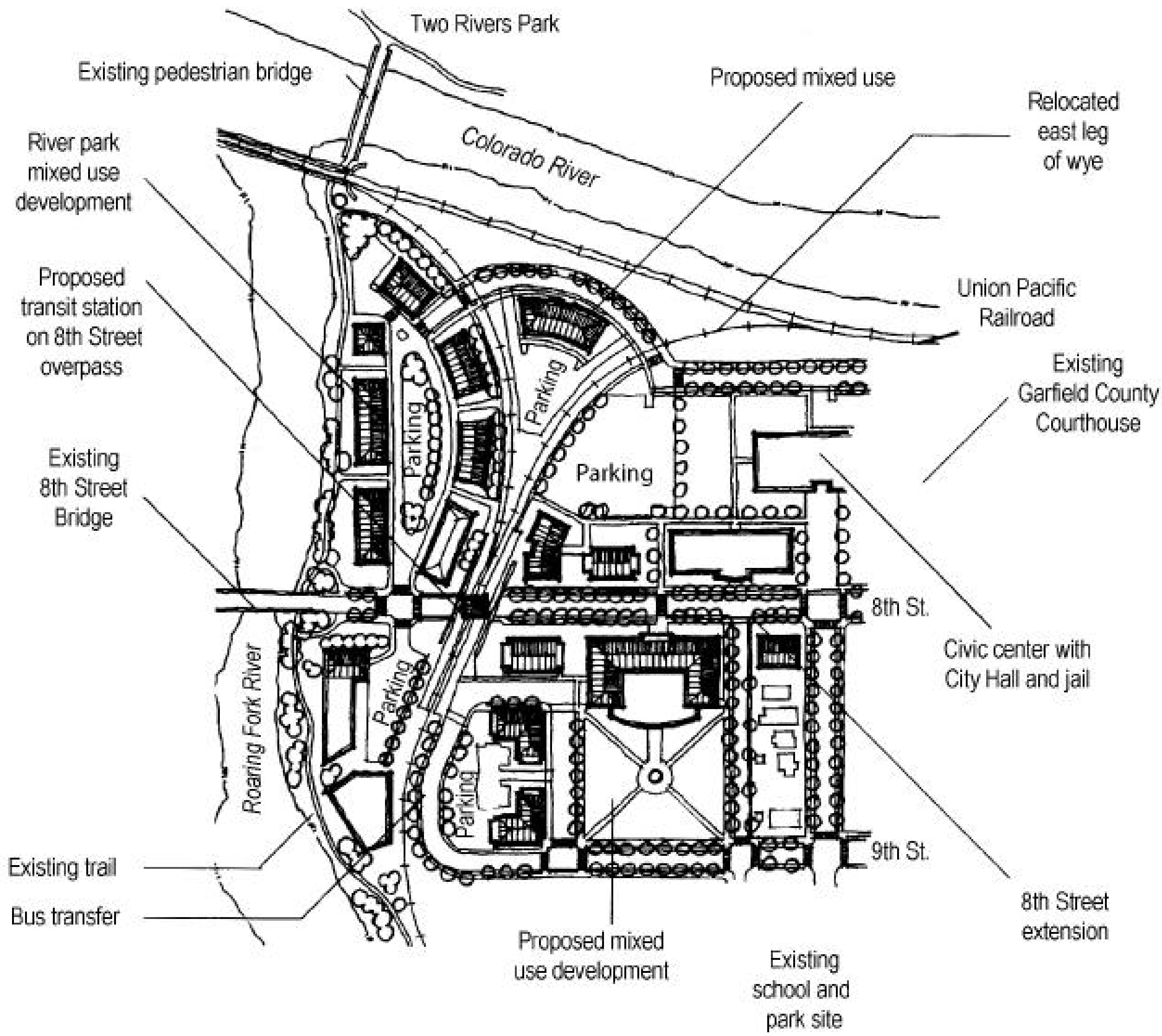


Figure II-9
Carbondale - Highway 133 Station Concept

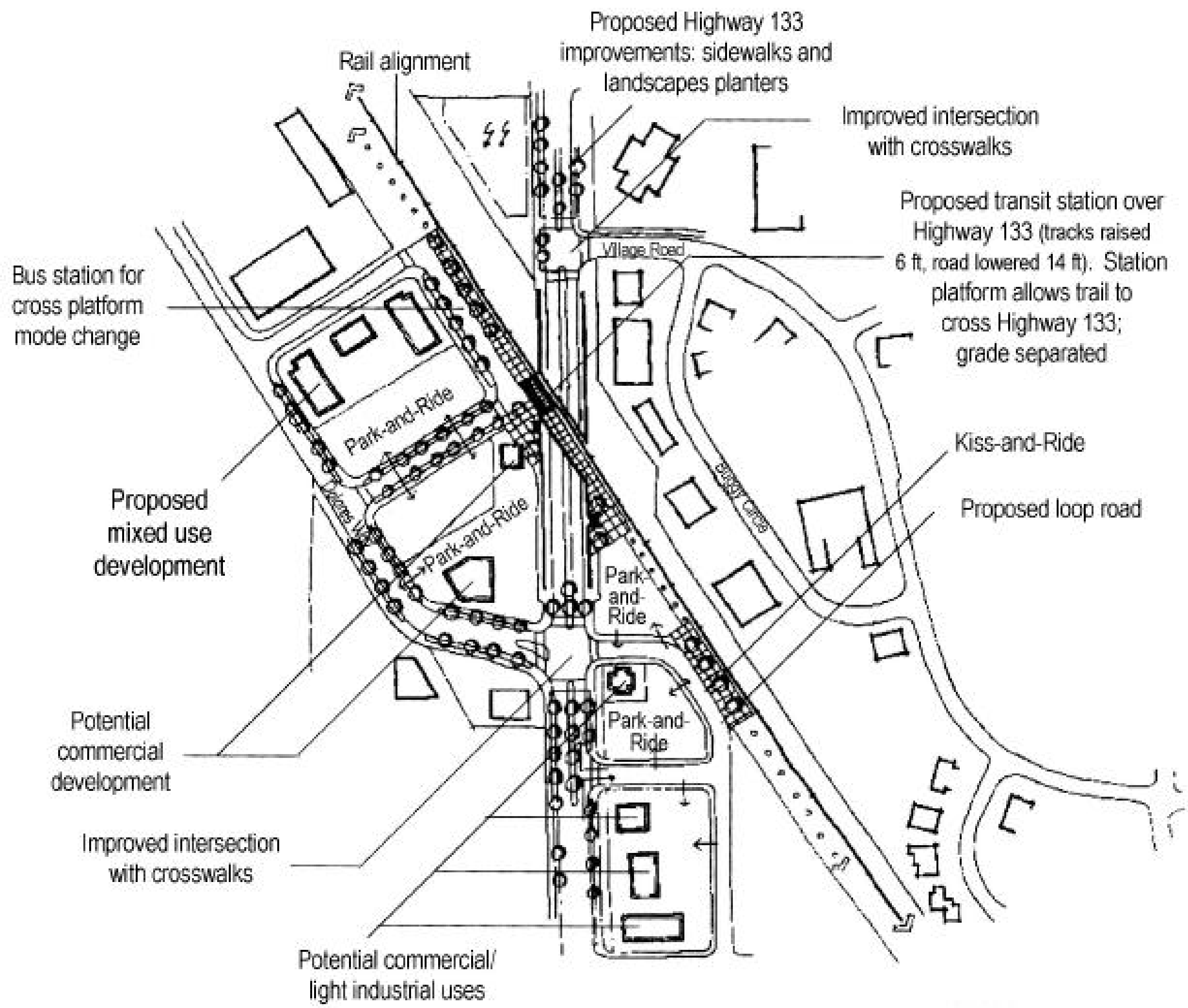


Figure II-10
Carbondale - Downtown Station Concept

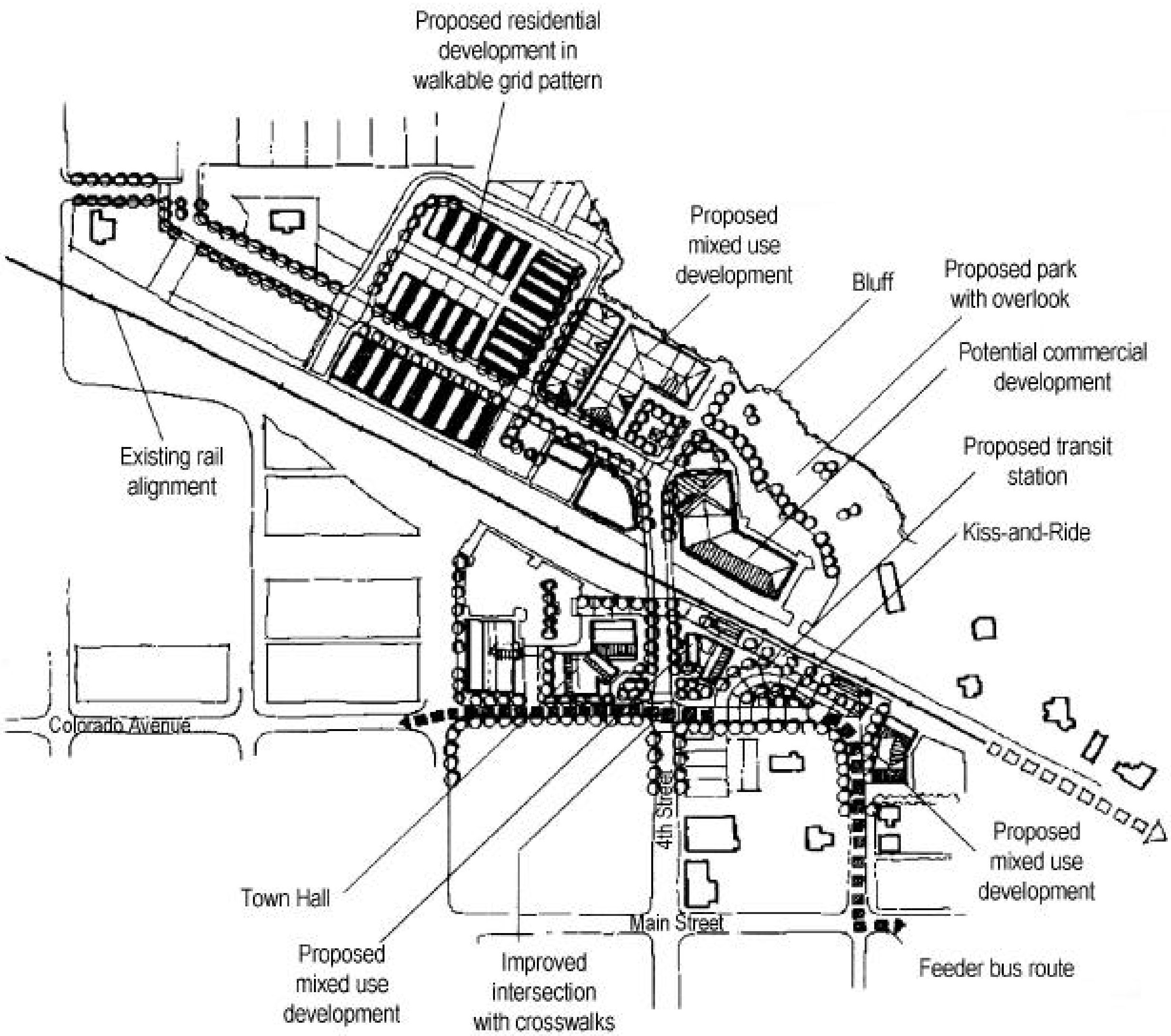


Figure II-11
El Jebel Station Concept

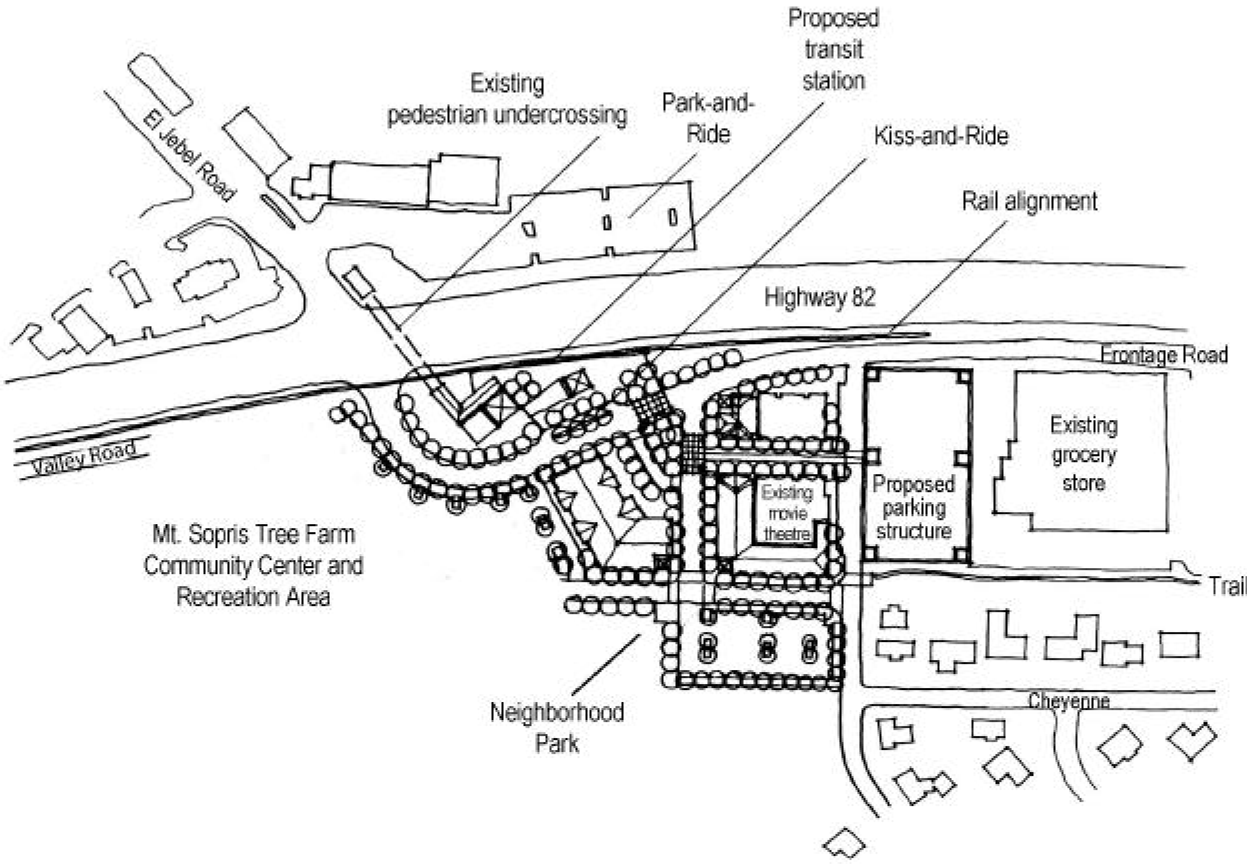


Figure II-12
Willits Lane Station Concept

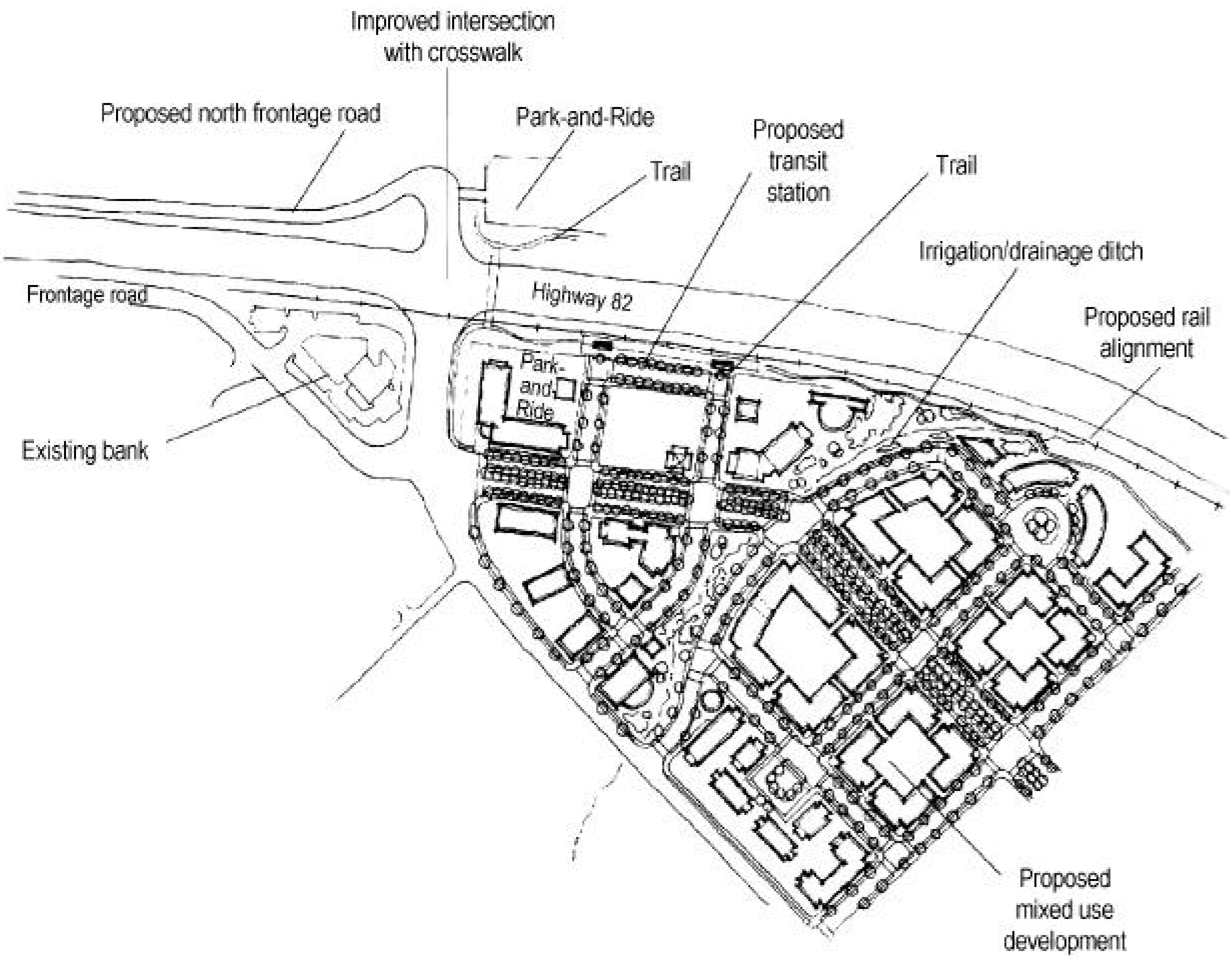


Figure II-13
Basalt Station Concept

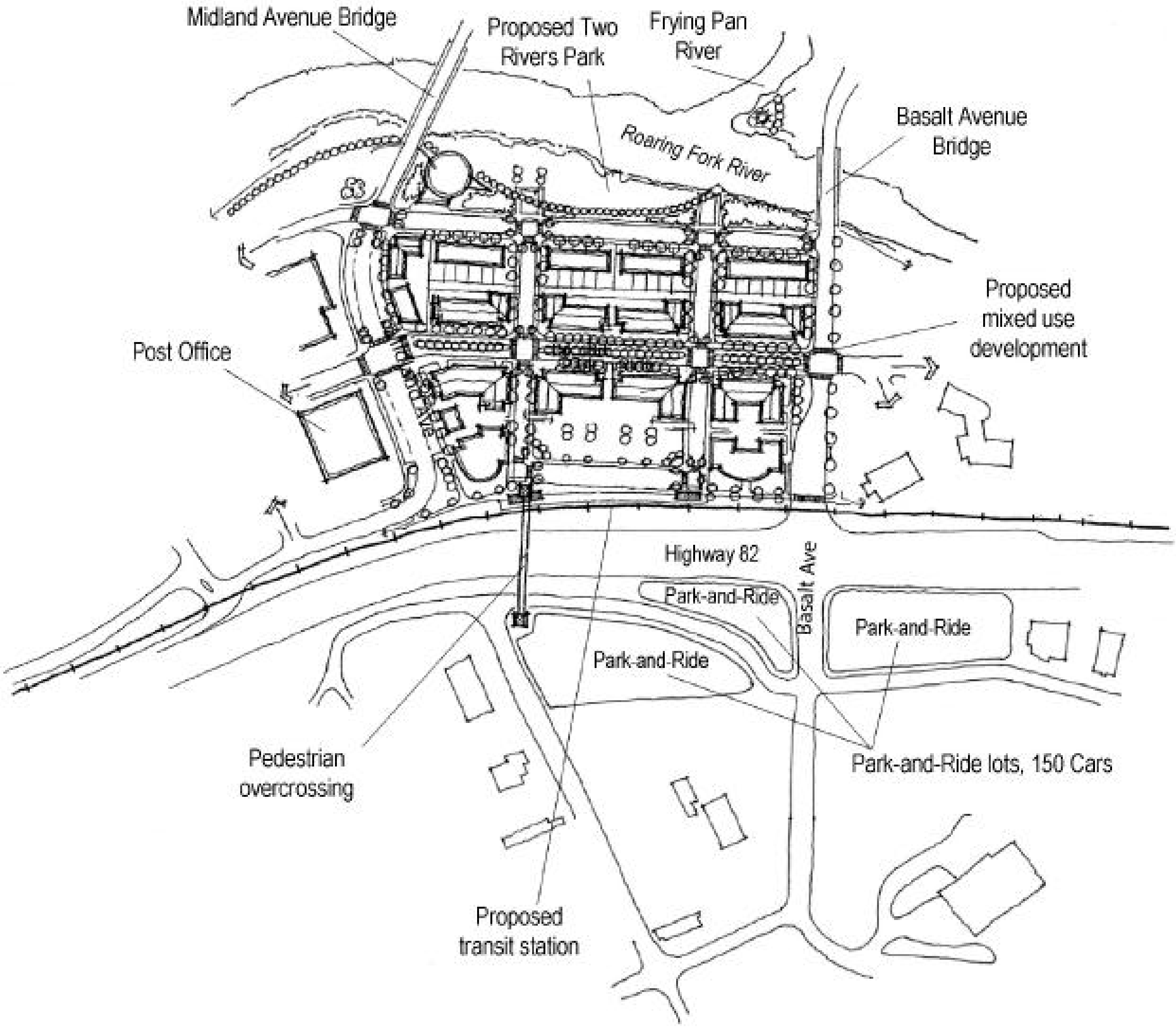


Figure II-14
Brush Creek Road Station Concept

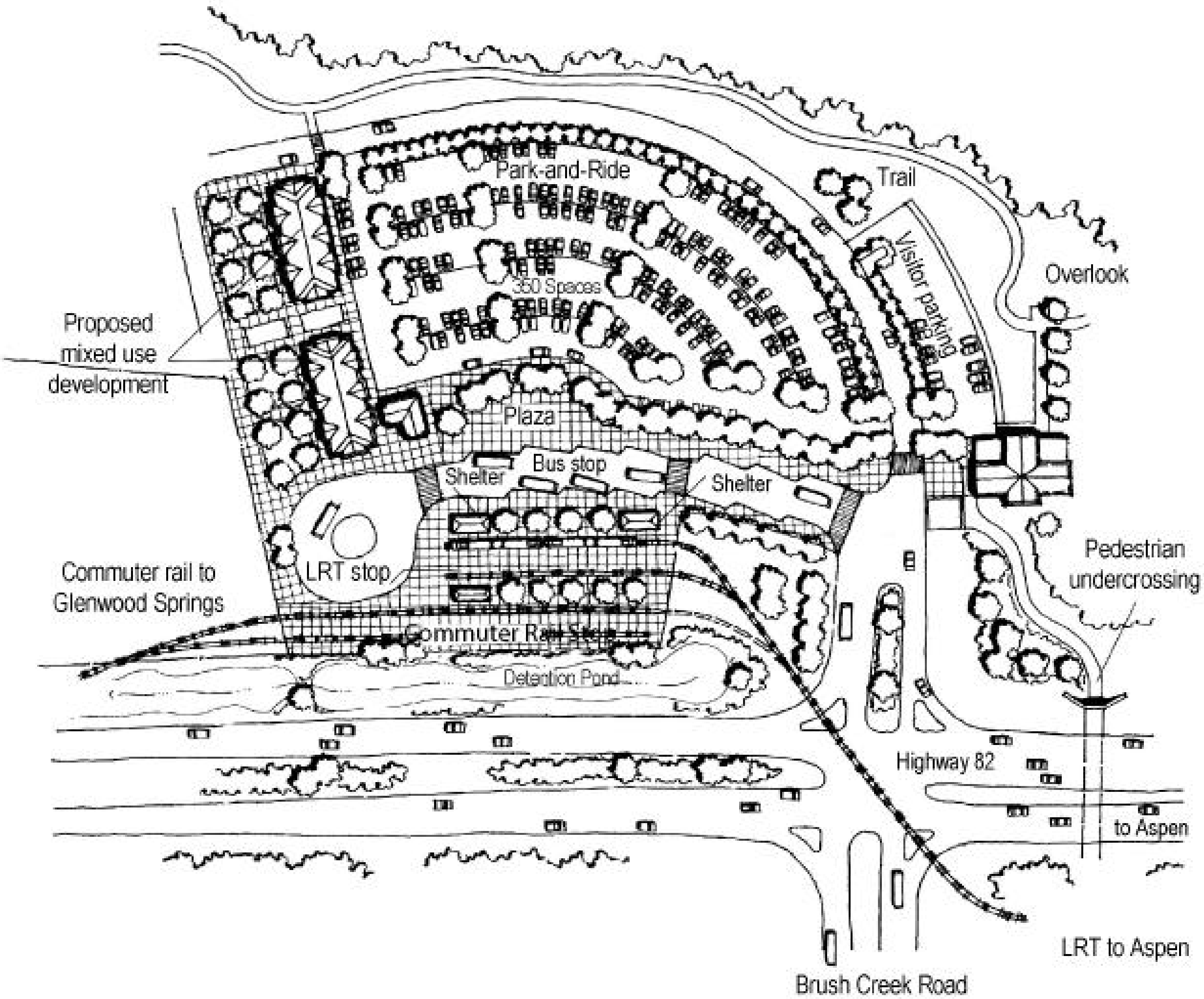


Figure II-15
Airport / AABC Station Concept

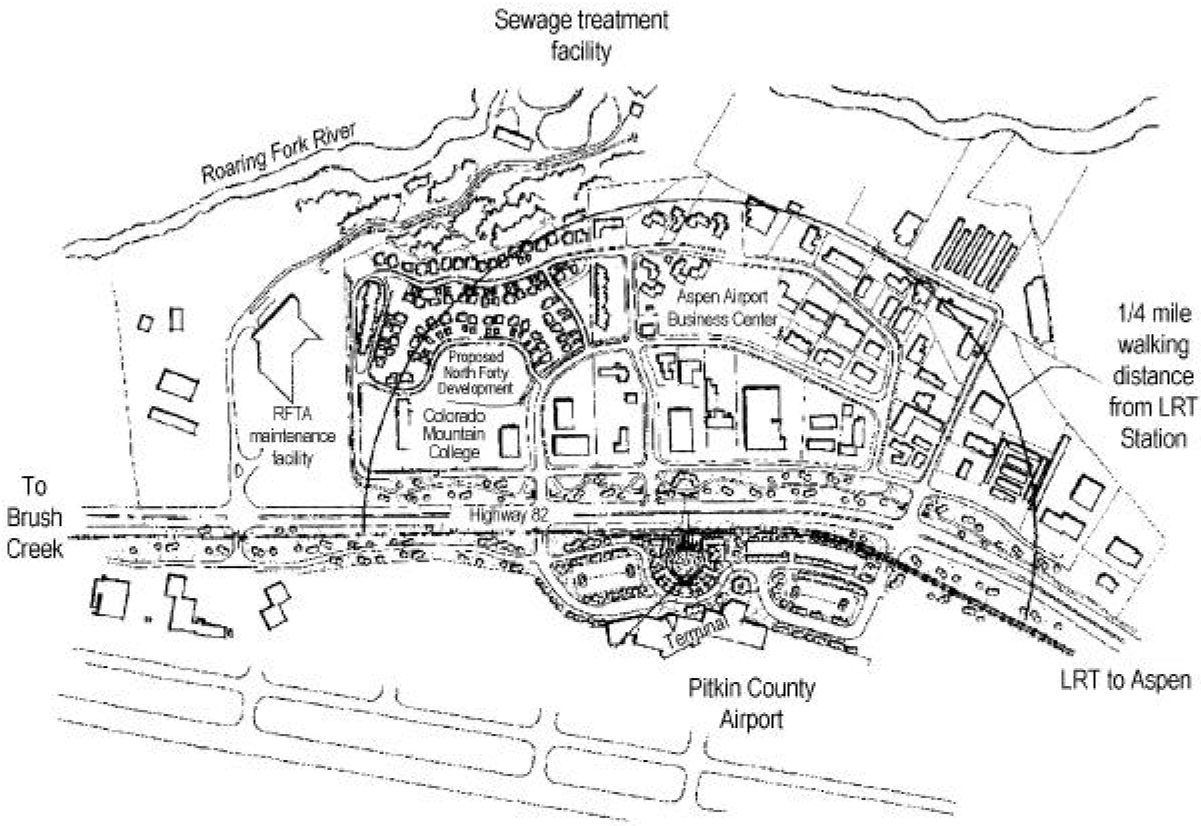
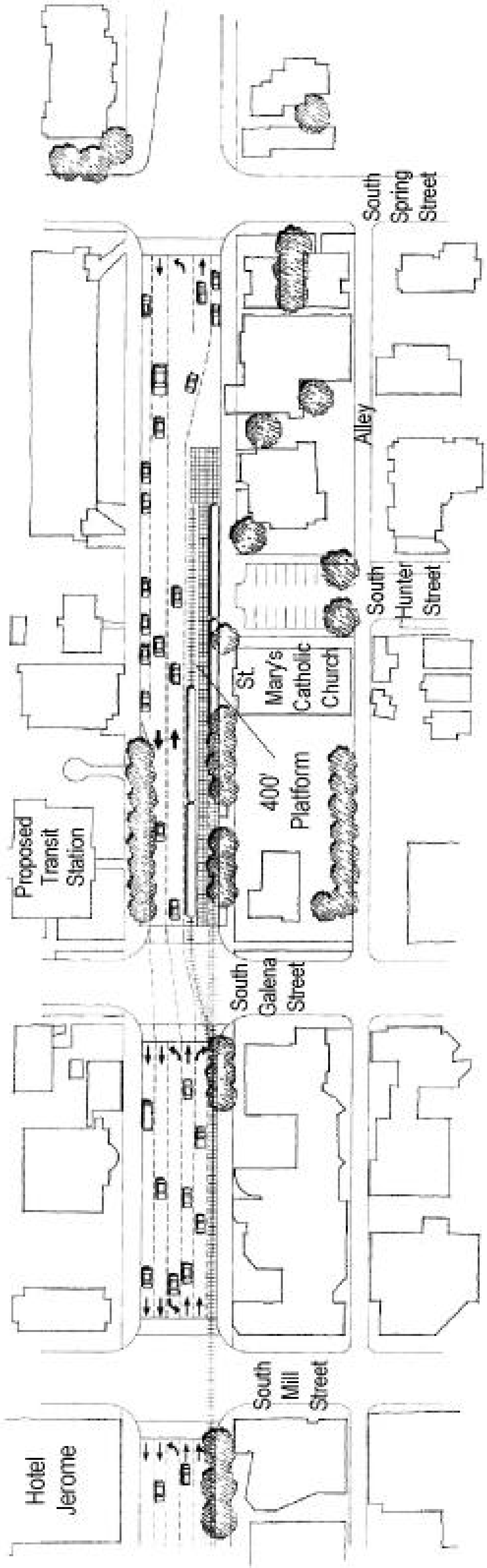


Figure II-16
Aspen Station Concept (Main at Galena)



The BRT Alternative calls for coordination and local regulation of land use around transit stations to encourage transit-oriented development patterns so that transit can serve the Project Corridor even more effectively over time. In addition to the efforts described in the *Transit Oriented Community Design Report* (Otak, 2000) and in the local policies and plans of the governments with jurisdiction over the Project Corridor, the BRT Alternative calls for enhanced pedestrian access to transit via improvements to bicycle and pedestrian trails. Safer and more convenient pedestrian connections to Express and Super Express bus stations (i.e.: grade separations, pedestrian signal indications, and improved lighting) are elements of each transit station plan.

2.2.5 Vehicles. The BRT Alternative assumes a fleet of 19.8 meter (65-foot) articulated alternative fuel coaches for Super Express and Express service and 8.5 meter (28-foot) alternative fuel coaches for feeder/collector service.

2.2.6 Park-and-Ride Facilities. The BRT-Bus Alternative requires a total of 4,140 park-and-ride spaces. The BRT-LRT Alternative requires a total of 3,620 park-and-ride spaces. The provision of high-quality transit service farther west in the Project Corridor when compared to the No Action/Committed Projects Alternative also appears to move the allocation of parking spaces farther west. Comparison of the BRT Alternatives to planned No Action/Committed Projects spaces is noted below:

- 560-600 spaces at West Glenwood Springs (an increase of 110 to 150 spaces)
- 260 spaces at South Glenwood Springs (an increase of 260 spaces)
- 630-800 spaces at Carbondale (an increase of 130 to 300 spaces)

- 360-1,030 spaces at El Jebel (a decrease of 140 to an increase of 530 spaces)
- 410-440 spaces at Basalt, (a decrease of 60 to 90 spaces)
- 140-530 spaces at Brush Creek Road (a decrease of 360 to an increase of 30 spaces)
- 30-260 spaces at Buttermilk (a decrease of 490 to 720 spaces)
- 170-1,280 spaces at Pitkin County Airport (a decrease of 2,320 to 3,430 spaces)

The Glenwood Springs Park-and-Ride described under the No Action/Committed Projects Alternative would be located at the West Glenwood Transit Station to provide direct access to I-70 at the West Glenwood interchange. There is no park-and-ride associated with the downtown Glenwood Springs station. The Carbondale Park-and-Ride would be located at the Highway 133 Transit Station to provide direct access to Highway 133. An additional park-and-ride with 260 spaces is proposed for South Glenwood Springs at the intersection of Highway 82 and the proposed Four Mile Connector, and will be incorporated into the planning and design of the new roadway. Figures II-7 through II-16 provide additional detail regarding the location and layout of representative parking facilities.

2.2.7 Storage and Maintenance Facilities. The BRT Alternative assumes the enhancement of the Glenwood Springs Maintenance Facility to accommodate additional BRT vehicles and reconstruction of the Carbondale Storage Facilities. Twenty-four articulated buses can be stored at the new Glenwood Springs Maintenance Facility. The approximately 0.76 hectares (1.88 acres) of additional storage required for the 103 vehicles that would make up the balance of the year 2025 BRT-Bus fleet (the largest fleet anticipated) would be accommodated by reconstructing the 1.62 hectare (4.0 acre) Carbondale facility. Both facilities will accommodate the larger fleet, the alternative fuel and possibly low-floor vehicles. Storage, fueling, washing, and maintenance will be performed at each facility. Parking would be provided to serve drivers, maintenance, and administrative staff. **Chapter IV: Transportation Impacts** describes the impact of these facilities in greater detail. The Aspen Maintenance Facility would be primarily dedicated to RFTA contract service to the City of Aspen, Pitkin County, and the Aspen Skiing Company, with minimal provision required for overnight storage of the few BRT vehicles originating from Aspen.

2.3 Operating Characteristics

2.3.1 HOV Policies. Highway 82 includes directional peak-hour HOV lanes between Basalt and Buttermilk. The outer eastbound lane operates as a two-passenger HOV lane between 6:00 and 9:00 a.m. Monday through Friday. The outer westbound lane operates as a two-passenger HOV lane between 3:00 and 6:00 p.m. Monday through Friday. The outer (right) lanes are designated HOV to provide for convenient access to transit stops along the highway. The BRT Alternative includes the additional enhancement of ITS technology to give transit vehicles a priority at traffic lights.

The *Entrance to Aspen ROD* calls for construction of light rail transit from the Pitkin County Airport to Rubey Park in Aspen **or** construction of a dedicated two-lane busway if light rail is not funded by the local governments. The busway would be designated for RFTA buses only at all hours under the BRT-Bus Alternative.

2.3.2 Guideways (Hours, Roadways, Speed). The BRT Alternative provides three levels of transit service: local feeder service, Express service, and peak-hour Super Express service during the summer and winter seasons. It is assumed that transit capacity will expand on the routes identified to meet modeled demand. Local feeder service is described below in section **2.3.3 Feeder Service**.

Express Service will run on 30-minute headways between West Glenwood Springs and Aspen. Stops will be in downtown Glenwood Springs, South Glenwood Springs, Colorado Mountain College/Highway 82, Carbondale/Highway 133, El Jebel, Basalt, Brush Creek Road, Pitkin County Airport/Aspen Airport Business Center (AABC), Maroon Creek Road, 7th and Main, Paepcke Park, Galena and Main, and Rubey Park. This service would operate 18 hours daily year-round.

Super Express Service on four routes will provide direct service to Aspen from stops in Glenwood Springs, Carbondale, El Jebel, and Basalt. Buses would pick up passengers at key stops in the community being served and then drive directly to the Rubey Park Transit Station (BRT-Bus) or Buttermilk (BRT-Rail). This service would operate during peak commute hours in the summer and winter seasons.

Express and Super Express Service will be provided using 19.8 meter (65-foot) alternative fuel, possibly low-floor buses. These buses will travel at highway speeds, enhanced by signal pre-emption and queue bypass lanes described above. Additional enhancements to transit service include:

- A transit management system that has the capability to perform and integrate many transit operations functions, such as computer-aided service restoration, and service monitoring.
- A real-time transit schedule system such as "Next Bus" to provide accurate and efficient information to RFTA customers. Real-time information on vehicle schedules would be available at transit stations, on the RFTA web site, and via telephone.
- An automated platform fare payment system to provide a more efficient way of handling fare payments to allow quicker boardings, more accurate accounting of origins and destinations, and the ability to implement peak period pricing more easily.

2.3.3 Feeder Service. In addition to the service described under the No Action/Committed Projects Alternative, local circulator/collector bus service will be provided on routes between Rifle and Glenwood Springs, in Glenwood Springs, between Glenwood and Carbondale, in Carbondale, between Carbondale and Redstone, in and between El Jebel and Basalt, and between Basalt and Brush Creek Road. Feeder bus operations provide many residences and businesses in the Project Corridor with access to the Express Service, allowing the Express Service to operate efficiently by remaining in the high-speed Highway 82 corridor. Feeder bus operations also reduce parking demand at park-and-ride facilities and provide local transit service to transit-dependent communities in the Project Corridor.

Feeder bus operations will utilize 8.5 meter (28-foot) alternative fuel and possibly low-floor transit vehicles. This service will operate 18 hours daily year-round and provide time transfers to Express bus service. This service will include:

Rifle. This route would operate between Rifle and West Glenwood Springs, serving local stops in between.

West Glenwood Springs. This route operates between the West Glenwood Springs Park-and-Ride and the downtown Glenwood Springs Transit Station, serving local stops in between.

Glenwood Springs. This route serves the Four Mile corridor, Glenwood Park, Mountain Valley neighborhood, and Wal-Mart on the south, and uses Grand Avenue and Midland Avenue to serve downtown Glenwood Springs and the downtown Glenwood Springs Transit Station.

Carbondale. This route serves downtown Carbondale, the Carbondale High School, River Valley Ranch, the downtown Carbondale Transit Station, and the Highway 133 Transit Station.

Redstone. This route provides service between Redstone and the Highway 133 Transit Station. Service includes two runs in the a.m. peak hour and two runs in the p.m. peak hour.

El Jebel/Basalt. This route serves the Blue Lake subdivision, the El Jebel Transit Station, Willits Lane, the Basalt Midland Avenue Transit Station, Basalt High School, and downtown Basalt.

Basalt to Brush Creek Road. This route runs along Highway 82 providing local service between the Basalt Transit Station and the Brush Creek Road Transit Station.

A connection with private bus service between Sunlight and Glenwood Springs could be operated by RFTA for the ski season only. Two a.m. peak and two p.m. peak hour runs are assumed.

2.3.4 Background Bus Service. The BRT Alternative replaces the existing transit service being provided along the Project Corridor by RFTA. RFTA's other service includes regional service between Snowmass Village and Aspen and contract service for the communities of Glenwood Springs, Aspen, and Pitkin County and for the Aspen Skiing Company. These services will not be adversely affected and could benefit from the economies of scale of the service being provided in the Project Corridor under the BRT Alternative.

2.3.5 Fare Policy/Pricing. The RFRHA Board, for purposes of this study, directed the Study Team to assume that fare policies and pricing for the BRT Alternative should be consistent with those of the TDP under No Action/Committed Projects. Implementation of TM in Aspen to maintain traffic at 1994 levels per *the Entrance to Aspen ROD* may impact local investment in transit service and/or the cost of driving a single occupant vehicle to/from Aspen.

2.3.6 Transportation Management Program. In addition to the incremental TM program identified for Aspen under the No Action/Committed Projects Alternative, the BRT Alternative includes implementation of a TM program in the Project Corridor. The program would provide the following types of services:

- **A carpool matching program** oriented toward matching long-term carpoolers, but eventually able to match people instantly so that short-term carpoolers could take advantage of the program.
- **A vanpool program**, which assumes that up to 15 vanpools are needed to serve the areas not served by the improved bus system. These could serve the outlying areas of Parachute, Silt and Gypsum. It is assumed these vanpools would be publicly subsidized (to match the user cost of the bus system) and operated by a third party.
- **A marketing/incentive program for buses, carpools, and vanpools**. In order to attract people to alternative modes of transportation, it is necessary to inform them about the programs available and to offer them some incentives to try these modes. A marketing program is especially important in a tourist area with temporary workers and residents. This marketing effort would focus on a media campaign, a website, kiosks and transportation coordinators at participating companies. The transportation coordinators would be responsible for informing new employees about their transportation alternatives and any incentives available to them, such as an ecopass or commuter club card.
- **Opportunities or information for other techniques**, such as flex hours, and telecommuting.

2.4 Rio Grande Trail

The RFTA right-of-way was purchased as a possible transit corridor, and also to provide a continuous trail connection between the communities in the Project Corridor. The proposed trail begins at the terminus of the Glenwood Springs River Trail at 23rd Street in Glenwood Springs at RFTA mile marker 361.7. It ends 51.5 kilometers (32 miles) east, where it connects to the end of the existing Rio Grande Trail at Woody Creek at RFTA mile marker 393.7. The Rio Grande Trail provides a connection into Aspen. The trail is described in further detail in the document *Aspen Branch Denver & Rio Grande Western Railroad: Recreational Trails Plan Glenwood Springs to Aspen CIS/DEIS/CP* (Land Plan, 1999). Appendix B provides detailed maps of the new Rio Grande Trail.

2.4.1 Trail Alignment and Cross-Section. The trail alignment follows the RFTA rail right-of-way. The trail is proposed with three-meter (ten-foot) pavement width and a 1.2-meter (four-foot) graded shoulder on one side. The pavement width may vary due to projected user volumes and physical constraints. The maximum grade is five percent. In lieu of use of the tracks by a rail line, the trail may be constructed over the top of the existing rails to avoid environmental impacts within the right-of-way such as wetlands or geological hazards. Figure II-25 presents a typical trail section.

2.4.2 Highway Crossings. Grade-separated trail crossings are proposed for highway crossings at Highway 133 in Carbondale (as part of the transit station plan) and at Highway 82 at Wingo Junction. Existing underpasses adjacent to the corridor provide safe access across Highway 82 near El Jebel and Emma. Proposed underpasses incorporated into transit stations at South Glenwood Springs, CMC, and Basalt will add grade-separated pedestrian access to the trail from population centers.

2.4.3 Bridges. The proposed trail alignment includes creek, gulch, and road crossings at several locations that require bridge structures for trail continuity. Rehabilitation of existing bridges is proposed at Cattle Creek, the Roaring Fork River at Satank, Sopris Creek, the Roaring Fork River at Wingo Junction, Arbaney Gulch in Snowmass Canyon, and potentially at the end of the corridor at Woody Creek.

2.4.4 Interpretive Signage. The Rio Grande Trail will include interpretive signing to provide relevant and appropriate information. Several means of providing information via signage are recommended:

- Information signs – mapping, regulations, safety information, resource protection etc.
- Interpretive signs – interpretive messages regarding historic, cultural, and natural resources
- Trailside signs – mileage, directions, distances, road intersections etc.
- Identification signs – graphic logo for trail definition
- Traffic control signs – regulatory signage and pavement markings

3. Rail Alternative + Trail

This alternative would use rail technology for Express service in the Project Corridor. The proposed alignment between West Glenwood Springs and Aspen uses portions of the RFTA right-of-way, the Highway 82 right-of-way, and new connecting rights-of-way.

3.1 Features

1. Commuter rail service from Glenwood Springs to Aspen

2. Timed transfers to/from circulator/connector bus service
3. New/enhanced transit stations to accommodate rail
4. New/modified maintenance facilities
5. State-of-the-art ITS technology, including signal pre-emption, queue bypass lanes, incident management, system/operator information, real-time traveler information systems, platform fare collection, smart card system.
6. Valley-wide transportation alternatives program, including carpool/vanpool program, employer outreach, advertising and public information.

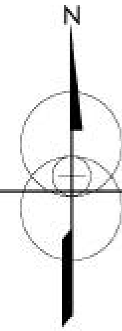
3.2 Physical Characteristics

3.2.1 Alignment. The Rail alignment begins at the West Glenwood interchange in Glenwood Springs and follows the south side of the Union Pacific Railroad right-of-way to downtown Glenwood Springs, where it connects to the RFTA right-of-way at RFTA mile marker 360.4. (Figure II-17 provides a general map of this alternative. Figure II-17a provides detail for this alternative.) It then follows the RFTA right-of-way through Glenwood Springs and Carbondale to the Catherine Store area. Near Catherine Store at RFTA mile marker 376.1, the alignment crosses the Roaring Fork River just east of County Road 100 and parallels County Road 100 to Highway 82 at Highway 82 mile post 15.4. The alignment is on the south side of Highway 82 from Catherine Store through El Jebel and Emma. Just east of Emma the alignment crosses Highway 82 at Highway 82 mile post 22.2 on a structure and continues on the north side of the highway to Basalt and then Wingo Junction. At Wingo Junction (Highway 82 mile post 24.7 and RFTA mile marker 385) the alignment returns to the RFTA right-of-way through Snowmass Canyon to the Gerbazdale area. At Gerbazdale (RFTA mile marker 391.2), the alignment crosses the Roaring Fork River to Highway 82 (Highway 82 mile post 30.2) and parallels Highway 82 on the north side to Brush Creek Road. From Brush Creek Road, the alignment crosses Highway 82 on a structure (Highway 82 milepost 35.4) and parallels the highway on the south side to the Pitkin County Airport/Aspen Airport Business Center Light Rail Station. (Appendix B illustrates the Rail Alignment in detail.)

The segment from the airport to the Main Street/ Monarch intersection in Aspen shares the proposed Entrance to Aspen light rail line. From the Main Street/Monarch intersection, the alignment continues on Main Street for three blocks to a terminus. The terminus is located between Galena Street and Spring Street. Spring Street and Hunter Street will become cul-d-sacs on the south side of Main Street under this alternative. The project terminates at Highway 82 milepost 41.3.

The Rail Alternative is proposed as a single-track system with passing tracks located to meet the headway requirements of the system. A single-track system is proposed to reduce cost and environmental impact. As the construction of a single-track system will limit RFTA's ability to change headways in the future, care should be taken during preliminary engineering to confirm the adequacy of policy headways and passing track locations. Passing tracks are currently proposed at locations along the alignment shown in Table II-10.

Figure II-17: Rail Alternative



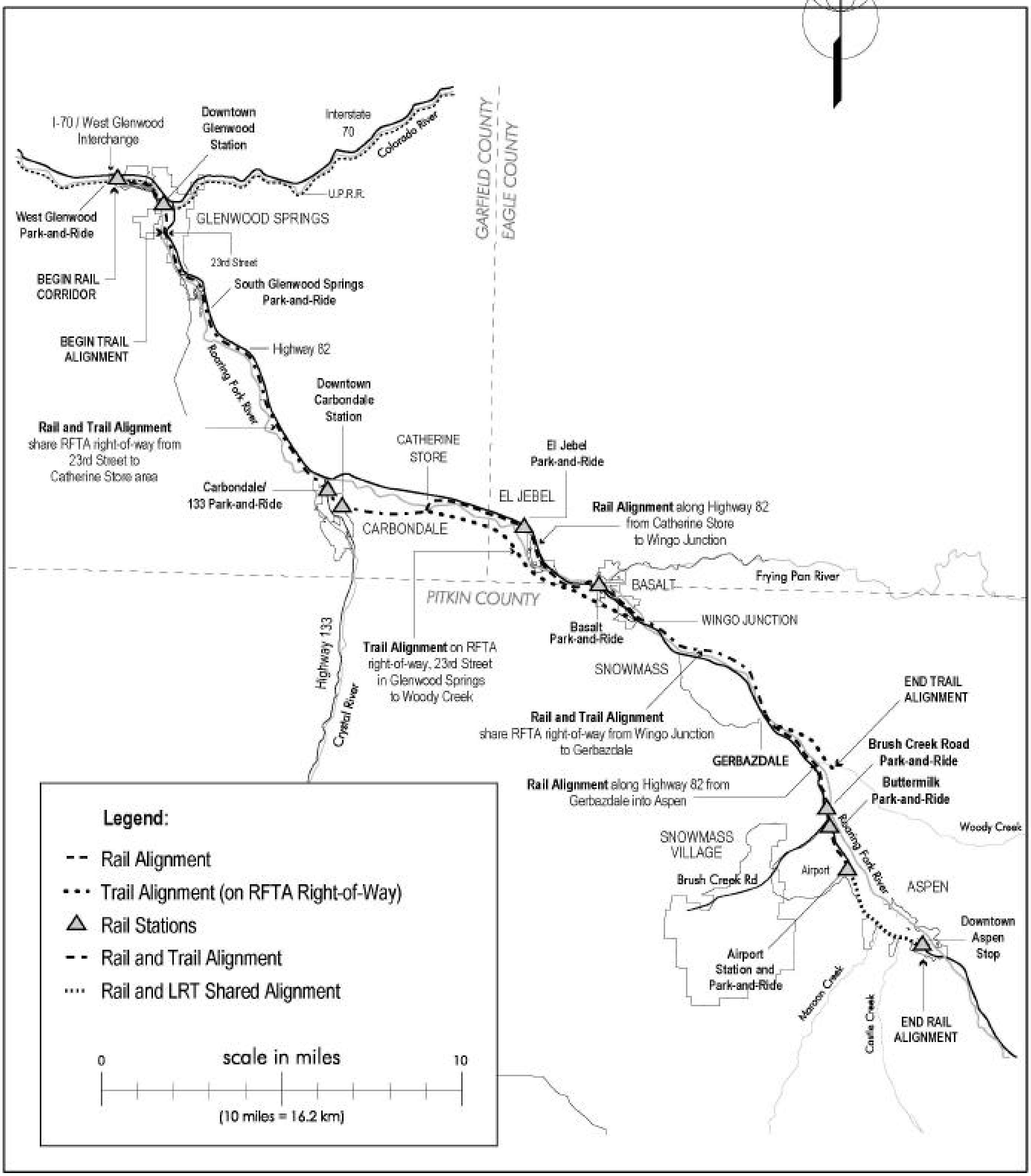


Figure II-17a: Rail Alternative Detail

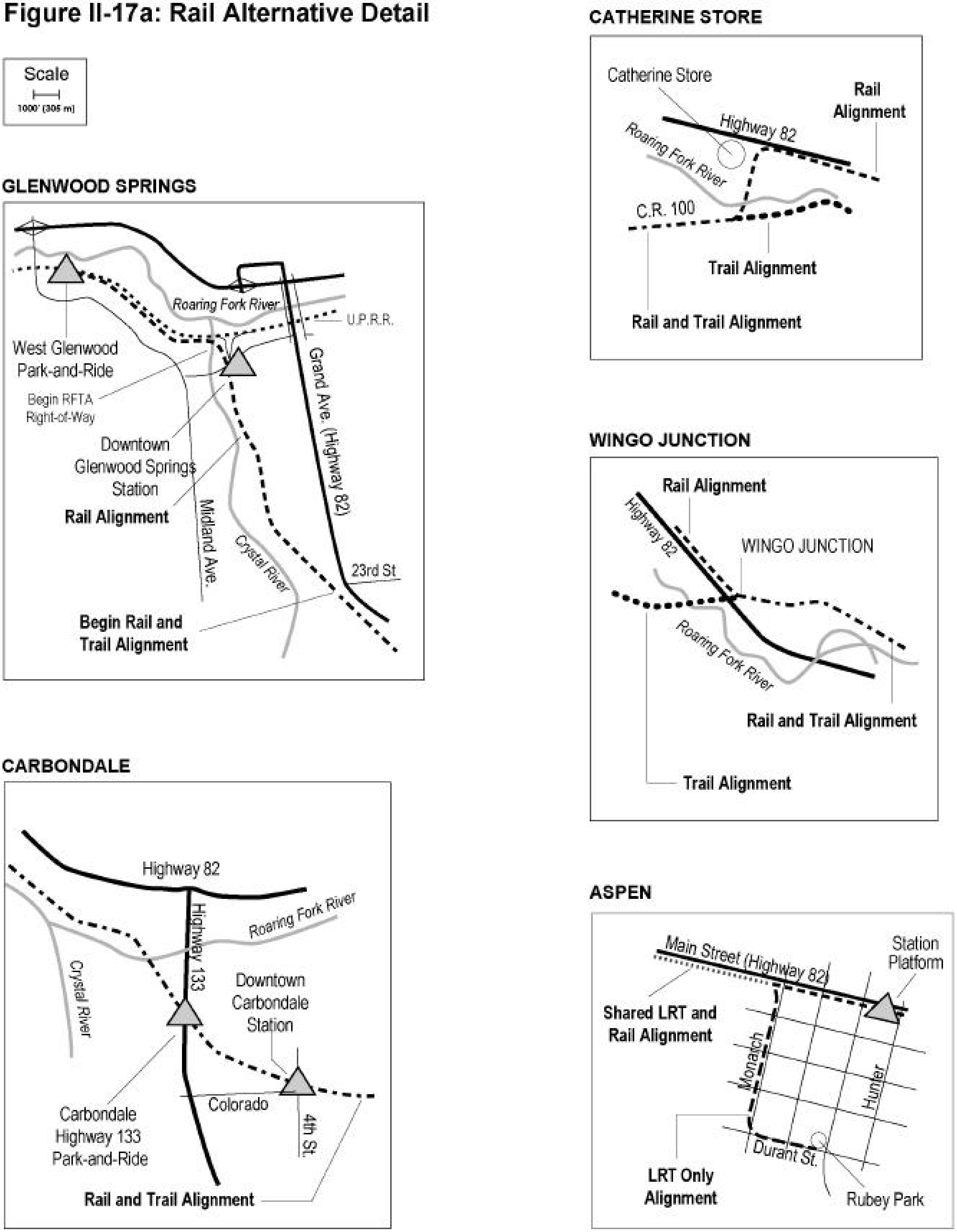


Table II-10
Proposed Locations of Passing Tracks, Rail Alignment

Location	Physical Location
RFTA mile marker 367.1	Between downtown Glenwood Springs and Carbondale
Highway 82 milepost 16	Between Carbondale and El Jebel
Highway 82 mile marker 22	Between El Jebel and Basalt
RFTA mile marker 388.3	4 Kilometers (2.5 miles) east of Basalt
Highway 82 milepost 32.6	7.72 kilometers (4.8 miles) west of Brush Creek Road

3.2.2 Access Control. The Rail Alternative provides for an Access Control Plan to minimize conflicts and enhance safety at public and private crossings along the rail alignment. *The Roaring Fork Railroad Access Control Plan* (RFRHA, 1999) provides more detail on access control in the Project Corridor. It has four main parts, including a Policy for Managing Railroad Crossings, Railroad Access Control Plan Maps, Highway 82 Access Control Plan Maps, and Appendices that include design specifications and supporting technical memoranda.

3.2.3 Typical Sections. Several rail cross-sections have been developed based upon safety and terrain features. Although the existing rail bed has been in service since the 1800s and was at one time used for passenger service, its most recent use was for slower-speed freight service. To upgrade the cross-section to accommodate higher-speed passenger rail service as well as potential freight service, the rail bed will be widened in some cases to accommodate higher lateral dynamic loads. Where new rail alignment is required, the rail bed will be designed to accommodate both passenger and freight rail for the speeds anticipated.

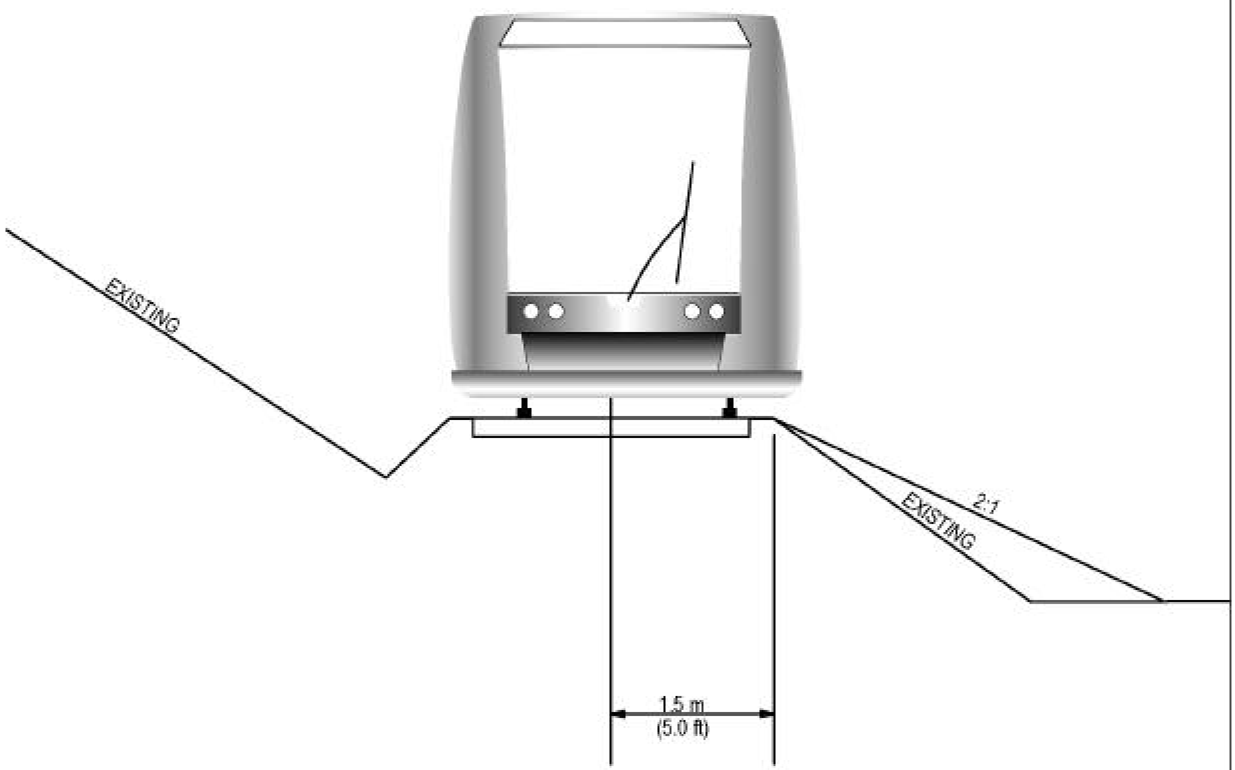
Existing Track Alignment, Straight Section, Less than 3.0 meters (ten feet) of Fill. No additional rail bed widening is included for straight sections where total fill, as measured from top of track platform to bottom of embankment, is less than 3.0 meters (ten feet). As this rail bed has been in place for over 100 years, and no additional lateral loads are being placed on the rail bed, the existing platform is considered adequate. The platform ranges from 2.4 meters (eight feet) to 3.0 meters (ten feet) wide in most locations.

Existing Track Alignment, Straight Section, More than 3.0 meters (ten feet) of Fill. When the rail bed fill is greater than 3.0 meters (ten feet), a minimum platform width of 1.5 meters (five feet) from centerline to edge of fill will be required (see Figure II-18). All fill slopes greater than 3.0 meters (ten feet) will have a minimum slope of 2:1.

Existing Track Alignment, Inside of Curve, Less than 3.0 meters (10 feet) of Fill. As with the straight section with less than 3.0 meters (ten feet) of fill, no additional rail bed widening is included. No additional lateral loads to the inside of the curve are being placed on the rail bed beyond those experienced with freight service.

Existing Track Alignment, Inside of Curve, More than 3.0 meters (ten feet) of Fill. As with the straight section, when the rail bed fill is greater than 3.0 meters (ten feet), a minimum platform width of 1.5 meters (five feet) from centerline to edge of fill will be required (see Figure II-18). All fill slopes greater than 3.0 meters (10 feet) will have a minimum slope of 2:1.

Figure II-18
Existing Track Alignment



STRAIGHT SECTION
MORE THAN 3.0 METERS (10 FEET) OF FILL

INSIDE OF CURVE
MORE THAN 3.0 METERS (10 FEET) OF FILL

OUTSIDE OF CURVE
LESS THAN 3.0 METERS (10 FEET) OF FILL

Existing Track Alignment, Outside of Curve, Less than 3.0 meters (ten feet) of Fill. For all curves greater than 0° 30’ there is the potential for higher speed passenger rail to exert more lateral force on the rail bed than freight rail (even with the higher weight of freight rail). When fill heights are less than 3.0 meters (ten feet), a minimum platform width of 1.5 meters five feet) from centerline to edge of fill or cut will be required (see Figure II-18). Fill slopes will have a minimum slope of 2:1.

Existing Track Alignment, Outside of Curve, More than 3.0 meters (ten feet) of Fill. A minimum platform width of 1.5 meters (five feet) from centerline to edge of fill will be required. In addition, a 0.4-meter (1.33-foot) bench will be required at bottom of ballast (see Figure II-19). Fill slopes would have a minimum slope of 2:1.

New Track Alignment (Downvalley of Brush Creek Road Only). For all new track alignment downvalley of Brush Creek Road, a minimum platform width of 1.5 meters (five feet) from centerline to edge of fill will be required. In addition, a 0.4-meter (1.33-foot) bench will be required at bottom of ballast (see Figure II-20). Fill slopes will have a minimum slope of 2:1. This new track alignment occurs between Catherine Store and Wingo Junction and from Gerbazdale to Brush Creek Road.

New Track Alignment (Brush Creek Road to Airport). New track east of Brush Creek Road will serve Light Rail Transit (LRT). The LRT envelope approved in the *Entrance to Aspen ROD* will be used. This envelope is 4.3 meters (14 feet) wide for single track and 8.5 meters (28 feet) wide for double and passing track. It will be separated from Highway 82 by a 0.6-meter (two-foot) concrete barrier in the Shale Bluffs area (see Figure II-21). A clear zone from Shale Bluffs to the Airport will separate the envelope from Highway 82 (see Figure II-22).

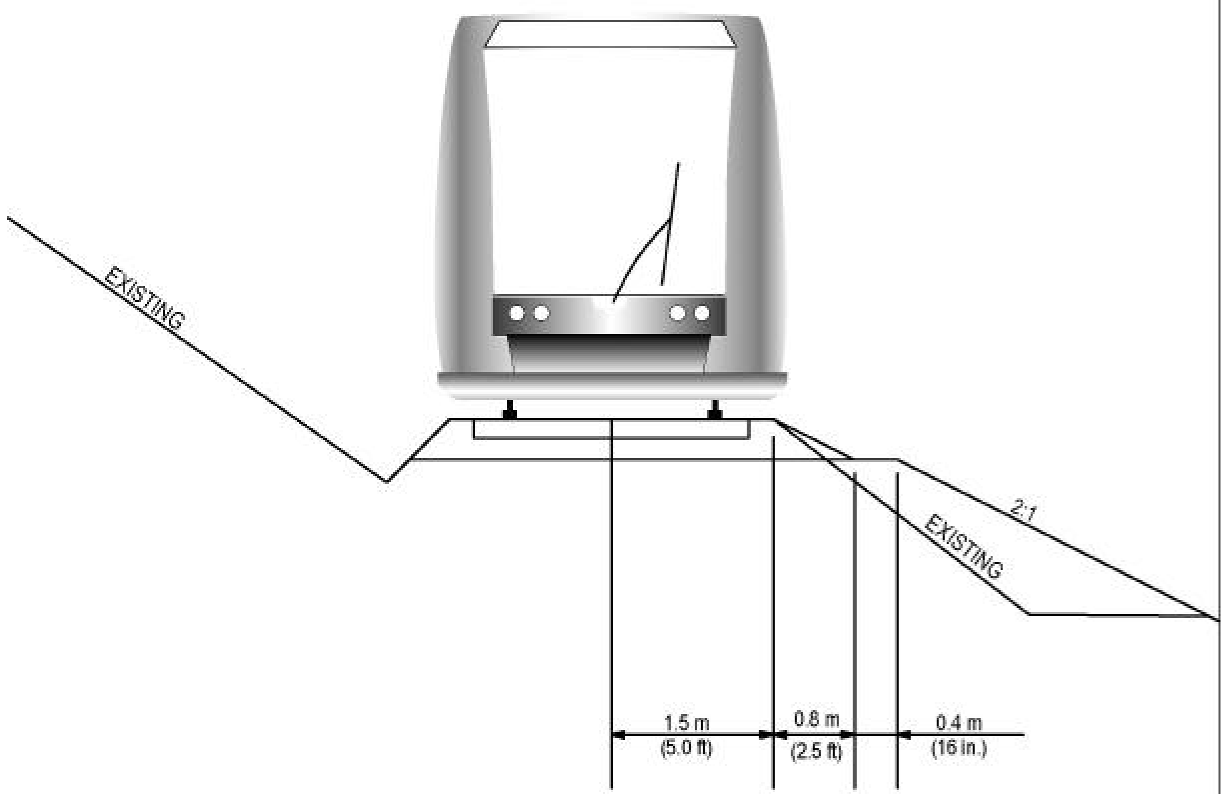
New Track Alignment (Airport to Aspen). The LRT envelope approved in the *Entrance to Aspen ROD* will be used to Monarch Street. At Monarch Street, the LRT will turn right towards Rubey Park and the Preferred Alternative will continue straight for three blocks before terminating near Hunter Street. A clear zone from the Airport to downtown Aspen will separate the envelope from Highway 82.

New Double (Passing) Track Alignment. The distance between the centerlines of passing tracks would be a minimum of 4.6 meters (15 feet). This dimension is also valid for double tracks at stations.

New Track Alignment Adjacent to Existing Union Pacific Railroad (UPRR) Track. The distance between the centerlines of the existing UPRR track and the Rail alignment will be a minimum of 7.6 meters (25 feet).

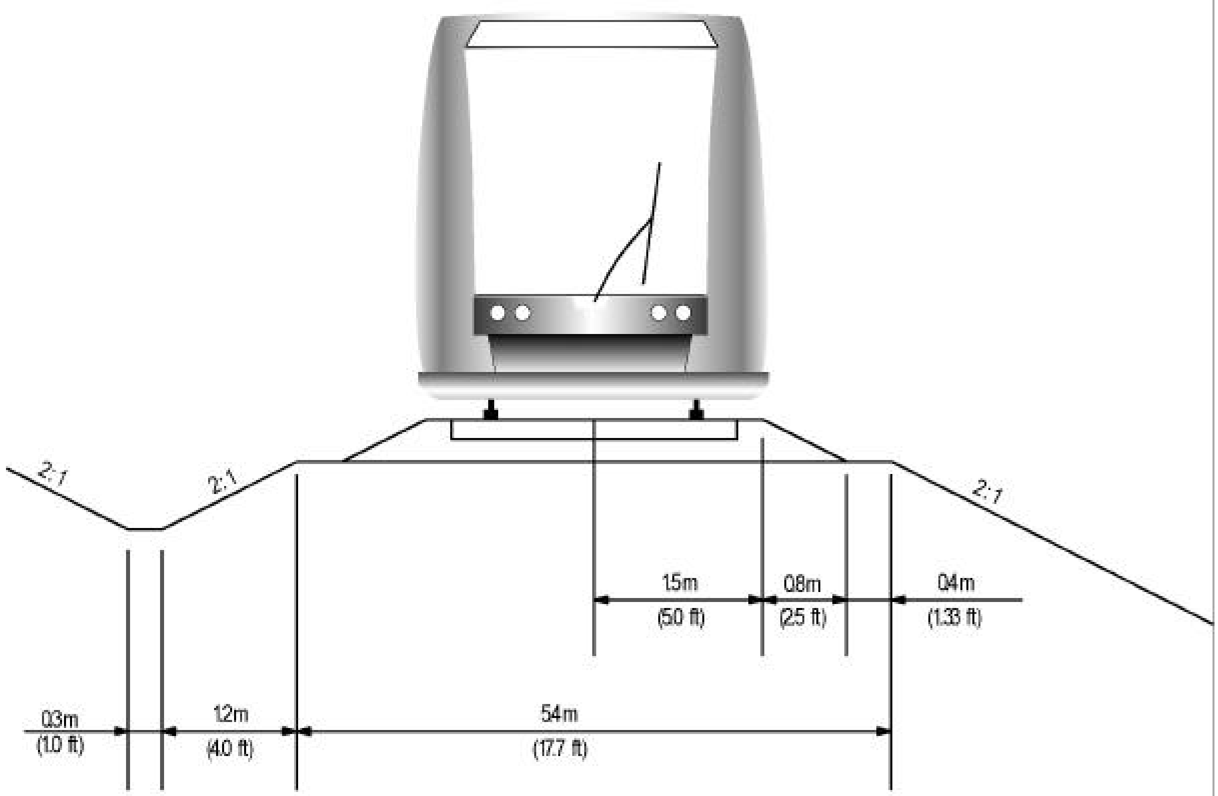
New Rail Bridges. A platform width of 6.1 meters (20 feet) will be used for new rail bridges (see Figure II-23).

Figure II-19
Existing Track Alignment



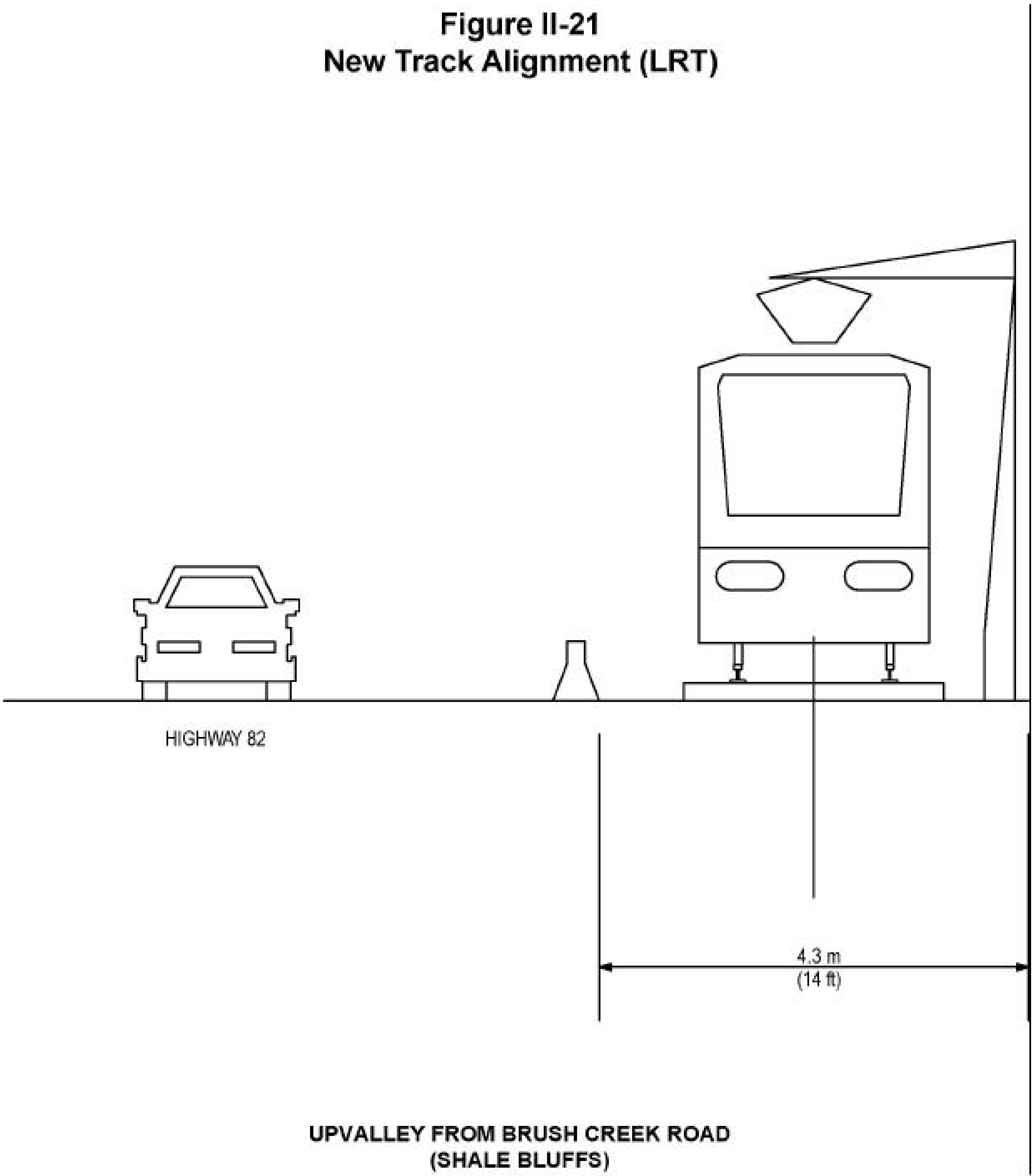
OUTSIDE OF CURVE
MORE THAN 3.0 METERS (10 FEET) OF FILL

Figure II-20
New Track Alignment



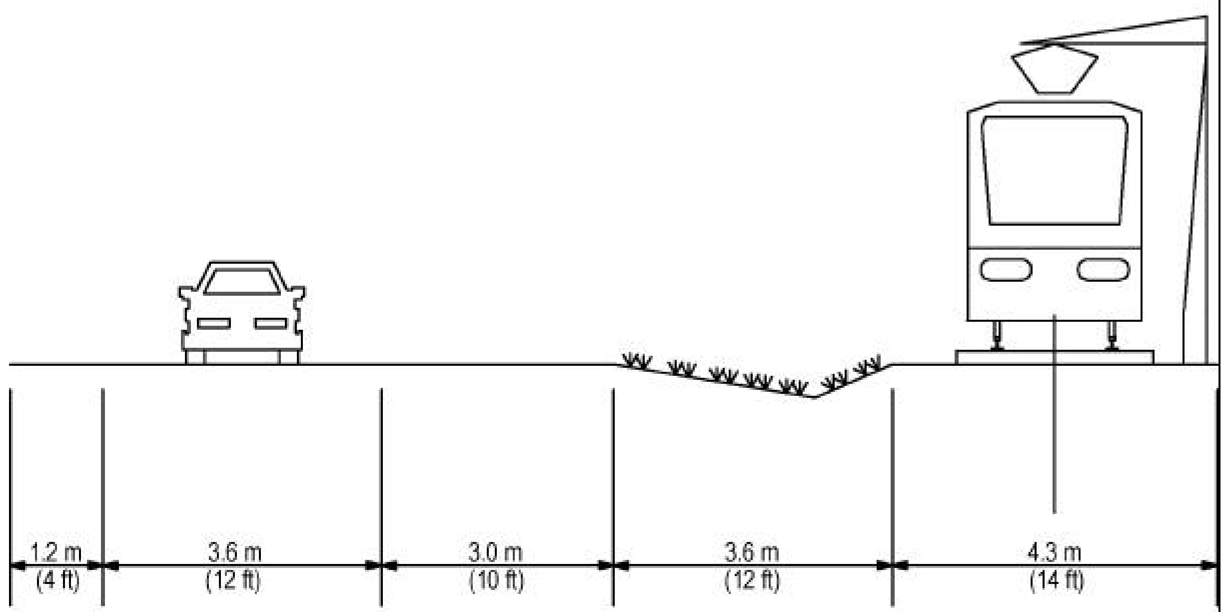
DOWNVALLEY FROM BRUSH CREEK ROAD

Figure II-21
New Track Alignment (LRT)



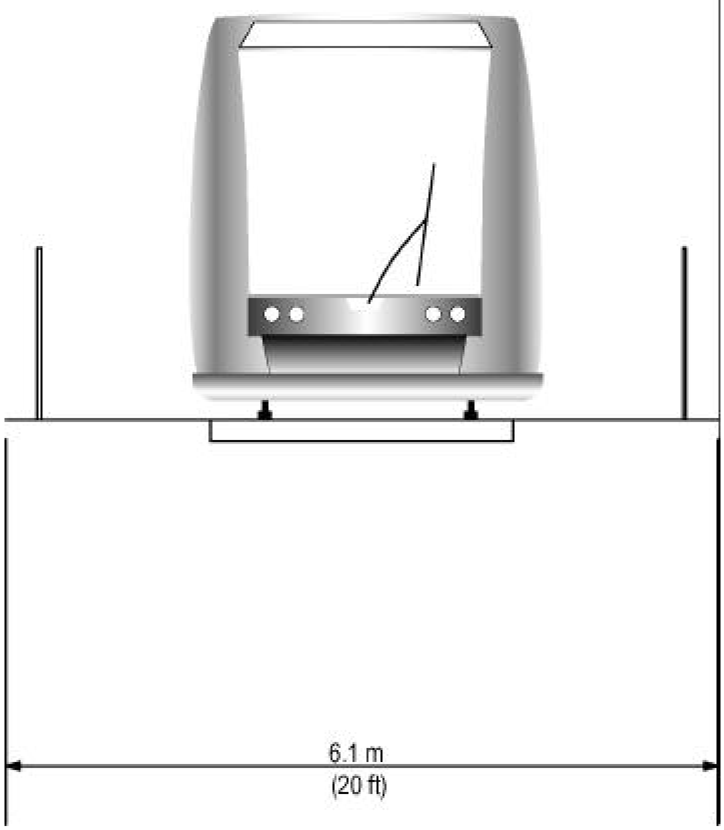
UPVALLEY FROM BRUSH CREEK ROAD
(SHALE BLUFFS)

Figure II-22
New Track Alignment (LRT)



UPVALLEY FROM BRUSH CREEK ROAD
(SHALE BLUFFS TO AIRPORT)

Figure II-23
New Rail Bridge



3.2.4 Station Locations and Conceptual Design. New transit stations are proposed at West Glenwood Springs, downtown Glenwood Springs, Highway 133, downtown Carbondale, El Jebel, Basalt, and downtown Aspen. Enhancement or replacement of transit stations at Brush Creek Road, Rodeo Lot, and Snowmass Village is also proposed (see Figures II-7 through II-16). Other stations may be considered at South Glenwood Springs and Aspen Village during preliminary engineering, depending upon more refined cost/ benefit analysis. Because the location and design of transit stations for the BRT and Rail Alternatives is the same in most communities, the stations identified for the BRT Alternatives can be readily adapted for Rail. This would facilitate any phasing from BRT to rail. See Table II-9 for a complete listing of transit station locations.

The Rail Alternative calls for coordination and regulation of land use around transit stations to encourage transit-oriented development patterns so that transit can serve the Project Corridor even more effectively over time. In addition to the efforts described in the *Transit Oriented Community Design Report* (Otak, 2000) and in the local policies and plans of the governments with jurisdiction over the project corridor, the Rail Alternative calls for enhanced pedestrian access to transit via improvements to bicycle and pedestrian trails. Safer and more convenient pedestrian-station connections (e.g., grade separations, pedestrian signal indications, and improved lighting) are elements of each transit station plan. Safe track crossings will be designed for pedestrians at all stations.

3.2.5 Vehicles. The vehicle proposed for Rail is a diesel multiple unit (DMU) self-propelled railcar. DMU railcars can be coupled into multi-car consists, providing expanded passenger carrying capacity with one operator. Examples include the Adtranz *GTW*, the Siemens *Regiosprinter*, and the Bombardier *Talent* vehicles. While these vehicles are very popular in Europe, currently only New Jersey Transit operates a modern DMU system in the United States, on its Trenton-Camden-Princeton line. Operations for commuter rail lines of this type fall under the jurisdiction of the Federal Railroad Administration (FRA).

3.2.6 Freight Operations. The DMU vehicles currently available do not meet Federal Railroad Administration (FRA) requirements to be able to operate on the same track with freight rail. While freight rail is not currently envisioned in the Project Corridor, the possibility of freight service should be considered. Freight trains could conceivably operate at night when the DMUs are not in revenue service. This would limit freight operations to times between midnight and 6:00 a.m. Optionally, RFTA could elect to purchase FRA-compliant DMUs. FRA-compliant DMU vehicles are typically more expensive. Their size and weight may limit RFTA's ability to operate the vehicles on the light rail alignment between the Airport and downtown Aspen.

3.2.7 Park-and-Ride Facilities. The Rail Alternative requires a total of 4,710 park-and-ride spaces. The provision of high-quality transit service farther west in the Project Corridor also appears to move the allocation of parking spaces farther west when compared to planned stations for the No Action/Committed Projects:

- 940 spaces at Glenwood Springs (an increase of 490 spaces)
- 660 spaces at Carbondale (an increase of 160 spaces)
- 1,140 spaces at El Jebel (an increase of 640 spaces)
- 390 spaces at Basalt, (a decrease of 110 spaces)
- 890 spaces at Brush Creek Road (an increase of 490 spaces)
- 120 spaces at Buttermilk (a decrease of 630 spaces)
- 570 spaces at Pitkin County Airport (a decrease of 3,030 spaces)

The Glenwood Springs Park-and-Ride described under No Action/Committed Projects would be located at the West Glenwood Transit Station to provide direct access to I-70 at the West Glenwood interchange. The Carbondale Park-and-Ride would be located at the Highway 133 Transit Station to provide direct access to Highway 133. Figures II-7 through II-16 provide additional detail regarding the location and layout of representative parking facilities.

3.2.8 Storage and Maintenance Facilities. The Rail Alternative assumes the enhancement of the Aspen Maintenance Facility to accommodate additional rail vehicles and reconstruction of the Carbondale storage facilities to accommodate rail. The approximately 0.9 hectares (2.25 acres) of required vehicle storage would be accommodated by reconstructing the 1.62 hectare (4.0 acre) Carbondale facility. Storage, fueling, and washing would occur primarily at the Carbondale facility. Maintenance would be performed at the Aspen Rail Maintenance Facility constructed for the Entrance to Aspen project

3.3 Operating Characteristics

3.3.1 HOV Policies. Highway 82 includes directional peak-hour HOV lanes between Basalt and Buttermilk. The outer eastbound lane operates as a two-passenger HOV lane between 6:00 and 9:00 a.m. Monday through Friday. The outer westbound lane operates as a two-passenger HOV lane between 3:00 and 6:00 p.m. Monday through Friday. The outer (right) lanes are designated HOV to provide for convenient access to transit stops along the highway. The Rail Alternative includes the additional enhancement of ITS technology to give feeder bus vehicles a priority at traffic lights.

3.3.2 Guideways (Hours, Roadways, Consists, Speed). The Rail Alternative provides direct service between West Glenwood and downtown Aspen without transfers. This assumes use of the Entrance to Aspen light rail tracks between Pitkin County Airport and the Main Street/Monarch Street intersection. At Monarch, the rail vehicles would continue along Main Street to a station between Galena Street and Spring Street using new tracks. It is assumed that transit capacity will expand on the route identified to meet modeled demand. Local circulator/collector service is described below in **3.3.3 Feeder Service**.

Service would initially operate 18 hours per day on 30-minute headways between West Glenwood Springs and Aspen. In the future, demand will be such that a second route, from El Jebel to Aspen, will be required on 30-minute headways during peak hours. This would provide 15-minute headways between El Jebel and Aspen during the peak three hours of the day.

Opening day peak hour consist sizes would be three vehicles. By 2025 train consists could reach four vehicles in length during peak hours. Additional study would be needed during the preliminary engineering phase of the project to determine the optimal operating scenario for commuter rail and light rail. This would include analysis of:

- possibly combining regional and local service using one rail vehicle,
- the appropriate amount and location of passing track in the Entrance to Aspen section, and
- the impacts of vehicle consist length on station locations and traffic operations downtown.

Additional enhancements to transit service include:

- A transit management system that has the capability to perform and integrate many transit operations functions, such as computer-aided service restoration, and service monitoring.
- A real-time transit schedule system such as "Next Bus" to provide accurate and efficient information to RFTA customers. Real-time information on vehicle schedules would be available at transit stations, on the RFTA web site, and via telephone.
- An automated platform fare payment system to provide a more efficient way of handling fare payments to allow quicker boardings, more accurate accounting of origins and destinations, and the ability to implement peak period pricing more easily.

3.3.3 Feeder Service. In addition to the service described under No Action/Committed Projects, local circulator/collector bus service will be provided on routes between Rifle and Glenwood Springs, in Glenwood Springs, between Glenwood and Carbondale, in Carbondale, between Carbondale and Redstone, in and between El Jebel and Basalt, and between Basalt and Brush Creek Road. This service would operate 18 hours daily year-round and provide time transfers to Express bus service. Feeder bus operations will utilize 8.5 meter (28-foot) alternative fuel and possibly low-floor transit vehicles. The following routes are envisioned:

Rifle. This route would operate between Rifle and West Glenwood Springs, serving local stops in between.

West Glenwood Springs. This route would operate between the West Glenwood Transit Station and the downtown Glenwood Springs Transit Station, serving local stops in between.

Glenwood Springs. This route serves the Four-Mile corridor, Glenwood Park, Mountain Valley neighborhood, and Wal-Mart on the south, and uses Main Street and Midland Avenue to serve downtown Glenwood Transit Station.

Glenwood Springs to Carbondale. This route provides local service along Highway 82 between the downtown Glenwood Springs Transit Station and the Highway 133 Transit Station.

Carbondale. This route serves downtown Carbondale, the high school, River Valley Ranch, the downtown Carbondale Transit Station, and the Highway 133 Transit Station.

Redstone to Carbondale. This route between Redstone and the Highway 133 Transit Station includes two runs during the a.m. peak hour and two runs during the p.m. peak hour.

El Jebel/Basalt. This route serves Blue Lake, the El Jebel Transit Station, Willits Lane, the Basalt Transit Station, Basalt High School, and downtown Basalt.

Basalt to Brush Creek Road. This route runs along Highway 82, providing local service between the Basalt Transit Station and the Brush Creek Road Transit Station.

A connection with private bus service between Sunlight and Glenwood Springs is also proposed. This could be operated by RFTA and would be used for ski season only. Two a.m. peak-hour and two p.m. peak-hour runs are assumed.

3.3.4 Background Bus Service. The Rail Alternative replaces the transit service being provided within the Project Corridor by RFTA. RFTA's other service includes regional service between Snowmass Village and Aspen and contract service for the communities of Glenwood Springs, Aspen, and Pitkin County and for the Aspen Skiing Company. These services will not be adversely affected, and could benefit from the economies of scale of the service being provided in the Project Corridor under the Rail Alternative.

3.3.5 Fare Policy/Pricing. The RFRHA Board, for purposes of this document, directed the Study Team to assume that fare policies and pricing for the Rail Alternative should be consistent with those of the RFTA TDP under No Action/Committed Projects. Implementation of incremental TM in Aspen to maintain traffic at 1994 levels per the *Entrance to Aspen ROD* may impact local investment in transit service and/or the cost of driving a single occupant vehicle to/from Aspen.

3.3.6 Transportation Management Program (TM). The Rail Alternative includes implementation of a TM program in the Project Corridor in addition to the incremental TM program identified for Aspen in the *Entrance to Aspen ROD* under No Action/Committed Projects. The program would provide the following types of services:

- **A carpool matching program** oriented toward matching long-term carpoolers but eventually able to match people instantly so that short-term carpoolers could take advantage of the program.
- **A vanpool program**, which assumes that up to15 vanpools are needed to serve the areas not served by the improved bus system. These could serve the outlying areas of Parachute, Silt, and Gypsum. It is assumed these vanpools would be publicly subsidized (to match the user cost of the bus system) and operated by a third party.
- **A marketing/incentive program for buses, carpools and vanpools**. In order to attract people to alternative modes of transportation, it is necessary to inform them about the programs available and to offer them some incentives to try these modes. A marketing program is especially important in a tourist area with temporary workers and residents. This marketing effort would focus on a media campaign, a website, kiosks and transportation coordinators at participating companies. The transportation coordinators would be responsible for informing new employees about their transportation alternatives and any incentives available to them, such as an ecopass or commuter club card.

- **Opportunities or information for other techniques** such as flex hours, and telecommuting.

3.4 Rio Grande Trail

The RFTA right-of-way was purchased as a possible transit corridor and also to provide a continuous trail connection between the communities in the Project Corridor. The proposed trail begins at the terminus of the Glenwood Springs River Trail at 23rd Street in Glenwood Springs, at RFTA mile marker 361.7. It ends 51.5 kilometers (32 miles) east where it connects to the end of the existing Rio Grande Trail at Woody Creek, at RFTA mile marker 393.7. The Rio Grande Trail provides a connection into Aspen. *Aspen Branch Denver & Rio Grande Western Railroad: Recreational Trails Plan Glenwood Springs to Aspen CIS/DEIS/CP* (Land Plan, 1999). Appendix B provides detailed maps of the new Rio Grande Trail.

3.4.1 Trail Alignment and Cross-Section. The trail alignment follows the RFTA rail right-of-way. The trail is proposed with three-meter (ten-foot) pavement width and a 1.2-meter (four-foot) graded shoulder on one side. The pavement width may vary due to projected user volumes and physical constraints. The maximum grade is five percent. Figures II-24 through II-28 provide typical trail sections associated with the Rail Alternative.

3.4.2 Operational Aspects.

Maintenance and operation for the trail when it runs along an operating rail line should create minimal impact on the rail operations and create a safe and enjoyable trail user experience. The recently published *Rails-with-Trails: Lessons Learned* (Alta Transportation Consulting for USDOT, 2002), includes the following operational recommendations.

- Coordination between rail operations personnel and trail staff.
- Consideration of the maintenance and access needs of the rail operator. In areas with a narrower than 7.6-meter (25-foot) setback, the trail likely will be used as a shared maintenance road.
- Develop appropriate phasing and management plans for the trail.
- Education and outreach plans should be part of the trail implementation process.
- Trail managers should develop, in coordination with local law enforcement and the rail operators, a security and enforcement plan.
- Trail managers should develop and post trail user regulations.
- Trail managers should follow recommended design practices, such as signing to warn trail users to stay on the trail and off the tracks.

3.4.3 Highway Crossings. Grade-separated trail crossings are proposed for highway crossings at Highway 133 in Carbondale (as part of the transit station plan) and on Highway 82 at Wingo Junction. Existing underpasses adjacent to the corridor provide safe access across Highway 82 near El Jebel and Emma. A proposed underpass incorporated into transit stations at Basalt will add grade-separated pedestrian access to the trail from population centers. A grade-separated trail crossing of Highway 82 is also proposed at the Pitkin County Airport.

Figure II-24
Rail with Trail Segment

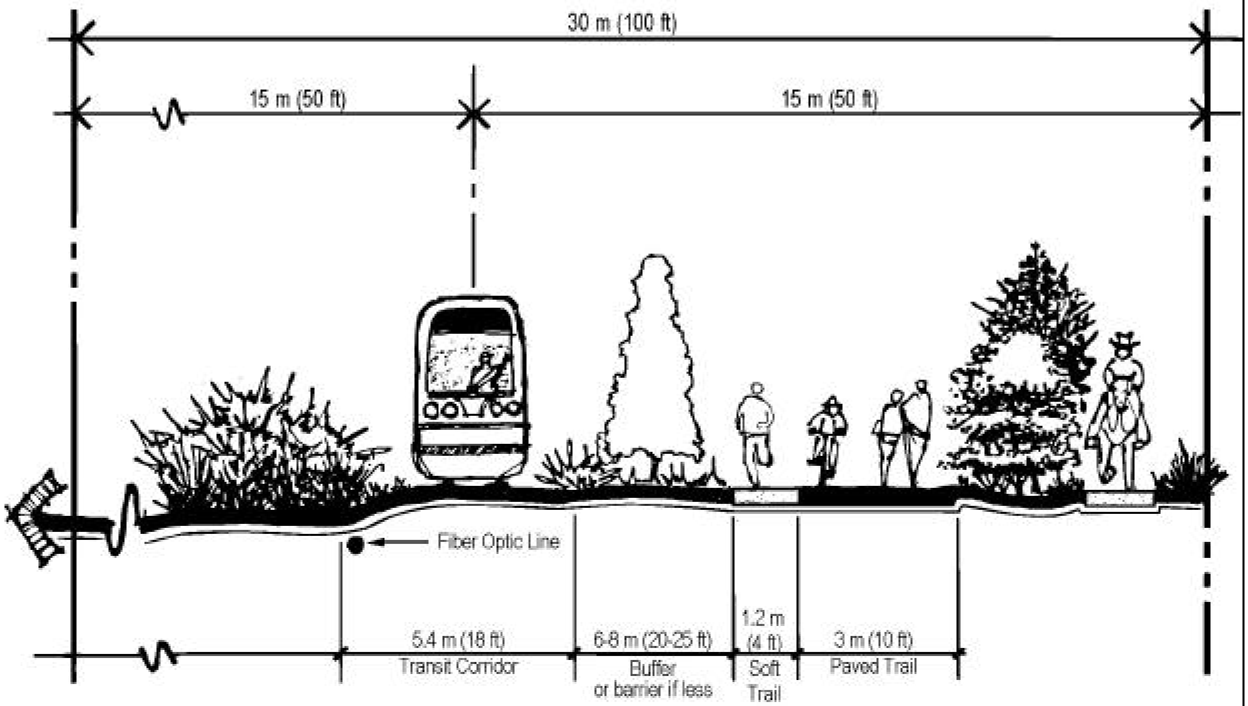


Figure II-25
Surface Cross Section

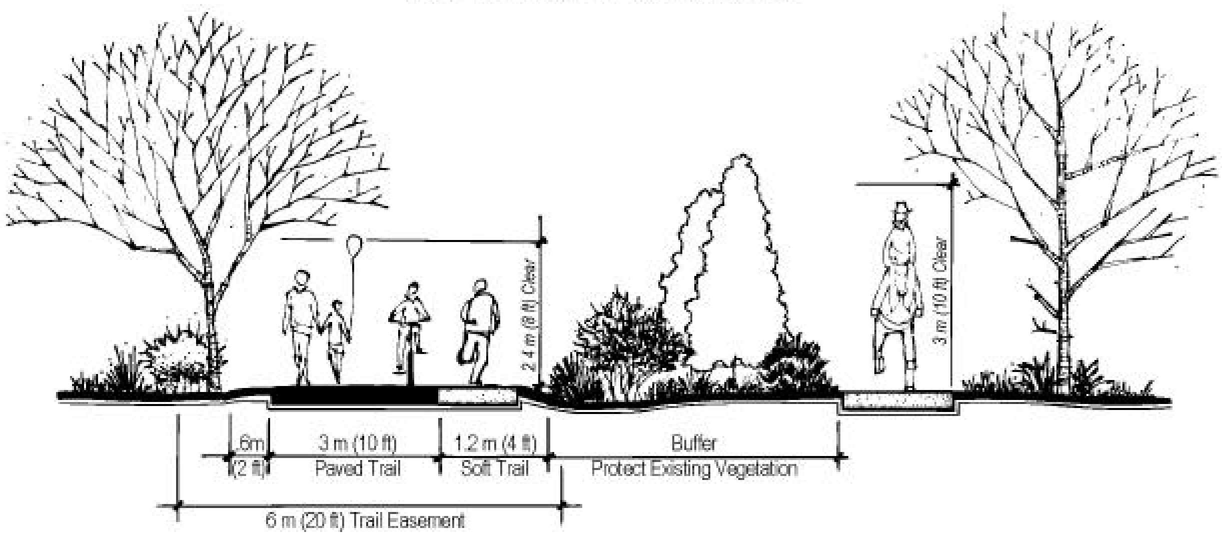


Figure II-26
Highway 82 and East Sopris Creek

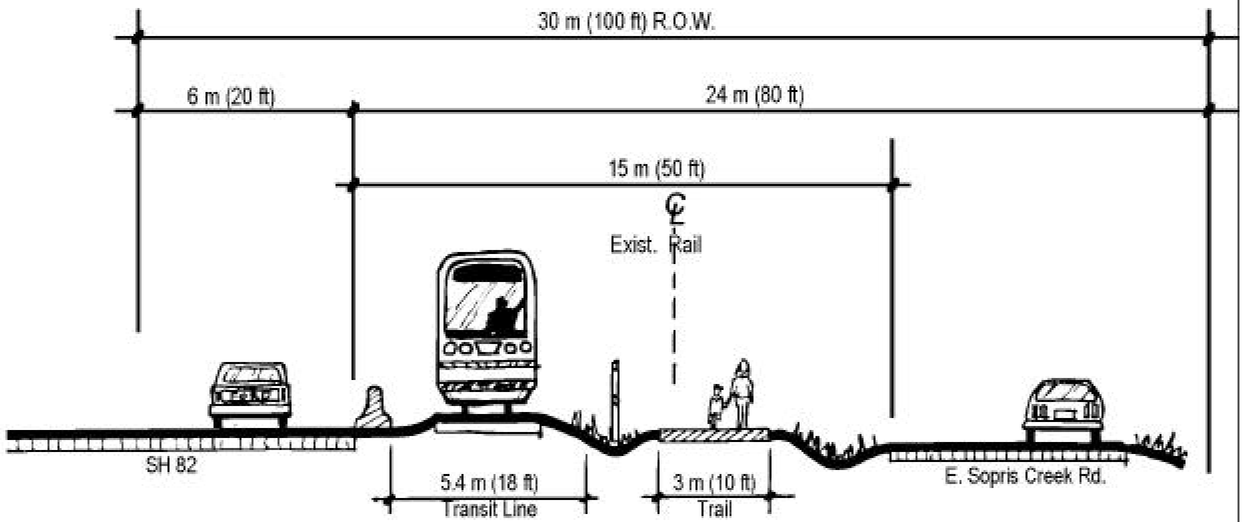


Figure II-27
Bridge at Old Snowmass

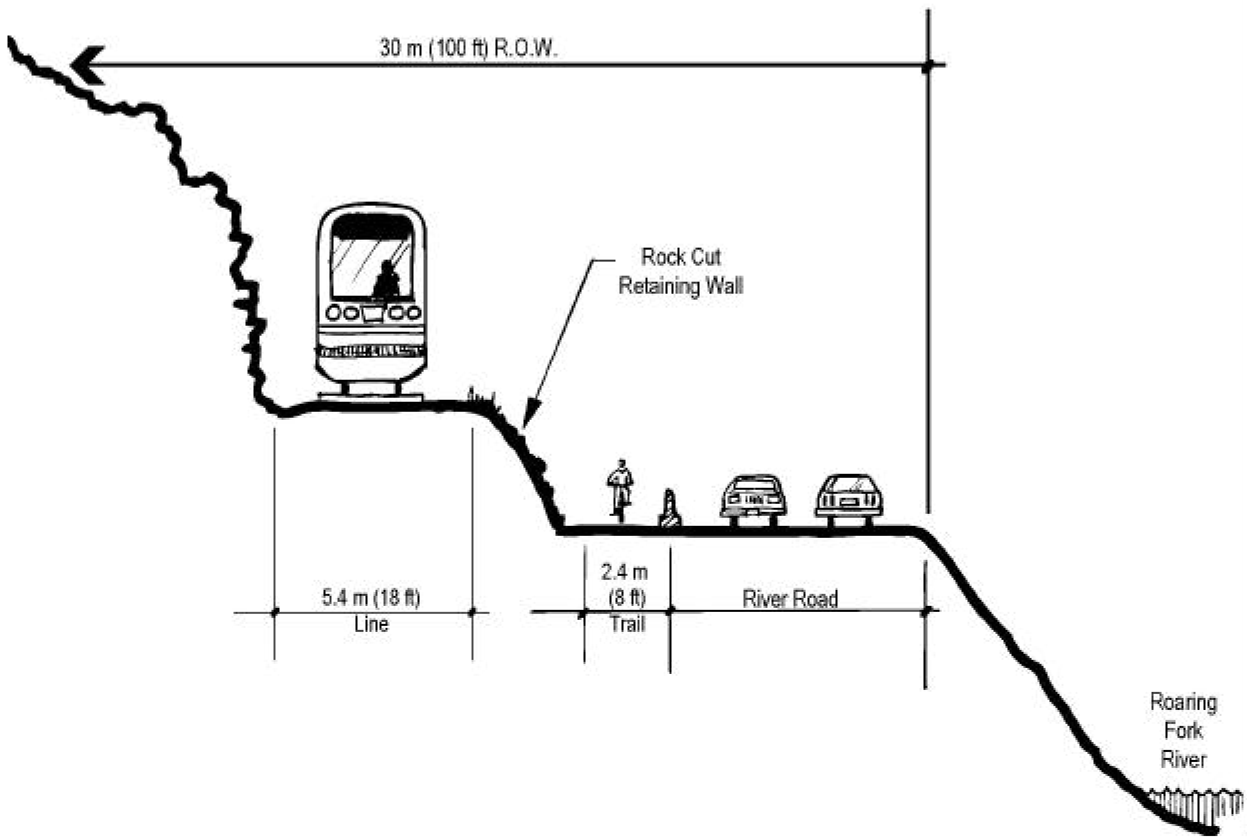
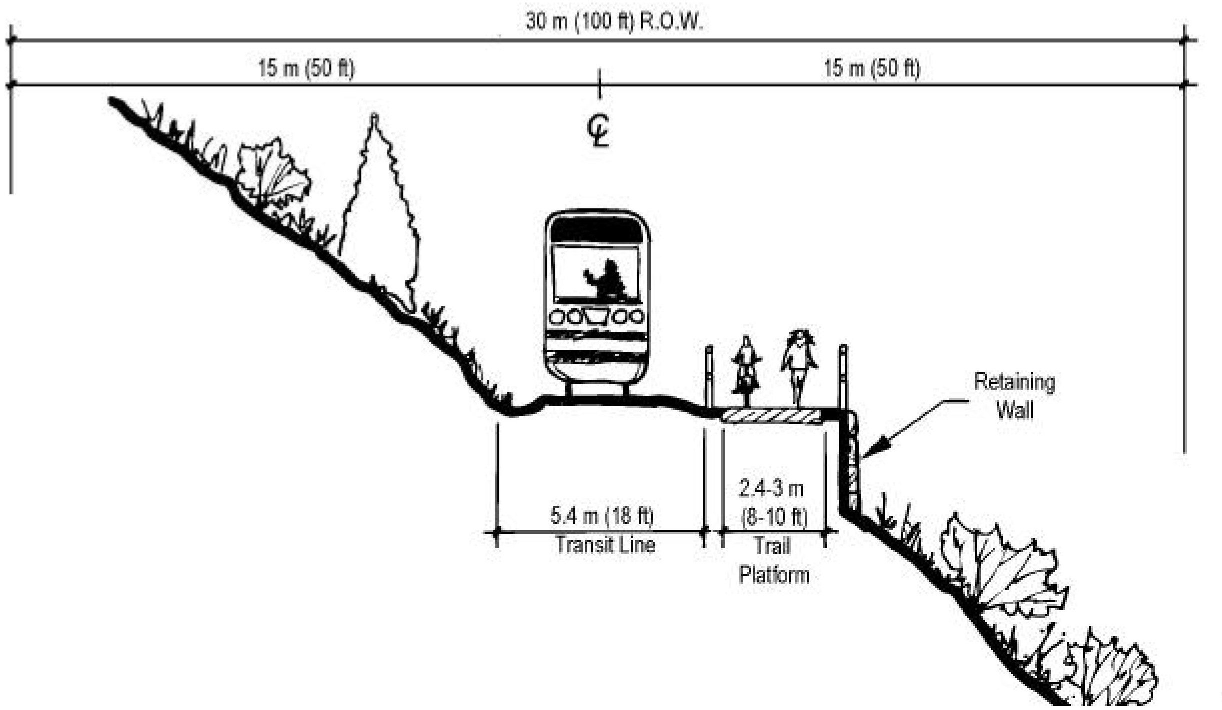


Figure II-28
Phillips Curve Area



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3.4.5 Interpretive Signage. The Rio Grande Trail will include interpretive signing to provide relevant and appropriate information. Several means of providing information via signage are recommended:

- Information signs – mapping, regulations, safety information, resource protection etc.
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- Trailside signs – mileage, directions, distances, road intersections etc.
- Identification signs – graphic logo for trail definition
- Traffic control signs – regulatory signage and pavement markings

4. Summary of Alternatives

Tables II-11 and II-12 (following pages) provide a comparison of the physical and operating characteristics of each alternative.

Table II-11
Comparison of CIS Alternatives – Physical Characteristics

ALIGNMENT

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
• Four general-purpose lanes Glenwood Springs to Basalt • Two general-purpose lanes and two peak-hour HOV lanes Basalt to Buttermilk • Two lane parkway from Buttermilk to 7th and Main • Light Rail Transit from Buttermilk to Rubey Park or Busway from Buttermilk to 7th and Main • Four-Mile Connection in South Glenwood Springs • New signals at 7th, 5th, 3rd, and Garmisch • Bike and ped improvements per Basalt to Buttermilk and Entrance to Aspen RODs	Includes No Action/ Committed Projects with Entrance to Aspen Busway plus: • Traffic signal modification for transit priority • Additional Remote Traffic Microwave Sensor on Highway 82 • Incident Management Program • Variable Message Sign System • Wildlife Warning Reflector System • Video surveillance to monitor traffic conditions • Queue Bypass Lanes for buses	Includes No Action/ Committed Projects with Entrance to Aspen Light Rail plus: • Traffic signal modification for transit priority • Additional Remote Traffic Microwave Sensor on Highway 82 • Incident Management Program • Variable Message Sign System • Wildlife Warning Reflector System • Video surveillance to monitor traffic conditions • Queue Bypass Lanes for buses	Includes No Action/ Committed Projects with Entrance to Aspen Light Rail plus: • Rail on Alignment C - See Figure II-3 • Additional Remote Traffic Microwave Sensor on Highway 82 • Incident Management Program • Variable Message Sign System • Wildlife Warning Reflector System • Video surveillance to monitor traffic conditions

STATION LOCATIONS

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
	• West Glenwood Springs	• West Glenwood Springs	• West Glenwood Springs
	• Downtown Glenwood Springs	• Downtown Glenwood Springs	• Downtown Glenwood Springs
	• South Glenwood Springs	• South Glenwood Springs	
	• CMC (CR 54)	• CMC (CR 54)	
	• Highway 133	• Highway 133	• Highway 133
	• Downtown Carbondale	• Downtown Carbondale	• Downtown Carbondale
	• El Jebel (El Jebel Road or Willits Lane)	• El Jebel (El Jebel Road or Willits Lane)	• El Jebel (El Jebel Road or Willits Lane)
	• Basalt	• Basalt	• Basalt
• Snowmass Village	• Snowmass Village	• Snowmass Village	• Snowmass Village
• Rodeo Lot	• Rodeo Lot	• Rodeo Lot	• Rodeo Lot
• Brush Creek Road	• Brush Creek Road	• Brush Creek Road	• Brush Creek Road
• Pitkin County Airport	• Pitkin County Airport	• Pitkin County Airport	• Pitkin County Airport
• Buttermilk	• Buttermilk	• Buttermilk	• Buttermilk
• Maroon Creek Road	• Maroon Creek Road	• Uses LRT stations from Buttermilk to Rubey Park	• Uses LRT stations from Buttermilk to Monarch
• 7th and Main	• 7th and Main		• Main and Galena
• 3rd and Main			
• Paepcke Park	• Paepcke Park		
• Monarch Street			
• Rubey Park	• Rubey Park		

Table II-11, continued
Comparison of CIS Alternatives – Physical Characteristics

PARK-and-RIDE FACILITIES

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
6,700 total spaces proposed [1] in the Project Corridor, including: • 450 spaces - Glenwood Springs • 500 spaces - Carbondale • 500 spaces - El Jebel • 500 spaces - Basalt • 400 spaces - Brush Creek Road • 750 spaces - Buttermilk • 3,600 spaces - Pitkin County Airport [1] *Note that the current transportation model shows a need by 2025 of 3,290 spaces.*	4,140 total spaces in the Project Corridor, including: • 600 spaces - West Glenwood Springs • 260 spaces - South Glenwood Springs • 800 spaces - Highway 133 • 360 spaces - El Jebel • 440 spaces - Basalt • 140 spaces - Brush Creek Road • 260 spaces - Buttermilk • 1,280 spaces - Pitkin County Airport	3,620 total spaces in the Project Corridor, including • 560 spaces - West Glenwood Springs • 260 spaces - South Glenwood Springs • 630 spaces - Highway 133 • 1,030 spaces - El Jebel • 410 spaces - Basalt • 530 spaces - Brush Creek Road • 30 spaces - Buttermilk • 170 spaces - Pitkin County Airport	4,710 total spaces in the Project Corridor, including: • 940 spaces - West Glenwood Springs • 660 spaces - Highway 133 • 1,140 spaces - El Jebel • 390 spaces - Basalt • 890 spaces - Brush Creek Road • 120 spaces - Buttermilk • 570 spaces - Pitkin County Airport

VEHICLES

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
• 19.8 meter (65-foot) articulated diesel buses • 40-foot diesel buses	• 19.8 meter (65-foot) articulated alternative fuel buses (possibly low-floor)	• 19.8 meter (65-foot) articulated alternative fuel buses (possibly low-floor)	• Diesel Multiple Unit Railcars (Adtranz GTW 4-12 or equivalent) • Up to 4 vehicle consists during peak hours

STORAGE AND MAINTENANCE FACILITIES

No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
• W. Glenwood Springs Bus Maintenance Facility • Carbondale Bus Storage Facility • Aspen Bus Maintenance Facility	• Expanded W. Glenwood Springs Bus Maintenance Facility at Existing Location • New Carbondale Bus Maintenance Facility at Existing Location • Aspen Bus Maintenance Facility	• Expanded W. Glenwood Springs Bus Maintenance Facility at Existing Location • New Carbondale Bus Maintenance Facility at Existing Location • Aspen Bus Maintenance Facility	• W. Glenwood Springs Bus Maintenance Facility at Existing Location • New Carbondale Rail Maintenance Facility at Existing Location • Aspen Bus Maintenance Facility

Table II-12
Comparison of CIS Alternatives – Operating Characteristics

GUIDEWAYS				
	No Action/Committed Projects Alternative	**BRT-Bus Alternative**	**BRT-LRT Alternative**	**Rail Alternative**
Hours	18+ hours/day	18+ hours/day	18+ hours/day	18+ hours/day
Roadways	Highway 82, City streets, County roads	Highway 82, City streets, County roads	Highway 82, City streets, County roads	Alignment C – See Figure II-3
Consists	Express and local buses	Super Express and Express Buses	Super Express and Express Buses, Light Rail	DMU Railcars (1 to 4-car consists)
Speed	Roadway speed limit	Roadway speed limit	Roadway speed limit	96.6 kph (60 mph) maximum
Headway	30 minutes peak/up to 60 minutes off-peak	30 minutes all day	30 minutes all day	30 minutes all day
Routes	**RFTA TDP Routes:** • LRT (Pitkin County Airport to Rubey Park) • Glenwood to Buttermilk Express • Glenwood to Buttermilk Local • Carbondale to Buttermilk Express • Carbondale to Buttermilk Local • El Jebel to Buttermilk Express • El Jebel to Buttermilk Local • Basalt to Buttermilk Express • Basalt to Buttermilk Local • Rifle to Glenwood Springs • Snowmass Village to Buttermilk • Woody Creek to Brush Creek Road	**Peak Hour Super Express Routes:** • Glenwood Springs to Rubey Park • Carbondale to Rubey Park • El Jebel to Rubey Park • Basalt to Rubey Park • Express Route from W. Glenwood Springs to Aspen • Snowmass Village to Rubey Park • Woody Creek to Brush Creek Road	**Peak Hour Super Express Routes:** • Glenwood Springs to Buttermilk • Carbondale to Buttermilk • El Jebel to Buttermilk • Basalt to Buttermilk • Express Route from W. Glenwood Springs to Buttermilk • LRT from Pitkin County Airport to Rubey Park • Snowmass Village to Buttermilk • Woody Creek to Brush Creek Road	**Rail Routes:** • West Glenwood to Main Street • Peak Hour El Jebel to Main Street **Bus Routes:** • Snowmass Village to Brush Creek Road • Woody Creek to Brush Creek Road

Table II-12, continued
Comparison of CIS Alternatives – Operating Characteristics

FEEDER BUS OPERATIONS			
No Action/Committed Projects Alternative	**BRT-Bus Alternative**	**BRT-LRT Alternative**	**Rail Alternative**
Interaction with local service in Aspen, Snowmass Village and Glenwood Springs	Interaction with local service in Aspen, Snowmass Village and Glenwood Springs. Timed transfers to/from Express Route to: • Rifle Feeder • West Glenwood Springs Feeder • Glenwood Springs Feeder • Carbondale Feeder • Redstone Feeder • El Jebel/Basalt Feeder • Basalt to Brush Creek Feeder	Interaction with local service in Aspen, Snowmass Village and Glenwood Springs. Timed transfers to/from Express Route to: • Rifle Feeder • West Glenwood Springs Feeder • Glenwood Springs Feeder • Carbondale Feeder • Redstone Feeder • El Jebel/Basalt Feeder • Basalt to Brush Creek Feeder	Interaction with local service in Aspen, Snowmass Village and Glenwood Springs. Timed transfers to/from Rail to: • Rifle Feeder • West Glenwood Springs Feeder • Glenwood Springs Feeder • Glenwood Springs to Carbondale Feeder • Carbondale Feeder • Redstone Feeder • El Jebel/Basalt Feeder • Basalt to Brush Creek Feeder

BACKGROUND BUS SERVICE			
No Action/Committed Projects Alternative	**BRT-Bus Alternative**	**BRT-LRT Alternative**	**Rail Alternative**
No Action/Committed Projects Alternative describes RFTA's background bus service	Replaces RFTA TDP Valley Service	Replaces RFTA TDP Valley Service	Replaces RFTA TDP Valley Service

FARE POLICY/PRICING			
No Action/Committed Projects Alternative	**BRT-Bus Alternative**	**BRT-LRT Alternative**	**Rail Alternative**
Per RFTA TDP	Comparable to RFTA TDP	Comparable to RFTA TDP	Comparable to RFTA TDP

TRANSPORTATION MANAGEMENT PROGRAM			
No Action/Committed Projects Alternative	**BRT-Bus Alternative**	**BRT-LRT Alternative**	**Rail Alternative**
Entrance to Aspen TM Program to maintain AADT entering Aspen at 1994 levels	Includes No Action/ Committed Projects plus: • Carpool matching program • Vanpool program • Marketing/Incentive program • Additional TSM techniques	Includes No Action/ Committed Projects plus: • Carpool matching program • Vanpool program • Marketing/Incentive program • Additional TSM techniques	Includes No Action/ Committed Projects plus: • Carpool matching program • Vanpool program • Marketing/Incentive program • Additional TSM techniques

III. AFFECTED ENVIRONMENT

The Project Corridor traverses the Roaring Fork Valley between Glenwood Springs in Garfield County and Aspen in Pitkin County. Figure I-3 in **Chapter I: Purpose and Need** provides a view of the linear project corridor. The corridor length is roughly 80 kilometers (50 miles). Highway 82 runs 66.5 kilometers (41.3 miles) from its beginning at I-70 in Glenwood Springs to downtown Aspen. The new Rio Grande Trail portion of the Aspen Branch of the D&RGW Railroad right-of-way meanders 53.6 kilometers (33.3 miles) from 23rd Street in Glenwood Springs to its terminus at Woody Creek. Table II-7 provides detailed notes on lengths of various segments of the Project Corridor. The Project Corridor passes through three counties: Garfield, Eagle, and Pitkin. The largest linear portion of the corridor is found in Garfield (55 percent) and Pitkin Counties (36 percent). Only 4.8 kilometers (three miles) pass through a corner of Eagle County (nine percent).

The width of the Project Corridor studied in the resources analyses in this chapter varies by resource. The potential area of direct project effect is generally a narrow band of less than 30 meters (100 feet) on either side of the linear transportation corridor. However, larger areas are described in order to establish a context for analysis. When the physical width of the area studied has relevance to a resource discussion, it is described in that section.

A. SOCIAL ENVIRONMENT

1. Population

1.1 Introduction

The region encompasses a large area bounded by the cities of Rifle, Eagle, and Aspen, that is accessed via Interstate 70 and Highway 82. A majority of the employment and recreational opportunities are in the Project Corridor along Highway 82 between Glenwood Springs and Aspen. As a result, the demographic analysis for the Project Corridor includes Eagle, Garfield, and Pitkin Counties. It focuses on the Highway 82 and RFTA rights-of-way between West Glenwood Springs and Aspen. The Project Corridor consists of the previous Aspen Branch of the Denver and Rio Grande Western Railroad right-of-way between Glenwood Springs and Woody Creek.

This analysis includes examination of county and community trends as well as trends identified within the Project Corridor. For the purposes of the demographic analysis and to remain consistent with the database used for transportation analyses, data was examined by traffic analysis zones (TAZs). This data was then divided into 12 sub-areas reflecting the names of nearby communities and neighborhoods. In subsequent social and economic analyses, some of these sub-areas have been combined.

Minor differences in population totals may occur for two reasons. First, the TAZ analyses do not include entire counties or communities and will vary somewhat from information provided by those local entities. Second, it is possible that population data will vary due to the source and manner in which it has been created. U.S. Census data, State of Colorado data, county data, and municipal data do not all match exactly. The purpose of this section is to provide a general background on population trends in the project area. Order of magnitude is more important to consider than exact numbers, especially when any data forecasts are presented.

1.2 County and Community Populations

During the period from 1990 to 2000, Colorado was the third fastest growing state in the United States. Eagle and Garfield Counties were among the fastest growing counties in Colorado. Garfield, Eagle, and Pitkin Counties have sustained tremendous growth over the past 20 years. Eagle County's growth has been most dramatic with a 214 percent increase since 1980. Garfield and Pitkin Counties have grown less dramatically, by 96 percent and 45 percent, respectively. In terms of actual growth during this period, Eagle and Garfield County populations each increased by approximately 20,000 people, while Pitkin County grew by an additional 4,600 people. Table III-1 illustrates the growth patterns for each county and the state between 1980 and 2000.

Corridor communities have also grown during the same period. Growth data since 1990 show that Aspen's growth rate has slowed and is slightly below that of Pitkin County. Basalt, which is located in both Eagle and Pitkin counties, has grown significantly since 1990, faster than either county. Carbondale has grown at a rate higher than Garfield County as a whole, while Glenwood Springs' growth since 1990 has been notably less than the Garfield County trend. Table III-2 shows these community trends.

Table III-1
County and State Growth Trends, 1980 - 2000

County	1980	1990	Avg. Annual Change 1980-1990	1995	Avg. Annual Change 1990-1995	2000	Avg. Annual Change 1995-2000	Total Change (20 years)
Eagle	13,320	22,118	5.1%	30,883	6.9%	41,888	6.3%	214%
Garfield	22,514	30,151	2.9%	36,417	3.8%	44,032	3.9%	96%
Pitkin	10,338	12,691	2.0%	14,652	2.9%	14,954	0.4%	45%
Colorado	2,889,735	3,294,473	1.3%	3,811,074	2.6%	4,301,261	2.1%	49%

Source: Colorado Division of Local Government, Demography Section

Table III-2
Community Growth Trends, 1990 - 2000

Community	1990	% Annual Change	1995	% Annual Change	2000
Aspen	5,049	2.4%	5,665	.09%	5,914
Basalt	1,128	8.1%	1,588	13.8%	2,681
Carbondale	3,004	6.9%	4,034	5.8%	5,196
Glenwood Springs	6,561	3.0%	7,575	.42%	7,736

Source: Colorado Division of Local Government, Demography Section

Table III-3 illustrates 1998 and forecast 2025 population and household data by community and neighborhood in the Project Corridor. Comparing the number of households with the population in each household results in a density-per-household calculation. This indicator shows that fewer people live in each household in and near Aspen than elsewhere in the Project Corridor. The larger households are between Glenwood Springs and the Wingo Junction area. A high number of persons per household or dwelling unit may indicate a shortage of housing in those areas. A high demand for affordable housing exists in all three counties. This higher number could also be an indicator of larger family sizes in these areas. No differentiation has been made between the households containing individuals who are related versus those containing unrelated individuals.

1.3 Population Growth Forecasts

The Colorado Division of Local Government's most recent forecasts of growth through 2025 for the three counties shows a slowing of growth rates for all three counties relative to the past. Eagle County's population is forecast to grow by 84 percent, to 77,223 by 2025, which is nearly double its current size. Garfield County population is also forecast to grow significantly by 85 percent to 81,483. Pitkin County population is forecast to grow by 62 percent to 24,242. Forecast data is shown in Table III-4. By 2025 average annual growth rates of 2.0, 2.2, and 1.5 percent are projected for Eagle, Garfield, and Pitkin Counties, respectively. Colorado's growth rate is expected to be 1.5 percent by 2025.

Table III-3
1998 and 2025 Population, Roaring Fork Valley Communities

	1998 Population	Number of Households	Persons per Household	2025 Population	Number of Households	Persons per Household
Garfield I-70 Corridor	14,899	5,639	2.6	30,204	11,500	2.6
Eagle I-70 Corridor	9,691	3,600	2.7	19,118	7,007	2.7
Glenwood Springs	8,713	3,634	2.4	13,418	5,496	2.4
Aspen Glen Area	4,026	1,433	2.8	6,100	2,173	2.8
Carbondale	5,331	1,993	2.7	11,418	4,315	2.6
Catherine Store Area	1,039	442	2.4	1,573	671	2.3
Basalt-El Jebel	4,780	1,624	2.9	11,325	3,833	3.0
Basalt	2,155	1,000	2.2	4,065	1,889	2.2
Basalt-Holland Hills	916	378	2.4	2,146	884	2.4
Snowmass/ Lower River Rd	761	376	2.0	1,142	526	2.2
Woody Creek/ Aspen Village	1,232	621	2.0	1,850	933	2.0
Snowmass Village	1,702	1,674	1.0	2,756	2,709	1.0
Brush Creek/Owl Creek	221	107	2.1	329	158	2.1
Aspen	6,222	3,983	1.6	9,259	5,795	1.6
East of Aspen	2,811	1,389	2.0	4,490	2,306	1.9
TOTAL	64,499	27,893	2.3	118,926	50,195	2.4

Source: Prepared by Joanna Morsicato and Associates with data provided by Claritas, October 1998; updated by Otak, 2002.

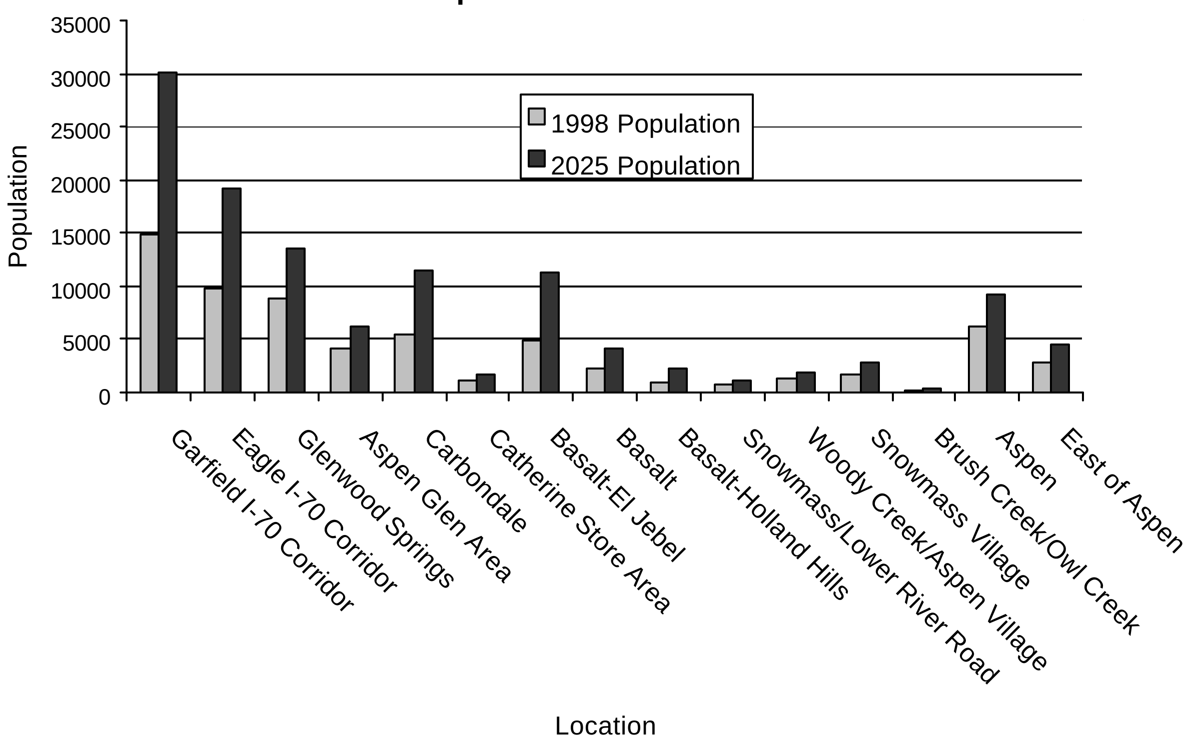
Table III-4
County and State - Population Forecasts

County	Population						% Change
	2000	2005	2010	2015	2020	2025	2000-2025
Eagle	41,888	49,477	56,518	63,299	70,207	77,223	84%
Garfield	44,032	50,580	57,978	65,535	73,457	81,483	85%
Pitkin	14,954	16,994	18,998	20,854	22,612	24,242	62%
Colorado	4,301,261	4,717,697	5,131,089	5,567,551	6,009,699	6,463,157	50%

Source: Colorado Division of Local Government, Demography Section, Table IC Preliminary Population Projections For Colorado Counties, 1990-2025.

Forecast growth is focused in the developing communities of Carbondale and Basalt-El Jebel, as well as neighborhoods along the Project Corridor. Figure III-1 shows 1998 and 2025 growth for communities and neighborhoods along the Project Corridor. Although the entire Project Corridor is forecast to grow 84 percent by 2025, the largest growth areas are forecast to be Carbondale and El Jebel-Basalt, with growth increase of 114 and 137 percent, respectively. In numbers, the Project Corridor population will expand by approximately 30,000. The combined growth of Glenwood Springs and Aspen represents approximately 8,000 of that total. From another perspective, Pitkin County is forecast to grow by a total of 11,000 in the same period. Eagle and Garfield Counties are

Figure III-1
1998 and 2025 Population and Overall Growth Rates



forecast to grow by approximately 35,000 each.

Source: Prepared by Joanna Morsicato and Associates with data provided by Claritas, October 1998, updated by Otak, 2002.

1.4 Commuters

One of the effects of Aspen, Snowmass Village, and Pitkin County being an attractive resort destination - with resulting high prices for housing - is that many of the service and tourist-related jobs are filled by employees who cannot afford to live in Aspen or Snowmass Village. (This is discussed further in **Chapter III.B: Economic Environment**.) This Downvalley commuter population significantly increases the traffic on Highway 82. Conversely, relatively few Pitkin County residents work in a different county. Pitkin County's Downvalley neighbors in the Roaring Fork Valley are Eagle County and Garfield County. The 2000 U.S. Census reported that 7.5 percent of Pitkin County residents worked outside their county of residence compared with 14.1 percent of Eagle County residents and 25.9 percent of Garfield County residents.

The Downvalley commuter pattern has continued, as evidenced in a recent City of Aspen study. Employed persons living in Pitkin County have been decreasing while employment has been growing. As a result, the number of employees commuting from Downvalley locations has increased from 48.4 percent in 1995 to 52.8 percent in 2000. Of the 14,039 persons employed in Aspen, 48.9 percent, or 6,632 live locally (Economic & Planning Systems, Inc., 2002).

1.5 Visitor Populations

The visitor counts include only those visitors who use the available short-term lodging facilities. Combining the number of available rooms with the seasonal occupancy rates yields an average daily number of rooms occupied by season. Occupancy rates for summer ranged from 48 percent to 67 percent depending upon location. For forecasting purposes, winter rates were between 35 percent and 78 percent. The same rates were used for both 1998 and 2025.

The average number of occupied rooms was multiplied by the average number of persons per room (2.14 in the summer and 1.65 in the winter) based on data provided by the Glenwood Springs Chamber Resort Association. Winter occupancies for the ski resort areas were increased to 2.2 persons per room based on rates obtained from the Snowmass Village Resort Association.

Table III-5 shows estimated 1998 visitor populations by community. Current visitor populations in the corridor are highest in summer with a peak at just under 18,000. Winter totals are less at approximately 11,000. Summer weekends attract the highest visitor populations. Aspen and Snowmass Village attract the highest number of visitors both summer and winter due to the all-season resort nature of the developments. Glenwood Springs attracts a significant summer tourist population. The smaller towns in the valley attract few visitors.

Table III-6 illustrates forecast 2025 visitor populations. Trends are expected to stay the same with the summer peak just above 34,000 and the winter totals at 19,000. Aspen and Snowmass Village will continue to grow, although Aspen's winter population growth rate will slow. Aspen summer weekend numbers are projected to increase by as much as 9,000 by 2025. Glenwood Springs' summer weekend numbers will also go up noticeably. The Basalt area is forecast to increase summer weekend visitors by close to 1,900 per day, from 192 to 2,128. Winter visitor numbers are also projected to increase by 1,300. (2025 data presented in Table III-6 includes the same occupancy rates as shown for 1998 in Table III-5. For most communities an increase in lodging availability is expected. If a growth ceiling is reached, number of guests per room and facility occupancy rates may change.)

Table III-5
1998 Average Daily Visitor Populations by Community

Community	Summer Visitors			Winter Visitors		
	Occupancy	Weekend	Weekday	Occupancy	Weekend	Weekday
Glenwood Springs	63%	2,996	1,198	35%	1,283	513
Basalt	61%	192	77	55%	133	53
Carbondale	61%	183	73	55%	127	51
Snowmass Village	48%	3,697	1,479	78%	3,529	3,529
Aspen	67%	10,707	4,283	72%	6,159	6,159
TOTAL	---	17,775	7,110	---	11,231	10,305

Source: Prepared by Joanna Morsicato and Associates with data provided by Parsons Transportation Group, February 1999.

Table III-6
2025 Average Daily Visitor Populations By Community

Community	Summer Visitors			Winter Visitors		
	Occupancy	Weekend	Weekday	Occupancy	Weekend	Weekday
Glenwood Springs	63%	4,639	1,855	35%	1,996	799
Basalt	61%	2,128	852	55%	1,474	589
Carbondale	61%	1,730	693	55%	1,136	454
Snowmass Village	48%	5,986	2,394	78%	5,715	5,715
Aspen	67%	19,565	7,825	72%	8,957	8,709
TOTAL	NA	34,047	13,621	N/A	19,278	16,266

Source: Prepared by Joanna Morsicato and Associates with data provided by Parsons Transportation Group, February 1999, Updated by OTAK May 2002.

2. Demographic Characteristics

2.1 2000 Age Characteristics of County Populations

Table III-7 indicates population by select age groups for 2000 for the State of Colorado and the three counties in the Project Corridor. The distribution of population by age for Garfield County mirrors the State pattern closely. All three counties have a significant adult population in the 25 to 44-year-old age group. This may be related to the emphasis on the resort industry in those counties. The low population in the over-65 age group in Eagle County may shift as more residents choose to stay in retirement.

Table III-7
Selected Population Characteristics, 2000

	Eagle	Garfield	Pitkin	Colorado
25 to 44 years of age	42%	33%	38%	33%
45 to 64 years of age	20%	22%	30%	22%
65 years of age and older	3%	9%	7%	10%
Caucasian	85%	90%	94%	83%
Hispanic/Latino[1]	23%	17%	6%	17%

[1] Hispanic/Latino is a subset of Caucasian.. Percentage shown is of total population.

Source: U.S. Census 1990-2000 County and Place Comparisons

2.2 2000 Race Characteristics of County Populations

Table III-7 also indicates population by race for 2000 in Colorado and the three study area counties. Each of the study area counties represents one percent or less of the total state population. The minority populations within these counties are very small. Except for the Hispanic/Latino population, the other minority racial groups are present in numbers of one percent or less of each county's population. In real numbers, these totals for any given county and group are often not more than a few hundred people. In 2000, the Black/African American population in Eagle, Garfield, and Pitkin counties was 142, 196, and 79, respectively. In 2000, American Indian population totals were 296, 310, and 40; and Asian population totals were 372, 226, and 173.

The Hispanic/Latino population for each county is more significant. Eagle County's Hispanic/Latino population has actually grown at a faster rate than the Hispanic population in the State of Colorado as a whole, and now represents 23 percent of the 2000 population, while the State's total is 17 percent. Garfield and Pitkin Counties, on the other hand, have somewhat smaller portions of Hispanic/Latino populations at 17 percent and six percent for 2000, respectively. Note: while the Hispanic/Latino population in Colorado has increased 73.4 percent between 1990 and 2000, the increases in Eagle, Garfield, and Pitkin Counties have been 232 percent, 336 percent and 105 percent, respectively.

3. Environmental Justice

3.1 Introduction

On February 11, 1994, Federal Executive Order 12898 was issued requiring federal agencies to incorporate Environmental Justice considerations into the National Environmental Policy Act (NEPA) planning process. While not required, this CIS has been carried out in accordance with the guidance provided in these regulations. The purpose of this order is to ensure that minority and low-income populations and minority-owned businesses do not receive disproportionately high and adverse human health or environmental impacts as a result of federal actions. In April 1997, the United States Department of Transportation issued DOT Order 5610.2 to summarize and expand upon the requirements of EO12898. The order defines a process for incorporating environmental justice principles into all DOT programs, policies, and activities. In December 1998, the FHWA issued regulations (DOT Order 6640.23) to implement and expand upon the directives of EO12898 and DOT Order 5610.2 by incorporating environmental justice principles in all FHWA programs, policies, and activities. In October 1999, the FHWA and FTA issued a Memorandum to clarify Title VI requirements for State and Metropolitan Planning Agencies.

3.2 Minority Populations (descriptive)

Minority population in the Project Corridor has increased significantly over the last decade. The predominant minority population is Hispanic/Latino. Immigrants from Mexico and Central and South America and citizens of Hispanic/Latino descent have been attracted to the area by the availability of employment as well as the physical beauty and recreational opportunities. Construction, maintenance, visitor service, and landscaping positions have been popular with minority populations. In the 1990 census, about 5,078 individuals were counted as Hispanic/Latino in the three counties included in the Project Corridor. In 2000, about 17,945 individuals were counted as Hispanic/Latino.

High housing prices in the resort employment centers of Aspen and Snowmass Village have led to employees commuting 40 to 112.65 kilometers (25 to 70 miles) from the communities of Basalt, Carbondale, New Castle, Rifle, and Silt, as well as areas of the unincorporated counties. The resort communities have the lowest minority populations in the Project Corridor but rely on minority workers to fill resort hourly wage positions. Glenwood Springs is another employment center with a strong employment base and a shortage of affordable housing.

Carbondale, with about 32 percent of the population reported as Hispanic/Latino in the 2000 census, is an area with a concentrated minority population. A majority of residents commute to jobs outside of their community, primarily to Aspen and Glenwood Springs. Many of these commuters rely on transit service to access employment and retail services.

RFTA performs bi-annual regional passenger surveys that seek to identify transit-dependent populations. In 2001, only 18 percent of passengers who completed surveys in Spanish reported that they had a car available for the trip and 24 percent had a driver's license. By comparison, 61 percent of those who completed the survey in English reported that they had a car available for the trip and 81 percent reported having a driver's license.

Affordable housing is an issue for all workers in the Project Corridor and is of special concern for minority and low-income workers. Every local jurisdiction has adopted regulations in an effort to slow the loss of affordable housing and/or to increase construction of housing for people of all income levels. Some communities also provide public subsidies for building affordable housing. Deed-restricted units have been built which lease or are sold through local housing agencies based on guidelines that prescribe employment, asset limits, income levels, and appreciation limits.

For a variety of social, cultural, and economic reasons, minority workers usually compete in the shrinking pool of free-market rental housing rather than the programs developed by local governments. As the price of single-family homes and condominiums has risen, former rental units have been sold and removed from the rental pool. The shrinking rental pool has increased pressure on traditional apartment and multi-family housing and has led to increased rents. In addition, several mobile home parks, which have historically been a part of the pool of low-income housing, are threatened without new mobile home parks being approved. The 19-unit Bonanza Trailer Park in Carbondale is being redeveloped into commercial and residential uses. Both the Roaring Fork and Pan and Fork Mobile Home Parks in Basalt are located in a flood danger area and are planned for redevelopment. Two other mobile home parks in Carbondale are already zoned for non-residential uses and the Aspen-Basalt Mobile Home Park in Eagle County is zoned for other residential uses.

The Catholic Archdiocese has participated in the development of two housing projects for low-income and minority residents in the Project Corridor. The Villa de Santa Lucia in Carbondale is a public-private-religious partnership created to provide 61 units of affordable rental housing. A similar project was constructed in Glenwood Springs. The Machebeuf Apartments provide 55 units of affordable rental housing.

Location, level of service, and accessibility of transit are critical to low-income and minority populations, but the population is also somewhat transient due to threats to housing stock and lack of affordable alternative housing. At this time, RFTA provides good bus service to the concentrated area of minority population in Carbondale and the remaining supply of free-market affordable rental housing. RFTA provides service every 30 minutes during peak hours to employment in Aspen and Snowmass Village, and has worked to increase service from communities such as Carbondale to employment and retail centers in Glenwood Springs, as well as adding service to the communities of New Castle, Silt, and Rifle to the west.

3.3 Minority Populations (demographic)

The discussion of minority populations below is based on information from 2000 Census data as well as data from local county and municipal sources. Additional demographic information is available in **Chapter III.A.1: Population** and **Chapter III.A.2: Demographics**. In the 2000 Census survey, national origin and race were two separate questions. The minority population figures can include both origin and race; therefore, percentages may exceed 100 percent. Respondents could select both national origin and a racial category (e.g. *Hispanic and African-American*, or *Hispanic and White*), or more than one race. Table III-8 represents data for White, Hispanic and one non-white racial minority category. Additional data on other minority populations is found in **Chapter III.A.2.2: 2000 Race Characteristics of County Populations**

In addition to the use of 2000 census data, local resources were contacted to obtain information on demographic trends and potential environmental justice concerns. Local resources interviewed include the Social Services Departments of Garfield, Eagle, and Pitkin counties and Asistencia Para Latinos, a local organization devoted to working with the Hispanic/Latino public in the Project Corridor.

For the three counties within the Project Corridor, the largest minority population is Hispanic/Latino. In Eagle County, the Hispanic/Latino population now makes up a greater percentage of the total than the state-wide average. Table III-8 displays the percentage of total population by race. The "Other Single Race" category includes Black, African-American, American Indian, Native Alaskan, Asian, and Pacific Islander populations.

Table III-8
Minority Population 1990-2000 in Project Corridor Counties

	Non- Hispanic White		Other Single Race		All Hispanic, Any Race	
County	**1990**	**2000**	**1990**	**2000**	**1990**	**2000**
Eagle	85.6%	74.2%	1.2%	1.9%	13.3%	23.2%
Garfield	93.1%	81.0%	1.4%	1.6%	5.6%	16.7%
Pitkin	94.4%	90.8%	1.8%	2.0%	3.8%	6.5%
State of Colorado	80.9%	74.6%	6.9%	7.4%	12.9%	17.1%

Source: U.S. Census 2000

Table III-9 displays minority populations by municipality. In Pitkin County, the percentage of minority residents matches the percentage within Aspen city limits. In Eagle County, the minority population is greater county-wide than within Basalt town limits. In Garfield County, the greatest concentration of minority population is in Carbondale, which has almost twice the percentage of minority population in the county.

Table III-9
Minority Population 1990-2000 in Project Corridor Municipalities

Municipality	Total 2000 Population	Non-Hispanic White	Other Single Race	All Hispanic Any Race
Aspen	5,914	91%	2%	6%
Basalt	2,681	85%	2%	12%
Carbondale	5,196	66%	2%	32%
Glenwood Springs	7,736	84%	2%	13%
Snowmass Village	1,822	95%	1%	3%

Source: U.S. Census 2000

3.4 Elderly Population

The percentage of the population aged 65 or older is consistently below the state-wide average in the Project Corridor. Table III-10 displays the median age and percentage of population aged 65 or older.

Table III-10
Elderly Population by Municipality

County/Municipality	Median Age	Aged 65+ (%)
Eagle	31	3%
Garfield	34	9%
Pitkin	38	7%
Aspen	37	7%
Basalt	34	3%
Carbondale	31	6%
Glenwood Springs	36	9%
Snowmass Village	37	6%
State of Colorado	34	10%

Source: U.S. Census 2000

3.5 Low-Income Population

The best available information about poverty within the Project Corridor is found in the *Regional Indicators Report* prepared by Healthy Mountain Communities. The information was derived from a model-based estimate using U.S. Census data and reflects estimates in 1997. Table III-11 displays the median income and percentages of total persons and children living below the poverty level by county. Additional income and poverty information is available in **Chapter III.B.4: Income**.

Table III-11
Median Income and Percentage of Persons Living Below Poverty Level in 1997

County	Median Income	Persons Below Poverty	Children Living Below Poverty
Eagle	$50,000	4%	6%
Garfield	$40,923	9%	13%
Pitkin	$52,744	5%	8%
State of Colorado	$40,853	10%	15%

Source: Healthy Mountain Communities, Regional Indicators Report

Table III-12
Percentage of Students Qualifying for Free or Reduced Cost Lunch Program in Project Corridor Elementary and Middle Schools July 2001 - June 2002

Municipality	Percentage
Aspen	<1%
Basalt	22%
Carbondale	43%
Glenwood Springs	26%

Source: Aspen School District and Roaring Fork RE-1 School District

Another measure of low-income population is the percentage of students qualifying for the Free or Reduced Lunch Program established by the US Department of Agriculture. Children from families with incomes at or below 130 percent of the poverty level are eligible for free meals. Those with incomes between 130 percent and 185 percent of the poverty level are eligible for reduced-price meals, for which students can be charged no more than 40 cents. For the period July 1, 2001 through June 30, 2002, 130 percent of the poverty level is $22,945 for a family of four; 185 percent is $32,653. Table III-12 displays the percentage of public school students in the Project Corridor who qualified for the Free or Reduced Lunch Program in October 2001.

The high cost of housing is an issue in the Project Corridor, and a prime reason for the extension of RFTA's service area to the communities of New Castle, Silt, and Rifle. All three counties and each municipality in the Corridor have enacted regulations concerning the creation of deed-restricted affordable housing in response to the shortage of rental and ownership housing which is affordable to households at or below the median income. There are additional households in the study area which do not fall below the federal poverty level but do face economic stress due to the higher-than-average percentage of their household income which goes towards housing. Access to an enhanced transit system can provide a benefit for such households if the need for a second automobile is avoided, if greater access to workplaces is achieved, or due to savings in transportation costs.

3.6 Public Involvement with Hispanic/Latino Population

A comprehensive effort was undertaken to understand the existing relationship between Hispanic/Latino populations and existing and proposed transit service in the Project Corridor. Public involvement activities included the following:

- Spanish interpreters were available at open houses.
- Two open houses for Spanish-speaking citizens were held on March 24, 1999 and May 8, 1999 to update the Hispanic/Latino community on the project and to scope issues. Spanish speakers presented study findings and facilitated a discussion of the Alternatives.
- Advertising for the open houses and additional scoping was provided by door-to-door canvassing in Hispanic/Latino neighborhoods.
- Study representatives participated in Hispanic/Latino radio programs.
- Members of the Study Team, in conjunction with Asistencia Para Latinos, spent two days riding on valley bus routes to answer questions and survey Hispanic/Latino community members who would be affected by the proposed transit improvements.

For more information on public involvement, see **Chapter IX: Public Involvement.**

4. Services

4.1 Schools

The Project Corridor includes a full range of public and private educational opportunities. The public schools are either in the Roaring Fork RE-1 or the Aspen 1 School District. Elementary and middle school enrollment in 2000 totaled 4,813. Total high school enrollment was 2,071. College level enrollments were 4,240. Types of schools and 2000 enrollments are summarized below by community.

Glenwood Springs. Glenwood Springs contains two public elementary schools (grades K-5), a middle school (grades 6-8), two high schools (grades 9-12), and a vocational school (grades 11-12). A private elementary-middle school (grades K-8) is also located in Glenwood Springs. Colorado Mountain College has two sites in Glenwood Springs. In 2000, elementary school enrollment totaled 889, middle school totaled 515, and high school totaled 778 students. The private school enrollment totaled 88. Colleges totaled 2,049 students.

Carbondale. Carbondale contains two elementary schools and a charter school with a total enrollment of 809. Carbondale Middle School had a 2000 enrollment of 274. The high school included 343 students. Private school enrollments totaled 288. The Carbondale Colorado Mountain College campus had an enrollment of 738.

Basalt. Basalt contains an elementary, middle, and high school with 2000 enrollments of 590, 413, and 387, respectively.

Aspen. There is one elementary school in Aspen District 1. 2000 enrollment was 448. The middle school (grades 5 - 8) included 395 students and the high school (grades 9-12), 393 students. A charter school in Woody Creek (grades K-8) included 114 students. A private school (grades K-9) had a 2000 enrollment of 160. Aspen Campus of Colorado Mountain College had an enrollment of 1,453 students.

4.2 Health Care

The Project Corridor includes two hospitals and numerous smaller clinics and medical practices. Full service health care facilities are available at each end of the corridor, in Glenwood Springs and Aspen.

Glenwood Springs. Valley View Hospital is a full-service, 80-bed hospital. Glenwood Springs has over 85 physicians and surgeons, chiropractors, optometrists, and podiatrists. Twenty-two dentists also have offices in this community.

Carbondale and Basalt-El Jebel. The Carbondale and Basalt-El Jebel area includes 40 physicians, surgeons and chiropractors. Sixteen dentists practice in this area.

Snowmass Village-Aspen. Aspen Valley Hospital is a 49-bed full-service facility. Eighty-one physicians, surgeons, chiropractors, optometrists, and podiatrists provide service for the Snowmass Village - Aspen area. Fifteen dentists practice in this area.

4.3 Law Enforcement

Law enforcement in the Project Corridor includes the State of Colorado, three counties, and five community agencies. The Colorado State Patrol has jurisdiction over Interstate 70 and Highways 82 and 133. Garfield, Eagle and Pitkin County Sheriff's Departments work together with Glenwood Springs, Carbondale, Basalt, Snowmass Village and Aspen community police departments. Each department is summarized briefly below.

Garfield County Sheriff's Department. Garfield County has a main office in Glenwood Springs. It also has two substations outside the Project Corridor. A new county jail has a total of 200 beds. Staff, including sworn officers, totals 90 people. The county has 31 patrol, transport, and administration cars. The total cases rose from 5,322 in 1998 to 6,783 in 2000.

Eagle County Sheriff's Department. The Eagle County Sheriff's Department is headquartered in the town of Eagle. Eagle County has 38 officers and a total law enforcement staff, including officers, of approximately 81 people. The county jail, also located in Eagle, has 52 beds with the possibility of double bunking when needed. The main office is in Eagle, with four substations located elsewhere in the county. The El Jebel substation is located in the Project Corridor. Total 1998 calls for service assigned case numbers were 6,302. Total calls for service in 2000 were 11,424.

Pitkin County Sheriff's Department. Pitkin County has its main office at the courthouse in Aspen. There is a substation at Aspen Village. The county jail in Aspen contains a 24-bed facility. Department staff includes 42 with 25 vehicles. Calls for service totaled 8,365 in 1998 and 8,849 in 2000.

Glenwood Springs Police Department. The Glenwood Springs Police Department has 36 staff members, including 27 sworn officers, and 18 vehicles. The Department has one office in Glenwood Springs. Calls for service (all types) totaled 16,243 in 1998, and 17,155 in 2000.

Carbondale Police Department. The Carbondale Police Department employs 18 people and has eight cars. Calls for service totaled 6,125 in 1998 and 7,196 in 2000.

Basalt Police Department. The Basalt Police Department includes ten sworn officers and seven cars. Calls are dispatched through Pitkin County and calls for service totaled 2,408 in 1998 and 2,624 in 2000.

Snowmass Village Police Department. This department has a total staff of 12 full-time and two part-time (traffic control), using six vehicles. Calls for the Snowmass Village Police Department are dispatched via the County in Aspen. Calls for service totaled 3,768 in 1998, and 3,752 in 2000.

Aspen Police Department. The Aspen Police Department is located at the courthouse in Aspen and has a small substation at the Rubey Park Transit Center. The Pitkin County Sheriff's Department dispatches calls for the Aspen Police Department. Aspen has 37 staff and 15 cars. Calls for service totaled 12,173 in 1998 and 13,702 in 2000.

4.4 Fire Protection and Emergency Services

The Roaring Fork Valley includes six different fire protection or ambulance districts and one private ambulance service. Each is described below.

Glenwood Springs Fire Department. Glenwood Springs has three fire stations. Station #1 in West Glenwood is staffed and maintains five apparatus and two ambulances. Station #2, which is downtown, is staffed and has one ambulance and three apparatus. Station #3 is under construction and will be staffed. Station #4, midway between Glenwood Springs and Sunlight, will be closed upon completion of the construction of Station #3. This station is not staffed, but includes one truck. The Department has 18 paid staff and 12 volunteers. Combined fire and emergency calls totaled 1,104 in 1998 and 1,139 in 2000.

Carbondale Fire District. This large district covers 515 square kilometers (320 square miles), including the area along Highway 82 between Glenwood Springs and the Eagle County line. The district actually enters three counties. The district has eight paid staff and over 70 volunteers. Five stations are located as follows. Station #1 is located in Carbondale. It includes six apparatus and three ambulances. Station #2 is in Redstone, and #3 is in Marble. Station #4 is in Glenwood Springs on County Road 154. It includes three apparatus. Station #5 is located outside of Carbondale at Missouri Heights and houses one engine. Combined District calls totaled 777 in 1998 and 775 in 2000.

Basalt Fire District. The Basalt Fire District includes four stations: Basalt, Old Snowmass, El Jebel and Thomasville. Total staff includes six paid and 48 volunteers. The district has 12 apparatus and four ambulances. Combined calls totaled 560 in 1998 and 576 in 2000.

Snowmass Fire Protection District. The Snowmass Fire Protection District covers 30.58 square kilometers (19 square miles), including the ski area and luxury homes. They have 14 full-time paid staff, 18 part-time paid, and two volunteers. The district houses four engines and three ambulances. Calls totaled 760 in 1998 and 795 in 2000.

Aspen Fire District. The Aspen Fire District includes four paid staff and 40 volunteers. The 140-squre-kilometer (87-square-mile) district maintains a station in Aspen plus unmanned stations at Aspen Village, Starwood, Woody Creek, and the Airport. Total apparatus includes ten vehicles. Calls in 1998 were 1,021 and in 2000 were 1,205.

Aspen Ambulance District. A separate ambulance district is maintained on site at the Aspen Valley Hospital. The district itself is part of Pitkin County government. It includes seven full-time staff and 15 part-time. It maintains four ambulances, three at the hospital and one at Aspen Village. Calls for service totaled 843 in 1998 and 966 in 2000.

Aspen Emergency Service. This private service has three ambulances and is licensed only to handle routine, non-critical calls. It services the ski areas and operates only during the winter months. The service handles an estimated 700-800 non-critical calls per year.

5. Recreation

Recreation and its associated activities are the mainstay of the Roaring Fork Valley's economy and lifestyle. This is due to the abundance of public land that lines the valley and adjacent mountain areas. Although private holdings are generally found in close proximity to the Project Corridor, numerous opportunities for trail access to BLM land occur between Glenwood Springs and Carbondale and throughout the Project Corridor.

The Mt. Sopris Tree Farm Community Center and Recreation Area is located adjacent to the Project Corridor at Valley Road in El Jebel. This 53.4 hectare (132 acre) property was acquired by Eagle and Pitkin Counties through a land exchange with the White River National Forest in 1994. The property has been redeveloped within the specifications of the land exchange to include the new Eagle County Community Center, developed recreation fields and an area of native vegetation.

The Christine State Wildlife Area is located northwest of Basalt. Between Basalt and Aspen, access to the US Forest Service-managed White River National Forest includes trails to the Maroon Bells-Snowmass and Holy Cross and Hunter/Frying Pan Wilderness areas. Most of the activities described in this section take place on some type of public land. County and community open space areas are also found throughout the corridor. Although the winter ski industry (downhill and cross-country) remains the primary attraction for both residents and visitors, summer and year-round opportunities include fishing, hunting, rafting, kayaking, bicycling, hiking, sightseeing, and golf.

5.1 Skiing

Pitkin County is internationally acclaimed for both downhill and cross country (Nordic) skiing. In an average year, the downhill ski season lasts from mid-November to early April. The cross-country season is about two weeks shorter, although backcountry skiing can last into June. There are five separate downhill ski areas in the Roaring Fork Valley: Aspen Highlands, Aspen Mountain, Buttermilk, Snowmass, and Sunlight. These are primarily destination resorts, although Sunlight is popular with local skiers. Because the Denver metropolitan area is approximately three to four hours away by vehicle, most winter visitors stay overnight or longer. Historic data for downhill skier visits are included in **Chapter III.B: Economic Environment.**

Downhill. Table III-13 contains data for each of the five ski areas, including the number of skier visits, acres of skiable terrain, number of trails and lifts, and the percent of skiable terrain allotted to each level of skiing proficiency. As the table illustrates, the areas vary in size and two of the areas are focused on opposite ends of skier levels of ability.

Cross-Country. An extensive network of cross-country trails and systems connects various points internal and external to the Roaring Fork Valley. Hut systems for overnight camping are located along the longer trails. Eleven huts lie within a day's ski trip from the valley, with others accessible for longer treks.

Table III-13
Roaring Fork Valley Ski Resorts

Ski Area	2000/2001 Skier Visits	Skiable Hectares (Acres)	Trails	Lifts	Type of Terrain (%)		
					Beginner	Intermed.	Adv./Expert
Aspen Highlands	140,640	289 (714)	115	4	20%	33%	47%
Aspen Mountain	319,343	272 (673)	76	8	---	35%	65%
Buttermilk	148,826	170 (420)	42	7	35%	39%	26%
Snowmass	740,241	1,218 (3,010)	83	18	7%	55%	38%
Sunlight	84,104	190 (470)	67	4	20%	55%	25%

Sources: Aspen Skiing Company; Colorado Ski Country USA; May 2002

Two sets of groomed trails are also available. Both are open to the public. The Aspen-Snowmass Nordic Council maintains 60 kilometers (37.3 miles) of groomed trails. The longest trail is 15 kilometers (9.3 miles) in length and connects Snowmass Village and Aspen. There is no charge to use these trails. Several other organizations access these trails as well, including the Snowmass Club Touring Center and the Aspen Cross Country Center. Ashcroft Ski Touring maintains 35 kilometers (21.7 miles) of groomed trails and has a trail fee. The Mt. Sopris Nordic Council maintains 19 kilometers (11.8 miles) of trails near Carbondale, and there is no charge for use of these trails. A fee-based Nordic Ski system is located at Sunlight Mountain.

5.2 Fishing

The Colorado Division of Wildlife classifies the Roaring Fork River as a cold water fishery and it is considered the best winter fishery in the state for large trout and mountain whitefish. From north Aspen to Basalt the river is classified as Wild Trout Water, and from north Carbondale to Glenwood Springs the river is classified as Gold Medal Water. The Frying Pan River, from Ruedi Reservoir to its confluence with the Roaring Fork River in Basalt, is also classified as Gold Medal Water. Only 254 kilometers (158 miles) of the 12,875 kilometers (8,000 miles) of trout stream in Colorado are designated as Gold Medal waters. In 1982, the Eagle County section of the Roaring Fork River produced the record Colorado whitefish: 2.32 kilograms (five pounds, two ounces), and 48 centimeters (18.75 inches) in length. Rainbow trout, brown trout, brook trout, and Colorado River cutthroat trout are found in the Roaring Fork River.

5.3 Hunting

Hunting and trapping are permitted along the rural areas of the Project Corridor, according to the Colorado Division of Wildlife. Game species in the area include deer, elk, and bighorn sheep. The State of Colorado is geographically divided into Wildlife Management Units, and the area surrounding the project corridor is divided among three of these units. Unit 43 is south of the Colorado River and west of the Roaring Fork River. Unit 47 is north of Highway 82, east of the Roaring Fork River, and south of the Frying Pan River. Unit 444 is bounded \on the north by the Colorado River and on the east by the Roaring Fork River.

Hunting seasons for elk and deer begin in late August and continue through mid-November, and vary according to the type of weapon used. Archery is the opening season, followed by muzzle-loading rifles. Three successive regular/combined rifle seasons generally begin in mid-October. Tables III-14 and III-15 record the number of deer and elk harvested and the number of hunters in each unit for the 2000 season. It should be noted that each of the three units includes a wider area than the Project Corridor.

Table III-14
2000 Deer Harvest and Number of Hunters

Unit	Bucks	Does	Fawns	Total Harvest	Total Hunters	% Success
43	337	180	5	522	1,286	39
47	51	37	0	88	312	28
444	174	0	0	174	561	31

Source: Colorado Division of Wildlife

Table III-15
2000 Elk Harvest and Number of Hunters

Unit	Bulls	Cows	Calves	Total Harvest	Total Hunters	% Success
43	430	578	34	1,042	3,920	27
47	170	130	8	308	1,199	26
444	187	364	33	584	1,963	30

Source: Colorado Division of Wildlife

5.4 Rafting

According to the owners of three local rafting companies, the stretch of the Roaring Fork River along Highway 82 from Aspen to Basalt is known among rafters as a fast, moderate to difficult run. Rivers are classified for rafting from Class I (easiest) to Class V (most difficult); this particular section contains segments that have been designated as Classes II and IV. The rafting season for commercial rafting companies runs from approximately mid-May to mid-July, depending on the amount of snow runoff each year. Private rafters continue to run this section through the end of July.

Most commercial rafts hold six passengers and a guide. Professional rafters escort at least 3,000 passengers through this section each year, and some years the count may be as high as 8,000 people. The annual number of private-use rafters is estimated at 2,000 to 3,000 individuals. There are seven boat ramps along the corridor, located at the following areas:

- Just upstream of Roaring Fork Bridge by Lazy Glen
- Below the upper bypass bridge on Two Rivers Road
- Below Basalt off Two Rivers Road at the bottom end of the family pool
- Across from Basalt Industrial Park, just upstream of Hooks Bridge off Willits Lane
- At the Sopris RV Park, accessed off Highway 82 at Milepost 10.4
- Upstream of Westbank Bridge on the north side of the river; accessed off Highway 82 at Milepost 5
- At Two Rivers Park; accessed off Highway 6 and 24 just west of the main Glenwood Springs I-70 interchange

5.5 Kayaking

Kayak enthusiasts make up a smaller, but substantial, portion of the traffic on the Roaring Fork River along Highway 82. The river requires beginner to intermediate skill levels on the slower portion between Carbondale and Basalt. Serious whitewater rafting and kayaking opportunities are available between Basalt and Aspen. Advanced kayakers often enter the water at Slaughterhouse Bridge, using Wink Jaffee Park as a takeout. Approximately 800 to 1,500 kayakers run the river each year, and instruction is available year-round at the Aspen Kayak School.

5.6 Recreational Trails

Much of the Roaring Fork Valley's open space is accessed from area trails for picnicking, wildlife observation, and other activities. Horses are welcome on some trails and some ranchers rent horses to visitors. Although commuters bike along Highway 82 and some local roads, most mountain bikers prefer off-road trails. In recent years, inline skaters have also taken advantage of the trail system. As bus or rail transit is further developed in the Project Corridor, options will increase for the interconnection of trails with transit stops and stations. Trails within and crossing the Project Corridor support a variety of popular recreation activities as well as commuting options. These trails are listed and shown in Figure III-2.

One of the purposes of the purchase of the RFTA right-of-way was to include a continuous trail connection between Glenwood Springs and Aspen. An early document supporting the trail aspect of this project was *Reading the Roaring Fork Landscape: An Ideabook for Interpretation and Environmental Education* (SAIC, 1999a). This study provided a framework for the creation of an educational and interpretive component for the corridor trail system.

The project planning process that led to the current CIS has always included consideration for a trail. Trail planning has included county and local governments, and trail, open-space, and recreation groups. In addition to representation from CDOT and all three Project Corridor counties; trail planning efforts included participation by Glenwood Springs, Carbondale, and Basalt, the Mid-Valley Trails Committee, and the Glenwood Springs River Commission. The *Recreational Trails Plan, Glenwood Springs to Aspen CIS/DEIS/CP* (Land Plan, 1999) provides additional information on this planning effort.

5.7 Additional Activities

Glenwood Springs offers 17.6 hectares (43.5 acres) of programmed space and open space parkland within the city. These parks offer a range of activities from baseball fields and skateboarding ramps to the tranquil solitude of open space.

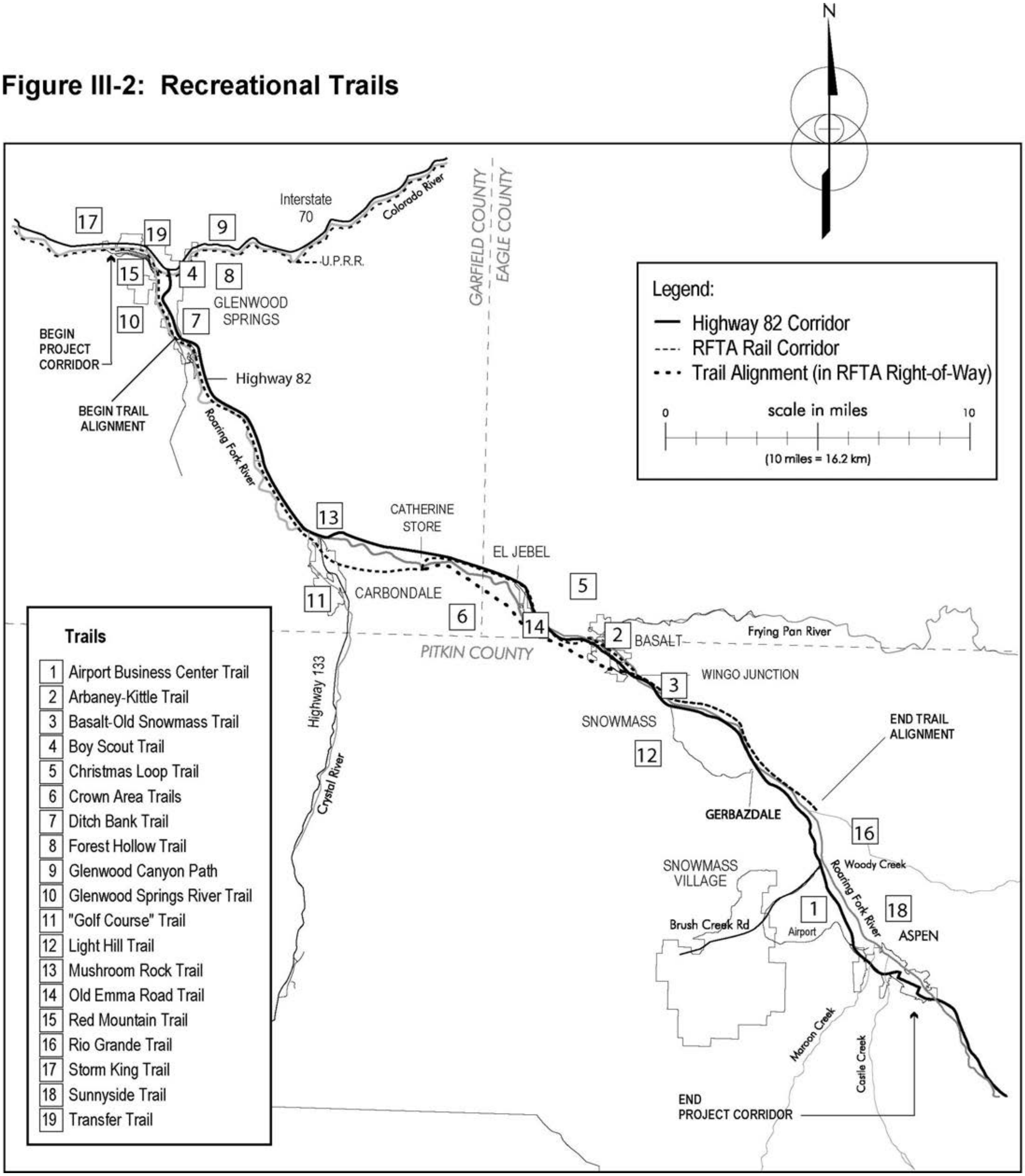
The Glenwood Hot Springs Lodge and Pool in Glenwood Springs offers full world-famous health and fitness facilities which are available to the general public and visitors. Glenwood Adventure Park, located just north of Glenwood Springs on Iron Mountain, incorporates the recently opened Glenwood Caverns, the historic Fairy Caves, and a restaurant and deck with a view of Glenwood Canyon. This major new attraction is accessible by dirt road, and by a new tramway from town that opened in late April of 2003.

There are ten golf courses within the Roaring Fork Valley. Five are located in the Glenwood Springs-Carbondale area and another five 18-hole golf courses are located in Pitkin County. The ten courses are Aspen Glen, Westbank, Glenwood Springs Golf Club, River Valley Ranch in Carbondale, The Ranch at Roaring Fork, Roaring Fork Club in Basalt, Aspen City Golf Course near the west end of Aspen, the public Maroon Creek Golf Course, the private Maroon Creek Club Course, and the private Snowmass Club in the Town of Snowmass Village. All but Maroon Creek Club Course are open to the public upon payment of fees.

The Snowmass Village Club also offers full health club facilities, with two outdoor and eleven indoor tennis courts, and a squash/racquetball court. Several other health and fitness facilities operate in the Aspen area. The City of Aspen operates a public swimming pool and recreational programs. A portion of the property southeast of Castle Creek Road is used for a hang-gliding/paragliding landing site. This location is approximately 0.4 kilometer (0.25 miles) south of Highway 82.

Many of the counties and towns in the valley also provide structured recreational activities for residents and nonresidents. Glenwood Springs, Carbondale, Eagle County, and Pitkin County each offer youth and adult sports programs. These programs vary by season and locality.

Figure III-2: Recreational Trails



6. Land Use

Most of the Project Corridor is federal land managed by the US Forest Service and Bureau of Land Management. Federal land comprises 80, 81, and 60 percent of Pitkin, Eagle, and Garfield Counties, respectively. Most private developed or developable land is located in a narrow corridor on the Valley floor adjacent to the Roaring Fork River.

The Project Corridor provides access to significant federal and state holdings, including the White River National Forest; the Maroon Bells/Snowmass, Hunter/Frying Pan, and Holy Cross Wilderness areas; numerous Bureau of Land Management parcels; the Christine State Wildlife Area; three Colorado Wildlife Management Units; and the Roaring Fork and Frying Pan Rivers (both Colorado Gold Medal fisheries).

Figures III-3 through III-9 show the current land use along the Project Corridor highlighting the BRT and Rail Alternatives and associated transit station locations. Although predominant land uses in close proximity to Highway 82 and the RFTA right-of-way are often residential or agricultural, with commercial and mixed uses associated with the developed communities, most of the land in the outlying areas is public land. The figures delineate land uses that are predominately residential and agricultural; however, commercial, industrial and mixed uses are prevalent surrounding transit station sites in Glenwood Springs, Carbondale, El Jebel, Basalt, the Pitkin County Airport, and in Aspen. Designated land uses immediately surrounding the proposed transit station locations and maintenance facilities are presented in Table III-16.

Table III-16
Land Uses Near Proposed New Transit Stations and Maintenance Facilities

Station Location	Zoning or Designation*
West Glenwood Springs	Industrial
West Glenwood Springs Maintenance Facility	Industrial
Downtown Glenwood Springs	Industrial
South Glenwood Springs	Commercial/Office
Colorado Mtn College at CR 54	Commercial/Office
Carbondale at Highway 133	Commercial/Office/Light Industrial
Downtown Carbondale	Commercial/Mixed Use
Downtown Carbondale Maintenance Facility	Industrial
El Jebel (El Jebel Road/Willits Lane)	Commercial/Open Space
Basalt at Midland Avenue	Industrial/Residential
Aspen Maintenance Facility	Commercial/Office
Aspen Main Street: Galena-Spring	Commercial/Office

**Ordered from most to least prevalent.*
Source: Washington Infrastructure Services, 1999.

The Project Corridor begins at West Glenwood Springs (Figure III-3), where it is surrounded by commercial and industrial uses. As the proposed rail alignment reaches the Glenwood wye at 8th Street, zoning changes to residential, with a brief industrial section at the confluence of the Colorado and Roaring Fork Rivers. Wye is a railroad term referring to 'Y'-shaped track used to reverse directions of trains or rail cars. The BRT (Highway 82) and the proposed rail alignment (RFTA right-of-way) are adjacent to the river confluence south to Colorado Mountain College area where they split until the Cattle Creek crossing. Commercial and medium-density residential zoning follow the alternatives until they depart Glenwood Springs.

Between Glenwood Springs and Aspen Glen (just outside of Carbondale), land is agricultural. A small section located halfway between is zoned as limited commercial and residential. Aspen Glen is zoned Planned Unit Development (PUD; the land returns to agricultural designation traveling south to Carbondale. Both the BRT and proposed rail alignments are parallel until just before Highway 133 in Carbondale where they split on either side of the Roaring Fork River.

At Carbondale (Figure III-4), land uses vary. Medium-density residential and commercial/retail abut the RFTA right-of-way, followed quickly by commercial/industrial and general industrial. Before leaving Carbondale, the alignment passes through commercial/office zoning, and more medium-density residential. Highway 82 runs through residential development in Carbondale. Much of the area between the separated alignments is agricultural, especially on the south side of the Roaring Fork River. Continuing south, the RFTA right-of-way follows CR 100. When CR 100 veers to the north, the RFTA right-of-way continues westward and the proposed rail alignment follows CR 100 north to rejoin Highway 82 at Catherine Store.

The land from Catherine Store to the Eagle County line is zoned agricultural. Upon entering Eagle County, zoning changes to medium-density residential, which continues until the commercial and industrial zoning of El Jebel (Figure III-5). South of El Jebel and the proposed Willits Lane transit station site, residential and limited agricultural uses continue to the Pitkin County line. The BRT and Rail Alternatives run parallel along Highway 82 from Catherine Store to Wingo Junction.

Portions of the Town of Basalt are in both Eagle and Pitkin Counties. When the alternatives cross the Pitkin County line, land is zoned residential to the north and agricultural to the south until the proposed Midland Avenue transit station site. South of Midland Avenue, land is designated residential and commercial (Figure III-6). Before leaving Basalt, the alignments pass through a Planned Unit Development, commercial, residential, and finally, multi-family residential.

The RFTA right-of-way, which contains the new Rio Grande Trail, runs through predominantly agricultural and residential land south of Basalt to Wingo Junction. At Wingo, the Rail Alternative diverts from Highway 82 back to the RFTA right-of-way. The Highway 82 BRT alignment runs adjacent to the Lazy Glen residential development, while the Rail alignment follows the RFTA right-of-way to the north on the other side of the Roaring Fork River. The land surrounding the alignments remains residential until Snowmass Canyon. Here, there is some industrial designation, but it quickly reverts back to residential. Lower River Road and associated residential development meanders alongside the rail and trail alignment in the RFTA right-of-way to Gerbazdale. The river separates Highway 82 from the RFTA corridor until Gerbazdale where the Rail Alternative rejoins Highway 82 for the remainder of the way to Snowmass Village and Aspen.

The new Rio Grande Trail follows RFTA right-of-way on the other side of the river from Gerbazdale to Woody Creek, where it joins previously-built segment of trail of the same name. Land use adjacent to the BRT and Rail alignments remains residential until the proposed Brush Creek Transit Station (Figure III-7). A shift in land use occurs as the alignments approach the Pitkin County Airport, which is zoned for commercial and light industrial uses (Figure III-8). Commercial land uses predominate on either side of Highway 82 and the alternatives corridor to the project end at Main and Hunter Streets in the Aspen Commercial Historic District (Figure III-9).

Figure III-3: Land Use, Glenwood Springs / West Glenwood Springs

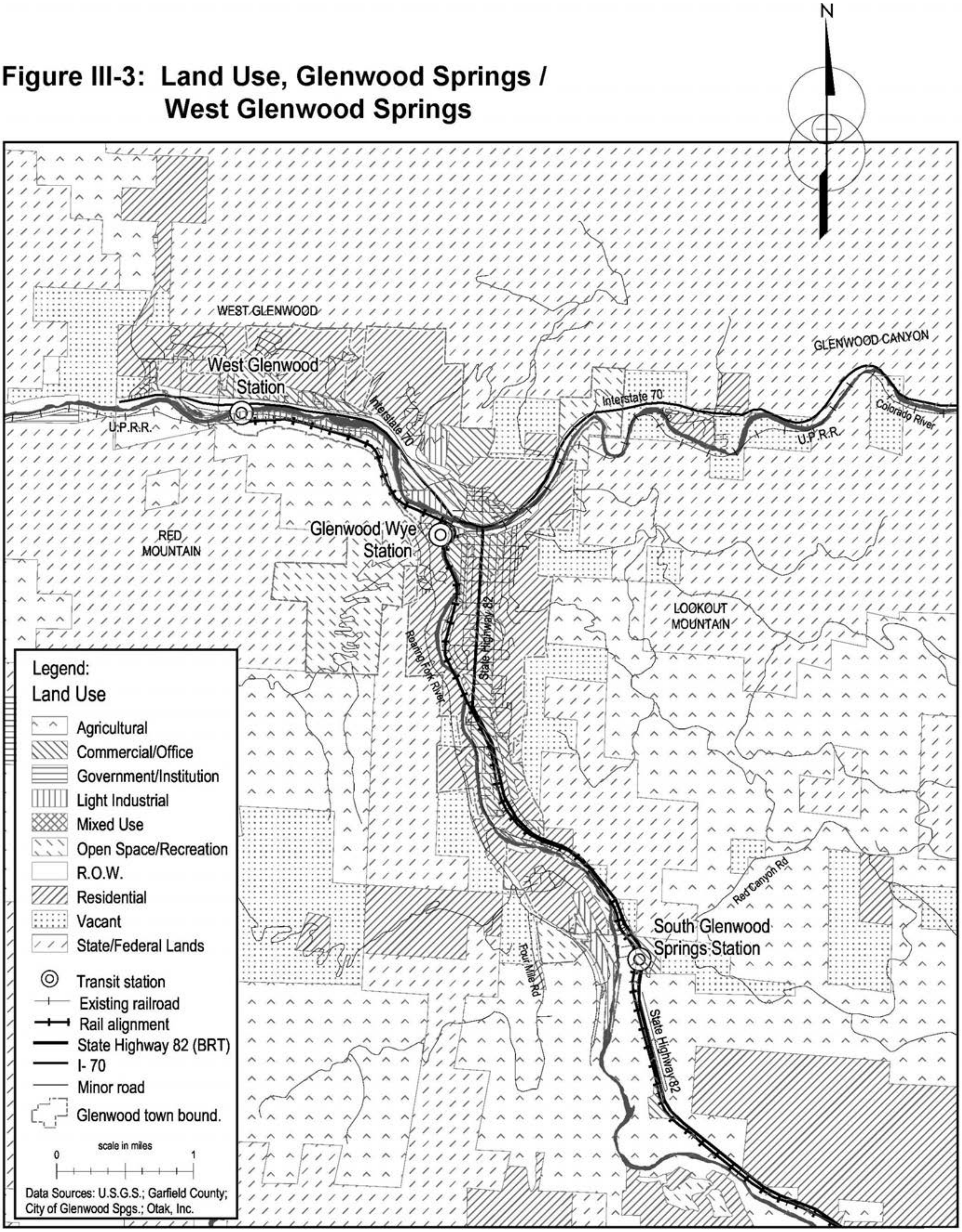


Figure III-4: Land Use, Carbondale / Highway 133

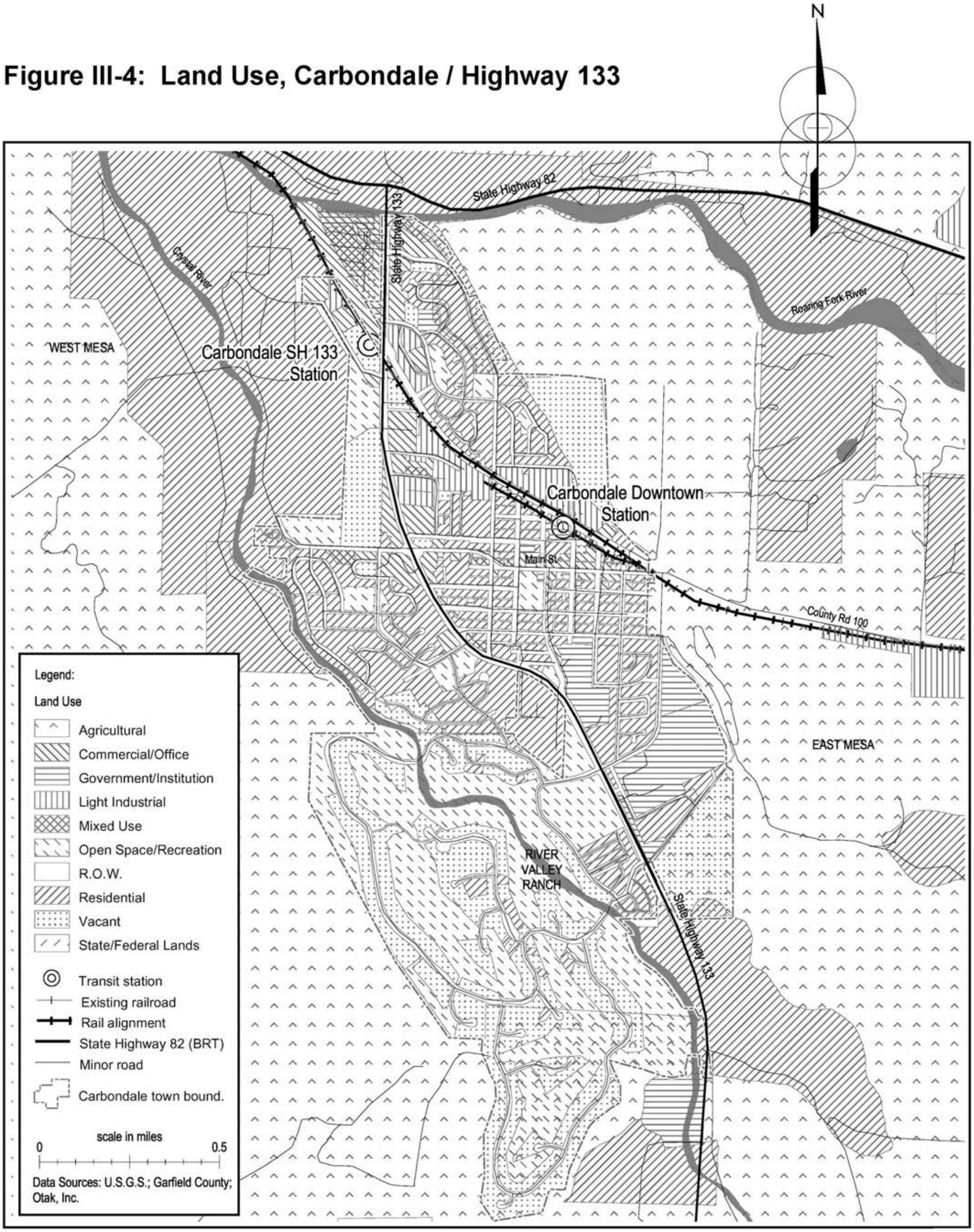


Figure III-5: Land Use, El Jebel / Willits Lane

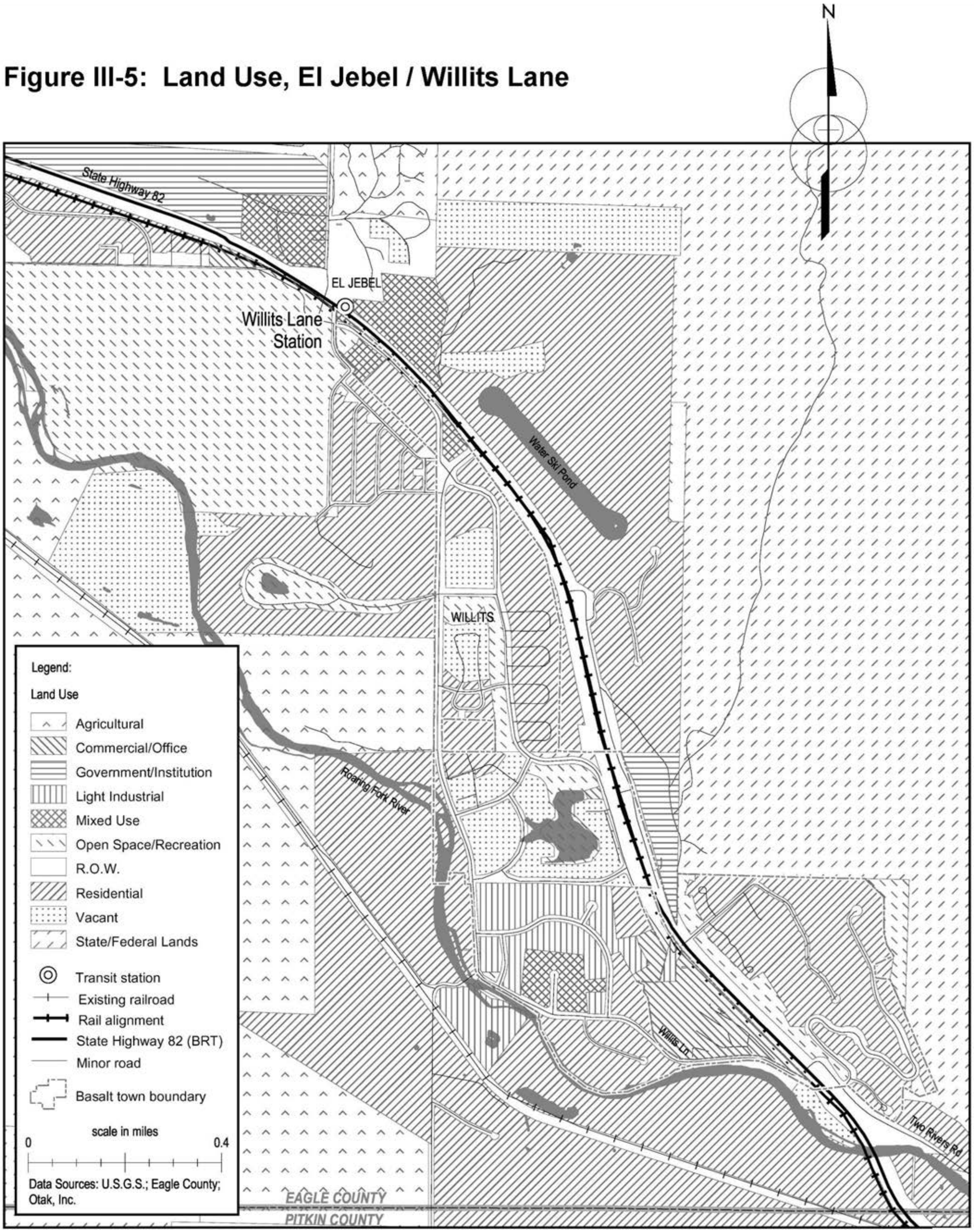


Figure III-6: Land Use, Basalt / Midland Avenue

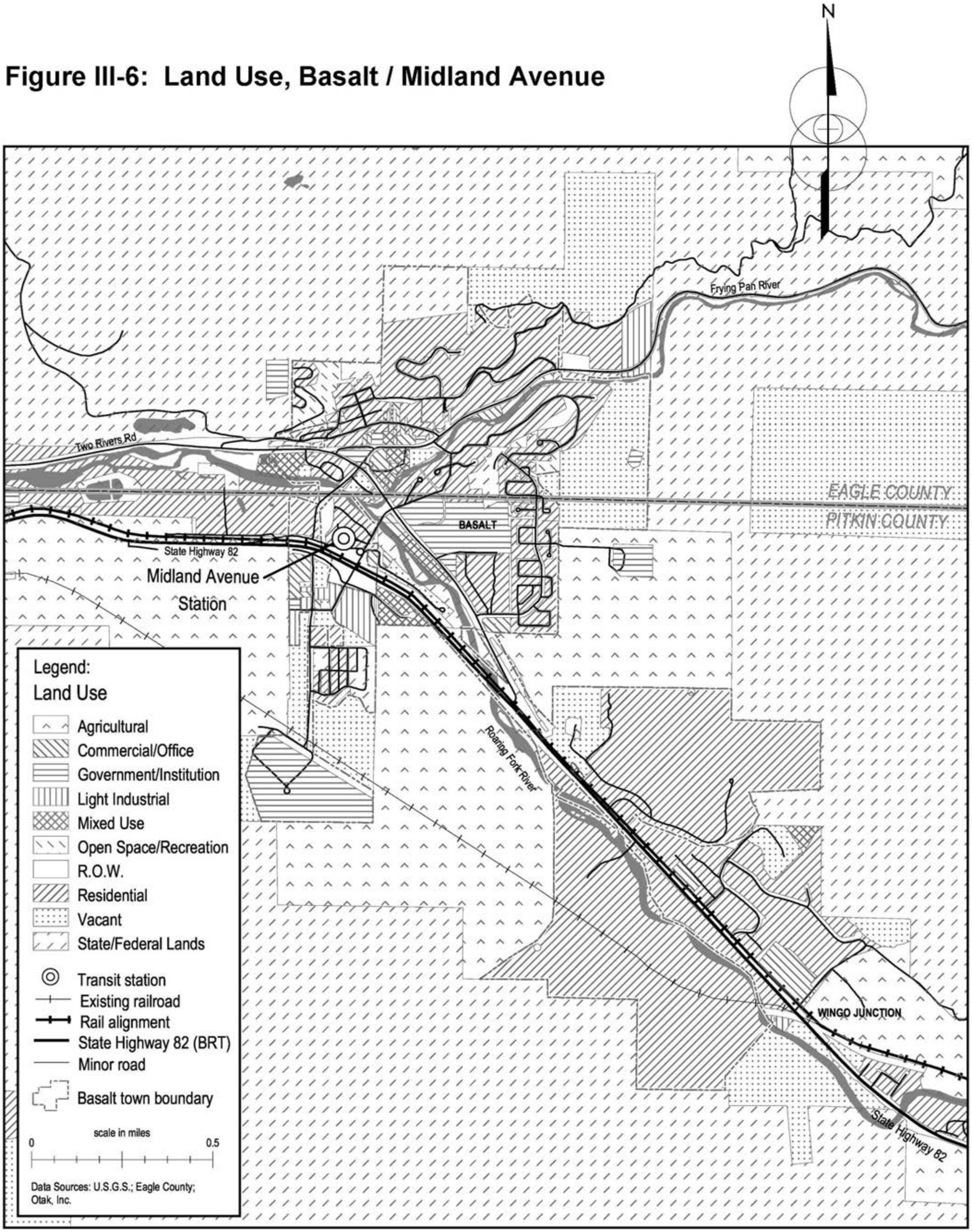


Figure III-7: Land Use, Pitkin County / Brush Creek

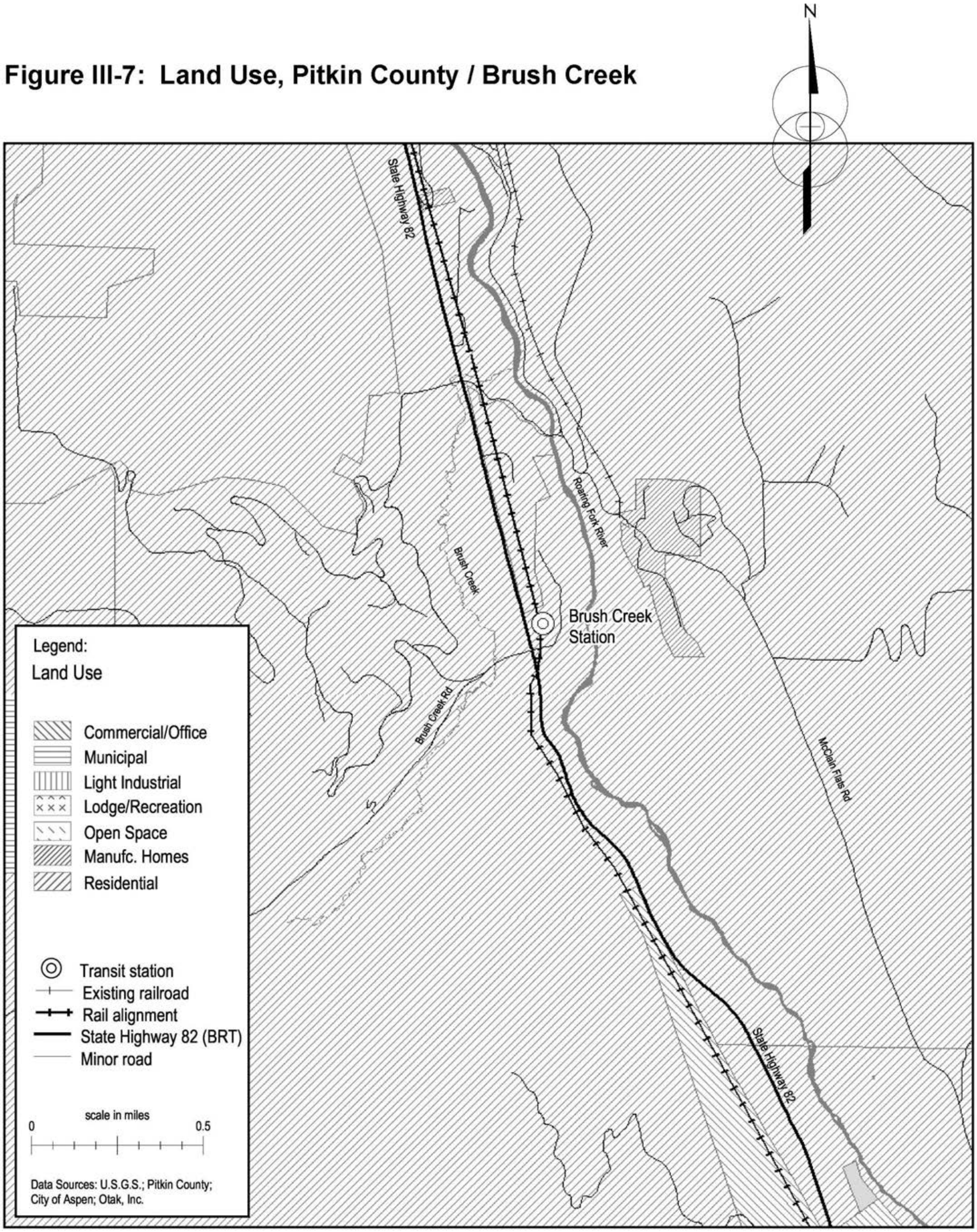


Figure III-8: Land Use, Pitkin County / Aspen

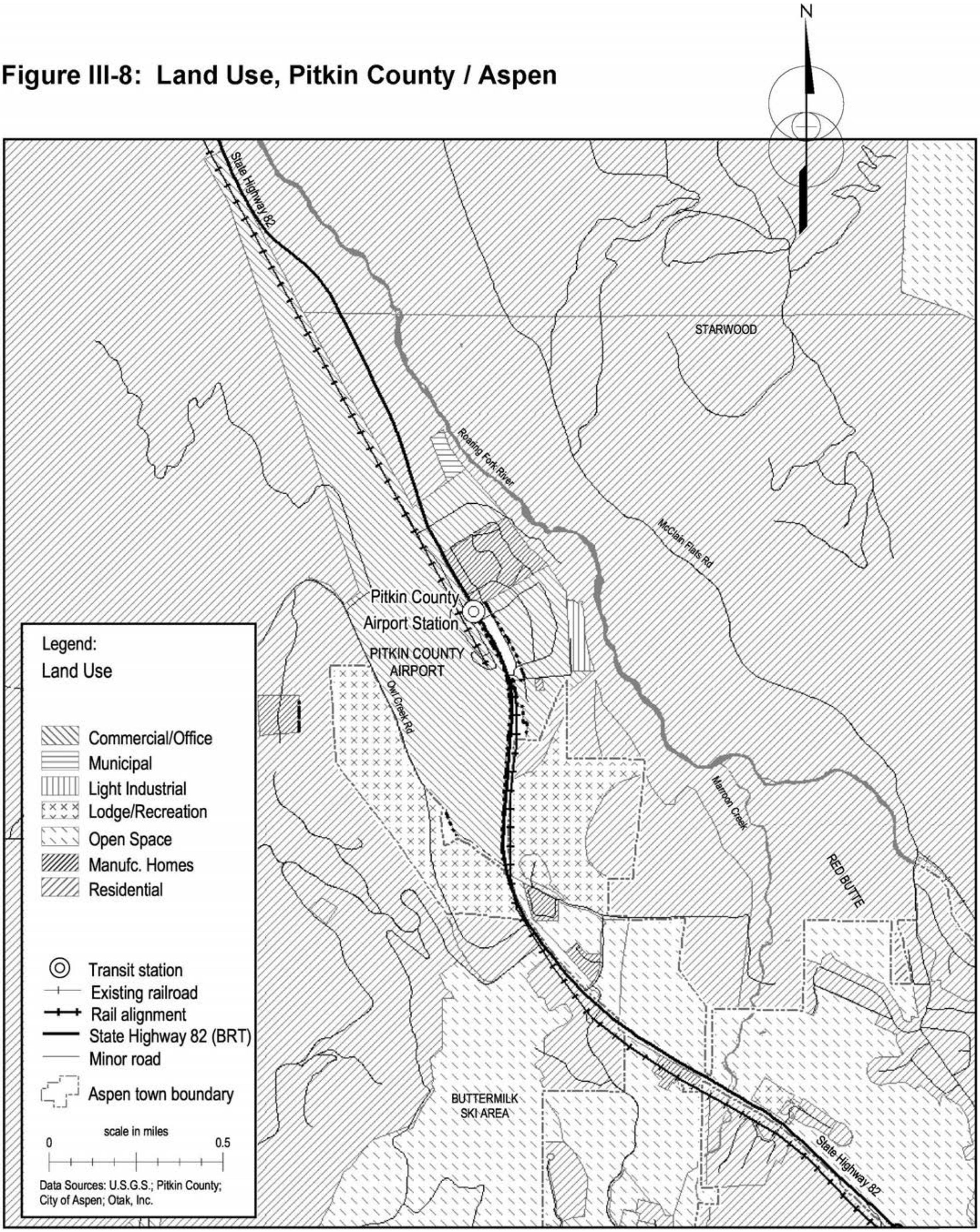
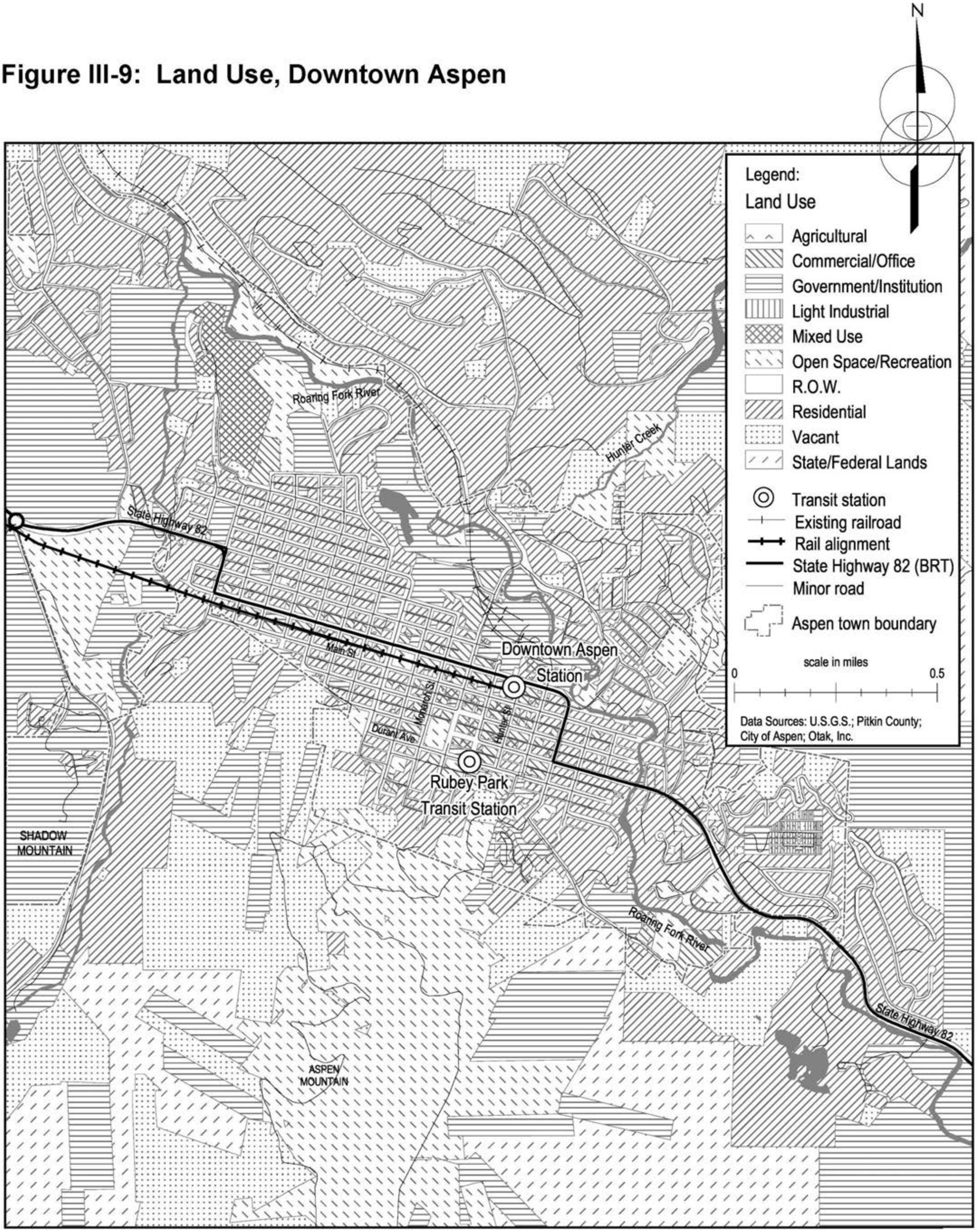


Figure III-9: Land Use, Downtown Aspen



B. ECONOMIC ENVIRONMENT

1. Economic Base

For all three counties and the Project Corridor itself, the resort and tourism industry plays a significant role. The ski industry and associated year-round resorts are a significant focus for these local economies. Table III-17 summarizes the skier visits over the past five years through 2001 within the Project Corridor. Visits have been down during the past three years. The lowest numbers came in 1999/2000 season. The Aspen Ski Company attributed this to a slow start in the season caused by Millennium travel concerns and light early season snow (Patrick O'Donnell, President and CEO Aspen Skiing Company, quoted in email from J. Hanle, May 13, 2002.) During 2000/2001, skier visits increased slightly. The Aspen Skiing Company owns and operates the four Pitkin County resorts: Aspen Highlands, Aspen Mountain, Buttermilk Mountain, and Snowmass. Sunlight is located in Garfield County just outside of Glenwood Springs. Highway 82 provides the transportation link for all of these resorts, for both tourist and employee access.

Impacts of national events and conditions, including the events of September 11, 2001 and stock market standings, as well as state and local fire and drought conditions, have had a significant effect on the economic base for Colorado and the Project Corridor region. Quantitative information on the level of effect is not available at this time. Long term impacts can only be speculated.

Table III-17
Annual Skier Visits to Project Corridor

	1996-97	1997-98	1998-99	1999-00	2000-01
Aspen Highlands	157,100	150,000	143,785	127,389	140,640
Aspen Mountain	334,500	345,400	333,215	331,121	319,343
Buttermilk	154,000	180,000	177,476	158,194	148,826
Snowmass	788,600	884,100	777,378	707,600	740,241
Sunlight	102,100	102,400	78,189	77,010	84,104
Total	1,536,300	1,661,800	1,510,043	1,401,314	1,433,154
Increase/(Decrease)	103,100	125,500	-151,757	-108,729	31,840
Percent Change	7	8	-9	-7	2

Sources: Aspen Skiing Company; Colorado Ski Country USA; May 2002

Most sectors of employment in the Project Corridor are connected directly or indirectly to the resort and tourist industry, such as retail trade, construction, transportation, communications, utilities, finance, insurance, real estate, and other service related activities including hotels and restaurants.

As vital as the tourist and ski industry is to the Roaring Fork Valley, the real estate and land development industry has surpassed tourism as an economic force. Also on the rise are the development of golf course communities and second home subdivisions, such as Aspen Glen and River Valley Ranch. While these types of developments are flourishing, the location of the inevitable commercial development that accompanies residential development has undergone much community debate.

2. Commercial Growth Trends

Table III-18 illustrates retail sales trends for each county over the past five years. Sales have continued to increase steadily for each county, in spite of the slowdown in skier visits several years ago. Growth in the resorts of Vail and Beaver Creek, which are located along I-70 approximately 60 miles east of the Project Corridor, explain the increase in retail sales for Eagle County. Table III-19 ties retail sales in Project Corridor communities to their respective counties. Basalt is a producer of retail sales in both Eagle and Pitkin Counties. Glenwood Springs produced 56 percent of Garfield County's retail sales in Fiscal Year 2000. Aspen produced 63 percent of total retail sales for Pitkin County.

Table III-20 summarizes retail sales per capita. Note that all three counties exceed the state average. This is created by the high portion of sales tied to the resort industry. The resort emphasis of both Eagle and Pitkin Counties is notable, especially in Pitkin county, where per-capita retail sales are more than two-and-a-half times the state average.

Table III-18
Calendar Years 1996 - 2000 Retail Sales (thousands of dollars)

	1996	1997	1998	1999	2000	% Growth 1996-2000
Eagle	$1,083,132	$1,238,083	$1,315,164	$1,324,264	$1,495,926	38%
Garfield	809,913	881,602	961,004	1,028,004	1,115,540	38%
Pitkin	724,877	764,854	819,123	808,730	850,387	17%

Source: Colorado Department of Revenue, 2001 Annual Report

Table III-19
FY 2001 Retail Sales by County and Community
(thousands of dollars)

	Sales	% of County
Eagle County	$1,553,945	---
Basalt	132,667	6% and 4%*
Garfield County	1,173,766	---
Carbondale	121,549	10%
Glenwood Springs	657,383	56%
Pitkin County	863,092	---
Aspen	547,797	63%
Snowmass Village	113,237	13%

Source: Colorado Department of Revenue, 2001 Annual Report
* *Basalt spans both Eagle and Pitkin Counties*

Table III-20
2001 Retail Sales Per Capita

Eagle County	$ 37,097
Garfield County	$ 26,657
Pitkin County	$ 57,716
Colorado Average	$ 23,949

Source: Colorado Department of Revenue, 2001 Annual Report

3. Employment

3.1 Labor Force

Table III-21 contrasts 1995 and 2000 labor force statistics for each of the counties in the Project Corridor with Colorado statistics. During that time period, the labor force grew most significantly for Eagle County, again associated with the resort industry outside the Project Corridor. For all counties in Colorado, unemployment rates dropped between 1995 and 2000.

Table III-21
Labor Force

	1995		2000	
	Total Labor	**% Unemployed**	**Total Labor**	**% Unemployed**
Colorado	2,087,518	4.2	2,275,545	2.7
Garfield	20,349	4.1	23,412	2.5
Eagle	17,452	3.3	20,684	2.1
Pitkin	8,927	4.8	8,764	2.6

Source: Colorado Dept. of Labor and Employment, Labor Market Information, May 2002

3.2 2000 Employment by Economic Sector

A useful indicator of the focus of employment in each county and in the communities along the Project Corridor is the breakdown of employment by sector. Table III-22 illustrates this breakdown in detail by county and for the major communities. Retail trade and services sectors are the highest. Garfield County has significant government employment. The construction industry is strong for all locations, reflecting the growth economy. Of minor significance in this part of the state are agricultural, mining, and manufacturing activities.

Table III-22 also reflects trends in Glenwood Springs and the City of Aspen. Glenwood Springs houses a significant number of government offices, together with retail and service-oriented employment. Glenwood Springs employment represents 57 percent of Garfield County employment. Aspen represents 68 percent of Pitkin County employment and mirrors Pitkin County trends.

Table III-22
2000 County and Project Corridor Employment by Economic Sector

	Basic Industry[1]	Retail Trade	Services[2]	Total[3]
Eagle Co. (total)	5,636	6,658	12,228	28,206
Garfield Co. (total)	4,646	4,492	5,695	19,329
Glenwood Springs	1,442	2,787	5,724	11,015
Pitkin Co. (total)	1,804	3,957	7,629	15,924
Aspen	745	3,473	5,961	10,898
Corridor Total	4,385	8,977	12,822	30,843

Source: Colorado Department of Labor & Employment, Labor Market Information

[1] *Basic Industry includes Agricultural, Mining, Construction and Manufacturing.*

[2] *Services include Financial, Insurance, Real Estate and Services. (Hotels, Auto Repair, Health, Legal, Educational, Social, Misc.)*

[3] *Total includes all industries.*

3.3 2025 Employment by Economic Sector

Table III-23 summarizes employment forecasts for the counties, communities, and Project Corridor. Only aggregated data was forecast. The employment patterns remain similar for both the counties and the Project Corridor.

Table III-23
Project Corridor Counties and Communities
2025 Employment By Economic Sector

	Basic Industry	Retail	Service	Total
Eagle County*	4,274	3,021	5,851	13,146
Garfield County*	7,976	8,553	17,281	33,809
Pitkin County*	2,762	7,237	17,178	27,177
Glenwood Springs	3,345	5,569	11,301	20,214
Carbondale	1,179	948	1,227	3,354
El Jebel - Basalt	1,008	1,274	1,322	3,604
Snowmass Village	374	952	2,387	3,713
Aspen	1,558	5,213	11,690	18,462
Corridor Total*	15,012	18,811	40,309	74,133
Percent Total	20%	25%	54%	N/A

Source: Prepared by Joanna Morsicato & Associates
**Portions of these Counties within the Project Corridor. City employment figures are contained within the County totals.*

4. Income

4.1 Average Household Income by Community 2000 and 2025

Tables III-24 and III-25 illustrate income ranges by household for the community areas within the Project Corridor for 2000 and 2025. Discussion focuses on 2000 data, since the 2025 forecast data reflects similar patterns.

Glenwood Springs' income profile illustrates a similar portion of households in the middle-income ranges. The group containing the largest portion of households is the $50,000 to $75,000 income range. Smaller portions of the population, under 16 percent, earn less than $15,000 or over $75,000. By 2025, a larger portion of households are projected to generate income in the medium to high range.

The population of Carbondale is similar to the Glenwood Springs pattern. Sixty percent of the household incomes fall within the $25,000 to $75,000 income range in 2000, but by 2025, the numbers rise to 72 percent in this same range.

The Basalt area shows close to 70 percent of households have average household incomes in the $50,000 or higher range. Twenty-two percent of households in this area are in the over-$100,000 range. A large proportion of these households with incomes over $100,000 is found in El Jebel. This pattern is forecast to hold in 2025.

The Aspen and Snowmass Village profiles reveal the largest portion of the population in the highest income ranges, with 23 percent in the over-$100,000 category. Less than 16 percent of the population in these areas earns under $25,000 per year. A significant portion falls within the medium to high income ranges for these two communities. This general pattern remains in 2025, with a slight increase at the top end and a decrease at the lower end.

Table III-24
2000 Household Income, Project Corridor and Communities

	<$10,000	$10,000 - $14999	$15,000 - $24,999	$25,000 - $34,999	$35,000 - $49,999	$50,000 - $74,999	$75,000 - $99,999	>$100,000
Glenwood Springs	9%	7%	15%	14%	18%	23%	7%	8%
Carbondale	5%	6%	11%	10%	25%	25%	9%	8%
Basalt	2%	2%	6%	8%	14%	29%	18%	22%
Snowmass Village	3%	2%	11%	12%	17%	18%	13%	23%
Aspen	4%	2%	9%	12%	15%	21%	14%	23%
Corridor Total	5%	4%	11%	11%	17%	23%	12%	16%

Source: Prepared by Joanna Morsicato and Associates with data provided by Claritas, October 1998.
2000 percentages shown are the same as those generated for 1998.

Table III-25
2025 Household Income, Project Corridor and Communities

	<$10,000	$10,000 - $14999	$15,000 - $24,999	$25,000 - $34,999	$35,000 - $49,999	$50,000 - $74,999	$75,000 - $99,999	<$100,000
Glenwood Springs	4%	4%	8%	19%	18%	29%	8%	10%
Carbondale	3%	4%	6%	25%	20%	27%	10%	9%
Basalt	1%	1%	4%	14%	13%	28%	18%	22%
Snowmass Village	3%	2%	6%	17%	16%	19%	14%	24%
Aspen	3%	1%	5%	14%	14%	22%	15%	25%
Corridor Total	3%	3%	6%	17%	16%	25%	13%	17%

Source: Prepared by Joanna Morsicato and Associates with data provided by Claritas, October 1998, updated for 2025 by Otak.

4.2 Per-Capita Income by County for 2000

Table III-26 shows the 2000 per-capita income for each county and the State of Colorado. Per-capita income serves as an indicator illustrating the relationship between total income and total population for an area. Garfield County's per-capita income is below the state average. On the other hand, Pitkin County's per-capita income is more than twice the state average. The large proportion of medium to high-income households in Aspen and Snowmass Village weight the per-capita income for Pitkin County. The populations in these two

Table III-26
2000 Per Capita Income

Eagle	$ 34,997
Garfield	$ 25,748
Pitkin	$ 68,761
Colorado	$ 32,434

Source: U.S Dept of Commerce, Bureau of Economic Analysis Regional Accounts Data communities represent close to half the county population. El Jebel and Basalt are located in Eagle and Pitkin Counties, both with high per-capita income levels.

4.3 2000 Poverty Level Definitions

The definition of poverty in the United States is complex. The threshold income level excludes non-cash benefits such as food stamps, health benefits, or rent-free housing. The threshold is adjusted annually to accommodate the change in the annual average Consumer Price Index. Threshold incomes are based on household size as well as number of children under 18 years of age. In addition, households containing two people over 65 years of age have a threshold of $10,419, while a two-person household under age 65 has a threshold of $11,590. For example, in 2000, the threshold income for a family of four was $17,603 for a family of three, $13,738.

The average household size in the Project Corridor is less than three persons. Table III-3 includes this data, which ranges from 1.92 persons per household in Aspen to 2.96 persons in the Aspen Glen and El Jebel areas. Data for household incomes shows an average of five percent of the corridor households at less than $10,000 in 2000. Another four percent had incomes under $15,000. It is reasonable to categorize most of these households as approaching or passing the threshold for the poverty level. However, based on the data collected, it was not possible to discern actual numbers of persons per household in each income range, or the age of these residents. The poverty threshold is a national statistic.

5. Housing

The issue of availability of affordable housing continues to attract significant attention in all three Project Corridor counties. The term “affordable housing” has various definitions. As defined by the U.S. Department of Housing and Urban Development, monthly payments for affordable housing do not exceed 30 percent of the income of the occupants. The major cause for the problem in the Project Corridor is that housing prices have been escalating at a faster rate than income. According to the results of the 1998 surveys by Healthy Mountain Communities and the Aspen Valley Improvement Association, approximately 32 percent of households in the Glenwood-Basalt area pay in excess of 30 percent of their income for housing.

Housing cost projections by the Colorado Division of Housing for January 2001 are shown by Project Corridor county in Table III-27.

Table III-27
Project Corridor Housing Cost Projections
Single Family Homes
January 10, 2001

County	Median Price	Projected Value		
		396 square meters (1,300 square feet)	457 square meters (1,500 square feet)	610 square meters (2,000 square feet)
Eagle	$ 245,290	$ 318,877	$ 367,935	$ 409,580
Garfield	$ 139,130	$ 180,869	$ 208,695	$ 278,260
Pitkin	$ 548,802	$ 713,433	$ 823,204	$ 1,097,605

Source: Colorado Division of Housing, 2002.

Affordable housing is an issue in all three Project Corridor Counties. See the discussion in **Section A.I.3: Environmental Justice** for additional discussion of affordable housing. Pitkin County prices are the highest, particularly in Aspen, where the most profitable use of available land and housing stock is for expensive homes and visitor lodging. Many working people who choose to reside in Aspen live in overcrowded conditions because of the lack of affordable housing.

6. Local Government Finance

Local government revenues and income sources vary among the three counties. Table III-28 summarizes 2000 county and city revenues within the Project Corridor. The availability of per-capita county revenues gives a strong indication of the wealth of each county. Garfield County has the highest population and the lowest budget. Funds available per capita are approximately $667. Pitkin County has the lowest population compared with budget, resulting in more than $2,291 per capita. The City of Aspen's revenues average $6,344 per capita, while Glenwood Springs funds are $2,299 per capita. Eagle County has approximately $1,113 per capita, with the highest revenues of the three counties.

When comparing revenues to population, it is important to note that visitor population in the resort counties and communities can exceed the permanent population. Table III-3 compared with Table III-5, for example, indicates that Aspen's permanent population in 1998 was 6,222 and its summer weekend visitor population was 10,707. Glenwood Springs, on the other hand, has a lower ratio of visitors, experiencing 2,996 on summer weekends compared with a permanent population of 8,713 for 1998.

Although Eagle and Pitkin Counties appear to have high revenues related to permanent residents, the presence of large visitor populations creates sales tax revenues. These revenues can be estimated by comparing the retail sales generated in Table III-19 with the various tax rates. For example, the State of Colorado rate of 2.9 percent yielded approximately $45 million in sales tax from Eagle County in 2001, $34 million from Garfield County and $25 million from Pitkin County.

Table III-28
2000 City and County Revenues

	Total Taxes	Licenses & Permits	Intergovt. Revenue	Charges for Services	Miscellaneous	Total Revenues
Garfield County	$ 12,908,807	$ 120,305	$ 10,015,566	$ 3,195,686	$ 3,114,127	$ 29,354,491
Glenwood Springs	$ 11,121,889	$ 357,524	$ 985,500	$ 2,788,705	$ 2,528,706	$ 17,782,324
Carbondale	$ 3,522,770	$ 560,632	$ 533,778	$ 235,127	$ 732,729	$ 5,585,036
Eagle County	$ 25,249,310	$ 2,038,384	$ 4,657,593	$ 9,475,962	$ 5,208,199	$ 46,629,448
Basalt	$ 2,318,828	$ 606,148	$ 334,901	$ 180,336	$ 412,254	$ 3,852,467
Pitkin County	$ 22,223,611	$ 794,421	$ 3,241,763	$ 5,718,318	$ 2,285,383	$ 34,263,496
Aspen	$ 22,972,599	$ 143,543	$ 1,450,043	$ 5,309,475	$ 7,583,381	$ 37,459,041

Source: Colorado Department of Local Affairs, Colorado County General Revenues, 2000.

The resort industry generates important sales tax revenues for the local governments. Table III-29 summarizes the sales tax rates for the Project Corridor counties and communities. Retail sales per capita of permanent population is high in Eagle and Pitkin Counties due to the spending habits of the visitor population. Additional discussion can be found in previous sections of the Social Environment portion of this document.

Table III-29
Sales Tax Rates (as of May 2002)

City or County	Current Rates	City or County	Current Rates
Eagle County	1.5%	Carbondale	3.5% + .5% RFTA
Garfield County	1.0%	Basalt	2.0% + .2% RFTA
Pitkin County	3.5%*	Snowmass Village	1.0%

**Except Basalt, which is 2.5%*
Source Colorado Department of Local Affairs, Colorado County General Revenues, 2000..

C. PHYSICAL ENVIRONMENT

1. Air Quality

The City of Aspen and surrounding developed area (primarily west to the Aspen Airport Business Center) is designated as an air quality non-attainment area for PM_{10} (particulate matter less than 10 microns in diameter). The non-attainment designation is given and defined by the Environmental Protection Agency (EPA) when air pollution exceeds the National Ambient Air Quality Standards (NAAQS). The NAAQS for PM_{10} are 50 micrograms per cubic meter of air, averaged annually, and 150 micrograms per cubic meter of air during a 24-hour period (a metric standard). The Aspen area has not exceeded either the annual or the 24-hour PM_{10} standard since 1991. The remainder of the project area is in attainment for all NAAQS.

The 1990 Clean Air Act Amendments (CAAA) require that transportation projects within a non-attainment area conform to the State Implementation Plan (SIP). The SIP specifies the control measures which non-attainment areas must implement in order to attain and maintain NAAQS. The Aspen element of the Colorado State Implementation Plan was approved by EPA in 1995. The Colorado Air Pollution Control Division has prepared and submitted to the EPA a PM_{10} Redesignation Request and Maintenance Plan for the Aspen Area. Upon EPA approval of the Maintenance Plan, Aspen will be redesignated as an attainment/maintenance area. Control measures in the Maintenance Plan to reduce PM_{10} emissions include magnesium chloride for highway de-icing, street sweeping after snowstorms (when feasible), and paid parking in the Aspen commercial core area.

2. Water Quality

2.1 Water Resources

The Roaring Fork River watershed encompasses 3,758 square kilometers (1,451 square miles) and has a perimeter of 293 kilometers (182 miles). The headwaters of the Roaring Fork River and its major tributaries are located in high alpine terrain where elevations can exceed 4,267 meters (14,000 feet) above mean sea level. Streambeds in the upper elevations are typically steep with turbulent flows. These high elevation areas are generally comprised of barren rock and maintain a snowpack for much of the year. Downstream from the headwater areas, the gradients of the Roaring Fork River and its tributaries lessen as they flow through alpine ecosystems with increasing amounts of vegetation. The Project Corridor is located on the valley floor where river flow velocities decrease and water bodies become wider. Within the Project Corridor itself, the Roaring Fork River and its tributaries typically flow within incised beds comprised primarily of rock cobbles.

Flows within the Roaring Fork River watershed are typical of high elevation catchments. In the western United States, peak discharge levels coincide with snowmelt occurring from April through June. Summer precipitation in the form of rain or high-elevation snow can result in short-duration peak flow events. Winter base flows are maintained by groundwater discharge. River flows within the Project Corridor are largely unregulated. The only significant impoundment affecting water flow in the Roaring Fork River is the Ruedi Reservoir, located on the Fryingpan River, about 24 kilometers (15 miles) upstream from Basalt. The Ruedi Dam and Reservoir are a part of the Fryingpan-Arkansas Project. The South Side Collection System transports project water annually from the Fryingpan and Roaring Fork River Basins. The remainder of streams and creeks in the Project Corridor either discharge directly into the Roaring Fork River or serve to fill several small storage reservoirs constructed for municipal and agricultural use. Discharge volume of the Roaring Fork River near Aspen averages 2.8 cubic meters per second (m^3/s) [99 cubic feet per second (cfs)] *(Daily Mean Discharge Data,* USGS, 1999a). Average discharge rates increase to 37 m^3/s (1,316 cfs) at Glenwood Springs *(Daily Mean Discharge Data,* USGS, 1999b). Between the years 1899 and 1960, the maximum recorded discharge of the Roaring Fork River was 1,053 m^3/s (37,200 cfs) at Glenwood Springs (USGS, 1999b).

The main stem of the Roaring Fork River flows in a northwesterly direction for approximately 80.5 kilometers (50 miles) before joining the Colorado River at Glenwood Springs. U.S. Geological Survey quadrangle maps indicate ten perennial rivers or streams directly tributary to the Roaring Fork River in the Project Corridor: Red Canyon, Three Mile Creek, Four Mile Creek, Cattle Creek, Crystal River, Fryingpan River, Sopris Creek, Snowmass Creek, Woody Creek, and Brush Creek (USGS, 1983a-f). Wheatley Gulch and Bionaz Gulch are ephemeral streams, also tributary to the Roaring Fork River. Numerous irrigation ditches convey water throughout the valley. These ditches occur throughout the Project Corridor, both paralleling and crossing under existing transportation alignments, and are integral to the local agricultural economy.

Highway 82 and the RFTA right-of-way generally parallel the Roaring Fork River between Glenwood Springs and Aspen. The highway and the rail grade currently make a total of fourteen crossings of intermittent or perennial rivers/streams (including multiple crossings of the same river/stream). The following surface water bodies are currently crossed one or more times by the highway or the rail grade: Roaring Fork River, Red Canyon, Cattle Creek, Snowmass Creek, Sopris Creek, Brush Creek, Wheatley Gulch, and Bionaz Gulch (USGS, 1983a-f).

2.2 Stream Classification

The main stem of the Roaring Fork River; including all tributaries, lakes and reservoirs, from the source to the confluence with the Colorado River, is classified by the Colorado Department of Public Health and Environment (CDPHE) as Cold Water Aquatic Life - Class 1, Recreation - Class 1, Water Supply and Agriculture (*Classifications and Numeric Standards,* CDPHE, 1999). The Cold Water Aquatic Life - Class 1 designation is applied to waters capable of sustaining a wide variety of cold water life, including sensitive species. Additionally, the Roaring Fork River is designated a High Quality - Class 2 water body. This designation is enacted when waters are of a quality higher than necessary to protect specified uses and water diversions are present in the area. In these cases a Class 2 designation is applied because the High Quality - Class 1 anti-degradation standard would make maintenance of water diversion structures difficult. Recreation - Class 1 applies to streams where primary contact recreation (e.g., whitewater boating or swimming) exists, or where the fecal coliform standard (a metric standard) of less than 200 fecal coliforms/100 milliliters (ml) of water is attained. Surface water in the Roaring Fork River drainage is classified as being suitable for crop irrigation, livestock watering, and domestic water supply after receiving standard treatment.

2.3 Ambient Water Quality Standards

Table III-30 presents ambient water quality data for the Roaring Fork River at its mouth (station 53), and at Glenwood Springs (station 9085000). *(STORET Water Quality Data for the Roaring Fork Watershed,* EPA, 1999). Water quality standards are calculated in the metric system and therefore are not translated into the English system. Data from two stations is required to characterize Roaring Fork River water quality because a complete set of ambient water quality parameters is not available for the individual stations. However, these stations are within several miles of each other and water quality is not expected to vary significantly between the stations. The data presented show water quality to be generally very good at the point where the Roaring Fork River discharges to the Colorado River. Roaring Fork River water can be characterized as slightly alkaline (120.6 mg/l as $CaCO_3$) water of a calcium sulfate type with a medium hardness (215.7 mg/l as $CaCO_3$) and pH of 8.4. All average, median, and maximum parameter values meet established Colorado water quality standards (CDPHE, 1999). While tributaries may contain different concentrations of water quality parameters, water at the River's mouth is generally assumed to be representative of upstream reaches and tributaries. Water quality data from the Roaring Fork River south of Aspen (station 1065901) supports this assumption. Water composition in this upstream reach is similar, with slightly higher alkalinity (96.4 mg/l as $CaCO_3$), and less hardness (184.8 mg/l as $CaCO_3$) (EPA, 1999).

The EPA, through its Index of Watershed Indicators Program, assigned the Roaring Fork River an overall watershed score of one, on a one to seven continuum, with one being best ("*Surfing Your Watershed. Roaring Fork,"* EPA, 1998). Rivers receiving a rating of one have high quality water and low vulnerability to stressors such as pollutant loadings (EPA, 1998). EPA's watershed indicators suggest that current land use practices do not have a significant adverse affect on water quality in the Roaring Fork Valley. EPA, however, ranked wetland loss, population increase, and hydrologic modification from dams as serious threats to Roaring Fork River water quality and watershed integrity (EPA, 1998).

Table III-30
Ambient Water Quality Data for the Roaring Fork River
January 1980 – June 1998

Parameter	Roaring Fork River					State Water Quality Standard
	Mean	Median	Max	Min	n	
Flow (cfs)	1,473.4	849.0	9,610.0	355.0	96	
Turbidity (Hach FTU)	39.3	28.5	87.0	3.7	6	nns
Dissolved oxygen (mg/l)[1]	11.2	11.2	14.2	8.0	208	>6
PH (s.u.)[1]	8.4	8.4	9.3	7.3	203	6.5-9.0
Total alkalinity as $CaCO_3$ (mg/l)[1]	120.6	124.0	172.0	60.0	195	nns
Total hardness as $CaCO_3$ (mg/l)[1]	215.7	230.0	320.0	87.0	176	nns
CO_3 (mg/l)[2]	4.0	0.0	31.0	0.0	37	nns
HC_3 (mg/l)[2]	131.9	135.0	195.0	77.0	37	nns
Magnesium (mg/l)[1]	11.6	12.7	17.6	4.0	247	nns
Calcium as CaCO (mg/l)[1]	144.6	150.0	220.0	72.0	7	nns
Total Sodium as Na (mg/l)[1]	13.5	12.0	22.0	6.0	6	nns
Total Chloride (mg/l)[2]	23.9	25.0	64.0	2.0	247	<250
Total sulfate as SO_4 (mg/l)[2]	109.3	121.0	180.0	27.0	247	<250

Source: EPA 1999, CDPHE 1999

[1] Roaring Fork River at Mouth, Station 53.

[2] Roaring Fork River at Glenwood Springs, station 9085000.
nns – no numerical standard.

3. Floodplains

While not required, this CIS was completed using NEPA guidelines. Executive Order 11988, Floodplain Management, requires federal agencies to avoid direct or indirect support of floodplain development whenever a practicable alternative exists. The base flood (100-year flood) is the regulatory standard used by federal agencies and most states to administer floodplain management programs. As described in 23 CFR 650 Subpart A, floodplains provide natural and beneficial values including fish, wildlife, plants, open space, natural beauty, scientific study, outdoor recreation, agriculture, aquaculture, forestry, natural flood moderation, water quality maintenance, and groundwater recharge.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM), prepared in 1986 and 1987, delineate the boundaries of 100-year floodplains for the Roaring Fork Valley Transportation Study Corridor segments that are within Garfield and Pitkin Counties. A set of topographic maps, completed for a 1976 Eagle County floodplain study of the Roaring Fork and Frying Pan Rivers, delineates the 100-year floodplain within the portion of the Project Corridor situated within Eagle County. In the Project Corridor, 100-year floodplains encompass the Roaring Fork River and its major tributaries including Cattle Creek, Crystal River, Fryingpan River, Sopris Creek, Snowmass Creek, Woody Creek, and Brush Creek. Any 100-year floodplain boundaries that have been modified by development since the aforementioned regulatory mapping was completed will be addressed during the preliminary and final design process.

4. Geology and Soils

4.1 Geology

The assessment of potential impacts related to geology and soils may differ from those of other disciplinary areas because project alternatives typically will not cause effects on the geology or soils within the project area. Rather, effects are normally "associated with" geology and soils. It is therefore necessary to thoroughly identify and describe existing geology to enable environmental hazard evaluation.

The Project Corridor is located in a riparian corridor between two large mountain ranges formed by arching layers of rock, or anticlines. To the northeast of the Roaring Fork River looms the Sawatch Range, a high granite belt consisting of steeply inclined beds bordered by numerous reverse faults *(Major Geologic Features of Colorado,* Curtis, 1960). To the southwest rise the volcanic and metamorphic Elk Mountains, a range carved from the rocks involved in the large subsidiary fold that developed west of the trough of layered rock known as the Roaring Fork Valley Syncline. Both ranges are faulted anticlines raised during the Laramide Orogeny (a large mountain-building period 200 million years ago), and experienced severe glaciation 10,000 years ago during the Pleistocene era (Curtis, 1960). These intense glaciers deposited large accumulations of earth and stone, known as terminal and lateral moraines, at the head of the Roaring Fork Valley, and large thick outwash terraces throughout the project area.

The valley floor consists of thick deposits of river gravel, the majority of which were derived from Pleistocene glacial outwash. Each glacier that proceeded down the valley formed broad horizontal terraces above the river. These terraces represent a period of gradient stability with constant deposits of sediment known as alluvium, and are widespread throughout the Roaring Fork Valley (Curtis 1960). As one travels from Glenwood Springs toward Snowmass Village and Aspen, three separate terrace levels are visible. These deposits are older by a few million years, and thus provide alluvium of various sizes ranging from boulders to clay.

Six principal geologic units have been identified in the Roaring Fork Valley by the *Pre-Acquisition Environmental Site Assessment* conducted by Steffen, Robertson and Kirsten, Inc. (SRK, 1996) for Pitkin County. These units were confirmed from youngest to oldest as being:

1. **Pleistocene alluvium,** consisting of recent sediments (gravels, sands, silts, and clay) associated with, and generally following, the present riverbed.

2. **Colluvium**, occurring as debris flows and mixed material, derived from higher elevations and deposited along steep slopes and embankments throughout the valley.

3. **Pleistocene lava flows** comprising the northern upper reaches of the valley from Glenwood Springs to Basalt.

4. **Cretaceous and Jurassic shales.** The slide-prone Cretaceous (Mancos shale) and Jurassic (Morrison formation) shales occur widely in the southern sections of the Project Corridor. The Mancos shale outcrops contain olive-grey shale interbedded with calcium-laden shale, clayey limestone, and a highly erodable yellowish sandstone. In contrast, the pale green to red shale of the Morrison Formation is visible only in four small, localized areas (SRK, 1996).

5. **The Triassic State Bridge Formation**, the faulted and tilted Triassic-Pennsylvanian "redbeds" found on both sides of Highway 82 near Basalt, is more or less continuous with the older Permian-Pennsylvanian Maroon Formation which forms outcrops throughout the central Project Corridor as cliffs and steep embankments. Both of these formations are made up of interbedded siltstones, sandstones, and shale with lens-shaped beds of sandy limestone and pebble conglomerate (SRK, 1996).

6. **Pennsylvanian Eagle Valley Evaporite** is the oldest geology identified in the Project Corridor. This unstable rock is made up of interbedded gypsum and dark shale with yellowish-gray weathered surfaces and chaotic internal structure (SRK, 1996).

4.2 Soils

The Roaring Fork Valley is characterized by the nearly level to gently sloping Roaring Fork River, steep mountain slopes, and steep to very steep terrace faces. Elevations range from more than 2,350 meters (8,000 feet) near Aspen to 1,800 meters (5,900 feet) at Glenwood Springs.

Livestock production is the principal agricultural activity within the Roaring Fork Valley, with all irrigated land being used primarily for pasture and hay. The soils found along the project area have been determined to be of limited agricultural use due to the elevation, short growing season, and moderately high erosion hazard (*Soil Survey of Aspen-Gypsum Area, Colorado,* SCS, 1992). Typical soil characteristics would be sandy to gravelly sandy loam soils formed from sandstone and shale alluvium to cobbly sandy loam derived from basalt.

The dominant soil group in the northern project area from just south of Glenwood Springs to Basalt is the Antencio-Redrob-Azeltine association located on gently sloping to strongly sloping alluvial valley floors, floodplains, fans, and terraces. These soils are deep and somewhat poorly drained to well drained. Elevation ranges from 1,798 to 1,981 meters (5,900 to 6,500 feet), with annual precipitation of 38 to 46 centimeters (15-18 inches). Stones, cobbles, and extremely gravelly sand are found at depths of 152 centimeters (60 inches). Major land-use activities in the area include livestock grazing, irrigated hay and pasture, wildlife habitat, and homesite/industrial development. Soils of this unit are sandy clay loam to gravelly sandy loam (SCS, 1992).

The soil types existing in the central Roaring Fork Valley near Woody Creek consist of the Brownsto-Showalter-Tridell association, and are located on strongly sloping to very steep fans, terraces, and mountainsides. These soils are deep and well drained to somewhat excessively drained. The elevation of this association is 1,950 to 2,590 meters (6,400 to 8,500 feet), with an annual precipitation of 31 to 41 centimeters (12 to 16 inches). Soil characteristics are gravelly sandy loam to gravelly loam with cobbly clay and clay loam. Major activities include rangeland, hayland, crops, and homesite development (SCS, 1992).

The Jerry-Uracca-Mergel soil association dominates the middle slope areas from Woody Creek to Aspen, and is located on gently sloping to very steep alluvial fans, terraces, valley sides, and hills. These soils are deep and well drained. Elevation is from 2,377 to 2,895 meters (7,800 to 9,500 feet), with an annual precipitation of 41 to 51 centimeters (16 to 20 inches). Soil characteristics include clay loam to cobbly sandy loam and cobbles. Major existing land use is mostly pasture and hay farming (SCS, 1992).

5. Upland and Floodplain Vegetation

5.1 Roaring Fork Valley Land Cover Types

Several approaches to describing land cover types (i.e. vegetation communities) are available, each with benefits and shortcomings. The Colorado Natural Heritage Program (CNHP) uses species composition to describe plant communities within a particular area. This approach produces descriptions applicable to relatively small areas. Maps of CNHP plant communities are typically generated on a localized basis and are not available for the immediate vicinity of the Project Corridor. The Colorado Gap Analysis Program (COGAP) has undertaken a project to map all land cover categories within the state. The map used for this project was developed from aerial photography taken in 1984, 1989, and 1993 and is at a relatively small (coarse) scale, with a minimum mapping unit of approximately 101 hectares (250 acres) (COGAP, 1993). While the mapping resolution is relatively coarse, it provides a consistent description of vegetation communities on a state-wide basis. The COGAP map was selected as the base map to describe land cover categories in this analysis due to its availability and its state-wide consistency. The discussion incorporates the CNHP communities into the COGAP land cover classes, to the extent possible, to reconcile the vegetation/wildlife descriptions with a description/assessment of vegetation.

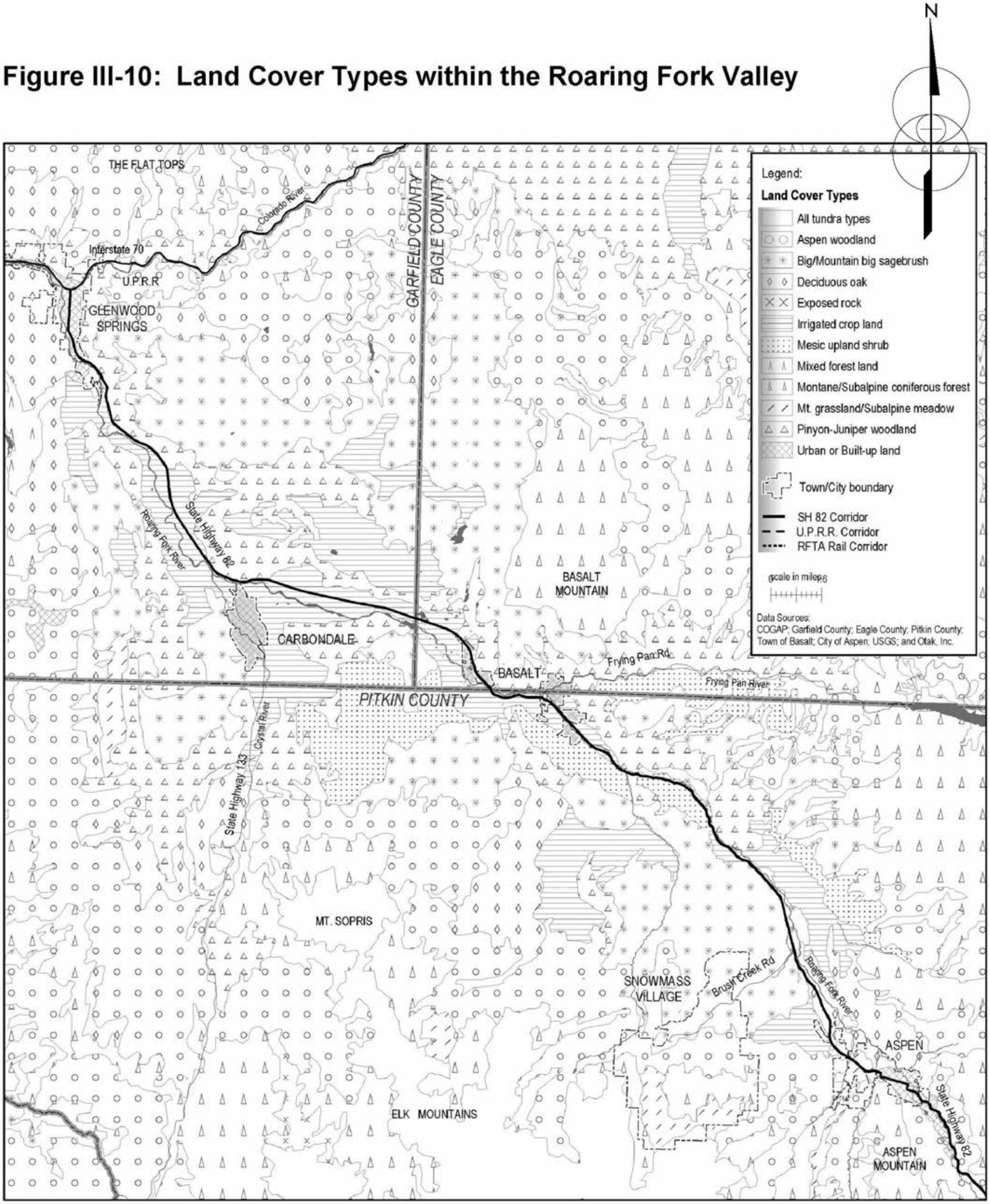
The rights-of-way (ROW) for the proposed project alternatives were overlaid on the land cover map provided by COGAP (COGAP, 1999). Figure III-10 presents the types of plant communities and acreages present within the Project Corridor and adjacent vicinity.

The urban land cover type refers to areas of development, including industrial, commercial, and residential settings. Irrigated cropland forms the dominant land cover class, particularly from Glenwood Springs to Basalt (COGAP, 1999). Irrigated cropland within the Roaring Fork Valley primarily applies to irrigated hayfields and pastures and the associated farms or ranches (COGAP, 1999). The mesic shrubland cover type applies to a range of shrub communities including Rocky Mountain maple (*Acer glabrum*), serviceberry (*Amelanchier sp.*), chokecherry (*Prunus virginiana*), and bitterbrush (*Purshia tridentata*) where shrubs occupy more than 25 percent of the vegetative cover (COGAP, 1999). This community type contains the mixed mountain shrubland as described by the CNHP and occurs adjacent to the Roaring Fork River southeast of Basalt and along the RFTA right-of-way west of El Jebel. Gambel oak (*Quercus gambelii*) and species of the mesic shrubland dominate the deciduous oak community. This community occurs primarily on the roadside slopes north of Aspen (COGAP 1999).

The big sagebrush (*Artemisia tridentata ssp. tridentata*) occurs on south-facing slopes northwest of Snowmass (COGAP 1999). This community type corresponds to the west slope sagebrush shrubland identified by the CNHP. The piñon/juniper *(Pinus edulis/Juniperus spp.*) land cover type exists on the north-facing slopes along the existing rail line southeast of Carbondale and east of the Roaring Fork River, south of Basalt (COGAP 1999). The montane riparian forest, narrowleaf cottonwood/chokecherry, and cottonwood riparian forest are identified by the CNHP occur along the Roaring Fork River, within the area mapped by COGAP as irrigated cropland. This is again due to the relatively coarse resolution of the COGAP mapping effort.

A community that is dominant within the Project Corridor but omitted from either CNHP or COGAP descriptions is the roadside and railroad vegetation type. Along Highway 82, this community consists of grasses and forbs planted following highway construction. This vegetation community serves to stabilize the cut-and-fill slopes that occur adjacent to the highway, and constitutes the

Figure III-10: Land Cover Types within the Roaring Fork Valley



unpaved portion of the highway right-of-way. Various weedy species are present along the historic railroad right-of-way, which has also been disturbed over time. The noxious weed discussion that follows addresses vegetation within the proposed project rights-of-way.

5.2 Noxious Weeds

Consideration of noxious weed species now occurs during all phases of CDOT and FHWA environmental processes. While not required, this document follows this guidance. Analysis criteria include identification of existing noxious weeds, potential for impacts from invasive species, and identification of preventative and control measures.

5.2.1 Noxious Weed Management Areas. 66.5 kilometers (41.3 miles) of Highway 82 fall within the Project Corridor. Responsibility for weed management for this portion of Highway 82 lies with CDOT Region 3, Grand Junction, Maintenance Section 2.

RFTA owns approximately 53.6 kilometers (33.3 miles) of railroad right-of-way, including 29.5 kilometers (18.3 miles) in Garfield County, 4.8 kilometers (three miles) in Eagle County, and 19.3 kilometers (12 miles) in Pitkin County. Responsibility for weed management of the property in Garfield and Eagle Counties lies with RFTA. Responsibility for weed management of the property in Pitkin County lies with Pitkin County. RFTA and Pitkin County Open Space are working out an IGA for this task. Proposed new stations and/or park-and-ride lot locations within the Highway 82 and railroad right-of-way corridors do not currently fall under either CDOT or RFTA weed management plans. Any project improvements in areas not listed above will be managed by RFTA or will fall within local and county jurisdictions.

5.2.2 Noxious Weed Identification. Sixty-eight plant species are currently included on the State of Colorado Noxious Weed "A" List. Ten have been prioritized by the State as being the most widespread and causing the greatest economic impact (the "B" List). Weeds that are not yet widespread, but that may be a threat to Colorado lands in the future are included on the "C" list. From the list designated by the State, each county has designated those weeds identified as the most problematic for their area. By law, these weeds must be controlled on properties within each county jurisdiction. The Highway 82 and RFTA right-of-way corridors pass through three counties: Pitkin County has listed 20 weeds, Garfield County has listed 21 weeds, and Eagle County has listed 15 weeds as the most problematic for their counties.

CDOT inventoried and mapped the Highway 82 right-of-way for noxious weeds in the fall of 2001 (Personal Communication, Knox, 2001). The thistle complex containing both Canada thistle (*Cirsium arvense*) and musk thistle (*Carduus nutans*) were the predominate species noted throughout the corridor. Russian knapweed (*Centaurea repens*) and/or Spotted knapweed (*Centaurea maculosa*) were also observed in the area between Catherine Store and Basalt. All of these species are identified on the top ten prioritized weed species of the State Noxious Weed list.

RFTA inventoried the railroad right-of-way for noxious weeds in 2000 and in the fall of 2002. A total of 28 noxious weeds from the State Noxious Weed List have been identified on the right-of-way, many in very small quantities. The predominant species are common tansy (*Tanaceturn vulgare*), plumeless thistle (*Carduus acanthoides*), canada thistle *(Cirsium arvense)*, scotch thistle *(Onopordum acanthium)*, russian thistle *(Salsola collina)*, houndstongue (*Cynoglossum officinale*), common mullien *(Verbascum thapsus)*, kochia *(Kochia scoparia)*, dalmation toadflax *(Linaria dalmatica)* and field bindweed *(Convovulus arvensis)*. In addition, both the canada thistle and field bindweed are considered to be in the top ten prioritized weed species for the State of Colorado.

Canada Thistle. The Canada thistle (*Cirsium arvense),* is a member of the Aster family, introduced from Europe. It is a creeping perennial that grows from .3 to 1.5 meters (one to five feet) tall. It reproduces by seeds and fleshy, horizontal roots. Because of its seeding habits, vigorous growth, and extensive underground root system, control and eradication are difficult.

Common Tansy. The common tansy (*Tanaceturn vulgare),* is a member of the Aster family, originally imported from Europe as an ornamental. It is a perennial plant that grows from .46 to 1.8 meters (1.5 to 6 feet) tall with yellow button-like flowers and fern-like leaves. This aggressive plant reproduces by both seed and rootstock and can be difficult to control.

Musk Thistle. The musk thistle (*Carduus natans)* is a member of the Aster family and was introduced from Eurasia. It is a winter annual or biennial which reproduces by seed. The first year it produces a large, compact rosette from large taproot. The second year it produces a .6 to 1.8 meter (two to six foot) spiny stalk, with waxy dark green leaves and purple flowers. It prefers moist bottomland soil, but can also be found on drier uplands. The key to management is to prevent seed formation.

Plumeless Thistle. The plumeless thistle (*Carduus acanthoides*), also a member of the Aster family introduced from Eurasia, is a winter annual or biennial. It is distinguished from the musk thistle by its smaller flowers, 1.27 to 2.54 centimeters (one-half to one inch) in diameter. Plumeless thistles are extremely prolific seed producers found in pastures, river valleys and along roadsides. This species has a rapid re-growth response to mowing or cutting and will tend to branch and re-flower.

Houndstongue. Houndstongue (*Cynoglossum officinale),* a biennial, is a member of the Borage family and was introduced from Europe. It appears as a leafy rosette in the first year. It produces reddish-purple flowers and grows .46 to .91 meters (1.5 to three feet) tall. A prolific seed producer, it is also known as "Velcro weed" because its small nutlets are rapidly spread by people and animals. It is also toxic to horses and cattle. Houndstongue grows on ranges, pastures, trails, and roadsides.

Russian Knapweed (*Centaurea repens*) is a member of the Aster family, native to Europe. It reproduces from seeds and creeping, horizontal roots. Flowers are thistle-like, 1.0 to 1.5 centimeters (one-third to one-half inch) in diameter and lavender to white. It is especially prevalent on the Western Slope of Colorado and is very poisonous to horses. Once established, it is difficult to control or eradicate.

Spotted Knapweed *(Centaurea. maculosa)* is a member of the Aster family, a native to Central Europe. It is a perennial that reproduces from seed and forms a new shoot each year from a taproot. It can have one or more shoots up to 1.2 meters (four feet) in height. Spotted knapweed tolerates dry conditions, but will survive in higher moisture areas as well.

Scotch Thistle *(Onopordum aanthium)* is a member of the Aster family that was introduced from Europe or eastern Asia and can reach a height of eight feet. The rosette forms the first year and can have leaves up to two feet long and one foot wide. The second year the plant produces flowers that are reddish-purple to violet. It is found primarily along roadsides and railroads, but can become an impassable obstacle to livestock on rangeland and pastures.

Russian Thistle *(Salsola iberica)* is a member of the Goosefoot family introduced from Russia and often called "tumbleweed." It is a rounded, bushy, many-branched annual, six inches to three feet tall, reproducing by seed. Seeds are spread when mature plants break off at ground level and scatter as the plant tumbles in the wind. Stems are usually red or purple striped. Leaves are long, string-like and soft when young, becoming tipped with a prickly spine as they mature. Russian thistle has become one of the most common and troublesome weeds in the drier regions of North America.

Common Mullien *(Verbascum thapsus L.)* is a member of the Figwort family that was introduced from Europe, originally a native of Asia. A biennial, it produces a large, thick rosette of fuzzy leaves the first year and a single, stout, erect stem, two to six feet tall, the second year. Leaves are alternate, overlapping one another, light green, densely woolly. Flowers are sessile, borne in long terminal spikes, sulphur yellow, five-lobed and more than an inch in diameter. Because of the large number of seeds produced by each plant, it is difficult to control.

Kochia *(Kochia scoparia)* is a member of the Goosefoot family, native to Asia and introduced from Europe. An annual, it grows one to six feet tall, with stems much branched, round, slender, usually soft-hairy. Leaves are alternate, lance-shaped, with an upper surface that is usually smooth and a lower surface that is usually covered with soft hairs. Livestock will readily graze kochia, but it sometimes contains high nitrate levels and can be toxic. Flowering and prolific seed production may occur from July to October.

Dalmation Toadflax *(Linaria genistifoia)* is a member of the Figwort family originally imported from Europe as an ornamental. It is a creeping perennial with stems from two to four feet tall. The flowers are snapdragon-shaped, bright yellow, with orange centers; leaves are waxy and heart-shaped. Dalmation toadflax is especially adapted to arid sites and can spread rapidly once established. Because of its deep, extensive root system and heavy seed production, this plant is difficult to manage.

Field Bindweed *(Convolvulus arvensis)* is a member of the Morning-glory family introduced from Europe. It reproduces by seed and horizontal roots. The stems are one to four feet long and spread thickly over the ground or wind around erect plants or other objects. The flowers are bell- or trumpet-shaped, white or pink. Field bindweed is one of the most competitive perennial weeds and is a problem throughout Colorado. Its roots can extend ten feet deep and a two- or three-year food supply is stored. This makes it hard to kill by cultivation because roots will live as long as their food reserve lasts. Seeds can also remain viable in the soil for up to 40 years.

5.2.3 Noxious Weed Management Plans. CDOT rights-of-way are managed for noxious weeds under the *CDOT Integrated Noxious Weed Management Plan* (CDOT, 2000). The CDOT management plan includes detailed goals and objectives for Maintenance Section 2, including, identification and inventory of noxious weeds, use of integrated methods to control specific weeds, and education of appropriate personnel. The plan does not identify any specific goals for the Highway 82 right-of-way.

Due to the identification of a serious noxious weed problem within the railroad right-of-way, RFRHA implemented a weed management plan in 2000. The plan is being updated and improved. The new plan is called the *RFTA Integrated Weed Management Plan* (2002) and will follow a six-point integrated and adaptive management approach:

1. Establish and record land management goals and weed management objectives.

2. Identify and prioritize species/infestations that threaten goals and objectives.

3. Assess control techniques.

4. Develop and implement weed management plans/actions.

5. Monitor and assess results of management actions.

6. Modify and improve weed management objectives, priorities, and plans, thereby starting the cycle again each year.

This plan is based on desired plant species and communities, rather than on simply eliminating weeds. Preventive programs are being implemented to keep the management area free of species that are not yet established but are known to be pests elsewhere in the area. Priorities have been set to reduce or eradicate weeds that have already become established on the property, according to their actual and potential impacts to the land management goals for the property, and according to the ability to control them now versus later.

Building and preparation for building segments of the Rio Grande Trail within the RFTA corridor have resulted in aggressive noxious weed management in all three counties in 2000, 2001 and 2002. Weed management methods include, but are not limited to, manual, mechanical, biological, and chemical controls and are intended to be the least environmentally damaging, yet practical and reasonable in achieving the desired results.

Approximately one-third of the railroad right-of-way is in Pitkin County. Pitkin County weed management falls under the *ThePitkin County Noxious Weed Management Plan* (Ordinance #99-48 and #01-006, 1999, revised 2001). Pitkin County Open Space and Trails has sprayed most Pitkin County sections with positive results in 2000, 2001 and 2002. The Roaring Fork Club, which abuts just under 3.22 kilometers (two miles) of the corridor in Pitkin County, has successfully run a natural weed control program, using no herbicides, for four years.

Approximately 4.8 kilometers (three miles) of the right-of-way runs through Eagle County. A natural weed control program was implemented on about half of this section in 2000 and is ongoing. The program includes the introduction of mushrooms and weed-eating insects, increasing soil fertility, manual pulling, and mechanical cutting. Reseeding with native plants is planned for 2003. Thistle, houndstongue and mullien populations have been greatly reduced, native vegetation is looking healthier and the program appears to be a gradual success story. The common tansy may have to be sprayed. In 2003 aggressive treatment will begin on the other half of the Eagle County section, using natural weed control techniques.

In 2001 a natural weed control program was started on a few small sections in Garfield County, while most of the difficult sections were sprayed with herbicide. In 2002 the natural weed control program was expanded and the only section sprayed with herbicide was a three-mile section along County Road 100.

6. Wetlands

Wetlands within the Roaring Fork River Valley principally occur along the river, creeks and irrigation ditches. They may also occur as a result of subsurface irrigation by groundwater, and/or in depressional areas that tend to collect and hold water for extended periods of time during the growing season.

Jurisdictional wetlands are those subject to regulatory authority of the Clean Water Act Section 404 and jointly administered by the U.S. Army Corps of Engineers (Corps) and the U.S. Environmental Protection Agency. These wetlands are created or supported in some way by waters of the U.S. Non-jurisdictional wetlands, those not regulated by the Corps, exhibit all three wetland criteria, but the sole water source may be a man-made irrigation ditch, for example.

Wetlands are delineated using three criteria: 1) Of the dominant species, occurrence of more than 50 percent hydrophytic vegetation; 2) Existence of hydric soils; and 3) Presence of wetland hydrology. A site is generally considered to exhibit wetland hydrology if soil saturation occurs continuously for a minimum of five percent of the growing season. The growing season within the Project Corridor ranges from 141 days near Glenwood Springs (SCS 1985) to only 105 days near Aspen (SCS 1992), making the number of consecutive days required to meet the wetland hydrology criteria seven days near Glenwood Springs and five days near Aspen.

Hydrophytic vegetation is defined as plant life growing in water, soil, or on a substrate that is at least periodically deficient in oxygen as a result of excessive water content. *Hydric soils* are defined as soils that are saturated, flooded, or ponded long enough during the growing season to develop anaerobic (without oxygen) conditions in the upper part of the soil profile. Generally, to be considered a hydric soil, there must be saturation at temperatures above freezing for at least seven days. Wetland hydrology is defined as permanent or periodic inundation, or soil saturation to the surface, at least seasonally.

Relatively narrow, fringe wetlands typically exist along the banks of irrigation ditches in the Roaring Fork Valley. These fringe wetlands vary from 0.6 to 3.0 meters (two to ten feet) in width and may occur on either, or both, sides of a given ditch. The Corps considers wetlands solely supported by agricultural irrigation systems non-jurisdictional. The important and obvious distinction is the sole artificial source for wetland hydrology. Despite the non-jurisdictional status, these wetland systems exhibit similar characteristics (i.e., prevalence of hydrophytic vegetation, wetland hydrology, and hydric soils) as jurisdictional wetlands. Non-jurisdictional wetlands created by the irrigation ditches have been included in Table III-30.

6.1 Wetland Community Types

Using the Cowardin classification system, palustrine and riverine wetlands were identified in the Project Corridor (Cowardin et al. 1979). Palustrine wetlands are marshy areas that may occur around seeps and springs as well as adjacent to streams and rivers. Within the Project Corridor, palustrine wetlands occur in the form of wet meadows, willow shrublands, and the cottonwood/alder/spruce forests that occur within the floodplains and outside the banks of the Roaring Fork River. Riverine wetlands refer to linear wetlands that occur within the banks of the Roaring Fork River, its tributaries, and irrigation channels.

A total of 100 wetlands (9.4 hectares/23.0 acres) were identified in the Project Corridor. Sixty-two of these wetlands (seven hectares/17.1 acres) are jurisdictional waters of the U.S. Sixty-four jurisdictional and nonjurisdictional wetlands were classified as Palustrine Persistent Emergent Seasonally Flooded in the Project Corridor. Thirty Palustrine Scrub-Shrub Broad-leaved Deciduous Seasonally Flooded wetlands and fringe wetlands were documented. Six Palustrine Forested

Seasonally Flooded wetlands were found. Table III-31 identifies specific wetlands in each category. Similarities within each wetland classification are discussed below.

6.2 Wetland Survey Methodology

A wetland survey of the project area was conducted in July 1999 (SAIC 1999b). In areas where a right-of-way had not been established, a 30-meter (100-foot) right-of-way on either side of the rail and trail alternative alignment of 61-meters (200-feet) total width was assumed. Hydrophytic vegetation was used as the first step in identifying potential wetland areas. When hydrophytic vegetation was found to occur within the right-of-way, the site was then evaluated for the presence of wetland hydrology. If both criteria were met, a determination of the presence, or absence, of hydric soils was made. When determined to be a wetland, each site was mapped in the field (Aero-Metric 1997). Wetland mapping conducted for this document is approximate. A land survey of wetland boundaries will be required prior to final design. All 100 wetland sites found within the Project Corridor are shown in *Wetland Assessment, West Glenwood Springs to Aspen, Colorado CIS/DEIS/CP*, December 20, 2000.

Palustrine Persistent Emergent Wetlands: A total of 5.4 hectares (13.2 acres) were determined to be Palustrine Persistent Emergent Wetlands. These sites were typically dominated by reed canary grass (*Phalaroides arundinacea)*, broad-leaf cattail *(Typha latifolia)*, wiregrass *(Juncus arcticus)*, Nebraska sedge *(Carex nebrascensis)*, beaked sedge *(Carex utriculata)*, woolly sedge (*Carex lanuginosa)*, and creeping spike rush *(Eleocharis palustris)*. Emergent wetlands often occurred adjacent to the railroad tracks or Highway 82. When irrigation water was the primary source of water, either through seepage or overflow, the resultant emergent wetlands generally exhibited low species diversity. Conversely, naturally occurring emergent wetlands had much higher species diversity. The largest wetland delineated (polygon 377-5) was an emergent wetland dominated by reed canary grass.

Palustrine Scrub-Shrub Broad-Leaved Deciduous Wetlands: A total of 3.3 hectares (8.1 acres) were determined to be Palustrine Scrub-Shrub Wetlands. Scrub-shrub wetlands were typically dominated by coyote willow *(Salix exigua)*, shining willow *(Salix lutea)*, red-osier dogwood *(Cornus stolonifera)*, and speckled alder *(Alnus incana ssp. tenuifolia)*. This wetland type typified the fringe wetlands located along the Roaring Fork River, its tributaries, and irrigation ditches of the valley. As expected, speckled alder is more common from Emma to Aspen than at lower elevations, and only occurs in relationship to rivers or naturally-occurring water sources. Coyote willow, on the other hand, is very common throughout the Project Corridor and frequently found in non-wetland areas, often associated with irrigation ditches and seeps.

Palustrine Forested Broad-Leaved Deciduous Wetlands: This wetland type occurs in only six locations within the proposed right-of-ways with a total size of 0.7 hectares (1.7 acres), primarily adjacent to the Roaring Fork River. River birch *(Betula fontinalis)*, and narrow-leaf cottonwood *(Populus angustifolia)* are the dominant overstory species present. Other associated species included speckled alder, coyote willow, woolly sedge, and red-osier dogwood.

Table III-31
Wetland Types in the Project Corridor
with Associated Wetland Polygon Number and Acreage

Wetland Type	Jurisdictional Wetland Polygons*	Area (ha/acres)	Nonjurisdictional Wetland Polygons	Area (ha/acres)	TOTAL AREA (ha/acres)
Palustrine Persistent Emergent Seasonally Flooded (PEM1C)	360-1,360-1,366-1,368-1,1c,368-2,371-3,371-6,375-4,376-2,376-7, 377-5, 377-7,378-1,378-2,378-3,378-4,378-5,378-6,378-7,379-1,379-2,379-3,379-5,379-6,379-7,379-8,380-1,380-2,381-1,381-2,381-3,382-1,382-3, 382-7a,382-7b,383-3,383-4,383-5, and 384-1	3.7/9.0	364-1, 365-1,365-2,367-1,368-1,370-1,370-3,370-4,372-2,374-1,375-7,376-8,377-6,377-8,378-8,378-9,379-10,379-11,380-3,380-4,381-4, 382-6,382-8, 383-2,383-6, 388-1,388-2,and 392-4	1.7/4.2	5.4/13.2
Palustrine Scrub-Shrub Broad-leaved Deciduous Seasonally Flooded (PSS1C)	360-2,370-2,371-2, 371-5,371-7,373-2,375-3,375-5,375-6,376-1,376-5,377-2,377-3,377-4,382-2,382-4,383-7,392-2,392-3,394-1,394-2, and Fringe areas	2.8/7.0	368-3,377-9,382-5,385-2,386-1,389-1,390-1,and 391-1	0.5/1.1	3.3/8.1
Palustrine Forested Broad-leaved Seasonally Flooded (PFO1C)	376-3,376-4,376-6,379-4	0.5/ 1.1	370-5 and 371-9	0.2/0.6	0.7/1.7

** Polygon number indicates railway milepost number (e.g. 379-) followed by the plot number.*
Source: SAIC,1999b .

6.3 Wetland Functions

Wetlands perform a variety of important functions within the environment. These functions include groundwater discharge and recharge, fish and wildlife habitat, sediment trapping, nutrient retention and removal, downstream food chain support, and flood storage/attenuation. Specific functions provided by a wetland, and the degree to which it performs those functions, depend on a number of factors including the type, size, diversity, and location of the wetland.

Typically, human-induced wetlands in the Project Corridor are associated with irrigation ditches, or are small, have low species diversity, and are in close proximity to Highway 82 or the RFTA right-of-way. Functionality for such wetlands is limited. The functions these non-jurisdictional wetlands perform, therefore, are limited to some ground water recharge, wildlife habitat, and to a limited extent, nutrient retention/removal. Wetlands positioned to intercept irrigation return flow waters can remove excess nutrients and other pollutants prior to water entering the Roaring Fork River or its tributaries. Naturally-occurring wetlands in the project area are typically larger, more diverse, exhibit a more natural hydrologic regime, and are slightly removed from Highway 82 or the RFTA right-of-way; such wetlands typically have a higher functionality than man-made wetlands associated with irrigation ditches.

7. Fisheries

This section describes the fisheries resource within the Project Corridor. The term fishery characterizes native and introduced fish resources and their habitat within the context of human use. It is a broader term than simply fish ecology and encompasses recreational and socioeconomic values.

Because they often comprise a major portion of the fish biomass and are therefore important at an ecosystem level, fish species with recreational or commercial value often define a fishery. Four fish species with recreational or commercial value inhabit the Roaring Fork River and its tributaries within the Project Corridor (*Personal Communication*, Wright, 1998). These are the brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), Colorado River cutthroat trout (*Oncorhynchus clarkii pleuriticus*), and the mountain whitefish (*Prosopium williamsoni*). Of these, only the Colorado River cutthroat trout is a native species; the rest are introduced species. Habitat for the Colorado River cutthroat trout appears to be limited to the headwaters and tributaries of the Roaring Fork River. As a special status species, Colorado River cutthroat trout will be discussed in more detail within **Chapter III.C.10: Threatened, Endangered, Candidate, and Other Special Concern Species**.

In addition to game fish species, the Roaring Fork River and tributaries support an assortment of non-game species such as the mottled sculpin (*Cottus spp.*) and mountain whitefish (*Prosopium williamsoni*) (*Personal Communication*, Sealing, 1995), and aquatic macroinvertebrate species from at least six insect Orders (*Ephemeroptera, Tricoptera, Plecoptera, Coleoptera, Diptera, Odonata*) (*Acquatic Ecosystem Inventory Macroinvertebrate Analysis*, Mangum 1993; Colorado Natural Heritage Program 1998a). Aquatic macroinvertebrates provide the prey base supporting the fishery. A rich aquatic macroinvertebrate community is an indicator of water quality and stream health.

The Roaring Fork River, from the Crystal River to its confluence with the Colorado River, and the Fryingpan River are designated Gold Medal fisheries by the Colorado Division of Wildlife. A Gold Medal fishery is an aquatic system with the highest quality habitat, reproducing populations of game fish species, and outstanding angling for large trout. Only 254 of more than 12,000 kilometers (158 of 7,456 miles) of trout habitat within the state receive this ranking. Portions of the Roaring Fork River near Aspen (from McFarlane Creek to upper Woody Creek Bridge) are designated as Wild Trout Waters, indicating that the waters support naturally reproducing trout populations.

8. Wildlife

This section describes wildlife resources within the Project Corridor. Wildlife resources include animal species, both native and naturalized, viewed within the context of their habitats. Although the existence and preservation of wildlife are intrinsically valuable, these resources also provide aesthetic, recreational, and economic values to the community. The analysis will focus on species that typify the habitats of the Project Corridor but are not necessarily endemic to the region, those that may be important to the function of the ecosystem, and those that are of special societal importance. Species that are specifically protected under federal or state law will be considered separately.

The wildlife evaluation includes all terrestrial vertebrate life (i.e., amphibians, reptiles, birds, and mammals) with the exception of those identified as threatened, endangered, candidate, or otherwise considered special concern species. Typical wildlife species considered include elk, deer, carnivores, small mammals, bats, snakes, songbirds, and raptors.

The composition, diversity, and abundance patterns of wildlife species or communities are determined by the attributes and quality of available habitats. Each species has its own set of habitat requirements and inter-specific interactions, which drive its distribution and abundance. Community structure emerges as the net effect of the diverse resource and habitat requirements of each constituent species within a geographic setting. Consequently, this evaluation considers impacts to wildlife habitat as the primary indicator of potential impacts to the wildlife populations themselves.

Due to its length and diverse topography, the Project Corridor includes five distinct natural terrestrial communities or habitat types: montane riparian forest, narrowleaf cottonwood/chokecherry association, west slope sagebrush shrubland, cottonwood riparian forest and mixed mountain shrubland *(Element Occurrence Locations, CNHP 1998a and Table 2, CNHP, 1998b)*. The complex mosaic of interacting habitats tracing the river corridor and valley contributes to the area's rich biodiversity. In addition to these natural habitat types, urban landscape communities, disturbance communities, and agricultural monocultures occur along much of the right-of-way.

8.1 Mammals

The Project Corridor supports an abundance of big game species and is classified as overall elk (*Cervus elaphus*) range by the Colorado Division of Wildlife *(Wildlife Resource Information System, CDOW 1998)*. The area encompasses all known seasonal activity areas within the observed range of the population. An elk migration corridor passes through the Project Corridor 1.6 kilometers (one mile) west of Basalt. The RFTA right-of-way also crosses a section of elk winter range 6.44 kilometers (four miles) northwest of Basalt. Additionally, a resident elk population is located within the Project Corridor. No elk calving areas are located within 0.8 kilometers (one-half mile) of the Project Corridor. Mule deer (*Odocoileus hemionus*) habitat occurs throughout Project Corridor. Both resident population areas and migration corridors are represented.

An assortment of other mammalian species occurs in appropriate habitats. Riparian areas and streams support mink (*Mustela vison*), beaver (*Castor canadensis*), voles (*Microtus spp*.), shrews (*Sorex spp*.) and other small mammals. Uplands provide habitat for coyotes (*Canus latrans*), white-tailed jackrabbits (*Lepus townsendii*), least chipmunks (*Tamius minimus*), deer mice (*Peromyscus spp*.), skunks (*Mephitis mephitis*), and mountain cottontails (*Sylvilagus nuttali*). Raccoons (*Procyon lotor*) move from the cover of forests to a variety of habitats in search of food. Forests and meadows support black bears (*Ursus americanus*) and porcupines (*Erethizon dorsatum*). Bats serve a critical role in montane systems, transporting nutrients from rich riparian areas to nutrient-poor forests. Bat species such as little brown myotis (*Myotis lucifugus*), big brown bats (*Eptesicus fuscus*), silver-haired bats (*Lasionycteris noctivagans*), and hoary bats (*Lasiurus cinerius*) move from forest roosts each evening to forage on insects within the canopy and over riparian corridors.

8.2 Birds

The diversity of habitats and excellent stream quality in the Roaring Fork Valley supports a rich bird population. Shrub-dominated wetlands support a variety of passerine birds. Species detected during wildlife surveys include song and Lincoln's sparrows (*Melospiza melodia* and *Passerella iliaca*), yellow warblers (*Dendroica petechia*), and veerys (*Catharus fuscescens*). Swainson thrush (*Catharus ustulatus*) is likely a more common breeding riparian thrush within the project area, but was not detected during wildlife surveys. Canada geese (*Branta canadensis*), common mallards

(*Anas platyrhynchos*), northern shovelers (*Anas clypeata*), blue- and green-winged teal (*Anas discors* and *Anas crecca*), and common mergansers (*Mergus merganser*) are common in aquatic habitats in the project area. American dippers (*Cinclus mexicanus*), an indicator of high quality, fast-flowing streams, may be found nesting and foraging along the Roaring Fork River. Belted kingfishers (*Ceryle alcyon*) also forage within these areas and nest in adjacent steep banks.

Upland birds include the green-tailed towhee (*Arremonops rufivirgatus*), lazuli bunting (*Passerina cyanea*), orange-crowned warbler (*Vermivora celata*) and blue grouse (*Dendragapus obscurus*). The forest canopy surrounding the Roaring Fork River supports an assortment of raptors including red-tailed hawks (*Buteo jamaicensis*), Coopers hawks (*Accipiter cooperii*), and great horned owls (*Bubo virginianus*). American kestrels (*Falco sparverius*) benefit from the abundant nest cavities present in the cottonwood riparian forest and may be observed foraging over agricultural fields. Prairie falcons (*Falco mexicanus*) are known to nest within the Project Corridor on cliff faces rising above the river.

8.3 Reptiles and Amphibians

Due to its high elevation and harsh climatic conditions, the Project Corridor portion of the Roaring Fork River Valley supports a relatively low diversity and abundance of reptile species. Specific species occurrences are driven by habitat associations. Piscivorous, riparian associated species such as western terrestrial garter snakes (*Thamnophis elegans*) are likely to occur in the highest abundance. Other species possibly occurring within appropriate habitats include tiger salamanders (*Ambystoma tigrinum*), striped chorus frogs (*Pseudacris triseriata*), leopard frogs (*Rana pipiens*), sagebrush lizards (*Sceloporus graciosus*), smooth green snakes (*Opheodrys vernalis*), bull snakes (*Pituophis catenifer*), and western rattlesnakes (*Crotalis viridis)* (*Western Reptiles and Amphibians,* Stebbins, 1985*).*

9. Wild and Scenic Rivers

Verbal communication, and the National Park Service's website confirmed that there are no designated Wild and Scenic Rivers in the Project Corridor from Glenwood Springs to Aspen (*Personal Communications*, Weiner, 1999 and *Wild and Scenic Rivers, State by State List*, NPS *2002*).

10. Threatened, Endangered, Candidate, and Other Special Concern Species

10.1 Specific Categories

This section describes threatened, endangered, candidate, sensitive and other species afforded special consideration by the U.S. Fish and Wildlife Service (USFWS), the U.S. Forest Service (USFS), the Colorado Natural Heritage Program (CNHP), and/or the Colorado Division of Wildlife (CDOW). Preservation of these sensitive biological resources is accomplished through many means, most notably the Endangered Species Act of 1973, which protects federally listed threatened and endangered plant and animal species. Federal candidate species are not protected by the full weight of the Endangered Species Act; however, these species could be proposed for listing, and therefore protected, at any time. Their consideration early in the planning process may avoid future conflicts that could otherwise develop.

Five rarity categories are included in this section on species with the potential to occur in the Project Corridor. These include: 1) Federal Threatened and Endangered Species, 2) Candidate Species, 3) Federal Sensitive Species, 4) State Threatened and Endangered Species, and 5) Colorado Natural Heritage Program rare or imperiled species or species otherwise of special concern. These categories are defined below.

Federally Listed Threatened and Endangered Species. The Endangered Species Act (ESA) provides protection to species listed under these categories. Endangered species are those species that are in risk of extinction in all or a large portion of their range. Threatened species are those that are likely to be listed as endangered in the near future. A federal action that may affect any species included in these categories require ESA section 7 consultation with the USFWS and preparation of a Biological Assessment in accordance with the Endangered Species Act.

Proposed Species. These are species for which the USFWS has received adequate petition information for listing as either threatened or endangered under the Endangered Species Act. Section 7 compliance may become necessary as soon as a species is proposed for listing or critical habitat is proposed for designation.

Candidate Species. These are species considered for possible addition to the List of Endangered and Threatened Species. These are species for which the USFWS has on file sufficient information on biological vulnerability and threat(s) to support issuance of a proposal to list, but issuance of a proposed rule is currently precluded by higher priority listing actions. The USFWS recommends that candidate species be treated as if they are listed since an emergency or standard listing could occur during the project.

Federally Sensitive Species. The USFS defines Federally Sensitive Species as those plant and animal species for which population viability is a concern, based on significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in habitat capability. These trends would reduce a species' existing distribution. Regional Foresters identify sensitive species occurring within their region. This category does not provide federal protection under the Endangered Species Act.

State Listed Threatened and Endangered Species. A list of Colorado State Threatened and Endangered Species is maintained by CDOW, and these species are protected by state statute from harassment, taking, and possession. Definitions of threatened and endangered in the federal category apply to the state category. This category does not provide federal protection under the Endangered Species Act.

Colorado Natural Heritage Program Rare or Imperiled Species/Special Concern Species. This category identifies species that are listed by CNHP as global/state 1 (G/S1), global/state 2 (G/S2), or state 3 (S3). G/S1 species are critically imperiled because of rarity or some other factor of their biology making them especially vulnerable to extinction. G/S2 species are imperiled because of rarity or other factors making them vulnerable to extinction. S3 species are vulnerable throughout their range. At present, these species receive no legal protection under the Endangered Species Act. Species of Special Concern is a broad category describing species whose viability is of local or regional concern but may or may not be adopted as state or federally threatened or endangered.

Table III-32 identifies species falling under the above categories that have the potential to occur within the Roaring Fork Valley, and provides a summary of species, their scientific names, and their current protection status. Species were identified by CDOW, USFWS, and the CNHP. No special status plant species were identified in the Project Corridor. Each species is discussed in the section that follows.

Table III-32
Status and Likelihood of Occurrence for Threatened and Endangered Species, Candidates for Federal Listing, and State of Colorado Threatened, Endangered, or Species of Concern

Species	Status	Occur in Project Corridor
Fauna		
Bald Eagle (*Haliaeetus leucocephalus*)	FT and ST	Yes
Mexican Spotted Owl (*Strix occidentalis*)	FT and ST	Not Likely
Eskimo Curlew (*Numenius borealis*)	FE	Not Likely
Southwestern Willow Flycatcher (*Empidonax trailii extimus)*	FE	Not Likely
Wolverine (*Gulo gulo)*	FS and SE	Not Likely
Canada Lynx *(Lynx canadensis*)	FT and SE	Not Likely
Black-Footed Ferret *(Mustela nigripes)*	FE and SE	Not Likely
Boreal Toad (*Bufo boreas boreas*)	FC	Not Likely
Uncompahgre Fritillary Butterfly (*Boloria acrocnema*)	FE	Not Likely
Colorado Pike Minnow (*Ptychocheilus lucius*)	FE and SE	Not Likely
Razorback Sucker (*Xyrauchen texanus*)	FE and SE	Not Likely
Humpback Chub (*Gila cypha*)	FE and SE	Not Likely
Bonytail Chub (*Gila elagans*)	FE and SE	Not Likely
Northern Goshawk (*Accipiter gentilis*)	FS	Not Likely
Great Blue Heron (*Ardea herodias*)	SOC	Yes
Boreal Owl (*Aegolius fenereus*)	FS	Not Likely
River Otter (*Lutra canadensis*)	SE	Yes
Preble's Shrew (*Sorex preblei*)	SOC	Not Likely
Colorado River Cutthroat Trout (*Oncorhyncus clarki pleuriticus*)	FS and S3	Not Likely
Flora		
Uinta Basin Hookless Cactus (*Sclerocactus glaucus*)	FT	Not Likely
Parachute Penstemon (*Penstemon debilis*)	FC	Not Likely
Debeque Phacelia (*Phacelia submutica*)	FC	Not Likely

FT – Federal Threatened
FE – Federal Endangered
FS – Federal Sensitive
FC – Federal Candidate for Listing
ST – State Threatened
S3 – Vulnerable Throughout State Range
SE – State Endangered
SOC – State Species of Concern (State, CNHP, or Other)

10.2 Species Discussion

Bald Eagle. Bald eagles utilize the Roaring Fork River and adjacent riparian woodlands for nesting, winter foraging, and roosting (Figure III-11). There is an historic bald eagle nest within the Aspen Glen subdivision north of Carbondale. Nesting pairs have centered activity around this site for many years, and unsuccessful yearly attempts at breeding have been monitored for the past five years by Aspen Glen personnel (*Personal Communications*, Williams 2002). Eagles return annually, maintain the nest, and use it as a day rest and roost. Coordination with USFWS has indicated that there has been no productivity (eggs laid or young eagles fledged) at this nest for eight years (Ireland, 2002). Communications with both the USFWS (Ireland, 2002) and CDOW (Wright, 2002) indicate that this nest does not function as an "active" eagle nest.

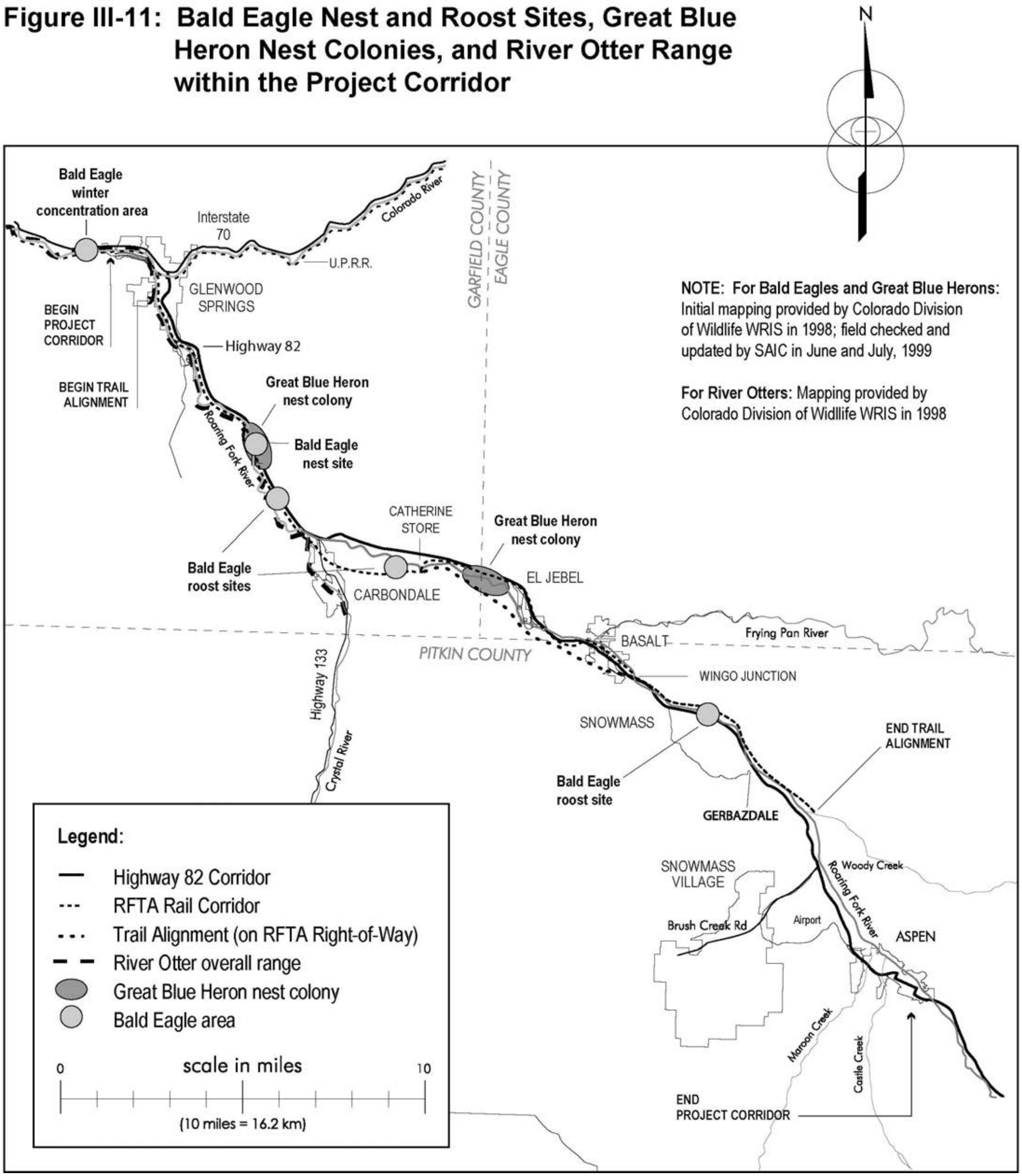
A bald eagle roost site is defined as "groups or individual trees that provide diurnal and/or nocturnal perches for less than 15 wintering bald eagles" (CDOW, 1998). Three bald eagle roost sites exist within the Project Corridor. One roost is near the confluence of Cattle Creek and the Roaring Fork River, the second is adjacent to the existing rail right-of-way south of Carbondale, and the third is along the Roaring Fork River south of Wheatley Gulch (CNHP, 1999; CDOW, 1998).

Mexican Spotted Owl. Mexican spotted owls occur in scattered areas from the Colorado Rockies and Utah, south to central Mexico (*Colorado Breeding Bird Atlas*, Kingery, 1998). In central Colorado, spotted owls occur in rocky canyons with tall conifers in the canyon bottom. In southwestern Colorado they occur in narrow slick rock canyons with piñon/juniper (*Pinus edulis/Juniperus osteosperma*) woodlands (Kingery, 1998). Currently, there are two confirmed nesting regions in Colorado – Mesa Verde National Park and the south central mountains, including the southern massif of Pikes Peak and the Wet Mountains (Kingery 1998). There is a 1903 record of a spotted owl in Snowmass, Colorado, but no occurrences have been documented since that time (*Birds of Colorado*, Bailey, 1965). Due to the absence of suitable habitat, no Mexican spotted owls are expected to occur within the Project Corridor.

Eskimo Curlew. There are currently no known populations of Eskimo curlew in Colorado (Letter, USFWS 2000). The last confirmed sighting of the Eskimo Curlew occurred in 1963 in Nebraska. The Project Corridor does not have suitable habitat for this species. No impacts are anticipated.

Southwestern Willow Flycatcher. The southwestern willow flycatcher is one of four valid subspecies of willow flycatcher (CNHP, 2000). This species nests in riparian willow shrub communities. According to (CNHP, 2000), the known range of this species in Colorado is within Baca, Dolores, Garfield, Gunnison, Hinsdale, and Yuma Counties. Although habitat for the species exists along the Roaring Fork River in the Project Corridor, no occurrences have been noted in the CNHP Natural Diversity Information Source internet data base (CNHP, 2002). The Project Corridor is considered outside the range of this endangered subspecies.

Figure III-11: Bald Eagle Nest and Roost Sites, Great Blue Heron Nest Colonies, and River Otter Range within the Project Corridor



Wolverine. In addition to its Federally Sensitive and State Endangered designations, the US Fish and Wildlife Service has recently been petitioned to list the wolverine as threatened or endangered. Wolverines have one of the lowest densities of any carnivore, and their occurrence in Colorado has never been very high (*Mammals of Colorado,* Fitzgerald et al, 1994). They have however, been documented as far south as southern Colorado (*The Scientific Basis for Conserving Forest Carnivores – American Martin, Fishes, Lynx and Wolverine in the Western United States,* RMFRES, 1994). Wolverines are generally restricted to sparsely populated wilderness areas in boreal forests, tundra, and similar habitats with year-round food supplies, in the western mountains (RMFRES, 1994). For these reasons, the probability of their occurrence within the Project Corridor is low.

Canada Lynx. The Canada lynx is listed as threatened under the Endangered Species Act, and as state-endangered in Colorado. Lynx occupy a northern range that includes most of Canada, portions of the northwest U.S., and the Rocky Mountain Range *(A Field Guide to the Mammals,* Burt and Grossenheider 1976*)*. Individual home ranges of lynx are highly dependent on its primary prey, the snowshoe hare (*Lepus americanus*). Lynx have large home ranges that typically encompass 15 to 21 square kilometers (six to eight square miles), but may be as large as 161 square kilometers (100 square miles). The preferred habitat of lynx is dense coniferous forests with intermittent shrub and sapling-dominated openings and coniferous swamps *(Furbearer Management Plan,* Leptich 1990*)*. This habitat preference coincides with the favored habitat of the snowshoe hare. In Colorado, lynx prefer dense spruce-fir forest that contains rock outcrops and large boulders *(*Fitzgerald et al., 1994*)*. Caves, rock crevices, overhanging banks or hollow logs are preferred sites for denning.

Lynx are generally found above 2,743 meters (9,000 feet) and are considered a wilderness species due to their requirements for extensive coniferous forest. Generally the lynx is not expected to occur in the Project Corridor due to the lack of suitable habitat for either the snowshoe hare or the lynx. The Project Corridor is located in close proximity to several Lynx Analysis Units as mapped by the U.S. Forest Service. Reintroduced individuals from 2000 with satellite collars have passed through the Project Corridor.

Black-footed Ferret. The black-footed ferret has co-evolved with black-tailed prairie dogs, and their ranges and habitats overlap closely in short and mid-grass prairie and semi-desert shrublands. Ferrets use black-tailed prairie dog colonies as a source of food and shelter. Presently, they are known to exist in remnant restored populations in Shirley Basin, Wyoming, and in captive breeding populations at various locations across the country. No prairie dogs were observed during wildlife investigations within the Project Corridor, and therefore presence of black-footed ferrets is unlikely. Since no impacts to black-tailed prairie dogs are anticipated, no surveys for black footed ferrets are required (USFWS, 2000).

Boreal Toad. The boreal toad is one of two subspecies of the western toad (*Bufo boreas*), and the southern Rocky Mountain population is geographically isolated from other boreal toad populations by inhospitable habitat to the north and west *(Amphibians and Reptiles of the Pacific Northwest,* Nussbaum et al*, 1983)*. Habitat preferences are not completely understood at this time and ongoing research is addressing this question. Currently, it is believed that boreal toads live near springs, streams, ponds, and lakes up to 3,615 meters (11,860 feet). Most populations occur between 2,438 meters to 3,353 meters (8,000 to 11,000 feet). Habitat types utilized include foothill woodlands, mountain meadows, moist subalpine forest, beaver ponds and marshes. Breeding occurs in large lakes, small puddles, slow moving portions of streams, and in marshy areas around beaver ponds.

Boreal toad populations have been declining in Colorado since the early 1980's and rapid declines have been documented since the mid-1980's [(Boreal Toad Recovery Team, 1998 (BTRT)]. The cause or causes of the decline are unclear. Alteration of habitat, flooding of small ponds from water impoundments, grazing, and recreation are not likely to benefit boreal toads, but are also not likely the causative agents for the decline (BTRT, 1998). Two current hypotheses for the decline of the boreal toad (and other amphibians) are stress-induced mortality caused by disease, and mortality related to a chytrid fungus (*Personal Communication*, Jones, 1999). Recently, a boreal toad occurrence was documented in the Northstar Preserve west of the Town of Aspen at an elevation of approximately 2,439 meters (8,005 feet) (*Personal Communication*, Lowsky, 1999). The Project Corridor lies within 1,737 meters (5,700 feet) and 2,347 meters (7,700 feet), generally below the altitudinal range of the boreal toad in Colorado.

Uncompahgre Fritillary Butterfly. This butterfly species is a Colorado endemic with a narrow range restricted to isolated alpine habitats in the San Juan Mountains of Southwestern Colorado. Unverified reports in the Sawatch Range could slightly expand the range (CNHP, 2000). Habitat of the Uncompahgre fritillary butterfly is above tree line in moist, rocky alpine tundra meadows (CNHP, 2000). No Uncompahgre fritillary butterfly habitat occurs within the Project Corridor.

Colorado Pikeminnow. The Colorado pikeminnow is an inhabitant of the Colorado River. Any projects that divert or utilize water from the Colorado River watershed could potentially affect this species. Since no water will be diverted from the Roaring Fork River or its tributaries related to this project, this species should not be affected.

Razorback Sucker. The razorback sucker is an inhabitant of the Colorado River. Any projects that divert or utilize water from the Colorado River watershed could potentially affect this species. Since no water will be diverted from the Roaring Fork River or its tributaries related to this project, this species should not be affected.

Humpback Chub. The humpback chub is an inhabitant of the Colorado River. Any projects that divert or utilize water from the Colorado River watershed could potentially affect this species. Since no water will be diverted from the Roaring Fork River or its tributaries related to this project, this species should not be impacted.

Bonytail Chub. The bonytail is an inhabitant of the Colorado River. Any projects that divert or utilize water from the Colorado River watershed could potentially affect this species. Since no water will be diverted from the Roaring Fork River or its tributaries related to this project, this species should not be affected.

Northern Goshawk. The federally sensitive (USFS) northern goshawk is a forest habitat generalist that preys on a variety of medium-sized forest animals. Despite its versatility, there are indications that populations are declining in some areas due to timber harvest *(Nevada Raptors, Herron et al., 1985)*. The home range of the northern goshawk contains three components: the nest stand, post-fledging family area (PFA), and the foraging area (*Management Recommendations for the Northern Goshawk*, Reynolds et al., 1992*)*. Nest stands in the Medicine Bow Mountains of Colorado are primarily within mature aspen stands greater than 8.09 hectares (20 acres) in extent and surrounded by coniferous forest *(Monitoring Aquatic Macroinvertebrates, Boreal Owls, Northern Goshawk,* Cavallaro, 1996*)*. The PFA surrounds the nest site and can be comprised of a variety of forest conditions. Recommendations for managing PFAs call for approximately 162 hectares (400 acres) of forest that exhibit a variety of vertical structural stages (Reynolds et al., 1992). The recommended

2,428 hectares (6,000 acre) foraging area (Reynolds et al., 1992) has similar conditions to that described for the PFA. However, foraging habitat is probably as much influenced by prey availability as forest structure *(Sustaining Forest Habitat for the Northern Goshawk,* Graham et al., 1994*).* In the western U.S., goshawks are known to nest in a variety of forest types and structures (Graham et al. 1994), but rarely below 2,133 meters (7,000 feet) (Johansson, 1994).

The Project Corridor ranges in elevation from 1,737 meters (5,700 feet) to 2,347 meters (7,700 feet). Based on elevation constraints (*Large-Area Goshawk Modeling,* Johansson 1994*)*, potential goshawk habitat may lie within the narrow gallery forest that extends from Basalt [approximately 2,042 meters (6,700 feet)] to the Pitkin County Airport [approximately 2,347 meters (7,700 feet)]. An active goshawk nest was located in the Christine State Wildlife Area in 1997, but was occupied by a Cooper's hawk *(Accipiter cooperii)* in 1998 (Lowsky, 1999). In general, the naturally isolated nature of the gallery forest along the river, combined with past and ongoing fragmentation associated with development, make the possibility of sustained goshawk occupancy unlikely.

A survey to determine the presence of nesting goshawks was conducted in June 1999 by staff of SAIC *(Roaring Fork Valley Field Analysis of Sensitive Wildlife Areas*, SAIC, 1999c*).* Surveyors broadcasted tapes of goshawk calls to elicit a response from nesting, roosting or foraging goshawks. Field protocol was an adaptation of the Kennedy and Stahlecker *(Journal of Wildlife Management*, 1993*)* method, which is widely used in the west. A 100 percent survey of the corridor between Basalt and the Pitkin County Airport did not elicit any goshawk responses.

Great Blue Heron. The great blue heron is listed as State 3 (S3) by the CNHP, which means that it is vulnerable throughout its range (CNHP 1999). In addition, great blue herons are a species of interest to local residents within the Roaring Fork Valley due to the presence of several nesting colonies (Figure III-11) (*Personal Communication,* Lofarro 1999).

Great blue herons occur across much of the United States but breeding occurs often only sporadically in much of their range. Herons consume mostly fish but are opportunistic, also feeding on amphibians and small mammals. Herons are solitary birds except during the breeding season. Breeding grounds include freshwater and brackish marshes, swamps, lakes, rivers, and mangroves. Group nesting colonies are composed of trees with the potential for the construction of nest platforms. Nests are typically found in the upper branches of dominant trees within riparian habitats and consist of interwoven sticks lined with twigs and leaves. If birds are undisturbed during nesting they will return to the same nest location year after year.

Great blue heron habitat exists within the Project Corridor along the Roaring Fork River. SAIC staff mapped two active nest colonies in June and July 1999 (SAIC 1999c). One site occurs near the confluence of Cattle Creek and the Roaring Fork River and contained four active nests in 1999.

The second site is on the Rock Bottom Ranch and had 22 active nests in 1999. This nest site has declined in the last few years; approximately six active nests remain in 2002. The original heronry was the result of local land owners' ditch work that created new river meanders and shallow waters for fisheries. As the water patterns have changed and the quality of the fisheries has been reduced, the number of nests has declined. (*Personal Communication*, Lofarro 2002).

Boreal Owl. In the southern Rockies, the federally sensitive (USFS) boreal owl occupies subalpine forest comprised of subalpine fir *(Abies lasiocarpa)* and Engelmann Spruce *(Picea engelmanni)* and transition forest within 100 meters (328 feet) of this elevation (*Habitat Selection, Movements and*

Activity of Boreal and Saw-Whet Owls, Palmer 1986). Boreal owls are secondary cavity nesters and nest in natural cavities or those excavated by woodpeckers (USFS, 1996). The red-backed voles *(Clethrionomys*) are an important prey genus in all boreal owl populations that have been studied (USFS, 1996). According to Palmer (1986) boreal owls in northern Colorado generally occur above 2623 meters (8,600 feet) and most occurrences were above 3050 meters (10,000 feet).

The Project Corridor within the Roaring Fork Valley ranges in elevation from 1,737 meters (5,700 feet) to 2,347 meters (7,700 feet). Due to the lack of suitable habitat within the project area, no boreal owls are expected to occur within the project area.

River Otter. The river otter *(Lutra canadensis)* is endangered in Colorado. No federal categories apply to this species. River otters occur throughout most of North America but are absent from large areas of the intermountain West due to the aridity of portions of Nevada and Utah. Otters inhabit aquatic and riparian habitats surrounding lakes, rivers, and streams. Home ranges often span 24 kilometers (15 miles) or more. Otters feed primarily in the water on fish, crayfish, frogs, and turtles (*Mammals of the Intermountain West, Zeveloff and Collett*, 1988). They travel on land frequently and may cover several kilometers between open water. River otter numbers have increased recently; however, variable river flows of many mountain rivers may prevent them from reaching high densities in this region. Within the Project Corridor, river otters are known to occupy the Roaring Fork River from the confluence with the Crystal River to the confluence with the Colorado River (Figure III-12) (CDOW, 1998).

Preble's Shrew. The Preble's shrew is listed by CNHP as S1-critically imperiled in the state because of extreme rarity. Only three locations are documented in Colorado (CNHP, 1999). A long-tailed shrew thought to be a Preble's shrew was trapped adjacent to but outside of the Project Corridor near Old Snowmass. Little is known about the natural history of the Preble's shrew except that it uses semi-arid shrublands, tundra, and sage openings within subalpine forest. The RFTA right-of-way near Old Snowmass does not pass through Preble's shrew shrubland habitat.

Colorado River Cutthroat Trout. The Colorado River cutthroat trout is listed as a species of special concern by the CDOW and is a federal sensitive species with the USFS, Rocky Mountain Region. This species was petitioned for listing as threatened or endangered under the ESA in 2000. The range of the Colorado River cutthroat trout encompasses all cool waters of the upper Colorado River drainage, including the Green, Yampa, Gunnison, Dolores, San Juan, Duchesne, (*Conservation Assessment for Inland Cutthroat Trout*, Duff, 1996). Cutthroat trout habitat includes small streams, beaver ponds, and lakes characterized by cold, clear running, well-oxygenated water. A cobble-gravel substrate is preferred with a good balance of pools and riffles along a somewhat steep stream gradient. Preferred pH values are between six and nine (*Personal Communication*, Sealing, 1995). Populations of this species have been drastically reduced, prompting its state listing. One of the greatest threats to Colorado River cutthroat trout is the introduction and subsequent spread of non-native trout species (Duff 1996). Brook trout often replace this species and hybridization with rainbow trout has created genetically impure populations.

Colorado River cutthroat trout inhabit the headwaters of the Roaring Fork River and its tributary waters. Many of the tributaries of the Roaring Fork contain cutthroat trout, but the stretch of river within the Project Corridor has typically not been considered as containing cutthroat trout.

Uinta Basin hookless cactus. This plant species inhabits rocky hills, mesas, and alluvial benches in desert shrub communities between elevations of 1,370 and 1,830 meters (4,500 and 6,000 feet). Its current known distribution in Colorado is central Garfield County south into Mesa, Montrose and Delta Counties (*Colorado Rare Plant Field Guide*, Spackman et al, 1997). Its known range does not occur within the Project Corridor and is unlikely to be affected by any construction activities.

Parachute penstemon. This plant species grows on sparsely vegetated, steep, white shale talus of the Parachute Creek member of the Green River Formation (Spackman et al, 1997). Its current known distribution is in Central Garfield County between elevations of 2,440 and 2,740 meters (8,000 and 9,000 feet). Its known range does not occur within the Project Corridor and is unlikely to be affected by any actions therein.

Debeque phacelia. This plant species is an annual found within an extremely narrow range on the border of Garfield and Mesa Counties (Spackman et al, 1997). Its known range does not occur within the Project Corridor and is unlikely to be affected by any activities therein.

11. Cultural Resources

Cultural resources can be both prehistoric and/or historic, and they may also be archaeological in nature. Archaeological resources consist of prehistoric and historical artifacts and features on or below the ground surface. Analysis of archaeological resources can provide valuable information about the heritage of local populations. Archaeological resources are non-renewable resources, which are afforded protection by federal, state, and local laws, ordinances, and guidelines.

The Antiquities Act of 1906 and the following federal legislation, policies, regulations, and guidelines have been enacted to protect cultural resources and have been considered during review of the proposed project. Significant properties are protected under Section 106 of the National Historic Preservation Act (NHPA) of 1966, as amended, Section 106 Compliance, 16 U.S.C. 470 et seq., and implementing regulations 36 CFR 800 and Section 4(f) of the U.S. Department of Transportation Act of 1966.

Prehistoric sites consist of the remains of artifacts and/or features representing a single or multiple events. Artifact materials can include bone, chipped stone and volcanic glass, metal, and perishable fiber and wood. Features are generally of stone, wood and earth. Historical resources are buildings, structures, features, objects, sites or districts that are older than 50 years.

11.1 Cultural Setting

11.1.1 Prehistoric Setting. Very little information is available about the prehistoric occupation of the Roaring Fork Valley and as a result, any framework of prehistoric activities in the area must be surmised from other archaeological investigations throughout western Colorado. Based on information from elsewhere it is known the human occupation of the Rocky Mountains extends back at least 12,000 years. These early inhabitants were big game hunters who tended to have a nomadic existence. This pattern continued until about 7,500 years ago and was known as the Paleo-Indian Stage. That stage was followed by the Archaic Stage which spans 7,500 to 1,800 years ago and has been divided into three periods: the Early, Middle and Late Archaic. Some archaeologists feel that during the Early Archaic Period (7,500 to 5,000 years ago) the Colorado Mountains served as a refuge for populations seeking to escape the prolonged dry conditions (Altithermal) that were sweeping across the lower elevations. Hunting and gathering continued as a way of life throughout the Archaic, however, by the Late Archaic Period new hunting technologies, primarily the bow and arrow, and the use of ceramics were becoming more widespread. Following the Archaic Period a number of cultures developed in the higher elevations of Colorado, including the Fremont and to the southwest, the Anasazi. Eventually, these people gave way to Shoshone speaking bands, the Ute, who maintained control of the region until the late 19th century when they were displaced by largely Euro-American miners, farmers, and ranchers. This brief overview was based on information found in McDonald 1993 and Zier 1993, two of the most recent studies undertaken in the Roaring Fork Valley area.

11.1.2 Historic Setting. The Euro-American history of the Roaring Fork Valley represents something of a microcosm of the major themes in western United States history. The earliest Euro-American incursions to the areas can be dated reliably to the 1830s when trappers and/or traders worked their way along the Roaring Fork and its tributaries searching for the elusive beaver. The following is adapted from *A Class III Cultural Resources Survey of the Roaring Fork Railroad Authority Environmental Impact Statement, Glenwood Springs to Brush Creek Transportation Corridor - Eagle, Garfield, and Pitkin Counties*, (Chambellan and Mehls, 2000a).

More intensive exploration of the area came after the Colorado Gold Rush of 1859. In 1860, Richard Sopris led an expedition of 14 adventurers into the Roaring Fork Valley. These men were seeking gold and, finding little, they made their way to the future site of Glenwood Springs.

Other prospectors also ventured into the region during the 1860s and early 1870s. Among those individuals were William Grant and Benjamin Graham (leading different parties). The Graham group first went to the Roaring Fork Valley in 1870, and by 1874 they established a prospecting camp at Rock Creek.

At approximately the same time, the Federal government sent explorers into the region. In 1873 the well-known Hayden surveys of Colorado began. The 1873 expedition included exploration of the central Rockies and Colorado (Grand) River Valley and its tributaries. The expedition led to detailed mapping of the Roaring Fork Valley, the Crystal River (Rock Creek), and Elk Mountains, among other accomplishments. As a result, both privately and publicly-supported explorers developed an understanding of the settlement potential of the Roaring Fork Valley. The key event in settlement of the area was the discovery of silver in the hills around Aspen. In 1878, charcoal burners at work in Sellars Meadow, near Basalt, began to notice outcroppings of the same ore that was making Leadville boom. This news led prospectors including Philip Pratt, Smith Steele, and William Hopkins to search the Roaring Fork Valley. Steele and Pratt made discoveries at the base of Aspen Mountain and set in motion a chain of events that led to the settlement of Aspen as a mining community and the Roaring Fork Valley as an area of farms and ranches to support the miners. Other groups soon joined the initial party at Aspen Mountain. By late summer of 1879 the miners founded a community, Ute City, at the base of the mountain. By the next year promoters such as B.C. Wheeler were actively involved in the new mining camp. Wheeler and his associates founded the Aspen Town and Land Co., successfully getting the name changed from Ute City to Aspen. Eventually, the mines of Aspen produced millions of dollars in silver and attracted many of Colorado's leading capitalists to the Roaring Fork Valley. Discoveries of silver led to Aspen's early growth, as well as the permanent agricultural settlement of the Roaring Fork Valley and its subsidiaries. The Panic of 1893 led to the closure of Aspen's silver mines and Roaring Fork Valley agriculturists were forced to seek new markets and new crops by the early 1900s. The mining boom at Aspen and the settlement of the Roaring Fork Valley led to the development of the Valley's transportation infrastructure.

Initial transport in the Roaring Fork Valley depended on animal power in comparatively low construction technologies, primarily trails, and wagon roads. During this same period, the 1880s, Aspen's primary route to the outside world was over Independence Pass, linking the area to the upper Arkansas Valley and Leadville. This route was tortuous at best and could be impassable for weeks at a time during heavy snows or extreme mud conditions during the spring runoff. These conditions resulted in attempts to improve the quality of the road and for others to seek alternative routes. B.C. Wheeler, one of the original founders of the Aspen Town Company, was key to early development of roads into the Aspen-Glenwood Springs area as discussed above. In 1882, Wheeler laid out a road between Aspen and Glenwood Springs and this route became the precursor of the current Project Corridor. In addition to Wheeler's efforts, Charles H. Harris became a toll road builder in the Roaring Fork Valley during the 1880s, building toll roads and connector routes between Aspen, the Valley, and other mining camps.

Road building moved to another level in 1883 when Pitkin County built the trail from Aspen to Emma. In 1885, Jerome B. Wheeler built a tollway from Aspen to Carbondale to haul coal. Thus, by the mid 1880s, the entire valley was inter-laced with a system of roads and trails. The last major road construction of the 19th century took place in 1891 when a road was built from Carbondale south to Marble. However, by that time railroads dominated the transportation network in the Valley.

Prosperity in the late 1800s also led to the building of two railroads into Aspen and through the Roaring Fork Valley – the Denver and Rio Grande (later the Denver and Rio Grande Western, D&RGW) and the Colorado Midland. These railroads prospered as long as Aspen's mines remained profitable, but by 1900 both companies were feeling financial strains as the local and Colorado economies adjusted to the new century and the lack of large incomes from precious metal mining. By the second decade of the 1900s the Colorado Midland went out of business and the D&RGW was forced into stringent economic measures. The Aspen Branch of the D&RGW remained active from the 1920s through the 1960s, but with only occasional service and the line ending at Woody Creek rather than Aspen. The Aspen Branch between Woody Creek and Aspen was eventually purchased by Pitkin County and is the location of the existing Rio Grande Trail. The remainder of the line was purchased in 1997 by the Roaring Fork Transportation Authority (RFTA), formerly known as the Roaring Fork Railroad Holding Authority.

The general decline in rail service through the Roaring Fork Valley during the first half of the 20th century is indicative of the general decline in the area's economy during the same period. For example, farming and ranching continued, but with much greater dependence on the whims of national marketplaces, and thus with a smaller profit margin than had been enjoyed earlier. This pattern continued until World War II. Wartime needs led to higher market prices, and a general prosperity. After the war the Aspen area became a well-known destination ski resort and cultural center for music, humanities and the arts. By the 1950s and 1960s the ski industry was well entrenched in Aspen and tourism became the economic mainstay for the community.

Farming and ranching in the rest of the Roaring Fork Valley continued after the war with variable results. However, by the 1970s a trend began that has accelerated to the present. That trend is to take ranching farmland out of agricultural production and turn it into ranchettes, summer homes, and year-round homes for individuals who want to be part of resort communities. At the other end of the economic spectrum lands have been developed into mobile home parks, apartments, and other low-cost housing for the service workers that support the tourism industry.

11.2 Cultural Resources in the Roaring Fork Valley

11.2.1 Studies Conducted within the Project Corridor. In addition to the current CIS, four environmental impact statements (EISs) have been conducted in portions of the Project Corridor *Carbondale East: Draft Environmental Impact Statement* (FHWA 1981), *State Highway 82 East of Basalt to Aspen: Draft Environmental Impact Statement/4(f) Evaluation* (FHWA, 1989), *Basalt to Buttermilk FEIS* (FHWA, 1993), *Entrance to Aspen FEIS, Section 4(f) Evaluation* (FHWA, 1997). All four were related to Highway 82 and were instigated by the CDOH/CDOT. Numerous additional surveys have been conducted over the years by various private sector individuals and corporations.

The current Project Corridor was inventoried by Western Cultural Resources Management, Inc. (WCRM). A Class III Cultural Resources Survey of the Project Corridor (Chambellan and Mehls 2000a), was conducted in 1998 and published in 2000. A 66.5 kilometer (41.3 mile) Project Corridor was surveyed, extending from the West Glenwood Springs Interchange south along the D&RGW right-of-way to Brush Creek Road. The survey corridor was 24 - 30 meters (80-100 feet) wide. Twenty-two new historic resources were recorded during the course of the pedestrian survey.

Due to a proposal to extend this project past the Entrance to Aspen LRT terminus, a literature search was also conducted at the Office of Archaeology and Historic Preservation (OAHP) by Collette Chambellan on August 25, 1999. This was for an area within the town of Aspen along Main Street between Monarch and Hunter Streets. During the search, it was found that this area of Main Street falls within the Aspen Commercial Historic District (5PT113), a certified local historic district. This district became a National Park Service Certified District in 1984 and is considered eligible to the NRHP. A second Class III survey was also conducted, *A Historic Resources Survey of the Lower River Road in Pitkin County, Colorado* (Chambellan and Mehls 2000b). This included a survey of approximately 0.8 hectares (two acres), and the recording of secondary impacts to several historic standing structures for the Lower River Road temporary detour. This detour was in conjunction with the widening of Highway 82 under another project. Six previously recorded historic sites were re-evaluated, including the Wheatley School (5PT57), a segment of the D&RGW Railroad (5PT123.2), the A. B. Foster Ranch (5PT471), a segment of the Aspen-Basalt Stage Road (5PT504), the Phillips Residence (5PT864), and the Wheatley Homestead (5PT867).

Pitkin County contracted Front Range Research Associates, Inc. to complete an *Inventory Update: Historic Resources Survey Pitkin County, Colorado 1999-2000* (Simmons and Simmons, 2000). Due to the nature of this update and its funding, eligibility determinations were not officially reviewed by the OAHP. However, the updated survey data is pertinent to the current project.

As a result of coordination with the OAHP, the resource information for the Denver and Rio Grande Western Railroad was re-sorted by county and features are listed with each county's site number. Features designated as bridges or trestles have been given their own site numbers as contributing features to the railroad segment in which they are located. Site forms and re-evaluation forms were compiled by Western Cultural Resource Management in 2002.

11.2.2 Forty-four Project Corridor Sites. As the result of various surveys and studies performed for associated projects by CDOT, WCRM, Pitkin County and others, 44 sites have been identified in the general Project Corridor. These sites may or may not be in the Area of Potential Effect (APE). The following discussion presents a definition of the APE, the discernment of sites located within the APE, and the eligibility status of these sites.

11.3 Resources within Area of Potential Effect (APE)

11.3.1 APE Definition. An Area of Potential Effect is not based on the knowledge that any cultural resources exist within the area, but rather an area where the project may cause changes to land or structures, or to their uses, whether beneficial or adverse, direct or indirect. For the current project, the APE has been defined as generally 30 meters (100 feet) on either side of RFTA or Highway 82 right-of-way. The following barriers may modify this definition: Roaring Fork River, the railroad grade, Highway 82 roadway or associated roadways. The project will not result in any permanent disturbance beyond Highway 82 or RFTA right-of-way. Noise and vibrational impacts may affect some resources.

No known historic resources have been reported within conceptual new station locations. Potential resources in proximity to conceptual station locations are noted in a brief discussion at the end of this section.

11.3.2 Sixteen Sites Outside of APE. Of the 44 sites identified, 16 have been determined to be outside the APE based on the definition noted above. The sites noted in Table III-33 have been determined to be outside the APE. These sites will not undergo further discussion in this document.

Table III-33
Cultural Resource Sites Outside the Area of Potential Effect

Site Number	Site Name/Location	NRHP Status
5GF398	Log House	Not Evaluated
5GF469/5PT324	Jerome Park Branch/Colorado Midland Railroad	Officially Eligible
5GF1356	Old Town Jail (S. 2nd & Main - Moved to 8th and Highway 133, Carbondale)	Not Evaluated
5GF2363	Sumers Lodge (1200 Mountain Dr., Glenwood Springs)	Listed
5EA56	Prehistoric Lithic Scatter	Not Evaluated
5EA58	Prehistoric Lithic Scatter	Not Evaluated
5EA64	Wagon Road	Not Evaluated
5EA659	Hook's Crossing (Bridge)	Not Evaluated
5EA660	Basalt- Town of	Not Evaluated
5PT475	Roadhouse on Aspen-Basalt Stage Road	Officially Not Eligible
5PT503.1	Woody Creek Toll Road	Officially Not Eligible
5PT617.1	Walthen Ditch	Officially Eligible
5PT617.2	Walthen Ditch Lateral	Officially Not Eligible
5PT822	Swan's Snowmass Cottages/Emma Bradshaw Ranch (26801 Highway 82, Snowmass)	Not Evaluated
5PT823	Emma Bradshaw Property (26625 Highway 82, Snowmass)	Not Eligible
5PT500	Rathbone, Town of - exact location unknown, NE of Aspen Airport - no standing structures	Not Evaluated

11.3.3 Twenty-eight Sites within the APE. Of the 44 sites identified, 28 have been determined to be within the APE for this project. Table III-34 lists sites located within the APE as well as their eligibility status.

Table III-34
Cultural Resource Sites within the Project Area of Potential Effect

Site Number	Site Name/Location	NRHP Status
5EA198/5GF1661/ 5PT123	D&RGW Railroad	Officially Eligible
5GF1167	Hardwick Bridge	Officially Eligible
5GF1282	Satank Bridge	Listed
5GF1457	Glenwood Ditch	Officially Not Eligible
5GF2129	White River Natl. Forest Supervisor's Warehouse (1101 School Street, Glenwood Springs	Officially Not Eligible
5GF2698	Railroad Support Facilities Ruin	Officially Not Eligible
5GF2818	Sanders Ranch	Officially Not Eligible
5PT27	Emma School	Officially Eligible
5PT57	Wheatley School	Officially Eligible
5PT113	Aspen Commercial Historic District (Certified Local Historic District)	Listed
5PT323	Emma Historic District	Officially Eligible
5PT471	A.B. Foster Ranch	Officially Eligible
5PT472	Ten Mile Stage Station	Officially Not Eligible
5PT474	Woody Creek School	Officially Not Eligible
5PT476	Woody Creek RR Siding	Officially Not Eligible
5PT477	Watson's Siding; Farmer's Alliance Hall	Officially Not Eligible
5PT504	Aspen to Basalt Stage Road	Officially Not Eligible
5PT542	Colorado Midland Railroad	Officially Eligible
5PT594.1	Segment of Alexis-Arbany Ditch	Officially Not Eligible
5PT612	Three Stone Cairns/ Magazines	Officially Not Eligible
5PT630	Potato Cellar	Officially Not Eligible
5PT632.1	Grace An Shehi Ditch	Officially Not Eligible
5PT787	Philip/Ould/Gerbaz Ranch (1776 Emma Road, Basalt)	Officially Not Eligible
5PT792	Mather Residence (Emma Road, Basalt)	Officially Eligible
5PT851	Wingo Trestle; Bridge 384A (Hwy 82 and Hoaglund Ranch Road)	Officially Eligible
5PT864	Phillips Residence / Joseph Diemoz Homestead-3558 Lower River Rd, Snowmass	Officially Not Eligible
5PT875	Cozy Point Ranch / True Smith Homestead (34700 Highway 82, Snowmass)	Officially Not Eligible
5PT876	Aspen Valley Vet Hospital / Orest A. Gerbaz Residence (30875 Highway 82, Snowmass)	Officially Not Eligible

An abbreviated description of each resource located within the APE is as follows:

Denver and Rio Grande Western Railroad (5EA198/5GF1661/5PT123). The D&RGW railroad has been recorded in all three counties. The Eagle County segment was originally recorded by Fredric Athearn of the BLM in 1971 (Athearn, 1994). It was reevaluated by Metcalf Archaeological Consultants (*Holland Hills to Old Snowmass Trail T8S,R86W, Section 21, Pitkin County, Colorado Class III Cultural Resource Inventory,* Spath, 1993) and determined eligible in 1994. Kim Gambrill of the CDOH recorded the railroad in Garfield County. This segment was not evaluated with regard to the NRHP. The Pitkin County portion of the railroad was originally recorded by Sally Pearce of the CDOH (1989) during the Basalt to Aspen Project. This segment was determined eligible in 1988. The D&RGW was re-evaluated by WCRM (Chambellan and Mehls, 2000a) and 226 features were recorded within the Project Corridor.

As a result of coordination with the OAHP, re-evaluation site forms have been completed for each county's railroad segment within the Project Corridor. Features have been listed as associated with the appropriate segment. Individual site numbers have been given to bridges and trestles associated with the D&RGW Railroad as contributing elements. A total of five additional bridges or trestles have been evaluated, and their sites are summarized in Table III-35 and in text below. Concurrence on the eligibility status of these bridges was requested and received from the State Historic Preservation Officer (SHPO) in January, 2003. Irrigation ditches that parallel the corridor have been deleted from the list of features. Structures that carry irrigation ditches under the railroad have been retained as railroad features.

Table III-35
Contributing Sites to the D&RGW Railroad

D&RGW RR Segment	Features	Bridges and Trestles
Garfield County: 5GF1661	F-1 to F-137	5GF3005 (F-9) 5GF3006 (F-14) 5GF3011 (F-63) 5GF3012 (F-87)
Eagle County: 5EA198	F-138 to F-156	
Pitkin County: 5PT123	F-157 to F-226	5PT1084 (F-158)

- **5GF3005, Bridge.** The bridge was recorded as Feature 9 of the D&RGW (5EA198/ 5GF5GF1661/5PT123) by WCRM (March 24, 2000). This is a four-span steel-beam railroad bridge over the Roaring Fork River near downtown Glenwood Springs. Its estimated date of construction is sometime after 1890, when the narrow-gauge railroad converted to standard gauge. The bridge was build as part of the D&RGW RR, Aspen Branch line. Although the bridge lacks the engineering qualities to be considered eligible to the NRHP, it is officially eligible under Criterion A for its association with the railroad.

- **5GF3006, Bridge.** The bridge was recorded as Feature 14 of the D&RGW (5EA198/ 5GF5GF1661/5PT123) by WCRM (March 24, 2000). This is a single-span steel-beam railroad bridge over West 7th Avenue in downtown Glenwood Springs. The bridge is officially eligible to the NRHP under Criterion A for its association with the railroad.

- **5GF3011,Trestle.** The trestle was recorded as Feature 63 of the D&RGW (5EA198/ 5GF5GF1661/5PT123) by WCRM (March 24, 2000). This is a framed, bent wooden railroad trestle over Cattle Creek, built sometime after 1890. The bridge is officially eligible to the NRHP under Criterion A for its association with the railroad.

- **5GF3012, Bridge.** The bridge was recorded as Feature 87 of the D&RGW (5EA198/ 5GF5GF1661/5PT123) by WCRM (March 24, 2000). This single-span Pratt Truss-deck bridge, with trestle approaches at both ends was built sometime after 1890, and is located just outside of Carbondale. The bridge is officially eligible to the NRHP under Criterion A for its association with the railroad.

- **5PT1084, Trestle.** The trestle was recorded as Feature 158 of the D&RGW (5EA198/ 5GF5GF1661/5PT123) by WCRM (March 24,2000). This structure, built sometime after 1890, is a pile-bent wooden trestle of three bents that crosses over Sopris Creek. The bridge is officially eligible to the NRHP under Criterion A for its association with the railroad.

Hardwick Bridge (5GF1167). The bridge and one acre surrounding it were surveyed in 1983 by Rebecca Herbst of the Colorado Department of Highways. The original (no date given) structure was destroyed when an excessive number of cattle were driven over it. Subsequently, a new bridge was constructed by the Monarch Engineering Company in 1923 to serve as a vehicular bridge. It is one of the earliest constructed rigid Pratt through truss bridges; however, it was not evaluated as significant because this construction style was not unique. The bridge was determined not eligible on November 15, 1983. It has since been re-evaluated by Fraser Design in 2000 as part of the Colorado Bridge Survey and is officially eligible.

Satank Bridge (5GF1282). This bridge was recorded by Clayton Fraser and Susan Cason of Fraser Design during a survey of Colorado bridges conducted by the Colorado Department of Highways (1983). The timber/steel Pratt through truss bridge was constructed by the Pueblo Bridge Company in 1900. It is one of the older roadway trusses in Colorado and the only remaining timber Pratt through truss in public use in the state. It was listed on the NRHP on February 4, 1985 and represents a significant vehicular bridge of the late 19th and early 20th centuries.

Glenwood Ditch (5GF1457). The Glenwood Ditch was recorded by Bill Kight of the BLM in 1988 during a Class III survey of the four-hectare (one acre) Kinlaw Right-of-Way. It was avoided by the right-of-way, and a determination of eligibility was not made. The purpose of the ditch was to supply water to the town of Glenwood Springs. Construction on the ditch began on November 18, 1900, and the ditch was filed on March 7, 1901. It was 1.8 meters wide (six feet) wide at the bottom and 2.4 meters (eight feet) wide at the high water mark and had a depth of .six meters (two feet). Due to modern impacts, abandonment, and poor physical integrity, this resource was found officially not eligible in 2001.

White River Supervisor's Warehouse (5GF2129). This building is the White River National Forest's Supervisor's Warehouse. It is located at 1101 School Street in Glenwood Springs, Colorado. It is a one-story structure, rectangular in plan view with a hipped roof, dormer, and chimney. The original architect was the United States Army and dates of use are between 1948 and 1951. The building has been moved and is currently used for storage. It was recorded by the National Park Service in 1993 and officially not eligible.

Railroad Support Facilities Ruin (5GF2698). This site was recorded by WCRM (Chambellan and Mehls 2000a) during a survey for the current Rail Corridor CIS. The site contains building vestiges and other constructed features, pits, depressions, waste piles, an excavated feature, and a debris scatter. The feature and debris are distributed across the top of the stream terrace. Features include three masonry building vestiges, six constructed features, five depressions or pits, three waste byproduct dumps, the remains of a coal stockpile and a filled trench. Debris on the site include glass, metal, food cans, wood, and some leather items. It was found officially not eligible, lacking architectural and archaeological integrity.

Sanders Ranch (5GF2818). The main house is in poor condition overall and has undergone some apparent alterations. This ranch complex and the surrounding lands are significant for their association with the history of the settlement and development of farming and ranching within the Roaring Fork Valley. As a cultural landscape, the property is representative of, and associated with, the farming and ranching activities that have continued unabated in this area since the early 1880s.

The structures that comprise the Sanders Ranch, with the exception of the main house, are less than 50 years old. While the complex may be of local or state-wide significance, in its entirety, it lacks the necessary integrity of location, materials, and association that would make the property eligible for inclusion in the NRHP. This resource was officially determined not eligible in 2001.

Emma School (5PT27). This one-story rectangular frame school was originally noted in the OAHP files in 1977; no evaluation was made. It is estimated that the building was constructed sometime around 1900 and served as a focus of community events for local ranching families. It is associated with the history of education in the rural communities of Colorado and represents rural schools of the early 20th century. It has been re-evaluated in the 1999-2000 Pitkin County Historic Buildings Survey as eligible to the NRHP. The SHPO concurred with this finding and determined that the school was officially eligible in 2003.

Wheatley School (5PT57). Originally, the school was a one-room schoolhouse built of brick before 1920. Its dimensions are 7.3 meters by 4.8 meters (24 feet by 16 feet). It is currently used as a residence and has been substantially modified. The school was originally recorded by Dykeman (1974) and was subsequently reevaluated by Metcalf Archaeological Consultants (MAC) in 1996 during a survey for the Holy Cross Basalt to Aspen 115kV Rebuild Project and WCRM (Chambellan and Mehls 2000b) during the historic resources survey of the Lower River Road detour. Both MAC and WCRM concurred with the original official determination of not eligible in 1988. In 2000 the Wheatley School was reevaluated by a Pitkin County Historic Buildings Survey. Pitkin County recommended the school as potentially eligible for its association with a multiple property submission for rural schools, although alterations have compromised its integrity. This property was determined officially eligible to the NRHP in 2001.

Aspen Commercial Core Historic District (5PT113). The district was originally recorded in 1980 by the Pitkin County Planning and Zoning Office. It consists of a number of buildings located within the zone defined by Durant Avenue on the south, Hunter Street on the East, Main Street on the north, and Monarch Street on the west. At the time of the *Entrance to Aspen FEIS* and *ROD*, this district was inadvertently listed as a local district only. This district became a National Park Service Certified District in 1984 and is considered eligible to the NRHP. It is within the APE for this project.

Emma Historic District (5PT323). Emma was established as a railroad section stop and was reportedly named after Mrs. Emma Robinson Shehi, who cooked for railroad crews. Charles Mather was a postmaster at Emma who also operated a successful general store. The district was recorded by the Department of Highways in 1976 and officially determined eligible in 1977. It consists of the Mather Buildings, mercantile stores, a warehouse, residences, and outbuildings.

A. B. Foster Ranch (5PT471). Arthur Bertram Foster settled on the land that was to become his ranch in 1882. The house was built in 1887 when railroads were introduced into the Roaring Fork Valley. After living there for 12 years, he sold the ranch to Jeremie J. Gerbaz, an immigrant from Italy. Besides ranching activities, Gerbaz was politically active serving as a school board member, constable and Pitkin County Commissioner. He died in 1947 and his sons took over operation of the ranch until it was sold in 1955. The house is significant for its association with Arthur B. Foster and Jeremie J. Gerbaz, two pioneer ranchers and influential citizens of Pitkin County. It is also a well preserved example of the late Victorian architecture popular among successful ranchers in the Roaring Fork Valley. It was officially determined eligible in 1988. A subsequent reevaluation of the ranch was conducted by WCRM (Chambellan and Mehls 2000b) during the Lower River Road detour study and again with the Pitkin County Historic Buildings Survey of 1999-2000. The recent evaluations concur with the existing eligibility determination.

Ten Mile State Station (5PT472). This station was reported by Ruth L. Mularz of Aspen; however, it was never officially recorded. It was built in the 1880s by A.B. Foster who also ran it, and it was torn down after 1887 with the arrival of the railroad line. The Colorado SHPO determined the station not eligible in July of 1988.

Woody Creek School (5PT474). The school was noted by Ruth L. Mularz of Aspen and like 5PT472, was never officially recorded. It was built in the 1880s and used until 1947. The Colorado SHPO determined the school not eligible in 1988. Re-evaluation of this site in 2002 by WCRM revealed that the schoolhouse no longer exists.

Woody Creek Railroad Siding (5PT476). The siding was originally reported by Ruth L. Mularz of Aspen, but was not officially recorded. It is likely the siding was utilized from 1887 to the mid-20th century during the operating period of the D&RGW. Re-evaluation by MAC (Spath et. al. 1996) found the integrity of the site to be poor. The water tank, the central focus of the site, had been removed and all that remained was scattered railroad debris. It was officially determined not eligible to the NRHP in 1988. WCRM re-evaluated this property in 2000 and the eligibility status has not changed.

Watson's Siding/Farmer's Alliance Hall (5PT477). This site was recorded by MAC (Spath et. al. 1996:13) and was the original location of the Farmers' Alliance Hall at the Colorado Midland Railroad Siding of Watson. The hall was built in 1891; however, the exact location of the original building is unknown. It likely existed from 1891 to 1960, the date of the original site inventory form. No evidence of a structure could be found by MAC. Materials found on the surface consisted of historically late railroad-related debris. The hall was officially determined not eligible in 1988.

Aspen to Basalt Stage Road (5PT504). The stage road was reported by Ruth L. Mularz of Aspen; however, it was never recorded. It was used from 1880/1881 to 1887 when the railroad arrived. The site was determined not eligible in 1988. This property was reevaluated in 2000 by WCRM and continues to be considered ineligible for the NRHP.

Colorado Midland Railroad (5PT542). The Colorado Midland Railroad was recorded by the Colorado Department of Highways (1989) for an EIS. Proposed construction involved the widening of the highway to four lanes for a 27.3 kilometer (17 mile) segment between Basalt and Aspen. The grade occupies the current route of Highway 82 and was built in 1883. It was determined eligible in 1988; it was the first standard gauge railroad to penetrate the Rockies, it was associated with Jerome Wheeler, and it was associated with early railroad history in Colorado. The Highway 82 Entrance to Aspen Preferred Alternative will take 0.23 hectares (0.57 acres). The SHPO determined No Adverse Effect for the site for the previous Highway 82 Entrance to Aspen LRT project.

Segment of the Alexis-Arbaney Ditch (5PT594.1). The ditch was recorded by MAC on the north side of the Roaring Fork River (Spath et al. 1996) and was officially determined not eligible in 1993. It has been used from 1897 to the present and varies from .6 to 1.5 meters (two to five feet) in width. This ditch does not cross under the D&RGW RR (RFTA right-of-way). Re-evaluation by WCRM in 2002 was not possible due to lack of access onto private property. The original finding of ineligibility continues to apply to this site.

Three Stone Cairns/Magazines (5PT612). The cairns were recorded in 1996 by MAC during a Class III inventory for the Holy Cross Basalt to Aspen 115kV Rebuild Project. They are located along the base of a south-facing hill slope on a flat terrace above the Roaring Fork River. They are circular and approximately two meters high. Materials include course rounded lichen covered boulders of granite and red sandstone. The cultural affiliation and age of the cairns could not be determined. The site was officially determined not eligible by the Colorado SHPO in 1997.

Potato Cellar (5PT630). The cellar was recorded by MAC (Spath, 1996) measuring 7.6 by 4.6 meters (25 by 15 feet). The pole and timber portion of the building had collapsed, leaving the concrete façade in place. It is a common type of structure built in the 1940s and 1950s. It was officially determined not eligible on December 19, 1996.

Segment of the Grace An Shehi Ditch (5PT632.1). This segment of the ditch was recorded by MAC (Spath, 1996) during a Class III inventory of the Roaring Fork Club South Planned Development. The channel is about 2.5 meters wide and one meter deep (8.2 feet wide and 3.2 feet deep). The first appropriation for the ditch was filed in April of 1886, and it subsequently played an important role in the development of this portion of the Roaring Fork Valley. However, this segment was officially determined not eligible in 1996.

Philip/Ould/Gerbaz Ranch (5PT787). This resource consists of a main house and associated agricultural buildings including a garage, sheds, a metal shop, a chicken coop, a blacksmith shop and a grave. Some modifications have occurred over time. A barn, school and potato cellar have been torn down and a Tuff Shed was added in 1987. Research by the current owners found that at the time of the 1910 Census the family of W. D. Philip lived on the property. The original house was located by the creek and possibly used in the past as a chicken coop. A subsequent owner, Ould, also lived at the site before 1920. After 1920, the son of Ernest Gerbaz, Orest E. Gerbaz, lived in the house and farmed the land. He sold the house to the current owners, John and Elizabeth Gredig. The ranch was recorded and evaluated during a survey of historic buildings by Pitkin County in 1999. Although the ranch is associated with the history of agriculture in Pitkin County, it has been altered by the removal of some historic outbuildings and structural modifications. Pitkin County recommended the ranch field not eligible for inclusion in the NRHP. The SHPO concurred with this finding in 2003.

Mather Residence (5PT792). The Mather house is a two-story painted brick building constructed in 1898 by Charles H. Mather. Mather was the second man to become the Emma postmaster. He also operated a general store and was a businessman associated with the history of Emma and the settlement of Pitkin County. The house is one of the more architecturally sophisticated 19th century buildings in the area. It was recorded and evaluated by the Historic Buildings Survey sponsored by Pitkin County from 1999-2000. The Mather Residence was determined officially eligible in 2003. Note: the Mather Residence is included in the Emma Historic District (5PT323).

Wingo Trestle (Bridge 384A - 5PT851). The Wingo Trestle is a deck truss 77 meter (222-foot) railroad bridge carrying one standard gauge track across the Roaring Fork River. The D&RGW constructed the Aspen Branch in 1887, and the current bridge was installed in 1917. The bridge was fabricated from parts of structures originally located on other parts of the D&RGW system. The bridge was recorded as Feature 178 of the D&RGW (5EA198/5GF5GF1661/5PT123) by WCRM (Chambellan and Mehls 2000a) for the current CIS. It was subsequently recorded and evaluated as a site by the Historic Buildings Survey sponsored by Pitkin County in 2000. As part of the D&RGW system, which was determined eligible in 1988, the trestle is a contributing element. Pitkin County recommended that the bridge is eligible for inclusion in the NRHP. The SHPO concurred in this finding in May 2002.

Phillips Residence / Joseph Diemoz Homestead (5PT864). This historic structure is a large log house, which has been built in several phases and has associated outbuildings. Its estimated construction date is the 1930s. The original house was one story and an addition to the rear is two stories. A series of bottles has been incorporated into the wall mortar that separates the first and second stories of this addition. Outbuildings include three large and two small sheds. This property was homesteaded by Joseph Diemoz, who filed his application in 1914. The homestead was subsequently purchased by Ellamae and Concer Phillips, who added on to the cabin several times. It was Ms. Phillips' idea to use bottles in the wall in place of glass blocks. The house is representative of the log construction popular in Colorado during this time period. It is neither unique nor associated with significant individuals in history. The homestead was recorded as a part of the 1999-2000 Pitkin County Historic Buildings Survey and was re-evaluated by WCRM as a part of a historic resources survey for the Lower River Road detour in 2000 (Chambellan and Mehls 2000b). Both Pitkin County and WCRM recommended the site as not eligible. The SHPO concurred with these findings in 2003.

Cozy Point Ranch/True Smith Homestead (5PT875). This complex includes two historic frame houses and a historic barn and a modern arena with stalls, sheds, and outbuildings. The houses have been extensively altered, while the barn has only been slightly modified. The land was homesteaded by True A. Smith who settled it in 1885. One house is estimated to have been built around 1900, while the other was most likely constructed in the 1930s. Because the railroad stop at Shale Bluffs nearby was called "Cozy Point," the ranch was also known as the Cozy Point Ranch. The homestead was recorded and evaluated by the Historic Buildings Survey sponsored by Pitkin County from 1999 to 2000. The barn is the only historic structure on the homestead/ranch with any historic integrity. As a result, this cultural resource was recommended not eligible for inclusion in the NRHP. The SHPO concurred with these findings and determined that the site was officially not eligible in 2003.

Aspen Valley Vet Hospital/Orest A. Gerbaz Residence (5PT876). This resource consists of a one and one-half story rectangular frame structure built in 1932 by Orest A. Gerbaz. The property was homesteaded by Harvey W. Boyce in 1885 and subsequently purchased by Gerbaz. Although the Pioneer Farmers' Sub Alliance Hall/Watson Hall/Gerbazdale Hall had been originally located on the property, the building was split into two sections and moved in 1965. The homestead was recorded and evaluated by the Historic Buildings Survey sponsored by Pitkin County from 1999 to 2000. The house is a bungalow style commonly used at the time of its construction. The resource is not unique and is not associated with significant events and individuals. Pitkin County recommended this site as not eligible to the NRHP in its 1999-2000 survey. The SHPO concurred with this finding and determined that the site was officially not eligible in 2003.

Miscellaneous Archaeological Resources. During October of 1998, WCRM conducted an intensive pedestrian inventory of approximately 19.4 hectares (48 acres). The project area was defined by a corridor of 24 to 30 meters (80 to 100 feet) wide and 66.5 kilometers (41.3 miles) in length along either side of the existing D&RGW railroad tracks and extending west of Glenwood Springs to approximately 4.8 kilometers (three miles) northwest of Aspen. No prehistoric cultural resources were recorded. This inventory recorded three historic period archaeological sites (5EA1560, 5GF2698, 5PT710); however, none were deemed to be significant or eligible for inclusion in the NRHP. Fifteen isolated historical artifacts were recorded during the survey and are considered archaeological in nature (Chambellan and Mehls, 2000a). Isolated finds, by definition, are not considered eligible to the NRHP.

11.3.4 Historic Resources Located in Close Proximity to the Proposed Station Locations. No known historic resources have been reported within the proposed station locations. Class 1 file searches have been completed and updated for the station locations. These searches revealed that historic resources have not been previously recorded at the proposed station locations. Since no resources are located within the station footprints, no further work is necessary. A Class III pedestrian survey of the station locations will need to be completed prior to completion of design plans for stations.

11.3.5 Native American Consultation. As mandated by Section 106 of the National Historic Preservation Act (as amended) and the revised Advisory Council on Historic Preservation regulations (36 CFR 800), in October 2002 four federally recognized Native American tribes with an established interest in Eagle, Garfield, and/or Pitkin Counties were notified of the project and invited to participate in cultural resources consultation. The tribes contacted included the Ute Mountain Ute Tribe, Southern Ute Indian Tribe, Ute Tribe of the Uintah and Ouray Agency (often known as the Northern Ute Tribe), and the White Mesa Ute Tribe.

Consultation with Native American tribes recognizes the government-to-government relationship between the federal government and tribal groups, and federal agencies must be sensitive to the fact 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.

The Southern Ute and Northern Ute Tribes indicated via U.S. Mail their desire to be considered consulting parties for the project under the terms and conditions set forth in Section 106 of the NHPA. See Appendix A for more information.

12. Paleontological Resources

A review of the paleontological resource potential in the Project Corridor was conducted as part of this document preparation. The potential for paleontological resources is subjectively determined by

1. the presence of fossil material recorded in the literature for this area,
2. the presence of fossils elsewhere within a stratigraphic unit mapped or recorded as present within the project area, and
3. the favorability of a stratigraphic unit to contain fossil material based on its assumed depositional environment.

The geologic maps of the Project Corridor show the route primarily runs through various Quaternary alluvial deposits. It also crosses sedimentary rocks of the Paleozoic, Eagle Valley Evaporite, Eagle Valley and Maroon Formations, late Paleozoic and early Mesozoic State Bridge Formation, and additionally the Mesozoic Chinle Formation, Morrison Formation, Burro Canyon Formation, Dakota Sandstone, Mancos Shale, and some exposures of questionable unnamed Miocene sedimentary deposits.

The significance of an area or resource is subjectively judged on the following criteria:

1. the kind of fossil material (all vertebrate fossils are said to have significance),
2. the uniqueness of the resource (the type area of a particular species), and
3. an assemblage of fossils which have particular value due to their joint presence.

These several factors, taken separately or in concert, determine if any area will be “sensitive” to planned disturbance, and if so, what can be done to mitigate that sensitivity.

In addition to a literature search at the Colorado School of Mines Library and a search of the collections at the Denver Museum of Natural History, a pedestrian survey of the proposed routes was completed.

Only two fossil localities were identified within the Project Corridor. The first is a Pennsylvanian-aged paleobotanical resource on the U.S. Geological Survey Cattle Creek 7.5 foot quadrangle. It consists of a poorly-preserved plant stem impression of Calamites and its significance should be rated as low. The second paleontological resource was located on the U.S. Geological Survey Woody Creek 7.5 foot quadrangle. There were several poorly-preserved plant stem casts and impressions with carbonaceous residue in the Cretaceous aged Dakota Sandstone and its significance should be rated as low. The coarse-grained nature of the Dakota Sandstone in this area indicates low potential for significant terrestrial paleobotanical resources.

13. Section 4(f) and 6(f) Resources

Section 4(f) of the US Department of Transportation (DOT) Act (49 U.S.C. Section 303) permits the use of land for a transportation project from a significant publicly-owned park, recreational area, wildlife or waterfowl refuge, or any significant historic site only when it has been determined that:

1. There is no feasible and prudent alternative to using that land, and
2. The project includes all possible planning to minimize harm to the property resulting from the use.

Section 6(f) resources are lands purchased with funding from the Land and Water Conservation Fund Act of 1965. No such properties have been identified adjacent to the existing or within proposed project rights-of-way.

Table III-36 outlines Section 4(f) resources found in the Project Corridor. Resources include open space, trails, and cultural resources. Resources and impacts for the area covered in the *Entrance to Aspen ROD* that overlap with this project are summarized for informational purposes only. No additional impacts are expected from the current project.

Table III-36
Section 4(f) Resources

Resource Type	Resource Location
Parks, Recreation Areas, Wildlife or Waterfowl Refuges	
Mt. Sopris Tree Farm Community Center and Recreation Area	W. Glenwood to Pitkin Co Airport
Zoline Open Space	Entrance to Aspen Project
Aspen Golf Course	Entrance to Aspen Project
Moore Open Space	Entrance to Aspen Project
Marolt-Thomas Open Space	Entrance to Aspen Project
Trail Crossings	
Miscellaneous Crossings - 16 trails	W. Glenwood to Pitkin Co Airport
Aspen Trail System	Entrance to Aspen Project
Cultural Resources (only those eligible for or on NRHP)	
D&RGW RR (5EA198/5GF1661/5PT123)	W. Glenwood to Pitkin Co Airport
Hardwick Bridge (5GF1167)	W. Glenwood to Pitkin Co Airport
Satank Bridge (5GF1282)	W. Glenwood to Pitkin Co Airport
Emma School (5PT27)	W. Glenwood to Pitkin Co Airport
Wheatley School (5PT57)	W. Glenwood to Pitkin Co Airport
Aspen Commercial Historic District (5PT113)	Both Projects
Emma Historic District (5PT323)	W. Glenwood to Pitkin Co Airport
A.B. Foster Ranch (5PT471)	W. Glenwood to Pitkin Co Airport
Colorado Midland Railroad (5PT542)	Entrance to Aspen Project
Mather Residence (5PT792)	W. Glenwood to Pitkin Co Airport
Wingo Trestle; Bridge 384A (5PT851)	W. Glenwood to Pitkin Co Airport
Maroon Creek Bridge	Entrance to Aspen Project
Holden Smelting & Milling Complex	Entrance to Aspen Project
Castle Creek Power Plant	Entrance to Aspen Project
920 West Hallam St.	Entrance to Aspen Project
Berger Cabin	Entrance to Aspen Project
Smith/Elisha House	Entrance to Aspen Project
Thomas Hynes House	Entrance to Aspen Project

14. Farmlands

U.S. Congressional Public Law 95-87 (Federal Register January 31, 1978: Part 657) requires the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) to identify and locate Prime and Unique Farmlands (*Important Farmland Inventory – Colorado* SCS, 1982). In addition to Prime and Unique Farmlands, the important farmland program encourages the identification of farmland of state-wide and local importance. Farmlands of state-wide importance, while not protected by law, should be given special consideration when planning and evaluating agricultural resources (SCS, 1982).

The *Important Farmland Inventory* concluded that "no soils" in Pitkin, Garfield, or Eagle County are classified as "Prime" because cold temperatures limit the growing season. Prime farmlands are considered to be of national importance, and have been defined as being land with the best combination of physical and chemical characteristics for producing feed, forage, fiber, and oilseed crops, and is available for these uses. Colorado has imposed additional requirements to the National Criteria for prime farmlands (SCS, 1982).

The NRCS (SCS, 1982) identified only two areas in Colorado which satisfy the unique farmland criteria, neither of which is in the Roaring Fork Valley. Unique farmlands are defined as land other than prime farmland that is used for the production of specific high value crops.

Farmlands of state-wide importance in Colorado are defined by land use as:

- irrigated lands that produce specific crops of special significance to the local economy,
- irrigated land – water supply inadequate, and
- high potential dry cropland (SCS, 1982).

Within the Project Corridor, the majority of state-wide important farmland is irrigated hay meadows, found near Basalt. **Appendix A** includes coordination with the NRCS.

15. Noise and Ground-Borne Vibration

The noise analyses conducted for this project follow guidelines from the US Department of Transportation (USDOT), the Federal Transit Administration (FTA) and the Federal Highway Administration (FHWA) as follows. Construction related noise and vibration impacts follow USDOT guidelines. The rail related noise analysis follows guidelines published by the Federal Transit Administration in their document *FTA Manual for Transit Noise and Vibration Impact Assessment* (FTA,1995).

FHWA Highway Noise Criteria are applicable to Highway 82 for this analysis. Although BRT and bus routes presented will utilize Highway 82, no physical improvements are proposed for the roadway as part of this project. As a result of the lack of physical improvements to Highway 82, FHWA noise regulations will not apply in conjunction with the proposed BRT alternative discussed in this document. Furthermore, Highway 82 already operates at a level of service that represents the worst case for traffic noise, Level of Service (LOS) C; thus the impact of the roadway traffic noise is captured in the existing noise levels (both measured and calculated). The Rail Alternative will include some co-locations on Highway 82 right-of-way. These segments will follow FTA guidelines as noted above. Proposed transit stations fall under FTA guidance.

In accordance with the regulations: audible airborne noise and ground-borne vibration are considered and discussed in this study.

15.1 Background Information

15.1.1 Noise Characteristics. Noise levels are measured in units called decibels (dB). Since the human ear does not respond equally to all frequencies, measured sound levels are adjusted or weighted to correspond to the frequency response of human hearing and the human perception of loudness. The weighted sound level is expressed in single number units called A-weighted decibels (dBA) and is measured with a calibrated noise meter.

Traffic and other noises found in communities tend to fluctuate from moment to moment, depending on whether a noisy truck passes by, an airplane flies over, a horn blows, or children scream as they play in a nearby schoolyard. In order to measure this noise accurately it is common practice to calculate an average noise produced by different activities over a period of time to obtain a single number. This single number is called the equivalent continuous noise level, or L_{eq}. Another noise measure, the day-night noise level (L_{dn}), takes into account the increased sensitivity of people to noise during sleeping hours. The L_{dn} is a 24-hour L_{eq}, but with a 10 dB penalty assessed to noise events occurring at night (10:00 p.m. to 7:00 a.m.).

Both L_{eq} and L_{dn} are used by the FTA in evaluating transit noise impacts. For transit operations, L_{eq} and L_{dn} are appropriate because these levels are sensitive to the frequency and duration of noise events.

15.1.2 Local Noise Ordinances. Local and county governments maintain ordinances regarding noise generated by construction activities which are relevant to the proposed project. Transportation operations noise, from roadway or rail, are not typically contained within local government ordinances.

Construction activities are restricted during night hours, either after 7 p.m. or after 10 p.m., typically until 7 a.m. the following morning, depending on location. Residential areas have more restrictions than commercial areas. Sundays and holidays have more stringent time restrictions.

Noise levels are also regulated by ordinance. For example, in Aspen and Pitkin County, it is a violation to operate any stationary source of sound in such a manner as to create a ninetieth-percentile sound pressure level (L90) of any measurement period (which shall be less than ten minutes unless otherwise provided in an ordinance) which exceeds the limits set forth for the following receiving land use districts when measured at the property boundary or at any point within the property affected by the noise. Table III-37 represents typical ordinance requirements based on Pitkin County and Aspen ordinances.

Table III-37
Example of Noise Level Ordinances By Land Use

Use District	Night (7 p.m. – 7 a.m.)	Day (7 a.m. – 7 p.m.)
Residential	50 dBA	55 dBA
Commercial	55 dBA	65 dBA
Industrial	55 dBA	65 dBA
Construction	70 dBA	80 dBA

15.2 Human Perception of Airborne Noise

The average individual's ability to perceive changes in noise levels is well documented. In general, changes in noise levels of less than 3 dBA will be barely perceived by most listeners. A 10 dBA change normally is perceived as a doubling of noise levels. Most noise acceptability criteria are based on the general principle that a change in noise level is likely to cause annoyance whenever it intrudes upon the existing ambient or background noise. Community noise levels in urban areas usually range between 45 dBA (the daytime level in a typical quiet living room) and 85 dBA (the approximate noise level near a sidewalk adjacent to heavy traffic). For reference and orientation to the decibel scale, representative environmental noises and their respective dBA levels are shown in Figure III-12.

15.3 Human Perception of Ground-Borne Vibration

Highway traffic does not generate ground-borne vibration levels that raise environmental concerns. With train systems, ground-borne vibration is created by the interaction of the steel wheels rolling on the steel rails. Although vibration is sometimes noticeable outdoors, it is almost exclusively an indoor problem. Although it is conceivable for ground-borne vibration from rail rapid transit trains to cause building damage, the vibration from trains is almost never of sufficient amplitude to cause even minor cosmetic damage to buildings. The primary concern is that the vibration from ground-borne noise can be intrusive and annoying to building occupants.

Velocity, a measure of the energy carried by vibration, is the preferred unit for assessing potential damage to buildings. Because of the general preference to use velocity as a measure of annoyance and building damage, vibration criteria and measured vibration data are presented in terms of vibration velocity levels. In order to compress the range of values required to describe vibration, vibration velocity levels are typically reported in decibels (VdB). VdB is the average vibration fluctuation over an hour. Train vibration velocity level is virtually always characterized in terms of the root-mean-square (RMS) amplitude. RMS is a widely used method of characterizing vibration, representing the average energy over a short time interval. Typically, a one-second interval is used to evaluate human response to vibration. RMS vibration velocity is considered the best available measure of potential human annoyance from ground-borne vibration. Common sources of vibration and their maximum velocity levels are shown in Figure III-13.

15.4 Basic Goals of Noise and Vibration Criteria

The basic goals of noise and vibration criteria for transit and highway projects are to minimize the adverse noise and vibration impacts on the community and to provide feasible and reasonable noise and vibration mitigation where necessary and appropriate. FHWA criteria are used to assess highway noise impacts. The FTA criteria used to assess the noise and vibration impacts from transit projects are based on land use category. Freight hauling in a typical situation is subject to Federal Railroad Administration (FRA) guidelines and not FHWA or FTA. The FRA does not have impact criteria, but rather considers noise and vibration levels at which equipment must operate.

15.5 Existing Noise Measurements

Existing ambient noise was monitored at 52 locations throughout the Project Corridor. Most of the monitoring locations were residential areas since that land use dominates the noise-sensitive receivers in the project area. The criteria for monitoring selection included land use, existing ambient noise, distance to a major road (Highway 82), number of sensitive receivers in the area, and the site's potential sensitivity to changes in the noise levels. Field measurements were conducted in accordance with the procedures described in *Sound Procedures for Measuring Highway Noise* (Report Number FHWA-DP-45-1R).

Concurrent with the noise measurements, notation was made of unusual noise events (sirens, barking dogs, aircraft, etc.). In addition all input parameters necessary to run the computer model were obtained. These parameters included distance from the center of the near travel lane to the receiver (where appropriate); width of the roadway; number of travel lanes; height of the receiver; barriers/buffers including trees, berms and structures; variations in terrain between the receiver and the source; and grade. Table III-38 provides information on the location of each measurement site and the recorded sound level.

Figure III-12
Common Noise Levels (all at 50 feet)

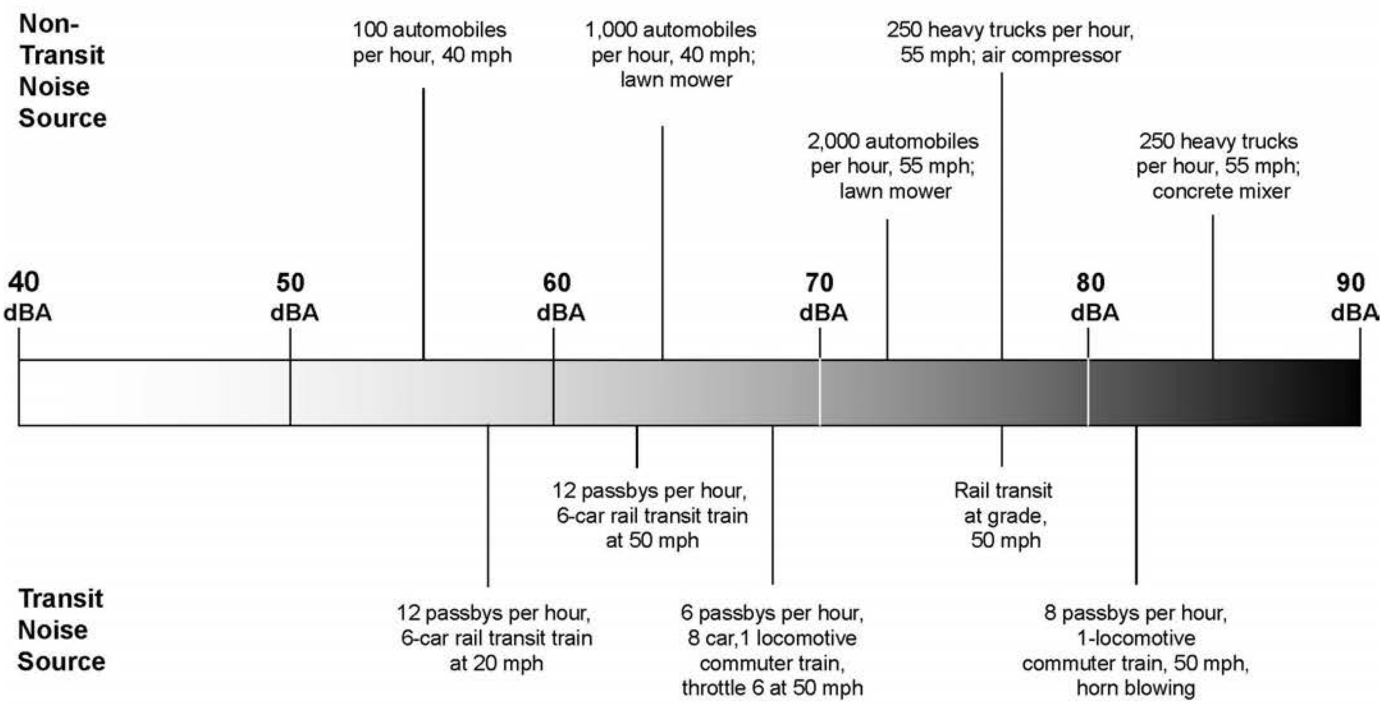
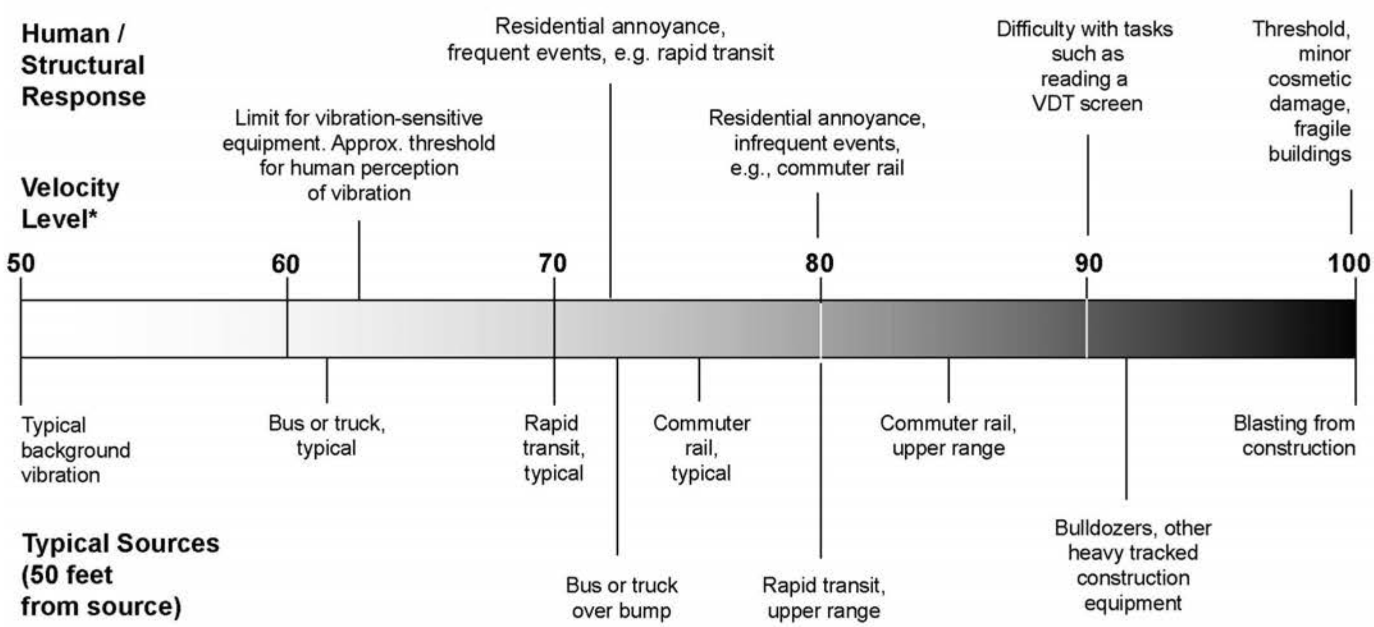


Figure III-13
Common Vibration Levels



** RMS vibration velocity level in VdB reltaive to 10 inches/second*

Table III-38
Summary of Noise Monitoring

Site	Description	Land Use	Date	Time	L_{eq}
1	Red Mountain Drive – Glenwood Springs	Residential	2/24/99	9:38 a.m.	46.8
2	Cowdin Ave. neighborhood adjacent to Roaring Fork River – Glenwood Springs	Residential	2/24/99	10:05 a.m.	49.5
3	Latson Court – Glenwood Springs	Residential	2/24/99	10:23 a.m.	46.5
4	Glenwood Springs Elementary School	Institutional	2/24/99	10:48 a.m.	52.4
5	Glenwood Springs High School	Institutional	2/24/99	11:11 a.m.	55.9
6	Park Drive neighborhood – Glenwood Springs	Residential	2/24/99	11:30 a.m.	48.8
7	Mobile Home Park adjacent to Highway 82 at Grand Ave. cutoff – Glenwood Springs	Residential	2/24/99	11:46 a.m.	66.9
8	Apartments on Blake Ave. – Glenwood Springs	Residential	2/24/99	12:04 p.m.	60.2
9	Neighborhood on Sopris Rd. – Glenwood Springs	Residential	2/24/99	12:25 p.m.	54.3
10	Midland Ave. near 27th St. Bridge – Glenwood Springs	Residential	2/24/99	12:45 p.m.	66.8
11	Riverside Cottages Motel – South Glenwood Springs	Motel	2/24/99	1:34 p.m.	48.2
12	Residential area adjacent to S.H. 82 – South Glenwood Springs	Residential	2/24/99	1:56 p.m.	60.7
13	Mobile Home Park (unnamed) 220 feet from Highway 82	Residential	2/24/99	2:14 p.m.	56.6
14	Residential Subdivision southwest of Roaring Fork River between Glenwood Springs and Carbondale	Residential	2/24/99	2:35 p.m.	54.9
15	Apartments on South Grand Avenue between Glenwood Springs and Carbondale	Residential/ Commercial	2/25/99	8:10 a.m.	52.9
16	Mobile Homes adjacent to RFTA ROW north of Carbondale	Residential	2/25/99	8:23 a.m.	45.3
17	Mountain Meadows Court Mobile Homes adjacent to S.H. 82 north of Carbondale	Residential	2/25/99	8:48 a.m.	67.6
18	Farmhouse adjacent to RFTA ROW and S.H. 82 north of Carbondale	Residential	2/25/99	9:12 a.m.	50.5
19	Aspen Glen – behind berm adjacent to Highway 82	Residential	2/25/99	9:35 a.m.	45.8
20	Residential area near old Satank Bridge in Carbondale	Residential	2/25/99	9:53 a.m.	52.6
21	Sopris RV Park between S.H. 82 and RFTA right-of-way – Carbondale	Residential	2/25/99	10:20 a.m.	51.0
22	Carbondale Mobile Home Park immediately adjacent to RFTA ROW – Carbondale	Residential	2/25/99	10:35 a.m.	46.6
23	Multi-family residential off Village Road in Carbondale immediately adjacent to RFTA ROW	Residential	2/25/99	10:57 a.m.	44.5
24	Downtown Carbondale proposed station location near town hall	Mixed Use	2/25/99	11:15 a.m.	41.7
25	Residential area adjacent to CR 100 south of Carbondale	Residential	2/25/99	11:34 a.m.	46.6
26	CR 100 between St. Finnbar Farm and Blue Creek Ranch near Catherine Store	Residential/ Mixed Use	2/25/99	11:52 a.m.	60.2

Table III-38
Summary of Noise Monitoring

Site	Description	Land Use	Date	Time	L_{eq}
27	Residential area adjacent to Highway 82 just south of Catherine Store	Residential	2/25/99	1:22 p.m.	61.9
28	Dakota duplex subdivision - El Jebel	Residential	2/25/99	1:45 p.m.	64.5
29	Blue Lake subdivision - El Jebel	Residential	2/25/99	2:07 p.m.	66.3
30	Apartment complex near Tree Farm, behind 8 foot berm - El Jebel	Residential	2/25/99	2:25 p.m.	59.4
31	Quadraplex complex south of Pine Ridge off Two Rivers Road	Residential	2/25/99	2:43 p.m.	66.3
32	Adjacent to S.H. 82 just north of Basalt station location	Residential	2/25/99	3:05 p.m.	62.0
33	Basalt Mobile Home Park just south of Basalt station	Residential	2/25/99	3:19 p.m.	56.8
34	Holland Hills subdivision in church parking lot	Residential/ Institutional	2/25/99	3:44 p.m.	58.0
35	Lazy Glen Mobile Home Park	Residential	2/25/99	4:02 p.m.	57.0
36	Residence on Lower River Rd. across road from RFTA ROW	Residential	2/25/99	4:17 p.m.	69.2
37	Mobile Home cluster on Lower River Rd. across road from RFTA ROW	Residential	2/25/99	4:36 p.m.	54.5
38	Aspen Village mobile home park	Residential	2/25/99	4:55 p.m.	59.1
39	Residential area 40 feet below Highway 82 north of Brush Creek Rd.	Residential	2/11/99	12:40 p.m.	62.8
40	House adjacent to Highway 82 near Brush Creek Rd.	Residential	2/11/99	12:58 p.m.	66.6
A1	Inn at Aspen on Highway 82	Hotel	9/13/00	7:50 a.m.	59
A2	Kingdom Hall of Jehovah's Witnesses	Institutional	9/13/00	8:34 a.m.	54
A3	Aspen Chapel	Institutional	9/13/00	9:06 a.m.	52
A4	835 West Main Street, Aspen	Residential	9/13/00	2:45 p.m.	56
A5	Rusty's Hickory House Restaurant, Aspen	Hotel	9/13/00	5:20 p.m.	64
A6	627 West Main Street, Aspen	Residential	9/13/00	4:22 p.m.	69
A7	L'Auberge Lodge, 435 West Main, Aspen	Hotel	9/14/00	7:28 a.m.	72
A8	Tyrolean Lodge, 200 West Main, Aspen	Hotel	9/13/00	5:52 p.m.	69
			9/14/00	8:00 a.m.	70
A9	Molly Gibson Lodge, 101 W. Main, Aspen	Hotel	9/13/00	4:18 p.m.	70
A10	216 West Main Street, Aspen	Residential	9/13/00	5:22 p.m.	67
			9/14/00	8:23 a.m.	68
A11	Limelite Lodge, 228 East Cooper, Aspen	Hotel	9/13/00	4:32 p.m.	56
A12	540 West Main Street, Aspen	Residential	9/14/00	7:58 a.m.	65

15.6 Existing Ambient Noise Levels

The principal source of noise throughout the project area is motor vehicles traveling on Highway 82 and local roads. Many of the receivers in close proximity to Highway 82 already experience elevated traffic noise levels. Near Aspen, aircraft arriving and departing from the Pitkin County Airport also contribute to the Project Corridor's ambient noise levels. Numerous receivers adjacent to the RFTA railroad right-of-way that do not currently experience elevated noise levels, particularly in areas that are not proximate to Highway 82.

16. Visual Character

The Roaring Fork Valley contains a diverse range of geographic features and landscapes, both natural and man-made. Beginning at the lowest part of the valley at Glenwood Springs, views are limited by development and old-growth vegetation. A mid-afternoon photo of downtown provides a contrast of heavy Highway 82 traffic against historic commercial development and adjacent mountain slopes (Figure III-14). Heading south, the panorama opens, providing for distant views of the mountains including Mt. Sopris. Both the rail and highway rights-of-way parallel the Roaring Fork River, passing by new residential housing and old river bridges until reaching Carbondale (Figure III-15). Irrigated cropland forms the dominant land cover type. Hillsides clearly show various soil shades from red to brown to tan in between the primarily shrub vegetation types.

At Carbondale, the rail right-of way crosses the river and separates from its position adjacent to Highway 82. Views become more limited again by area development. As the railroad grade passes through several land use types, including the commercial district, views are limited to urban development that slowly gives way to residential development and open vistas (Figure III-16). Upon leaving the residential areas, the railroad grade becomes sandwiched between the river and cliffs, providing a dramatic contrast. Old-growth vegetation provides a canopy, making this section one of the most unique in the valley.

The views approaching the Catherine Store cross over from the railroad again, and open to a wide expanse with the distant mountains containing the valley. Open space dominates the Catherine Store and County Road 100 area, as vegetation and development remain sparse. Irrigated cropland is prevalent. The highway corridor is relatively visible from the surrounding land uses, whereas the existing rail corridor is relatively hidden.

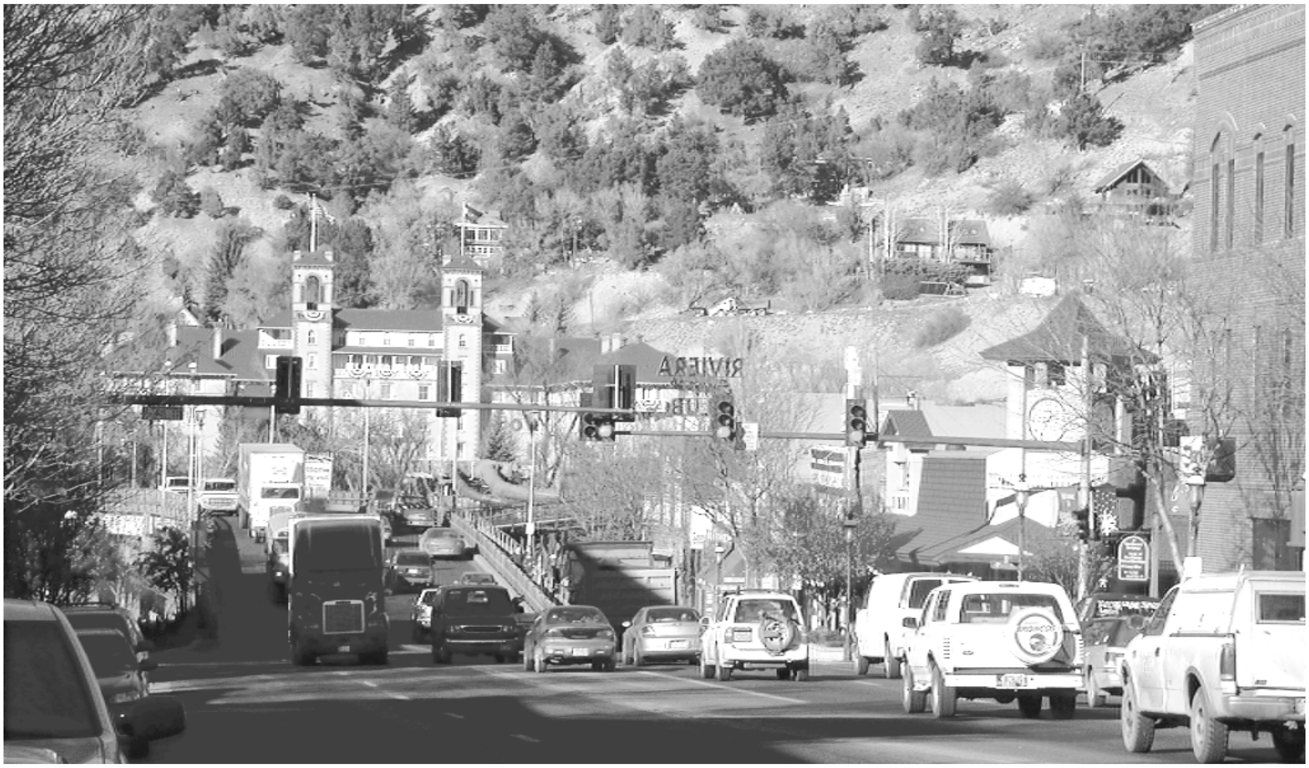


Figure III-14, above**: Downtown traffic in Glenwood Springs, looking north**

Figure III-15, below**: Rail trestle with Mt. Sopris behind – Downvalley from Carbondale**

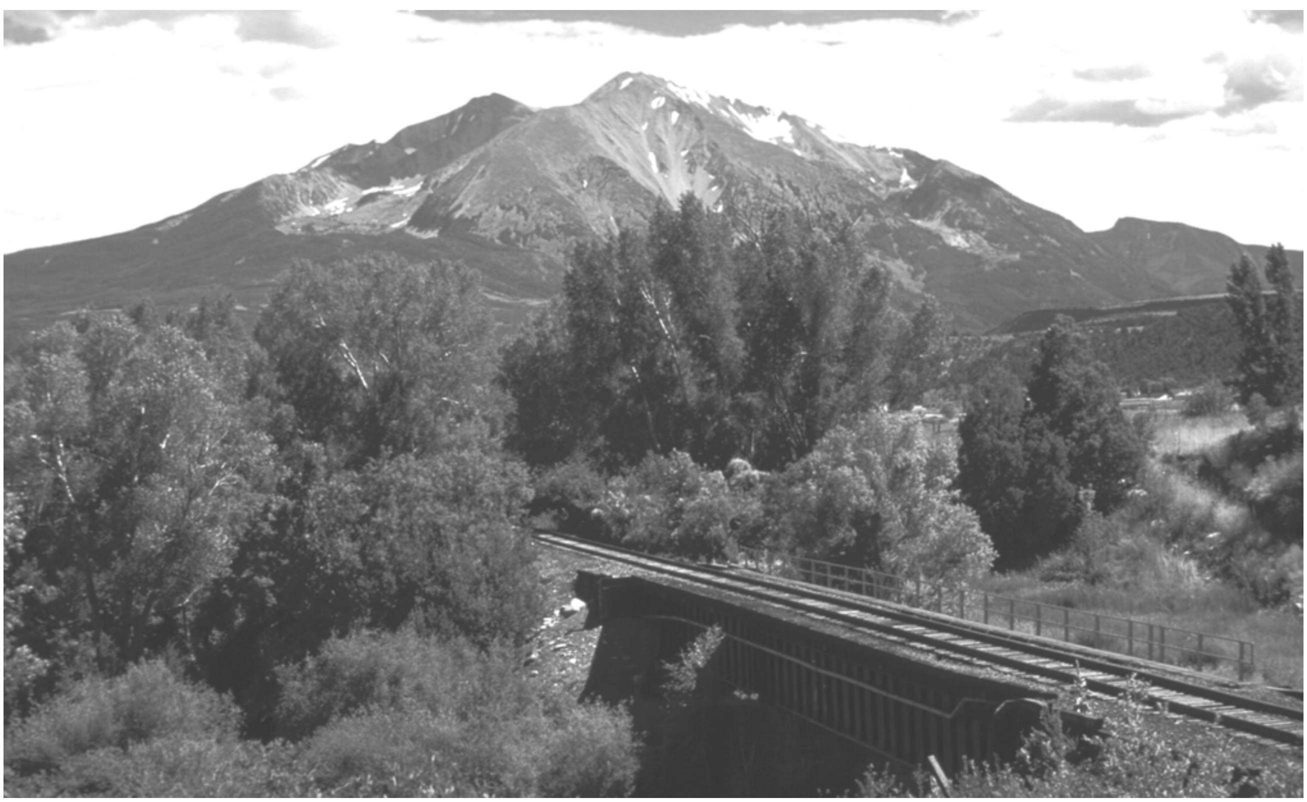


Figure III-16
Rail Right-of-Way at Carbondale - View Northwest from 8th Street Crossing

From El Jebel to Wingo, the river valley is visually dominated by a wide valley floor consisting of farm and ranchland, residential and commercial development, and a wide meandering riparian area. The highway and railroad rights-of-way are separated by the Roaring Fork River valley until they reach Emma. Just outside Emma, Highway 82 crosses the river to briefly join the railroad right-of-way. Scrub oak and other shrub vegetation cover the steep north- and east-facing slopes, while piñon and juniper cover the west- and south-facing slopes. Highway 82 runs close by the Town of Basalt, while the railroad right-of-way runs through a less-developed area with residential properties and a few businesses.

At Wingo Junction, the historic railroad crosses the Roaring Fork River and Highway 82 as it takes up location on the edges of steep slopes on the other side of Lazy Glen. From Wingo through the narrow Snowmass Canyon, the slopes support stands of spruce and fir. The riparian vegetation in the canyon is dense and varied, but allows views of the river from the rail right-of-way. The rail grade is moderately visible from the surrounding areas. Large-lot residential development occupies the pasture and brush areas of the valley floor north and east of the Roaring Fork River. A view from the park-and-ride lot at Highway 82 and Old Snowmass Road hints of the traffic patterns that run through the steep-walled canyon and along the river valley floor (Figure III-17).

The area between Gerbazdale and Brush Creek Road known as Woody Creek is characterized by an expansive valley floor and glacial terracing. The river in this section of the valley is far below both

Figure III-17:
Highway 82 and Old Snowmass Road: View North from Park-and-Ride Lot

the Highway 82 and railroad rights-of-way. It is only moderately visible from the mixture of variable-density residential and commercial/industrial areas that lie below the highway and just above the river. The railroad right-of-way remains on the east side of the Roaring Fork River all the way from the Wingo crossing to its connection with the pre-existing Rio Grande Trail at Woody Creek. Lower River Road provides access to residential properties adjacent to the railroad grade on the west side of the river.

Shale Bluffs provides a definite visual boundary between the Woody Creek section of the valley and the airport area. The Roaring Fork River gorge is deep: 46 to 60 meters (150 to 200 feet) through the bluffs. Residential development is spread along the benches east of the gorge and dominant views are focused on the terraces and ridges east of Highway 82.

South of Shale Bluffs, the valley widens. The Pitkin County Airport, AABC, RFTA Bus Facility, ski area base facilities and lower trail systems, and hillside residential developments define the visual character. The hillsides are dominated by scrub oak, native sage, and grasses, but stands of aspen and clusters of spruce and fir are also present. Homes are scattered throughout the landscape and are highly visible from Highway 82. The highway is highly visible from all developed areas. Views of distant landmark peaks, many of which are located in surrounding federally-designated wilderness areas, enhance the visual character of the valley by providing a scenic backdrop for the valley views and vistas.

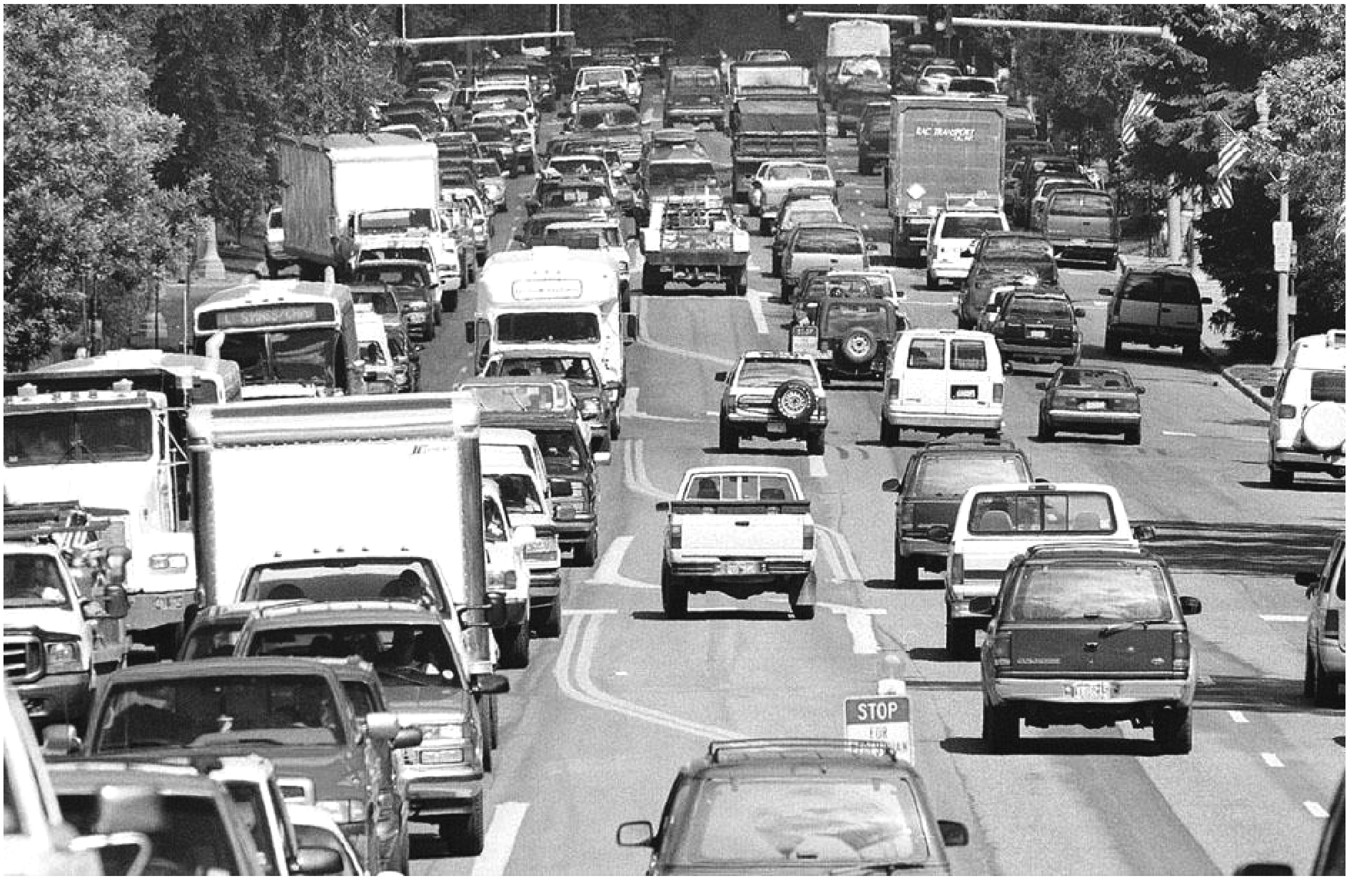


Figure III-18
Rush Hour on Main Street in Aspen

The viewshed for the highway and rail rights-of-way extends beyond the limit of the Project Corridor to distant hillsides, mountain peaks, and stream valleys. These views enhance the visual character of the valley by providing a scenic contrast to a short-grass pastureland and open space adjacent to the Project Corridor. In general, the valley is considered to be high in scenic quality.

Although the residents of the City of Aspen maintain that visual quality is important to their community, there is no clear consensus on what constitutes visual quality. The views within the Project Corridor are readily accessible from the highway and are enjoyed by travelers to and from Aspen. Some travelers come to the valley just to drive the highway and experience the views. The residents of the Aspen area also enjoy the high quality of views of the valley. The Victorian-style mountain cottages and other historic structures adjacent to the roadway define the visual character of Main Street in Aspen. Rush hour traffic congestion on Main Street detracts from the historic viewshed just described (Figure III-18). The western-most portion of Main Street consists of a viewshed defined by a tree canopy at the entrance to the city. Buildings and the vegetation on either side of Main Street limit these scenic views within the city; however, the scene is not restricted when viewed along the length of Main Street.

17. Potential Hazardous Waste Sites

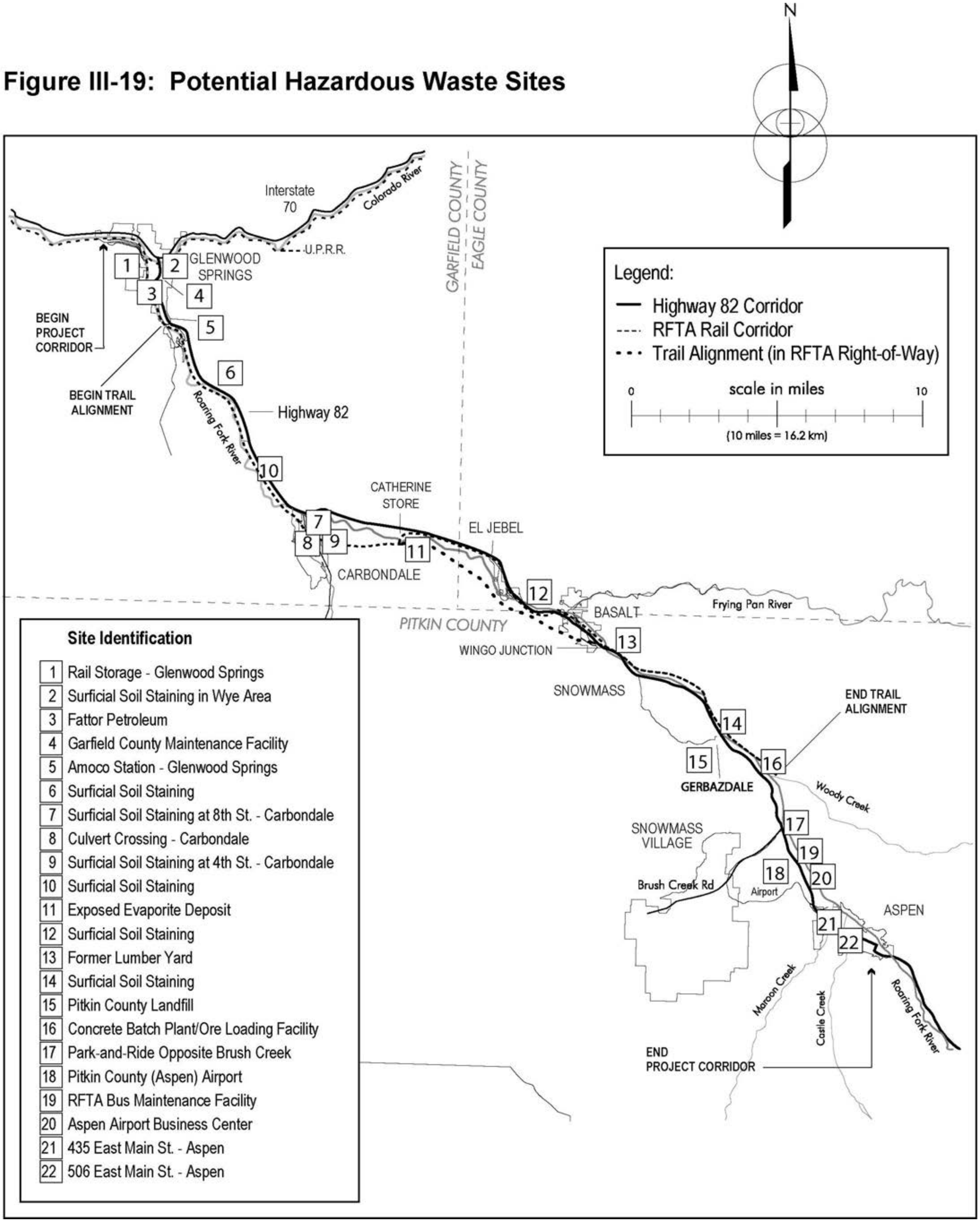
Numerous potential hazardous waste sites were identified during the study process. The investigation relied upon existing documents as well as new research. New research consisted of a limited site survey conducted in areas not covered by the previous studies. Additionally, after completing a comprehensive list of potential sites, an evaluation of sites was performed to address 1) those sites which may have been eliminated by additional sampling and no hazardous waste having been found, or 2) sites which had already been remediated.

In order to identify clearly the sources of the data, the Project Corridor was divided into ten segments. These segments correspond with previously prepared studies and data taken from each are cited. Following is a list of the ten segments and their data sources:

1. West Glenwood Springs (I-70 Exit 114) to the Railroad wye area, Glenwood Springs [*Environmental Data Resources (EDR) Area Corridor Study Phase I ESA for RFRHA*, Environmental Data Resources Inc., 1998]
2. Railroad wye area, Glenwood Springs, to South Glenwood Springs (*Pre-acquisition Environmental Site Assessment*, *Aspen Branch of the D&RGW RR*, SRK, 1996)
3. South Glenwood Springs to Buffalo Valley to North Carbondale (SRK, 1996)
4. North Carbondale to Mulford (SRK, 1996)
5. Mulford to East Basalt (Environmental Data Resources Inc., 1998)
6. East Basalt to Wingo Junction (*Basalt to Buttermilk FEIS*, (FHWA, 1993) and *Preliminary Site Investigation, Highway 82 Basalt to Aspen, CDOT Project No., FC 082-1(14).* (Walsh and Associates, Inc., 1992).
7. Wingo Junction to Woody Creek (SRK, 1996)
8. Woody Creek to Pitkin County Airport (CDOT, 1993)
9. Pitkin County Airport to Aspen: Monarch Street (*Entrance to Aspen FEIS*, FHWA, 1997)
10. Aspen: Monarch Street to Hunter Street (Environmental Data Resource, Inc., 1998)

Neither the No Action/Committed Projects nor the BRT Alternatives (except potential new station locations) will affect areas not previously cleared for hazardous materials. This analysis addresses the potential for affected environment along the Rail Alternative alignment only. A brief description of the Rail Alternative Corridor follows: Segment 1, West Glenwood Springs (I-70 Exit 114) to the Railroad wye area, the alignment follows the Union Pacific railroad corridor. Segments 2 through 4, Railroad wye area, Glenwood Springs to Mulford, the alignment follows the RFTA right-of-way formerly the Aspen Branch of the Denver and Rio Grande Western Railroad. Segments 5 and 6, from Mulford to Wingo Junction, the alignment follows County Road 100 and Highway 82. Segment 7, Wingo Junction to Woody Creek, the alignment follows the RFTA right-of-way and shifts back to Highway 82 at Gerbazdale. Segments 8 and 9, Woody Creek to Pitkin County Airport, the alignment follows Highway 82. Along Segment 10, the alignment follows Main Street to its terminus at the Hunter Street intersection. Figure III-20 illustrates the general location of the 22 potential hazardous materials sites identified within the Project Corridor.

Figure III-19: Potential Hazardous Waste Sites



17.1 West Glenwood Springs (I-70 Exit 114) to the Railroad Wye Area, Glenwood Springs

Specific features and areas of interest noted from West Glenwood Springs (I-70 Exit 114) to the Railroad wye area, Glenwood Springs are presented in this section. Observations of general features include:

Land Use. The Rail Alternative from West Glenwood Springs (I-70 Exit 114) to the Railroad wye area follows the existing Union Pacific Railroad right-of-way and tracks including several railroad sidings. This area is fenced and was not accessible for close inspection. Additional land uses along the rail corridor include industrial use along Devereux Road and residential closer to the wye area.

Industries include a Coca-Cola Bottling Plant with four active underground storage tanks (USTs), Rocky Mountain Natural Gas, with two out-of-service USTs and several above ground storage tanks (ASTs). These tanks, owned by the aforementioned businesses, were found by electronic database search (EDR, 1998). The records do not indicate any leaking USTs or reportable spills to date.

There appear to be grain elevators or tanks and other railroad storage areas, presumably owned by Union Pacific along the rail sidings. This area should be fully inspected and sampled, if indicated, prior to acquisition.

Transformers. Several transformers were found along the Union Pacific rail corridor from west Glenwood Springs to the Railroad wye area; however, it is stated clearly that they are non-PCB containing transformers. They appear to be relatively new, and if they replaced older transformers, PCBs could still be found in the area.

The roadway south of the Union Pacific rail corridor appears to have been recently graded and paved. The groundcover of homogenous grasses indicates relatively recent grading and seeding. Surface sampling would be unlikely to yield any contamination.

Assessment of this segment of the Rail Alternative Corridor indicates no evidence of recognized potential hazardous waste sites with exception of the following:

Railroad storage (1). Railroad storage, including the multiple railroad sidings and tanks along tracks is visible from outside the fenced property. This area should be fully inspected, and if indicated, sampled prior to acquisition. This is potential site #1.

17.2 Railroad Wye Area, Glenwood Springs, to South Glenwood Springs

Specific features and areas of interest noted from the Railroad wye area to South Glenwood Springs are presented in this section. (This area includes RFTA mile markers 360 to 363 and potential sites #2 through #5.) Observations of general features include:

Land Use. A mix of commercial retail properties, residential properties, schools, and light industrial businesses are located adjacent to the east side of the RFTA right-of-way in the Glenwood Springs area. The property adjacent the west side of the right-of-way is primarily undeveloped.

Electrical Transformer Storage. A transformer storage yard operated by the City of Glenwood Springs Electric (GSE) department is located in the south portion of the wye area. Transformer labels indicate that they are non-PCB. An interview was conducted with GSE regarding the storage area (SRK, 1996, Appendix D,).

City of Glenwood Springs Facilities. North of 7th Street within the wye area, facilities owned by the City of Glenwood Springs include office space, a maintenance shop, equipment storage areas, and facilities associated with the City wastewater treatment plant. (SRK, 1966, Appendix D).

Assessment of this segment of the Rail Alternative Corridor indicates no evidence of potential hazardous waste sites with exception of the following:

Surficial Soil Staining in Railroad Wye Area (2). Staining of the soil surface is identified in the railroad wye area near the confluence of the Colorado River and Roaring Fork River in Glenwood Springs. The staining pattern extends approximately 366 meters (1,200 linear feet) along the rail siding adjacent to the Southern Pacific Office. Interviews with Southern Pacific indicate that the staining is apparently associated with prior usage of petroleum products such as waste oil and rail lubricants. Additional staining of surficial soil/ballast material is present at in the vicinity of RFTA mile markers 361 and 362. This area represents potential hazardous waste site #2 along the RFTA right-of-way.

Fattor Petroleum (3). Above-ground storage of petroleum products is present adjacent to the east side of the RFTA right-of-way at Fattor Petroleum (bulk plant) near 13th Street. Stained surficial soil and petroleum hydrocarbon odors were observed near the fence line, which is located within approximately nine meters (30 feet) of the main trackage. This area may indicate a potential hazardous waste site in connection with the Rail Alternative and is identified as site #3.

Garfield County Facilities(4). A vehicle and equipment maintenance facility operated by Garfield County is located adjacent to the east side of the RFTA right-of-way near 1lth Street. The Records Review database summary reports a leaking underground storage tank (LUST) finding for this facility. Above-ground fuel storage is present. Surficial soil staining was observed on the facility. A drainage culvert from the facility protrudes into the RFTA right-of-way. This is site #4.

Amoco Station (5). The Amoco Station at 2205 Grand Avenue is located immediately adjacent to the east side of the RFTA right-of-way. The Records Review database summary reported that registered USTs were present at this location. Observations made from the RFTA right-of-way indicate that the USTs were likely located within 30 meters (100 feet) of the Rail Alternative alignment. During completion of supplemental sampling activities, it was observed that removal of the USTs was initiated at the property. The owner of the Amoco Station was contacted on May 10, 1996. A site assessment was being performed. The owner indicated that preliminary observations suggest some evidence of leakage. Removal of the USTs was completed by August 1996 according to the City of Glenwood Springs Fire Department (GSFD). Backfilling and soils testing were done in August of 1996. No further activities have occurred on that site to date (*Personal Communication*, Biggers, R., May 2002). This property, noted as site #5 adjacent to the Project Corridor, may indicate a material threat of a potential hazardous waste site in connection with the Project Corridor.

17.3 South Glenwood Springs to Buffalo Valley to North Carbondale

Specific features and areas of interest noted between South Glenwood Springs and North Carbondale are presented in this section. (Note: RFTA mile markers 363 to 371.5, potential site #6.) Observations of general features and adjacent properties from South Glenwood Springs to North Carbondale include:

Land Use. The current usage of properties varies throughout this segment. Primary usage is residential and undeveloped property from approximately mile marker 367 - 371.5. Agricultural usage is identified (sheep, cattle grazing) in the Cattle Creek area (mile markers 370.5-371.5). Undeveloped land, scattered commercial and light industrial/office space, and residential properties were observed from mile markers 363-367. The region to the west includes undeveloped land, rural properties, gravel pits, and scattered light industrial activity between the RFTA right-of-way and the Roaring Fork River. Areas to the east of Highway 82 are densely vegetated and include drainage ditches that carry runoff from the highway and properties east of the highway.

The Aspen Glen residential development is located between Highway 82 mile markers 23 and 24 to the west of the RFTA right-of-way, just outside of Carbondale. Site grading operations feature the alluvial material (gravels and cobbles), which is the predominant geological characteristic of the area. Assessment of this segment indicates no evidence of potential hazardous waste sites with the exception of the following:

Surficial Soil Staining (6). Limited staining of surficial soil/ballast material is apparent in the vicinity of RFTA mile markers 366.0, 366.7, and 367.5. The horizontal extent of the surficial staining is primarily isolated between the rails and ranges from less than 0.46 square meters (five square feet) to seven square meters (75 square feet) in size. These areas represent potential hazardous waste sites for both the rail and trail alignments at site #6.

17.4 North Carbondale to Mulford

Specific features and areas of interest noted from north Carbondale to Mulford are presented in this section. (Note: RFTA mile markers 371.5 to 376.0, potential sites #7 - #10.) Observations of general features of the Project Corridor and adjacent properties from North Carbondale to Mulford include:

Land Use. Properties from Mulford to North Carbondale include vacant lands, residential areas, construction yards, and industrial areas.

Decommissioned Rail Loadout Facility. Mid-Continent Resources Coal Company, approximately mile markers 374.5 to 374.7, is a decommissioned rail load-out facility located east of Carbondale. The facility was used to store and load coal for rail transport. No mining activities occurred at this facility. No potential project related hazardous waste sites were identified in connection with this facility. An interview regarding this facility is found in SRK, 1996, Appendix D.

Bulk Fuel Storage Area. The Conoco-Mosbarger Bulk Plant is located at 120 4th Street in Carbondale. The plant features several large fuel storage tanks and fuel dispensers. Some abandoned tanks (apparently empty) are present at the rear of the facility and are within 4.6 to 7.6 meters (15 to 25 feet) of the RFTA right-of-way. No potential project related hazardous waste sites were observed in connection with this facility.

Miscellaneous Debris. Rockslide debris is present on the trackage just east of Carbondale between RFTA mile markers 373.5 and 374.2.

Assessment of this segment of North Carbondale to Mulford indicates no evidence of potential hazardous waste sites with the exception of the following:

Surficial Soil Staining at 8th Street (7). Soil staining was observed in Carbondale to the west of the 8th Street crossing within 7.6 meters (25 feet) of the south side of the trackage. The stained area exhibits a petroleum hydrocarbon odor and the horizontal extent is approximately 16 square meters

(175 square feet). This material is within the 15 meter (50 foot) RFTA right-of-way. This material at site #7 represents a potential hazardous waste site for both the rail and trail alignments.

Between 7th and 8th Streets in Carbondale (8). Two ditch culvert headwalls straddle the trackage. The standing water and sediment observed in these headwalls appeared to exhibit a hydrocarbon sheen during the site reconnaissance and constitute a potential hazardous waste site #8.

Surficial Soil Staining at 4th Street (9). Soil staining was observed in Carbondale to the south of the 4th Street crossing within 15 meters (50 feet) of the south side of the trackage at the location of the proposed walk-in station. The stained areas exhibit a petroleum hydrocarbon odor and the horizontal extent of the multiple stains is approximately 6 to 30 square meters (20 to 100 square feet). This material represents a potential hazardous waste site #9 that may affect both the rail and trail alignments.

Other Surficial Soil Staining (10). Limited surficial staining of soil/ballast material is apparent at approximately RFTA mile markers 373.8, and 373.9. The horizontal extent of the surficial staining is primarily isolated between the rails, and ranges from less than 0.46 square meters (five square feet) to 2.3 square meters (25 square feet) in size. These areas represent a potential hazardous waste site #10 for both the rail and trail alignments.

17.5 Mulford to East Basalt

Specific features and areas of interest noted from Mulford to East Basalt) are presented in this section. (Note approximate RFTA mile markers 376 to 381 or Highway 82 mileposts 15.5 to 23.5; potential site #11.) The proposed trail follows the RFTA right-of-way in this segment while the rail alignment follows County Road 100 and Highway 82. Observations of general features and adjacent properties from Mulford to East Basalt include:

Land Use. The properties adjacent to the proposed rail alignment (following County Road 100 and then Highway 82) from Mulford to East Basalt are comprised of agricultural and ranchlands, residential, and retail including retail gasoline stations. A few light industrial (i.e., construction equipment yard and county road maintenance yard) properties are located in the Emma area.

Dense overgrowth of vegetation is present on the trackage around RFTA mile marker 376.0. The burning of weeds is evident along both sides of trackage from mile marker 376.0 to 377.0. Abandoned railroad ties in these areas have been burned.

Irrigation Channels. Irrigation channels adjacent to the RFTA right-of-way and occasionally crossing under the trackage exhibited low flow of water during the site reconnaissance. The flowing channels were observed near RFTA mile markers 381.0 to 381.5. The average size of the channels in this area are 0.6 meters (2.0 feet) wide by 0.46 meters (1.5 feet) deep. No potential hazardous waste sites were observed in connection with the irrigation channels.

Construction Yard. Near Hooks Crossing (approximately RFTA mile marker 380), the Ellsworth Construction yard is located to the north side of the RFTA right-of-way. Above ground fuel storage tanks, heavy equipment, and gravel stockpiles are located in the construction yard. No potential hazardous waste sites were observed in the construction yard or in connection with the project right-of-way.

Equipment Storage Yard. An unidentified equipment storage yard is located at Hooks Crossing (RFTA mile marker 380). The fence line of the storage yard is located within six meters (20 feet) of the trackage, which indicates that a portion of this area is located within the 15 meter (50-foot) right-of-way. The yard is presently used for storage of corrugated metal pipe and a few unmarked 189-liter (50-gallon) drums. The drums are apparently empty. No evidence of potential hazardous waste sites was observed in connection with this property, or in connection with the right-of-way nearby this property.

Automotive Scrapyard. An unidentified automotive scrapyard is present at approximately Highway 82 mile marker 11.5 south of Emma. The scrapyard is located between Highway 82 and the RFTA right-of -way. The rear fence line of the scrapyard is within the 15 meter (50-foot) right-of-way. The scrapyard consists of several junked cars and equipment, scrap metal, and unidentified containers (i.e., drums). The scrapyard is apparently no longer in business. No personnel or activity were observed at the scrapyard on two separate occasions. On both occasions, the facility was closed. No business signs or markers were available to identify the property. Although the right-of-way behind the scrapyard exhibits isolated soil staining (described below), there is no apparent connection between the isolated soil staining and the scrapyard. No physical or visual evidence of potential hazardous waste sites was observed in connection with the scrapyard.

Automotive Scrap. Several junked cars, automotive debris and unidentified containers (i.e., drums) are present at approximately RFTA mile marker 382 across the south side of the trackage. The majority of the material is outside of the 15 meter (50-foot) right-of-way in this area. Some debris (e.g., domestic trash and scrap metal) is present in the ditch between this property and the trackage. Although the right-of-way behind this property exhibits soil staining (described above), there is no apparent connection between the isolated soil staining on the trackage and the adjacent property. No physical or visual evidence of potential hazardous waste sites was observed in connection with this property.

Construction Debris. At approximately RFTA mile marker 383.5, construction debris is identified near the RFTA right-of-way, which consists of scrap metal, electrical wire, and unidentified tanks. The tanks appear to be empty, out of service, and temporarily stored in this area. A business name for this storage area could not be identified. No persons responsible for the materials were present during the site reconnaissance. No evidence of potential hazardous waste sites was observed in this area adjacent to the RFTA right-of-way, or in connection with the RFTA right-of-way.

Rock Stockpiles. Piles of rounded cobbles are present within the 15 meter (50 foot) RFTA right-of-way at approximately mile markers 383.2 through 384.2. These piles of rock were apparently left near the trackage during excavation of the irrigation ditches along the RFTA right-of-way. No evidence of potential hazardous waste sites was observed.

Assessment of this segment indicates no potential hazardous waste sites, with the exception of the following. This concern is pertinent only to the trail which is proposed to follow the RFTA right-of-way in this area.

Exposed Evaporite Deposit (11). Discoloration of low flowing surface water is evident in the vicinity of RFTA mile marker 377 approximately 0.8 kilometers (0. 5 miles) east of the Mulford Bridge. The surface water is located directly below the trackage adjacent to the Roaring Fork River. The trackage is bounded on the north by the Roaring Fork River, and on the south by steep evaporate deposits. The materials above the trackage exhibit the effects of weathering and oxidation (e.g., portions of the hillside are weathered to a fine sandy material that exhibits iron oxide or rust-colored staining). The steep terrain adjacent to the south bank of the RFTA right-of-way exhibits rockslide areas onto the trackage. The rust colored staining may be indicative of acidic conditions in local surface water. This area indicates a potential for a hazardous waste site , #11.

17.6 East Basalt to Wingo Junction

Specific features and areas of interest noted from East Basalt to Wingo Junction are presented in this section. (Note: RFTA mile markers 381 to 385, potential sites #12 and #13.) The rail alignment does not return to the RFTA right-of-way until Wingo Junction. Observations of general features on the right-of-way and adjacent properties from East Basalt to Wingo Junction include:

Land Use. The properties adjacent to the proposed rail alignment (along Highway 82) from East Basalt to Wingo Junction are comprised of agricultural and ranchlands, residential, and retail including retail gasoline stations. A few light industrial (the former lumberyard) properties are located along the RFTA right-of-way.

Assessment of this segment from East Basalt to Wingo Junction indicates no evidence of potential hazardous waste sites, with exception of the following:

Surficial Soil Staining (12). Limited surficial staining of soil/ballast is present in the corridor at approximately RFTA mile markers 381.7, 382, 382.3 and 382.4. The horizontal extent of the surficial staining appears to be isolated between the rails, with a size of less than 0.46 square meters (5 square feet) to less than 0.92 square meters (10 square feet). These areas represent a potential hazardous waste site (#12) for the proposed trail only.

Former Lumberyard and Monitor Well (13). This site is a former lumberyard near RFTA mile marker 385. The property contained at least one underground storage tank (UST) during occupation by Boise Cascade and BMC Corporation. Colorado Department of Health (CDH) records indicate that all tanks were removed from the property on November 6, 1989.

A monitor well was observed on the former lumberyard property during the site visit. Telephone conversations with Shelton Drilling, Inc. of Basalt and Roger Moore of Storage Tank Technology, Inc., indicated that a site assessment was conducted for the former owner, BMC, Inc. of Boise, Idaho. The investigating firm (Walsh, 1992) was unable to obtain a copy of the site assessment from CDH or the former owner. The property was not investigated during the site survey because the current owner did not permit access. This property warrants further investigation, including the need to review existing data and possible drilling and sampling if it is to be acquired. This site represents a potential hazardous waste site #13 for the proposed trail only.

17.7 Wingo Junction to Woody Creek

Specific features and areas of interest noted from Wingo Junction to Woody Creek are presented in this section. (Note RFTA mile markers 385 to 393, potential sites #14-#16.) Observations of general features of the RFTA right-of-way, which will contain both the rail and trail alignments to Gerbazdale where the rail alignment crosses back to Highway 82, and adjacent properties from Wingo Junction to Woody Creek include:

Land Use. The properties adjacent to the RFTA right-of-way from Wingo Junction to Woody Creek include sparse farm units and residential dwellings. Meadows, grazing properties, and ranch lands are present. River Road is adjacent the RFTA right-of-way to the north. The Roaring Fork River meanders adjacent to the south and southwest. Isolated surficial staining of soil/ballast is present in the corridor at approximately mile marker 390.5. Several areas along this portion of the RFTA right-of-way exhibit overgrowth of weeds and willows. In some areas, the trackage and ballast are densely covered with vegetation.

Electrical Transformers. Electrical transformers are present at approximately RFTA mile markers 390.0 and 388.8. Evidence of transformer leakage was not observed in these areas during site reconnaissance (SRK, 1996, Appendices D and F).

Abandoned Railroad Debris. Abandoned railroad ties and rail debris (spikes, tie plates, and rail) are present among several areas of RFTA right-of-way, specifically at RFTA mile markers 390.5, 389.9, 389.6, 387.7 and 386.9. Previous burning of railroad ties, apparently associated with weed burning, is evident at RFTA mile marker 389.4. No potential hazardous waste sites were observed.

Phillips Curves. The Phillips Curves area at approximately RFTA mile marker 390.0 features junked cars and unidentified drums which are not adjacent to the RFTA right-of-way. Septic systems and leach fields are present immediately adjacent to the right-of-way. No distinct changes in the vegetation, surficial soils or foul odors were detected in connection with these features. No recorded hazardous waste sites were noted.

Irrigation Channels. Irrigation channels run along both sides of the RFTA right-of-way and cross beneath the railroad grade in several areas, through box culverts and corrugated metal pipe culverts. The channels in this area are approximately 0.9 to 1.5 meters (3 to 5 feet) in depth and 0.9 meters (3 feet) wide. These channels were observed to be dry during the site reconnaissance.

Railroad Storage Shed. Structures within the RFTA right-of-way include an old railroad storage shed. The shed was inaccessible during the site reconnaissance. Observations from outside the shed indicate that it is currently used for storage of household items. Two rail cars are located directly north of the shed and have been refurbished as residences.

Miscellaneous Debris. Rockfall debris is present at approximately RFTA mile marker 387.2. The colluvial material appears to be derived from the Maroon Formation, which is featured on the adjacent hillside to the east. The trackage cannot be identified in this area as it is covered with the colluvium and overgrowth.

Assessment of this segment indicates no evidence of potential hazardous waste sites, with exception of the following:

Surficial Soil Staining (14). Limited surficial staining of soil/ballast material is present at approximately RFTA mile marker 390.5. The horizontal extent of the surficial staining is apparently isolated between the rails, and ranges from less than 0.46 to 1.4 square meters (five to 15 square feet) in area. These surficial staining areas may represent potential hazardous waste sites (#14) for both the rail and trail alignments.

The Pitkin County Landfill (15). The Pitkin County Landfill (#15) is beyond the RFTA right-of-way. It is upgradient of Highway 82 and across the Roaring Fork River from the RFTA right-of-way. The rail alignment is located adjacent to Highway 82 in this area. Both surface runoff and groundwater flow toward the roadway. A records check of Colorado Department of Health (CDH) inspections revealed mostly minor violations for blowing trash, odors, etc. However, colored leachate from the landfill had crossed Highway 82 during heavy spring runoff in 1984. Analyses of the leachate show elevated levels of biological oxygen demand (BOD) (770 ppm). BOD is commonly used to estimate the overall organic pollution load for such pollutants as domestic sewage, but does not distinguish individual contaminants. Groundwater quality monitoring has been conducted since 1988 at the landfill and has not shown significant organic contamination to date. The discovery of the leachate release led to inclusion of the drainage crossing Highway 82 in the field investigation (*East of Basalt to Buttermilk FEIS,* FHWA, 1993).

The site was inaccessible to the drill rig due to narrow shoulders and steep roadside embankments, so the investigation was limited to shallow soil sampling at the intersection of the landfill drainage and the highway.

A hand-augured soil sample was collected from the landfill drainage ditch 9.4 meters (31 feet) west of Highway 82. The sample was composited from below ground at a low point in the drainage where contaminants from runoff would be anticipated to collect. Field screening did not yield visible signs of contamination or measured readings. Analysis of the soil sample did not show contamination in the form of semi-volatile organic compounds (SVOCS) or Resource Conservation Recovery Act (RCRA) metals. Results for these analyses were below laboratory detection limits. VOCs were not analyzed since field screening did not indicate their presence.

The Concrete Batch Plant/Ore Loading Facility (16). A visual inspection of this property did not reveal environmental concerns. No acquisition is planned, so further assessment was not conducted. This site (#16) is adjacent to the proposed trail alignment only.

17.8 Woody Creek to Pitkin County Airport

Specific features and areas of interest noted from Woody Creek to Pitkin County Airport are presented in this section. The proposed trail does not extend beyond Woody Creek and the rail alignment runs along Highway 82 in this segment. (Note potential sites #17 - #20.) Observations of general features of the right-of-way and adjacent properties from Woody Creek to Pitkin County Airport include:

Land Use. The properties adjacent to rail and trail alignments from Woody Creek to Pitkin County Airport include farm units, ranch lands, residential dwellings, and increasing light industry as the airport is approached. Construction of two additional lanes of Highway 82 is ongoing in the Snowmass Canyon section of the corridor.

Park-and-Ride opposite Brush Creek Road (17). Isolated surficial staining of soil was present in the construction lay down area at approximately Highway 82 milepost 35. Numerous areas of approximately 1.8 to 13.9 square meters (20 to 150 square feet) of staining were apparent. This park-and-ride (#17) has been constructed per the *Basalt to Buttermilk ROD.* No impacts to the rail alignment are anticipated.

The Pitkin County Airport (18). The airport (potential hazardous waste site #18) lies between mileposts 36.5 and 38.0, to the west of Highway 82. The site visits and records search identified two UST systems, including the Rental Car Fuel Depot and the Aviation Fuel Depot. In addition, a surface spill of aviation fuel was reported near the Aviation Fuel Depot sometime around 1984.

Lithology at the site consists of approximately 1.5 meters (five feet) of gravel fill over silty gravel that contains several different sizes of particles. Numerous gray to light red sandstone cobbles and boulders were encountered.

Two test holes (TH-4 and TH-5) were installed at the Rental Car Fuel Depot, approximately six meters (20 feet) east of the fuel dispensers. The Rental Car Fueling Depot is located in a fill area along the frontage road just east of the main entrance to the airport. This UST system was installed as recently as 1988, in full compliance with Federal standards. It is equipped with automatic leak detectors and is monitored monthly, making it unlikely that a significant release has gone undetected at this location. Drilling logs did not indicate unusual coloration, staining, or odors. However, due to the lithology, samples would be needed directly below the UST to confirm a release from this site. Contaminant migration would be primarily vertical in the highly permeable materials and may not be easily detected at a significant lateral distance. A maximum soil sample headspace reading of 6 ppm was recorded at three meters (ten feet) below ground and five ppm at 1.5 meters (five feet) below ground in TH-5. Soil samples do not contain detectable concentrations of BTEX compounds. Total volatile hydrocarbons (TVH) are estimated at less than one ppm (990 micrograms per kilogram (g/kg)) in the sample from TH-5. Total petroleum hydrocarbons (TPH) were below laboratory detection limits in all samples. No groundwater was encountered and the borings are plugged and abandoned.

The Aviation Fuel Depot is located west of the security fence along the frontage road to the west of the main entrance. This system has been in place for a number of years and may not comply with standards for tank upgrades or leak detection. The pavement in the tank fill area drains north to a ditch that crosses the frontage road and intersects Highway 82. Surface runoff from the fueling area south of the fence appears to drain to this same ditch, making it the likely receptor for any surface spills of fuels or solvents in the vicinity.

The airport fueling system is located in a security area and was not accessible to the field team. A third test hole (TH-6) is located in a berm area between the frontage road and Highway 82, on the north bank of the ditch that drains the aircraft fueling area. This is the reported site of the 1984 aviation fuel spill. Approximately 5,678 liters (1,500 gallons) was released to the surface at the UST site and drained into the ditch. The accident required a remediation effort involving the removal and disposal of over 382 cubic meters (500 cubic yards) of contaminated soil from the ditch. Pitkin County and EPA officials reviewed and approved cleanup efforts. Groundwater was not observed in the soils encountered. No staining or odors were observed in the soils encountered. A maximum soil headspace of four ppm was recorded at 1.4 to 1.8 meters (4.5 to 6.0 feet) below ground. The boring is plugged and abandoned.

Two additional shallow soil samples (SS-4 and SS-5) were collected from the bottom of the ditch between the frontage road and Highway 82, also in the drainage reportedly impacted by the 1984 aviation fuel release. Samples were collected at 41 and 61 cm (16 and 24 inches) below ground. Field observations did not detect petroleum contamination. Methyl tertiary butyl ether (MTBE) was detected in SS-5 at an insignificant concentration of 1 g/kg. Groundwater was not assessed at either UST location. Soils are highly permeable, and it is possible that a release could migrate vertically from a UST system to groundwater. Such a release might not be detected by soil drilling which did not advance to the water table.

RFTA Maintenance Facility (19). The maintenance facility site (#19) located at this property is a small quantity generator (SQG) of hazardous waste and a UST site with a reported petroleum release and an identified groundwater contaminant plume. The site is several hundred feet downgradient of the RFTA right-of-way and not adjacent to Highway 82 right-of-way; consequently, no further assessment work was conducted. If revisions to the alignment result in future plans to acquire this property, additional investigation will be necessary.

AABC (20). This site includes the Boise Cascade and former CDOT Maintenance Facilities and is located between the Roaring Fork River and Highway 82. Site observations indicate that USTs are still in place from the former CDOT facility now occupied by Grizzly Landscaping at the south end of the business center. This data indicates a potential for soil or groundwater contamination at site #20.

17.9 Pitkin County Airport to Aspen: Monarch Street

This segment was fully evaluated and documented in the *Entrance to Aspen FEIS*. Three sites were considered as potential hazardous waste sites, the Pitkin County Airport (18), the RFTA Maintenance Facility (19), both discussed above, and the Holden Smelting and Milling Complex, discussed below.

Holden Smelting and Milling Complex (not mapped for the current project). The Holden Smelting and Milling Complex, also known as the Holden/Marolt Property, was a silver processing plant located on the west bank of Castle Creek (south of Highway 82 milepost 40.4). The plant was constructed in 1891 and reduced silver ore using lixiviation (leaching process). The ores were roasted with salt, producing silver chloride, which was then dissolved with sodium or calcium hyposulfate. An alkaline sulfide was added to precipitate silver (National Park Service, 1988). The plant operated for only three years before the silver crash of 1893 forced it to close. Scattered remains of the plant foundation are visible above the banks of the creek. The property was owned by the Marolt family and operated as a ranch before its conversion to its present use as a museum. A barn on the property has been restored for use as a mining and ranching museum, now operated at the site by the Aspen Historical Society.

Results of surface samples in the vicinity of the Holden Smelting and Milling Complex showed clear elevated total concentrations of arsenic (As), cadmium (Cd), and lead (Pb), which could expose the public to heavy metal laden dust and soil. The highest elevated concentrations found were: 44 milligrams per kilogram (mg/kg) for arsenic, 35 mg/kg for cadmium, and 3,300 mg/kg for lead. The water quality at the proposed bridge pier locations were within anticipated limits for a possible dewatering permit (CDOT, 1997).

17.10 Aspen: Monarch Street to Hunter Street

The last segment of the rail alignment includes three blocks, within the exiting Highway 82 right-of-way along the south side of Main Street in Aspen from Monarch Street to Hunter Street. Specific features and areas of interest are presented in this section. The environmental databases (EDR, 1998) were searched for sites that could potentially affect this segment. Properties for the three blocks along Main Street are generally commercial/business. Two properties contiguous to the subject area were identified that have reported leaking underground storage tanks (LUSTs) or underground storage tanks (USTs). These sites are located at 435 E. Main Street and 506 East Main Street in Aspen (See Figure III-20, potential sites #21 and #22.)

435 East Main Street (21). The current status of all tanks at 435 E. Main Street is “permanently out of use.”

506 East Main Street (22). The current status of one tank at 506 E. Main Street is "permanently out of use," and the status of the other is active. How the "out of use" tanks were closed or cleaned up is not reported.

18. Traffic Safety

Accident data was obtained from the CDOT Transportation Safety and Traffic Engineering department for the years 1998-2000. The Weighted Hazard Index (WHI) is a statistic computed by considering accident frequency, accident severities (injuries and fatalities), traffic volume within the section, the length of the section, and a comparison with the accident history of similar highways. The WHI for this study corridor, 0.90, is positive, indicating that this section has an accident frequency/severity history higher than the state-wide average. Table III-39 shows types of accidents from each study segment. The majority of accidents are rear-end, fixed object, and animal accidents. Some of the possible solutions are being addressed by the Highway 82 construction in progress. Table-40 summarizes the types of accidents along Highway 82, typical causes, and potential solutions.

Table III-39
Highway 82 Accidents by Type, 1998-2000

Segment	Segment Length in kilometers (miles)	Rear-End	Side-swipe	Approach Turn and Broadside	Fixed Object	Animal	Other	Total Accidents	Rate
Glenwood Springs	10.78 (6.7)	245	79	102	88	21	55	590	3.99
Carbondale	14.32 (8.9)	50	12	33	65	53	29	242	1.42
El Jebel & Basalt	25.90 (16.1)	137	33	41	125	76	68	480	1.68
Snowmass Canyon to Buttermilk	12.55 (7.8)	109	15	31	47	28	14	244	1.50
Aspen	4.67 (2.9)	128	52	69	72	4	32	357	6.58

Table III-40
Typical Causes and Potential Solutions for Accidents along Highway 82

Accident Types	Typical Causes	Potential Solutions
Rear-End	High levels of congestion	Reduce congestion through signal progression and better lane utilization
Sideswipe	Narrow lanes or turning traffic	Widen narrow lanes or improve access control
Approach Turn & Broadside	Conflicts with oncoming and unsignalized side street traffic	Reduce the number of potential conflicts with medians and access control
	High levels of congestion	Reduce congestion through signal progression and lane utilization
Fixed Object	Roadside hazards within the clear zone	Remove or protect hazards within the clear zone
Animal	Wild / domestic animals interfere with traffic	Warning signs, fences, reflectors, animal crossings

IV. TRANSPORTATION IMPACTS

A. INTRODUCTION

This chapter presents projected impacts of the alternatives on the overall transportation system. Impacts include changes in transit facilities and service, roadway volumes and level of service, parking patterns related to transit access, and bicycle and pedestrian facilities. The impacts are presented as a comparative analysis between the No Action/Committed Projects and Build alternatives. While some of the effects of the alternatives are described with system-wide characteristics, the majority of potential impacts are focused near the proposed transit facilities.

Transportation impacts are assessed for both an opening day scenario (2008) and a 20-year planning horizon (2025).

1. Evaluation Methodology

A regional travel demand model was used to produce comparative travel statistics for each alternative. A travel demand model is a widely accepted planning tool that estimates future roadway volumes and transit ridership for alternative scenarios. Primary inputs to the model include future socio-economic data and transportation networks representing the roadway and transit systems.

The regional travel demand model for this area was developed specifically for this CIS process. It was calibrated to 1998 winter season conditions with observed counts of roadway and transit volumes. The structure of the model followed the standard "four-step" process to forecast travel demand. Steps included trip generation, trip distribution, mode choice, and trip assignment. Travel forecasts were developed for an average winter (peak season) weekday. The model incorporates state-of-the-practice procedures for performing these steps, and accounts for unique travel characteristics that exist in the Project Corridor. Further documentation on the travel model is available in *Technical Report on Travel Forecasting Demand Model* (Parsons, 2000) and *Technical Memorandum: Travel Forecasts for CIS/DEIS Alternatives* (Parsons, 2002).

The socio-economic assumptions form the basis for generating travel activity. Future socio-economic data is based on a Planned Growth Scenario that assumes development follows the adopted comprehensive plans of the communities in the Project Corridor. Table IV-1 displays the assumed average annual growth rates for different components of the Planned Growth Scenario socio-economic forecasts.

Table IV-1
Growth Assumptions for Population and Employment

	Population Growth Rate to 2025					Employment Growth Rate to 2025	
	Resident	Seasonal Resident		Visitor			
		Summer	Winter	Summer	Winter	Summer	Winter
Average Annual Growth	2.3%	1.8%	1.6%	1.8%	1.6%	2.6%	2.5%

Due to the high level of congestion along portions of Highway 82 in the Project Corridor, it has been important to consider how land use decisions could impact future travel demand and traffic. As a result, growth projections were also prepared for a Trend Growth Scenario. The Trend Growth Scenario was based on the expectation that the high 1990 – 1998 growth patterns would continue through the plan year 2025. This scenario indicated residential and employment growth rates would be approximately one percent higher than the Planned Growth Scenario.

The Planned Growth socio-economic data sets of households and employment were specifically developed for years 1998 and 2020. A trip generation process was then used to produce trip tables for each year. An average annual growth rate of 2.2 percent was used to factor 2020 trip generation levels to 2025. This rate was based on the forecast growth in total households between 1998 and 2020, and is reasonably consistent with the average annual household growth rate developed for the *I-70 Mountain Corridor Programmatic Environmental Impact Statement* (CDOT, 2002-2003), an overlapping geographic region. The remainder of the modeling process (trip distribution, etc.) was then performed to produce 2025 travel demand estimates.

For 2008 travel demand projections, the annual growth rate between 1998 and 2025 travel model results was utilized for interpolation.

B. COMPATIBILITY WITH LONG-TERM PLANS AND PROJECTS

The Project Corridor is located in the Intermountain Transportation Planning Region (ITPR). The Regional Transportation Plan of the ITPR recognizes the West Glenwood Springs to Aspen project as a priority project necessary to maintain future mobility in the region. The West Glenwood Springs to Aspen project is included in the 2020 Statewide Transportation Plan adopted by the State Transportation Commission on November 16, 2000. The communities along the Project Corridor have adopted land use and transportation plans that specifically reference and/or impact the CIS. A list of adopted local plans is provided in **Chapter I: 3.1.1 Local Plans**. The socio-economic data and transportation networks used in the travel demand model are consistent with these plans.

The committed set of improvements in the Project Corridor includes results from the federally-approved *Entrance to Aspen ROD*. A general discussion of the current study's relationship with the *Entrance to Aspen ROD* is found in **Chapter I: 3.1, 3.2, and 3.3.** For the purpose of analysis, all alternatives presented in this document include the selected improvements identified in the *Entrance to Aspen ROD*. Specifically, two principal features of the Entrance to Aspen project are assumed: the transportation management program and future light rail transit (LRT) service or an interim busway. The Entrance to

Aspen TM program includes a threshold for maintaining the vehicle volume that enters/exits Aspen at 1994 levels (24,800 vehicles per day during the winter at the Castle Creek Bridge). All Build alternatives, except the BRT-Bus Alternative, also assume an LRT system from Brush Creek Road or the Pitkin County Airport to Aspen. The alignment, stations, and operating assumptions are consistent with the definition in the *Entrance to Aspen ROD*. The BRT-Bus Alternative, with a dedicated busway into Aspen as defined by the *Entrance to Aspen ROD*, is evaluated in the event that the Entrance to Aspen light rail project is not funded[1].

Table IV-2 lists each of the CIS alternatives that were evaluated for transportation impacts, and their assumptions regarding the Entrance to Aspen.

Table IV-2
Alternatives and Entrance to Aspen Assumption

	ENTRANCE TO ASPEN ASSUMPTION	
Alternative	**Light Rail Transit**	**Transportation Management Program**
No Action/Committed Projects	Yes	Yes
BRT-Bus (with dedicated busway from Buttermilk to Aspen)	No	Yes
BRT-LRT (with LRT from Buttermilk to Aspen)	Yes	Yes
Rail	Yes	Yes

C. TRANSIT OPERATIONS

1. Transit Service

The operating characteristics of each of the alternatives are described in detail in **Chapter II.C: Definition of Alternatives**. Table IV-3 presents a summary of the regional transit system operating characteristics for each of the alternatives. As seen in the table, the Build alternatives provide line-haul Express service in the Project Corridor throughout the day. In contrast, the No-Action/Committed Projects Alternative provides limited regional service during the peak periods, and local service during the remainder of the day. It should be noted that common to all of the alternatives are the existing local services in Glenwood Springs, Snowmass Village, and Aspen.

[1] The transit component of the *Entrance to Aspen ROD* includes a LRT system that, if local support and/or funding are not available, will be developed initially as exclusive bus lanes. (*Entrance to Aspen ROD*, 1998)

Table IV-3
Regional Transit System Operating Characteristics, 2008 and 2025
Winter Season

	No Action/Committed Projects Alternative	BRT-Bus Alternative	BRT-LRT Alternative	Rail Alternative
Headways	30 minutes peak* Up to 60 minutes off-peak	30 minutes all day	30 minutes all day	30 minutes all day
Routes	**RFTA TDP Routes:** • LRT (Pitkin County Airport to Rubey Park) • Glenwood to Buttermilk Express • Glenwood to Buttermilk Local • Carbondale to Buttermilk Express • Carbondale to Buttermilk Local • El Jebel to Buttermilk Express • El Jebel to Buttermilk Local • Basalt to Buttermilk Express • Basalt to Buttermilk Local • Rifle to Glenwood Springs (60 min. all day) • Snowmass Village to Buttermilk • Woody Creek to Brush Creek Rd (60 min. all day)	**Peak-Hour Super Express Routes:** • Glenwood Springs to Rubey Park • Carbondale to Rubey Park • El Jebel to Rubey Park • Basalt to Rubey Park • Express Route from W. Glenwood Springs to Aspen • Snowmass Village to Rubey Park • Woody Creek to Brush Creek Road	**Peak-Hour Super Express Routes:** • Glenwood Springs to Buttermilk • Carbondale to Buttermilk • El Jebel to Buttermilk • Basalt to Buttermilk • Express Route from W. Glenwood Springs to Buttermilk • LRT from Pitkin County Airport to Rubey Park • Snowmass Village to Buttermilk • Woody Creek to Brush Creek Road	**Rail Routes:** • West Glenwood to Main Street • Peak-hour El Jebel to Main Street **Bus Routes:** • Snowmass Village to Brush Creek Road • Woody Creek to Brush Creek Road
Feeder Buses	Interaction with local service in Aspen, Snowmass Village and Glenwood Springs	Interaction with local service in Aspen, Snowmass Village and Glenwood Springs. Timed transfers to/from Express Route to: • Rifle Feeder • West Glenwood Springs Feeder • Glenwood Springs Feeder • Carbondale Feeder • Redstone Feeder • El Jebel/Basalt Feeder • Basalt to Brush Creek Feeder	Interaction with local service in Aspen, Snowmass Village and Glenwood Springs. Timed transfers to/from Express Route to: • Rifle Feeder • West Glenwood Springs Feeder • Glenwood Springs Feeder • Carbondale Feeder • Redstone Feeder • El Jebel/Basalt Feeder • Basalt to Brush Creek Feeder	Interaction with local service in Aspen, Snowmass Village and Glenwood Springs. Timed transfers to/from Rail to: • Rifle Feeder • West Glenwood Springs Feeder • Glenwood Springs Feeder • Glenwood Springs to Carbondale Feeder • Carbondale Feeder • Redstone Feeder • El Jebel/Basalt Feeder • Basalt to Brush Creek Feeder

**Peak service during the three-hour AM and PM peak periods. Some service is provided for 18 hours each day for all alternatives.*

Under the No Action/Committed Projects Alternative, regional trips on transit services are provided by a combination of local and limited service between the Aspen area and various communities in the Project Corridor. The local routes operate on a 30-minute or 60-minute frequency and make numerous stops along the corridor. The Rifle to Glenwood Springs local route also functions as a feeder service in this alternative. The No Action/Committed Projects limited routes operate on a 30-minute frequency and stop along the corridor as a local route until the bus reaches capacity, and then the bus proceeds directly to the destination. Financial constraints prohibit the provision of a sufficient number of buses to meet demand in the No Action/Committed Projects Alternative. Due to these limitations, there is some inherent uncertainty in the transit services offered to the transit patron. Additional transit demand over the capacity that can be accommodated by the RFTA fleet was diverted to other modes of transportation in the model of this alternative.

The BRT alternatives replace the No Action/Committed Projects transit system with Express and Super Express service. The Express routes operate from West Glenwood Springs to the Aspen area, operating every 30 minutes all day, and stop at designated transit stations along the corridor. The Super Express routes operate every 30 minutes during the peak period and do not make intermediate stops along the Project Corridor. The BRT-Bus and BRT-LRT Alternatives differ only in that the buses terminate at Buttermilk in the BRT-LRT Alternative, to allow transfers to/from LRT into Aspen. It is assumed that capacity of the Express and Super Express service is provided to meet demand.

The Rail Alternative provides passenger rail service every 30 minutes all day between West Glenwood Springs and Aspen. By the year 2025, an additional rail route between El Jebel and Aspen would operate every 30 minutes during the peak periods to serve projected demand.

Feeder routes “feed” Express transit service by collecting transit patrons from local communities. The Build alternatives each provide nine bus feeder routes (plus, the Rail Alternative provides an additional feeder route between Glenwood Springs and Carbondale). The feeder services for the Build alternatives operate at 30-minute intervals throughout the day with timed transfers to the Express regional services.

Overall, each of the Build alternatives improves regional transit service by offering frequent service along the Project Corridor that is not constrained by fleet size. The feeder routes provided by the Build alternatives increase the coverage and access to the regional transit system, relative to the No Action/Committed Projects Alternative.

2. Travel Times

Future travel time estimates were compared for trips between Main and Galena Streets in Aspen to the downtown Glenwood Springs Station during the PM peak period. Transit travel times are estimated for transit riders using a limited bus (No Action/Committed Projects Alternative), Super Express bus (BRT Alternatives) or rail mode (Rail Alternative). The transit travel times account for the time benefit of the ITS improvements included in the Build alternatives.

Roadway travel time estimates were also developed as a point of comparison. Roadway travel, categorized by High-Occupancy Vehicle (HOV) and general-purpose vehicle lanes, exhibited inconsequential time differences between the Build alternatives. The estimates include delay due to congestion at current traffic signals in the Project Corridor. Table IV-4 displays the estimated future travel times. Travel time savings associated with ITS improvements are described in Table IV-4.

Table IV-4
Estimated Travel Times Between Aspen and Glenwood Springs
(Minutes)

		2008	2025
Transit	No Action/Committed Projects	67	78
	• BRT-Bus	58	67
	• BRT-LRT	59	66
	• Rail	64	64
Roadway	No Action/Committed Projects		
	• HOV Lanes	51	60
	• General Purpose Lanes	54	64
	Build Alternatives		
	• HOV Lanes	50	57
	• General Purpose Lanes	52	60

Note: PM Peak Conditions

Table IV-5
Travel Time Savings (per trip, per direction)

ITS element	Travel Time Savings
Queue bypass lanes	1 to 1 ¾ minutes
Transit signal optimization	Minimal (assumed in the priority system)
Transit/HOV priority system	2 ¾ to 3 ½ minutes
AVL system[1]	None
Bus scheduling system	None
Automated fare collection	7 ½ minutes (dwell time)
Video surveillance (Closed Circuit TV)	None (schedule reliability improvements)
Traffic data collection station	None
Incident management program	None (schedule reliability improvements)
Communication link	None
Total	**11 ¼ to 12 ¾ minutes**

[1] AVL, or Automatic Vehicle Locate, is a system which uses GPS transponders or other technology to let the transit agency, and therefore the transit customer, know exactly where each vehicle in the fleet is in real time.

The Build alternatives all improve transit travel time over the No Action/Committed Projects Alternative. The higher transit travel times in the No Action/Committed Projects Alternative are due to increased roadway congestion and lack of ITS benefits under that alternative. With the exception of the Rail Alternative, transit travel times increase by several minutes between 2008 and 2025 due to increased congestion and signal delay on the roadway. In 2025, the Rail Alternative offers the shortest transit travel time between Aspen and Glenwood Springs. Both BRT alternatives have similar travel times. In 2025, roadway congestion and signal delay between Buttermilk and Aspen affect the buses but not the LRT, resulting in a slightly higher travel time for the BRT-Bus Alternative than the BRT-LRT Alternative. Travel times on the roadway remain competitive with transit services through the year 2025. Roadway travel times are higher under the No Action/Committed Projects Alternative due to the higher vehicle volumes of that alternative, resulting in greater delay.

3. Overall Transit Demand

Overall demand for transit is measured by the transit mode share, i.e., the percentage of all trips that are made using transit. A trip is defined as travel by a person between an origin and a destination.

The change in transit mode share was evaluated to identify the overall impact of each alternative on transit demand. Table IV-6 reports the mode share percentages related to daily person trips for each of the alternatives. For example, under the No Action/Committed Projects Alternative in 2008, 5.5 percent of all daily trips made within the Project Corridor are projected to utilize transit.

Table IV-6
Overall Mode Share – Project Corridor

	2008			2025		
Alternative	Transit Trips	Auto-Person Trips	Total	Transit Trips	Auto-Person Trips	Total
No Action/Committed Projects	5.5%	94.5%	100.0%	9.3%	90.7%	100.0%
BRT-Bus	8.8%	91.2%	100.0%	10.6%	89.4%	100.0%
BRT-LRT	8.6%	91.4%	100.0%	10.1%	89.9%	100.0%
Rail	9.0%	91.0%	100.0%	11.4%	88.6%	100.0%

A relatively high portion of transit trips are represented under each option, reflecting the propensity for transit use in the Project Corridor. This is a continuation of existing trends. RFTA is the second largest transit system in the State of Colorado. The share of transit trips increases under each of the Build alternatives relative to the No Action/Committed Projects Alternative. Overall mode share among the Build alternatives is similar. The Rail Alternative attracts the most transit use, representing 11.4 percent of the trips in 2025. This represents an additional 12,000 daily transit trips compared to the No Action/Committed Projects Alternative.

Another perspective on transit demand is the mode share near the Aspen end of the Project Corridor. The mode share of trips entering and exiting Aspen is displayed in Table IV-7 for each alternative.

Table IV-7
Mode Share – Near Aspen

Alternative	2008			2025		
	Transit Trips	Auto-Person Trips	Total	Transit Trips	Auto-Person Trips	Total
No Action/Committed Projects	13.1%	86.9%	100.0%	23.6%	76.4%	100.0%
BRT-Bus	23.1%	76.9%	100.0%	26.9%	73.1%	100.0%
BRT-LRT	23.3%	76.7%	100.0%	27.5%	72.5%	100.0%
Rail	23.5%	76.5%	100.0%	28.1%	71.9%	100.0%

The 2025 demand for transit in the Project Corridor near Aspen is very high for all of the alternatives, ranging between 23 and 28 percent of all trips. This reflects the effect of the TM programs of the *Entrance to Aspen ROD* on the Project Corridor. Each of the Build alternatives has a higher portion of trips on transit that enter/exit the Aspen area, relative to the No Action/Committed Projects Alternative.

Transit Ridership. Transit ridership provides another perspective on transit utilization. It is measured by the number of boardings onto transit routes. A trip using transit could have more than one boarding if a transfer is required between transit routes to complete the trip.

Transit ridership activity is summarized by the number of trips that board the regional transit routes. These numbers do not include RFTA's local Aspen service or skier boarding. These services consist of the mainline and Express services that serve regional trips along the corridor. Table IV-8 summarizes the daily boardings generated by each of the alternatives, and does not include boardings on local/feeder routes.

Boardings are highest for the BRT-Bus Alternative, reflecting additional access and short-trip activity on the route segment through Aspen. In the other alternatives, Aspen area local activity is accommodated by LRT service, with the longer regional trips required to make a transfer for access in this segment. The No Action/ Committed Projects Alternative has the lowest number of boardings onto regional transit services among all of the alternatives.

Table IV-9 shows transit activity in terms of the number of annual boardings on regional transit services for each of the alternatives.

Table IV-8
Daily Boardings on Regional Transit Services

Alternative	2008	2025
No Action/ Committed Projects	9,300	14,700
BRT-Bus	19,500	35,300
BRT-LRT	18,000	28,300
Rail	18,700	31,600

Note: *Boardings for the No Action /Committed Projects Alternative include some select local routes that serve regional as well as local trips along the corridor.*

Annual boardings on regional transit services range about 75 percent to 125 percent higher for the Build alternatives compared to the No Action/Committed Projects Alternatives.

Table IV-9
Annual Boardings on Regional Transit Services

Alternative	2008	2025
No Action/ Committed Projects	1,510,000	3,830,000
BRT-Bus	4,780,000	8,740,000
BRT-LRT	3,890,000	6,730,000
Rail	3,990,000	6,920,000

Note: *Boardings for the No Action/Committed Projects Alternative include some select local routes that serve regional as well as local trips along the corridor.*

Figure IV-1A through D displays the total daily boarding and alighting activity among stations for each alternative in 2025. The figure depicts the relative number of persons "getting on" (boarding) transit services and "getting off" (alighting) at each station. The distribution of activity in 2008 shows a similar pattern. Station activity is categorized by origination/destination trips as well as transfers to/from local and feeder bus services. The origins and destinations reflect the number of persons beginning or ending their trip on transit at that location, while the transfers indicate the number of riders transferring from one transit service to another. The Build alternatives have a higher number of transfers than the No Action/ Committed Projects Alternative, due to the feeder bus system provided with the Build alternatives. Transfer movements to/from LRT in the No Action/ Committed Projects and the BRT-LRT Alternatives are evident at the Buttermilk Station, which is the transfer location for the regional bus routes. Transfer movements to/from LRT in the Rail Alternative occur at Brush Creek where the LRT terminates. These movements between LRT and rail service occur primarily due to the increased access that LRT offers within Aspen.

Figure IV-1A
Station Activity
No Action/Committed Projects Alternative

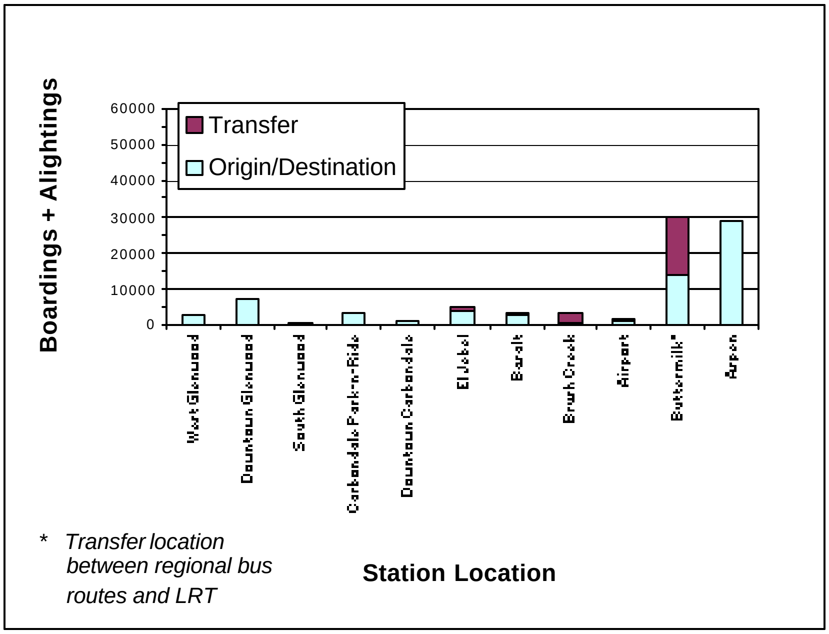
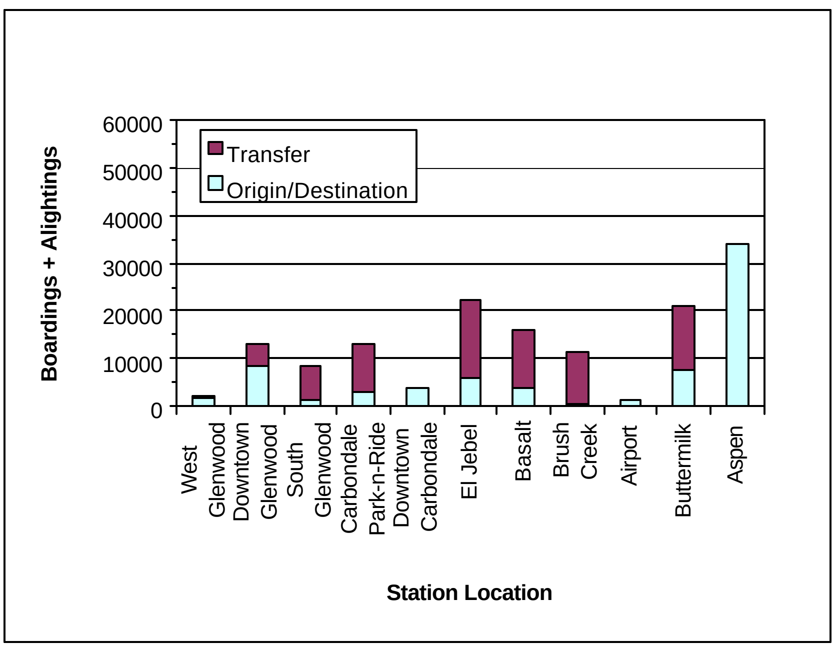


Figure IV-1B
Station Activity
BRT-Bus Alternative



Note: *Boardings and alightings of each station in the vicinity of each transit route are included*

Source: CIS/DEIS Travel Model

Figure IV-1C
Station Activity
BRT-LRT Alternative

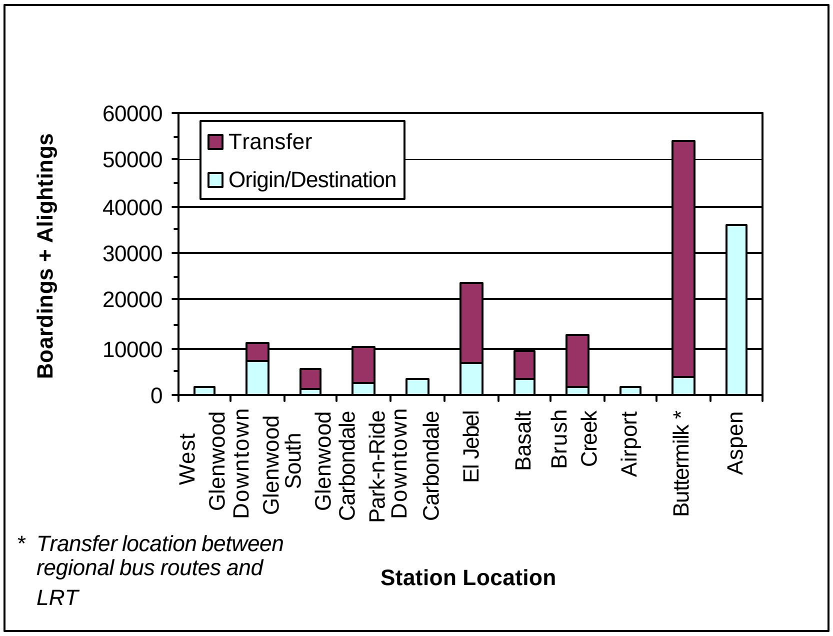
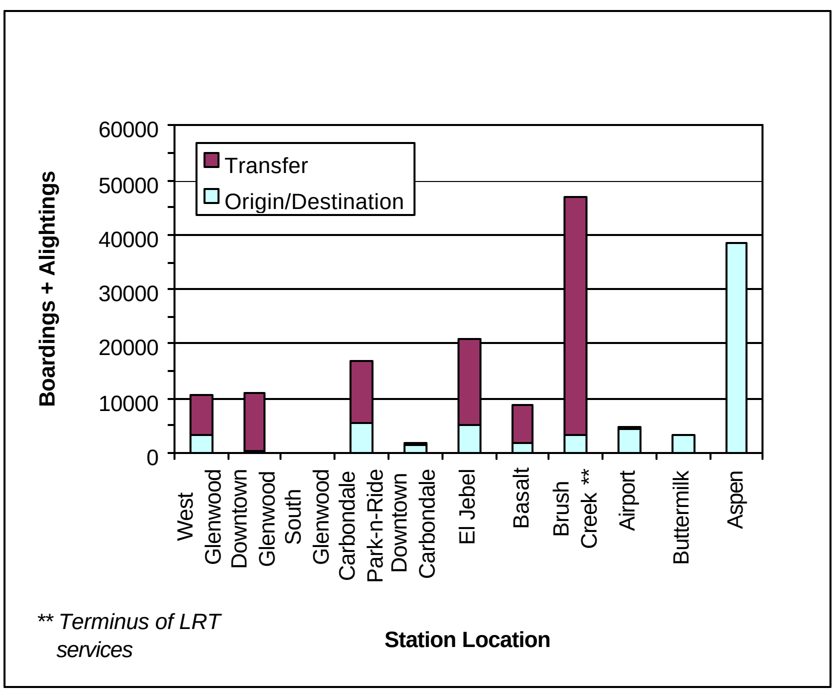
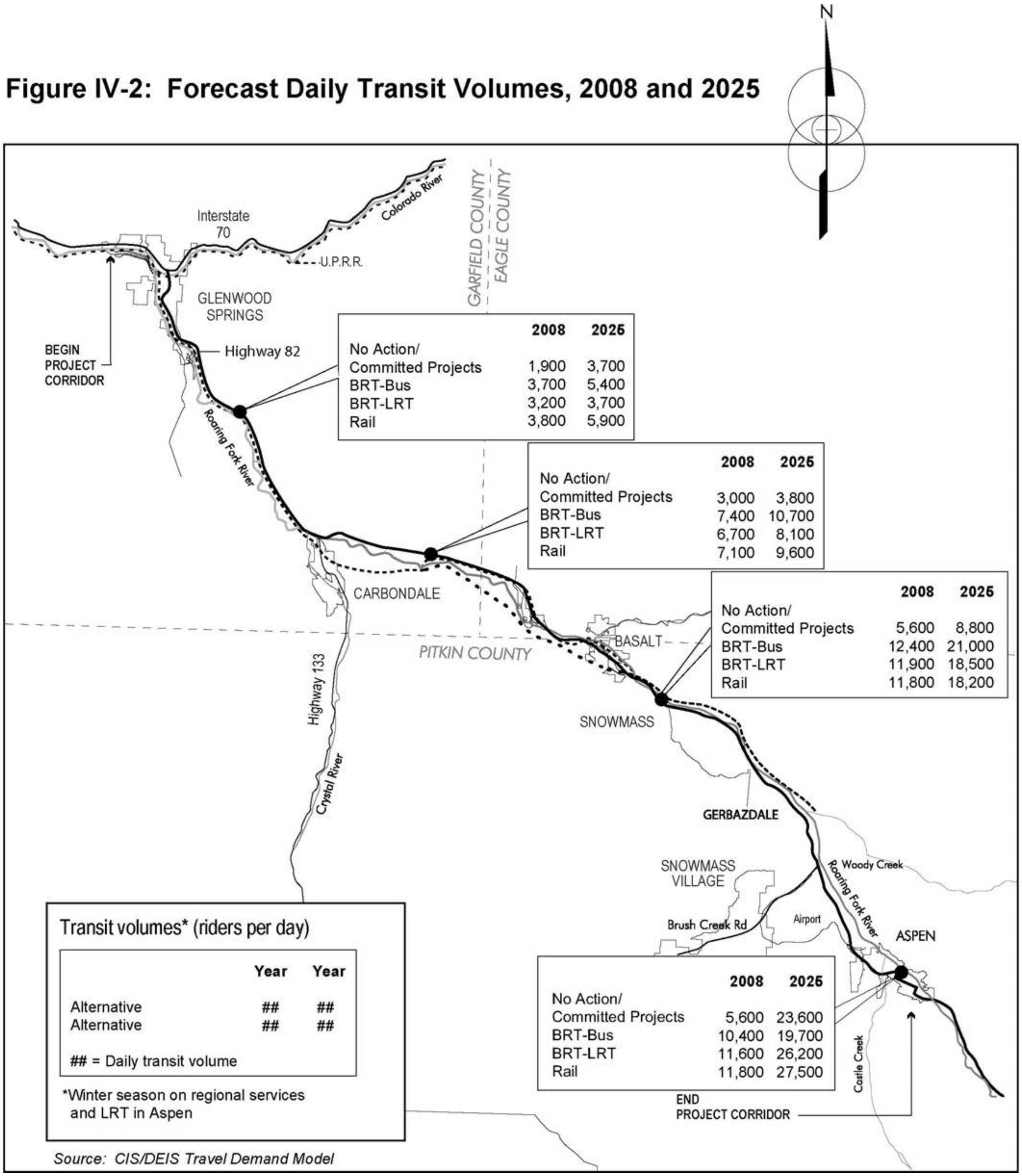


Figure IV-1D
Station Activity
Rail Alternative



Another indicator of transit ridership is daily transit volume. Figure IV-2 depicts the daily transit ridership on regional routes at key points along the corridor. For comparison purposes, ridership on LRT is included at the Aspen location. The transit volumes show that ridership on regional routes

Figure IV-2: Forecast Daily Transit Volumes, 2008 and 2025



Source: CIS/DEIS Travel Demand Model

increases along the corridor from west to east, particularly east of El Jebel. In Aspen, the volumes include local trips on LRT for the alternatives that include LRT (No Action/ Committed Projects, BRT-LRT, and Rail). At the two mid-corridor locations, BRT-Bus shows the highest transit volumes on regional services among the alternatives.

4. Transit Parking

Estimates of daily parking demand in the Project Corridor were prepared using the travel demand model. The daily numbers were factored to account for auto occupancy and peak period activity. While the travel model provides a reasonable estimate of overall corridor demand for parking, the allocation of parking demand to individual stations is more appropriately addressed within a broader context of a parking management plan. For this reason, year 2025 peak parking demand in terms of number of spaces is summarized for major segments along the Project Corridor in Table IV-10.

Table IV-10
Parking Requirements in Year 2025

Segment	No Action/Committed Projects	BRT-Bus	BRT-LRT	Rail
West of Carbondale	1,040	1,660	1,450	1,600
Carbondale and East	2,250	2,480	2,170	3,110
Total	**3,290**	**4,140**	**3,620**	**4,710**

Source: Technical Memorandum, Travel Forecasts for CIS/DEIS Alternatives (PTG, 2002

The Build alternatives all require more parking supply than the No Action/Committed Projects Alternative, ranging from an additional 30 percent for the BRT-LRT option to an additional 70 percent for the Rail Alternative. In terms of total number of spaces, the Build alternatives require 810 to 1,900 more spaces by the year 2025. Note that area planning has provided for as many as 6,700 spaces for the No Action/Committed Projects Alternative. The current travel demand model suggests that these all of these spaces may not be necessary.

The preparation of a parking management plan is recommended as a next step in determining the specific parking needs along the corridor. A parking management plan would provide a comprehensive approach to planning the sizes of park-and-ride facilities. The allocation of parking supplies should account for several considerations:

- Initial travel demand model allocation
- Existing and future transit ridership accumulation throughout the corridor
- Overlap/proximity of station capture areas
- Site opportunities and constraints of the physical size of the proposed stations
- Feeder bus system and walk access characteristics at each station
- Existing transit rider preferences

D. ROADWAY OPERATIONS

1. Regional Travel

1.1 Vehicle Miles Traveled

Vehicle Miles Traveled (VMT) provides a measure of the amount of daily vehicle travel that occurs in a given area. Table IV-11 summarizes future VMT for an average winter season weekday.

Table IV-11
Regional Daily Vehicle Miles of Travel (millions)

	2008	2025
No Action/ Committed Projects	3.443	5.138
BRT-Bus	3.289	4.940
BRT-LRT	3.299	4.978
Rail	3.298	4.974

Area: *Exceeds immediate Project Corridor and includes Pitkin County, Garfield County as far west as Rifle, and Eagle County in the Roaring Fork Valley and in the I-70 Corridor as far east as Eagle. Project Corridor VMT can be found in Table V-4*

All Build alternatives reflect a reduction in regional VMT of about three to four percent in comparison to the No Action/Committed Projects Alternative. By comparison, LRT projects in major cities typically reduce VMT by less than one percent. VMT reduction in the Project Corridor is even greater. The differences between the Build alternatives are slight, varying less than one percent. The BRT-Bus Alternative demonstrates the lowest overall VMT in 2008 and 2025. All of the alternatives demonstrate an average annual VMT growth rate of about 2.5 percent.

1.1 Traffic Projections

Projected daily volumes (winter season) on Highway 82 at key locations along the corridor are presented in Figure IV-3. The analysis of the Build alternatives determined that the differences in future roadway volumes were negligible, and therefore an average volume for the Build alternatives is displayed.

In general the No Action/Committed Projects Alternative is estimated to have higher traffic volumes than the Build alternatives, ranging from two percent higher near Glenwood Springs to about 19 percent higher near Aspen in the year 2025. Traffic volumes are highest near Glenwood Springs, ranging between 38,000 and 40,000 vehicles per day in the year 2025. Within Aspen, volumes display the effect of the implementation of the TM program constraint on vehicle traffic, maintaining 1994 levels. The differences in 2025 volumes just outside Aspen reveal the vehicular traffic demand generated with the No Action/Committed Projects Alternative regardless of the TM program.

2. Station Areas and Major Intersections

Traffic operations at intersections near the proposed transit stations have been analyzed to assess the impact on adjacent roadways. Table IV-12 lists the specific intersections analyzed near each station, and Figure II-6 in **Chapter II: Alternatives** lists the transit stops and park-and-ride locations in the Project Corridor.

Table IV-12
Transit Stations and Adjacent Intersections Analyzed

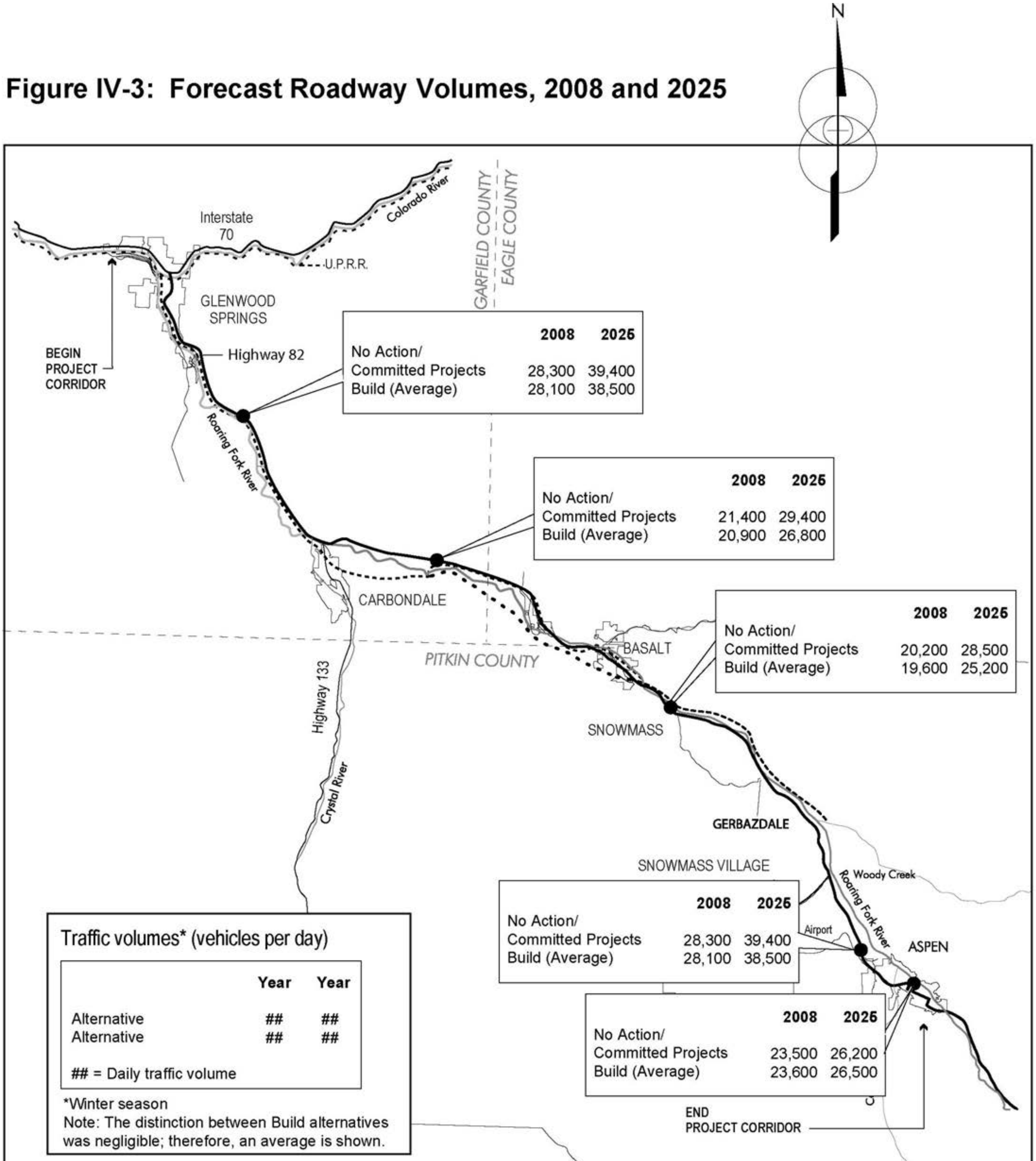
Location	Intersections Analyzed
West Glenwood Springs Station	• Midland Avenue & US 6 • Midland Avenue & I-70 Westbound Ramps • Midland Avenue & I-70 Eastbound Ramps • Midland Avenue & Gilstrap Court • Midland Avenue & Station Access
Downtown Glenwood Springs Station	• Midland Avenue & 8th Street • 8th Street & Grand Avenue
South Glenwood Springs Station	• Highway 82 & South Glenwood Connection
Colorado Mountain College Station	• Highway 82 & CMC Road
Carbondale/ Highway 133 Station	• Highway 133 & Delores Way
Carbondale Station	• 4th Street & Colorado Avenue
El Jebel Station	• Highway 82 & El Jebel Road • Highway 82 & Willits Lane
Basalt Station	• Highway 82 & Basalt Avenue
Brush Creek Transit Center	• Highway 82 & Brush Creek Road
Pitkin County Airport Station	• Highway 82 & Airport Road
Buttermilk Station	• Highway 82 & Buttermilk Road
Aspen Rail Station: Main and Galena	• Highway 82 (Main Street) & Mill Street • Highway 82 (Main Street) & Galena Street • Highway 82 (Main Street) & Hunter Street • Main Street & Spring Street • Hopkins Avenue & Original Street
Rubey Park Transit Center	• Durant Street & Monarch Street • Durant Street & Hunter Street

2.1 Methodology

Intersection delay and level of service (LOS) were calculated for existing conditions and future alternatives, based on PM peak-hour traffic characteristics. The analysis utilized procedures outlined in the *Highway Capacity Manual 2000* (Transportation Research Board, 2000). LOS ranges from "A" through "F," where LOS "A" describes free-flow conditions and LOS "F" describes conditions where traffic volumes exceed capacity. Control delay is the primary measure for evaluating LOS at signalized and unsignalized intersections. A description of LOS values for intersections is summarized in Figure IV-4.

Although the definition of control delay is the same for signalized and unsignalized intersections, its application and LOS thresholds differ. Control delay values are shown in Table IV-13 for each application. Control delay involves movements at slower speeds and stops on intersection approaches, as vehicles move up in line or slow down upstream of an intersection. Drivers frequently reduce speed when a downstream signal is red or there is a line at the downstream intersection approach. At unsignalized intersections, control delay is caused by vehicles waiting for an acceptable gap to cross or join the traffic flow.

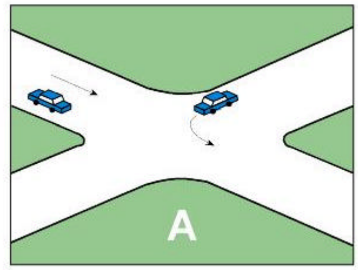
Figure IV-3: Forecast Roadway Volumes, 2008 and 2025



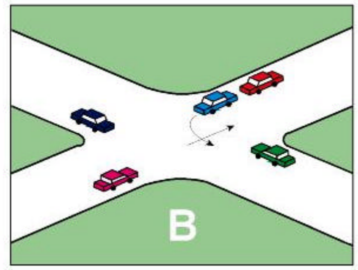
Source: CIS/DEIS Travel Demand Model

Figure IV-4: Description of LOS Values

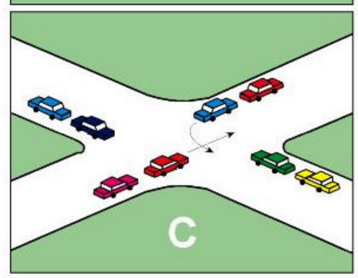
LOS A describes operations with low delay. This LOS occurs when most vehicles arrive during the green phase. Many vehicles do not stop at all. Short cycle lengths may tend to contribute to low delay values.



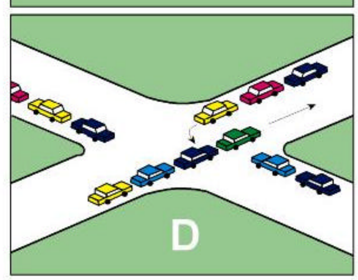
LOS B describes operations with more vehicles stopping than with LOS A, causing higher levels of delay. This level generally occurs with good progression, short cycle lengths, or both.



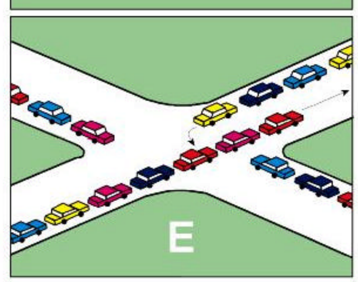
LOS C describes operations with higher delays, which may result from only fair progression, longer cycle lengths, or both. Individual cycle failures may begin to appear at this level. Cycle failure occurs when a given green phase does not serve queued vehicles, and overflows occur. The number of vehicles stopping is significant at this level, though many still pass through the intersection without stopping.



LOS D describes operations with increased delay. At LOS D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, and individual movement volumes near capacity. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.



LOS E describes operations with significant delay. These high delay values generally indicate poor progression, long cycle lengths, and individual movement volumes near capacity. Individual cycle failures are frequent.



LOS F describes operations with excessive delay. This level, considered unacceptable to most drivers, often occurs with oversaturation, that is, when arrival flow rates exceed the capacity of lane groups. It may also occur with many individual cycle failures. Poor progression and long cycle lengths may also contribute significantly to high delay levels.

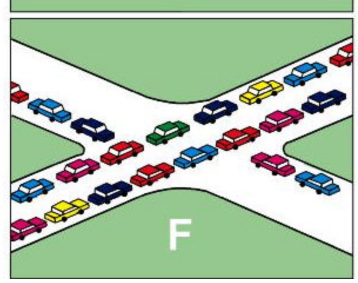


Table IV-13
Signalized and Unsignalized LOS Criteria

LOS	Signalized Control Delay per Vehicle (seconds/vehicle)	Unsignalized Control Delay per Vehicle (seconds/vehicle)
A	10	10
B	>10-20	>10-15
C	>20-35	>15-25
D	>35-55	>25-35
E	>55-80	>35-50
F	> 80	> 50

Source: Highway Capacity Manual 2000; Transportation Resource Board, National Research Council; Washington, DC; 2000, Exhibit 16-2 and 17-2

Existing turn movement data provided the basis for the intersection LOS analyses. Turn movement data for the PM peak period were collected at the intersections listed in Table IV-11. Summaries of the field data are presented in *West Glenwood Springs to Aspen CIS, Transportation Impacts, Supporting Technical Information* (Carter and Burgess, 2003). Growth rates from the alternative travel model runs were used to estimate 2008 and 2025 background PM peak turn movements. The growth rates were applied to the existing turn movement data for each alternative to obtain 2008 and 2025 estimates of background traffic.

Traffic to/from park-and-rides was added to background traffic at the intersections.

Estimated daily park-and-ride demand was obtained from the travel model. To ensure a worst-case analysis, the highest level of forecast parking demand among all alternatives was applied for each of the Build options. The daily volumes were factored to represent PM peak hour entering and exiting parking, and passenger drop-off activity. The resulting volumes were distributed to the network based on existing turning movement patterns.

The unsignalized LOS reported in the following sections represents the worst major street left turn movement and the worst minor street approach. An overall LOS is reported for signalized intersections. Mitigation measures were developed at locations where:

- The intersection LOS under future conditions was worse than LOS D; and
- The intersection LOS under Build alternatives was worse than the No Action/Committed Projects LOS.

Mitigation measures could include adjustments to signal timing or the addition of turn lanes. Refer to the text describing each intersection for specific mitigation measures (if any).

Unsignalized intersection volumes were compared to peak-hour signal warrants in Chapter 4 of the *Manual of Uniform Traffic Control Devices* (FHWA, 2000). Accepted practice calls for full eight-hour warrant analyses to be performed before a signal is installed. These analyses have not been completed for this study due to data constraints. Tables are included as appropriate to indicate where peak-hour signal warrants were satisfied. The peak-hour warrants conducted serve as an indication of where signalization may be appropriate, and further analysis should be performed.

2.2 Analysis by Station

2.2.1 West Glenwood Springs Station

Impacts. The proposed West Glenwood Springs Station with park-and-ride will impact traffic on Midland Avenue and at the West Glenwood I-70 interchange. As shown in Table IV-14, the Midland Avenue and I-70 South ramps will be at LOS F in 2025 regardless of the addition of this station. Congestion difficulties will arise by opening day for this location.

Mitigation. Several mitigation measures were explored, and lane additions on Midland Avenue were determined to be necessary to improve the overall level of service. However, to widen Midland Avenue, the I-70 bridge structure adjacent to this intersection would have to be widened to accommodate the new lanes. This widening would be difficult and costly. The peak-hour signal warrant is satisfied at Midland Avenue and I-70 north ramps by opening day regardless of the alternative. Based on the need for a signal at Midland and the north ramps and the need for widening along Midland Avenue at the south ramps, it is recommended that an overall interchange study be undertaken at this location. Table IV-15 shows the unsignalized intersections that meet the peak-hour warrant for each alternative.

Table IV-14
LOS Near West Glenwood Springs Station

Intersection (**Signalized** / *Unsignalized*)	Movement	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
Highway 6 & 24 and Mel Rey Road	**Overall**	**C**	**C**	**C**	**C**	**C**	**D**	**E**	**E**	**E**
Midland & I-70 North Ramps	• *Left*	*B*	*C*	*C*	*C*	*C*	*F*	*F*	*F*	*F*
	• *Approach*	*C*	*C*	*F*	*F*	*F*	*F*	*F*	*F*	*F*
Midland & I-70 South Ramps	**Overall**	**B**	**B**	**B**	**B**	**B**	**F**	**F**	**F**	**F**
Midland & Gilstrap Court	• *Left*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
	• *Approach*	*D*	*E*	*E*	*E*	*E*	*F*	*F*	*F*	*F*
Midland & West Glenwood Park-and-Ride	• *Left*	--	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
	• *Approach*	--	*C*	*E*	*E*	*E*	*F*	*F*	*F*	*F*

Table IV-15
Peak-hour Signal Warrant Satisfied Near West Glenwood Springs Station

Intersection	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
Midland & I-70 North Ramps	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Midland & Gilstrap Court	No	No	No	No	No	Yes	Yes	Yes	Yes
Midland & West Glenwood Park-and-Ride	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

2.2.2 Downtown Glenwood Springs Station

Impacts. The proposed Downtown Glenwood Springs Station will be located on 8th Street and will impact traffic at the intersections with Midland Avenue and Grand Ave (Highway 82). The LOS results for each alternative are shown in Table IV-16.

Mitigation. The peak-hour signal warrant is satisfied at 8th Street and Midland Avenue by opening day regardless of the addition of this station.

Table IV-16
LOS, Downtown Glenwood Springs Station

Intersection (Signalized / *Unsignalized*)	Movement	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
8th Street & Midland	• *Left*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
	• *Approach*	*F*	*F*	*F*	*F*	*F*	*F*	*F*	*F*	*F*
8th St & Grand Ave	**Overall**	**C**	**C**	**C**	**C**	**C**	**E**	**E**	**E**	**E**

2.2.3 South Glenwood Springs Station

Impacts and Mitigation. The proposed South Glenwood Springs Station with park-and-ride will be located on the South Glenwood Connection (a planned roadway connecting Highway 82 at Red Canyon to West Glenwood Springs) for the BRT Alternative(s) only. Peak-hour turning movements at Highway 82 were estimated from the travel demand model. The LOS results are shown in Table IV-17. No congestion problems are anticipated for this area. The peak-hour signal warrant was not satisfied.

Table IV-17
LOS Near South Glenwood Springs Station

Intersection (Signalized / *Unsignalized*)	Movement	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
Highway 82 & South Glenwood Connection	• *Left*	--	--	*A*	*A*	--	--	*B*	*B*	--
	• *Approach*	--	--	*C*	*C*	--	--	*C*	*C*	--

2.2.4 CMC Station

Impacts and Mitigation. The proposed Colorado Mountain College (CMC) Station will be located on Highway 82 at the road to CMC for the BRT Alternative(s) only. The LOS results are shown in Table IV-18. The LOS at CMC will be E regardless of station construction or alternative in the 2025 peak hour.

Table IV-18
LOS Near CMC Station

Intersection Signalized *Unsignalized*	Movement	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
Highway 82 & CMC	**Overall**	**B**	**C**	**C**	**C**	**C**	**E**	**E**	**E**	**E**

2.2.5 Carbondale/Highway 133 Station

Impacts. The proposed transit station and/or park-and-ride at Highway 133 will be located on Delores Way and will affect traffic on Highway 133 near Carbondale. The LOS results are shown in Table IV-19. The intersection of Highway 133 and Highway 82 currently operates at LOS F.

Mitigation. The CDOT report, *SH 133 Corridor Feasibility Study*, investigated the Highway 133 corridor in greater detail. The study included future development in addition to station generated traffic and recommended an interchange at Highway 133 and Highway 82. The analyses below support the recommendation for an interchange.

The peak-hour signal warrant is satisfied for existing conditions and all future alternatives at Highway 133 and Delores Way. The *SH 133 Corridor Feasibility Study* recommended a signal at this intersection, and the warrant analysis shown below agrees with this conclusion.

Table IV-19
LOS Near Highway 133 Station

Intersection Signalized *Unsignalized*	Movement	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
Highway 133 & Delores Way	• *Left*	*A*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*
	• *Approach*	*E*	*F*	*F*	*F*	*F*	*F*	*F*	*F*	*F*
Highways 82 & 133	**Overall**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**

2.2.6 Downtown Carbondale Station

Impacts and Mitigation. The proposed Downtown Carbondale Station will be located at 4th Street and Colorado Avenue. The LOS results are shown in Table IV-20. It should be noted that the volumes for the BRT alternatives are the same as the No Action/Committed Projects Alternative, resulting in the same LOS. The LOS analysis shows that this transit station facility will have minimal impact on traffic operations at this intersection. The peak-hour signal warrant is not satisfied for any alternative.

Table IV-20
LOS Near Carbondale Station

Intersection Signalized *Unsignalized*	Movement	Existing	2008 No Action	 BRT-Bus	 BRT-LRT	 Rail	2025 No Action	 BRT-Bus	 BRT-LRT	 Rail
Colorado Avenue & 4th Street	• *Left*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*
	• *Approach*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*	*A*

2.2.7 El Jebel Station

Impacts. The proposed El Jebel Station and/or park-and-ride will be located at either Highway 82 and El Jebel Road or Highway 82 and the unsignalized intersection with Willits Lane. By 2025 impacts for all alternatives are almost the same. The LOS results are shown in Table IV-21.

Mitigation. The peak-hour signal warrant is satisfied at Highway 82 and Willits Lane for existing conditions and all future alternatives.

Table IV-21
LOS for El Jebel Station Alternatives

Intersection Signalized *Unsignalized*	Movement	Existing	2008 No Action	 BRT-Bus	 BRT-LRT	 Rail	2025 No Action	 BRT-Bus	 BRT-LRT	 Rail
Highway 82 & El Jebel Rd.	**Overall**	**C**	**C**	**D**	**D**	**D**	**E**	**E**	**E**	**E**
Highway 82 & Willits Lane	• *Left*	*A*	*B*	*B*	*B*	*B*	*C*	*B*	*C*	*C*
	• *Approach*	*F*	*F*	*F*	*F*	*F*	*F*	*F*	*F*	*F*

2.2.8 Basalt Station

Impacts and Mitigation. The proposed Basalt Station and/or park-and-ride will be located on Highway 82 between Basalt and Midland Avenues. The LOS results are shown in Table IV-22. Regardless of the alternative, the year 2025 LOS at Basalt Avenue will not be worse than C.

Table IV-22
LOS near Basalt Station

Intersection Signalized *Unsignalized*	Movement	Existing	2008 No Action	 BRT-Bus	 BRT-LRT	 Rail	2025 No Action	 BRT-Bus	 BRT-LRT	 Rail
Highway 82 & Basalt Ave.	**Overall**	**B**	**B**	**B**	**B**	**B**	**C**	**C**	**C**	**C**

2.2.9 Brush Creek Transit Center

Impacts and Mitigation. The Brush Creek Transit Center is located on Highway 82 at Brush Creek Road. The LOS results are shown in Table IV-23. Regardless of the alternative, the year 2025 LOS at Brush Creek Road will not be worse than D.

Table IV-23
LOS Near Brush Creek Transit Center

Intersection Signalized *Unsignalized*	Movement	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
Highway 82 & Brush Creek Road	**Overall**	**B**	**C**	**C**	**C**	**C**	**D**	**D**	**D**	**D**

2.2.10 Pitkin County Airport Station

Impacts and Mitigation. The proposed Airport Station with park-and-ride will be located on Highway 82 at Airport Road. The LOS results for each alternative are shown in Table IV-24. Regardless of the alternative, the year 2025 LOS at Airport Road will not be worse than D. No mitigation is proposed.

Table IV-24
LOS Near Airport Station

Intersection Signalized *Unsignalized*	Movement	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
Highway 82 & Airport Road	**Overall**	**C**	**C**	**C**	**C**	**C**	**D**	**D**	**D**	**D**

2.2.11 Buttermilk Station

Impacts and Mitigation. The proposed Buttermilk Station with park-and-ride will be located on Highway 82 at Buttermilk Road. The LOS results are shown in Table IV-25. The year 2025 LOS at Buttermilk Road is D for the No Action/Committed Projects Alternative and will not be worse than C for the Build alternatives. No mitigation is proposed.

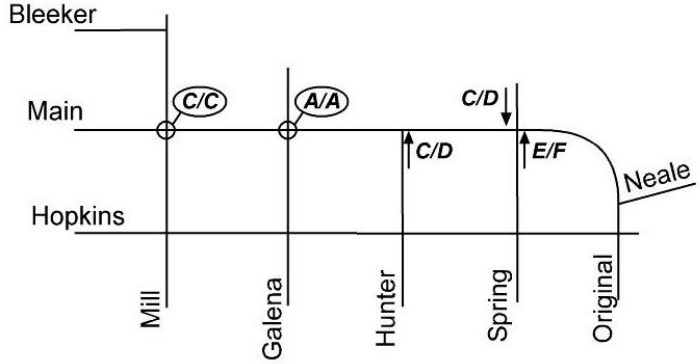
Table IV-25
LOS Near Buttermilk Station

Intersection Signalized *Unsignalized*	Movement	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
Highway 82 & Buttermilk Road	**Overall**	**B**	**C**	**C**	**C**	**C**	**D**	**C**	**C**	**C**

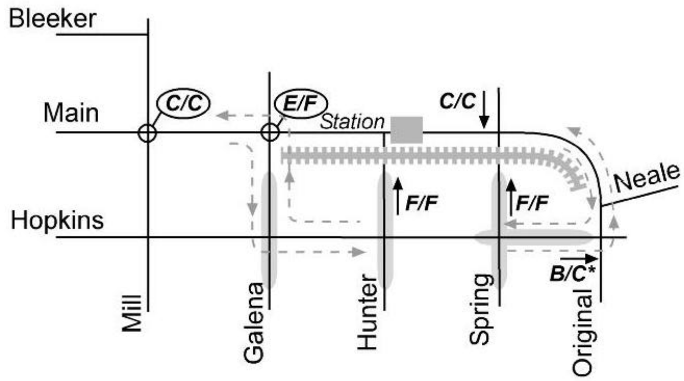
2.2.12 Aspen Rail Station

Impacts. For the Rail Alternative, the proposed Rail Station in Aspen will be located on the south side of Highway 82 (Main Street) between Galena and Spring Streets. (The LRT turns south at Monarch and ends at Rubey Park. Impacts of LRT in Aspen were examined in the *Entrance to Aspen ROD*.) During the 2025 peak period, the Rail Alternative will require a four-car train (approximately 1,000 feet), which will block the northbound approaches to Main Street at Spring and Hunter Streets.

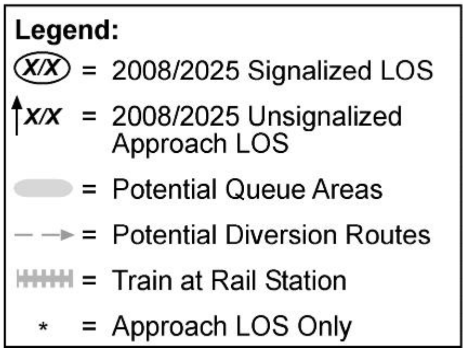
Figure IV-5: Traffic Impacts at Aspen Rail Station



A: Downtown Aspen LOS Without Train
(No Action/Committed Projects, BRT-Bus, and BRT-LRT Alternatives)
PM Peak Hour



B: Downtown Aspen LOS With Train
(Rail Alternative)
PM Peak Hour



The construction of cul-de-sacs for Spring and Hunter Streets on the south side of Main is proposed as part of the design for this alternative. The analysis below explains why this is needed.

A LOS analysis was undertaken to evaluate the impact of the train blocking these streets. The LOS analysis used the peak 15 minutes as a worst case scenario. The LOS analysis was completed for the No Action / Committed Projects and BRT alternatives, shown in Figure IV-5A. In the Rail Alternative, it was assumed that all northbound to westbound traffic would move to Galena and all northbound through traffic and northbound to eastbound traffic would move to the nearest open intersection (Galena or Original Street) via Hopkins Avenue (Figure IV-5B). The northbound approaches to Main Street operate at LOS F, as the approach is blocked, causing unacceptable delays. In addition, the LOS at the open intersections drops due to the diverted traffic. It should be noted that the approach LOS for eastbound Original Street (Figure IV-5 Part B) is for diverted traffic only, and does not include existing traffic volumes.

The LOS at the signalized intersection of Main and Galena is worse than the No Action/Committed Alternative. This LOS can be improved to C in 2008 and 2025 by re-timing the signal based on the diverted traffic volumes.

In lieu of the proposed cul-de-sacs, the train sitting in the Aspen Station would cause traffic northbound on Hunter and Spring to back up since it could not proceed past the train. The delays to this traffic would range up to 15 minutes (the anticipated train dwell time). Motorists tend to be impatient, and may begin making U-turns to find different routes. If sufficient lines form, the intersections of Hunter and Spring with Hopkins Avenue could be blocked. After the train departs, the backed-up traffic would move to the Hunter and Spring intersections with Main Street, possibly overloading these intersections while the back-ups dissipate. With the introduction of the cul-de-sacs at Spring and Hunter Streets, traffic patterns would shift to Galena and Original, providing an improved condition without blockage of flow due to the train. Potential diversion routes created by the cul-de-sacs are shown on figure IV-5B**.**

Mitigation. ITS elements could be used along Hopkins Avenue to improve traffic flows when trains are present.

A cursory congestion analysis has been completed. The peak 15-minute volume crossing the tracks northbound is assumed to occur while the train is in the station. Based on these volumes, back-ups without the cul-de-sacs would extend south by up to four city blocks. With the design of cul-de-sacs and supportive ITS elements, the likelihood of train-caused back-ups decreases. Some increased congestion will be apparent on Hopkins as traffic seeks through streets for departure from the area.

Table IV-26 shows the unsignalized intersections that meet the peak-hour warrant for each alternative. Even if the train is not blocking intersections, Hunter will meet the peak-hour warrant.

Table IV-26
Peak-hour Signal Warrant Satisfied Near Aspen Station

Intersection	Existing	2008 No Action	2008 BRT-Bus	2008 BRT-LRT	2008 Rail	2025 No Action	2025 BRT-Bus	2025 BRT-LRT	2025 Rail
Highway 82 (Main Street) & Hunter Street	No	Yes	Yes	Yes	Yes*	Yes	Yes	Yes	Yes*
Highway 82 (Main Street) & Spring Street	No	No	No	No	Yes	Yes	Yes	Yes	Yes

** Based on volumes when the train does not block the intersection*

2.2.13 Rubey Park.

Impacts and Mitigation. The Rubey Park Transit Station is located on Durant Avenue between Mill and Galena Streets in Aspen. This station is not proposed for the Rail Alternative. The LOS results are shown in Table IV-27. The LOS analysis shows that this facility will have minimal impact on traffic operations at this intersection. The peak-hour signal warrant, Table IV-28, is not satisfied at Durant and Monarch and is barely met in 2025 at Durant and Hunter.

Table IV-27
LOS for Intersections Near Rubey Park

Intersection / **Signalized** / *Unsignalized*	**Movement**	**Existing**	**2008** No Action	BRT-Bus	BRT-LRT	**2025** No Action	BRT-Bus	BRT-LRT
Durant Street & Hunter Street	• *Left*	*B*	*B*	*B*	*B*	*B*	*B*	*B*
	• *Approach*	*A*	*A*	*A*	*A*	*B*	*B*	*B*
Durant Street & Monarch Street	• *Approach*	*C*	*C*	*C*	*C*	*C*	*C*	*C*

Table IV-28
Peak-hour Signal Warrant Satisfied Near Rubey Park

Intersection	**Existing**	**2008** No Action	BRT-Bus	BRT-LRT	**2025** No Action	BRT-Bus	BRT-LRT
Durant Street & Hunter Street	No	No	No	No	Yes	Yes	Yes
Durant Street & Monarch Street	No	No	No	No	No	No	No

3. Maintenance Facilities

Maintenance activities will be accommodated by the expansion/reconstruction of existing RFTA maintenance facilities. Increases in bus traffic will occur on streets accessing these facilities. The West Glenwood Springs Bus Maintenance Facility will be somewhat expanded on location. Minimal changes are expected at the Aspen Bus Maintenance Facility. A new facility will be constructed at the Carbondale location for the Build alternatives.

3.1 Impacts

The impact of the proposed new Carbondale maintenance facility on traffic operations was analyzed for the LOS of the adjacent intersection of Highway 133 and Industry Place. The analysis was conducted using the same assumptions and procedures as described above. A review of the roadway trip generation for the proposed Carbondale Maintenance Facility was undertaken. The following components were considered:

Peak-Hour Bus Activity. Bus service levels are highest during peak hours. Therefore, the vehicles are on the road prior to each peak period, and return to the facility after the peak period ends.

Vehicle Operators. The employees that operate these vehicles arrive at and depart from the maintenance facility during off-peak periods, for similar reasons.

Maintenance Employees. The vehicles are maintained during off-peak periods (when they are at the facility), and these employees typically arrive and depart after the buses and/or rail vehicles have returned from the evening shift.

Administrative Staff. Maintenance operations require an administrative staff. Because this staff is already in place at the Glenwood and Aspen facilities, administrative trips at the Carbondale facility would be limited.

Based on these considerations, it was assumed that trip generation for the Carbondale Maintenance facility was negligible during the PM peak hour analyzed, and therefore the LOS analysis only reflects the increase in trips along Highway 133 from the nearby park-and-ride.

3.2 Mitigation

The LOS results for each alternative at Highway 133 and Industry Place are shown in Table IV-29. The Industry Place approach to Highway 133 currently operates at LOS F and the peak-hour signal warrant is satisfied for existing conditions and all future alternatives. The analysis assumes Industry Place and Highway 133 remains a three-way intersection. The *SH 133 Corridor Feasibility Study* (CDOT, August 2002) recommended a full-movement intersection at this location. The study also recommended providing a full-movement intersection at Nieslanik Avenue, which is 400 feet south of Industry Place. As a result of this CIS, a signal is recommended at either Industry Place or Nieslanik Avenue, depending on development and signal warrants.

Table IV-29
LOS Near Carbondale Maintenance Facility

Intersection			2008				2025			
Signalized / *Unsignalized*	**Movement**	**Existing**	**No Action**	**BRT-Bus**	**BRT-LRT**	**Rail**	**No Action**	**BRT-Bus**	**BRT-LRT**	**Rail**
Highway 133 & Industry Place	• *Left*	*A*	*B*	*B*	*B*	*B*	*B*	*B*	*B*	*B*
	• *Approach*	*F*	*F*	*F*	*F*	*F*	*F*	*F*	*F*	*F*

E. SAFETY

1. Traffic Safety

Chapter III.C.19 includes existing traffic safety information for Highway 82. The projected improvements may affect safety in the Project Corridor. Because accidents are random events, it is difficult to predict quantitative changes in crash rates based on potential roadway improvements. However, qualitative improvements can be described. The three Build alternatives proposed for the Project Corridor are intended to provide mobility options that should reduce congestion. That reduction can be assumed to bring a comparable reduction in congestion-related collisions (typically rear-end accidents). The BRT Alternatives introduce several elements that should affect roadway safety. Most bus stops will be relocated away from the roadside in park-and-ride facilities. This reduces the potential for fixed-object collisions as the number of fixed roadside objects is reduced. However, the introduction of queue bypass lanes in certain segments of the Project Corridor will increase the number of vehicular conflict points, potentially having a negative effect on safety. Appropriate design for the queue bypass lanes can mitigate this impact. The Rail Alternative introduces at-grade rail crossings that create the potential for highway-rail collisions. These impacts and related mitigation measures are described in the following section of this report.

2. Railroad Crossing Safety

The No Action/Committed Projects, BRT-Bus, and BRT-LRT Alternatives have no new impacts associated with at-grade railroad crossings. Existing DOT safety and regulatory policies will prevail for the Rail Alternative.

The Rail Alternative includes railroad crossings of approximately 124 public and private roadways along the Project Corridor (Legacy Project Grant Agreement, Exhibit I, List A, *Inventory of Existing Uses*, RFRHA, 1997). Many of these crossings currently exist, but trains have not operated in the Project Corridor since the mid 1990's. New crossings would be created for sections where the rail is on a new alignment. There are opportunities to consolidate many of the crossings. The *Roaring Fork Railroad Access Control Plan* (RFRHA, 1999) included a "Policy for Managing Railroad Crossings." This policy defined and provided design standards for existing and new crossings. Grade-separated crossings are preferred and would be required when exposure factors are exceeded. The exposure factors are calculated by train frequency and traffic volume projections. At-grade crossings of public or private roads generally would not be permitted except where the train operates at slow speeds, and/or appropriate safety features are included. The safety measures for at-grade crossings of public roads would include:

- cross-buck signage with lights and bells,
- automated gates,
- audible warning devices (in select areas pending regulatory review),
- approved roadway crossing surface and related design elements,
- approach signage and pavement markings, and
- other safety features as required by the Colorado Public Utilities Commission (PUC).

At-grade crossings of private roads would include an approved roadway crossing surface and related design elements, and some or all of the above safety features, depending on the projected average daily traffic.

These elements would help mitigate the potential safety impacts of new rail service over existing crossings and new grade crossings corridor-wide. A public safety campaign (such as provided by Operation Lifesaver) could further mitigate these impacts.

The specific design standards and specifications, as well as detailed descriptions of specific crossings along the Project Corridor, can be found in the *Roaring Fork Railroad Access Control Plan* (RFRHA, 1999) and its supporting technical documents.

3. Pedestrian and Bicycle Facilities Safety

3.1 Grade-Separated Crossings

Highway 82 is a major barrier to the travel and safety of bicyclists and pedestrians. Under The No Action/Committed Projects Alternative, transit users must often cross more than four lanes of pavement to reach transit stops, with traffic traveling at speeds exceeding 104.6 kilometers (65 miles) per hour. The No Action/Committed Projects Alternative will result in continued degradation of conditions for bicyclists and pedestrians crossing this roadway. All of the Build alternatives improve conditions by adding grade-separated crossings for bicyclists and pedestrians near most station locations. Table IV-30 lists the proposed pedestrian/bicycle facilities near stations along Highway 82.

In Glenwood Springs, Carbondale, and Aspen, each Build alternative would provide ADA-compliant crosswalks near stations for pedestrian access.

Table IV-30
Pedestrian and Bicycle Facility Treatment for Highway 82

	Grade-Separated Crossing	
Station	**No Action/ Committed Projects Alternative**	**Build Alternatives**
South Glenwood	No	Yes (BRT only)
CMC	No	Yes (BRT only)
Carbondale/Highway 133	No	Yes*
El Jebel at El Jebel Road	Yes **	Yes **
El Jebel at Willits Lane	No	Yes
Basalt	No	Yes
Brush Creek	Yes **	Yes **
Airport	No	Yes
Buttermilk	Yes ***	Yes ***

* *Grade-separated crossing of Highway 133*
** *Existing*
*** *Grade-separated crossings of Highway 82 exist immediately east (Tiehack Road) and west (Stage Road) of the Buttermilk Station.*
Source: *Glenwood Springs to Aspen CIS/EIS Financial Technical Memoranda (Otak, et. al., 2000)*

3.2 Safety

Implementation of the BRT Alternative(s) will not adversely impact bicycle or pedestrian travel with the inclusion of the pedestrian grade separations described above. The Rail Alternative introduces an additional hazard for pedestrians and bicyclists due to the proximity of trains to pedestrian and bicycle activity. About one-half of the Project Corridor would have the rail alongside the Rio Grande Trail. The tracks would be separated from the Rio Grande Trail by a buffer area of natural vegetation. Physical barriers such as fences or retaining walls would be provided when buffer areas are less than six meters (20 feet) wide. Figures II-24 through Figure II-28 in Chapter II: Alternatives display typical cross-sections of the rail with Rio Grande Trail. Additional discussion on trail safety can be found in Chapter III.C.18.3.

The Rio Grande Trail will have grade-separated railroad crossings except at locations meeting both of the following conditions:

1. Site constraints prevent development of a separated crossing, and
2. The crossing is essential to implement the Public Recreation Trail Plan.

However, each at-grade crossing will expose Rio Grande Trail users to potential accidents. When at-grade Rio Grande Trail crossings are provided, they will include at a minimum:

- stop signs,
- cross-buck signage,
- bells,
- pavement markings, and
- other safety features such as z-crossings as site conditions warrant.

V. ENVIRONMENTAL CONSEQUENCES

This chapter discusses the impacts associated with each of the three alternatives evaluated in this CIS. Prior alternative screening included the objective of developing a system that avoids, minimizes and mitigates adverse environmental, social, and economic impacts. **Chapter I: Purpose and Need** describes all nine project objectives. **Chapter II: Alternatives** summarizes the prior screening process.

Both direct impacts (caused by the proposed action and expected to occur at the same time and place) and indirect impacts (expected to occur later in time and farther removed in distance) are addressed. Although not required, the intent of this analysis is to meet the spirit of the National Environmental Policy Act (NEPA) in the following manner:

- A comprehensive range of alternatives was identified during the initial screening process as reviewed in Chapter II.
- An open public involvement process was conducted as was summarized in Chapter IX.
- An assessment of environmental issues was conducted during the earlier Screening Process that resulted in the selection of the final three alternatives for consideration in this report as noted in Chapter II. Impacts of the alternatives identified in this CIS have been identified and considered as noted in the current chapter.
- The analysis of alternatives was conducted in a systematic and interdisciplinary manner as presented in this document.

Cumulative impacts on the environment result from the incremental effect of an action when added to other past, present, and reasonably foreseeable future actions, regardless of responsible agency or person. Cumulative impacts are addressed in **Chapter VI: Cumulative Impacts**. Transportation impacts are addressed in **Chapter IV: Transportation Impacts**. When used in this chapter, the terms *impacts* and *effects* are synonymous. The chapter is organized to complement **Chapter III**: **Affected Environment**. Impacts to potentially affected resources are outlined by alternative. The three alternatives are:

- **No Action/Committed Projects**. Impacts associated with committed projects have been identified and mitigated under other environmental actions. Impacts associated with the previously-approved *Entrance to Aspen FEIS* and *ROD* are not generally addressed in this chapter. Appropriate avoidance or mitigation measures have been implemented as a part of the previous analyses.

  Additional environmental analyses are not required for the following existing or previously-approved transit stations from the *Entrance to Aspen FEIS* and *ROD*:

  - Pitkin County Airport Transit Station
  - Buttermilk Station, Aspen - Maroon Creek Road Station
  - Aspen -7th and Main Station,
  - Aspen - 3rd and Main Station
  - Monarch Street Station
  - Rubey Park Station

Additional environmental analyses are not required for the following locations. Stations designed and constructed independently of the *Entrance to Aspen FEIS* and *ROD*, but considered part of the No Action/Committed Projects Alternative include:

- Snowmass Village Transit Center (locally funded)
- Brush Creek Road Station (*Basalt to Buttermilk ROD)*
- Rodeo Lot at Brush Creek and Owl Creek Road intersection (locally funded)
- Main Street at Paepcke Park Transit Stop (existing)

Existing storage and maintenance facilities are located in industrial areas in Glenwood Springs, Carbondale, and Aspen. Expansion or reconstruction of these facilities associated with the Build alternatives will occur within existing RFTA right-of-way, and generally will not require environmental analyses.

- **Bus Rapid Transit (BRT) Alternative + Trail**. Impacts of this alternative are minimal due to the use of existing roadways to implement additional bus service and routes. New transit stations or park-and-ride lots will require 11.76 additional hectares (29.06 acres) of right-of-way. Eight new transit station locations will be addressed with regard to environmental impacts:

  - West Glenwood Springs (Midland south of I-70)
  - Downtown Glenwood Springs (the wye at 8th)
  - South Glenwood Springs
  - Colorado Mountain College (County Road 54)
  - Highway 133 in Carbondale
  - Downtown Carbondale (4th and Colorado)
  - El Jebel (Highway 82 at either El Jebel Road or Willits Lane)
  - Basalt (Midland Avenue, west of Texaco)

  Within the BRT Alternative, there are two sub-alternatives. For the purpose of this study, BRT-Bus assumes that bus routes to/from the rest of the Project Corridor would operate between Buttermilk and Aspen on a dedicated two-lane busway to downtown Aspen. An existing transit stop in Aspen (Main Street at Paepcke Park) will be replaced or enhanced for the BRT-Bus sub-alternative. BRT-LRT assumes a cross-platform transfer to the Entrance to Aspen light rail system at the Buttermilk Transit Station if light rail is funded by local government(s). Transit stations approved under No Action/Committed Projects will be utilized along the LRT route. The Glenwood Springs, Carbondale, and Aspen Maintenance Facilities will be enhanced within the existing RFTA properties to accommodate this alternative.

  In the analyses below, sub-alternatives will only be referenced when a direct or indirect impact is unique to one sub-alternative. Otherwise, a general reference to the BRT Alternative will be made.

  The new Rio Grande Trail is also included in this alternative. The trail will be located totally within the RFTA right-of-way, beginning with its connection to the Glenwood Springs River Trail at 23rd Street in Glenwood Springs, and continuing 51.5 kilometers (32 miles) Upvalley to its connection with the existing Rio Grande Trail at Woody Creek.

- **Rail Alternative + Trail**. This alternative includes the proposed rail alignment (Alignment C and sub-alternative CS-1) from West Glenwood Springs to Hunter Street in Aspen and associated bus system improvements. Impacts associated with freight hauling are identified only when they occur in addition to those associated with commuter rail. Seven new station locations will be addressed with regard to environmental impacts:

- West Glenwood Springs (Midland south of I-70)
- Downtown Glenwood Springs (the wye at 8th)
- Highway 133 in Carbondale
- Downtown Carbondale (4th and Colorado)
- El Jebel (Highway 82 at either El Jebel Road or Willits Lane)
- Basalt (Midland Avenue, west of Texaco)
- Downtown Aspen (Main Street at Galena)

The Glenwood Springs, Carbondale, and Aspen Maintenance Facilities will be enhanced within the existing RFTA properties to accommodate this alternative. New facilities will be constructed on site in Carbondale.

The addition of rail traffic to the LRT alignment in Aspen is addressed in cases where it will create an added impact. This is also discussed in **Chapter VI: Cumulative Impacts**. Transit stations approved under No Action/Committed Projects will be utilized along the shared LRT route. The extension of the Rail Alternative between Monarch and Hunter Streets in Aspen, beyond the scope of the Entrance to Aspen project, is also addressed as a part of the Rail Alternative.

The rail alignment runs in existing RFTA right-of-way and Highway 82 right-of-way, except where it parallels County Road 100 near Catherine Store. Minor additional right-of-way will be needed along Highway 82 and County Road 100. Total additional right-of-way needs are estimated at 18.85 hectares (46.57 acres) for the entire route: 8.97 hectares (22.18 acres) for transit stations or park-and-ride lots, and 9.17 hectares (22.67 acres) for rail alignment areas outside of the RFTA right-of-way.

The new Rio Grande Trail is also included in this alternative. The trail will be located totally within the RFTA right-of-way, beginning with its connection to the Glenwood Springs River Trail at 23rd Street in Glenwood Springs, and continuing 51.5 kilometers (32 miles) Upvalley to its connection with the existing Rio Grande Trail at Woody Creek

In the subsections below, the Trail discussion is separate from the two Build alternatives with which it is associated. Opening day (Year 2008) and Year 2025 time frames are discussed as applicable in each subsection.

Resources that will have impacts requiring mitigation beyond best management practice (BMP) techniques include: Right-of-Way and Relocation, Environmental Justice, Wetlands, Noise, and Hazardous Materials. Each of these resource areas together with potential project impacts will be reassessed upon selection of a Preferred Alternative. Implementation of the proposed Rio Grande Trail will also require reconsideration of Wetlands and Hazardous Materials impacts prior to construction. Wetlands impacts will be re-assessed as a part of the Section 404 permit process.

A. SOCIAL IMPACTS

This section addresses direct and indirect effects of the proposed alternatives on the social environment. Due to the nature of this project, and because it involves alternatives that are mostly constructed and/or operated along existing rights-of-way, there are often very few direct and only minor indirect impacts for these resources.

1. Neighborhood Impacts

This discussion is based on the background information presented in **Chapter III.A.1: Population** and **III.A.2: Demographics**. Neighborhood impacts include changes in Project Corridor neighborhoods as a result of proximity to a Build alternative, isolation of portions of neighborhoods, generation of new development patterns, changing property values (in either direction), or separation of local residents from access to daily activities.

The following impacts are discussed in the applicable subsections below:

- proximity impacts
- accessibility and isolation issues related to congestion at station locations
- changes in development patterns associated with transit-oriented development

Note that congestion at the following committed park-and-ride and/or station locations and maintenance facilities will occur for all alternatives, resulting in poor levels of service for opening day: Carbondale at Highway 133, El Jebel at Willits Lane, and the Carbondale Maintenance Facility. By 2025 all alternatives will result in poor levels of service associated with West Glenwood Springs, the West Glenwood Springs Maintenance Facility, Downtown Glenwood Springs, and the CMC areas, as well as Carbondale at Highway 133, the Carbondale Maintenance Facility, both El Jebel locations, Brush Creek Road, the Airport, and Buttermilk. **Chapter IV.D.2: Station Areas and Major Intersections** summarizes these impacts. Although the park-and rides and stations themselves are not located in residential areas, traffic congestion in these areas will indirectly affect adjacent neighborhoods.

1.1 No Action/Committed Projects Alternative

No new impacts have been identified for this alternative for opening day or the year 2025 time frame. However, poor levels of service at park-and-ride locations may compromise access to adjacent neighborhoods.

1.2 Trail

The proposed trail will follow the existing RFTA right-of-way and will not intrude into any neighborhoods. Where the RFTA right-of-way passes adjacent to a neighborhood, trail access will be a neighborhood enhancement. No differences have been assessed for opening day or the year 2025 time frame.

1.3 BRT Alternative

Both sub-alternatives will follow existing Highway 82 to the connection with the previously approved LRT or dedicated busway at the Buttermilk Transit Station.

1.3.1 Opening Day Time Frame.

Proximity. No proximity impacts have been identified for the BRT alternative since it will follow existing Highway 82 throughout. For opening day, an 11 to 12 percent decrease in vehicle miles traveled (VMT) in the Project Corridor is forecast for the BRT- LRT and BRT-Bus alternatives, respectively. This means fewer miles of driving along Highway 82 than under No Action/Committed Projects.

Accessibility. Poor levels of service at park-and-ride and station areas may also compromise access to adjacent neighborhoods.

Development Patterns. Historically, incorporated communities in the Roaring Fork Valley support transit-oriented development. The small block sizes, street grids, storefronts, and mix of housing and commercial activity within close proximity are all legacies of the Valley's railroad era. This historic integration of land use and transportation created today's pedestrian-friendly communities. These patterns will be reinforced by the implementation of proposed transit station designs and transit-oriented development planning.

1.3.2 Year 2025 Time Frame.

Proximity. No proximity impacts have been identified for the BRT alternative since it will follow the existing Highway 82 throughout. For 2025, a 10 to 12 percent decrease in VMT in the Project Corridor is forecast for the BRT-LRT and BRT-Bus alternatives, respectively.

Accessibility. Poor levels of service at park-and-ride and station areas may also compromise access to adjacent neighborhoods.

Development Patterns. Transit-oriented development patterns will continue to be reinforced by the implementation of proposed transit station designs.

1.4 Rail Alternative

1.4.1 Opening Day Time Frame.

Proximity. Two hundred ninety households will be within 30 meters (100 feet) of the proposed Rail Alternative alignment. Half of the affected households are located in Glenwood Springs or Carbondale. The remainder are found at Aspen Village and other Upper Valley (El Jebel to Aspen) communities. The passing trains will be audible to these households, and for many, the train will also be visible. **Section 17** below discusses visual impacts. **Section 16** below discusses noise and vibration impacts. For opening day, an 11 percent decrease in VMT in the Project Corridor is forecast for the Rail Alternative over the No Action/Committed Projects Alternative. This means that households in proximity to the Rail when it is located along Highway 82 may notice somewhat less highway traffic.

Accessibility. Poor levels of service at park-and-ride and station areas may also compromise access to adjacent neighborhoods.

Development Patterns. Historically, incorporated communities in the Roaring Fork Valley support transit-oriented development. The small block sizes, street grids, storefronts, and mix of housing and commercial activity within close proximity are all legacies of the Valley's railroad era. This historic integration of land use and transportation created today's pedestrian-friendly communities. These patterns will be reinforced by the implementation of proposed transit station designs and transit-oriented development planning.

1.4.2 Year 2025 Time Frame

Proximity. The same 290 households will be affected by the Rail Alternative in 2025. A 10 percent decrease in VMT over the No Action/Committed Projects Alternative is forecast for 2025. This may be discernable by households adjacent to the rail line.

Accessibility. Poor levels of service at park-and-ride and station areas may also compromise access to adjacent neighborhoods.

Development Patterns. Transit-oriented development patterns will continue to be reinforced by the implementation of proposed transit station designs.

2. Relocation and Right-of-Way Impacts

This new subsection is responsive to data presented in **Chapter III.A.1: Population** and **III.A.2: Demographics.**

2.1 No Action/Committed Projects Alternative

No new right-of-way or relocation impacts are expected for this alternative for opening day or 2025.

2.2 Trail

No right-of-way or relocation impacts for opening day or 2025 are expected for the new Rio Grande Trail, which will be constructed totally within existing RFTA right-of-way.

2.3 BRT Alternative

2.3.1 Opening Day Time Frame. Estimated right-of-way associated with the proposed new transit station and park-and-ride locations totals 11.76 additional hectares (29.06 acres). Table V-2 annotates right-of-way associated with the BRT Alternative. There is no difference in station right-of-way requirements for the BRT-Bus or BRT-LRT sub-alternatives. New stations and park-and-ride locations are proposed for vacant or undeveloped parcels. No relocations are associated with station or park-and-ride locations for this alternative.

2.3.2 Year 2025 Time Frame. No additional right-of-way or relocations are anticipated by 2025.

2.4 Rail Alternative

2.4.1 Opening Day Time Frame. All right-of-way and relocation impacts for this alternative are associated with opening day. Table V-1 summarizes residential and business relocations for the Rail Alternative. Table V-2 annotates the right-of-way takes associated with the Rail Alternative. Right-of-way includes alignment, transit station, and park-and-ride acreage. No relocations are associated with station or park-and-ride locations for this alternative. Fourteen residential and three business relocations are anticipated as follows:

- Two business relocations in Glenwood Springs on the east side of the RFTA rail corridor between 8th Street and 12th Street. These relocations are related to a series of small storage buildings or warehouses located close to the rail right-of-way. No activity has been observed at these locations. Several of the buildings are empty.

- One residential relocation south of Buffalo Valley is along County Road 154 and just south of the County Road 109 intersection.
- One business relocation north of Satank Bridge is near the confluence of the Roaring Fork and Crystal Rivers. This small nursery/greenhouse has temporary license to operate adjacent to and within the RFTA right-of-way.
- One residential relocation in Carbondale is south of 2nd Street.
- Eleven residential relocations (out of 73 units) from the Aspen-Basalt Mobile Home Park between El Jebel and Basalt are on the southwest side of Highway 82 near the southeast intersection of Willits Lane. (See additional discussion under **Section 3. Environmental Justice** in this chapter.)
- One residential relocation in Snowmass Canyon is just north of Gerbazdale.

Table V-1
Rail Alternative Relocation Impacts

Location	Residential Relocation	**Business Relocation**
Glenwood Springs	--	2
South of Buffalo Valley	1	--
North of Satank Bridge	--	1
Carbondale	1	--
El Jebel: Aspen-Basalt Mobile Home Park	11	--
Snowmass Canyon	1	--
Total	14	3

Table V-2
Right-of-Way Acquisitions for the Build Alternatives Alignments

	BRT Alternative		**Rail Alternative**	
Project Segment	**hectares**	**acres**	**hectares**	**acres**
West Glenwood Springs to South Glenwood Spgs	0	0	0.23	0.56
South Glenwood Springs to Catherine Store	0	0	0.08	0.20
Catherine Store to Wingo Junction	0	0	5.08	12.55
Wingo Junction to Gerbazdale	0	0	1.11	2.75
Gerbazdale to Brush Creek Road	0	0	2.09	5.17
Brush Creek Road to Aspen	0	0	0.58	1.43
Total Additional Alignment Right-of-Way	0	0	9.17	22.67
Stations				
West Glenwood	3.51	8.68	3.51	8.68
Wye Station - Downtown	0.89	2.19	0.89	2.19

Table V-2
Right-of-Way Acquisitions for the Build Alternatives Alignments

Project Segment	BRT Alternative		Rail Alternative	
	hectares	acres	hectares	acres
Colorado Mountain College	0.70	1.72	0.00	0.00
South Glenwood	1.39	3.44	0.00	0.00
Carbondale at Highway 133	2.49	6.15	2.49	6.15
Downtown Carbondale	.70	1.72	.70	1.72
El Jebel at Willits	1.39	3.44	1.39	3.44
or				
El Jebel at El Jebel Road	See Willits above	See Willits above	See Willits above	See Willits above
Basalt at Midland	0.69	1.71	0.69	1.71
Downtown Aspen - Main at Galena	NA	NA	0.00	0.00
Total Right-of-Way for Stations	11.76	29.06	9.67	23.90
TOTAL Additional Right-of-Way	11.76	29.06	18.85	46.57

It is customary to include population characteristics in relocation studies of this type. Since individual locations are easily identifiable due to the low number and specific locations within the 83.7-kilometer (52-mile) lenth of the rail corridor, information on race, ethnicity, and income levels is excluded to protect individual privacy.

The majority of potential residential relocations affect mobile home inhabitants, who are generally service workers in Aspen with incomes that restrict housing opportunities. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, provides for fair and equitable treatment of all persons displaced from their homes, businesses, or farms. No person shall be displaced by a federal-aid project unless and until adequate replacement housing has been offered to all affected persons, regardless of race, color, religion, gender, or national origin. All relocatees are given a minimum of 90 days in which to find replacement housing or business locations. All qualified relocatees receive monetary payments, which may include payments for moving expenses, business-in-lieu payments, rent supplement, down payments, and increased interest payment. Assistance will be provided to any eligible owner or tenant in relocating their buisness or residence at the time of displacement. Benefits under the Uniform Act, to which each eligible owner or tenant may be entitled, will be determined on an individual basis and explained to them in detail in addition to information regarding their financial options.

In general, the Valley has a housing shortage. Not only is there a shortage of housing units of all types, but there is also a shortage of immediately developable land. While multitudes of housing units are planned for development in Aspen and areas Downvalley, there is limited affordable housing available at this time.

2.4.2 Year 2025 Time Frame. No additional right-of-way or relocations are anticipated by 2025.

3. Environmental Justice Impacts

This assessment is intended to identify whether minority and/or low-income populations are likely to experience adverse <u>and</u> disproportionate environmental or human health impacts resulting from implementation of the project alternatives.

The goals of federal Environmental Justice (EJ) regulations are:

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

The Environmental Justice analysis for this project included the following five steps:

1. Outreach to minority and low-income populations to identify possible EJ issues
2. Addressing EJ concerns identified by the community in the scoping process
3. Describing minority and low-income populations in the project area
4. Consulting with local resources
5. Assessing the potential for EJ impacts for each Alternative

Although no significant issues or negative impacts were identified in the scoping process, a thorough analysis of steps two, three, four, and five was conducted. In general, individuals interviewed from Project Corridor communities were in favor of BRT and Rail alternatives due to the potential benefits for low-income and minority populations, given adequate access to transit stations.

Low-income and minority participants had similar issues to other publics: cost, safety, and alignment. However, those issues were not related to Environmental Justice (see **Chapter IX: Public Involvement**). Three issues which received greater emphasis from minority populations are listed below.

Subsidized Transit Passes. There was strong interest in expanding the existing RFTA programs that encourage employers to provide bus passes for employees. This was considered a significant employee benefit. This issue is addressed in both Build alternatives by including enhanced Transportation Demand Management (TM) programs, with a commitment to work with local employers. For additional information on TM programs see **Chapter II: Alternatives: C.2.3.6 and C.3.3.6.**

Emphasis on serving employment centers. There was an interest in increasing express service to Snowmass Village and Aspen for resort workers. Both Build alternatives have been optimized to provide long hauls with high levels of service. The BRT Alternative includes super-express service during peak hours, and the Rail Alternative provides a high level of service to both Aspen and Glenwood Springs.

Reliability. There was a strong interest in increasing the ability to arrive at work on time in order avoid tardiness penalties imposed by employers. There were reports of people losing their job due to unpredictable bus arrivals and lack of facilities at bus stops to call employers. In particular, winter reliability was a concern among current bus riders.

3.1 No Action/Committed Projects Alternative

There will be no adverse and disproportionate impacts to minority, low-income, or elderly populations in the opening year or in 2025 as a result of the No Action/Committed Projects Alternative.

This alternative will fail to significantly improve transit service for transit-dependent populations identified in **Chapter III.A.3: Affected Environment-Environmental Justice.** Additional potential impacts to targeted populations have been identified in Environmental Justice analyses previously conducted for individual committed projects.

The completion of the Entrance to Aspen LRT project would create additional transit capacity into the employment center of Aspen. Incremental increases in transit service are expected as local taxes allow, but these increases will be unable to meet transit demand by 2025. The system will continue to support a primary orientation toward Upvalley employment centers in Snowmass Village and Aspen.

3.2 Trail

No opening day or 2025 impacts are associated with the implementation of the new Rio Grande Trail.

3.3 BRT Alternative

There are no identified disproportionate impacts to minority, low-income, or elderly populations in opening year or in 2025.

The proposed transit improvements will provide more reliable, higher-quality service and better access to employment and retail centers. Transit improvements will benefit those who are transit-dependent and those who rely on transit for access to employment centers. These improvements will increase accessibility to employment, retail outlets, and recreation. Additional choices in employment and retail spending will benefit low-income and minority populations. The *Entrance to Aspen FEIS and ROD* addressed impacts related to construction of the LRT system into Aspen.

3.4 Rail Alternative

3.4.1 Opening Day Time Frame.

The Rail Alternative will significantly improve transit service for transit-dependent populations, provide more reliable and higher-quality service, and significantly improve access to employment and retail centers. The collector bus system would also provide new intra-city bus service that would benefit the transit-dependent populations.

Noise Impacts. Eighty-nine impacted receiver sites are identified in the noise and vibration analysis. Receiver sites identified in this report were visited and assessed for concentrations of low-income, minority, or elderly residents. Four areas of possible concern were identified. Additional information on receiver site mitigation is found in **Chapter VII.16.**

- **H Lazy F Mobile Home Park.** Three receivers (sites R143-R145) are located in the H Lazy F Mobile Home Park near Glenwood Springs along existing Highway 82 and the new Rail alignment. Existing Highway 82 noise levels are actually higher than noise levels forecast for the Rail Alternative. However, the impact level still exceeds the FTA onset-of-impact level.

- **Mountain Valley Mobile Home Park.** Receiver site R387 represents 17 homes in the Mountain Valley Mobile Home Park behind the Red Rock Diner in Carbondale, along the RFTA right-of-way. The rail alignment is located in a cut section adjacent to these homes. The future impact level will only be one decibel over the FTA onset-of-impact criteria.

- **Roaring Fork Mobile Home Park.** The Basalt Station would potentially affect approximately 23 mobile homes at the Roaring Fork Mobile Home Park. The Town of Basalt has already committed to redeveloping the mobile home park as part of the *Basalt River Master Plan* (Basalt, 2002) because the current park lies in a flood hazard area. The Town has a 100 percent replacement housing policy that will guide redevelopment impacts to the pool of affordable housing. Redevelopment is expected to occur prior to the proposed Basalt Station construction and will preclude this future impact.

- **Philips Mobile Home Park**. There are four impacted sites (R909,R911-R913) in the area commonly referred to as the Phillips Mobile Home Park along Lower River Road in Snowmass Canyon.

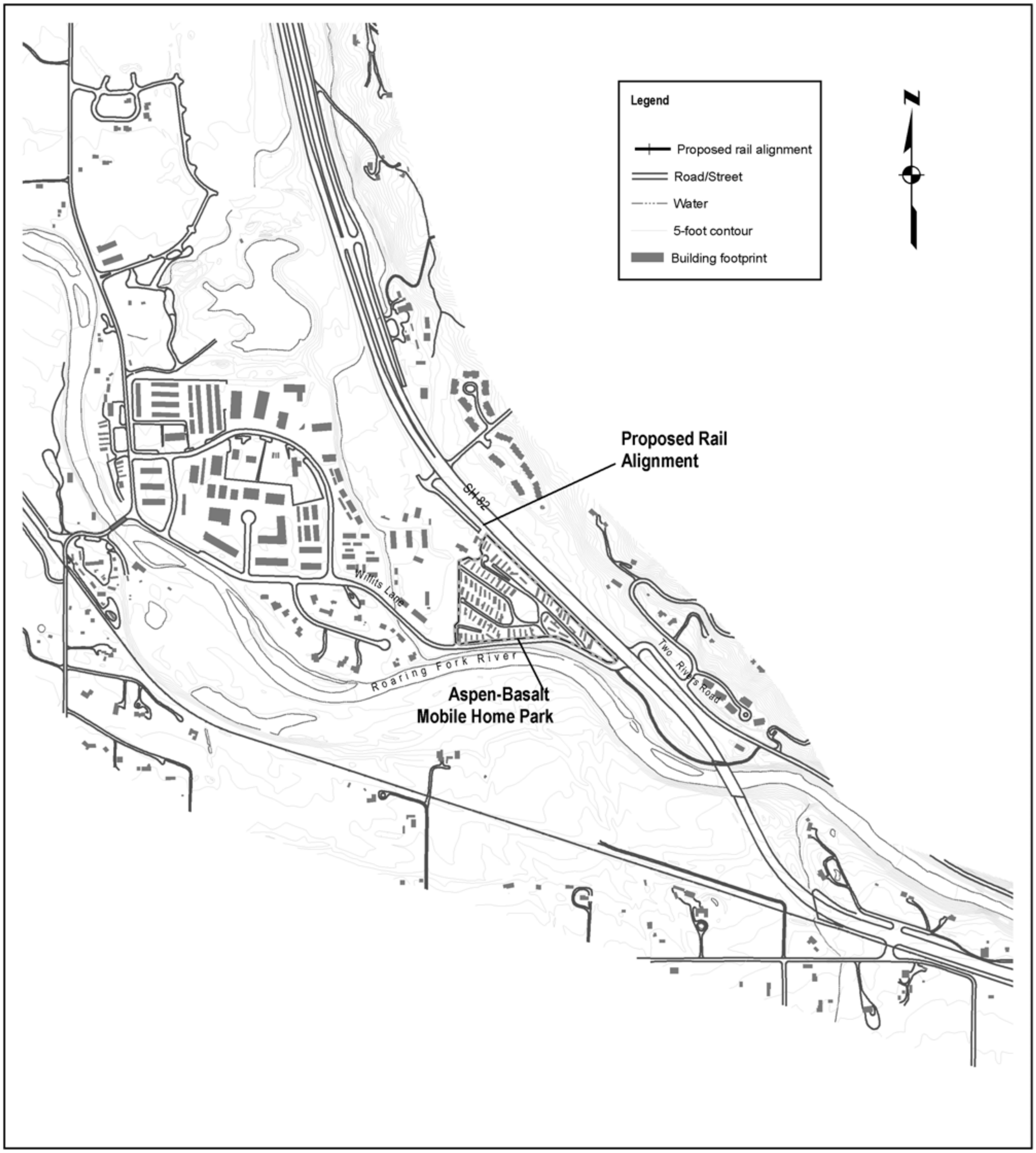
Overall, very few of the total receivers affected include housing for low-income and minority populations. There will be no disproportionate or high impacts due to increased noise or vibration on low-income, minority or elderly populations. Many of these units were built along pre-existing active rail or highway routes. In most cases there will be little audible difference in the noise experienced at these receivers.

Relocation Impacts. There is an identified relocation impact to minority and low-income populations. The Rail Alternative is anticipated to require relocation of a total of 14 residential housing units and three businesses, including one area of concentrated minority population.

The proposed Rail Alternative could require relocation of up to 11 mobile homes in the Aspen-Basalt Mobile Home Park along Highway 82 at the intersection with Willits Lane. Figure V-1 displays the Willits Lane relocation impact area. Information on the race and/or income level of the specific housing units affected is not presented in order to protect privacy. However, the mobile home park affected includes minority populations and is generally described as “below-market-rate” housing. There are 73 units in the mobile home park, and approximately 90 percent of the units are occupied by members of the Hispanic/Latino public, according to the operator of the park. Mobile homes are owned by individuals, though not necessarily the occupant, and the spaces are leased from the park operator. Remaining units will be a sufficient distance from the Project Corridor to preclude noise and vibrational impacts.

Mobile homes serve an important role in the housing mix for minority and low-income populations who are less likely to participate in government-sponsored housing initiatives. One of the attractions of this particular mobile home park is its accessibility to transit service. There is currently a bus stop adjacent to the park. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, provides for fair and equitable treatment of all persons displaced from their homes, businesses, or farms. No person shall be displaced by a federal aid project unless and until adequate replacement housing has been offered to all affected persons regardless of race, color, religion, sex, or national origin.

Figure V-1: Willits Lane Relocation Impact Area



3.4.2 Year 2025 Time Frame. No additional noise or relocation impacts are associated with the Rail Alternative for the year 2025.

4. Services Impacts

Note that congestion at the following committed park-and-ride and/or station locations and maintenance facilities will occur for all alternatives, resulting in poor levels of service for opening day: Carbondale at Highway 133, El Jebel at Willits Lane, and the Carbondale Maintenance Facility. By 2025 all alternatives will result in poor levels of service associated with West Glenwood, the West Glenwood Springs Maintenance Facility, Downtown Glenwood Springs, and the CMC areas, as well as Carbondale at Highway 133, the Carbondale Maintenance Facility, both El Jebel locations, Brush Creek Road, the Airport, and Buttermilk. **Chapter IV.D.2: Station Areas and Major Intersections** summarizes these impacts. Although the park-and-rides and stations themselves are not located in residential areas, traffic congestion in these areas will indirectly affect adjacent neighborhoods. Congestion associated with transit facilities could compromise police, fire, and emergency services response times during peak hours. Poor levels of service at these locations may also compromise delivery of services to adjacent neighborhoods. These impacts are the same for the No Action/Committed Projects Alternative, the BRT Alternative, and the Rail Alternative.

The Build alternatives reduce overall VMT by nine to 11 percent in the Project Corridor, which would result in a corridor-wide improvement to delivery of services.

No services impacts are related to the proposed new Rio Grande Trail for opening day or the year 2025 time frame.

5. Recreational Impacts

5.1 No Action/Committed Projects Alternative

Recreational activities along the project corridor include, but are not limited to, skiing, fishing, hunting, rafting, kayaking, bicycling, sightseeing, and hiking. No new impacts to recreational areas or activities are anticipated for the No Action/Committed Projects alternative for opening day or the year 2025 time frame, except for continued congestion on Highway 82.

5.2 Trail

No adverse impacts are related to the construction of the new Rio Grande Trail for this project for opening day or the year 2025 time frame. Hikers and bicyclists may be temporarily affected as trails are realigned to better fit the new trail along the project alignment, making the valley trail network more contiguous. Trail completion will meet regional recreation goals and provide connectivity between Glenwood Springs and Aspen trail systems. This trail will create an enjoyable and pleasant recreation option extending from West Glenwood Springs to Aspen.

Positive trail impacts include improved access to fishing along the Roaring Fork River. Twelve significant locations for trail access to the river were identified in the *Aspen Branch Denver & Rio Grande Western Railroad Recreational Trails Plan* (LandPlan Design Group, 1999). Some of these correspond with existing boat ramps identified in **Chapter III.A5.4 Rafting**. Fishing access areas that can be connected to the trail system include:

1. River access south of Sunlight Bridge in Glenwood Springs (RFTA mile marker 362)
2. The DOW Westbank Bridge area (RFTA mile marker 366)
3. DOW fisherman parking area and associated river access easements (RFTA mile marker 369.5)

4. Access from the historic Satank bridge to the railroad bridge, extending to the confluence with the Crystal River (RFTA mile marker 371)
5. Catherine Bridge and Upvalley to the west end of Hooks Spur Road (RFTA mile markers 376-378)
6. Hooks Bridge and primitive boat launch area (RFTA mile marker 380.6)
7. Highway underpass at Sopris Creek and Two Rivers Road (RFTA mile marker 381)
8. Wingo Bridge area includes a river access easement (RFTA mile marker 385)
9. Lazy Glen area (RFTA mile marker 386.5) from opposite Lazy Glen downstream for one mile from the Old Snowmass bridge
10. Fishing easements near Arbaney Gulch (RFTA mile markers 389.4 to 389.6)
11. Lower Woody Creek bridge area (RFTA mile marker 390.7 to 391.4)
12. Easement via private land (RFTA mile marker 392.45)

5.3 BRT Alternative

5.3.1 Opening Day Time Frame. Under the BRT Alternative, no physical impacts are anticipated to recreational areas or activities. Access to recreation areas will be improved since the transportation improvements associated with this alternative are expected to result in decreased travel times for individuals electing to use the transit system.

Avoidance of intrusion into the Mt. Sopris Tree Farm Community Center and Recreation Area is possible with the implementation of the transit station/park-and-ride lot in El Jebel. The location of the transit station and parking area at El Jebel has two options: El Jebel Road and Willits Lane. If the El Jebel Road location is chosen, the proposed station will be across the road from the recreation area development. It will be located within an existing commercial area that includes a restaurant, theater, and supermarket. It will be designed to avoid visual intrusion into the recreational and open space uses on the Tree Farm property and the associated neighborhood park. The recreation area itself includes the newly-built Eagle County Community Center, located at the north end of the property parallel to the existing commercial area and proposed transit station.

5.3.2 Year 2025 Time Frame. No additional effects are associated with this alternative for this time frame. Potential traffic congestion at El Jebel Road and Highway 82 is forecast regardless of alternative.

5.4 Rail Alternative

5.4.1 Opening Day Time Frame. For the Rail Alternative, impacts to recreational activities will be temporary, resulting from construction activities in the vicinity of existing trails. Recreational users may be affected by construction along the Highway 82 segments if traffic flow is disrupted. Hunters will be affected only to the extent that migration patterns for deer and elk are altered. Fishing along the route will be affected during construction of bridges. This construction could also affect boating, rafting, and kayaking.

Access to these areas and activities will be improved since the recreational transportation improvements associated with this alternative are expected to result in decreased travel times for individuals electing to utilize the transit system.

Avoidance of intrusion into the Mt. Sopris Tree Farm Community Center and Recreation Area is possible with the implementation of the transit station/ park-and-ride lot in El Jebel. The relocation of Valley Road to accommodate the rail line location adjacent to Highway 82 will avoid taking right-of-way from the open space associated with the recreation area. The location of the transit station and parking area at El Jebel has two options: El Jebel Road and Willits Lane. If the El Jebel Road location is chosen, the proposed station will be across the road from the recreation area development. It will be located within an existing commercial area that includes a restaurant, theater, and supermarket. It will be designed to avoid visual intrusion into the recreational and open space uses on the Tree Farm property and the associated neighborhood park. The recreation area itself includes the newly-built Eagle County Community Center, located at the north end of the property parallel to the existing commercial area and proposed transit station.

5.4.2 Year 2025 Time Frame. No additional affects are associated with this alternative for this time frame. Potential traffic congestion at El Jebel Road and Highway 82 is forecast regardless of alternative.

6. Land Use Impacts

6.1 No Action/Committed Projects Alternative

Land use within the corridor will remain much the same as it is today under the No Action/Committed Projects Alternative. Although efforts have been made throughout the Valley to reduce sprawl and encourage the development of affordable housing, these efforts have been only marginally successful to date. Additional congestion will continue to occur on Highway 82 under this alternative, and may make in-fill development more attractive. However, the demand for and development of high-income housing will likely override the issue of traffic congestion. No changes between the 2008 opening day and 2025 have been identified for this alternative. Local effects of the various committed projects will be related to opening day for those projects and have been identified in other studies.

6.2 Trail

No land use impacts are associated with the trail for either opening day or the year 2025.

6.3 BRT Alternative + Trail

6.3.1 Opening Day Time Frame. It is more challenging to accomplish positive land use impacts with BRT than with rail. The following relevant observations have been made in a recent Transportation Research Board (TRB) publication (TRB, 2002):

- Transit redistributes rather than creates growth, and a healthy economy is a prerequisite.
- Land use impacts are greatest when transit investments occur just prior to an upswing in regional growth.
- Regional transit investments generally reinforce decentralization trends.
- Pro-active planning is necessary if decentralized growth is to end up in subcenters.
- An advantage of bus service is that it can cover an entire community. A successful bus TOD strategy will need to be focused on a few key sites.

Future land use patterns should be supported by development concentrated around stations. The concentration of transit-oriented development will benefit the Valley by curtailing sprawl. The denser development surrounding each station will reduce reliance on automobiles as in-fill development surrounding each station cluster makes walking more desirable. A transit-oriented community design process was conducted as part of this study. The potential configurations and benefits of transit-oriented development were discussed, evaluated, and documented in *Transit Oriented Community Design Report* (Otak, 2000). A discussion of transit-oriented development follows in **Section 6.4**. Zoning is currently in place to support transit-oriented development around proposed transit stations. Development opportunities can accompany station construction. Table V-3 illustrates appropriate community plans for reference with regard to new station construction.

6.3.2 Year 2025 Time Frame. By 2025, land use changes and development associated with Transit-oriented development at station locations will have been fully implemented.

6.4 Rail Alternative

6.4.1 Opening Day Time Frame. No changes in land use are needed to accommodate the Rail Alternative as it will be built mainly within existing transportation rights-of-way. Future land use patterns should be supported by development concentrated around stations. The concentration of transit-oriented development will benefit the Roaring Fork Valley by curtailing sprawl. The denser development surrounding each station will reduce reliance on automobiles as in-fill development surrounding each station cluster makes walking more desirable. A transit-oriented community design process was conducted as part of this study. The potential configurations and benefits of transit-oriented development were discussed, evaluated, and documented in *Transit Oriented Community Design Report* (Otak, 2000). A discussion of transit-oriented development follows in **Section 6.4**. Zoning is currently in place to support transit-oriented development around proposed transit stations. Development opportunities can accompany station construction. Table V-3 illustrates appropriate community plans for reference with regard to new station construction.

6.4.2 Year 2025 Time Frame. By 2025, land use changes and development associated with transit-oriented development at station locations will have been fully implemented

Table V-3
Transit-Oriented Development Land Use Plans

Station Name	Associated Land Use Plans
West Glenwood Springs (Midland south of I-70) Downtown Glenwood Springs (the wye at 8th) South Glenwood Springs Colorado Mountain College (County Road 54)	*City of Glenwood Springs Long Range Transportation Plan*, 1999 *City of Glenwood Springs Downtown Plan*, 1998 *Glenwood Springs Confluence Transit Oriented Design Study,* 2000 *Glenwood Springs Confluence Area Plan*, 2002 *Garfield County Zoning Resolution – Transit PUD Regulations*, 2002
Highway 133 in Carbondale Downtown Carbondale (4th and Colorado)	*Town of Carbondale Comprehensive Plan,* 1999
El Jebel (Highway 82 at either El Jebel Road or Willits Lane)	*Town of Basalt Master Plan*, 2000 (for Willits Lane)
Basalt (Midland Avenue, west of Texaco	*Town of Basalt Master Plan*, 2000
Aspen (Main Street: Spring-Hunter)	*2000 Aspen Area Community Plan Update*

6.5 Transit-Oriented Development

The success of any transit system is determined by the degree to which the transit user population is served by the system. The existing RFTA bus system has experienced huge increases in utilization over the last decade. These increases can be largely attributed to improved service provided throughout the Valley. To continue this ridership trend, service must continue to be provided to new areas of concentrated population.

Transit-Oriented Development (TOD) refers to a land use planning strategy intended to optimize transit access at transit stations and reduce the need for automobile trips. The fundamental principle of TOD is to orient residential and ancillary development around and within walking distance to transit stations. In addition to maximizing walking access to transit, TOD generates enough pedestrian activity to support retail and service businesses. In this way, TOD can significantly reduce automobile trip generation by allowing residents to access transit and run errands by foot.

The Transit Cooperative Research Program (TCRP) of the Transportation Research Board of the National Research Council has determined that, "In general, 0.4 kilometers (0.25 miles) or five minutes walk time is the limit of a bus route's typical 'service area;' for a rail transit station, these figures can be doubled (*Walking Distances from Light Rail Transit Stations*, O'Sullivan and Morrall, TRB Record 1538, 1996)." Based upon these findings, and using a 0.8 kilometer (0.5 mile) radius for each transit station service area, up to 60 percent of employment and 42 percent of homes in the Project Corridor are within walking distance of BRT Express, Super Express, or Rail transit. Local bus service that connects to trunk service substantially increases the percentage of jobs and homes within walking distance.

Many of the station sites identified for this CIS were chosen to be located in existing town centers. The function of these stations will be enhanced by the pedestrian-friendly nature of their locations. Station areas located outside of the traditional town sites will require more creativity and public and private investment to make them pedestrian-friendly and thus transit-supportive locations.

Station area concepts for the towns and cities of the Roaring Fork Valley were crafted by residents and design professionals through a Transit Oriented Community Design Process that sought to preserve and enhance the special characteristics of scale in each community. Existing community plans were respected. Opportunities for sensitive infill development were created that reinforce pedestrian connections within towns while providing additional activity areas. The results of this community dialogue on transit-oriented design can be found in the *Glenwood Springs to Aspen/Pitkin County Airport CIS: Transit Oriented Community Design Report* (Otak, 2000).

B. ECONOMIC IMPACTS

This section addresses direct and indirect effects of the proposed alternatives on the economic environment. Due to the nature of this project, and because it involves alternatives that are mostly constructed and/or operated along existing rights-of-way, there are often very few direct and only minor indirect impacts for these resources. Since there are few alternative specific impacts in this section, alternatives are discussed together for each resource.

The economic impacts from the lack of sufficient transportation facilities in the Project Corridor have not been quantified. **Chapter I: Purpose and Need** addresses the need for implementation of a Build alternative within the Project Corridor. **Chapter IV: Transportation Impacts** describes the effects of the various alternatives on the transportation system. Inability of local residents to meet their employment obligations due to inability to access the work place in a timely and affordable manner will have economic consequences. Lack of efficient access for tourists and resort users will also have economic consequences for the Project Corridor and the entire Roaring Fork Valley. Additional discussion is also found in **Chapter VI: Cumulative Impacts, B. Economic Impacts.** See **Chapter VIII: Financing** for actual costs and funding strategies associated with each alternative.

1. Economic Base

None of the alternatives will directly affect the trends in the resort and tourism industry in the Roaring Fork Valley. These are affected by regional (including wildfires and droughts), national, and world economic conditions. None of the alternatives create direct adverse effects to adjacent resort or tourist-related facilities in the Project Corridor. Any improvement to the transportation system and general accessibility for tourists and employees will indirectly support the existing economic base within the Project Corridor.

1.1 No Action/Committed Projects

The No Action/Committed Projects Alternative will continue to support a primary orientation toward upper valley (Aspen area) employment centers. No opening day or year 2025 time frame economic impacts have been identified in the current study for this alternative. Impacts are outlined in appropriate committed projects documents.

1.2 Trail

No economic impacts are associated with the construction and operation of the new Rio Grande Trail for opening day or the year 2025 time frame.

1.3 BRT Alternative

No direct economic impacts are associated with the construction and operation of the BRT for opening day or the year 2025 time frame. The BRT Alternatives will provide a more efficient transportation system throughout the Project Corridor, indirectly supporting the existing economic base.

1.4 Rail Alternative

1.4.1 Opening Day Time Frame. Loss of tax revenue from the acquisition of 14 residential properties and three business will be minimal. The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, provides for fair and equitable treatment of all persons displaced from their homes, businesses, or farms.

1.4.2 Year 2025 Time Frame. No additional impacts have been identified for the Year 2025 time frame.

2. Commercial Growth Trends

Commercial growth is directly measurable by retail sales. Transit-oriented development around new stations associated with the Build alternatives may create additional retail sales opportunities. The Build alternatives create additional transit stations and design opportunities Downvalley. Generally the focus of transit-oriented development is to attract concentrated activities rather than unfocused sprawl. This may simply attract retailers from other potential locations rather than create a new demand. None of the alternatives are expected to generate major increases in retail activity in the Project Corridor. No differences in opening day and 2025 time frames have been noted for this resource or any of the alternatives.

3. Employment

Construction of the Build alternatives will create temporary employment within the Project Corridor. Implementation of any of the Build alternatives will directly create transit industry employment in the Roaring Fork Valley. For transit agencies, the number of employees increases as the number of vehicles increases. In the Roaring Fork Valley, the number of employees required is critical because high housing costs and competition for employees has historically made recruitment and retention a challenge. The order of magnitude of changes caused by any alternative for 2008 or 2025 is minor, approximately 100 employees more or less. This will not create a recognizable impact on the Project Corridor or regional employment base, or the housing shortage.

4. Income and Housing

4.1 Opening Day Time Frame

Temporary construction employment will have minor impacts on Project Corridor income and housing. These projects are not expected to attract measurable employment from outside the region. Additional growth is not anticipated.

4.2 Year 2025 Time Frame

No additional impacts are expected in this time frame for any of the alternatives.

5. Financing

Financing for the No Action/Committed Projects Alternative, BRT, Rail Alternative and the associated new Rio Grande Trail is discussed in detail in **Chapter IX: Finance**.

C. PHYSICAL ENVIRONMENT IMPACTS

This section addresses direct and indirect effects of the proposed alternatives on the physical environment. Due to the nature of this project, and because it involves alternatives that are mostly constructed and/or operated along existing rights-of-way, there are generally few direct or indirect impacts to these resources. Sections containing measurable direct and/or notable indirect impacts are broken down by alternative.

1. Air Quality Impacts

The EPA lists Aspen as a non-attainment area for PM_{10} (small particulates). The Colorado Air Pollution Control Division has prepared and submitted to EPA a PM_{10} "Re-designation Request and Maintenance Plan" for the Aspen Area. Upon EPA approval of the Maintenance Plan, Aspen will be re-designated as "attainment/maintenance area." No other locations in the Project Corridor are designated as non-attainment for air quality pollutants. Emissions for both the Aspen non-attainment area and the remaining Project Corridor were estimated for this project.

1.1 Aspen Non-Attainment Area

The non-attainment boundary for the Aspen area includes the city of Aspen, the Aspen Airport Business Center and the developed areas around Aspen. The northerly boundary on Highway 82 is approximately milepost 37.2.

The 1990 Clean Air Act Amendments (CAAA) require that transportation projects within a non-attainment area will not:

1. cause or contribute to a violation of the federal air quality standards,
2. increase the frequency or severity of any existing violations of any standards, or
3. delay attainment of any standard.

The SIP requires implementation of air quality measures to help reduce emissions. The City of Aspen and the Colorado Department of Transportation have implemented beneficial air quality measures beyond what is required in the SIP. These include a cross-town shuttle program, no sanding on Highway 82 in Aspen, and the use of commercial de-icers on Highway 82 outside of Aspen. The Colorado Air Pollution Control Division has prepared and submitted to the EPA a PM_{10} Redesignation Request and Maintenance Plan for the Aspen Area. The mobile source PM_{10} emissions budget established for the Aspen PM_{10} Maintenance Plan is 7,368 kilograms (16,244 pounds) per day. Upon EPA approval of the Maintenance Plan, Aspen will be redesignated as an attainment/maintenance area.

Based on the continued implementation of air quality measures by the City of Aspen and its continued attainment of the goal to keep traffic at 1994 traffic levels in town, PM_{10} levels are not expected to exceed 1,680 kilograms (3,700 pounds) per day through 2025 for the No Action/Committed Projects Alternative. Current Build Alternatives also support a similar order of magnitude of PM_{10} emissions within the Aspen area. The new Rio Grande Trail will not generate air quality impacts.

The least change in emissions is expected from the Rail Alternative. This alternative includes the Entrance to Aspen LRT and the rail portion of the Rail Alternative. No additional vehicular traffic is anticipated in the Aspen "non-attainment area" with the SIP requirements in place and the enhanced valley-wide transit service. All alternatives are expected to comply with the transportation conformity regulations and the SIP budget of 1,680 kilograms per day (3,700 pounds per day).

1.2 Remainder of the Project Corridor

For the remainder of the Project Corridor, generally from Highway 82 milepost 37.2 to Glenwood Springs milepost zero, air quality is expected to continue to meet all standards and the effects of the Build alternatives will be minimal or beneficial. Table V-4 shows VMT and estimated PM_{10} for the entire Project Corridor. As shown, PM_{10} emissions for the Build alternatives are 9 to 11 percent less than the No Action/Committed Projects Alternative. The VMT is based on major roadways as identified in the Transportation Demand Model and do not represent all travel within the Project Corridor. The estimates can be used for comparative purposes.

Table V-4
2008 and 2025 Estimated VMT and PM_{10} for the Project Corridor

Alternative	2008 VMT/day (millions)	2008 PM_{10} Emissions Kg/day (lb/day)	2008 Percent Difference	2025 VMT/day (millions)	2025 PM_{10} Emissions Kg/day (lb/day)	2025 Percent Difference
No Action/ Committed Projects	1.346	12,100 (26,700)		1.865	16,700 (37,000)	
BRT-Bus	1.204	10,800 (23,900)	-10%	1.668	15,000 (33,000)	-11%
BRT-LRT	1.213	10,900 (24,000)	-10%	1.701	15,300 (33,700)	-9%
Rail	1.210	10,900 (24,000)	-10%	1.690	15,200 (33,500)	-9%

Note: Regional VMT can be found in Table IV-10.

In an effort to consider cleaner and more environmentally friendly alternative propulsion technologies, RFTA has committed to a fleet conversion policy that will positively affect all the bus elements within the project alternatives. This will reduce environmental impacts of transit operations on the community, reduce RFTA's dependence on petroleum by moving towards sustainable and renewable forms of energy, and provide higher service quality to the community. There may be some limitations to possible technologies due to the elevations in the RFTA service area, which ranges from 1,524 to 3,352 meters (5,000 to 11,000 feet).

Although a hot spot analysis is not required for this project because it falls within a carbon monoxide attainment area, a comparison with other hot spots in the state provides perspective. Regardless of alternative, Levels of Service within the Project Corridor will fall to LOS F in 2008 at Carbondale and Highway 133. By 2025 LOS F will also occur at the West Glenwood Station, regardless of the alternative. Worst-case peak-direction, peak-hour volumes are projected at 1,500 vehicles in 2008 at Highway 133. Peak-direction/peak-hour volumes of 2,210 vehicles are forecast for 2025 at Highway 133 and 1,080 at the West Glenwood Station area in 2025. 2025 weekday winter traffic volumes on Highway 82 will run between 25,200 and 38,500.

For purposes of comparison, a hot spot in Denver near a carbon monoxide monitoring station at Speer Boulevard and Auraria Parkway provides a good example. Although this location approaches LOS E or F during peak hours, no violations of the carbon monoxide standard have been recorded during the past six years. Peak-hour traffic volumes are 2,508 to 2,999 vehicles. Daily traffic at this intersection runs between 21,000 and 25,000 vehicles in each direction (May 16, 2000 count per www.denvergov.org/trafficcountsearch.asp.).

1.3 No Action/Committed Projects Alternative

Except for the issues of Aspen's non-attainment for particulates, general air quality in the Project Corridor is expected to continue to meet all standards under this alternative. As shown in Table V-4, this alternative results in the highest increase in VMT, and the highest PM_{10} of the three alternatives. Differences between the opening day (2008) and 2025 show an added VMT of approximately 38 percent with a corresponding increase in PM_{10}.

1.4 BRT Alternative

This alternative is not expected to have a significant effect on the overall air quality in the Project Corridor or the particulate generation in the Aspen area. Overall VMT for the BRT alternatives is nine to 11 percent less than the No Action/Committed Projects Alternative. The BRT-LRT and Rail Alternatives are very close. VMT and PM_{10} between opening day and 2025 is forecasted to increase by 38 percent for the Build alternatives as well as the No Action/Committed Project Alternative.

1.5 Rail Alternative

The Rail Alternative is also not expected to have a significant effect on the overall air quality in the corridor, or on the particulate generation in the Aspen area. VMT and particulate emissions will be similar to the BRT alternatives, resulting in nine to ten percent less PM_{10} emissions than the No Action/Committed Projects Alternative for opening day and 2025.

Issues regarding odor and particulate emissions from the DMU (diesel multiple unit) rail vehicles will be analyzed in detail should this alternative be selected. Technology is rapidly improving for diesel emissions for both buses and rail. Ultra-low sulfur diesel fuels offer reduced odor as well as significantly reduce particulate emissions. Other possibilities include devices that allow engines to be turned off rather than idling for long periods at stations. The applicability of individual technologies to the ultimate vehicle selected for the Rail Alternative will be included in future studies if applicable. Applicability to freight hauling will also be assessed.

2. Water Resource and Water Quality Impacts

2.1 Water Resources Impacts

2.1.1 No Action/Committed Projects Alternative. The No Action/Committed Projects Alternative is not expected to result in significant adverse direct or indirect impacts to water resources, nor will it affect local hydrology through changes in the quantity or timing of water reaching waters of the U.S. No differences have been identified for opening day and year 2025 time frames.

2.1.2 Trail.

Opening Day Time Frame. The new Rio Grande Trail, at an estimated pavement width of three meters (ten feet), will add approximately 15.75 hectares (38.8 acres) of impervious surface over the length of the Project Corridor. This added impervious surface will comprise less than one percent of the total surface area of the watershed and is not expected to generate measurable effects to water resources. The trail is not expected to result in adverse direct or indirect impacts to ground water in the Roaring Fork Valley.

Year 2025 Time Frame. No additional impacts are expected after the opening day time frame.

2.1.3 BRT Alternative.

Opening Day Time Frame. The BRT Alternative is not expected to result in significant adverse direct or indirect impacts to water resources, nor will it affect local hydrology through changes in the quantity or timing of water reaching waters of the U.S.

This alternative will result in an increase in impervious surface area through the construction of transit stations and parking lots. Maximum additional impervious surface estimated for the BRT Alternative is 11.76 hectares (29.06 acres). New impervious surface area will comprise less than one percent of the total surface area of the watershed and is not expected to generate significant, or measurable, impacts to water resources. This alternative is not expected to result in adverse direct or indirect impacts to ground water in the Roaring Fork Valley.

Year 2025 Time Frame. No additional impacts are expected after the opening day time frame.

2.1.4 Rail Alternative

Opening Day Time Frame. The Rail Alternative is not expected to result in adverse direct or indirect impacts to water resources. The right-of-way for the proposed Rail Alternative Alignment, with the exception of those sections connecting the existing RFTA corridor with the existing Highway 82 corridor, is already in place. The new sections are generally perpendicular to the Roaring Fork River and are not expected to impede the flow of surface water and run-off.

For the Rail Alternative, estimated new impervious surface associated with transit stations and parking lots is 9.67 hectares (23.9 acres). New impervious surface area will comprise less than one percent of the total surface area of the watershed and is not expected to generate significant, or measurable, impacts to water resources.

The Rail Alternative is not expected to result in adverse direct or indirect impacts to ground water in the Roaring Fork Valley. The Roaring Fork's alluvial aquifer is generally located at a depth below where construction activities are expected to occur.

Year 2025 Time Frame. No additional impacts are expected after the opening day time frame.

2.2 Water Quality Impacts

2.2.1 No Action/Committed Projects Alternative. Under the No Action/Committed Projects Alternative, 14 stream crossings already exist. No additional crossings are expected. Slight differences between opening day and year 2025 time frames may be anticipated as a result of increased traffic on highway elements of this alternative at stream crossings, thereby increasing the potential for vehicle related impacts.

2.2.2 Trail.

Opening Day Time Frame. The new Rio Grande Trail will include new stream crossings at Cattle Creek, over the Roaring Fork River at Carbondale, and at Prince Creek near Emma.

Further, the existing rail line on the RFTA right-of-way has been out of service for more than ten years. The condition of the line has deteriorated, and it is expected that cross drains may be clogged with debris, and erosion of surface and side slopes may be adversely affecting water quality. Rehabilitation of these existing structures or construction of new structures for the trail are expected to positively benefit water quality by re-establishing hydrologic connections and minimizing sediment delivery to the Roaring Fork River and other waters of the U.S.

Year 2025 Time Frame. No additional impacts are expected after the opening day time frame

2.2.3 BRT Alternative.

Opening Day Time Frame. The BRT Alternative is not expected to result in significant adverse direct or indirect impacts to water quality over current conditions. The BRT sub-alternatives will potentially result in indirect positive impacts to water quality by reducing vehicle miles traveled within the Project Corridor. Reductions in vehicle miles can improve air quality associated adverse water quality impacts from atmospheric deposition; however, these reductions, if any, have not been measured and are likely to be small. Additionally, accidental discharges from vehicle accidents may be reduced by the availability of a bus alternatives to driving.

Year 2025 Time Frame. No additional or different impacts are expected after the opening day time frame.

2.2.4 Rail Alternative

Opening Day Time Frame. Potential water quality impacts associated with the Rail Alternative arise largely from the eight additional river crossings, over the baseline total, required for this alternative. Bridges will be constructed over the Roaring Fork River at Glenwood Springs, Catherine Store (two), Emma, Basalt, and Gerbazdale. Two significant new stream crossings via box culvert will be located at Sopris Creek and Brush Creek. Construction of bridge footings adjacent to streams may result in sediment discharges and increased suspended solids and turbidity downstream from the construction site. Soil erodibility in the project corridor, however, is low because the soils are generally well-drained, indicating that precipitation will infiltrate into the soil rather than pond on the surface. Erosion and sedimentation impacts to surface waters, should they occur, will be temporary in nature and are not expected to increase annual total suspended solid (TSS) loads over time. Adverse sediment discharge impacts can include loss of aesthetics, sedimentation of trout spawning areas, and possible increases in soluble constituents that may be attached to sediments.

Other potential construction-related impacts include spills of gasoline, diesel fuel, and engine oils. Construction-related spills are normally small, but if near a stream they can adversely impact water quality. Small spills can create a surface sheen on the water and coat vegetation and rocks. Large spills can cause significant wildlife mortality. Discharges from construction dewatering activities are not expected to have an adverse impact on water quality so long as the water being pumped is unpolluted groundwater.

Operation and maintenance (O&M) of the Rail Alternative is not expected to adversely impact water quality. The rail line will be plowed during the winter; sand, salts, and other de-icers are used much less frequently on railroad tracks than highways.

Railroad equipment will be serviced at the Glenwood Springs, Carbondale, or Aspen Maintenance facilities. Potential water pollutants associated with the maintenance facility include oils, grease, coolants, benzene and derivatives, vinyl chloride, metals, dinitro compounds, and other industrial solvents.

Other possible O&M impacts arise from the application of herbicides and other chemicals to control vegetation on and around the rail line. Adverse impacts from herbicide application are expected to be negligible, if properly applied.

The Rail Alternative will potentially result in indirect positive impacts to water quality by reducing vehicle miles traveled within the Project Corridor. Reductions in vehicle miles can improve air quality and associated adverse water quality impacts from atmospheric deposition; however, these reductions, if any, have not been measured and are likely to be small. Additionally, accidental discharges from vehicle accidents may be reduced by the use of rail as an alternative to driving.

Further, the existing rail line on the RFTA right-of-way has been out of service for more than ten years. The condition of the line has deteriorated, and it is expected that cross drains may be clogged with debris, and erosion of surface and side slopes may be adversely affecting water quality. Rehabilitation of these existing structures or construction of new structures under the Rail Alternative is expected to positively benefit water quality by re-establishing hydrologic connections and minimizing sediment delivery to the Roaring Fork River and other waters of the U.S.

Year 2025 Time Frame. No additional or different impacts are expected after the opening day time frame.

3. Floodplain Impacts

Final design of all alternatives will be consistent with local, state, and federal floodplain and water resource management programs. Final design of minor and major hydraulic structures will adhere to CDOT Drainage Criteria, follow all FEMA requirements, and ensure that historic drainage patterns are not altered. Final design will also emphasize avoidance of longitudinal encroachment.

3.1 No Action/Committed Projects Alternative

3.1.1 Opening Day Time Frame. The planned construction of the new bridge at the Four Mile Connector will encroach somewhat on the 100-year floodplain. However, the new bridge would provide adequate freeboard between the bottom of the structure and the 100-year flood surface elevation. There would be minimal risk of new flooding, minimal to no impacts on natural and beneficial floodplain values, and no support of probable incompatible floodplain development. No other new impacts to floodplains are forecast for this alternative.

3.1.2 Year 2025 Time Frame. No additional floodplain impacts are anticipated for this alternative.

3.2 Trail

New Rio Grande Trail stream crossings will follow the historic railroad grade and are not expected to create additional floodplain impacts. No differences between opening day and year 2025 time frames are expected.

3.3 BRT Alternative

This alternative will have no additional floodplain impacts since it involves use of existing Highway 82. No differences between opening day and year 2025 time frames are expected.

3.4 Rail Alternative

3.4.1 Opening Day Time Frame. The Rail Alternative alignment generally parallels the Roaring Fork River and minimizes lateral movement across the 100-year floodplain. At locations where the Rail Alternative will cross the Roaring Fork floodplain (e.g., County Road 100 near Catherine Store), the new and/or reconstructed bridge structures will provide adequate freeboard between the bottom of the proposed structure and the 100-year flood surface elevation. Some stream crossings for the Rail Alternative may require the installation or replacement of bridge piers; however, pier placement will occur outside the 100-year floodplain and thus, impacts to the 100-year water surface elevation are not anticipated. Precise placement of bridge piers will be determined during project design.

Encroachment on the floodplain as a result of the Rail Alternative will be minimal. The Rail Alternative will not significantly modify floodplain hydraulics and risk of new flooding will not be increased by this alternative. Impacts to natural and beneficial floodplain functions from the Rail Alternative will be minimal and will not result in a loss of significant flood conveyance or storage.

3.4.2 Year 2025 Time Frame. No additional floodplain impacts are anticipated for this alternative.

4. Geology and Soil Impacts

4.1 No Action/Committed Projects Alternative

The No Action/Committed Projects Alternative will have no previously unmitigated impacts on soil or geology. Under this alternative no additional geological hazards, other than existing rockfall hazards, are anticipated to occur within the Project Corridor. No differences between opening day and year 2025 time frames are anticipated.

4.2 Trail

The new Rio Grande Trail will be constructed over predominantly stable alluvial terrace deposits consisting of well-rounded gravel to cobble-sized material. The *Pre-Acquisition Environmental Site Assessment* (SRK, 1996) identified specific areas with associated geology that are potentially subject to geological impacts. SRK determined that the Eagle Valley Evaporite Formation posed substantial risk and presented potentially "serious engineering problems" for these specific areas of the project. The physical characteristics and orientation of the evaporite outcrop include steep hillsides and bluffs adjacent to the track, which make it prone to failure, resulting in unstable slopes. In addition, the movement of groundwater and surface water can dissolve evaporite minerals within the formation leading to serious subsidence problems. Other concerns include the colluvium deposits. These deposits are relatively thin (less than 30 meters / 100 feet), occur along the edges of the Roaring Fork Valley at the base of slopes and embankments, and consist of poorly-sorted sediments and rock debris that are commonly unstable, poorly drained, and susceptible to erosion and hydrocompaction. Geologic hazards associated with colluvium include landslides, mudflows, rockfalls, rock glaciers, slumps, and talus (SRK, 1996). No differences between opening day and year 2025 time frames are anticipated.

4.3 BRT Alternative

The BRT Alternative will have no new effects on soil or geology. Under this alternative no additional geological hazards, other than existing rockfall hazards, are anticipated to occur within the Project Corridor.

4.4 Rail Alternative

The Rail Alternative rail alignment would be constructed over predominantly stable alluvial terrace deposits consisting of well-rounded gravel to cobble-sized material. The *Pre-Acquisition Environmental Site Assessment* identified specific areas with associated geology that are potentially subject to geological impacts. SRK determined that the Eagle Valley Evaporite Formation posed substantial risk and presented potentially "serious engineering problems" for these specific areas of the project. The physical characteristics and orientation of the evaporite outcrop include steep hillsides and bluffs adjacent to the track, which make it prone to failure, resulting in unstable slopes. In addition, the movement of groundwater and surface water can dissolve evaporite minerals within the formation leading to serious subsidence problems. Other concerns include the colluvium deposits. These deposits are relatively thin (less than 30 meters / 100 feet), occur along the edges of the Roaring Fork Valley at the base of slopes and embankments, and consist of poorly-sorted sediments and rock debris that are commonly unstable, poorly drained, and susceptible to erosion and hydrocompaction. Geologic hazards associated with colluvium include landslides, mudflows, rockfalls, rock glaciers, slumps, and talus (SRK, 1996). No differences between opening day and year 2025 time frames are anticipated.

5. Impacts on Upland and Floodplain Vegetation

5.1 Roaring Fork Valley Land Cover Types

The resolution of the Colorado Gap Analysis Program (COGAP) data used to calculate the disturbance area results in minimum mapping areas of approximately 100 hectares (250 acres), and most of the disturbances occurring along Highway 82 or the RFTA right-of-way would be confined to the vegetation type found in the railroad and roadside rights-of-way. This land cover type is too small to be represented as a mapping unit under the COGAP data. Additional discussion on the COGAP data can be found in **Chapter III.C.5.1Roaring Fork Valley Land Cover Types**.

5.1.1 No Action/Committed Projects Alternative. The No Action/Committed Projects Alternative will have no new impacts on upland and floodplain vegetation. No differences between opening day and year 2025 time frames are anticipated.

5.1.2 Trail. The new Rio Grande Trail will have little to no impact on upland and floodplain vegetation. The trail will be contained fully within the RFTA right-of-way. No differences between opening day and year 2025 time frames are anticipated.

5.1.3 BRT Alternative. The BRT Alternative will have little to no impact on upland and floodplain vegetation. The new transit station and parking locations will be constructed in urban, commercial and/or industrial areas requiring a total of 11.76 hectares (29.06 acres) of new right-of-way. No differences between opening day and year 2025 time frames are anticipated.

5.1.4 Rail Alternative. The Rail Alternative and associated new Rio Grande Trail will have little to no impact on upland and floodplain vegetation. The new transit station and parking locations will be constructed in urban industrial areas. A total of 18.85 hectares (46.57 acres) of additional right-of-way will be required for the entire route.

Percentages of land cover types adjacent to the project rights-of-way are shown in Table V-5. Project disturbances outside of the rights-of-way may affect small portions of these land cover types. Vegetation within the rights-of-way is already subject to weed management as described in the following section. The construction of new bridges over the Roaring Fork River floodplain could produce localized shading of some cover types, which in turn could bring about a shift in species composition to the affected areas. Such effects are likely to be minor in extent. No differences between opening day and year 2025 time frames are anticipated.

Table V-5
Potential Impacts to Land Cover Types

Land Cover Type	Percentage of Land Cover Adjacent to Rights-of-Way*
Urban	7%
Irrigated Cropland	63%
Mesic Shrubland	4%
Deciduous Oak	4%
Big Sagebrush	10%
Piñon Juniper	12%
Total	**100%**

**Based on RFTA right-of-way*

5.2 Noxious Weed Management – Preventative Actions and Control Measures

The Highway 82 Corridor is located in three counties: Garfield, Eagle, and Pitkin; all of which are located within CDOT Region 3 and Maintenance Section 2. Portions of project alternatives that are located within CDOT rights-of-way, such as along Highway 82, will be subject to noxious weed management per the *CDOT Integrated Noxious Weed Management Plan* (CDOT, 2000). RFTA right-of-way noxious weeds will be managed via the *RFTA Integrated Weed Management Plan* (RFTA, 2002 and/or the *Pitkin County Noxious Weed Management Plan*, 2001). Weed management in the vicinity of proposed new stations and/or park-and-ride locations within the corridor will be managed by RFTA or will fall within local and county jurisdictions. The footprints for new stations and/or park-and-rides are not expected to include non-maintained lawn areas.

5.2.1 No Action/Committed Projects Alternative. Noxious Weed management for previously approved projects will include management per CDOT, RFTA, county and/or local jurisdiction. Application of weed control techniques identified in the applicable management plan are expected to control the spread of invasive species within or beyond the corridor and eliminate potential impacts from invasive species associated with this alternative. No differences between opening day and year 2025 time frames are anticipated.

5.2.2 Trail. Noxious weed management along the new Rio Grande Trail, which is completely contained within the RFTA right-of-way, will follow the *RFTA Integrated Weed Management Plan* or the *Pitkin County Noxious Weed Management Plan.* Application of weed control techniques identified in the management plans is expected to control the spread of invasive species within or beyond the corridor and eliminate potential impacts from invasive species associated with this alternative. No differences between opening day and year 2025 time frames are anticipated.

5.2.3 BRT Alternative. Noxious Weed management for Highway 82 will be implemented based on the *1999-2000 CDOT Integrated Noxious Weed Management Plan.* Weed management in the vicinity of proposed new stations and/or park-and-ride locations within the corridor will be managed by RFTA or will fall within local and county jurisdictions. The footprints for new stations and/or park-and-rides are not expected to include non-maintained lawn areas. No differences between opening day and year 2025 time frames are anticipated.

5.2.4 Rail Alternative. Noxious Weed management for the portion of the Rail Alternative involving CDOT rights-of-way will be implemented based on the *1999-2000 CDOT Integrated Noxious Weed Management Plan.* Noxious weed management within the RFTA right-of-way will follow the *RFTA Integrated Weed Management Plan* or the *Pitkin County Noxious Weed Management Plan.* Weed management in the vicinity of proposed new stations and/or park-and-ride locations within the Project Corridor will be managed by RFTA or will fall within local and county jurisdictions. The footprints for new stations and/or park-and-rides are not expected to include non-maintained lawn areas. Application of weed control techniques identified in the management plans is expected to control the spread of invasive species within or beyond the corridor and eliminate potential impacts from invasive species associated with this alternative. No differences between opening day and year 2025 time frames are anticipated.

6. Wetland Impacts

Permanent impacts to wetlands resulting from rail and trail construction may be direct and/or indirect. Direct impacts include filling or draining wetlands. Estimates of direct, permanent impact are given in Table V-6 for all alternatives. Temporary effects to wetlands will also occur due to the need for heavy equipment to maneuver during construction and for site access. An estimate of temporary effects indicates approximately 0.4 hectares (one acre) of wetlands will be temporarily affected by construction activities associated with the Rail Alternative.

Discussion of wetland mitigation and avoidance opportunities are fully discussed in **Chapter VII: Mitigation Measures.** Routine Wetlands Determination Forms and Wetland Findings will be prepared for inclusion in preferred alternative and trail environmental documents.

Table V-6
Estimated Area of Permanent Impact, Roaring Fork Valley Wetlands
(hectares/acres)

Measure	Committed Projects/No Build	BRT[1]	Rail	Rio Grande Trail
Area estimate of filled non-jurisdictional wetlands [2]	0	.02/.05	0.36/.88	0.59/1.45
Area estimate of filled jurisdictional wetlands [2]	0	.004/.01	0.15/.37	0.34/.86
Estimated Total Impact	0	.024/.06	0.51/1.25	0.93/2.31

[1] *Wetlands impacts associated with this alternative are for both BRT-Bus and BRT-LRT at the proposed Basalt Station.*

[2] *Wetland fill estimated from 7.6 m (25 ft) cut-and-fill boundaries along proposed rail alignment, and a 6.1 m (20 ft) cut-and-fill projection for the Rio Grande trail alignment. Acreage estimates assume that all bridge impacts at stream/river crossings occur within cut-and-fill boundaries.*

6.1 No Action/Committed Projects Alternative

The No Action/Committed Projects Alternative will have no previously unmitigated impact to wetlands. No differences between opening day and year 2025 time frames are anticipated.

6.2 Trail

Impacts caused by the trail were calculated by assuming a maximum cut-and-fill distance of 6.1 meters (20 feet) on either side of the centerline of the abandoned railroad when the trail does not share the right-of-way with the proposed rail line. When the rail and trail are proposed to exist side by side, a maximum cut-and-fill distance of 7.6 meters (25 feet) on either side of the centerline was considered. A maximum of .34 hectares (.86 acres) of jurisdictional wetlands may be affected by the trail. A maximum of .59 hectares (1.45 acres) of non-jurisdictional wetlands may be affected by trail construction. Wetland boundaries will be surveyed and re-mapped prior to the trail design due to the ever-changing local environment and the passage of time since the original survey. Based on current mapping, a total of 40 wetland polygons and fringe areas may be affected by the proposed Rio Grande Trail. Twenty-one of these are jurisdictional wetlands. Table V-7 illustrates jurisdictional and non-jurisdictional wetlands that may be affected by trail construction. Areas of potentially affected jurisdictional wetlands that are larger than 92 square meters (1,000 square feet) are identified in Figure V-5, Primary Wetland Habitat Affected within the Project Corridor. Approximately half of the wetlands affected are jurisdictional and carry a functional assessment of "high" due to their connection to a natural hydrologic regime.

No additional impacts to wetlands are expected after opening day, in the year 2025 time frame.

Table V-7
Jurisdictional and Non-Jurisdictional Wetlands Impacts for Proposed Rio Grande Trail

Wetland ID [1]	Wetland Type [2]	Permanent Impact		Impacts from [3]
		Square feet	Square meters	
Jurisdictional Wetlands				
368-1	PEM1C	673.0	62.6	Rail + Trail
370-2	PSS1C	1,990.0	184.9	Rail + Trail
371-3	PEM1C	111.0	10.3	Rail + Trail
371-5	PEM1C	1,134.0	105.3	Rail + Trail
375-5	PSS1C	1,368.0	127.1	Rail + Trail
376-4	PFO1C	1,632.0	151.7	Trail Only
376-5	PSS1C	508.0	47.2	Trail Only
377-2	PSS1C	76.0	7.1	Trail Only
377-3	PSS1C	188.0	17.4	Trail Only
378-1	PEM1C	7,421.0	689.4	Trail Only
378-4	PEM1C	2,838.0	263.6	Trail Only
378-5	PEM1C	120.0	11.2	Trail Only
378-6	PEM1C	7,103.0	659.9	Trail Only
379-1	PEM1C	1,684.0	156.5	Trail Only
379-3	PEM1C	1,914.0	177.8	Trail Only
379-4	PFO1C	666.0	61.8	Trail Only
379-5	PEM1C	1,925.0	178.8	Trail Only
379-7	PEM1C	1,356.0	125.9	Trail Only
379-8	PEM1C	368.0	34.2	Trail Only
380-2	PEM1C	1,889.0	175.5	Trail Only
Fringe Wetland	PSS1C	2,666.0	247.7	Rail + Trail
Subtotal	--	37,630.0	3,495.9	--
Non-Jurisdictional Wetlands				
365-1	PEM1C	349.0	32.4	Rail + Trail
367-1	PEM1C	91.0	8.5	Rail + Trail
370-3	PEM1C	236.0	21.9	Rail + Trail
Non-Jurisdictional Wetlands				
370-4	PEM1C	1,701.0	158.0	Rail + Trail
370-5	PFO1C	21.0	2.0	Rail + Trail
371-9	PFO1C	1,425.0	132.4	Rail + Trail
372-2	PEM1C	26.0	2.4	Rail + Trail
374-1	PEM1C	13,038.0	1,211.2	Rail + Trail
375-7	PEM1C	1,582.0	146.9	Rail + Trail
379-11	PEM1C	7,327.0	680.6	Trail Only
390-3	PEM1C	611.0	56.7	Trail Only
380-4	PEM1C	362.0	33.6	Trail Only
381-4	PEM1C	913.0	84.8	Trail Only
382-8	PEM1C	712.0	66.1	Trail Only
383-2	PEM1C	98.0	9.1	Trail Only
385-2	PSS1C	2,484.0	230.8	Rail + Trail
388-2	PEM1C	110.0	10.2	Rail + Trail
389-1	PSS1C	42.0	3.9	Rail + Trail

Table V-7
Jurisdictional and Non-Jurisdictional Wetlands
Impacts for Proposed Rio Grande Trail

Wetland ID [1]	Wetland Type [2]	Permanent Impact		Impacts from [3]
		Square feet	Square meters	
390-1	PSS1C	377.0	35.0	Rail + Trail
Subtotal		31,505.0	2,926.5	
Grand Total		63,010.0	5,853.0	

Source: SAIC data files, 01-11-01

[1] *Wetland ID's are polygon numbers indicating RFTA ROW mileposts followed by a plot number (SAIC, 1999).*
[2] *Wetland type are defined as follows. Additional information is located in* ***Chapter III.C.6 Wetlands****. PEM1C = Palustrine Persistent Emergent Persistently Flooded, PSS1C = Palustrine Scrub-Shrub Broadleaved Deciduous Persistently Flooded, PFO1C = Palustrine Forested Broadleaved Persistently Flooded Deciduous.*
[3] *Cut-and-fill distances, either side of the centerline for the Trail Only alignment average approximately 6.1 meters (20 feet) and for the Trail + Rail average 7.6 meters (25 feet) on either side of the proposed alignment.*

6.3 BRT Alternative

The BRT Alternative alignment will have no impact to wetlands because it will be implemented within Highway 82 right-of-way and within existing laneage. Wetlands have been identified in the vicinity of the proposed Basalt Station. A total of .004 hectares (0.01 acres) of jurisdictional and .02 hectares (0.05 acres) of non-jurisdictional wetlands may be affected by construction of the Basalt Station. Re-examination of all sites will occur prior to completion of final design plans. No differences between opening day and year 2025 time frames are anticipated.

6.4 Rail Alternative

Cut-and-fill distances for the rail alignment average approximately 7.6 meters (25 feet) on either side of the proposed alignment. Where the trail and the rail alignment occur together, only wetland impacts caused by the rail alignment were used due to its larger construction footprint. When the trail is adjacent to the rail, the wetland impact area will not exceed that estimated for rail. Wetlands have been identified in the vicinity of the proposed Basalt Station. A total of .004 hectares (0.01 acres) of jurisdictional and .02 hectares (0.05 acres) of non-jurisdictional wetlands may be affected by construction of the Basalt Station. Re-examination of all sites will occur prior to completion of final design plans.

Wetland boundaries must be surveyed and re-mapped prior to the final design due to the ever-changing local environment and the passage of time since the original survey. Based on current mapping, a total of 34 wetland polygons and fringe areas may be affected by the Rail Alternative. Fifteen of these are jurisdictional wetlands. Table V-8 illustrates jurisdictional and non-jurisdictional wetlands that may be affected by rail construction. Areas of potentially affected jurisdictional wetlands that are larger than 92 square meters (1000 square feet) are identified in Figure V-5, Primary Wetland Habitat Affected within the Project Corridor. Less than half of the wetlands affected are jurisdictional and carry a functional assessment of "high" due to their connection to a natural hydrologic regime.

Because the Rail Alternative route generally follows the existing Highway 82 and RFTA rights-of-way, permanent impacts to wetlands from the Rail Alternative have been minimized. The limited nature of direct impacts to jurisdictional wetlands along the Rail Alternative, 0.15 hectares (.37 acres) and to non-jurisdictional wetlands, 0.36 hectares (.88 acres), is not expected to affect wetland function on a local or regional scale. No differences between opening day and year 2025 time frames are anticipated.

Indirect impacts are often less obvious than direct impacts and do not necessarily produce predictable or measurable changes to the affected wetlands. Types of indirect impacts typically include:

- addition of pollutants into wetlands from stormwater runoff,
- increases in sediment from land clearing activities,
- alteration of wetland hydrology from changes in drainage patterns, and
- changes in sunlight and surface water temperatures from new structures or loss of tree canopy.

The potential for indirect impacts is relatively minor because 1) the highway and rail corridors already exist, and 2) RFTA will employ standard Best Management Practices to avoid/minimize these impacts.

Table V-8
Jurisdictional and Non-Jurisdictional Wetlands
Impacts for Rail Alternative

Wetland ID [1]	Wetland Type [2]	Permanent Impact		Impacts from [3]
		Square feet	Square meters	
Jurisdictional Wetlands				
360-1	PEM1C	53.0	5.0	Rail Only
368-1	PEM1C	673.0	62.6	Rail + Trail
370-2	PSS1C	1,990.0	184.9	Rail + Trail
371-3	PEM1C	111.0	10.3	Rail + Trail
371-5	PEM1C	1,134.0	105.3	Rail + Trail
375-5	PSS1C	1,368.0	127.1	Rail + Trail
376-6	PSS1C	957.0	88.9	Rail Only
376-7	PEM1C	2,985.0	277.3	Rail Only
381-1	PEM1C	324.0	30.1	Rail Only
Jurisdictional Wetlands				
382-1	PEM1C	94.0	8.7	Rail Only
382-4	PSS1C	1,132.0	105.1	Rail Only
382-5	PSS1C	1,684.0	156.5	Rail Only
383-7	PSS1C	585.0	54.3	Basalt Station
394-2	PSS1C	345.0	32.1	Rail Only
Fringe Wetland	PSS1C	2,666.0	247.7	Rail + Trail
Subtotal	--	16,101.0	1,495.9	--
Non-Jurisdictional Wetlands				
364-1	PEM1C	479.0	44.5	Rail Only
365-1	PEM1C	349.0	32.4	Rail + Trail
367-1	PEM1C	91.0	8.5	Rail + Trail
370-3	PEM1C	236.0	21.9	Rail + Trail
370-4	PEM1C	1,701.0	158.0	Rail + Trail

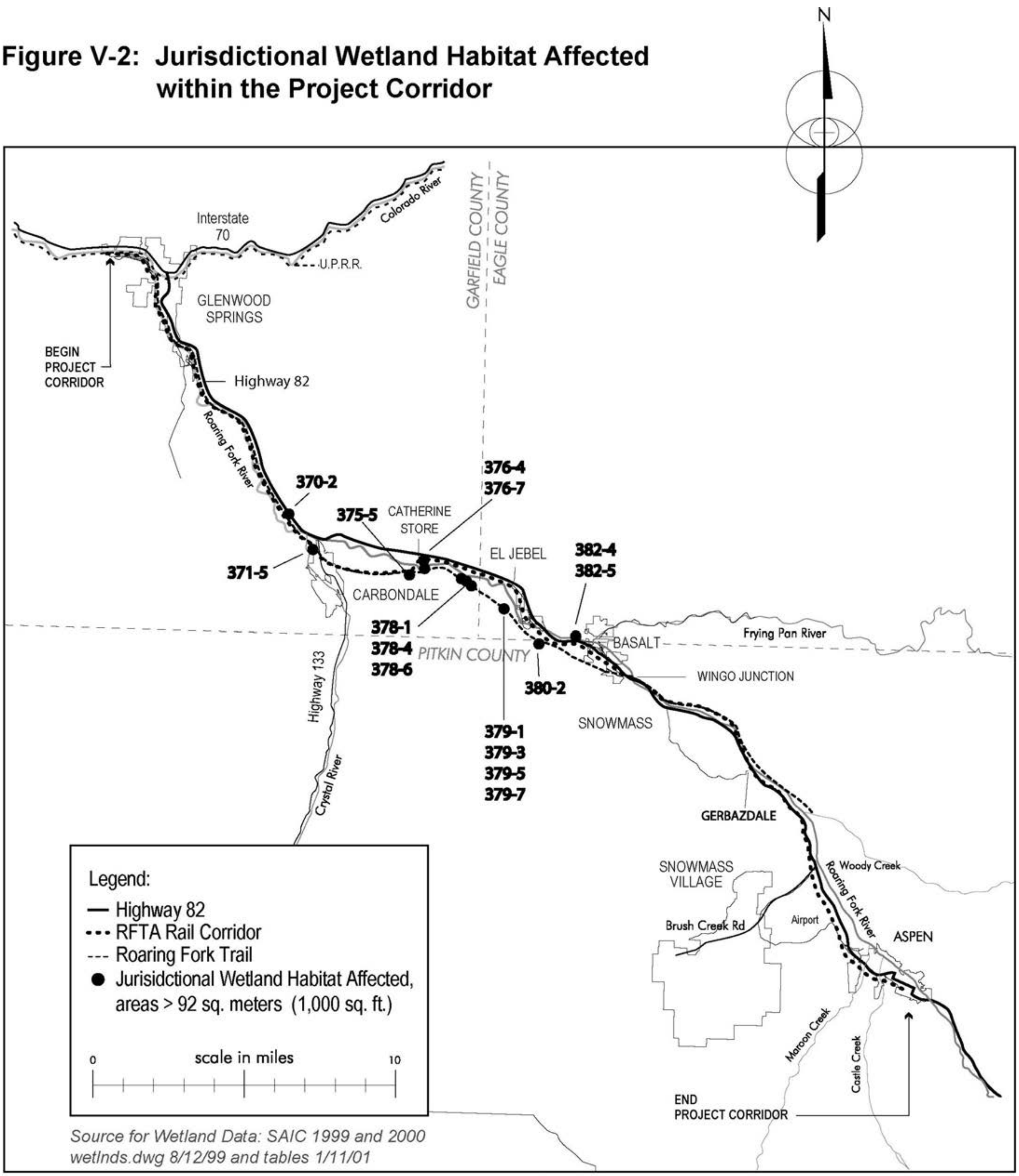
Table V-8
Jurisdictional and Non-Jurisdictional Wetlands Impacts for Rail Alternative

Wetland ID [1]	Wetland Type [2]	Permanent Impact		Impacts from [3]
		Square feet	Square meters	
370-5	PFO1C	21.0	2.0	Rail + Trail
371-9	PFO1C	1,425.0	132.4	Rail +Trail
372-2	PEM1C	26.0	2.4	Rail + Trail
374-1	PEM1C	13,038.0	1,211.2	Rail + Trail
375-7	PEM1C	1,582.0	146.9	Rail + Trail
377-6	PEM1C	13,731.0	1,275.6	Rail Only
377-9	PSS1C	109.0	10.1	Rail Only
378-9	PEM1C	63.0	5.9	Rail Only
382-6	PEM1C	100.0	9.3	Rail Only
383-6	PEM1C	2,267.0	210.6	Basalt Station
385-2	PSS1C	2,484.0	230.8	Rail + Trail
388-2	PEM1C	110.0	10.2	Rail + Trail
389-1	PSS1C	42.0	3.9	Rail + Trail
390-1	PSS1C	377.0	35.0	Rail + Trail
Subtotal		38,231.0	3,551.6	
Total		54,332.0	5,047.5	

Source: SAIC data files, 01-11-01

[1] *Wetland ID's are polygon numbers indicating RFTA ROW mileposts followed by a plot number (SAIC, 1999).*
[2] *Wetland type are defined as follows. Additional information is located in* ***Chapter III.C.6 Wetlands****. PEM1C = Palustrine Persistent Emergent Persistently Flooded, PSS1C = Palustrine Scrub-Shrub Broadleaved Deciduous Persistently Flooded, PFO1C = Palustrine Forested Broadleaved Deciduous Persistently Flooded.*
[3] *Cut-and-fill distances, either side of the centerline for the rail average 7.6 meters (25 feet) on either side of the proposed alignment, for both the Rail Only and the Rail + Trail.*

Figure V-2: Jurisdictional Wetland Habitat Affected within the Project Corridor



7. Fisheries Impacts

Impacts to fisheries are the result of changes in water quality and characteristics that adversely affect fish habitat and fish populations. Sources of such effects may include the introduction of chemical pollutants, changes in pH, conductivity or temperature, increased turbidity, reductions in filtering capacity, changes in stream flow, and sedimentation. These sources may arise from actions such as site grading, removal of riparian vegetation or trees, ground disturbance within stream channels, fuel leaks, capping of soils with pavement, reductions of wetland acreage, and pollution due to increases in impervious surface runoff. Except for accidental occurrences, impacts to fisheries can be prevented with appropriate BMPs. See **Chapter VII: Mitigation Measures** for a detailed discussion on BMPs. Effects are most likely to occur at stream crossings, where fisheries habitat and a project alternative are in closest proximity These impacts are related to both construction and operations activities and are directly proportional to the number of additional stream crossings per alternative.

7.1 No Action/Committed Projects Alternative

Under the No Action/Committed Projects Alternative, 14 stream crossings already exist. No additional crossings are expected. Slight differences between opening day and year 2025 time frames may be anticipated as the result of increased traffic on highway elements of this alternative at stream crossings, thereby increasing the potential for vehicle-related impacts.

7.2 Trail

Although three additional stream crossings are associated with trail construction, the impact potential after completion of trail construction is negligible. No differences between opening day and year 2025 time frames are anticipated.

7.3 BRT Alternative

Under the BRT Alternative, no additional stream crossings will occur. Slight differences between opening day and year 2025 time frames may be anticipated as the result of increased traffic on highway elements of this alternative at stream crossings, thereby increasing the potential for vehicle-related impacts.

7.4 Rail Alternative

Under the Rail Alternative, eight new stream crossings will occur on the rail alignment. Despite the sensitivity of the Roaring Fork River drainage within the Project Corridor, proper design and BMPs can minimize adverse impacts and maintain high environmental quality within the fishery. Slight differences between opening day and year 2025 time frames may be anticipated as the result of increased rail traffic at stream crossings, thereby increasing the potential for rail-related impacts.

8. Wildlife Impacts

This section analyzes the potential for impacts to wildlife resources for the proposed alternatives. Appropriate Colorado Division of Wildlife Coordination letters are included in **Appendix A**. Determination of the significance of potential impacts to biological resources is based on:

1. importance (i.e., legal, commercial, recreational, ecological, or scientific) of the resource;
2. sensitivity of the resource to proposed activities;
3. proportion of the resource that would be affected relative to its occurrence in the region; and
4. duration of activities affecting the resource.

Impacts to wildlife are significant if species or habitats of high concern are adversely affected over relatively large areas, or if disturbances cause reductions in population size or distribution of a species of high concern. Potential for impact is directly proportional to the number of crossings or habitat encounters identified per alternative.

Construction activities will be focused on a relatively small percentage of the overall Project Corridor. Consequently, negligible habitat loss and associated impacts to wildlife populations is anticipated under any of the alternatives. Potential impacts to threatened, endangered, candidate, and other special concern species are discussed in **Section 10** of this chapter.

8.1 No Action/Committed Projects Alternative

8.1.1 Opening Day Time Frame. The Roaring Fork Valley is classified as overall elk range by CDOW, and mule deer habitat occurs throughout the proposed project area (CDOW, 1998).

Two elk crossings and eleven mule deer crossings exist along Highway 82 under the No Action/Committed Projects Alternative. This is two fewer big game crossings than the Rail Alternative. Accident data for Highway 82 between 1998 and 2000 indicated that close to 20 percent of all accidents were animal-related in the more rural Carbondale and El Jebel-Basalt areas of the highway, compared with negligible occurrences in the cities of Glenwood Springs and Aspen. Additional information on safety and accidents can be found in **Chapter III.18: Traffic Safety**.

Impacts to big game crossing Highway 82 are expected to increase as vehicle miles traveled (VMT) increases in future years. Projects that reduce VMT may create a decrease in animal accidents. Other factors may outweigh this impact, including adjacent development and fencing practices, signage, and changes in game crossing patterns.

8.1.2 Year 2025 Time Frame. To the extent that impacts are VMT-related, year 2025 impacts will be greater than opening day. Regardless, the effects of Highway 82 traffic on big game are not expected to significantly affect the plentiful deer and elk resource based on the four criteria for determination of significance.

8.2 Trail

8.2.1 Legacy Project Grant Agreement. A portion of the funding to purchase the project rail right-of-way was acquired from the Legacy Project Grant Agreement, between the State Board of Great Outdoors Colorado Trust Fund and RFRHA. A significant portion of this grant came from the wildlife quadrant of this funding source. As a result wildlife, wildlife habitat and wildlife programs are important to the trail design and operation for the proposed project.

Subsequent to this grant agreement, a substantial portion of these wildlife quadrant funds were de-authorized, switched to another funding quadrant. Regardless, the project continues its commitment to wildlife issues in the Project Corridor.

Relevant to the Legacy Grant is the commitment to design a wildlife-compatible trail, to protect the integrity of the natural systems while teaching users about wildlife and natural features. An attempt will be made to balance human impact to wildlife while enhancing visitor experience and education. To some extent, the development of the trail corridor within the historic railroad right-of-way, which happens to parallel the Roaring Fork River and associated habitats, is not the ideal wildlife situation. A meandering trail right-of-way that occasionally cuts through this sensitive riparian area would be more ideal. However, the preservation of the railroad corridor with associated trail use is preferable to abandonment and the potential for the absorption of the property into adjacent land uses and developments.

8.2.2 Opening Day Time Frame. Construction activities for the new Rio Grande Trail would affect wildlife resources through permanent loss or alteration of small sections of habitat and through temporary disturbance from construction, noise, and human presence. Noise and ground-clearing activities would temporarily displace wildlife from habitat in the immediate vicinity of construction, even within project-owned rights-of-way, with some wildlife possibly returning after construction is complete. Seasonal timing of construction activities to avoid wildlife migrations or seasonal habitat use would minimize these conflicts. The total permanent loss of habitat will be similar to the estimated 15.75 hectares (38.80 acres) of new impervious surface for the entire length of the Project Corridor. Based on the criteria for determination of the significance of potential impacts to biological resources, no population-level effects are anticipated for this minimal linear impact.

An active red-tailed hawk nest (SAIC 1999c) lies adjacent to RFTA right-of-way and will be affected by construction and use of the new Rio Grande Trail. An active great horned owl nest currently adjacent to the RFTA right-of-way will be similarly affected. Based on the criteria for determination of the significance of potential impacts to biological resources, no population-level effects are anticipated for these species occurring along the Project Corridor. Rick Lofarro of the Roaring Fork Conservancy indicated that these nests appeared to be reasonably separated from the proposed trail location and that impacts are not likely (*Personal Communication*, Lofarro, 2002).

8.2.3 Year 2025 Time Frame. Potential for localized impacts to wildlife caused by trail users and their pets will exist throughout the corridor. Wildlife impacts from trail use are not expected to change through 2025. Increased trail usage could result in increased affects to local wildlife, depending on the sensitivity of the areas adjacent to the trail.

8.3 BRT Alternative

8.3.1 Opening Day Time Frame. Two elk crossings and eleven mule deer crossings are present along Highway 82 under this alternative. These are the same crossings associated with the No Action/Committed Projects Alternative. Reduced VMT associated with the BRT alternative may create fewer animal-related accidents than for the No Action/Committed Projects Alternative. This is two fewer game crossings than the Rail Alternative. No construction impacts are associated with the BRT aspects of this alternative. Station and park-and-ride locations are all within existing disturbed commercial and industrial areas and will not impact significant wildlife habitat.

8.3.2 Year 2025 Time Frame. To the extent that impacts are VMT related, year 2025 impacts will be greater than opening day. The BRT alternatives will generally result in ten to 12 percent less VMT than the No Action/Committed Projects Alternative through 2025. Regardless, the effect of Highway 82 traffic on big game is not expected to significantly affect the plentiful deer and elk resource based on the four criteria for determination of significance.

8.4 Rail Alternative

8.4.1 Opening Day Time Frame. Three highway or rail elk crossings and 12 mule deer crossings exist under the Rail Alternative. This is an addition of two big game crossings over the No Action/Committed Projects and BRT Alternatives. The addition of the two crossing locations will not result in a significant increase in potential impacts for this alternative. However, the fact that this alternative involves a regularly scheduled, high-speed, multiple-car train, rather than a constant stream of automobiles on a highway, may result in a decrease in animal accidents. There may be an initial increase in rail/animal accidents as portions of the old rail corridor come back into active use. Other factors may outweigh this impact, including adjacent development and fencing practices, signage, and changes in game crossing patterns.

Construction activities under the Rail Alternative would affect wildlife resources through permanent loss or alteration of small sections of habitat and through temporary disturbance from construction, noise, and human presence. Noise and ground-clearing activities would temporarily displace wildlife from habitat in the immediate vicinity of construction, even within project-owned rights-of-way, with some wildlife possibly returning after construction is complete. Seasonal timing of construction activities to avoid wildlife migrations or seasonal habitat use would minimize these conflicts. Minimal established habitat is anticipated along the already disturbed railroad grade and tracks.

An active great horned owl nest currently adjacent to the existing rail line may be affected by the implementation of the Rail Alternative.

The Rail Alternative passes through three golden eagle (*Aquila chrysaetos*) nest site buffer zones. The three zones are on one wall system near Red Canyon and are likely part of one nest territory. The nest site was active in 1999 (SAIC 1999c). Currently, Highway 82 intersects the buffer (Highway 82 passes directly below the nest wall) and eagles are still using the site. The Rail Alternative will be adjacent to Highway 82 on the opposite side of the nest wall. Therefore, despite intersecting the recommended buffer, adverse impacts due to rail operations are unlikely. Scheduling of rail construction at this location should consider the eagle nesting season (March 1 to July 31) to avoid construction-related impacts.

A stick nest on a wall near Cattle Creek on the northeast side of Highway 82 has been used alternately by nesting prairie falcons and red-tailed hawks (CDOW, 1998). The site was inactive in 1999 (SAIC, 1999c). Highway 82 passes through the CDOW-recommended buffer zone, as would the proposed rail. The Rail Alternative alignment would pass on the south side of the highway and thus impacts from rail use would be negligible. Schedules for rail construction at this location should consider the prairie falcon/red-tailed hawk nesting season (March 1 to July 31) to avoid potential construction-related impacts.

Even without implementation of BMPs as noted in **Chapter VII: Mitigation Measures,** none of the impacts noted will affect species population levels. Based on the criteria for determination of the significance of potential impacts to biological resources, no significant level effects are anticipated for these species occurring along the Project Corridor for the Rail Alternative.

8.4.2 Year 2025 Time Frame. To the extent that impacts are VMT-related, the Rail Alternative is expected to result in a reduced VMT for opening day over 2025. The Rail Alternative, similar to the BRT options, will result in an overall decrease in VMT of ten to 11 percent through 2025. Regardless, the effects of the Rail Alternative on big game are not expected to significantly affect the plentiful deer and elk resource based on the four significance criteria. Note that station and park-and-ride locations are all within existing disturbed commercial and industrial areas and will not impact significant wildlife habitat.

9. Impacts on Wild and Scenic Rivers

No Wild and Scenic Rivers exist in the Project Corridor; therefore, no impacts are associated with any of the alternatives under consideration.

10. Impacts on Threatened and Endangered Species

Impacts on threatened and endangered species for each alternative are identified below. Only three special-status species are known to occur within the Project Corridor: bald eagle (Federal and State Threatened), great blue heron (State Species of Concern), and river otter (State Endangered). No river otter habitat will be adversely impacted by any of the alternatives in the Project Corridor, and river otter populations are not likely to be affected. Correspondence with the CDOW and USFWS is located in **Appendix A.** Consultation with the CDOW and USFWS may also be necessary on the recent Canada Lynx activities in the vicinity of the Project Corridor should the Rail Alternative be selected.

10.1 No Action/Committed Projects Alternative

No new impacts to Threatened and Endangered Species have been identified under this alternative for either the opening day or year 2025 time frame.

10.2 Trail

10.2.1 Opening Day Time Frame.

Bald Eagle. The proposed new Rio Grande Trail intersects one inactive bald eagle nest (Ireland, 2002) and three roost sites. Construction and trail use between November 15 and April 1 has the potential to affect nesting and roosting bald eagles.

The bald eagle nest site is currently affected by existing development, including an active golf course and residential development, inside the recommended buffer zone. The RFTA right-of-way is generally behind an earthen berm, approximately 381 meters (1,250 feet) from the nest. Coordination with USFWS indicates that there has been no productivity (eggs laid or young eagles fledged) at this nest for eight years (Ireland, 2002). Aspen Glen has documented this for the past five years. Future productivity at this nest is questionable. Due to the proximity of existing development to this nest site, the construction and use of the trail is not expected to create further impacts to the nest site. Additional discussion can be found in **Chapter VII: Mitigation Measures.**

The three bald eagle roost site buffer zones intersected by the proposed trail include Cattle Creek, Wheatley Gulch, and Catherine Store. The Cattle Creek roost buffer is tangentially intersected by the proposed trail. The Wheatley Gulch and Catherine Store roost site buffers are intersected by the trail alignments. Minimal to no impacts are anticipated. Additional discussion can be found in **Chapter VII: Mitigation Measures.**

Great Blue Heron. Two known great blue heron nesting colonies (heronries) occur along the Roaring Fork River adjacent to the RFTA right-of-way. The heronries are locally known as the Rock Bottom Ranch site and Sanders Ranch site (Lofarro, 1999). The Colorado Division of Wildlife recommends a buffer zone of 500 meters (1,640 feet) around active heronries to avoid disturbance and subsequent impacts.

The Sanders Ranch heronry buffer will be intersected by the trail where the RFTA right-of-way is adjacent to existing Highway 82 on a bluff approximately 457 meters (1,500 feet) away from and above the heronry. The distance and topographic relief between the trail alignment and the heronry are sufficient to avoid impacts to this heronry.

The Rock Bottom Ranch heronry contained 22 active nests in June 1999 (SAIC 1999c). The active nests are spread in a linear fashion for about 0.08 kilometers (0.5 mile) along a riparian cottonwood forest parallel to RFTA right-of-way. Observer Rick Lofarro, Roaring Fork Conservancy, noted that this heronry was the result of ditch work conducted by local landowners several years ago. The result was the creation of new meanders and shallow waters for fisheries that attracted the herons. Recently, the water patterns have changed and the number of nests has declined to approximately six. (*Personal Communication*, Lofarro, 2002).

The new Rio Grande Trail alignment will pass within the buffer. According to *Managing Development for People and Wildlife: A Handbook for Habitat Protection by Local Governments*, the average flushing distance for a great blue heron, when a person is walking directly towards the nest, is 32 meters (105 feet) (Clarion and Associates, no date). The approximate distance from the new Rio Grande Trail to the nearest heron nest is estimated at over 122 meters (400 feet). The interpretation of the flushing distance implies that trail use would not have an effect. Based on current observation on the decline of the heronry related to the changes in river patterns and food source, it is reasonable to conclude that the proposed project is not a key factor at this location.

10.2.2 Year 2025 Time Frame. No additional impacts are anticipated for this time frame.

10.3 BRT Alternative

No impacts to Threatened and Endangered Species have been identified under the BRT alternative for either the opening day or year 2025 time frame. Consultation with the CDOW and USFWS may also be necessary on the recent Canada Lynx activities in the vicinity of the Project Corridor should the Rail Alternative be selected.

10.4 Rail Alternative

10.4.1 Opening Day Time Frame.

Bald Eagle. The proposed Rail Alternative intersects one inactive bald eagle nest and three roost sites. Construction of the Rail Alternative between November 15 and April 1 also has the potential to affect nesting and roosting bald eagles in the Project Corridor.

The bald eagle nest site is currently affected by existing development, including an active golf course and residential development, inside the recommended buffer zone. The RFTA right-of-way is generally behind an earthen berm, approximately 381 meters (1,250 feet) from the nest. Coordination with USFWS indicates that there has been no productivity (eggs laid or young eagles fledged) at this nest for eight years (Ireland, 2002). Future productivity at this nest is questionable. Due to the proximity of existing development to this nest site, the construction and use of the Rail Alternative is not expected to create further impacts to the nest site. Additional discussion can be found in **Chapter VII: Mitigation Measures.**

The three bald eagle roost site buffer zones intersected by the proposed rail include Cattle Creek, Wheatley Gulch, and Catherine Store. The Cattle Creek roost buffer is tangentially intersected by the proposed rail. The Wheatley Gulch and Catherine Store roost site buffers are intersected by the rail alignments. Minimal to no impacts are anticipated. Additional discussion can be found in **Chapter VII: Mitigation Measures.**

Great Blue Heron. Two known great blue heron nesting colonies (heronries) occur along the Roaring Fork River adjacent to the RFTA right-of-way. The heronries are locally known as the Rock Bottom Ranch site and Sanders Ranch site (Lofarro 1999). The Colorado Division of Wildlife recommends a buffer zone of 500 meters (1,640 feet) around active heronries to avoid disturbance and subsequent impacts.

The Sanders Ranch heronry buffer will be intersected by the Rail Alternative where the RFTA right-of-way is adjacent to existing Highway 82 on a bluff approximately 457 meters (1,500 feet) away from and above the heronry. The distance and topographic relief between the Rail alignment and the heronry are sufficient to avoid impacts to this heronry.

The Rail alignment follows Highway 82 on the other side of the Roaring Fork River at the Rock Bottom Ranch heronry and will not affect this resource.

10.4.2 Year 2025 Time Frame. No additional impacts are anticipated for this time frame.

11. Impacts on Cultural Resources

This section analyzes the potential for impacts to cultural resources, both historic and archeological, for the proposed alternatives. Appropriate Colorado State Historic Preservation Office coordination and Section 106 compliance letters are included in **Appendix A**.

An undertaking is regarded as having an effect on a cultural resource if it alters any of the characteristics that may qualify the property for inclusion in the National Register of Historic Places (NRHP). An adverse effect is one that diminishes the integrity of any of those characteristics that qualified the resource for inclusion in the NRHP. Adverse effects, therefore, can only be incurred on sites that have been identified as significant historical resources eligible for inclusion in the NRHP. Section 106 of the National Historic Preservation Act (NHPA), as amended, applies to the historic properties listed or eligible for listing on the NRHP that may be affected by this project.

The impact analysis for cultural resources is based on studies referenced in **Chapter III.C.11.2.1**. Corridor analyses included both Highway 82 and RFTA rights-of-way. An Area of Potential Effect (APE) was defined for this project based on the locations of these rights-of-way and their relationship with the Roaring Fork River and other intervening roadways. Exact locations and sizes for transit stations and parking facilities have not been determined. At this time, no known cultural resource sites have been reported at the projected station locations.

Direct physical impacts to archaeological resources could occur during ground-disturbing activities associated with construction of the park-and-rides, stations and terminal facilities, new rail lines, or other related facilities. If any resources are identified during construction, work will be stopped and the CDOT staff archaeologist will be notified. Any adverse impact to an archaeological resource that is eligible for inclusion in the National Register of Historic Places (NRHP) is considered a significant impact. The significance of an archaeological resource is an assessment of the importance of the resource to the citizens of the United States and indicates that the site has attributes that qualify it for inclusion in the NRHP.

None of the known archaeological resources within the APE are considered to be eligible for inclusion in the NRHP. As a result, no alternatives will adversely affect significant archaeological resources in the Project Corridor.

11.1 Resources Eligible to the NRHP

A total of 44 cultual resource sites were identified, of which 28 are included in the APE. Of these, 11 resources have been identified as eligible for the NRHP (see Table V-9). An additional five resources are eligible to the NRHP for their association with the D&RGW RR. These are listed under the railroad in Table V-9. Potential effects to these resources are described by alternative in the following section.

Table V-9
Historic Properties - NRHP Eligible or Listed

Site Number	Site Name/Location	NRHP Status
5EA198/5GF1661/5PT123	D&RGW Railroad	Officially Eligible
5GF3005	Bridge – for association with D&RGW RR	Officially Eligible
5GF3006	Bridge – for association with D&RGW RR	Officially Eligible
5GF3011	Trestle- for association with D&RGW RR	Officially Eligible
5GF3012	Bridge – for association with D&RGW RR	Officially Eligible
5PT1084	Trestle – for association with D&RGW RR	Officially Eligible
5GF1167	Hardwick Bridge	Officially Eligible
5GF1282	Satank Bridge	Listed
5PT27	Emma School	Officially Eligible
5PT57	Wheatley School	Officially Eligible
5PT113	Aspen Commercial Historic District	Listed
5PT323	Emma Historic District	Officially Eligible
5PT471	A.B. Foster Ranch	Officially Eligible
5PT542	Colorado Midland Railroad	Officially Eligible
5PT792	Mather Residence - within the Emma Historic District	Officially Eligible
5PT851	Wingo Trestle	Officially Eligible

11.2 Potential Effects to Historic Properties

11.2.1 No Action/Committed Projects Alternative. Impacts to cultural resources associated with committed projects have been addressed in other studies, including but not limited to the *Entrance to Aspen ROD* (CDOT, 1998) and *Basalt to Buttermilk ROD* (CDOT, 1993). No differences in impacts have been identified for opening day or year 2025 time frames.

The *Entrance to Aspen FEIS* (CDOT, 1997) and *ROD* (CDOT, 1988) inadvertently identified the NRHP status of the Aspen Commercial Cores District (5PT113) as a local district only. The Entrance to Aspen Selected LRT alternative will not result in the physical taking of property from the district. The LRT will turn at Main and Monarch Streets, at the edge of the district, and run south to Durant Street where it turns east and ends at Rubey Park. A combined noise analysis has been done for the committed LRT and the proposed Rail Alternative.

The Entrance to Aspen LRT project will result in noise increases to receivers within the Historic District. The change in overall noise levels between the No-Build and Build cases for the LRT would be between one and five dBA along Monarch Street. This level of noise impact is not expected to compromise the historic value of the district nor the current uses of the properties.

The LRT project will not result in significant vibration impacts due to operations activities. There is a potential for impact during construction and this can be monitored and appropriate mitigation or avoidance actions taken based on monitoring results.

11.2.2 Trail. Eight NRHP-eligible or listed cultural resources noted in Table V-10 are within the APE for the construction of the new Rio Grande Trail.

The SHPO concurred with CDOT's finding that the trail location would have no adverse effect on the historic D&RGW Railroad grade and right-of-way. The finding of No Adverse Effect was based on the following rationale:

- The railroad is significant as a historic transportation corridor (Criterion A), and any proposed trail improvements would retain the corridor for transportation purposes and thus would not adversely affect the qualities that make the railroad eligible for the National Register of Historic Places (NRHP). The trail will result in no adverse effect to the setting and features of the railroad line, as it will not diminish the qualities that make the railroad eligible to the National Register.

- Under the federal legislation cited above, rail banking is considered a beneficial use, as it preserves the rail corridor from abandonment that would have caused the right-of-way to revert back to adjacent property ownership. Abandonment could have resulted in the loss of portions of, or all of, the historic Aspen Branch railroad grade.

- Even in areas where the trail results in paving on top of the rail bed or a siding, it can be said that the alignment and profile of the existing railbed or siding are being preserved from potentially erosive forces. The action does not alter any of the significance of the corridor, and will allow it to remain recognizable as a former railroad grade.

Except for the location of the trail on the historic D&RGW grade and right-of-way, the trail will simply run in the vicinity of the other properties. Of the five bridges identified for their association with the D&RGW RR, the trail will run on only three: 5GF3011, 5GF3012 and 5PT1084. There will be no physical intrusion on any of the adjacent cultural properties, nor indirect impacts. None of the eight sites will be adversely affected by the proposed trail construction. No additional actions are required regarding sites for which there is no adverse effect. No differences in impacts have been identified for opening day or year 2025 time frames.

Table V-10
NRHP Eligible or Listed Resources Potentially Affected by New Rio Grande Trail

Site Number	Site Name/Location	Determination of Effect
5EA198/5GF1661/5 PT123	D & RGW Railroad	**No Adverse Effect.** See discussion in text.
5GF3011	Trestle– for association with D&RGW RR	**No Adverse Effect.** See discussion for D&RGW RR in text.
5GF3012	Bridge – for association with D&RGW RR	**No Adverse Effect.** See discussion for D&RGW RR in text.
5PT1084	Trestle –for association with D&RGW RR	**No Adverse Effect.** See discussion for D&RGW RR in text.
5GF1167	Hardwick Bridge	**No Historic Properties Affected.** The bridge is separated from the trail by CR 154.
5GF1282	Satank Bridge	**No Adverse Effect.** This bridge across the Roaring Fork River is less than 30 meters (100 feet) from the trail project. Trail construction and use will not affect this resource, which is adjacent to the railroad right-of-way.
5PT27	Emma School	**No Adverse Effect.** Trail construction and use will not affect this resource, which is adjacent to railroad right-of-way.
5PT57	Wheatley School	**No Adverse Effect.** Trail construction and use will not affect this resource, which is adjacent to the railroad right-of-way.
5PT323	Emma Historic District	**No Historic Properties Affected.** The buildings in this District are separated from the trail by Highway 82.
5PT792	Mather Residence - within the Emma Historic District	**No Historic Properties Affected.** The buildings in the District are separated from the trail by Highway 82.
5PT851	Wingo Trestle	**No Adverse Effect.** Handrails and decking have been constructed over this existing trestle for trail use.

11.2.3 BRT Alternative. No impacts to cultural resources are associated with the development of bus rapid transit service along the existing Highway 82. The BRT system will not utilize any additional right-of-way along this route and the resulting reduction in VMT over the No Action/Committed Projects Alternative will more than offset the addition of bus traffic to Highway 82. Although VMT will increase over the opening day by the year 2025, it will remain less than VMT for the No Action/Committed Projects Alternative. Impacts associated with the portion of the BRT alternative that will utilize the Entrance to Aspen LRT or associated right-of-way were assessed and mitigated in the *Entrance to Aspen ROD* (CDOT, 1998) except as noted above The other applicable Highway 82 study was the *Basalt to Buttermilk ROD* (CDOT, 1993).

11.2.4 Rail Alternative. Table V-11 lists the ten cultural resources within the APE for the construction of the Rail Alternative. In addition, it lists the five sites eligible to the NRHP for their association with the D&RGW RR. Note that seven resources and three railroad-associated sites are common to both the trail and the rail aspects of this alternative. Four of these resources carry Conditional No Adverse Effect designations due to the potential for construction vibration impacts. Except for the location of the proposed rail alignment on the historic Denver and Rio Grande Western Railroad grade and right-of-way, this alternative will not physically intrude onto any of the identified properties. Except for potential construction vibration impacts identified for the four aforementioned resources, no indirect impacts are anticipated for any of these resources. No differences in effects are expected for opening day or the year 2025 time frame. Table V-11 summarizes the reasons for determination of No Adverse Effect for adjacent cultural resources. There will be no physical intrusion on the properties and the re-introduction of historic rail use will not create noise or visual impacts that are not customary for these historic resources.

Table V-11
NRHP Eligible or Listed Resources Potentially Affected By Rail Alternative

Site Number	Site Name/Location	Determination of Effect
5EA198/5GF1661/ 5PT123	D&RGW RR	**No Adverse Effect.** See detailed discussion in text .
5GF3005	Bridge – for association with D&RGW RR	**No Adverse Effect.** See discussion for D&RGW RR in text .
5GF3006	Bridge – for association with D&RGW RR	**No Adverse Effect.** See discussion for D&RGW RR in text .
5GF3011	Trestle- for association with D&RGW RR	**No Adverse Effect.** See discussion for D&RGW RR in text .
5GF3012	Bridge – for association with D&RGW RR	**No Adverse Effect.** See discussion for D&RGW RR in text .
5PT1084,	Trestle – for association with D&RGW RR	**No Adverse Effect.** See discussion for D&RGW RR in text .
5GF1167	Hardwick Bridge	**No Adverse Effect.** This bridge across the Roaring Fork River is separated from the rail project by existing CR 154 and is over 61 meters (200 feet) from the rail.
5GF1282	Satank Bridge	**Conditional No Adverse Effect.** This bridge across the Roaring Fork River is less than 30 meters (100 feet) from the rail project. This effect is conditional upon the installation of sensors to monitor potential ground-borne vibration from construction activities. See additional discussion below.
5PT27	Emma School	**Conditional No Adverse Effect.** Emma School is located adjacent to the RR on the south side. This effect is conditional upon the installation of sensors to monitor potential ground-borne vibration from construction activities. See additional discussion below.
5PT57	Wheatley School	**Conditional No Adverse Effect.** Wheatley School is located adjacent to the RR on the south side. This effect is conditional upon the installation of sensors to monitor potential ground-borne vibration from construction activities. See additional discussion below.
5PT113	Aspen Commercial Core Historic District	**Conditional No Adverse Effect.** Both airborne noise and ground-borne vibrations may be an impact of the new rail alignment between Monarch and Hunter Streets on Main Street. This effect is conditional upon the installation of sensors to monitor potential ground-borne vibration. See additional discussion below.]
5PT323	Emma Historic District	**No Adverse Effect.** The District is separated from the rail project by Highway 82 and is over 61 meters (200 feet) from the Railroad center.
5PT471	A.B. Foster Ranch	**No Adverse Effect**. The ranch faces Lower River Road is approximately 61 meters (200 feet) from the Railroad, which will run along Highway 82 in this area.
5PT542	Colorado Midland Railroad	**No Adverse Effect.** The railroad grade has already been affected by previous Highway 82 construction and also the Entrance to Aspen LRT. There are no additional effects.
5PT792	Mather Residence - within the Emma Historic District	**No Adverse Effect.** The District is separated from the rail project by Highway 82 and is over 61 meters (200 feet) from the Railroad center.

D&RGW Railroad (5EA198/5GF1661/5PT123).

The Rail Alternative will directly affect the existing historic railroad by rehabilitating the track, renovating associated historic features, and replacing or relocating other historic features. While some features may be destroyed, representative examples from all categories will be preserved. The transit plans include moving some historic features laterally out from the tracks as necessary to meet current safety and clearance standards. Such movement will occur only to the extent necessary to meet the standards. Also, deteriorated components will be replaced with similar materials and/or reused historic components on retaining walls, culvert faces, and similar features to preserve the setting and character of the railroad grade. These actions, which seek to preserve as much of the original appearance of the railroad and insert only compatible materials for new elements, will have no adverse effect on the portions of the railroad grade that may be converted to a rail system. The SHPO concurred with the finding of No Adverse Effect in 2003.

Satank Bridge (5GF1282), Emma School (5PT27) and Wheatley School (5PT57). The Rail Alternative may create temporary impacts to these resources caused by ground-borne vibrations from construction activities. USDOT recommends applying a vibration damage threshold criterion velocity of 0.12 inches per second (approximately 95 VdB) for extremely fragile historic buildings or 0.20 inches per second (approximately 100 VdB) for fragile buildings. Neither of these levels would create a risk of architectural damage for normal buildings. The threshold of perception is between 0.04 and 0.08 inches per second. Construction impacts are not usually anticipated for sites over 61 meters (200 feet) away. Actual impacts will be dependent on the type of construction equipment used and the geological conditions of the area. Since this is unknown at this time, monitoring of each of these sites for possible impacts will be necessary during construction activities.

Additional information on noise and ground-borne vibration criteria and impacts are found in **Chapter III.C.15** and **Chapter IV.C.15**. (Note operational vibration is expected to be only 80 vdB, 3.0 to 4.8 meters (10-15 feet) from the source.)

Aspen Commercial Core Historic District (5PT113). The Rail Alternative will have a minimal impact on the setting of the Aspen Commercial Core Historic District (5PT113). The previously-approved Aspen Light Rail line will turn off Main Street at Monarch Street and turn again at Durant Avenue to end at Rubey Park. The proposed Rail Alternative will continue down Main Street for three blocks to its terminus at Hunter Street, routing the rail line through the north edge of the Historic District. Design and operating plans will be developed to minimize the intrusion of the rail line.

The proposed Rail Alternative for the current project will not result in noise impacts to receptors along Main Street. Additional information is available in the *City of Aspen LRT and DMU Noise Evaluation* (Parsons Engineering Science, Inc. 2000).

Neither project will result in vibration impacts due to operations activities. There is a potential for impact during construction; this can be monitored and appropriate mitigation or avoidance actions taken based on monitoring results.

12. Impacts on Paleontological Resources

Paleontological resources are non-renewable and easily disturbed or damaged. Damage to these resources can occur through ground disturbance, casual site visitation, theft, and vandalism. Direct impacts to paleontological resources can occur as a result of development activity such as construction, operation, and maintenance. Indirect impacts can occur as a result of increased access to the fossil-bearing formations caused by the project.

No significant resources have been identified in the Project Corridor. Direct physical impacts to paleontological resources could occur during ground-disturbing activities associated with construction of the park-and-rides, stations and terminal facilities, new rail lines, or other related facilities. If any new resources are identified during construction, work will be stopped and the CDOT staff paleontologist will be notified.

12.1 No Action/Committed Projects Alternative

The paleontological resources along the Highway 82 corridor from Basalt east to Monarch and Main Streets in Aspen were identified within the *Entrance to Aspen ROD* and the *Basalt to Buttermilk ROD*. No additional paleontological resources have been identified for this alternative. There are no differences identified for the opening day and year 2025 time frames.

12.2 Trail

Only two fossil localities were identified within the Rail and Trail Corridor, neither of high significance. The trail will have no significant environmental consequences for presently-known paleontological resources for either the opening day or year 2025 time frames.

12.3 BRT Alternative

None of the previously-identified paleontological resources are considered significant. This alternative will have no significant environmental consequences for presently-known paleontological resources for either the opening day or year 2025 time frames.

12.4 Rail Alternative

Only two fossil localities were identified within the Rail and Trail Corridor, neither of high significance. Consequently, this alternative will have no significant environmental consequences for presently-known paleontological resources for either the opening day or year 2025 time frames.

13. Impacts on Section 4(f) and Section 6(f) Resources

The purpose of Section 4(f) is to preserve parkland, recreation areas, refuges, and historic sites by limiting the conditions under which these lands can be used for transportation projects. No impacts to Section 4(f) resources have been identified for any of the current project alternatives. Resources applicable to each alternative are identified below, and the rationale for finding no impacts is included.

Section 6(f) refers to lands purchased under the Land and Water Conservation Fund Act of 1965 and is under the jurisdiction of the National Park Service. There are no Section 6(f) Resources associated with the proposed project.

13.1 No Action/Committed Projects Alternative

No previously-unidentified Section 4(f) resources or impacts are associated with this alternative. Section 4(f) resources, impacts and mitigation measures have been identified in other studies, including but not limited to the *Entrance to Aspen ROD* (CDOT, 1997) and *Basalt to Buttermilk ROD* (CDOT, 1993). Nine resources were identified in the *Entrance to Aspen ROD.* The *ROD* included least-harm analysis and measures to minimize harm for all impacts. There are no additional impacts anticipated for either the opening day or year 2025 time frame.

The *Entrance to Aspen FEIS* (FHWA, 1997) and *ROD* (FHWA, 1988) inadvertently identified the Aspen Commercial Cores District (5PT113) as a local district only. The Entrance to Aspen Selected LRT alternative will not result in the physical taking of property from the district. The LRT will turn at Main and Monarch Streets, at the edge of the district, and run south to Durant Street where it turns east and ends at Rubey Park. A finding of No Adverse Effect has been made by the SHPO for this property in 2003.

13.2 Trail

The new Rio Grande Trail will provide connections with other existing trails in the Project Corridor. This is viewed as a beneficial impact of the trail construction and is not subject to Section 4(f). The new trail will not adversely affect any of the eight NRHP-eligible or listed cultural resources along its route. (See **Section 11.2.2** of this chapter for additional information on these resources.)

The construction of the new Rio Grande Trail is fully within the RFTA right-of-way, which is also the right-of-way from the old D&RGW. A finding of No Adverse Effect was made by the SHPO in 2003. The right-of-way was purchased under the rail banking program to preserve it as noted in **Chapter I:B.3: Goals and Objectives**. The use of this historic location preserves the profile and alignment of the existing railbed from potentially erosive forces. There will be no permanent or substantial impairment to the resource, and therefore no use or need for a Section 4(f) evaluation. There are no additional impacts anticipated for either the opening day or year 2025 time frame.

13.3 BRT Alternative

This alternative utilizes the existing Highway 82 laneage to its junction with the Entrance to Aspen LRT, where it will either use the LRT or the previously-approved LRT corridor for bus service. No additional impacts are anticipated with the addition of this transit service. Although some additional buses or trains will enter downtown Aspen for this alternative, the result will be a general decrease of automobile traffic throughout the community. VMT, as well as 2008 and 2025 forecast traffic volumes, will be less than for the No Action/Committed Projects Alternative.

Avoidance of intrusion into the Mt. Sopris Tree Farm Community Center and Recreation Area development is possible with the implementation of the transit station/park-and-ride lot in El Jebel, where there are two options for the location of the transit station and parking area: El Jebel Road and Willits Lane. If the El Jebel Road location is chosen, the proposed station will be across the road from the recreation area development. It will be located within an existing commercial area that includes a restaurant, theater, and supermarket. It will be designed to avoid visual intrusion into the recreational and open space uses on the Tree Farm property and the associated neighborhood park. The recreation area itself includes the newly-built Eagle County Community Center, located at the north end of the property parallel to the existing commercial area and proposed transit station.

Avoidance is possible, and there is a feasible and prudent alternative to use of this recreation property. There is little difference in potential traffic congestion in the vicinity of the El Jebel Road transit station and parking area between the No Action/Committed Projects and Build alternatives. Further Section 4(f) Evaluation is unnecessary for this property. There are no additional impacts anticipated for either the opening day or year 2025 time frame.

13.4 Rail Alternative

13.4.1 Entrance to Aspen Section 4(f) Resources. Section 4(f) resources were identified from the Entrance to Aspen project, and the currently proposed rail project will also pass by those resources. The *Entrance to Aspen ROD* included least-harm analysis and measures to minimize harm for all impacts. There are no additional impacts anticipated for either the opening day or year 2025 time frame.

No additional impacts are anticipated for the Rail Alternative for opening day or year 2025 time frames. Associated VMT reductions will create an improvement over the No Action/Committed Projects Alternative. Noise and vibrational analysis run for use of additional trains on the LRT system did not result in additional noise and vibration impacts for these resources.

As noted in the No Action/Committed Projects Alternative discussion above, the Aspen Commercial Core Historic District was identified as a local district only. The current study has provided appropriate analysis, and the SHPO has concurred with the determination of No Adverse Effect to this property as it is associated with the LRT project. The proposed Rail Alternative will traverse through the northern edge of this district as discussed in **Section 13.3.2, Current Project Section 4(f) Resources** below.

13.4.2 Current Project Section 4(f) Resources. Avoidance of intrusion into the Mt. Sopris Tree Farm Community Center and Recreation Area development is possible with the implementation of the transit station / park-and-ride lot in El Jebel. There are two options for the location of the transit station and parking area: El Jebel Road and Willits Lane. If the El Jebel Road location is chosen, it will be across the street from, but adjacent to, the recreation area and will avoid intrusion into the property. There is little difference in potential traffic congestion in the vicinity of the El Jebel Road transit station and parking area between the No Action/Committed Projects and Build alternatives. Avoidance is possible, and there is a feasible and prudent alternative to use of this recreation property. Further Section 4(f) Evaluation is unnecessary for this property. There are no additional impacts anticipated for either the opening day or year 2025 time frame.

Ten cultural resources eligible for the NRHP have been identified within the APE for the Rail Alternative. Of these, all but four carry a No Adverse Effect designation. Four are found to have Conditional No Adverse Effect. **Section 11.2.4** of this chapter includes a detailed discussion of these resources. The Rail Alternative will directly affect the existing historic railroad by rehabilitating the track, renovating associated historic features, and replacing or relocating other historic features. While some features may be destroyed, representative examples from all categories will be preserved. The transit plans include moving some historic features laterally out from the tracks as necessary to meet current safety and clearance standards, and only to the extent necessary to meet the standards. Also, deteriorated components will be replaced with similar materials and/or reused historic components on retaining walls, culvert faces, and similar features to preserve the setting and character of the railroad grade. These actions, which seek to preserve as much of the original appearance of the railroad and insert only compatible materials for new elements, will have no adverse effect on the portions of the railroad grade that may be converted to a rail system.

No Section 4(f) Evaluation is required for this project because avoidance of impacts has been pursued and there will be no adverse impacts to any Section 4(f) resources.

14. Farmland Impacts

None of the project alternatives will affect Prime or Unique Farmland, since no Prime or Unique Farmland exists within the Project Corridor (SCS, 1982).

14.1 No Action/Committed Projects Alternative

This alternative will not affect state-wide important farmland on the opening day or in the year 2025 time frames.

14.2 Trail

The trail will be constructed fully within existing RFTA right-of-way and will not affect state-wide important farmland on opening day or in the year 2025.

14.3 BRT Alternative

Except for the construction of additional transit stations and park-and-ride lots in commercial and industrial areas, no additional right-of-way will be acquired for this alternative. It will not affect any state-wide important farmland on opening day or in the year 2025.

14.4 Rail Alternative

The Rail Alternative alignment may affect state-wide important farmland consisting of irrigated hayfields. The Natural Resources Conservation Service (NRCS) has been consulted (Davidson, 2000). COGAP mapping indicated 942 hectares (2,327 acres) of irrigated cropland within the immediate vicinity of the Project Corridor. An additional right-of-way of 7.28 hectares (18 acres) will be required outside of developed areas, and portions may qualify as Statewide Important Farmland. This represents less than one percent of the irrigated cropland adjacent to the Project Corridor.

Determination of the amount of state-wide important farmland affected will be the result of the amount of land that is in use as irrigated pasture or mountain hay meadows that contribute to the viability of the local livestock industry at the time of project implementation. The majority of potential impact from the Rail Alternative would occur in the Basalt area. As required by the Farmland Protection Policy Act, NRCS Form AD-1006 impact estimates have been sent to the NRCS field offices. Correspondence is included in **Appendix A**.

15. Noise and Vibration Impacts

The purpose of this section is to describe the potential impacts resulting from each of the alternatives under consideration. A separate noise analysis was conducted for the City of Aspen.

15.1 Background Information

15.1.1 Characteristics of Rail Noise. Operational noise from a rail transit or freight system is a function of distance from the noise receptor to the tracks, as well as vehicle speed, type of track support structure, and the number and length of vehicles operating on the system. Noise exposure from operations depends on individual pass-by noise levels and the number of trains that pass by in a given period of time. Other factors that can directly affect noise levels at a sensitive receptor include the type of intervening terrain, whether or not there are natural or constructed noise barriers, or noise from existing local sources that will combine with the transit noise.

15.1.2 Characteristics of Ground-Borne Vibration from Rail. Factors that influence the amplitudes of ground-borne vibration from rail transit or freight systems include vehicle suspension parameters, condition of the wheels and rails, type of track, track support system, type of building foundation, and the properties of the soil and rock layers through which the vibration propagates. Use of continuously-welded rail eliminates wheel impacts at rail joints and results in significantly lower vibration levels than jointed track. Adequate wheel and rail maintenance are also important preventative measures in controlling levels of ground-borne vibration. Further reductions in ground-borne vibration levels typically involve special track support systems, vehicle modifications, building modifications, operational changes, or adjustments to the vibration transmission path. To be effective, many of these measures must be optimized or tuned for the frequency spectrum of the vibration.

15.1.3 Characteristics of Traffic Noise. The traffic noise level at a site depends on both site geometry and traffic characteristics (volume, vehicle type, speed) of roadways near the site. For a straight, at-grade roadway with a steady stream of vehicles, the average noise level (L_{eq}) would decrease when the distance from the roadway to the receptor increases. The rate at which the noise level drops off with distance can vary with the hardness or softness of the surface between the roadway and the receptor site. Where the area between the roadway and the receptor site is primarily grass or other sound-absorbent material, the noise level will drop off at a rate of 4.5 dBA per doubling of the distance. This becomes more complicated, however, where the roadway is curved, the terrain is uneven, or there are nearby structures that act as sound barriers or reflectors.

Noise emission levels from medium trucks are 10-12 dBA louder and heavy trucks are 14-18 dBA louder at 15.2 meters (50 feet) than automobiles. Consequently, at a given traffic speed, noise levels are more sensitive to changes in truck volumes than they are to changes in overall traffic flow.

On a roadway carrying a given volume of automobile traffic, the noise level will increase by approximately two to five dBA as the speed increases from 48 to 72 kilometers per hour (30 to 45 miles per hour). Traffic noise levels will increase by another one to three dBA, on average, as speed increases to 88 kilometers per hour (55 miles per hour).

15.2 Noise and Vibration Prediction Methodology

While not required for this CIS, three different sets of guidelines are used for noise and vibration impact analyses.

- FHWA highway noise criteria are applicable to aspects of the various alternatives that are related to Highway 82 traffic.
- FTA guidelines are applicable to those aspects of the alternatives that are related to rail transit.
- FRA regulations address noise emission levels of rail equipment only; therefore, potential freight hauling noise and vibration will be addressed following FTA guidelines at this time.
- USDOT guidelines are applicable to all construction-related noise and vibration issues.

Due to the number of agencies involved, inter-agency coordination will occur upon selection of a preferred alternative to ensure that reasonable noise and vibration impact mitigation is implemented. This will ensure appropriate mitigation of potential impacts to residential and business receivers, as well as to sensitive cultural resources.

15.2.1 Inventory of Noise/Vibration-Sensitive Sites for Rail Alternative. The inventory of noise and ground-borne vibration-sensitive sites began with the selection of a screening distance (Table 4-1, FTA, 1995). Since Diesel Multiple Unit (DMU) technology is not specifically cited in the table, the maximum commuter rail mainline screening distance of 229 meters (750 feet) was used.

The initial screening effort identified a total of 979 individual land use Category 2 and 3 receiver sites within 229 meters (750 feet) of the proposed alignment. No land use Category 1 receiver sites were identified. The screening was initially carried out using aerial photography to identify the structures which fell within the screening distance. The aerial information was field verified in order to identify those structures which are noise-sensitive (Category 2 or 3), as well as any structures which are vibration-sensitive.

An additional 12 land use Category 2 and 3 receiver sites were identified and monitored in the field in a subsequent analysis of the City of Aspen from the Aspen/Pitkin County Airport to the project terminus at Hunter Street.

Additional data tables for the entire Project Corridor, noise receiver sites, and the entire *City of Aspen LRT and DMU Noise Evaluation* (Parsons Engineering Science, Inc, 2000) are further referenced in **Chapter X: Availability of Technical Reports**.

15.2.2 Development of Sound Exposure Level (SEL) for the Rail Alternative.

Project Corridor. The technology contemplated for the Rail Alternative is known as Diesel Multiple Unit (DMU). Although popular in Europe, the technology has not yet been used widely in the United States. No standard Sound Exposure Level (SEL) for DMU technology is provided in the FTA methodology. Consequently, it was necessary to develop a SEL for the DMU based on information provided by the manufacturer.

The vehicle analyzed for operation under the rail alternative is the Adtranz GTW. Information provided by the manufacturer indicated a noise exposure level of 81 dBA for an 80 kilometers per hour (50 miles per hour) pass-by at a distance of 7.5 meters (25 feet) from the center of the rail line. Based on typical conditions, it is estimated that the noise exposure level at 15 meters (50 feet) would be 78 dBA. In order to maintain a conservative estimate of the SEL for the Adtranz vehicle, a SEL of 80 dBA was used for a 80 kilometers per hour (50 miles per hour) pass-by at a distance of 15 meters (50 feet) for welded track. In cases where jointed track will be installed, a correction factor was used to account for increased noise.

Daytime DMU operations vary between four and eight train consists per hour, depending on the time of day and the location in the Project Corridor. During night-time hours, the DMU would be operating on a 30-minute headway, or two train consists per direction and a total of four trains per hour. The operating speed used for the DMU operations averages 30.1 kilometers per hour (18.7 miles per hour) over the length of the Project Corridor.

City of Aspen. In addition to the proposed implementation of DMU technology in Aspen, previously approved Light Rail Transit (LRT) will run within the same alignment from the Airport to Monarch Street. It separates at Monarch and extends to a final station at Durant Avenue.

There will be up to 12 LRT operations per hour in each direction during the 15 primary hours. During off-peak periods (evening), the reduced schedule of four LRT operations in each direction per hour will be used. An operating speed of 40.23 kilometers per hour (25 miles per hour) was assumed for the LRT operation noise analysis. A referenced Sound Exposure Level (SEL) of 82 dBA at 15.24 meters (50 feet) was used, as in previous studies, for the LRT (USDOT, 1995).

15.2.3 Determination of Existing Noise Conditions for Rail Alternative. Existing ambient noise levels were identified for all receivers. Most of the 991 (979+12) receiver sites were estimated based on FTA criteria (Table 5-7, FTA, 1995). As noted in **Chapter III: Affected Environment, 15.5 Existing Noise Measurements**, 52 locations were monitored in the field. Twelve of these were also identified as receiver sites in Aspen. Criteria for monitoring selection included land use, existing ambient noise, distance to a major road (Highway 82), number of sensitive receivers in the area, and the site's potential sensitivity to changes in noise levels.

In some cases, both methods were compared in order to determine the most accurate representation for a particular group of receivers. Professional judgment was used in order to identify the noise level that best represented the conditions as identified in the field.

In cases where FTA criteria were used in order to estimate the existing noise exposure, shielding was applied to represent the impact of intervening rows of buildings, berms, or other structures between the major roadway and the receiver. Existing noise levels in the project area were found to range from a low of 42 dBA to a high of 75 dBA. Existing levels generally vary based on a receiver's distance from Highway 82; however, other local roadways and activity areas also have some influence.

15.3 Noise and Vibration Criteria

15.3.1 Freight Noise Criteria. Freight hauling in a typical situation is subject to Federal Railroad Administration (FRA) regulations. The FRA does not have impact criteria, but rather considers noise and vibration levels at which equipment must operate. For the purposes of this project, the passenger rail alternative is subject to FTA criteria. When considering potential noise impacts from freight hauling, issues that may be considered would include freight speed (the higher the speed, the greater the noise increase); hours of operation (day vs. night); and length of trains (duration of noise impact). Compatibility with proposed passenger train types is also an issue due to the potential for shared operation times. The sound of the freight train horn-whistle could also be an issue depending on location of crossings in the communities and the time of the operations.

15.3.2 FHWA Noise Guidelines Relevant to Highway 82. Table V-12 delineates FHWA highway noise criteria. These guidelines are applicable to properties adjacent to Highway 82.

Table V-12
FHWA Highway Noise Abatement Criteria

Land Use Category	Description	Hourly L_{eq} (dBA)
A	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	57 (exterior)
B	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences (exterior), motels, hotels, schools, churches, libraries, and hospitals	67 (exterior)
C	Developed lands, properties, or activities not included in the above categories	72 (exterior)
D	Undeveloped land	None
E	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals, and auditoriums	52 (interior)

Source: Title 23 of the Code of Federal Regulations Part 772, Procedures for Abatement of Highway Traffic Noise and Construction Noise, Federal Highway Administration, Washington, D.C.

15.3.3 FTA Noise Guidelines for Rail Transit Projects. FTA guidelines are based on relative impact criteria, whereby project noise impacts are assessed by comparing the increase in future combined total (rail plus roadway where applicable) hourly L_{eq} or L_{dn} noise levels to the existing ambient hourly L_{eq} or L_{dn} noise levels. The amount by which the rail transit project is allowed to change the overall noise environment is reduced with increasing levels of existing noise. The FTA criteria used to assess the noise and vibration impacts from rail transit projects are based on land use category. Table V-13 shows the noise metrics selected by FTA for particular land use categories.

L_{dn} is used to characterize noise exposure for residential areas (Category 2). Maximum one hour L_{eq} (during the period that the facility is in use) is used for other noise-sensitive land uses where night-time noise levels are not as important, such as schools and applicable office buildings (Categories 1 and 3). Two levels of impact are included in the FTA criteria. They are interpreted as summarized below.

Table V-13
FTA Guidelines for Land Use Categories and Metrics for Transit Noise

Land Use Category	Noise Metric (dBA)	Description of Land Use Category
1	Outdoor L_{eq} (h)*	Tracts of land where quiet is an essential element in their intended purpose. This category includes lands set aside for serenity and quiet, and such land used as outdoor amphitheaters and concert pavilions, as well as National Historic Landmarks with significant outdoor use.
2	Outdoor L_{dn}	Residences and buildings where people normally sleep. This category includes homes, hospitals and hotels where a night-time sensitivity to noise is assumed to be of utmost importance.
3	Outdoor L_{eq} (h)*	Institutional land uses with primary daytime and evening use. This category includes schools, libraries, and churches where it is important to avoid interference with such activities as speech, meditation, and concentration on reading material.

**L_{eq} for the noisiest hour of transit-related activity during hours of noise sensitivity.*
Source: FTA Manual for Transit Noise and Vibration Impact Assessment (FTA, 1995).

Severe Impact. Severe noise impacts are considered significant. Where practical, noise mitigation will be specified for severe impact areas.

Impact. This level is sometimes referred to as moderate impact within this document. In this range, other project-specific factors must be considered to determine the magnitude of the impact and the need for mitigation. These other factors can include the predicted increase over existing noise levels, the types and number of noise-sensitive land uses affected, existing outdoor-indoor sound insulation, and the cost effectiveness of mitigating noise to more acceptable levels.

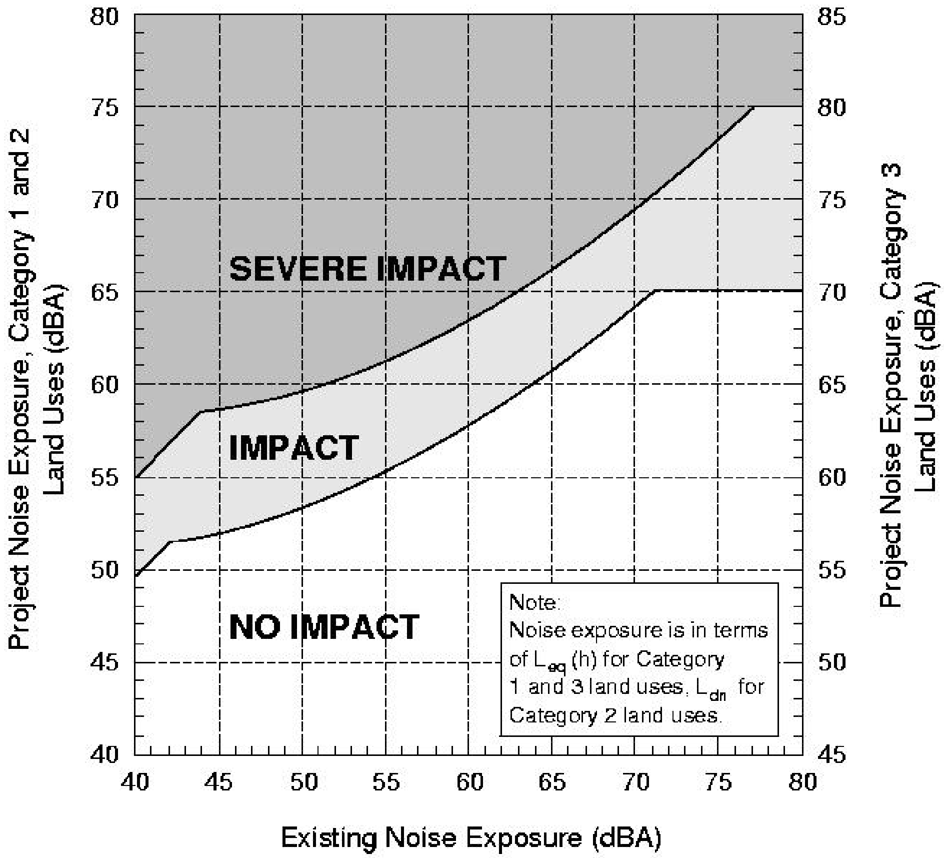
The FTA impact criteria are summarized in Figure V-3. The noise impact criteria are defined by two curves that allow increasing project noise levels up to a point, beyond which impacts are determined based on project noise alone. As the existing noise exposure increases, the amount of allowable increase in the overall noise exposure caused by the transit project decreases. It is important to emphasize that it is the increase in the cumulative noise, when project noise is added to existing noise, that is the basis for the criteria. Figure V-4 provides an example based on noise impact criteria for Category 1 and 2 land use in terms of the allowable increase in the cumulative noise exposure.

15.3.4 FTA Ground-Borne Vibration Criteria. The FTA has developed impact criteria for acceptable levels of ground-borne vibration. The threshold of vibration perception for most humans is around 65 VdB. Levels in the 70 to 75 VdB range are often noticeable but acceptable. Levels greater than 80 VdB are often considered unacceptable. For urban transit systems with ten to 20 trains per hour throughout the day, limits for acceptable levels of ground-borne vibration are usually between 70 and 75 VdB.

For human annoyance, there is some relationship between the number of events and the degree of annoyance caused by the vibration. It is reasonable to expect that more frequent vibration events, or events that last longer, will be more annoying to building occupants. To account for commuter rail systems that have fewer daily operations than the typical urban transit line, the criteria in the *FTA Manual* (FTA, 1995) include an impact threshold that is eight VdB higher than if there are fewer than 70 trains per day.

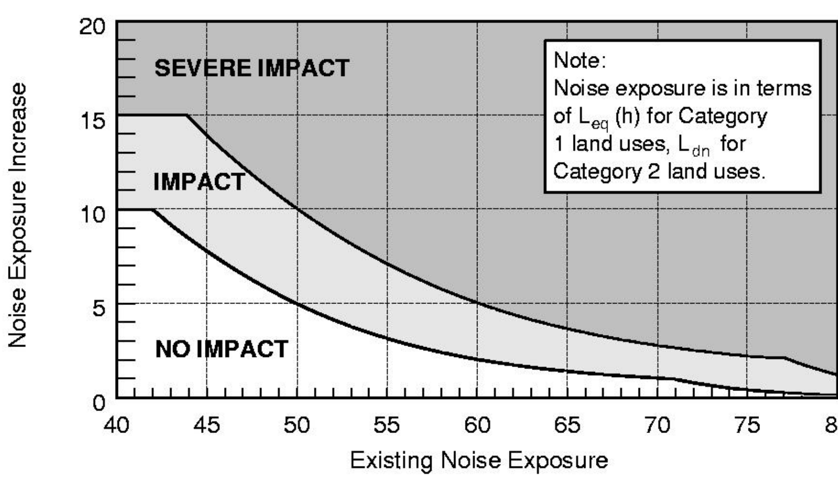
Figure V-3

Noise Impact Criteria for Transit Projects



Source: Harris, Miller, Miller & Hanson Inc., 1995

Figure V-4
Increases in Cumulative Noise Levels Allowed by Criteria, Land Use Category 1 & 2



Source: Harris, Miller, Miller & Hanson Inc., 1995

Ground-borne vibration from any type of train operations will rarely be high enough to cause any sort of building damage, even minor cosmetic damage. The only real concern is that the vibration will be intrusive to building occupants or interfere with vibration-sensitive equipment. Ground-borne vibration from train operations is governed by the FTA criteria, which are presented in Table V-14.

Some buildings, such as concert halls, TV and recording studios, and theaters, can be very sensitive to vibration and noise but do not fit into any of the three categories. Due to the sensitivity of these buildings, they usually warrant special attention during the vibration impact assessment of a transit project. Table V-15 gives criteria for acceptable levels of ground-borne vibration for various types of special buildings. Note that these criteria pertain to types of activities conducted within buildings, and do not address any kind of effect upon the building structure.

Table V-14
FTA Ground-borne Vibration Impact Criteria[1]

Land Use Category	Description	Vibration Velocity Impact Levels for Frequent Events[2]	Vibration Velocity Impact Levels for Infrequent Events[3]
1	Buildings where low ambient vibration is essential for interior operations	65 VdB[4]	65 VdB
2	Residences and buildings where people normally sleep	72 VdB	80 VdB
3	Institutional land uses with primarily daytime use	75 VdB	83 VdB

1. *Vibration levels expressed in VdB are 1 micro-inch/sec and noise levels in dBA.*
2. *"Frequent Events" is defined as more than 70 vibrations per day. Most rapid transit projects fall into this category.*
3. *"Infrequent Events" is defined as fewer than 70 vibration events per day, including most commuter rail systems.*
4. *This criterion limit is based on levels that are acceptable for most moderately sensitive equipment, such as optical microscopes.*

Table V-15
Ground-borne Vibration Impact Criteria for Special Buildings

Type of Building or Room[1]	Ground-borne Vibration (VdB re 1 micro-inch/sec)	
	Frequent Events	Infrequent Events
Concert Halls	65 VdB	65 VdB
TV Studios	65 VdB	65 VdB
Recording Studios	65 VdB	65 VdB
Auditoriums	72 VdB	80 VdB
Theaters	72 VdB	80 VdB

1. If the building will be rarely occupied when the trains are operating, there is no need to consider impact.

Source: FTA Manual for Transit Noise and Vibration Impact Assessment (FTA, 1995).

15.3.5 Construction Noise and Vibration Criteria. For construction-related noise and vibration impacts, the US Department of Transportation (USDOT) has set guidelines for the construction of public mass transit projects. The guidelines are used in this analysis.

USDOT Construction Noise Criteria. USDOT recommends that project construction noise criteria take into account the existing noise environment, the absolute noise levels during construction activities, the duration of construction, and the adjacent land use. USDOT's detailed assessment procedures for evaluating construction noise impacts include: 1) estimating construction noise levels in terms of eight-hour L_{eq} and 30-day averaged L_{dn} and 2) comparing the noise level estimates to the criteria in Table V-16.

Table V-16
USDOT Detailed Noise Assessment for Construction of Transit Projects

Land Use	8-hour L_{eq} (dBA)		L_{dn} (dBA) 30-day Average
	DAY	NIGHT	
Residential	80	70	75[1]
Commercial	85	85	80[2]
Industrial	90	90	85[2]

1. *In urban areas with very high ambient noise levels (L_{dn} >65 dBA), Ldn from construction operations should not exceed existing ambient + 10 dBA.*
2. *24 hour L_{eq} not L_{dn}.*

Source: Guidelines for Assessing the Environmental Impact of Public Mass Transportation Projects, USDOT.

USDOT Construction Vibration Criteria. USDOT has set guidelines for the evaluation of construction impacts due to vibration resulting from public mass transit projects. These guidelines are based on peak-particle velocity (PPV) readings shown in Table V-17. The PPV represents the maximum instantaneous peak in the velocity of an object's vibratory motion about the equilibrium position. It is used to define the thresholds of potential building damage from vibration because it is thought to be more directly correlated to peak stresses in building components than RMS vibration for construction activities.

In general, construction impacts may be expected near sensitive sites within approximately 61 meters (200 feet) of construction activity. Actual distances at which impacts occur will depend on the type of construction equipment used and soil characteristics in the area.

USDOT recommends applying the vibration damage threshold criterion of 0.20 inches per second (approximately 100 VdB) for fragile buildings, or 0.12 inches per second (approximately 95 VdB) for extremely fragile historic buildings. For assessing annoyance or interference with vibration-sensitive activities, USDOT recommends that the vibration levels be calculated and compared to the FTA Ground-Borne Vibration Impact Criteria as shown in Table V-15.

Table V-17
USDOT Peak Particle Velocity Guidelines

Velocity (inches per second)	Effects on Humans	Effects on Buildings
0 to 0.01	Imperceptible by people - no intrusion	Vibrations unlikely to cause damage of any type
0.04 to 0.08	Threshold of perception - possibility of intrusion	Vibrations unlikely to cause damage of any type
0.15	Vibrations perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected
0.64	Level at which continuous vibrations begin to annoy people	Virtually no risk of “architectural” damage to normal buildings
1.27	Vibrations annoying to people in buildings (this agrees with the levels established for people standing on bridges and subjected to relatively short periods of vibration)	Threshold at which there is a risk of “architectural” damage to normal dwelling – houses with plastered ceilings and walls
2.54 to 3.81	Vibrations considered unpleasant by people subjected to continuous vibration and unacceptable to some people walking on bridges	Vibrations at a greater level than normally expected from traffic, but would cause “architectural” damage and possible minor structural damage

Source: Guidelines for Assessing the Environmental Impact of Public Mass Transportation Projects, USDOT.

15.4 Noise Impacts

Impact and severe impact are defined based on the existing and future noise levels for each receiver and the anticipated increase associated with the operation of the Rail Alternative. Information from Figures V-2 and V-3 was used in conjunction with project noise exposure vs. distance curves to identify the distance from the fixed guideway source at which each receiver would experience a noise impact or a severe noise impact. The noise exposure vs. distance curves were developed using FTA guidelines (Section 5.3, FTA, 1995).

As presented, project noise analysis was actually conducted for the time frame of 2020 based on a 1999 traffic forecasting model. The traffic model has been refined and run again for 2025 in 2002. As a result of the refinement, the previous 2020 VMT remains very close to the 2025 VMT. In terms of the noise analysis, this means that the information presented below for 2020 is very reasonable to consider for 2025. No opening day 2008 analysis was done, nor was the 2020 noise model run updated for 2025.

15.4.1 No Action/Committed Projects Alternative.

Opening Day Time Frame. No opening day 2008 analysis was conducted for this alternative as a part of this project. Noise studies were conducted for the individual Committed Projects as appropriate.

Year 2020 Time Frame. Noise levels anticipated for the No Action/ Committed Projects Alternative were determined using the FHWA traffic noise prediction computer model STAMINA 2.0. Since no transportation improvement will occur within the RFTA right-of-way under this alternative, Highway 82 will continue to be the major noise source throughout the Project Corridor. Traffic data and site conditions were input to STAMINA 2.0 in order to identify the approximate distance to the 66 dBA noise contour from Highway 82. The 66 dBA contour was used since that level represents the noise abatement criteria as defined by CDOT for residential land uses..

The STAMINA 2.0 analysis conducted for the No Action/Committed Projects Alternative 2020 conditions revealed that a total of 73 individual receiver sites reside within the 66 dBA traffic noise contour of Highway 82 for the No Action/Committed Projects Alternative. Two receiver locations in the City of Aspen were identified in the *Entrance to Aspen FEIS* as potentially experiencing an increase in noise levels of ten or more dBA as a result of that project.

The major noise sources along the Project Corridor between the Airport and project terminus in Aspen will be vehicular traffic and the already-approved Light Rail Transit system. Golf courses, single/multi-family residences, churches, and hotels are located along Highway 82 from the Airport to Maroon Creek Road.

The proposed alignment diverges from Highway 82 just north of Maroon Creek Road and meets Highway 82 at Main Street. This portion of the proposed alignment would pass through the open field designated as Conservation Area, and runs past a historical building, the Holden/Marolt Mining and Ranching Museum. The portion of this segment from Maroon Creek Road to Castle Creek would be in a "cut-and-cover" tunnel.

The LRT would be located on the south side of Highway 82 in a separate but adjacent right-of-way starting at 7th and Main Streets. This is preferred because it will serve the transit-oriented locations on the south side of the Highway in Aspen. This locates the LRT line within 15 feet of sensitive receptors in the area. The *Entrance to Aspen FEIS* and *ROD* identified the area from Castle Creek Bridge to the intersection of 7th Street and Main Street as requiring mitigation for noise impacts. A commitment was made to conduct a noise analysis during final design for the LRT project.

The current project has conducted an analysis for the combined LRT and DMU noise impacts using FTA criteria (Parsons Engineering Science, Inc, 2000). LRT (and DMU) noise impacts are anticipated to occur at all first-row sensitive receptors (both Category 2 and 3 land uses) on the south side of the alignment on West Main Street, between Maroon Creek Road and 7th Street in Aspen. Receptor A4 is the representative sensitive receptor in this segment of the alignment.

These impacts may be as much related to the No Action/Committed Projects Alternative as to the Rail Alternative, since they are related to the realignment of Highway 82 together with the positioning of the transitway on the south side of the Highway.

15.4.2 Trail. No noise impacts are associated with the trail for opening day or year 2025.

15.4.3 BRT Alternative. Since no roadway expansion is taking place for this alternative, the requirements of the FHWA noise regulations (23 CFR 772) do not apply for this project. The only associated impacts with the BRT are associated with station locations. These fall under FTA guidance. The 66-dBA contour line and the receivers within it are disclosed for informational purposes only. If roadway expansion is ever considered, then the FHWA noise regulations will apply and analysis will be required.

Opening Day Time Frame. No opening day 2008 analysis was conducted for this alternative. This alternative runs along existing Highway 82 and the previously-approved Entrance to Aspen LRT corridor. Lower automobile traffic volumes associated with the BRT will offset the higher number of buses associated with this alternative. In total, VMT will be reduced in this corridor over the No Action/Committed Projects Alternative.

Year 2020 Time Frame. A total of 73 individual receiver sites are located within the 66 dBA traffic noise contour of Highway 82 for this alternative. The same number of receivers are located within the 66 dBA contour, even though traffic volumes differ for the No Action/Committed Projects and BRT Alternatives. The reason for this is that lower automobile traffic volumes associated with the BRT Alternative are offset by a higher volume of buses, resulting in roughly the same contour distances for both alternatives. The BRT-Bus Alternative will travel in the same corridor as the BRT-LRT Alternative between Buttermilk and Aspen. For the BRT-LRT Alternative, users will ride on the pre-approved LRT to Aspen. No additional noise impacts will occur. For the BRT-Bus Alternative, users will ride buses in a dedicated two-lane busway to downtown Aspen. This assumes that construction of the LRT is not funded. Noise impacts are likely to be the same or less than those associated with the LRT system, based on the busway configuration in relationship to Highway 82.

All proposed transit station locations were analyzed for noise impacts except South Glenwood Springs and Colorado Mountain College, which were added after completion of the Noise Analysis. Land uses surrounding these stations indicate a lack of sensitive noise receivers. The South Glenwood Springs location is just east of Holy Cross Electric, a commercial development largely surrounded by agricultural land. The Colorado Mountain College location is at the intersection of Highway 82 and County Road 154, which contains a mix of light industrial and retail/commercial.

At the downtown Carbondale site, receiver R449 (representing seven residences) and receiver R480 (representing two residences) fall within the area of impact. In Basalt, receivers R792, R793, R794, and R795 fall within the area of severe impact for that station location. These receivers represent approximately 23 mobile homes in a mobile home park adjacent to the proposed station site. Regardless of the proposed project, the Town of Basalt has committed to redeveloping the mobile home park as part of the *Basalt River Master Plan* because the current park lies in a flood hazard area. The Town has a 100 percent replacement housing policy that will guide redevelopment impacts to the pool of affordable housing. Completion of the mobile home park redevelopment is expected to occur prior to construction of the Basalt Station.

No other locations resulted in potential receiver sites. Maintenance facilities associated with this alternative already exist in Glenwood Springs, Carbondale and Aspen. These facilities are located in developed commercial and industrial areas and are not associated with sensitive noise receivers. No additional noise analysis was conducted for these locations.

15.4.4 Rail Alternative

Opening Day Time Frame. No opening day 2008 analysis was conducted for this alternative. Note that examination of 2020 data indicates that by this time, 36 receiver sites are at the level of severe impact. It is likely that these same locations could be at the lesser level of impact by 2008. An especially notable area would be Maroon Creek Road to 7th Street in Aspen.

Year 2020 Time Frame. Noise impacts associated with the Rail Alternative were determined using the FTA methodology described earlier. In many cases, the effect of Highway 82 traffic noise on adjacent receivers is dominant and the impact of the DMU vehicles is almost negligible. Nevertheless, the FTA criteria used to determine impact require that existing noise conflicts be incorporated into the analysis. Consequently, in several instances noise impacts occur even where no new noise from transit would be added.

The analyses determined that some impact would occur for 53 of the 991 receiver sites and severe impact would occur for 36 of the receiver sites. Figure V-5 illustrates the location of the receivers that are anticipated to be affected by the Rail Alternative. Table V-18 shows the relationship between monitoring stations and receiver sites and describes impacted receiver locations. Table V-19 summarizes future noise levels for these receiver sites. Monitoring/receiver sites preceded by the letter "A" denote sites in Aspen. Receiver sites preceded by the letter "R" come from the remainder of the Project Corridor. Other Project Corridor monitoring sites do not include letters.

Figure V-5: Locations of Affected Receivers for the Rail Alternative

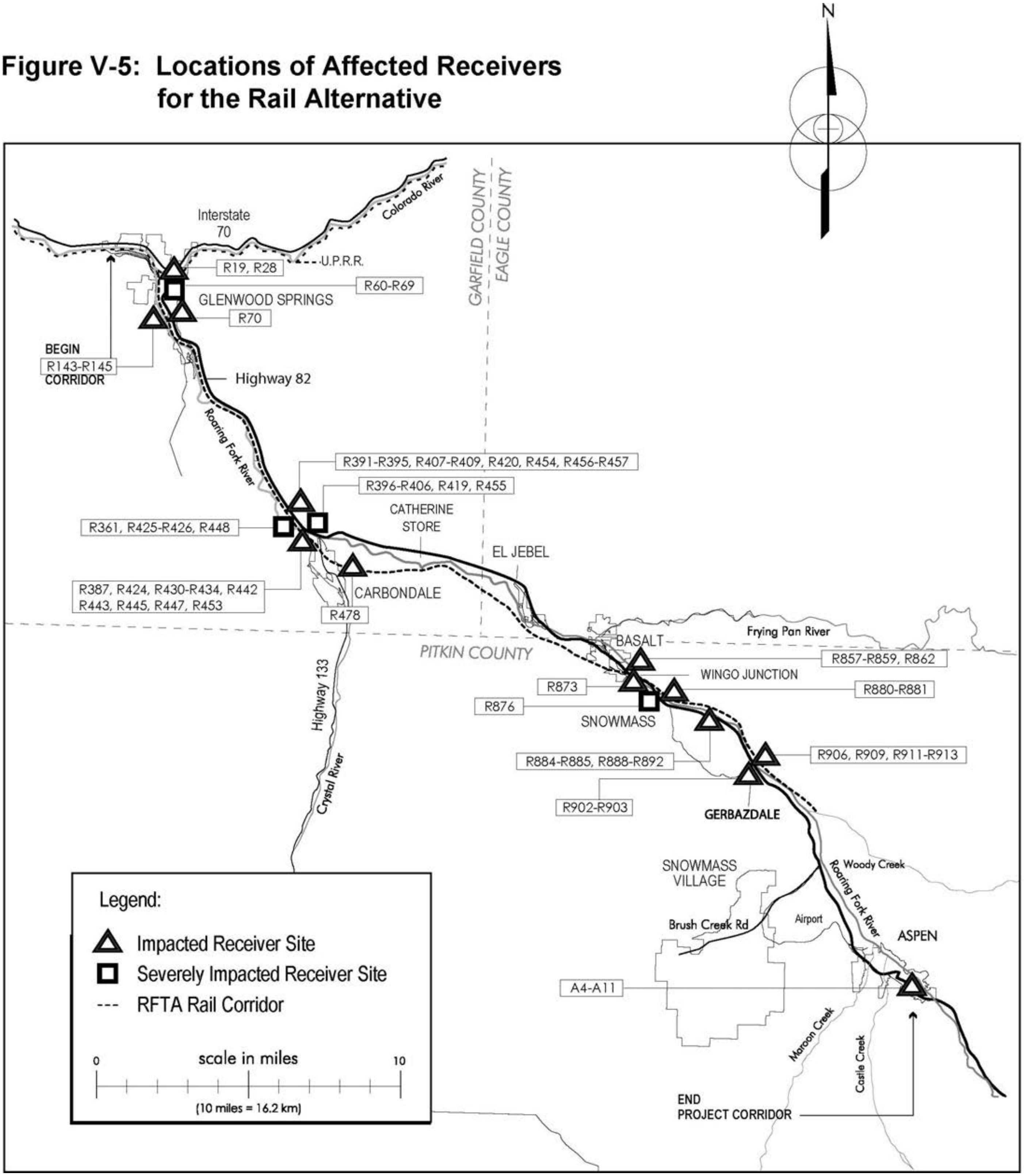


Table V-18
Rail Alternative Noise Monitoring Site and Receiver Locations and Description of Impacted Receivers

Receiver #	Location	Monitoring Site #	Impacted Receivers	Impacted Receiver Descriptions
R1-R195	Glenwood Springs	1-10	16	#19 - School Street Residence # 28 - 11th St. near GSHS #60-70 - Park Drive Residences #143-145 - Mobile Home Park
R196-R245	South Glenwood	11-12	0	
R246-R269 R270-R352	South of Glenwood North of Carbondale	13-18	0	
R353-R358	Aspen Glen	19	0	
R359-R385	Carbondale	20	1	#361 - Residence
R386	Sopris RV Park	21	0	
R387-R457	Carbondale	22-24	40	#387 - 17 Mobile Homes (Mountain Valley) #391-409,419, 420 - Village Rd. Residences #424-426. 430-434 - 8th St. Residences #442, 443, 445, 447, 448, 453 - 2nd St. Residences #454 - 457 - Northern 2nd St.
R458-R480	South of Carbondale	25	1	#478 - Residence on CR 100
R481-R491	Catherine Store Road	-	0	
R492-R493	Highway 100	26	0	
R494-R515	Highway 82 South of Catherine Store	27	0	
R516-R540	El Jebel	-	0	
R541-R556	Dakota	28	0	
R557-R612	El Jebel	-	0	
R613-R622	Summit Loop	-	0	
R623-R681	Blue Lake	29	0	
R682-R740 R471-R744	Willits Aspen/Basalt MHP	30-31	0	
R745-R783	Emma		0	
R784-R804	Basalt	32-33	0	
R805-R868	Holland Hills	34	5	#857 - 859, 861, 862 - Residences
R869-R872	Lazy Glen	35	0	
R873-R915	Lower River Road	37	18	#873, 876, 880, 881, 884, 885, 888 - 892, 902, 903, 906 - Single Family Residences #909, 911 - 913 - Mobile Homes (Philips)
R916-R921	Gerbazdale	-	0	
R922-R924	Aspen Village	38	0	
R925-R945	Gerbazdale	-	0	
R946-R991	N of BCR	39-40	0	
A1- A12	Aspen	A1 - A12	8	A4 - W. Main: Maroon Cr Rd to 7th, South side (6 residences) A5 -A10 - W. Main: 7th to Galena, South side (8 residences, 5 hotels) A11- Monarch St. (2 residences, 3 hotels, 1 park)

Table V-19
Noise Impact Levels for the Rail Alternative

Location	Receiver Sites	NOISE LEVEL - L_{dn} 2000 Existing	2020 Future
Glenwood Springs:			
School Street Residence	19	52.4	55
11th Street Residences	28	55.9	59
Park Drive Residences	60-70	48.8	59-61
Mobile Homes	143-145	65	62
Carbondale:			
Residence	361	60	63
Mountain Valley- Mobile Homes (17)	387	50	55
Village Road Residences	391-395	55	59-60
	396-400	50	59
	401-406	50	60-61
	407-408	50	57-58
	409	50	54
	419	50	59
	420	50	55
8th Street Residences	424	50	58
	425	50	60
	426	50	61
	430	50	54
	431,432	50	58,57
	433,434	50	55,56
2nd Street Residences	442	50	58
	443	50	55
	445,447	50	57
	448	50	61
	453	50	55
Northern 2nd Street Residences	454-457	50	57-59
County Road 100: Residence	478	50	57
Holland Hills: Residences	857	60	62
	858	60	60
	859	60	59
	861	55	62
	862	55	60
Lower River Road: Residences	873	50	56
	876	50	64
	880	55	59
	881	50	58.5
	884	50	55
	885	50	57
	888	50	58.5
	889-890	50	57
	891	55	59
	892	55	58
	902	55	60
	903	55	57
	906	50	55
Phillips Mobile Homes	909,911-913	50	56-58
Aspen:			
West Main: Maroon Creek Road to 7th, Southside (6 residences)	A4	58	69
West Main: Maroon Creek Road to 7th, Southside (6 residences)	A5-A10	69	70-72
Monarch St. (2 residences, 3 hotels, 1 park)	A11	55	59-63

Source: MK Centennial, 2000

When comparing a future noise level which includes the construction of the LRT and DMU projects to future noise levels with neither LRT nor DMU rail construction, the changes in the overall noise levels at receptor sites along Highway 82 and Aspen's Main Street generally vary between approximately minus one and plus one dBA in Leq, and minus two and zero dBA in Ldn. These differences will not usually be perceptible. There is one exception: the segment between Maroon Creek Road and 7th Street.

For that segment, the increase in traffic noise levels will result in moderate or severe impacts as a result of the Entrance to Aspen Highway 82 realignment. The increase in noise levels would be 12 dBA for Leq, and 11 dBA for Ldn (see receiver A4). The main reason for the impacts is that the existing (pre-LRT) noise level in the area is low since the existing (pre-LRT) Highway 82 is relatively distant. However, with the completion of the LRT project, the LRT-Rail alignment would be located approximately 15 feet from receptors on the south side of the street; thus, the noise would be much more noticeable compared to the current (pre-LRT) condition.

The DMUs from the current project Rail Alignment will share the corridor with the LRT system. Resulting noise levels will be the similar to the LRT system. Table V-20 summarizes future noise levels for various Build and No-build scenarios related to the portion of this project that overlaps the Entrance to Aspen LRT project. (No analysis has been done to show separate LRT or DMU noise impacts.) Note that the current analysis using FTA guidelines is consistent with prior FHWA analysis for the same segment for the Entrance to Aspen. Noise impacts have been identified in the prior study and mitigation proposed. The addition of the DMU from the current Rail Alternatives will not substantially increase noise levels.

All of the proposed transit stations/park-and-ride locations and one expanded/reconstructed maintenance facility were analyzed to determine if any adjacent receivers would fall within the area of impact. The maintenance facility was located in Carbondale.

No receivers fall within the potential impact area for the station locations at West Glenwood Springs, Glenwood Springs, Highway 133 in Carbondale, the Aspen station at Main Street and Galena, or for the proposed maintenance facility in Carbondale. The other maintenance facilities associated with this alternative already exist in Glenwood Springs and Aspen. No additional noise analyses were conducted for these locations. At the downtown Carbondale site, receiver R449 (representing seven residences) and receiver R480 (representing two residences) fall within the area of impact. Neither station location in the El Jebel area will affect any adjacent receivers.

In Basalt, receivers R792, R793, R794, and R795 fall within the area of severe impact for that station location. These receivers represent approximately 23 mobile homes in a mobile home park adjacent to the proposed station site. The Town of Basalt has committed to redeveloping the mobile home park as part of the *Basalt River Master Plan* because the current park lies in a flood hazard area. No receivers were identified as falling within the APE for the station at Brush Creek Road. None of the receiver sites identified as potentially affected at the transit station locations identified above were previously identified as likely to be affected by the alignment of the Rail Alternative.

Table V-20
Future Noise Level Summary - Airport to Downtown Aspen

Roadway Segment	Receiver Site	Side Of Street	2000 Noise Level		2020 No Projects		2020 Highway Noise Only		2020 Transit Only (LRT+DMU)		2020 Highway + Transit Noise		Cumulative Increase	
			L_{eq}	L_{dn}	L_{eq}	L_{dn}	L_{eq}	L_{dn}	L_{eq}	L_{dn}	L_{eq}	L_{dn}	L_{eq}	L_{dn}
Airport to Maroon Ck Road	A1,A2,A3	North	56	56*	58	59	57	58	46	46	57	58	-1	-1
		South	56	56*	58	59	57	58	49	49	58	59	0	0
Maroon Ck Rd. to 7th St.	A4	North	56	58	56	58	68	69	53	54	68	69	12	11
		South	56	58	56	58	68	69	63	64	69	70	13	12
7th St. to 3rd St.	A5,A6,A7	North	69	69	71	72	71	71	53	54	71	71	0	-1
		South	69	69	71	72	71	71	63	64	72	72	1	0
3rd St. to Galena St.	A8,A9,A10	North	69	69	70	71	70	70	53	54	70	70	0	-1
		South	69	69	70	71	70	70	63	64	71	71	1	0
Galena St. to Spring St.	A12	North	65	65*	69	70	68	68	47	49	68	68	-1	-2
		South	65	65*	69	70	68	68	58	59	68	69	-1	-1
Monarch St.	A11	East	56	55	58	59	57	57	62	62	63	63	5	4
		West	56	55	58	59	57	57	54	54	59	59	1	0

The hauling of freight along the RFTA right-of-way would create the following noise-related issues: freight speed (the higher the speed, the greater the noise increase), hours of operation (day vs. night), length of trains (duration of noise impact), and possible use of the horn or whistle in sensitive areas. Before freight hauling could occur in conjunction with the Rail Alternative, the issue of DMU vehicle design compatibility and scheduling of freight trips would need to be resolved. Noise receivers noted in the discussion above would also be sensitive to freight noise.

15.5 Ground-Borne Vibration Impacts

Due to the difference in operations for Downvalley (Glenwood Springs to El Jebel) and Upvalley (El Jebel to Aspen) locations, different criteria were used in order to determine vibration impact distances for both locations. Downvalley rail events were determined to fall in the infrequent category (less than 70 events per day); therefore, a criteria level of 80 VdB was used. Upvalley rail events were determined to fall in the frequent category (more than 70 events per day); therefore, a criteria level of 75 VdB was used.

For Category 2 receivers (residences) it was determined that ground-borne vibration impacts would be likely to occur at receiver locations within 4.6 meters (15 feet) of the rail alignment in the Downvalley segment and at receiver locations within 18 meters (60 feet) of the alignment in the Upvalley segment. For Category 3 receivers (schools, churches) it was determined that vibration impacts would be likely to occur at receiver locations within less than three meters (10 feet) of the rail alignment in the Downvalley segment and at receiver locations within 12 meters (40 feet) of the alignment in the Upvalley segment.

15.5.1 No Action/Committed Projects Alternative. No ground-borne vibration impacts will be associated with this alternative based on the *Entrance to Aspen ROD* and other Committed Project documents. Specific analyses were not conducted for opening day (2008) or year 2025 time frame. Vibration studies were completed as appropriate for Committed Projects.

15.5.2 Trail. No vibration impacts are associated with the trail for opening day or 2025 time frame.

15.5.3 BRT Alternative. This alternative remains on existing Highway 82 and follows the LRT route into and through Aspen. Should the BRT-Bus alternative be implemented along the LRT route in lieu of the LRT, ground-borne noise impacts from buses are not anticipated to exceed those identified in the *Entrance to Aspen FEIS* and *ROD* for the LRT. No ground-borne vibration impacts have been identified with this alternative. Specific analyses were not conducted for opening day (2008) or year 2025 time frames.

15.5.3 Rail Alternative

Opening Day Time Frame. No specific analyses were conducted for opening day (2008) time frame. Based on the forecast for 2020, it is unlikely that vibration impacts will occur for opening day for this alternative.

Year 2020 Time Frame. For Category 2 receivers in the Downvalley portion of the project area, no vibration impacts are anticipated, since all receivers are located more than 4.6 meters (15 feet) from the centerline of the rail alignment. For Category 2 receivers in the Upvalley portion of the project area, potential vibration impacts may occur for two receivers (R861 and R876) that are located approximately 18 meters (60 feet) from the centerline of the rail alignment and three receivers in Aspen (represented by sites A7 and A9) that are located 7.6 meters (25 feet) from the centerline of the rail alignment.

For Category 3 receivers, no vibration impacts are anticipated throughout the project area since all of these receivers are located more than three meters (10 feet) from the alignment in the Downvalley portion of the project area and more than 12 meters (40 feet) from the alignment in the Upvalley portion of the project area.

No Category 1, or other highly vibration-sensitive land uses were identified in the project area adjacent to the proposed alignment.

Potential impacts from vibration associated with freight hauling along the same tracks would be associated with the same receivers noted above.

15.6 Construction-Related Noise and Ground-Borne Impacts

15.6.1 Construction Noise. Noise impacts from construction activity are a function of the noise generated by construction equipment, the location, the sensitivity of nearby land uses, and the timing and duration of the noise-generating activities. Normally, construction activities are carried out in stages and each stage has its own noise characteristics based on the mix of construction equipment in use. The noise levels created by construction equipment will vary greatly depending on factors such as the type of equipment, the specific model, the operation being performed, and the condition of the equipment. The L_{eq} of the construction activity also depends on the fraction of time that the equipment is operated over the time period of construction.

Table V-21 provides the typical noise levels from representative pieces of equipment at 50 feet from the noise source. For point sources, sound levels drop off with distance in accordance with the "inverse square law," which yields a six-decibel sound level reduction for each doubling of the distance from the source. A sound source can be treated as a "point source" when the distance from the source is large compared to the dimensions of the source.

Table V-21
Construction Equipment Noise Emission Levels

Equipment	Typical Noise Level (dBA) 15.24 meters (50 feet) from Source	Equipment	Typical Noise Level (dBA) 15.24 meters (50 feet) from Source
Backhoe	80	Loader	85
Compactor	82	Paver	89
Concrete Mixer	85	Pneumatic Tool	85
Concrete Pump	82	Roller (vibratory)	81 [1]
Concrete Vibrator	76	Saw (Rail)	90 [1]
Crane, Derrick	88	Scarifier	83
Crane, Mobile	83	Scraper	89
Dozer	85	Shovel	82
Generator	81	Spike Driver	82 [1]
Grader	85	Tie Cutter	84
Impact Wrench	78 [1]	Tie Handler	80
Jackhammer	91 [1]	Tie Inserter	85
Impact Wrench	78 [1]	Truck	88

Source: USDOT, 1995
[1] Parsons Engineering Science

15.6.2 Construction Ground-Borne Vibration. Generally, impacts from ground-borne vibration related to construction may be expected for receptors located within approximately 61 meters (200 feet) of construction activity. Actual distances will vary depending on the equipment and methods employed. Operation of construction equipment causes ground vibrations that spread through the ground and diminish in strength with distance. Buildings founded on the soil in the vicinity of the construction site respond to these vibrations, with varying results ranging from no perceptible effects at the lowest levels, to low rumbling sounds and perceptible physical vibrations at moderate levels, and slight damage at the highest levels. Table V-22 presents the average measured vibration for various types of construction equipment under a wide variety of construction activities.

Table V-22
Vibration Source Levels for Construction Equipment

Equipment	PPV at 7.62 meters/ 25 feet (cm/second or inches per second)	Approximate Velocity Level [1] at 7.62 meters/25 feet (dB)
Large bulldozer	0.089	87
Caisson drilling	0.089	87
Loaded trucks	0.076	86
Jackhammer	0.035	79
Small bulldozer	0.003	58
Wheel impactor	0.36 [2]*	--
Vibratory roller	0.55*	--

Source: USDOT, 1995
** Parsons Engineering Science*

Note: [1] RMS velocity in decibels (dB) referenced to 1 micro-inch/second.
[2] Measured at approximately 15.24 meters or 50 feet.

It is possible that some types of heavy vehicles and excavation activities can generate sufficient ground-borne vibration levels to be noticeable in nearby buildings. The vibration levels created by the normal movement of vehicles including graders, loaders, dozers, scrapers and trucks generally are of the same order of magnitude as the ground-borne vibration created by heavy vehicles traveling on streets and highways.

FTA provides a vibration damage threshold criteria of 0.50 centimeters per second (0.20 inch per second or approximately 100 dB) PPV for fragile buildings and 0.30 centimeters per second (0.12 inch per second or approximately 95 dB) PPV for extremely fragile historic buildings, for typical construction equipment (USDOT, 1995). The FTA recommends that these criteria be used as a damage threshold for the fragile structures located near the right-of-way of a transit project.

Besides the potential for minor building damage to occur, businesses on the side of the street where construction activity will take place may also be affected during periods of construction. Businesses with outdoor seating areas, such as restaurants in downtown Aspen, would be the more severely affected because customers would likely be annoyed by the construction activity.

The following cultural resource sites may be subject to construction vibration impacts under criteria for fragile historic buildings due to their proximity to the Rail Alternative: the Satank Bridge (5GF1282), Emma School (5PT27), Wheatley School (5PT57), and the Aspen Commercial Historic District (5PT113). See **Section 11: Cultural Resources** in this chapter for additional information on these sites.

16. Visual Impacts

The West Glenwood Springs to Aspen Project Corridor lies within the Roaring Fork Valley and is visually dominated by natural open space areas within the valley foreground and mountain backgrounds. Development is interspersed within the foreground. Project-related visual impacts are not expected to change from opening day to the year 2025.

16.1 No Action/Committed Projects Alternative

No additional new or adverse visual impacts are anticipated under the No Action/Committed Projects Alternative. Impacts were discussed in appropriate Committed Projects documents. The *Entrance to Aspen FEIS* describes the effects of the LRT and associated overhead power supply in detail. Many of the stations and all three maintenance facilities are part of this alternative.

16.2 Trail

The new Rio Grande Trail will create minimal visual effects since it will follow the pre-existing railroad grade. Additional detail on the trail impacts are described under the Rail Alternative below.

16.3 BRT Alternative

Except for new transit stations, no new visual impacts are anticipated under the BRT Alternative. Buses are already a standard feature on Highway 82. All of the new stations will be located within commercial and industrial areas along the corridor.

Three new transit stations are proposed in Glenwood Springs. The first is at West Glenwood Springs (on Midland Avenue south of I-70), the second is in downtown Glenwood Springs (the wye area at 8^{th}) and the third is in South Glenwood Springs (near Holy Cross Electric). The next transit station is proposed for the Colorado Mountain College area at County Road 154. Every effort will be made to design the stations so that they conform to their surroundings.

Two transit stations are proposed for Carbondale. The first is near Highway 133 and the second is in downtown Carbondale near the town hall at 4th and Colorado. The stations are proposed in areas containing urban development.

Two locations were considered in El Jebel: El Jebel Road and Willits Lane. Both station site options are in developed areas. The station will be designed to complement the surroundings at the selected site. Should the station location at El Jebel Road be selected, avoidance of visual intrusion into the Mt. Sopris Tree Farm Recreation area can be obtained through appropriate site and landscaping design, including visual buffers.

A station location is proposed in a developed area of Basalt at Midland Avenue. It will be designed to complement the surrounding area.

Additional transit stations associated with this alternative include locations associated with No Action/Committed Projects. Three transit station locations will be replaced or enhanced under either sub-alternative: Snowmass Village Transit Center at the Snowmass Mall, the Brush Creek Road Transit Station, and the Rodeo Lot at the Brush Creek and Owl Creek intersection. The Paepcke Park station in Aspen will be replaced or enhanced under the BRT-Bus Alternative.

16.4 Rail Alternative

In order to assess visual impacts associated with the Rail Alternative, the Project Corridor was divided into segments based on similar physical features and land use patterns. The segments are as follows:

- West Glenwood Springs to South Glenwood Springs
- South Glenwood Springs to Catherine Store
- Catherine Store to Wingo Junction
- Wingo Junction to Gerbazdale
- Gerbazdale to Brush Creek Road
- Brush Creek Road to Aspen

Description of the existing visual qualities within the Project Corridor were provided in **Chapter III.C.17: Visual Character.** Visual impacts associated with the Rail Alternative will occur in the form of new transit stations, ancillary facilities, new bridges, and retaining walls. The anticipated impacts are discussed by segment below.

16.4.1 West Glenwood Springs to South Glenwood Springs. Rail lines exist throughout this segment. From West Glenwood Springs to Glenwood Springs, Union Pacific rail lines are active with freight and passenger service. New rail will be constructed within the existing Union Pacific right-of-way. Between downtown Glenwood Springs and South Glenwood Springs, the Rail Alternative will utilize the existing RFTA right-of-way. Tracks are present in the right-of-way, but no train service currently exists.

Two new stations are proposed in this segment. The first is in West Glenwood Springs, and the second in downtown Glenwood Springs. Every effort will be made to design the stations so that they conform to their surroundings. The new Rio Grande Trail begins with its connection to the

Glenwood Springs River Trail at 23rd Street. The trail will run adjacent to the rail line from this location south to County Road 100.

Retaining walls are also proposed for this segment near the confluence of the Colorado and Roaring Fork Rivers. A total of two walls will be necessary, each averaging three meters (ten feet) in height and 280 meters (920 feet) in length. In addition to the retaining walls, two new bridge structures will be necessary. The first bridge will span the Roaring Fork River immediately adjacent to the existing Union Pacific bridge, and the second will span 7th Street, just north of the downtown Glenwood Springs station location.

Visual impacts associated with the structures described above will mainly be concentrated on the homes located along Cowdin Drive. These homes are already affected by the existence of the Union Pacific rail lines and the associated bridge. New impacts will be minimized through the incorporation of design details to help the structures blend with their surroundings.

16.4.2 South Glenwood Springs to Catherine Store. The Rail and Trail follow the RFTA right-of-way to County Road 100. At the point where County Road 100 turns to cross the Roaring Fork River, the Rail portion of the alternative crosses the river and follows County Road 100 to Highway 82. The Rail alignment then follows the Highway 82 corridor to the end of the segment. The new Rio Grande Trail continues along the RFTA right-of-way.

Two new transit stations are proposed in this segment. The first is in Carbondale near Highway 133 and the second is in downtown Carbondale near the town hall. The stations are proposed in areas that contain urban development, and will be designed to complement their surroundings.

A retaining wall is proposed for the area along County Road 100 north of the crossing of the Roaring Fork River. The retaining wall would be five meters (17 feet) high and approximately 168 meters (550 feet) long. Two bridges are also proposed in this segment. The first would span Highway 133 in Carbondale and the second would span the Roaring Fork River immediately adjacent to the County Road 100 bridge. Implementation of the new rail line from County Road 100 to Highway 82 and along Highway 82 through Carbondale will create a new sight along the highway.

Visual impacts associated with the structures described above will be concentrated in Carbondale and at the Roaring Fork River crossing near Catherine Store. New impacts will be minimized through the incorporation of appropriate design details to help the structures blend with their surroundings.

16.4.3 Catherine Store to Wingo Junction. The Rail alignment in this segment runs along Highway 82. No rails or existing railroad right-of-way are present through the area. The new rails will be constructed immediately adjacent to Highway 82, partly within existing right-of-way, and will increase the width of that transportation corridor.

Two new stations are proposed in this segment. The first will be in El Jebel, either at El Jebel Road or at Willits Lane. If the El Jebel Road location is selected, appropriate visual buffers will be included to protect the integrity of the nearby Mt. Sopris Tree Farm Community Center and Recreation Area. The second is at Midland Avenue in Basalt. Both stations will be located in developed areas, and will be designed to complement their surroundings.

Retaining walls are proposed for several locations throughout this segment. A total of 12 walls would be constructed at various locations, mainly surrounding new bridge locations and steep slopes.

Retaining walls would average 1.8 meters (six feet) in height and 175 meters (575 feet) in length. Three new bridges would be necessary to span the Roaring Fork River near Aspen Junction, Highway 82 near Basalt, and the Roaring Fork River again south of Basalt.

Visual impacts associated with the structures described above will be concentrated in the residential and commercial areas surrounding the stations and structures. Visual effects will also occur for motorists on Highway 82 with the addition of a bridge crossing the highway near Basalt. Visual impacts will be minimized to the extent possible through the incorporation of appropriate design details.

16.4.4 Wingo Junction to Gerbazdale. At Wingo Junction, the rail alignment returns to the existing RFTA right-of-way and rejoins the trail. The existing right-of-way and rails will be utilized throughout this segment to the new crossing of the Roaring Fork River at Gerbazdale.

Retaining walls are proposed for several locations throughout this segment. A total of seven walls would be constructed at various locations, mainly adjacent to steep slopes. Retaining walls would average 1.8 meters (six feet) in height and 78 meters (255 feet) in length. One new bridge would be constructed to span the Roaring Fork River at Gerbazdale. No stations are proposed to be constructed within this segment.

Visual impacts associated with the retaining walls discussed above will affect residences located adjacent to Lower River Road. These retaining walls will not represent a drastic departure from the existing condition, however, since the rails, railbed, and steep slopes already exist in the area. Visual impacts associated with a new bridge spanning the Roaring Fork River at Gerbazdale will affect only the few residences located in the area. The bridge should not be noticeable to motorists on Highway 82. Efforts will be made to design all structures in this segment so that they blend with their surroundings to the extent possible.

16.4.5 Gerbazdale to Brush Creek Road. The rail alignment separates from the new Rio Grande Trail and again runs along the Highway 82 right-of-way through this segment. The new trail ties into the existing Rio Grande Trail at Woody Creek where the RFTA right-of-way ends. No rails or existing railroad right-of-way are present along Highway 82. New rails would be constructed immediately adjacent to Highway 82 and would effectively increase the width of that transportation corridor.

The Snowmass Village Transit Center at the Snowmass Mall and the Brush Creek Road Transit Station will be replaced or enhanced as a part of this alternative. Several retaining walls are proposed throughout the segment. A total of seven wall locations are proposed with an average wall height of 2.7 meters (nine feet) and an average length of 220 meters (720 feet). The walls are incorporated to reduce the amount of right-of-way necessary for the rail and to control steep slopes where present. No new bridges are proposed for this segment.

Visual impacts associated with the retaining walls proposed in this segment will occur for adjacent residences. Only a limited number of residents are present adjacent to any of the proposed wall locations. Visual impacts associated with the walls and the Brush Creek Road Transit station will be minimized to the extent possible through the incorporation of appropriate design materials.

16.4.6 Brush Creek Road to Aspen. Visual impacts associated with structures in this segment are largely covered in the *Entrance to Aspen FEIS*, including a transit station at the airport. That document included an assessment of visual impacts from the Pitkin County Airport to downtown Aspen at Rubey Park. The Rodeo Lot Transit Station at the Brush Creek / Owl Creek intersection will be replaced or enhanced as a part of this alternative. Additional structures not covered in the previous assessment include a bridge spanning Highway 82 just south of Brush Creek Road, two retaining walls, and a new station near the intersection of Main Street between Galena and Spring Streets in downtown Aspen. The transit station will be a simple platform designed to fit with the surrounding architecture. All structures discussed above will be designed to blend with the surroundings to the extent possible.

Both retaining walls proposed in this segment are associated with the new bridge proposed to span Highway 82. The walls are anticipated to be about 3.5 meters (12 feet) high and approximately 85 meters (280 feet) long. No residences are located in this area, but motorists on Highway 82 will experience visual impacts.

17. Impacts on Potential Hazardous Waste Sites

17.1 No Action/Committed Projects Alternative

No impacts from hazardous waste sites have been identified for this alternative as a part of this project. Potential sites and mitigation for impacts are covered for the Highway 82 roadway right-of-way in the *Basalt to Buttermilk ROD* and the *Entrance to Aspen ROD*. No additional effects are anticipated after opening day for the appropriate projects.

17.2 Trail

Sites No. 9 and No. 13 (see Table V-22 and Figure III-19) may present hazards to the proposed Rio Grande Trail. Each is described below. No additional effects are anticipated after opening day for the appropriate projects.

<u>*Site 9:*</u> *Surficial soil staining at 4th Street Crossing in Carbondale*. A potential environmental condition associated with soil staining at this property, located at RFTA mile marker 374, was identified during the site reconnaissance of this area. This area was not sampled during the site reconnaissance of the RFTA right-of-way. This location represents a potential area of interest that may be subject to further investigation.

<u>*Site 13:*</u> *Former Lumberyard*. No sampling was conducted at this site due to difficulty in obtaining access to the property. Record searches were unsuccessful in obtaining underground storage tank (UST) closure or site investigation reports for the property. The former lumberyard was previously owned by BMC Corporation, and prior to that by Boise Cascade, Inc. This property has undergone previous investigations for leaking USTs and will be investigated further acquisition is necessary. Since the trail does not require additional property acquisition, no additional analysis is required for Site 13.

17.3 BRT Alternative

No impacts from hazardous waste sites have been identified for the BRT Alternative since it will utilize existing rights-of-way. No additional effects are anticipated after opening day. Footprints for proposed station locations have not been analyzed for hazardous waste sites.

17.4 Rail Alternative

The same references are used in this chapter as were listed in the **Chapter III.C.18: Potential Hazardous Waste Sites.** The Project Corridor was divided into ten segments noted below:

- West Glenwood Springs to the Railroad wye area
- Railroad wye area to South Glenwood Springs
- South Glenwood Springs to North Carbondale
- North Carbondale to Mulford
- Mulford to East Basalt
- East Basalt to Wingo Junction
- Wingo Junction to Gerbazdale
- Gerbazdale to Pitkin County Airport
- Pitkin County Airport to Aspen
- Main Street - Aspen

This section reports the results of additional investigation and eliminates those sites that pose no additional environmental risk for this project. For the remaining sites, either additional sampling is suggested in this section, or health and safety precautions and mitigation measures are recommended in **Chapter VII: Mitigation Measures**. No additional effects from these sites are expected after opening day.

The studies performed identified 32 potential hazardous waste sites (PHWS) in the Project Corridor, that may affect or be affected by the proposed project due to proximity to the project or the need to acquire property. Of those 32 potential sites, ten were eliminated based on visual inspection, interviews, evaluation of existing data, or clean-up documentation. The remaining 22 sites, listed in Table V-23 and shown in Figure III-19, required further investigation. Of these sites, eleven had additional site investigation work performed, such as drilling, surface sampling, or reviews of existing analytical data. Eleven sites were found to pose no significant threat, requiring no special materials handling, or extra health and safety precautions during construction due to hazardous substances in the areas investigated. The remaining eleven sites will require sampling prior to any property acquisition or prior to construction if within an existing right-of-way.

Table V-23
Potential Hazardous Waste Sites, Rail Alternative

No.	Site Identification	Reason For Listing	RFTA Mile Marker
1	West Glenwood Springs to Wye Rail Storage	Past Use	360
2	Surficial Soil Staining in Wye Area	Past Use/Visible Staining	360
3	Fattor Petroleum	BTEX Detected	361
4	Garfield County Maintenance Facility	Past Use	361
5	Amoco Station	UST Investigation	361
6	Surficial Soil Staining/Mile markers 366, 366.7, 367.5	Visible Staining	366-367
7	Surficial Soil Staining 8th Street Crossing, Carbondale	Visible Staining	372.6
8	Culvert Crossing Carbondale	Sheen on water in culvert	373
9	Surficial Soil Staining 4th Street Crossing, Carbondale	Visible Staining/Odors	374
10	Surficial Soil Staining/Mile markers 373.8, 373.9	Visible Staining	373 - 374

Table V-23
Potential Hazardous Waste Sites, Rail Alternative

No.	Site Identification	Reason For Listing	RFTA Mile Marker
11	Exposed Evaporite Deposit	Discoloration/rust colored staining	377
12	Surficial Soil Staining/Mile markers 381.7 to 382.4	Visible Staining	381- 382
13	Former Lumber Yard	Past Use	385
14	Surficial Soil Staining/Mile markers 390.5	Visible Staining	390.5
15	Pitkin County Landfill	Leachate	--
16	Concrete Batch Plant/Ore Loading Facility	Industrial Site	--
17	Park-and-Ride Opposite Brush Creek Road	Visible Staining/Odors	--
18	Pitkin County Airport	UST	--
19	RFTA Bus Maintenance Facility	UST, Hazardous Waste Generator	--
20	Aspen Airport Business Center	UST	--
21	435 E. Main St. Aspen	UST	--
22	506 E. Main St. Aspen	UST	--

** Potential Hazard applies only to the Trail*

The 22 sites listed in Table V-23 are discussed in further detail below along with justification for retainage or elimination. These sites are listed by corridor segment as identified in **Chapter III.17**.

17.4.1 West Glenwood Springs (I-70 Exit 114) to the Railroad Wye Area, Glenwood Springs.

<u>*Site 1*</u>*: Storage along Union Pacific railroad tracks from West Glenwood Springs to the wye area.* No access was available to directly inspect this area. No samples were obtained from this property. Prior to any acquisition, it is recommended that potential contamination, remedial alternatives, and liability be assessed.

17.4.2 Railroad Wye Area, Glenwood Springs, to South Glenwood Springs.

<u>*Site 2*</u>*: Surficial Soil Staining in Railroad Wye Area.* This area was tested for petroleum contamination, including total recoverable petroleum hydrocarbons (TRPH); oil and grease; benzene toluene, ethyl-benzene and xylenes (BTEX); and Phenols due to the possible presence of creosote. The presence of TRPH and oil and grease at low levels was confirmed by the samples; however, the State of Colorado does not maintain a risk-based action criteria for the cleanup of surficial soils (not in contact with groundwater) impacted by TRPH or oil and grease. No BTEX compounds were detected, and phenols were detected at very low levels (SRK, 1996). As a result of these findings, this site has been eliminated as a site for further investigation.

<u>*Site 3:*</u> *Railroad right-of-way adjacent to Fattor Petroleum.* This area was tested for TRPH, oil and grease, and BTEX. TRPH and oil and grease were detected at elevated levels. BTEX compounds were all detected and were elevated relative to other samples collected during the site investigation. The BTEX levels indicate a presence of gasoline and suggest the possibility that the contamination originates at the Fattor Petroleum facility. All BTEX values found for surficial soils are two to four orders of magnitude below EPA soil screening guidance levels (SRK, 1996). This area is not subject to further investigation; however, precautions should be taken during construction to protect human health and the environment.

Site 4: *Railroad right-of-way adjacent to the Garfield County Maintenance Facility*. This area was tested for TRPH, oil and grease, and BTEX. The presence of TRPH and oil and grease at low levels was confirmed by the samples; however, the State of Colorado does not maintain a risk-based action criteria for the cleanup of surficial soils (not in contact with groundwater) impacted by TRPH or oil and grease. BTEX compounds were either non-detect or detected at very low levels (SRK, 1996). As a result of these findings, this site has been eliminated as a site for further investigation.

Site 5: *Amoco Station, 2205 Grand Avenue*. A potential environmental condition associated with USTs at this property was identified during the site reconnaissance of this area. No data were available regarding the nature of this hazardous waste site. This location is currently undergoing remediation. Health and safety precautions should be based on the stage of cleanup or results if complete.

17.4.3 South Glenwood Springs to Buffalo Valley to North Carbondale.

Site 6: *Surficial soil staining at mile markers 366-367*. This area was tested for TRPH, oil and grease, and BTEX. The presence of TRPH and oil and grease at low levels was confirmed by the samples. BTEX compounds were either non-detect or detected at very low levels (SRK 1996). As a result of these findings, this site has been eliminated as a site for further investigation.

17.4.4 North Carbondale to Mulford.

Site 7: *Surficial Soil Staining at 8th Street Crossing, Carbondale* (mile marker 372.6). This area was tested for TRPH, oil and grease, and BTEX. The presence of TRPH and oil and grease at low levels was confirmed by the samples. BTEX compounds were either non-detect or detected at very low levels (SRK, 1996). As a result of these findings, this site has been eliminated as a site for further investigation.

Site 8: *Surficial Soil Staining Between 7th and 8th Streets in Carbondale*. This area is adjacent to trackage and includes observed hydrocarbon sheen on surface water at a culvert crossing. This area was tested for TRPH, oil and grease, and BTEX. The presence of TRPH and oil and grease at low levels was confirmed by the samples. BTEX compounds were either non-detect or detected at very low levels. Additionally, sediment samples were collected upgradient and downgradient of the RFTA right-of-way. No significant increase in concentrations of TRPH or oil and grease were found downgradient, relative to the upgradient sample. Therefore, the RFTA right-of-way does not appear to be contributing TRPH, oil, or grease to the surface water drainage sediments (SRK, 1996). As a result of these findings, this site has been eliminated from further investigation.

Site 9: *Surficial soil staining at 4th Street Crossing in Carbondale*. A potential environmental condition associated with soil staining at RFTA mile marker 374 at this property was identified during the site recognizance. This area was not sampled during the site recognizance of the RFTA right-of-way. This location represents a potential area of interest that may be subject to further investigation.

Site 10: *Surficial Soil Staining at RFTA Mile Markers 373.8 and 373.9*. This area was tested for TRPH, oil and grease, and BTEX. The presence of TRPH and oil and grease at low levels was confirmed by the samples. BTEX compounds were either non-detect or detected at very low levels (SRK,1996). As a result of these findings, this site has been eliminated as a site for further investigation.

17.4.5 Mulford to East Basalt.

Site 11: *Exposed Evaporate Deposits Adjacent to RFTA right-of-way East of Mulford.* Surface water in this area was tested for pH. The results of testing the surface water, which was identified during site reconnaissance as being discolored, do not indicate acidic conditions. The soil pH results indicate the potential for generating acidic conditions in surface water; however, at the time of this sampling event, surface water impacts were not evident (SRK, 1996). As a result of these findings, this site has been eliminated from further investigation.

17.4.6 East Basalt to Wingo Junction.

Site 12: *Surficial Soil Staining at RFTA Mile Markers 381.7 to 382.4.* This area was tested for TRPH, oil and grease, and BTEX. The presence of TRPH and oil and grease at low levels was confirmed by the samples. BTEX compounds were either non-detect or detected at very low levels (SRK, 1996). As a result of these findings, this site has been eliminated as a site for further investigation.

Site 13: *Former Lumberyard.* No sampling was conducted at this site due to difficulty in obtaining access to the property. Record searches were unsuccessful in obtaining underground storage tank (UST) closure or site investigation reports for the property. The former lumberyard was previously owned by BMC Corporation, and prior to that by Boise Cascade, Inc. This property has undergone previous investigations for leaking USTs and will be investigated further if it is to be acquired.

17.4.7 Wingo Junction to Woody Creek.

Site 14: *Surficial Soil Staining at RFTA Mile Marker 390.5.* This area was tested for TRPH, oil and grease, and BTEX. The presence of TRPH and oil and grease at low levels was confirmed by the samples. BTEX compounds were either non-detect or detected at very low levels. (SRK, 1996). As a result of these findings, this site has been eliminated from further investigation.

Site 15: *Pitkin County Landfill.* The landfill was included because the property is upgradient of Highway 82 and because of the Colorado Department of Health (CDH) report of runoff having crossed Highway 82 in 1984. This prompted concern about potential contamination impact to construction areas. No acquisition of the actual landfill area is anticipated. Field screening and soil samples yielded no measurable contamination. No special materials handling or extra health and safety considerations are anticipated for construction activities due to hazardous substances in the area investigated.

Site 16: *Concrete Batch Plant/Ore Loading Facility.* This property is located near Highway 82 milepost 32. A visual site inspection did not reveal conspicuous environmental concerns, and it indicated that the site is downgradient of the proposed project. No acquisition is planned, so no further assessment was conducted.

17.4.8 Woody Creek to Pitkin County Airport.

Site 17: *Park-and-Ride opposite Brush Creek Road.* Isolated surficial staining was observed in this area. The project has recently been completed per the *Basalt to Buttermilk Ski Area ROD.* As such, this site has been cleared and mitigated as appropriate. No further investigation is required.

Site 18: *The Pitkin County Airport.* This site is covered under the *Entrance to Aspen FEIS* and *ROD.* Since this project uses the improvements approved in those documents, no additional impact is expected. Following is documented information on this site.

This site was tested for petroleum contamination at two UST locations and the area where a 1,500-gallon aviation fuel spill was reported sometime around 1984.

Any acquisition of right-of-way containing USTs would involve tank closure and possible remediation. Sample results indicate soils in the drainage crossing Highway 82 from the release area are not contaminated in excess of CDH (now CDPHE) guidelines for cleanup of petroleum-contaminated soils under Remedial Action Category 1 (CDH, 1991). Subsurface soils collected for the PSI did not contain significant petroleum contamination at either storage tank site investigated. Petroleum contamination is not expected in shallow soils along the right-of-way. Therefore, it appears no special handling or extra health and safety considerations are required during construction activities due to excess levels of petroleum in the areas investigated.

If the UST systems are to be acquired, however, further evaluation will be necessary. Some potential exists for groundwater pollution at the site. The difficult drilling conditions and depth to water will make groundwater assessment costly and time-consuming. Consultation with legal counsel is recommended to determine potential liability for groundwater pollution prior to property acquisition (Walsh, 1992).

17.4.9 Pitkin County Airport into Aspen.

Site 19: *RFTA Maintenance Facility.* This site is covered under the *Entrance to Aspen FEIS* and *ROD*. Since this project uses the improvements approved in those documents, no additional impact is expected.

No physical investigation took place at this property. The RFTA Maintenance Facility near Highway 82 milepost 37.5 is a small-quantity generator of hazardous waste and a UST site with a reported petroleum release and an identified ground water contaminant plume. Further investigation was not conducted at this time because the site is downgradient of any proposed acquisition.

Site 20: *AABC*. No samples were obtained from this property. This site is covered under the *Entrance to Aspen FEIS* and *ROD*. Since this project uses the improvements approved in those documents, no additional impact is expected. Following is documented information on this site.

The AABC, including the Boise Cascade and former CDOT maintenance facilities, contains USTs still in place from the former CDOT facility (now occupied by Grizzly Landscaping). These data indicate a potential for soil or groundwater contamination. The potential for environmental contamination at this location justifies further investigation. Potential contamination, remedial alternatives, and liability should be assessed prior to any acquisition (Walsh, 1992).

17.4.10 Main Street, Aspen. Additional corridor examined for potential acquisition includes three blocks within the existing right-of-way along the south side of Main Street in Aspen, from Monarch Street to Hunter Street. The environmental databases (EDR, 1999) used for the original corridor were searched for sites which could potentially impact the rail corridor.

Site 21, 455 East Main Street and *Site 22, 506 East Main Street:* These two properties contiguous to the Project Corridor were identified as having reported leaking underground storage tanks (LUSTs) or underground storage tanks (USTs). The current status of all tanks at 435 E. Main Street is "permanently out of use." The current status of one tank at 506 E. Main Street is "permanently out of use," and the status of the other is active. How the "out of use" tanks were closed or cleaned up is not reported. Potential contamination, remedial alternatives, and liability should be assessed prior to any property acquisition.

17.5 Summary of Sites

Of the 22 sites evaluated, 11 were found to pose no significant threat requiring special materials handling or extra health and safety precautions during construction due to hazardous substances. One site has been cleared and mitigated under another CDOT project, and the remaining ten sites were not eliminated because they require sampling during preliminary engineering, health and safety precautions, or mitigation during construction. The remaining sites and respective additional actions needed are listed in Table V-24. All ten sites may present hazards for the Rail Alternative. No additional effects are anticipated after opening day. Footprints for proposed station locations have not been analyzed for hazardous waste sites.

Table V-24
Potential Hazardous Waste Sites Requiring Further Sampling during Preliminary Engineering, Health and Safety Planning, or Mitigation for the Rail Alternative

Site #	Site Identification	Mile Marker	Sampled	Additional Action Needed
1	West Glenwood Springs to Wye Rail Storage	360	No	Sampling
3	Fattor Petroleum	361	Yes	Health and Safety Planning/Mitigation
5	Amoco Station	361	Yes	Health and Safety Planning/Mitigation
9	Surficial Soil Staining 4th St. Crossing, Carbondale	374	No	Sampling
13	Former Lumber Yard	385	Yes	Health and Safety Planning
18	Pitkin County Airport	--	Yes	Health and Safety Planning/Mitigation
19	RFTA Bus Maintenance Facility	--	Yes	Health and Safety Planning/Mitigation
20	Aspen Airport Business Center	--	Yes	Health and Safety Planning/Mitigation
21	435 East Main Street	--	Yes	Health and Safety Planning/Mitigation
22	506 East Main Street	--	Yes	Health and Safety Planning/Mitigation

18. Public Safety and Security

Public transit projects could impact public safety and security by increasing the demand for police and fire protection in the communities they serve, or by increasing or decreasing the potential for accidents involving pedestrians or automobiles. (Note that discussion under **Section A.4 Services** in this chapter includes a general discussion of project effects on community services. This section focuses on safety and security issues.) Potential impacts to safety and security as a result of the No Action/Committed Projects and the Build alternatives were evaluated.

The differences in public safety and security between the No Action/Committed Projects Alternative and the Build alternatives are difficult to quantify. There is the potential for moderate increases in theft, vandalism, and other emergencies at transit stations and park-and-ride lots.

Note that congestion at the following committed park-and-ride and/or station locations and maintenance facilities will occur for all alternatives resulting in poor levels of service for opening day: Carbondale at Highway 133, El Jebel at Willits Lane, and the Carbondale Maintenance Facility. By 2025 all alternatives will result in poor levels of service associated with West Glenwood Springs, the West Glenwood Springs Maintenance Faciltiy, Downtown Glenwood Springs, and the CMC areas, as well as Carbondale at Highway 133, the Carbondale Maintenance Facility, both El Jebel locations, Brush Creek Road, the Pitkin County Airport and Buttermilk. **Chapter IV.D.2: Station Areas and Major Intersections** summarizes these impacts. This congestion may compromise delivery of police and fire protection and emergency services.

18.1 Police Protection and Community Safety Impacts

18.1.1 No Action Committed Projects Alternative

Opening Day Time Frame. The No Action/ Committed Projects Alternative involves the existing Highway 82 and transit system, together with the approved Aspen LRT project. Highway 82 will be patrolled by the Colorado State Patrol. In addition, each county or municipality will have a local law enforcement agency that has jurisdiction within the Project Corridor, station locations, park-and-ride lots or maintenance facilities. As congestion increases, there is an increased likelihood of congestion-related accidents on Highway 82 and associated local streets. Congestion will occur at committed park-and-ride and/or station locations under this alternative.

Year 2025 Time Frame. The impacts to Safety and Security as a result of the No Action/Committed Projects Alternative are expected to differ from the Opening Day time frame. A higher number of congestion-related accidents is expected in 2025 on Highway 82 given the increasing congestion and deteriorating nature of the corridor. Increased neighborhood congestion will also make it more difficult for emergency vehicles to move through traffic, decreasing police response times. Congestion at committed park-and-ride and/or station locations and maintenance facilities will increase into the future under this alternative.

18.1.2 Trail. No significant increases in safety and security staffing are expected to be required for the construction and operation of the trail for either the Opening Day or Year 2025 time frame.

18.1.3 BRT Alternative

Opening Day Time Frame. Since the BRT Alternative utilizes the existing Highway 82 together with the approved Aspen LRT project, it is not expected to require substantial additional law enforcement services. During the operation phase of the BRT project, police protection would be required to ensure safety aboard the vehicles and at the stations and park-and-rides. RFTA will provide uniformed, armed security officers as appropriate. Additional maintenance facility security will be provided by RFTA as required.

The BRT Alternative will generally enhance accessibility and circulation for emergency vehicles traveling through the Project Corridor and will generally make it easier for residents to reach emergency facilities. However, local congestion at stations, park-and-ride locations, and maintenance facilities may impede accessibility and circulation for emergency vehicles during peak times at those locations.

Year 2025 Time Frame. The impacts to police protection and community services as a result of the BRT Alternative are not expected to differ substantially from those described in Opening Day. In the year 2025, the BRT Alternative would potentially result in an increased need for RFTA security and municipal law enforcement due to potential increased populations and ridership.

The BRT Alternative will enhance accessibility and circulation for emergency vehicles traveling through the Project Corridor and will generally make it easier for residents to reach emergency facilities. However, local congestion at station, park-and-ride locations and maintenance facilities may impede accessibility and circulation for emergency vehicles during peak times at those locations.

18.1.4 Rail Alternative.

Opening Day Time Frame. Highway 82 will be patrolled by the Colorado State Patrol. In addition, each county or municipality will have a local law enforcement agency with jurisdiction over the station locations, park-and-ride lots, or maintenance facilities within the Project Corridor.

The Rail Alternative will enhance accessibility and circulation for emergency vehicles traveling through the corridor and will generally make it easier for residents to reach emergency facilities. However, congestion at stations, park-and-ride locations, and maintenance facilities may impede accessibility and circulation for emergency vehicles during peak times at those locations.

Police protection services will be required for project security during both the construction and operation phases. During the construction phase, security will be required to minimize or prevent construction site thefts. Control of security at the construction site will be the responsibility of the construction contractor. Responding to site thefts is within the existing responsibilities of the affected municipalities. Responding to construction site theft would represent a minimal impact to the overall police workload and is not expected to require an increase in staff.

Police protection would be required during rail operations to ensure safety aboard the vehicles and at the stations and park-and-rides. RFTA will provide uniformed, armed security officers as appropriate. Maintenance facility security will be provided by RFTA as required.

Recent studies and literature suggest that violent crimes do not increase with the addition of mass transit to a community. Criminal incidents in the Portland TriMet area, serviced by the MAX LRT line, actually decreased from 1997 to 1998. Portland and Gresham police report that in eleven years, they have not experienced a high proportion of crime resulting from criminals utilizing MAX as a mode of travel from one area to another.

Year 2025 Time Frame. The impacts to police protection and community services as a result of the Rail Alternative are not expected to differ substantially from those described in Opening Day. In the year 2025, the Rail Alternative would potentially result in an increased need for RFTA security and municipal law enforcement due to potential increased populations and ridership.

The Rail Alternative will enhance accessibility and circulation for emergency vehicles traveling through the corridor and will generally make it easier for residents to reach emergency facilities. However, congestion at station locations, park-and-rides, and maintenance facilities may impede accessibility and circulation for emergency vehicles during peak times at those locations.

18.2 Fire Protection and Emergency Medical Impacts

18.2.1 No Action/Committed Projects Alternative. Appropriate local jurisdictions will continue to provide fire protection and emergency response. Impacts to fire protection and emergency services are not expected to differ substantially between Opening Day and the Year 2025 time frames, except as related to increased vehicular traffic and transit ridership.

18.2.2 Trail. Impacts as the result of first aid calls are expected to be negligible. No significant increase in fire protection and emergency medical services are expected to be required for the construction and operation of the trail for either the Opening Day or Year 2025 time frames.

18.2.3 BRT Alternative.

Opening Day Time Frame. The BRT Alternative will enhance accessibility and circulation for emergency vehicles traveling through the Project Corridor. This alternative will make it easier for residents to reach emergency facilities and services, except at station locations noted in the opening section discussion above. Localized congestion at stations, park-and-rides, and maintenance facility locations may impede traffic flow for these emergency vehicles.

Fire protection services would be required for control of vehicle and transit station fires. Station fires are generally unlikely due to design and non-flammable construction materials. Because the potential for fire is low, it is not anticipated that the BRT Alternative will require hiring additional fire protection personnel.

2025 Time Frame. Impacts to fire protection and emergency services are not expected to differ substantially from the Opening Day time frame. In the year 2025, increased ridership could potentially result in an increased need for these services.

18.2.4 Rail Alternative.

Opening Day Time Frame. The Rail Alternative will enhance accessibility and circulation for emergency vehicles traveling through the Project Corridor. This alternative will make it easier for residents to reach emergency facilities and services, except at station locations noted in the opening section discussion above. Localized congestion at stations, park-and-rides, and maintenance facility locations may impede traffic flow for these emergency vehicles.

Fire protection services to control DMU vehicle and transit station fires would be required. Station fires are generally unlikely due to design and nonflammable construction materials. Because the potential for fire is low, it is not anticipated that the Rail Alternative would require hiring additional fire protection personnel.

2025 Time Frame. Impacts to fire protection and emergency services are not expected to differ substantially from the Opening Day time frame. In the year 2025, a potential increase in ridership could create a need for additional services.

18.3 Pedestrian and Vehicle Crashes

See **Chapter IV.E: Safety** for additional discussion on traffic safety, rail crossing safety, and pedestrian and bicycle facilities safety.

18.3.1 No Action/Committed Projects Alternative. The likelihood of vehicular crashes will be decreased due to implementation of design improvements to Highway 82, but will be increased due to mounting congestion related to unmet transportation demands in the Project Corridor. The Entrance to Aspen LRT project will implement appropriate safety standards to protect vehicles and pedestrians. Except for the increase of unmet transportation demand in the Project Corridor and resulting safety problems, the nature of the impacts is not expected to differ between Opening Day and Year 2025 time frames.

18.3.2 Trail. Trail safety has been an important consideration during the development of the trail design. The following safety guidelines have been developed:

- Provide sufficient trail width to minimize use conflict.
- Provide barrier fencing at convergence areas to protect property, privacy, or livestock.
- Utilize discrete or unobtrusive barriers to direct the trail use away from hazard and sensitive natural areas.
- Recommend grade-separated trail crossings of rail and major roadways.
- Develop a security and enforcement plan, in coordination with local law enforcement and the rail operators.
- Develop and post trail user regulations.
- Follow recommended design practices, such as signing to warn trail users to stay on the trail and off the tracks.

Trail cross-sections include a three meter (10 foot) minimum buffer from the nearest rail track and the trail alignment locates the trail near the property boundary to maximize the offset and buffer distance to the rail line. In areas where topography reduces the buffer width, physical barriers such as fencing are included in the rail and trail plan. Barrier fencing is provided at convergence areas to protect trail users from transit hazards.

The nature of the impacts is not expected to differ between Opening Day and Year 2025 time frames.

18.3.3 BRT Alternative

Opening Day Time Frame. The BRT will utilize existing Highway 82 and the approved Entrance to Aspen LRT corridor. The Entrance to Aspen LRT project will implement appropriate safety standards to protect vehicles and pedestrians.

Year 2025 Time Frame. The nature of the impacts is not expected to differ between Opening Day and Year 2025 time frames.

18.3.4 Rail Alternative.

Opening Day Time Frame. Resuming use of a rail corridor that has been dormant will require re-education of area residents about the new presence of trains along the route. Where the rail alignment follows Highway 82, the rail experience will be new for everyone. Treatment of crossings will require special attention. The *Roaring Fork Railroad Access Control Plan* (Otak, 1999) prepared for this project as part of *A Comprehensive Plan for the Aspen Branch of the Denver & Rio Grande Western Railroad Corridor (RFRHA, 1999)*, includes a "Policy for Managing Railroad Crossings." This policy defines existing and new crossings, identifies the responsibility for all types of crossings, and provides design standards for upgrading existing crossings. The policy also identifies a course of action to be taken by RFTA to consolidate crossings throughout the Project Corridor whenever and wherever possible. It identifies the conditions for consolidating various types of crossings.

For new crossings, the policy identifies two potential types. Type I is a grade-separated crossing which represents the preferred crossing type. Type II is an at-grade crossing. Typically, at-grade crossings will not be permitted except in areas where train operations are at slow speeds, or when an owner closes or consolidates existing rail crossings. The policy sets forth the standards under which such crossings will be permitted. The specific design standards and specifications can be found in the *Access Control Plan* and supporting appendices.

Year 2025 Time Frame. The impacts to pedestrians and potential for vehicle crashes as a result of the Rail Alternative are not expected to differ substantially from those described on Opening Day.

19. Energy Impacts

In an effort to consider cleaner and more environmentally friendly alternative propulsion technologies, RFTA has committed to a fleet conversion policy that will positively affect all the bus elements within the project alternatives. This will reduce environmental impacts of transit operations on the community, reduce RFTA's dependence on petroleum by moving towards sustainable and renewable forms of energy, and provide higher service quality to the community.

Poor levels of service identified in the areas around committed and proposed stations, park-and-ride areas and maintenance facilities may contribute to energy impacts. Congestion at the following locations will occur for all alternatives, resulting in poor levels of service for opening day: Carbondale at Highway 133, the Carbondale Maintenance Facility and El Jebel at Willits Lane. By 2025 all alternatives will also result in poor levels of service associated with: West Glenwood, the West Glenwood Maintenance Facility, Downtown Glenwood and the CMC areas, as well as Carbondale at Highway 133, the Carbondale Maintenance Facility, both El Jebel locations, Brush Creek Road, the Airport, and Buttermilk. **Chapter IV.D.2: Station Areas and Major Intersections** summarizes these impacts

19.1 No Action/Committed Projects Alternative

Construction and Operations-related energy effects from No Action/Committed Projects have been reviewed under previous environmental studies. No additional impacts are anticipated. Impacts are not expected to differ substantially between Opening Day and Year 2025 time frames.

19.2 Trail

Trail construction and operation will require minimal energy use. Impacts are not expected to differ substantially between Opening Day and Year 2025 time frames.

19.3 BRT Alternative

19.3.1 Construction Energy. No energy use will be associated with construction delays on Highway 82 since no changes will be made to the highway for this alternative. This alternative will consume energy during construction of proposed transit stations. The alternative does not involve major construction efforts, but will require additional construction energy over the No Action/ Committed Projects Alternative. Construction energy is related to preparation for Opening Day only and not the Year 2025 time frame.

19.3.2 Operational Energy. Operationally, the BRT Alternative will result in a net energy savings over the No Action/Committed Projects Alternative. RFTA's commitment for cleaner and more environmentally friendly alternative propulsion technologies can be maximized with the BRT alternative. The provision of an improved network of buses will induce increased ridership on the transit system, thus reducing the number of single-occupant vehicles traveling through the Project

Corridor. Energy use for maintenance activities will be related to the station locations, streets upon which the buses run, and trail upkeep.

19.4 Rail Alternative

19.4.1 Construction Energy. The Rail Alternative has two types of construction impacts: energy required to build rail improvements, primarily resulting from earthwork and the erection of retaining walls, bridges, new track, and transit stations; and potential energy expended as vehicles are delayed by construction activities along the Highway 82 sections of the Project Corridor. Due to the nature of the rail construction adjacent to Highway 82 or in the RFTA right-of-way, very little energy loss is anticipated due to highway traffic delays.

19.4.2 Operational Energy. The Rail Alternative results in a positive energy impact due to operational efficiency. It will substantially reduce overall operational energy requirements because rail transit is more efficient per passenger mile and this alternative reduces congestion and improves the level of service on Highway 82. Energy use for maintenance activities will be related to the station locations, the rail grade itself, streets upon which associated buses run, and trail upkeep.

20. Construction Impacts

These impacts will occur during preparation for the Opening Day time frame and do not apply to the Year 2025 time frame.

20.1 No Action/Committed Projects Alternative

Construction impacts will occur as identified in the *Entrance to Aspen FEIS* and *ROD* and the *Basalt to Buttermilk Ski Area FEIS* and *ROD*. No additional construction impacts occur under the No Action/Committed Projects scenario.

20.2 Trail

The trail will be constructed totally within RFTA right-of-way. Trail construction impacts are expected to be minimal.

20.3 BRT Alternative

This alternative involves minor construction efforts that will result in temporary and limited impacts. Likely impacts from construction of queue bypass lanes include minor traffic delays and minimal earthwork and paving. Transit station, park-and-ride, and maintenance facility construction will occur in commercial and industrial areas, resulting in minimal neighborhood or traffic disturbances.

20.4 Rail Alternative

This alternative will also result in minor construction-related impacts. All portions of the rail route will be constructed along existing linear transportation corridors. Transit station, park-and-ride, and maintenance facility construction will occur in commercial and industrial areas, resulting in minimal neighborhood or traffic disturbances.

Although disruption from the Rail Alternative construction will be minimal, ground disturbance within the RFTA and Highway 82 rights-of-way and the few areas outside these rights-of-way have the potential for impacts as discussed below.

20.4.1 Air Quality. Construction impacts on air quality result from the particulates released by earthwork and the carbon monoxide created by construction equipment exhausts and vehicles delayed by construction. Air quality impacts will be mitigated by minimizing construction activities during the critical winter air pollution season, and by pre-wetting cuts and fills when necessary.

20.4.2 Water Quality. Construction impacts to water quality may arise from the ten additional river crossings (eight bridges and two box culverts) on the rail alignment. Construction of bridge footings adjacent to streams may result in sediment discharges and increased suspended solids and turbidity downstream from the construction site. Other potential construction-related water quality impacts include spills of gasoline, diesel fuel, and engine oils. Construction-related spills are normally small, but may adversely impact water quality if near a stream.

20.4.3 Traffic Safety. Potential safety impacts are due to construction next to active traffic lanes along County Road 100, Highway 82, and railroad crossings. Increased accident potential is due to stop-and-go traffic and the presence of workers and equipment on the roadway. Safety impacts will be minimized by traffic control measures including signs, pavement markings, barriers, and flagging, as well as increased enforcement of traffic rules.

20.4.4 Geology and Soils. A balance of earthwork (equal amounts of fill material used and cut material obtained) is feasible for Rail Alternative construction. Road base material will be obtained from existing permitted borrow-sources in the Roaring Fork Valley. There are approximately five operating sources of sand, gravel, and concrete in the valley between Glenwood Springs and Aspen.

20.4.5 Noise and Ground-Borne Vibration. To minimize impacts of construction noise, construction equipment will include appropriate mufflers in good working condition, and noisy construction will be limited to daylight hours. However, certain construction operations may be more productive during the night-time, especially those requiring highway closures. Variance from local ordinances may be requested in those cases, and appropriate mitigation may be necessary. For further information, refer to **Section.15.6: Construction-Related Noise and Ground-Borne Vibration Impacts** in this chapter.

20.4.6 Utilities. Construction operations may require that electric, telephone, and other overhead utilities be relocated to avoid conflicts. Underground utilities such as electric, telephone, fiber optic, gas, water, sewer, and others may require special construction techniques to avoid or to relocate in order to accommodate construction.

20.4.7 Hazardous Waste. Ten potential hazardous waste sites have been identified and are discussed in **Section 18: Impacts on Potential Hazardous Waste Sites** in this chapter. Additional analyses are required on these sites to determine effects. Mitigation will follow federal and state guidelines. Any newly-identified sites or spills during construction will be investigated and mitigated as necessary. Construction in potential hazardous waste areas will include implementation of a dust suppression program and a worker protection program.

20.4.8 Wildlife. Construction between November 15 and April 1 may affect nesting and roosting bald eagles near Cattle Creek, Wheatley Gulch, and Catherine Store. Sensitive great blue heron rookeries at Sanders Ranch and Rock Bottom Ranch may also be affected by construction activities. Additional discussion is found in **Section 10: Threatened and Endangered Species**, in this chapter.

20.4.9 Traffic Delays. Construction of the Rail Alternative may have a negative impact on traffic. Traffic delays may be experienced where the alignment crosses the highway, first in the construction of the crossing, and subsequently as materials for track construction are delivered to the construction site along the completed track. Construction of the highway/trail crossings may create minor delays.

20.4.10 Business Access. Access to adjacent businesses will be maintained subject to minor delays created as a result of construction adjacent to Highway 82.

20.4.11 Phasing. The Rail Alternative will require some construction phasing to accommodate commuter, tourist, and local traffic to the local businesses and residential areas in the Project Corridor. Construction of portions of the project causing the most conflict will be scheduled during the off seasons, whenever possible. Phasing may also be required to minimize wildlife impacts.

21. Short-Term Uses and Long-Term Productivity

21.1 No Action/Committed Projects Alternative

Short-term uses have been addressed for the construction of transportation improvements associated with the No Action/Committed Projects Alternative.

Long-term productivity will be enhanced with the improvements as identified in the *Basalt to Buttermilk ROD* and the *Entrance to Aspen ROD*.

21.2 Trail

Trail construction will not require additional rights-of-way and will have minimal construction impacts and thus minimal short-term effects. In the long term, improved regional trail connectivity will create a positive impact.

21.3 BRT Alternative

Short-term uses for stations related to right-of-way and construction are associated with the BRT Alternative. The BRT Alternative requires an additional 11.76 hectares (29.06 acres) of right-of-way for station construction.

Long-term productivity will be increased as a result of reduced travel time and reduced highway congestion associated with this alternative. The primary products of the Roaring Fork Valley are recreation and tourism, and this industry is assumed to grow. This assumption is documented and consistent with local planning efforts. Because of this growth and current inadequacies, improvements to the transportation system are necessary. These improvements will provide a system that is safer and has a larger capacity than the No Action/Committed Projects Alternative, and will help to ensure the future productivity and economic viability of the area.

21.4 Rail Alternative

The Rail Alternative requires purchasing an additional 18.85 hectares (44.57 acres) of right-of-way and also results in short-term construction impacts noted in **Section 20** of this chapter.

The Rail Alternative will result in an increase in long-term productivity due to reduced travel times and reduced highway congestion. The primary products of the Roaring Fork Valley are recreation and tourism and this industry is assumed to grow. This assumption is documented and consistent with local planning efforts. Because of this growth and current inadequacies, improvements to the transportation system are necessary. These improvements will provide a system that is safer and has a larger capacity than the No Action/Committed Projects Alternative, and will help to ensure the future productivity and economic viability of the area.

22. Commitments of Resources

In an effort to consider cleaner and more environmentally-friendly alternative propulsion technologies, RFTA has committed to a fleet conversion policy that will positively affect all the bus elements within the project alternatives. This will reduce environmental impacts of transit operations on the community, reduce RFTA's dependence on petroleum by moving towards sustainable and renewable forms of energy, and provide higher service quality to the community. This commitment extends to all alternatives and moves towards a positive effect on natural resources. To the extent that an alternative will meet projected travel demand in the Project Corridor, this will increase.

22.1 No Action/Committed Projects Alternative

Resources committed for this alternative are addressed in the appropriate documents for significant projects including the *Entrance to Aspen ROD* and the *Basalt to Buttermilk ROD*. This alternative will not meet projected travel demand in the Project Corridor and will result in a strain on corridor resources.

22.2 Trail

The new Rio Grande Trail will require a minimal additional commitment of natural, physical, human and fiscal resources.

22.3 BRT Alternative

RFTA's commitment to cleaner and more environmentally-friendly alternative propulsion technologies can be maximized with the BRT alternative. Construction of queue bypass lanes and transit stations as part of the BRT Alternative will involve a commitment of natural, physical, human, and fiscal resources. Additional fiscal and human resources will be necessary in order to upgrade the existing RFTA bus service. Resources used will include fossil fuels, labor, cement, aggregates, and bituminous paving material.

22.4 Rail Alternative

Construction of both elements of the Rail Alternative will involve commitment of natural, physical, human, and fiscal resources. These specifically include land, fossil fuels, labor, cement, aggregates, and bituminous paving material. Use of the land for the transportation improvements is generally an irreversible commitment of the resource. The conversion of the previously-committed rail transportation corridor that was subject to abandonment reduces the requirement for commitment of new rights-of-way to this project.

The use of fossil fuels, labor, cement, aggregates, and bituminous paving materials is generally not retrievable. However, these are not in short supply, and their use will not have an adverse effect upon continued availability of these resources. The construction of this alternative will also involve the expenditure of fiscal resources. Highway and air travel, however, are the primary forms of travel in the Roaring Fork Valley, and the use of these resources is required if the transportation improvements are to meet the project objectives.

D. SUMMARY OF ENVIRONMENTAL CONSEQUENCES

Table V-25 outlines the quantitative impacts outlined in this chapter.

Table V-25
Summary of Environmental Consequences

		ALTERNATIVE			
Resource	**Measurement**	**No Action / Committed Projects**	**Rio Grande Trail**	**BRT**	**Rail Alternative**
SOCIAL IMPACTS					
Neighborhood Impacts					
• Proximity	30m/100ft from new alignment	--	--	None	290 homes
• Accessibility	LOS near stations and maintenance facilities	Poor for all alternatives (excluding trail): West Glenwood Springs, West Glenwood Springs Maintenance Facility, Downtown Glenwood Springs, and the CMC areas, as well as Carbondale at Highway 133, Carbondale Maintenance Facility, both El Jebel locations, Brush Creek Road, the Pitkin County Airport, and Buttermilk.			
• Development patterns	Transit-Oriented Development (TOD)	--	--	Supports TOD	Supports TOD
Relocation and right-of-way					
• Relocations	Structure taken and/or loss of access	--	--	--	17
• Additional right-of-way	Hectares (acres) of land acquisition	--	None	11.76 (29.06)	18.85 (46.57)
Environmental Justice	Target populations: minority, low-income, elderly	No disproportionate or adverse impacts	No impacts	No disproportionate or adverse impacts	Noise and/or relocations for mobile home parks
Services	LOS near stations and maintenance facilities	Poor for all alternatives (excluding trail): West Glenwood Springs, West Glenwood Springs Maintenance Facility, Downtown Glenwood Springs, and the CMC areas, as well as Carbondale at Highway 133, the Carbondale Maintenance Facility, both El Jebel locations, Brush Creek Road, the Pitkin County Airport, and Buttermilk.			
Recreation	Physical take of parks, recreation areas, trails	No new impacts	Improved fishing access and local trail connectivity	No impacts	No impacts

Table V-25
Summary of Environmental Consequences

Resource	Measurement	ALTERNATIVE: No Action / Committed Projects	Rio Grande Trail	BRT	Rail Alternative
ECONOMIC IMPACTS					
Economic base	Resort industry trends and revenue	Supports existing	None	Supports existing	Supports existing and minimal loss from relocations
Commercial growth trends	Retail Sales	No direct impact	No direct impact	No direct impact	No direct impact
Employment	Minimal effect	Minimal effect	Minimal effect	Minimal effect	Minimal effect
Income and housing	Construction growth	No direct impact	--	No direct impact	Minor; no direct impact
Financing	Expenditure	No additional costs	See Finance Chapter	See Finance Chapter	See Finance Chapter
PHYSICAL ENVIRONMENT IMPACTS					
Air quality	Violations of Standards	No violations	--	No violations	No violations
• Yearly VMT (2025)	Vehicle miles traveled (in millions)	1.86	--	1.67-1.70	1.69
• Total emissions PM_{10} (2025)	kg/day (lbs/day)	16,700 (37,000)	--	15,000-15,300 (33,000-33,700)	15,200 (33,500)
Water quality					
• Crossings	River/stream crossings	14 Existing Highway 82 or RFTA ROW	3 new crossings	No new crossings	8 new crossings
• Water resources	Hectares (acres) of impervious surface added	No new impacts	15.7 (38.8)	11.76 (29.06)	9.67 (23.9)
Floodplain	Encroachment into floodplain	Four Mile Connector	None	None	Minimal
Geology and soils	Hazardous formations identified	No new impacts	Eagle Valley Evaporite and Colluvium Deposits	No new impacts	Eagle Valley Evaporite and Colluvium Deposits
Upland and floodplain vegetation					
• Land cover types	hectares/acres of vegetation affected	No new impacts	100% in RFTA Right-of-Way	No new impacts	Minimal impacts
• Noxious weed management	Management Plans	CDOT Plan	RFTA & Pitkin County Plans	CDOT & RFTA Plans	CDOT,RFTA & Pitkin County Plans
Wetlands					
• Total filled	Hectares (acres) permanent fill	No new impacts	0.87 (2.16)	0.024 (0.06)	0.51 (1.25)

Table V-25
Summary of Environmental Consequences

Resource	Measurement	ALTERNATIVE: No Action / Committed Projects	Rio Grande Trail	BRT	Rail Alternative
PHYSICAL ENVIRONMENT IMPACTS					
• Jurisdictional wetlands	Hectares (acres) permanent fill	No new impacts	0.42 (1.05)	0.004 (0.01)	0.15 (0.37)
Fisheries	River/stream crossings	14 Existing Highway 82 or RFTA ROW	3 new crossings	No new crossings	8 new crossings
Wildlife	Big game crossings & raptor nests	2 elk and 11 mule deer	5 nest areas	2 elk and 11 mule deer	3 elk and 11 mule deer 5 nest areas
Wild and scenic rivers	Wild and scenic rivers in Project Corridor	None	None	None	None
Threatened & endangered species	Impacts	No new impacts	Minimal to no impacts	No impacts	Minimal to no impacts
• Bald eagle	Nest and roost sites/buffers intersected	--	1 inactive nest, 3 roosts	None	1 inactive nest, 3 roosts
• Blue heron	Nesting colonies buffers intersected	--	2 nesting colonies	None	2 nesting colonies
Cultural Resources		No new impacts	No adverse Impacts	No new impacts	No adverse impacts
• Area of Potential Effect	Number of properties	--	44	44	44
• Listed or eligible sites	Number of properties	--	8+3	--	10+5
• Sites affected	No effect, no adverse effect, or conditional no adverse effect	--	8+3	--	10+5
• Archaeological Resources	Direct impacts to known NRHP sites	No new impacts	None	None	None
Paleontological	Resources affected	No new impacts	No significant impacts	No new impacts	No significant impacts
Section 4(f) & 6(f) resources	Takes or "use" of parks, trails, NRHP sites	No new impacts	None	None	None
Farmlands					
• Prime and unique farmland	Farmland in Project Corridor	None	None	None	None
• Statewide important farmland	Hectares (acres) right-of-way potential	None	None	None	7.28 (18.0)

Table V-25
Summary of Environmental Consequences

Resource	Measurement	ALTERNATIVE: No Action / Committed Projects	Rio Grande Trail	BRT	Rail Alternative
PHYSICAL ENVIRONMENT IMPACTS					
Noise and vibration					
• Noise	Number of receiver sites	73 FHWA sites on Highway 82	None	73 FHWA sites on Highway 82 + 2 transit stations	89 FTA receiver sites along Rail Alignment + 2 transit stations
• Ground-borne vibration	Number of receiver sites identified	None identified	None	None identified	2 Upvalley + 3 Aspen
• Construction vibration	Number of receiver sites identified	None identified	None	None identified	4 possible cultural resource sites
Visual effects	Number of retaining walls, stations, bridges	No new locations	-, -, 3	6, 10, 3	31, 8, 9
Potential hazardous waste sites	Number of sites needing further investigation	No new sites identified	2 sites	No new sites identified	10 sites
Public safety and security					
• Police protection and safety	Staffing increases required	Increases in congestion and accidents	No significant increases	On-board, station, and maintenance facilities	On-board, station, and maintenance facilities
• Fire protection and medical emergency	Responses and service increases	Increases in traffic and ridership	Minor service needs	At stations and with traffic and ridership	At stations and with traffic and ridership
• Pedestrian / vehicle crashes	Likelihood related to congestion and use	Increases with congestion	Protect trail from adjacent uses, including rail and roadways	No additional over No Action/ Committed Projects	Re-education on rail and implementation of crossing safety
Energy use	Construction and operations energy	No new impacts	Minimal use	Station construction energy use and potential congestion at stations. Less operational energy than No Action/ Committed Projects	Rail and station construction energy use Less operational energy than buses
Construction	Temporary resource related impacts	No new impacts	Minimal impacts	Minor at station locations only	Numerous temporary resource impacts
Short-term use	Right-of-way and construction	No new impacts	No new right-of-way and minimal construction	11.76 hectares (29.06 acres) right-of-way for stations; minimal construction	18.85 hectares (44.57 acres) new right-of-way for rail and stations; some construction impacts to resources

Table V-25
Summary of Environmental Consequences

Resource	Measurement	ALTERNATIVE No Action / Committed Projects	Rio Grande Trail	BRT	Rail Alternative
PHYSICAL ENVIRONMENT IMPACTS					
Long-term productivity	Travel times and congestion	Will not meet regional travel demand.	Enhances regional trail connectivity.	Reduced travel times and congestion over No Action/ Committed Projects	Reduced travel times and congestion over No Action/ Committed Projects
Commitments of resources	Natural, physical, human and fiscal resources	Will strain corridor resources due to inability to meet travel demands	Minimal additional resources	Construction and operations will require resources	Construction and operations will require resources

VI. CUMULATIVE IMPACTS

Cumulative impacts on the environment result from the incremental effect of adding an action to other past, present, and reasonably foreseeable future actions, regardless of responsible agency or person. The following analysis considers the likely changes in the social, economic and physical environment in the Project Corridor over time with and without the proposed alternatives. By viewing these larger systems over time and considering the changes with and without the alternatives, one can look for cumulative impacts that threaten social, economic, or physical systems.

Past, present, and reasonably foreseeable future actions were determined based on the current Transportation Improvement Plan and proposed developments within the Project Corridor. The most significant project over the last 20 years has been the expansion of Highway 82 from a two-lane to a four-lane platform. The highway expansion, in conjunction with land use policies, has shaped development patterns over the last ten years and is likely to shape them over the next 20 years. The transportation and land use actions that are included in this discussion of CIS cumulative impacts are:

Highway 82 Improvements. Expansion of Highway 82 to a four-lane highway is ongoing in the Project Corridor. It is anticipated that the highway expansion will be completed by the time a selected current project alternative is implemented. Highway expansion will create additional transportation capacity in the corridor. From Basalt to the roundabout in Aspen, the expanded highway will include two lanes reserved for high-occupancy vehicles and buses during peak hours. *Basalt to Buttermilk FEIS* considers impacts of this highway expansion project.

Entrance to Aspen. An LRT system has been approved through the *Entrance to Aspen ROD*. Aspen voters have granted right-of-way for two lanes of traffic and LRT across public open space. If voters do not approve construction funding for the LRT system, then the ROD provides environmental clearance for constructing two lanes for traffic and two bus lanes. Aspen voters have not approved use of public open space for that purpose. Completion of the Entrance to Aspen is a high priority project for state highway funding. The *Entrance to Aspen FEIS* considers impacts of this LRT project.

Highway 133. CDOT and the Town of Carbondale have developed a *State Highway 133 Corridor Study* that includes a template for improvements to Highway 133. The plan includes increasing capacity from two to four lanes from the intersection of Highway133 and Highway 82 past Main Street. An interchange is also planned at the intersection of Highway 133 and Highway 82. These improvements are likely to improve operations for feeder/collector and mainline buses. The project is not currently a state priority highway project, but the town is considering private and public financing proposals to fund some or all of the improvements.

Highway 82 Access Control Plan, Eagle County. Eagle County, the Town of Basalt, and CDOT have developed the *SH 82 Access Control Plan for Eagle County* for that portion of Highway 82 over the next 20 years. The plan calls for additional signalization and turning lanes in the area of Basalt.

Glenwood Springs Bypass. The City of Glenwood Springs has proposed a new bypass that would provide an alternative route for commuters and trucks traveling from I-70 to Highway 82. The project is not currently a state priority highway project for funding, and there is no local funding plan in place.

Snowmass Village Transit Center. The Town of Snowmass Village has planned the reconstruction of its transit center to provide additional capacity, enhanced safety, transit rider amenities, and additional parking in the Snowmass Village Town Center. The Town Center is approximately 11.3 kilometers (seven miles) south of the Project Corridor and accesses the Project Corridor using Brush Creek Road. Snowmass Village is a major regional destination for workers and visitors. Approximately 70 percent of the skier days recorded by the Aspen Skiing Company occur at Snowmass Mountain, directly adjacent to the Town Center. Transit service is provided by RFTA and the Town's Shuttle, with approximately 700 buses visiting the Transit Center daily during peak periods. The reconstructed Snowmass Village Transit Center will be an integral component of the regional system and will accommodate the vehicle and ITS technologies proposed in the Build alternatives. Pitkin County transit sales tax revenues have been earmarked to fund a portion of the new Transit Center. The Town is in discussions with adjacent business and development interests regarding design development and an appropriate contribution to the project budget. Current interest in a new Base Village may change the emphasis regarding the proposed Snowmass Village Transit Center project.

City of Aspen TM Program. The City of Aspen and the Elected Officials Transportation Committee, made up of elected officials from Pitkin County, the Town of Snowmass Village, and the City of Aspen, adopted a policy to maintain traffic entering Aspen at 1994 levels. That policy was embraced in the *Entrance To Aspen ROD* through a TM Program. The plan has been successful to date and will require that most of the growth in person-trips into and out of Aspen be on transit.

I-70 West Mountain Corridor Programmatic Environmental Impact Statement (PEIS). This PEIS, being developed by CDOT, will propose alternatives to solve congestion, accessibility, and mobility issues in the I-70 corridor between Denver and the Vail Valley. The alternatives may include some form of high-speed transit, realignment and/or safety improvements to I-70, and additional lanes or tunnel bores.

The Intermountain Connection. This proposal to provide commuter rail service and a trail in the I-70 corridor between Gypsum and Vail was developed by a public/private partnership which includes Eagle County; Eagle County Regional Transportation Authority; the cities and towns of Avon, Basalt, Eagle, Gypsum, Minturn, Red Cliff, and Vail; Beaver Creek Resort Company, Vail Associates, and the Beaver Creek and Smith Creek Metropolitan Districts. The rail service would use existing tracks between Gypsum and Dowd Junction to the east, and south to Leadville. New track would be installed to connect with the Town of Vail.

Residential Growth. Development has increased significantly in the Eagle County and Garfield County sections of the Project Corridor. Eagle County grew 90 percent during the period from 1990 to 2000, making it the fourth-fastest-growing of the 63 counties in the state. Garfield County grew 46 percent, making it the 15^{th}-fastest growing county in the state. Pitkin County grew by 17.5 percent, making it the 42^{nd}-fastest growing county in the state. The state as a whole grew by about 31 percent and was one of the fastest-growing states in the U.S. during the period.

The future rate of growth is difficult to predict. Two growth scenarios were analyzed early in this study. The Trend Growth Scenario indicates that from 1990-1998 the region saw an increase in the percentage of residents living outside of community centers, and that trend would continue based on existing zoning and growth patterns. The Planned Growth Scenario calls for implementation of existing comprehensive plans in community centers to accommodate future growth. Due to financial constraints, current modeling has been limited to the Planned Growth Scenario. Additional discussion on growth is located in **Chapter III.A.1** and **Chapter IV.A.1**.

All growth projections were constrained by existing zoning. However, an overwhelming majority of the land in Garfield County is zoned for one residential unit per two acres of land. No land use limitations were identified which would prevent a continuation of the historic growth trend into the future through the study period. Local community land use plans were consulted in order to assess possible cumulative impacts from residential and commercial development.

Commercial Expansion. The Cities of Aspen and Glenwood Springs have historically been the commercial and resort centers of the Roaring Fork Valley, while other communities have been transformed from agricultural or mining towns to bedroom communities. This phenomenon has concentrated employment opportunities and increased transportation demand between bedroom communities and employment centers at either end of the Roaring Fork Valley.

The towns of Basalt, Carbondale, Silt, New Castle, and unincorporated areas have now zoned land for both community and regional commercial uses. While additional community-oriented commercial opportunities could relieve some transportation demand as residents shop closer to home or become passer-by trips, additional regional commercial opportunities in other communities are likely to alter transportation patterns. At this time, there is not enough information available to quantitatively predict or assess the effect of those potential changes. It is possible to serve the locations of various commercial developments that have been approved in the Project Corridor to date with the existing transit system, the proposed BRT, or Rail.

Local community land use plans were consulted in order to assess possible cumulative impacts from community development. Plans reviewed included The *Aspen Area Community Plan, Snowmass Village Comprehensive Plan, Pitkin County Downvalley Master Plan, Basalt Comprehensive Plan, Eagle County Master Plan, Carbondale Comprehensive Plan, Garfield County Comprehensive Plan, and Glenwood Springs Comprehensive Plan.*

Second Home Jobs. A trend toward increased second-home ownership in the Project Corridor is expected to continue over the next 20 years. Pitkin County has identified second homes as important employment generators for both construction and ongoing maintenance jobs. The distribution of second homes will affect transportation demand related to employment.

Redevelopment of Mobile Home Parks. As discussed in the analysis of Environmental Justice in **Chapters III.A.3** and **V.A.3**, mobile home parks are part of the mix of affordable housing in the Project Corridor. Redevelopment of existing mobile home parks has occurred or is planned to occur in Carbondale and Basalt. Three other existing mobile homes parks not yet slated for redevelopment operate on land zoned for other types of land uses. Only Basalt currently has replacement housing regulations that require replacement of affordable housing as a part of redevelopment proposals. This type of housing is threatened within the Project Corridor.

A. SOCIAL IMPACTS

Note that congestion at the following committed park-and-rides, station locations, and maintenance facilities will occur for all alternatives, resulting in poor levels of service for opening day: Carbondale at Highway 133, the Carbondale Maintenance Facility and El Jebel at Willits Lane. By 2025 all alternatives will result in poor levels of service associated with West Glenwood Springs, the West Glenwood Springs

Maintenance Facility, Downtown Glenwood Springs, and the CMC areas, as well as Carbondale at Highway 133, the Carbondale Maintenance Facility, both El Jebel locations, Brush Creek Road, the Pitkin County Airport, and Buttermilk. **Chapter IV.D.2: Station Areas and Major Intersections** summarizes these impacts. Although the facilities themselves are not located in residential areas, severe traffic congestion in these areas will indirectly affect adjacent neighborhoods.

1. Neighborhood Impacts

A neighborhood impact is defined related to project proximity, accessibility, and project-related changes in development patterns. The focus for assessment of cumulative impacts was on neighborhood impacts from each alternative when combined with foreseeable impacts from other projects. The areas around transit centers received the greatest scrutiny. The potential for traffic congestion at station and park-and-ride locations will result in negative neighborhood situations when combined with future development. These locations are forecast to be heavily congested regardless of the proposed project. At this time, there is not enough information available to quantitatively predict or assess the effect of those potential changes. No significant known cumulative neighborhood impacts were identified in the opening year or in 2025 for any of the alternatives. It is possible to serve the needs of adjacent neighborhoods in the Project Corridor to some extent with each of the project alternatives.

2. Relocation and Right-of-Way Impacts

The focus for assessment of cumulative impacts was on relocation and right-of-way impacts from alternatives when combined with foreseeable impacts from other projects. Only the Rail Alternative included project-related impacts.

2.1 No Action/Committed Projects Alternative

No significant cumulative relocation and right-of-way impacts were identified in the opening year or 2025 subsequent to previous studies.

2.2 Trail

No relocation or right-of-way impacts are associated with the trail; thus there are no cumulative impacts to consider.

2.3 BRT Alternatives

No significant cumulative relocation and right-of-way impacts were identified in the opening year or in 2025. Right-of-way needs for station construction are minimal and are available from vacant or developable commercial and industrial areas.

2.4 Rail Alternative

The shortage of affordable housing is a significant issue in the Project Corridor. Mobile home parks are generally considered part of the mix of affordable housing. The Rail Alternative has potential relocation impacts to 11 of 73 units in the Aspen-Basalt Mobile Home Park. While it is not a large number by itself, several other mobile home parks in the area are threatened with redevelopment, often without a requirement to replace affordable housing.

3. Environmental Justice Impacts

The focus for assessment of cumulative impacts was on environmental impacts from alternatives when combined with foreseeable impacts from other projects. The shortage and loss of affordable housing is a threat to low-income and minority populations in the Project Corridor.

3.1 No Action/Committed Projects Alternative

No additional significant cumulative environmental justice impacts were identified in the opening year or 2025.

3.2 Trail

No cumulative environmental justice impacts were identified for the trail for opening year or 2025.

3.3 BRT Alternatives

No significant cumulative environmental justice impacts were identified in the opening year or 2025.

3.4 Rail Alternative

The shortage of affordable housing is a significant issue for low-income and minority populations in the Project Corridor. Mobile home parks are generally considered part of the mix of affordable housing, especially for minorities who have historically been less likely to participate in government-sponsored affordable housing programs. The Rail Alternative has potential relocation impacts to 11 of 73 units in the Aspen-Basalt Mobile Home Park. While it is not a large number by itself, several other mobile home parks in the area are threatened with redevelopment, often without a requirement to replace affordable housing.

4. Services Impacts

Increased highway congestion in the Project Corridor will result in compromised police, fire, and emergency service response times. To the extent that a particular Build alternative addresses future transportation demand, these effects will be reduced. Congestion associated with station locations, park-and-rides, and maintenance facilities may compromise delivery of services, regardless of the proposed project alternative. At this time, there is not enough information available to quantitatively predict or assess the cumulative effect of those potential changes. No significant known cumulative neighborhood impacts were identified in the opening year or in 2025 for any of the alternatives.

5. Recreational Impacts

Demand for recreation is expected to continue to grow through 2025 based on a growing visitor economy and resident population. Walking, biking, horseback riding, and roller-blading are all very popular recreational activities along local trails in the Project Corridor. Public lands in the Roaring Fork Valley attract users nationwide.

The demand for use of recreational resources will continue to exist regardless of the proposed transportation improvements in the Project Corridor. State and Federal recreation area management plans are expected to address the pressures of increased demand. Increased accessibility to public lands supported by the Build alternatives for the Roaring Fork Valley may create additional pressure on campsites and hiking areas within the area. This could be considered a cumulative effect, but it is not measurable at this time.

5.1 No Action/Committed Projects Alternative

No significant cumulative recreation impacts were identified in the opening year or 2025.

5.2 Trail

Local trail systems are planned to connect to the proposed Rio Grande Trail, thereby creating a positive cumulative impact through increased mobility, recreation, and non-motorized access to public lands.

5.3 BRT Alternatives

No cumulative effects to recreational resources have been identified for this alternative.

5.4 Rail Alternative

No cumulative effects to recreational resources have been identified for this alternative.

6. Land Use Impacts

Cumulative land use effects from the proposed transit alternatives will be related to the extent to which an alternative helps to focus new growth into a desirable land-use pattern. Generally, bus transit redistributes, rather than creates, growth. A healthy regional economy will have the strongest impact on growth. Pro-active planning is essential.

Transit (bus and rail) improvements are most likely to affect land uses at transit centers associated with the Build alternatives. Transit centers have been located in community centers and areas planned for development. The effects of changing land use patterns have been examined in local comprehensive and land use plans.

The concentration of transit-oriented development could benefit the Valley by curtailing sprawl. The denser development surrounding each station will reduce reliance on automobiles as in-fill development surrounding each station cluster makes walking more desirable. A transit-oriented community design process was conducted as part of this study. The potential configurations and benefits of transit-oriented development were discussed, evaluated, and documented in *Transit Oriented Community Design Report* (Otak, 2000). Potential effects will vary according to the location of enhanced or new transit stations.

The implementation of the new Rio Grande Trail will not affect land use patterns in the Valley.

B. ECONOMIC IMPACTS

1. Economic Base

The primary drivers of the economy in the Project Corridor are resort/tourism and construction. None of the alternatives will directly affect the trends in the resort and tourism industry in the Roaring Fork Valley. These are affected by regional (including wildfires and droughts), national, and world economic conditions.

Transit service is critical to the resort economy in the upper valley as described in the *Entrance to Aspen FEIS*, and Downvalley transit provides critical services for workers traveling to and from employment centers in Aspen and Snowmass Village, not only within the Project Corridor, but west along the I-70 Corridor. The BRT and Rail Alternatives provide improved service to Glenwood Springs that could provide a modest attraction as an economic base. Transit service is designed to serve expected economic growth in community centers and resort centers. The proposed project supports the established economic base of the area rather than contributing to cumulative growth.

2. Commercial Growth Trends

Transit-oriented development around new stations associated with the Build alternatives may create additional retail sales opportunities. The Build alternatives create additional transit stations and design opportunities Downvalley. Generally, the focus of transit-oriented development is to attract concentrated activities rather than unfocused sprawl. This may simply attract retailers from other potential locations rather than create a new demand. None of the alternatives are expected to generate major increases in retail activity that would cumulatively affect trends in the Project Corridor.

3. Employment

More than 74,000 jobs are expected to be available in the Project Corridor counties by 2025. Because of the resort nature of the economy, it is common for individuals to have more than one job. The shortage of affordable housing creates pressure for higher wages and limits the pool of potential employees. Recruiting and retaining employees is a challenge for many employees in the Project Corridor. Enhanced transit services will create additional options for employees and employers who provide transit passes for their employees.

Employment growth is expected to continue to outpace the growth of affordable housing in the Project Corridor. Competition for employees is expected to continue as the number of construction, service, and government jobs continues to grow. In the Roaring Fork Valley, the number of employees required is critical because high housing costs and competition for employees has historically made recruitment and retention a challenge.

The proposed project will provide support for the established economy, rather than generate cumulative effects. Additional employment directly created by any of the Build alternatives will not be a measurable portion of the total Project Corridor employment and thus will not create potential cumulative effects.

4. Income and Housing

The high cost of housing is expected to continue to be an issue in the Project Corridor through 2025; however, no cumulative impact to income or housing is expected from any of the alternatives. The demand for housing is largely driven by macroeconomic forces outside the Project Corridor.

5. Financing

Transit improvements are likely to be funded through a combination of local, state, and federal revenues. RFTA has additional taxing capacity that voters can approve for enhanced transit services. A range of local taxes is possible for increasing RFTA revenue, including a bed tax, sales tax, and impact fees. Taxes affect different populations and potentially change their shopping or visitation patterns. There is no evidence that the cumulative impact of the RFTA revenues along with other possible tax changes will affect regional or Project Corridor individual spending patterns. No significant cumulative financing impacts were identified in the opening year or in 2025 for any of the alternatives.

C. PHYSICAL ENVIRONMENT IMPACTS

1. Air Quality Impacts

PM_{10} particulate pollutants associated with vehicle trips and wood smoke are potential air quality concerns in the Project Corridor. Except for particulate pollutants in the Aspen area, the remainder of the Project Corridor has met all air quality standards. The Aspen area, which has been a non-attainment area, is currently meeting particulate standards. The BRT and Rail alternatives forecast daily traffic volumes, vehicle miles traveled, and emissions are all reduced compared with the No Action/Committed Projects Alternative. In general, transit improvements are expected to minimize cumulative air quality impacts. No significant cumulative air quality impacts were identified in the opening year or in 2025 for any of the alternatives.

2. Water Resource and Water Quality Impacts

The Project Corridor includes the Roaring Fork River, Frying Pan River, and Colorado River, which provide both drinking and irrigation water locally and across the western US. Stormwater run-off from impervious surfaces is a cumulative concern in the region. Management approaches to stormwater vary by jurisdiction; however, it is common for untreated stormwater to drain into the Roaring Fork River.

2.1 No Action/Committed Projects Alternative

No significant cumulative water resource and water quality impacts were identified in the opening year or in 2025.

2.2 Trail

Although the Rio Grande Trail will be an impervious surface of 15.75 hectares (38.8 acres), this is less than one percent of the watershed. No significant cumulative water resource and water quality impacts were identified in the opening year or in 2025.

2.3 BRT Alternatives

No significant cumulative water resource and water quality impacts were identified in the opening year or in 2025. The BRT Alternatives will require new parking facilities that will increase impervious surfaces of 11.76 hectares (29.06 acres). The BRT Alternative will use Highway 82, which is already plowed and treated with de-icers.

2.4 Rail Alternative

No significant cumulative water resource and water quality impacts were identified in the opening year or in 2025. The Rail Alternatives will require new parking facilities that are likely to increase impervious surfaces. Operation and maintenance (O&M) of the Rail Alternative is not expected to adversely impact water quality. The rail line will be plowed during the winter; sand, salts, and other de-icers are used much less on railroad tracks than highways. Railroad equipment will be serviced at maintenance facilities in Glenwood Springs, Carbondale, or Aspen. Potential water pollutants associated with the maintenance facility include oils, grease, coolants, benzene and derivatives, vinyl chloride, metals, dinitro compounds, and other industrial solvents. Water quality impacts from the maintenance facility are expected to be minor and insignificant because the facility will have a spill prevention plan in place and compounds will be stored in protected areas. Other possible O&M impacts arise from the application of herbicides and other chemicals to control vegetation on and around the rail line. Adverse impacts from herbicide application are expected to be negligible, if properly applied.

3. Floodplain Impacts

No significant cumulative floodplain impacts were identified in the opening year or in 2025. Application of appropriate BMPs will minimize or eliminate the potential for cumulative impacts for all alternatives.

4. Geology and Soil Impacts

No significant cumulative geology and soil impacts were identified in the opening year or in 2025 for any of the alternatives.

5. Impacts on Upland and Floodplain Vegetation

No significant cumulative upland and floodplain impacts were identified in the opening year or in 2025 for any of the alternatives. Applicable noxious weed management within the Project Corridor will preclude cumulative weed impacts from any of the Build alternatives.

6. Wetland Impacts

Wetlands are an important resource in the Project Corridor. Changes from historic agricultural land uses to residential development have created wetland impacts throughout the Project Corridor. Because unavoidable wetland impacts are typically mitigated to ensure no net loss of wetland acreage or function, cumulative impacts to wetlands in the Roaring Fork Valley and the region will be minimal.

6.1 No Action/Committed Projects Alternative

No significant cumulative wetland impacts were identified in the opening year or in 2025.

6.2 Trail

No significant cumulative wetland impacts were identified in the opening year or in 2025. The Rio Grande Trail will affect a total of .42 hectares (1.05 acres) of jurisdictional wetlands, which will be replaced. Regardless, this will not affect wetland function on a local or regional scale.

6.3 BRT Alternatives

A tiny jurisdictional wetland will be lost at the site of the Basalt Transit Station, totaling .004 hectares (.01 acres), which will be replaced. Regardless, this will not affect wetland function on a local or regional scale.

6.4 Rail Alternative

No significant cumulative wetland impacts were identified in the opening year or in 2025. The limited nature of direct impacts to jurisdictional wetlands along the rail (0.15 hectares/.37 acres) is not expected to affect wetland function on a local or regional scale. Impacts to wetlands may be avoided or further minimized through appropriate use of Best Management Practices (BMPs). Looking at project impacts from the perspective of the larger system confirms a lack of significant impacts. The lost wetlands will be replaced.

7. Fisheries Impacts

Significant effects are most likely to occur where fisheries habitat and project construction are in closest proximity. Construction of all Build alternatives may result in erosion and sedimentation of area streams. However, commitment to the use of BMPs will minimize potential impacts. In general, construction-related impacts will be temporary and localized, and are not expected to adversely impact the fishery. Potential for temporary construction-related effects is directly proportional to the number of additional stream crossings per alternative.

Fourteen stream crossings already occur under the No Action/Committed Projects Alternative. The BRT does not require additional stream crossings. and the Rail Alternative requires eight additional or renovated stream crossings. The trail will require three new crossings. In recent years a new stream crossing was approved and constructed in the Project Corridor at Aspen Glen, and there is at least one possible new stream crossing proposed in Glenwood Springs. One or more new stream crossings are likely to be proposed by future developments that could create construction impacts. Application of BMPs to all projects will ensure minimization of local and regional level cumulative effects.

8. Wildlife Impacts

Determination of the significance of potential impacts to biological resources is based on:

1. the importance of the resource (legal, commercial, recreational, ecological, or scientific);
2. the sensitivity of the resource to proposed activities;

3. the proportion of the resource that would be affected relative to its occurrence in the region; and
4. the duration of activities affecting the resource.

Due to the small wildlife populations potentially affected by any of the Build alternatives, only minor impacts are expected. Except for the construction of stations, park-and-rides, and maintenance facilities in disturbed commercial and industrial areas, all alternatives are being proposed within existing disturbed rights-of-way. Possible cumulative effects to wildlife resources will be the result of many minor population impacts from human occupation of the Project Corridor.

Wildlife travels across transportation and housing corridors in the Roaring Fork Valley in the course of traveling to and from area rivers. The historic location of the RFTA right-of-way, generally parallel to the Roaring Fork River, does not create the ideal condition for wildlife. Pitkin County's wildlife plan employs staff wildlife biologists who perform land use reviews in an effort to maintain the flow of wildlife in the Pitkin county portion of the Project Corridor. Wildlife protection in Eagle and Garfield Counties relies on recommendations from the CDOW. The land use process does not require conformance with CDOW recommendations.

8.1 No Action/Committed Projects Alternative

No significant cumulative impacts to wildlife were identified in the opening year or in 2025. Two elk highway crossings and 11 mule deer crossings along Highway 82 are pre-existing under the No Action/Committed Projects Alternative. To date, the numbers of all animals (statistics do not differentiate large or small, domestic or wild) reported killed along Highway 82 is relatively low when compared with regional populations, a total of 60 per year (1998-2000) for the length of Highway 82 within the Project Corridor. Roadkill data may be inaccurate due to possible under-reporting of road kill numbers by the public and the potential for animals that are hit to run off the road to die elsewhere. As VMT and daily traffic increase in future years, vehicle/wildlife collisions are also likely to increase along this corridor.

8.2 Trail

The location of the trail in RFTA right-of-way parallel to the Roaring Fork River is not ideal for wildlife. Heavy trail use may affect some local populations. Protection of wildlife through signage, enforcement of leash laws, and small areas of effective, affordable fencing can reduce this potential. Generally, trail impacts on wildlife will not reach levels that will adversely affect any local or regional populations.

An active red-tailed hawk nest (SAIC 1999c) lies immediately adjacent to RFTA right-of-way and may be affected by construction and use of the new Rio Grande Trail. An active great horned owl nest currently adjacent to the RFTA right-of-way may be similarly affected. Cumulative factors have not been identified for these specific wildlife resources.

8.3 BRT Alternatives

No significant cumulative impacts to wildlife were identified in the opening year or in 2025, although the continued growth and development in the Project Corridor, together with increased traffic on Highway 82, is not a positive factor for wildlife habitat or transportation corridor crossings along Highway 82.

8.4 Rail Alternative

No significant cumulative impacts to wildlife were identified in the opening year or in 2025. Two additional big game transportation corridor crossings are associated with the Rail aspect of this alternative. The Rail Alternative passes through three golden eagle (*Aquila chrysaetos*) nest site buffer zones; however, minimal effects are expected. Continued growth and development in the Project Corridor is not a positive factor for wildlife habitat or transportation corridor crossings along Highway 82.

9. Wild and Scenic Rivers

No Wild and Scenic Rivers exist in the Project Corridor; therefore, no impacts are associated with any of the alternatives under consideration.

10. Impacts on Threatened and Endangered Species

Impacts on threatened and endangered species for each alternative (if any) are identified below. Only three special status species are known to occur within the Project Corridor: bald eagle (Federal and State Threatened), great blue heron (State Species of Concern) and river otter (State Endangered). No river otter habitat will be adversely impacted by any alternatives in the Project Corridor, and river otter populations are not likely to be affected. For additional regional and cumulative level issues, see the discussion above on wildlife in **Section 8**.

10.1 No Action/Committed Projects Alternative

No significant cumulative threatened and endangered species impacts were identified in the opening year or in 2025.

10.2 Trail

Potential for cumulative impacts to sensitive wildlife species are discussed below for the bald eagle and great blue heron. No significant impacts have been identified.

Bald Eagle. Portions of the RFTA right-of-way associated with the Rio Grande Trail alignments pass through CDOW-recommended buffer zones for one inactive bald eagle nest at Aspen Glen and three roost sites (Cattle Creek, Wheatley Gulch, and Catherine Store). Buffer zones associated with these sites are intended to aid in protection of this sensitive resource from cumulative impacts.

Construction activities between November 15 and April 1 may affect nesting and roosting bald eagles within the Project Corridor. The bald eagle nest site is currently impacted by existing development, including residential development and active golf course inside the recommended buffer zone. Even without the addition of the Rio Grande Trail, future productivity at this nest is questionable.

The Cattle Creek site has benefited from a conservation easement offered by the landowner as part of an approved development. The conservation easement will be monitored by the Roaring Fork Conservancy for the benefit of wildlife. The approved development is within the buffer zone and in closer proximity to the roost site than the proposed transit improvements.

Great Blue Heron. Great Blue Heron nesting colonies at Sanders Ranch and Rock Bottom Ranch will be affected by the proposed new Rio Grande Trail.

The recommended buffer area at the Sanders Ranch will be intersected. The distance and topographic relief between the trail alignment and the Sanders Ranch heronry, are anticipated to be sufficient buffers to avoid impacts to this heronry.

The Trail alignment at Rock Bottom Ranch will pass within the buffer, but beyond the startle distance for the birds. It is not known if constant use of the trail within the recommended buffer could affect the heronry. (The Rock Bottom Ranch has been purchased by the Aspen Center for Environmental Studies and is expected to be preserved as an education center and working ranch. There may be land use changes on surrounding properties; however, the heronry site is likely to be protected from development. Additional impacts from other sources have not been identified at this time.

10.3 BRT Alternatives

No cumulative impacts were identified in the opening year or in 2025 for the BRT system.

10.4 Rail Alternative

Potential cumulative impacts to sensitive wildlife species are discussed below for the bald eagle and great blue heron. No significant impacts have been identified.

Bald Eagle. Portions of the RFTA right-of-way associated with both the Rail alignment pass through CDOW-recommended buffer zones for one inactive bald eagle nest at Aspen Glen and three roost sites (Cattle Creek, Wheatley Gulch, and Catherine Store). Buffer zones associated with these sites are intended to aid in protection of this sensitive resource from cumulative impacts.

Construction and operation of the Rail Alternative between November 15 and April 1 may affect nesting and roosting bald eagles within the Project Corridor. The bald eagle nest site is currently impacted by existing development, including residential development and an active golf course inside the recommended buffer zone. Even without the addition of the Rail Alternative, future productivity at this nest is questionable.

The Cattle Creek site has benefited from a conservation easement offered by the landowner as part of an approved development. The conservation easement will be monitored by the Roaring Fork Conservancy for the benefit of wildlife. The approved development is within the buffer zone and in closer proximity to the roost site than the proposed transit improvements.

Great Blue Heron. Great Blue Heron nesting colony buffer zones at Sanders Ranch and Rock Bottom Ranch will not be affected by the proposed Rail Alternative. The recommended buffer area at the Sanders Ranch will be intersected. The distance and topographic relief between the rail and trail alignment and the Sanders Ranch heronry are anticipated to be sufficient buffer to avoid impacts to this heronry. The rail alignment follows Highway 82 on the other side of the Roaring Fork River at the Rock Bottom Ranch location and will not affect this heronry.

11. Impacts on Cultural Resources

No cumulative cultural resource impacts were identified in the opening year or in 2025 for any of the alternatives. No Effects, No Adverse Effects, or Conditional No Adverse Effects have been identified for NRHP sites within the APE.

12. Impacts on Paleontological Resources

No cumulative paleontological resource impacts were identified in the opening year or in 2025 for any of the alternatives.

13. Impacts on Section 4(f) Resources

No takes or "uses" of parks, trails, or NRHP sites have been identified. No cumulative Section 4(f) impacts were identified in the opening year or in 2025 for any of the alternatives.

14. Farmland Impacts

No significant cumulative farmland impacts were identified in the opening year or in 2025 for any alternatives. Potential for impact to 7.28 hectares (18 acres) of irrigated hayfields, state-wide important farmland, has been identified for the Rail Alternative. This represents less than one percent of the irrigated cropland adjacent to the Project Corridor. No cumulative impacts are anticipated.

15. Noise and Ground-Borne Vibration Impacts

15.1 No Action/Committed Projects Alternative

No significant cumulative noise and vibration impacts were identified in the opening year or in 2025 based on the *Entrance to Aspen FEIS and ROD*. However, that analysis did not consider FTA noise criteria for the proposed LRT. The current project has conducted a noise analysis using FTA noise criteria for the LRT and DMU rail system combined for the City of Aspen. Additional discussion follows under the Rail Alternative below.

15.2 Trail

No direct, indirect or cumulative noise or vibration impacts are associated with the trail.

15.3 BRT Alternatives

No significant cumulative noise and vibration impacts were identified in the opening year or in 2025 for the BRT-Bus or BRT-LRT alternative.

15.4 Rail Alternative

In many cases, the impact of Highway 82 traffic noise is great on adjacent receivers and the impact of the rail DMU vehicles is negligible. Nevertheless, the FTA criteria used to determine impact require that existing noise conflicts be incorporated into the analysis. Consequently, several instances occur where no new noise from transit could be added without resulting in noise impact. For the portion of the Project Corridor between West Glenwood Springs and Aspen, these impacts were not considered as cumulative.

The current project has conducted a noise analysis using FTA noise criteria for the LRT and DMU rail system combined for the City of Aspen.

When comparing a future noise level with either LRT or DMU rail construction to the construction of the LRT and DMU projects, the changes in the overall noise levels at receptor sites along Highway 82 and Aspen's Main Street generally vary between approximately –1 and +1 dBA in Leq, and –2 and 0 dBA in Ldn. These differences will not be noticeable. There is one exception: the segment between Maroon Creek Road and 7th Street.

For that segment, the increase in traffic noise exposure will be significant as a result of the Entrance to Aspen Highway 82 realignment. The increase in noise levels would be 12 dBA for Leq, and 11 dBA for Ldn. The main reason for the impacts is that the existing (pre-LRT) noise level in the area is low since the existing (pre-LRT) Highway 82 is relatively distant. However, with the completion of the LRT project, the LRT-Rail alignment would be located approximately 15 feet from receptors on the south side of the street; thus, the noise would be much more noticeable compared to the current (pre-LRT) condition. The DMU's from the current project Rail Alignment will share the corridor with the LRT system. Resulting noise levels will be the similar as for the LRT system. Table V-20 summarizes future noise levels for various project build and no-build scenarios. (No analysis has been done to show separate LRT or DMU noise impacts.)

[Due to the cumulative nature of the effects of the combined LRT and DMU, this discussion has been repeated in both **Chapter V.15.4.4** and above.]

16. Visual Impacts

No cumulative visual impacts were identified in the opening year or in 2025 for any alternatives.

17. Impacts on Potential Hazardous Waste Sites

No cumulative potential hazardous waste impacts were identified in the opening year or in 2025 for any alternatives.

18. Public Safety and Security

Increased travel demand and associated future populations will increase the need for services. None of the project alternatives is expected to contribute a disproportionate amount of increased demand for police, fire, or emergency services related to the project itself. Minor additional staff needs are expected and therefore no significant cumulative impacts are anticipated.

19. Energy Impacts

No significant cumulative impacts have been associated with construction or operational energy requirements for any of the alternatives.

D. SUMMARY OF CUMULATIVE IMPACTS

Table VI-1 summarizes the cumulative impacts identified in this chapter.

Table VI-1
Summary of Cumulative Impacts

Resource	Measurement	ALTERNATIVE: No Action / Committed Projects	ALTERNATIVE: Rio Grande Trail	ALTERNATIVE: BRT Alternative(s)	ALTERNATIVE: Rail Alternative
SOCIAL IMPACTS					
Neighborhood Impacts					
• Proximity	--	No cumulative effects identified for any of the alternatives			
• Accessibility	LOS near stations, park-and-rides, and maintenance facilities	Traffic congestion at facilities for all alternatives could create cumulative neighborhood effects. Insufficient information available to quantitatively assess future impacts.			
• Development patterns	Corridor and Regional Pattern Influence	No measurable cumulative effects identified. Potential to support transit-oriented development in neighborhoods around stations for build alternatives.			
Relocation and right-of-way					
• Relocations	--	None	None	None	Potential shortage of replacement housing for acquired mobile homes
• Additional right-of-way	--	No cumulative effects identified for any of the alternatives			
Environmental Justice	Target populations: minority, low-income	No cumulative effects identified	No cumulative effects identified	No cumulative effects identified	Potential shortage of replacement housing for acquired mobile homes
Services	LOS near stations, park-and-rides, and maintenance facilities	--	Traffic congestion at facilities for all alternatives could create cumulative neighborhood effects. Insufficient information available to quantitatively assess future impacts.		
Recreation	Corridor and regional effects	No measurable cumulative effects	Improved fishing access and local trail connectivity	No measurable cumulative effects	No measurable cumulative effects

Table VI-1
Summary of Cumulative Impacts

Resource	Measurement	ALTERNATIVE: No Action / Committed Projects	Rio Grande Trail	BRT Alternative(s)	Rail Alternative
ECONOMIC IMPACTS					
Land Use	Corridor and regional pattern influence	No measurable cumulative effects identified. Potential to support transit-oriented development in neighborhoods around stations for build alternatives. This may curtail sprawl development.			
Economic base	Area-wide and regional effects to economic base (resort industry and construction)	Supports existing	Not applicable	Supports existing; the better transportation demand is met, the more the system will support the economic base	
Commercial growth trends	Retail Sales	No direct impact	No direct impact	No direct impact	No direct impact
Employment	Area-wide and regional effects	Minimal effects	No direct impact	Minimal effects	Minimal effects
Income and housing	Construction growth	No direct impact	No direct impact	No direct impact	No direct impact
Financing	Cumulative expenditure effects	No significant impact	No significant impact	No significant impact	No significant impact
PHYSICAL ENVIRONMENT IMPACTS					
Air quality	Corridor or regional effects on emissions	None	None	None	None
Water resources and quality	Corridor or regional effect on resources or quality	None	None	None	None
Floodplain	Floodplain encroachment	No significant impact	No significant impact	No significant impact	No significant impact
Geology and soils	Cumulative effects to corridor or region	None	None	None	None
Upland and floodplain vegetation	Cumulative effects to vegetation or noxious weed management	None	None	None	None
Wetlands	Corridor or regional effect of wetland losses.	None	Minor loss and full replacement required; no regional impact	Minor loss and full replacement required; no regional impact	Minor loss and full replacement required; no regional impact
Fisheries	Cumulative effects of stream crossings.	No additional impacts	BMPs will minimize any cumulative effect potential.	BMPs will minimize any cumulative effect potential	BMPs will minimize any cumulative effect potential

Table VI-1
Summary of Cumulative Impacts

Resource	Measurement	ALTERNATIVE: No Action / Committed Projects	Rio Grande Trail	BRT Alternative(s)	Rail Alternative
PHYSICAL ENVIRONMENT IMPACTS					
Wildlife	Corridor and Regional effects to resources.	No additional impacts	None	None	No significant impacts
Wild and Scenic Rivers	No Wild and Scenic Rivers in Project Corridor	Not applicable	Not applicable	Not applicable	Not applicable
Threatened & endangered species: bald eagles and great blue herons	Corridor and regional level Impacts	No new impacts	None	None	None
Cultural Resources	Corridor or regional level effects to resources	No new impacts	No effects or adverse effects	None	No adverse effects or conditional no adverse effects
Paleontological	Corridor or regional level effects to resources	No new impacts	None	No new impacts	None
Section 4(f) & 6(f) resources	Corridor or regional level effects to resources	No new impacts	None	None	None
Farmlands	Corridor or regional level effects to state-wide important irrigated hayfields	No new impacts	None	None	Right-of-way represents less than one percent of irrigated cropland adjacent to Project Corridor
Noise and vibration	Impacts	Some cumulative LRT plus DMU in Aspen. Noise will increase over time with growth	None	Noise will increase over time with growth	Some cumulative LRT plus DMU in Aspen. Noise will increase over time with growth
Visual impacts	Corridor level changes	No new impacts	None	Station view changes only	Station view changes plus new rail locations along Highway 82
Potential hazardous waste sites	Cumulative impacts from additional sites	No new impacts	None	None	None
Public safety and security	Minor local staffing increases only	No significant increases	No significant increases	No significant increases	No significant increases
Energy use	Cumulative construction and operations energy effects	No new impacts	Minimal energy uses	No significant increases in energy use	No significant increases in energy use

VII. MITIGATION MEASURES

This chapter address potential mitigation measures for each of the environmental resources identified in **Chapter III: Affected Environment** and **Chapter V: Environmental Consequences**. Each category contains several subsections.

- Subsections containing the caption "no mitigation required" are considered to have no negative or adverse effects. Mitigation measures are only described for impacts for which avoidance, best management practices (BMPs) and design choices cannot eliminate impacts. In some cases the caption notes that "no project level mitigation" is required. This refers to situations in which the No Action/Committed Projects Alternative results are negative and the project Build alternatives do not improve or noticeably worsen the problem.
- Some subsections note "no mitigation required after implementation of BMPs." Descriptions in these sections include avoidance recommendations, BMPs and design-related issues.
- Project benefits are summarized in the applicable sections.

A. SOCIAL IMPACT MITIGATION

1. Neighborhoods - no project level mitigation required

Neighborhood impacts are measured by project proximity, accessibility effects and project-related changes to development patterns. No neighborhood impacts have been identified in association with the No Action/ Committed Projects Alternative or the new Rio Grande Trail. No mitigation is required.

Two hundred ninety households have been identified within 30 meters (100 feet) of the Rail Alternative alignment. These households are considered sensitive to potential project effects. Direct impacts such as noise will be mitigated as appropriate. No proximity impacts have been identified for the BRT Alternative.

Improvements in accessibility offered by any of these alternatives are beneficial to the community. Local accessibility may be affected due to poor levels of service at park-and-rides, station locations and maintenance facilities associated with the No Action/Committed Projects Alternative as well as the BRT and Rail Alternatives. Congestion solutions will be necessary regardless of the proposed action, because these impacts are also associated with the No Action/Committed Projects Alternative in the same order of magnitude. Implementation of Build alternatives will not noticeably change the levels of service at these congested locations. Mitigation possibilities are discussed in **Chapter IV: Transportation Impacts**. Mitigation measures could include implementation of ITS elements, installation of new traffic signals, adjustments to signal timing, or the addition of turn lanes. Full intersection studies will be appropriate at heavily congested locations.

No mitigation is necessary for reinforcement of desired development patterns associated with new Transit Stations.

2. Relocation and Right-of-Way Impacts - mitigation described below

The Acquisition and Relocation Program for this project will be conducted in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended. Relocation resources will be available without discrimination to all residents and businesses that are required to relocate.

No new relocation or right-of-way impacts are associated with the No Action/Committed Projects Alternative or the new Rio Grande Trail.

The BRT Alternative station construction will require acquisition of 11.76 hectares (29.06 acres) of right-of-way.

Fourteen residential and three business relocations are anticipated as a result the Rail Alternative. In addition, approximately 18.85 hectares (46.57 acres) of right-of-way will be acquired for the Rail Alternative.

3. Environmental Justice - mitigation described below

3.1 No Action/Committed Projects Alternative

No impacts have been identified.

3.2 Trail

The new Rio Grande Trail improvements will benefit a variety of publics, including minority and low-income populations.

3.3 BRT Alternative

Pedestrian-friendly enhancements at every location that requires crossing a major highway, such as pedestrian underpasses, sidewalk and trail connections, and traffic signalization which accounts for pedestrian needs, would contribute to safe pedestrian access and would enhance the transit experience for either BRT Alternative. El Jebel is currently the only location between Brush Creek Road and Glenwood Springs with grade-separated pedestrian access near a proposed transit station. This is particularly important for transit-dependent populations who are most likely to access the transit system on foot.

The BRT transit improvements would provide additional service and better access to employment and retail centers. This creates an overall positive benefit to low-income and minority populations. A comprehensive TM program that creates incentives for employers to subsidize or otherwise support transit use by employees would benefit low-income and minority publics. Both real-time transit information and incident management proposals in the Build alternatives would support the issues of user fees and system reliability that were identified as low-income and minority concerns.

3.4 Rail Alternative

3.4.1 Benefits. Pedestrian-friendly enhancements at every location that requires crossing a major highway, such as pedestrian underpasses, sidewalk and trail connections, and traffic signalization which accounts for pedestrian needs, would contribute to safe pedestrian access and would enhance the transit experience for either the BRT Alternative. El Jebel is currently the only location between

Brush Creek Road and Glenwood Springs with grade-separated pedestrian access near a proposed transit station. This is particularly important for transit-dependent populations who are most likely to access the transit system on foot.

The BRT transit improvements would provide additional service and better access to employment and retail centers. This creates an overall positive benefit to low-income and minority populations. A comprehensive TM program that creates incentives for employers to subsidize or otherwise support transit use by employees would benefit low-income and minority publics. Both real-time transit information and incident management proposals in the Build alternatives would support the issues of user fees and system reliability that were identified as low-income and minority concerns.

3.4.2 Noise Impacts. Four areas of concern were identified for possible noise impacts to the targeted populations. All four sites are for mobile home parks. All sites include noise impacts. All were assessed for noise mitigation and are summarized below. Additional information for these sites is found in **Section 15.1.3** in this chapter.

H Lazy F Mobile Home Park. A barrier could be engineered for this location. Cost effectiveness is marginal since only three of the mobile homes are affected at this location. *Recommendation: barrier construction is marginal, pending further investigation during preliminary engineering.*

Mountain Valley Mobile Home Park. The receiver represents approximately 17 mobile homes adjacent to the RFTA right-of-way in Carbondale. A noise barrier has a high likelihood of success in the area, and several second-row receivers would also benefit from the noise reduction. The barrier be relatively cost-effective. *Recommendation: barrier construction is reasonable, pending further investigation during preliminary engineering.*

Roaring Fork Mobile Home Park. The Basalt Station would impact approximately 23 mobile homes at the Roaring Fork Mobile Home Park. The Town of Basalt has committed to redeveloping the mobile home park as part of the *Basalt River Master Plan* because the current park lies in a flood hazard area. The Town has a 100 percent replacement housing policy that will guide redevelopment impacts to the pool of affordable housing. *Recommendation: no additional mitigation necessary at this time.*

Philips Mobile Home Park. These receivers are located in a mobile home park along Lower River Road. Mitigation has a low to moderate chance of success; however, the location and alignment of Lower River Road results in less than optimal conditions for the placement of a barrier. Such a barrier, would not be cost-effective. *Recommendation: barrier is not feasible.*

3.4.3 Relocation Impacts. Implementation of the Rail Alternative would require the potential loss of 11 mobile homes in the Aspen-Basalt Mobile Home Park along Highway 82 at Willits Lane in El Jebel. Similar units are typically considered part of the inventory of affordable housing units. Consideration of relocating these mobile homes or otherwise ensuring no net loss of affordable housing would optimize benefits to minority, low-income, and elderly populations. An evaluation of the ability of the community to absorb these units will be conducted if the Rail Alternative is selected as the Preferred Alternative, and specific mitigation will be proposed.

Several options exist for avoiding loss of these mobile homes. There are opportunities to prevent the area from receiving disproportionate impacts. Additional engineering with input from the residents will be required to determine which of the options described below should be pursued.

1. **Moving Highway 82**. Avoiding the mobile home park completely would require moving Highway 82 and the intersection to the north. The creation of the Basalt Bypass resulted in a realignment of this intersection. Two Rivers Road (formerly Highway 82) turns sharply into the intersection to avoid transit and CDOT maintenance facilities and adjacent properties. There are technical and economic challenges to moving Highway 82 very far north, but further consideration of this option is recommended during preliminary engineering.

2. **Realigning mobile homes in the park**. There may be an opportunity to maintain many or most of the impacted units in the park through adjustments in the mobile home park layout. Realigning mobile homes is likely to accommodate approximately half the units. A few of the remaining units might be accommodated by infringing on the mobile home park's lawn area.

3. **Noise/Privacy Wall Construction.** Another option would be to construct a noise/privacy wall along the boundary of the park adjacent to the Highway. Such an approach would also help mitigate existing highway noise impacts for residents. However, it is likely that there will still be some impacted units.

4. Services - no project level mitigation required

No direct impacts to services have been identified. Local accessibility may be affected due to poor levels of service at stations, park-and-rides, and maintenance facility locations associated with the No Action/Committed Projects Alternative, as well as the BRT and Rail Alternatives. Congestion solutions will be necessary regardless of the proposed action, because these impacts are also associated with the No Action/Committed Projects Alternative in the same order of magnitude. Implementation of Build alternatives will not noticeably change the levels of service at these congested locations. Mitigation possibilities are discussed in **Chapter IV: Transportation Impacts**. Mitigation measures could include implementation of ITS elements, installation of new traffic signals, adjustments to signal timing, or the addition of turn lanes. Full intersection studies will be appropriate at heavily congested locations.

5. Recreational Resources - no mitigation required

The El Jebel Road option for the El Jebel Transit Station is proposed for location adjacent to the Mt. Sopris Tree Farm Community Center and Recreation Area. Avoidance of this property is possible, either by selecting another location for the transit station or using appropriate design planning. This station option is associated with both the BRT and Rail Alternatives.

None of the alternatives will directly encroach on any recreational properties. Improvements in traffic flow and access associated with the BRT and Rail Alternatives will be beneficial to the numerous Roaring Fork Valley recreation areas.

The construction of the new Rio Grande Trail associated with both the BRT Alternative and the Rail Alternative will optimize trail connectivity between Glenwood Springs and Aspen and within the entire Roaring Fork Valley. Recreational access to the Roaring Fork River will be indirectly improved as a result of these actions. Appropriate planning and scheduling will minimize temporary inconvenience to recreation and trail users in the Project Corridor during construction.

6. Land Use Impacts - no mitigation required

The potential for new rail stations associated with the BRT and Rail Alternatives to attract concentrated development will positively affect land use patterns. Transit-oriented development patterns are encouraged, and this may curtail additional sprawl-type development patterns. The new Rio Grande Trail will not affect land use patterns.

B. ECONOMIC IMPACT MITIGATION

No mitigation required.

All transportation projects that improve the flow of goods and services within the Project Corridor will have positive effects on the economic health of the area. None of the alternatives is expected to affect the trends in the resort and tourism industry in the Roaring Fork Valley or create measurable commercial growth. The Rail Alternative will require less operations employment than the BRT and No Action/ Committed Projects alternatives. No direct economic effects to local income or housing are anticipated for any of the alternatives. No mitigation for economic impacts is required.

Expenditure of public funds has already been committed or planned with the No Action/Committed Projects Alternative. Funding will be necessary for the BRT or Rail Alternative and the new Rio Grande Trail. Both Federal and local funding will be necessary. Either directly or indirectly the local public will be affected by the funding mechanisms selected.

C. PHYSICAL IMPACT MITIGATION

1. Air Quality - no mitigation required

The EPA lists Aspen as a non-attainment area for PM_{10} (small particulates). The Colorado Air Pollution Control Division has prepared and submitted to EPA a PM_{10} “Re-designation Request and Maintenance Plan” for the Aspen Area. Upon EPA approval of the Maintenance Plan, Aspen will be re-designated as an attainment/maintenance area.

The air quality compliance measures for all alternatives are in conformance with the PM_{10} State Implementation Plan (SIP) for Aspen, the Clean Air Act Amendments (CAAA), and subsequent regulations. Pitkin County, Garfield County, Eagle County, RFTA, and CDOT are committed to continuing implementation of current air quality measures.

2. Water Resources and Water Quality - no mitigation required after implementation of BMPs

No significant adverse impacts to water resources or water quality have been identified for the No Action/Committed Projects or BRT Alternative (excluding stations and trail). Potential impacts associated with the Rail Alternative, the BRT Alternative's new station construction, and the associated new Rio Grande Trail are noted below. Potential impacts are associated with increased amounts of impervious surface, stream crossings and project construction, operations, and maintenance activities.

The best approach to avoid adverse effects to water resources and water quality is to ensure sufficient distance between the alignment and wetlands and rivers/streams, follow terrain contours to avoid headcutting and other erosion/slope stability issues; and site the transportation corridor away from high erosion hazard areas.

NPDES MS4 Phase I + II Stormwater Regulations will be followed as appropriate. For areas of the project or alternatives that fall under the designated Colorado (CDPS) Phase II regulations, as designated and administered by CDPHE Water Quality Control Division, BMPs for construction and permanent post-construction BMPs will be considered. CDOT's New Development/Redevelopment MS4 Stormwater Management Program calls for increased protection of waters identified as sensitive, including the Roaring Fork River.

All applicable work done on this project will be completed in conformity with Section 107.25 and Section 208 of the CDOT *Standard Specifications for Road and Bridge Construction.*

Existing state law requires consultation with the CDOW when project activities may affect streams and wetlands in Colorado. Per CDOT and CDOW Memorandum of Agreement (MOA), Senate Bill 40 Certification requires attention to projects involving permanent or temporary stream re-alignment, bank stabilization activities, stream encroachment and potential effects to Gold Medal fishing waters. Should any of the proposed stream crossings activate SB 40 requirements, mitigation will be implemented per the MOA.

The next two sections describe best management practices (BMPs) that will be undertaken in order to eliminate or reduce water quality impacts to an acceptable level during construction, maintenance, and operation of the Rail Alternative and the new Rio Grande Trail. BMPs associated with station and trail construction would also be associated with the BRT Alternative.

2.1 Construction BMPs

Construction BMPs may include both non-structural and structural erosion control measures. Non-structural measures will be designed to prevent soil movement by protecting the soil surface from raindrop impact and overland flow, and snow collection/storage impacts. Non-structural BMPs identified for use during construction of the Rail Alternative include:

1. Control and minimize erosion and sedimentation during and after the construction phase of the project,
2. Minimize the pollution of stormwater and receiving waters during construction activities, and
3. Reduce pollutants in stormwater runoff.

Potential adverse impacts to water quality will be prevented through implementation of BMPs identified in the SWMP and in accordance with CDOT's *Erosion Control and Stormwater Quality Guide* (CDOT, 2002). BMPs are defined as "schedules of activities, prohibitions of practices, maintenance procedures, and other management practices to prevent or reduce the pollution of waters of the United States" (40 CFR 122.2). Construction BMPs are designed to control erosion and sedimentation, and prevent spills. Post-construction BMPs are used to control erosion and control the quality of stormwater run-off.

Construction BMPs may include both non-structural and structural erosion control measures. Non-structural measures will be designed to prevent soil movement by protecting the soil surface from raindrop impact and overland flow. Non-structural BMPs identified for use during construction of the Rail Alternative include:

- diverting clean water runoff around construction areas; and
- mulching, seeding with a native seed mix, erosion control blankets, cover crops, or a combination, depending on local site conditions.

In erosion-prone areas or at sites adjacent to waters of the U.S., ground-disturbing activities will be timed so as not to occur during the wet spring months when saturated soils are susceptible to compaction and movement, and surface and ground water levels are at their highest.

Structural erosion-control BMPs may be used to reduce the quantity of sediment being transported in water moving over and off disturbed sites. Structural BMPs may include:

- use of surface roughening, terracing, vegetative buffer strips, filtering structures, sediment traps/basins, or a combination thereof, depending on site conditions;
- filtering structures such as straw bales, filter fences, or vegetated buffer strips used along the downslope edge of all construction sites to capture sediment in overland flow, using straw bales to stabilize temporary channel flow lines; and
- sequencing of ground-disturbing activities so that no area remains exposed for unnecessarily long periods of time as noted in CDOT *Standard Specifications for Road and Bridge Construction*, Section 208, Erosion Control. (CDOT, 1999).

Affected areas will be stabilized and revegetated before other sites are disturbed per CDOT, 1999. Limiting the acreage of disturbed ground exposed to the atmosphere at any one time will significantly reduce adverse impacts to water quality. Specific BMPs will be detailed in the SWMP when the final design of the selected alternative has been approved.

The spill prevention and emergency response plan will include plans for storage, handling, and use of chemicals, and a detailed plan for emergency response in the event a spill occurs. Finally, construction related impacts to water quality might be mitigated by minimizing the number of bridge supports placed in waters of the United States. Bridges will be anchored outside the bed and banks of the Roaring Fork River and its tributaries whenever possible.

2.2 Operation and Maintenance BMPs

Non-structural and structural BMPs may be implemented following the construction phase to manage the quality of stormwater flowing into waters of the U.S. as per CDOT's *Erosion Control and Stormwater Guide* (CDOT, 2002). Non-structural BMPs will include curb elimination, reduction of direct discharges, and establishment and maintenance of vegetation and buffer strips. Non-structural BMPs may be used to prevent stormwater from being concentrated in specific areas (e.g., along curbs) or discharged directly into waters of the U.S. Drainage systems may be the primary structural means of mitigating potential impacts to water resources and water quality from parking lots and other paved areas associated with the Rail Alternative.

Structural BMPs include:

- grass-lined swales or buffers,
- wet and dry detention basins, and
- constructed wetlands and infiltration basins or trenches.

Grassy swales (i.e. vegetated filter strips) will be used, instead of curb and gutter, to increase infiltration of direct precipitation and storm water run-off. Catchment basins will be installed to collect polluted run-off from station parking lots and maintenance facilities. Selection of structural BMPs will be dependent on topography, available land, and the proximity of paved areas included in the final design for the Selected Alternative to U.S. waters. Drainage pathways in the vicinity of river crossings will be directed away from the streambed. Drainageways will be planted with native grasses, where feasible, to reduce flow velocity and enhance natural constituent removals, particularly sediments. Grasses will be planted in the fall, when possible, to allow establishment and germination before the spring snowmelt and summer rains. Erosion control blankets can also be used to protect seeds during the germination and establishment period. Overland flow from above the Project Corridor will be intercepted and channeled under the project to maintain hydrologic connections on both sides of the project.

BMPs for long-term snow collection and storage will be considered for the Rail Alternative and for stations, park-and-rides, and maintenance facility locations for all Build alternatives in proximity to streams or rivers.

3. Floodplains - no mitigation required after implementation of BMPs

The construction of the new bridge at the Four Mile Connector, as part of the No Action/Committed Projects Alternative, will encroach somewhat on the 100-year floodplain. The new bridge design will minimize impacts by providing adequate freeboard between the bottom of the structure and the 100-year flood surface elevation. No other floodplain impacts have been associated with the No Action/Committed Projects or BRT Alternative, excluding the trail. Potential impacts and mitigation from the Rail Alternative and the new Rio Grande Trail are discussed below.

Following standard stream-crossing design criteria, avoiding direct impacts on stream channels, and adjusting the alignment where possible have minimized impacts to the floodplain. In addition, the design of the Rail Alternative reduces impacts to the 100-year floodplain water surface elevation by placing bridge piers outside of the 100-year floodplain. Final designs will adhere to CDOT drainage criteria for both minor and major hydraulic structures and will ensure no significant change in historic drainage patterns. All FEMA requirements will be followed. All practical measures to minimize harm to floodplains have been incorporated, and design of the Rail Alternative and new Rio Grande Trail will ensure no change to historical drainage patterns in the Project Corridor. Longitudinal encroachment into the floodplain should also be avoided.

Under the direction of the CDOT landscape architect, the development and implementation of an erosion control plan for each phase of the design/build process that utilizes best management practices identified in the *Erosion Control and Stormwater Quality Guide* (CDOT, 2002) will minimize impacts to floodplains. Specific measures will include:

- development and implementation of a storm water management plan (SWMP) for each phase of the project;
- coordination with Garfield, Eagle, and Pitkin County governments concerning issues related to floodplain encroachment;
- installation of detention basins, infiltration beds, and other facilities to reduce and minimize the effects of increased runoff on floodplains due to increases in impervious surfaces;
- incremental grading and seeding to reduce soil loss during construction, using seed mixes which contain native grasses;
- rounding of ditches and slopes to prevent unnecessary erosion;
- temporary exclusion fencing of wetlands during construction;
- clean water diversions during construction with measures to protect existing wetlands with temporary fences or silt fencing and/or erosion logs in areas where sedimentation may occur
- identification and use of appropriate concrete washout areas away from floodplains to ensure polluted water does not leave the site;
- use of soil stabilization practices such as erosion control blankets and mulching impacted areas to reduce erosion;
- installation of structural BMPs such as silt fences and erosion bales in impacted areas to reduce offsite siltation;
- development of an emergency spill response program and the implementation of spill-prevention practices such as locating staging areas and fuel and hazardous construction material storage sites well away from floodplains to reduce risks from accidental spills and leaching; and
- when practicable, protecting existing shrubs and trees in the floodplains, and fencing trees to prevent damage or replacing shrub and trees species removed during construction.

4. Geology and Soils - no mitigation required after implementation of BMPs

No new impacts to geology or soils have been identified for the No Action/Committed Projects or BRT Alternative (except trail). Potential effects associated with the construction of the new Rio Grande Trail and the Rail Alternative, rail alignment are noted below. These impacts are associated with construction activities along the RFTA right-of-way.

Mitigation for impacts resulting from geologic processes can be minimized by simply avoiding hazards such as sinkholes, caves, surface mines, and steep embankments/bluffs. Geologic hazards will be minimized through shifting site locations or design characteristics as defined by best engineering practices.

If movement of a site location is not possible, it may be economically feasible to bridge small sections of rail line that are adjacent to steep banks to allow slides to flow over them. Additional measures to reduce the consequences of slope instability would include chain-link fencing draped over exposed rock to protect the railway from rockfall, and the use of rock bolts to stabilize very steep walls. The application of subsurface drainage techniques would be advantageous where rock and soil is fine-grained, drains slowly, or is highly permeable. Possible moisture reduction methods may include systems of underground boreholes drilled to increase drainage to accompanying pipelines that carry unwanted water away from slide-prone areas. Moisture reduction works to reduce pore pressure and increase frictional resistance to sliding.

Mitigation for soil impacts should consist of using BMPs, as defined by the Natural Resources Conservation Service (NRCS, 1993), to promote the use of this land within its capabilities to protect natural resources and to ensure public health, safety, and welfare.

5. Upland and Floodplain Vegetation - no mitigation required after implementation of BMPs

5.1 Upland and Floodplain Vegetation BMPs

No new impacts to upland and floodplain vegetation have been identified for construction of the No Action/Committed Projects Alternative or the new Rio Grande Trail. Station construction for the BRT and Rail Alternatives will require additional right-of-way from existing disturbed areas. The Rail Alternative will require minimal additional right-of-way along the proposed alignment, approximately 9.17 hectares (22.67 acres). BMP techniques are identified for the Rail Alternative. BMPs in accordance with CDOT's *Erosion Control and Stormwater Quality Guide* (CDOT, 2002), and as directed by the CDOT Landscape Architect will be implemented. These BMPs will be part of erosion control plans developed for each phase of the design/build process and may include:

- fencing of construction zones and access roads to limit impacts outside of the project area;
- where possible, avoidance and/or pruning of tree and shrub species instead of removal;
- where avoidance is not possible, replacement of tree species removed during construction where water requirements can be met and conflicts with maintenance requirements are minimized;
- implementation of temporary and permanent erosion control measures such as re-seeding disturbed areas with native grasses, mulching, erosion control blankets, sediment basins, erosion bales, and silt fences;
- incremental grading and seeding to reduce soil loss during construction, with seed mixes that include native grasses; native shrub species should be added to the seed mix in areas where conflicts with maintenance can be avoided; and
- rounding of ditches and slopes to prevent unnecessary erosion.

Affected landscaping can be replaced if sufficient area remains for such replacement. Landscaping must comply with highway safety and local quality standards, and be maintainable by CDOT or another applicable agency.

5.2 Noxious Weed Management - Preventative Actions and Control Measures

There are no project-specific impacts for this resource since management practices are already in place for both CDOT and RFTA rights-of-way. Pitkin County management practices will be implemented as appropriate. Where additional right-of-way is acquired adjacent to CDOT or RFTA right-of-way, management plans already in place will extend to the new areas.

Application of weed control techniques identified in the CDOT, RFTA, and Pitkin County weed management plans is expected to control the spread of invasive species within or beyond the corridor and eliminate potential impacts from invasive species associated with all alternatives. Weed management in the vicinity of proposed new stations and/or park-and-ride locations within the Project Corridor will be managed by RFTA or will fall within local and county jurisdictions. The footprints for new stations and/or park-and-rides are not expected to include non-maintained weedy areas.

To avoid importation of weeds to project sites during construction, BMPs will be employed such as washing of equipment, not importing topsoil, treatment of weed-infested topsoil, and use of certified weed-free mulch.

6. Wetlands - mitigation described below

Wetlands evaluations were conducted in 1999 and will need to be updated as a part of the Section 404 permit process upon alternative selection and implementation of trail construction. Jurisdictional wetlands are subject to the Clean Water Act, Section 404 (b)(1) Guidelines. Non-jurisdictional wetlands are mitigated the same as jurisdictional wetlands as per CDOT policy.

Existing state law requires consultation with the CDOW when project activities may affect streams and wetlands in Colorado. Per CDOT and CDOW MOA, Senate Bill 40 Certification is needed for single-location wetland impacts that exceed one-quarter acre when stream-associated, and one-half acre for other locations. When total wetland impacts exceed one acre, SB 40 is also applicable.

The Guidelines identify wetland mitigation as avoidance, minimization, and compensatory mitigation. The Section 404 Program stresses the avoidance of adverse impacts to wetlands with the goal of no overall net loss of wetland functions and values. The most important type of wetland mitigation is avoidance. If avoidance is not possible across an entire alignment, mitigation may include minimizing or compensating for unavoidable impacts.

Design of minor and major hydraulic structures will adhere to CDOT Drainage Criteria, FEMA requirements, and local criteria. Hydraulic structures will be designed to maintain historic drainage patterns, thereby minimizing the potential for downstream hydrologic disruptions which may impact wetlands. Unavoidable impacts will be minimized through the development of an erosion control plan for each phase of the design/build process. A wetland mitigation plan will be developed by the CDOT landscape architect to mitigate impacted wetlands at 1:1. BMPs specified by the CDOT landscape architect will include:

- protecting existing trees in impacted wetlands when possible and fencing trees and shrubs to prevent damage;
- incremental grading and seeding to reduce soil loss during construction;
- use of native grasses in seeding mixtures;
- rounding of ditches and slopes to prevent unnecessary erosion;
- temporary exclusion fencing of wetlands and erosion protection during construction;
- clean water diversions during construction;
- identification and use of appropriate concrete washout areas well away from wetlands and other waters of the U.S. to ensure polluted water does not leave the site;
- use of soil stabilization practices such as erosion control blankets and mulching;
- installation of structural BMPs such as silt fences and erosion bales in disturbed areas;
- development of an emergency spill response program and the implementation of spill-prevention practices, such as locating staging areas and fuel and hazardous construction material storage sites away from wetlands and other waters of the U.S. to reduce risks from accidental spills and leaching, and construction of berms to provide a storage volume greater than1.5 the total volume of the stored material (CDOT, 1995);
- disposal of surplus fill in non-wetland areas;

- timing construction in and around open water to occur in late autumn and winter when water levels are low, soil compaction is minimal, and vegetation is dormant; and
- vegetated buffer strips positioned down-slope and between construction areas and wetlands, or surface water to prevent elevated inputs of non-point source pollution.

Restoration of existing degraded wetlands and creation of new wetlands are two methods of compensatory mitigation. Restoration or creation options exist along the RFTA and Highway 82 rights-of-way and will, if necessary, be investigated further following selection of an alternative and discussions with interested agencies, including the U.S. Army Corps of Engineers. Alternative-specific mitigation is discussed below.

6.1 No Action/Committed Projects Alternative

No additional wetland impacts are associated with the No Action/Committed Projects Alternative.

6.2 Trail

Construction of the Rio Grande Trail along the RFTA right-of-way will result in a potential wetlands loss of .93 hectare (2.31 acres), of which .34 hectare (.86 acre) are jurisdictional.

Avoidance and minimization. Within the constraints of the project, the design of the trail reflects an effort to avoid wetland impacts when practicable, and to minimize the extent of unavoidable impacts. Avoidance and minimization have been accomplished by reducing the size of the footprint and by maximizing the use of existing infrastructure (e.g. the existing rail line). Further reduction of the trail impact area may be possible during trail design.

Wetland replacement. Where practicable, mitigation will occur onsite at a replacement ratio of 1:1. Functional replacement of more than 1:1 may be required to allow an adequate margin of safety to reflect the expected degree of success associated with the mitigation. Specific mitigation and monitoring requirements for permanent and temporary impacts will be established as part of any Clean Water Act Section 404 permit for the project. Water rights issues will be considered during the final selection of mitigation sites.

6.3 BRT Alternative

Station construction at Basalt will result in a potential wetlands loss of .024 hectares (.06 acres), of which .004 hectares (.01 acres) are jurisdictional.

Avoidance and minimization. Avoidance and minimization have been accomplished by reducing the size of the footprint and adjusting station design. Wetlands at this site will be revisited prior to station design to assure minimization of impact at this location.

Wetland replacement. Where practicable, mitigation will occur on-site at a replacement ratio of 1:1. Functional replacement of more than 1:1 may be required to allow an adequate margin of safety to reflect the expected degree of success associated with the mitigation.

6.4 Rail Alternative

Construction of the Rail Alternative will result in a potential wetlands loss from station construction at Basalt and alignment construction along the RFTA and Highway 82 rights-of-way of 0.51 hectare (1.25 acres), of which 0.15 hectares (.37 acres) are jurisdictional.

Avoidance and minimization. Within the constraints of the project, the design of the Rail Alternative reflects an effort to avoid wetland impacts when practicable, and to minimize the extent of unavoidable impacts. Avoidance and minimization have been accomplished by reducing the size of the footprint and by maximizing the use of existing infrastructure (e.g. the existing rail line).

For the Basalt Station, avoidance and minimization have been accomplished by reducing the size of the footprint and adjusting station design. Wetlands at this site will be revisited prior to station design to assure minimization of impact at this location.

Wetland replacement. Where practicable, mitigation will occur on-site at a replacement ratio of 1:1. Functional replacement of more than 1:1 may be required to allow an adequate margin of safety to reflect the expected degree of success associated with the mitigation. Specific mitigation and monitoring requirements for permanent and temporary impacts will be established as part of any Clean Water Act Section 404 permit for the project. Water rights issues will be considered during the final selection of mitigation sites.

7. Fisheries - no mitigation required after implementation of BMPs

Fisheries may be affected by changes in erosion and sedimentation patterns in areas adjacent to water resources. Except for potential effects caused by construction activities and the addition of river or stream crossing structures, fisheries will not be affected by any of the alternatives. Two additional stream crossings are associated with the construction of the new Rio Grande Trail and eight new crossings are associated with the Rail Alternative, rail alignment.

Mitigation measures for construction, maintenance, and operations under the Rail Alternative will be driven by two overriding principles: avoidance of adverse impacts and use of BMPs. Fisheries are complex systems whose many components must be sustained to support proper function. These components include not only the most apparent features, such as the river and the fish, but also tributary streams, substrate structure, wetlands, springs, adjacent riparian vegetation, and forests. An avoidance approach would include ensuring sufficient distance barriers between the alignment and critical features. BMPs include:

- providing vegetated buffer zones between project areas and streams or wetlands;
- installing catchment basins or artificial wetlands to collect run-off;
- using silt fences or baling to control sedimentation-induced changes to stream substrate structure;
- placing bridge supports outside of streambeds;
- timing construction in or near trout habitat to occur in August and September to minimize adverse effects on spawning habitat;

8. Wildlife - no mitigation required after implementation of BMPs

All alternatives include elk and mule deer crossings. Efforts are ongoing to reduce conflicts between wildlife and vehicles. Fencing and vegetation can be used to direct animals to safe crossings or to preclude animals from crossing at selected locations. Seasonal highway signage has also been effective in reducing vehicular collisions with deer and elk. A wildlife warning reflector system has been proposed for Highway 82 as a part of the BRT Alternatives. This system will include reflectors that direct the headlights of approaching vehicles at animals desiring to cross the road.

Construction, maintenance, and operations under the rail component of the Rail Alternative have the potential to impact wildlife species. Mitigation measures include avoidance and the use of BMPs. For wildlife, avoidance may be both spatial and temporal. Large animal/vehicle conflicts can be minimized by providing wildlife-friendly passages under railroad tracks or roads.

Mitigation for activity around raptor nest and roost sites associated with the Trail and the Rail Alternative include observing CDOW-recommended buffer zones and seasonal human activity restrictions, as shown in Table VII-1 (CDOW, 1998). Buffer size and construction and maintenance activity restriction dates may be adjusted based on site-specific knowledge and consultation with the local CDOW District Wildlife Manager prior to project construction or significant maintenance activities. Restrictions are species specific. For example, prairie falcons have guidelines for human activity restrictions from March 15 to July 31, golden eagles from February 1 to July 15, and red-tailed hawks from March 1 to July 15. Additional mitigation will include avoiding destruction or alteration of known raptor roost trees and perches during construction and planting of vegetation to screen raptor nests from the rail and trail alignments. No significant negative impacts are anticipated from rail or trail operations for these species.

The trail aspect of the project is committed to design a wildlife-compatible trail, to protect the integrity of the natural systems while teaching users about wildlife and natural features. An attempt will be made to balance human impact to wildlife while enhancing visitor experience and education. Trail construction will include the installation of signage and interpretive sites throughout the corridor emphasizing the wildlife and historic context for the area. Where appropriate seasonal closures, leash requirements for dogs, and appropriate protection of sensitive areas is possible.

Table VII-1
Wildlife BMP - CDOW Seasonal Recommendations
for Human Disturbances in Close Proximity to Sensitive Nesting Birds

Species	CDOW Buffer Size	Restrictions on Surface Occupancy	Construction and Maintenance Activity Restriction Dates
Golden Eagle	804 m (2,640 ft)	No surface occupancy within ¼ mile	2/01-7/15
Prairie Falcon	804 m (2,640 ft)	No surface occupancy within ½ mile	3/15-7/31
Red-tailed Hawk	402 m (1,320 ft)	--	3/01-7/15
Great Horned Owl	201 m (660 ft)	--	--

9. Wild and Scenic Rivers - no mitigation required

There are no Wild and Scenic Rivers in the Project Corridor.

10. Threatened and Endangered Species - no mitigation required after implementation of BMPs

Only species known to occur within the Project Corridor and potentially affected by proposed activities were considered for mitigation measures. These include the bald eagle and great blue heron. These species are potentially affected by the new Rio Grande Trail and the Rail Alternative.

10.1 Bald Eagle

No mitigation is recommended for the inactive bald eagle nest since the Trail and Rail will located behind an existing earth berm and are 381 meters (1,250 feet) from the nest. Mitigation for potential impacts to the roost sites from rail construction or trail use may include seasonal construction and trail closures from November 15 through April 1 or until it is determined that eagles are not using roost sites. Potential impacts can be further avoided or minimized by realignment, planting of a natural vegetation buffer screen, restriction of activities, signage, environmental education, and seasonal closures.

Design of the rail and trail alignments can avoid removal of roost trees. Any construction of the rail and trail through the roost buffer will use buffer screens and seasonal closure to avoid disturbing roosting eagles. Final alignment and mitigation for all bald eagle sites will be coordinated with the U.S. Fish and Wildlife Service.

10.2 Great Blue Heron

Both the trail and rail alignments intersect a great blue heron buffer near the mouth of Cattle Creek (Sanders Ranch heronry) and the proposed trail intersects a second colony on the Rock Bottom Ranch.

Trail and rail intrusion into the Sanders Ranch heronry buffer is minor. The colony is approximately 500 meters (1,640 feet) away and removed from direct line of sight due to elevation changes. Despite the distance between the heronry and the rail and trail alignments, avoidance or modification of construction activities during the sensitive breeding season may be considered. Trail use during the breeding season will be monitored to ensure no impact to the heronry. Implementation of a leash requirement for all dogs passing through this portion of the trail during nesting seasons is a useful and effective protection for the heronry, if enforceable. Minor fencing may also be useful along the trail in this area.

The proposed trail intersects a second great blue heron nest colony buffer on the Rock Bottom Ranch. Recent observations indicate a decline in quality and size of this heronry as the result of changes in the river flow patterns and associated fishery food source. An update on the status of this heronry is recommended prior to trail design activities. The construction and use of the new Rio Grande Trail may create a minor impact to this colony. Installation of buffer material between the trail and nest colony could minimize disturbance from pedestrians using the trail. Monitoring during construction and trail operation will be conducted to ensure no impact to the heronry. Implementation of a leash requirement for all dogs passing through this portion of the trail during nesting seasons is a useful and effective protection for the heronry, if enforceable. Minor fencing may also be useful along the trail in this area.

11. Cultural Resources - no mitigation required

Cultural (historic and archaeological) resources are non-renewable and easily disturbed or damaged. Damage to these resources can occur through ground disturbance, casual site visitation, theft, and vandalism. Direct impacts to cultural resources can occur as a result of development activity such as demolition, construction, operation, and maintenance. Indirect impacts can occur as a result of increased access to the resources caused by the project, ground vibrations associated with construction or increased traffic, and/or through neglect.

An undertaking is regarded as having an effect on the historical resource if it alters any of the characteristics that may qualify the property for inclusion in the NRHP. An adverse effect is one that diminishes the integrity of any of those characteristics that qualified the resource for inclusion in the NRHP. Adverse effects can only be incurred by sites that have been identified as significant historical resources eligible for inclusion in the NRHP. Section 106 of the National Historic Preservation Act (NHPA), as amended, applies to the historic properties listed on or eligible for listing on the NRHP that may be impacted by this project.

Findings of No Effect, No Adverse Effect, and Conditional No Adverse Effect have been made by the SHPO for all potentially affected cultural resources within the APE. No mitigation is required for these findings. Additional alternative-specific discussions follow.

11.1 No Action/Committed Projects Alternative

Previous projects have provided appropriate mitigation for effects to cultural resources associated with this alternative. The Aspen Commercial Core Historic District (5PT113) was not identified as an NRHP district at the time of the *Entrance to Aspen ROD* (1998). The current study has included this resource. As a result of Section 106 coordination with the SHPO, a determination of Conditional No Adverse Effect has been made for this property, pending installation of monitoring devices to measure construction vibration.

11.2 Trail

The construction of the new Rio Grande Trail along the D&RGW Railroad (5EA198/ 5GF1661,5PT123) grade and right-of-way will affect this NRHP-eligible property. The SHPO has concurred with the CDOT determination of No Adverse Effect for this resource.

While mitigation is not required for a determination of no adverse effect, a full photographic recordation of the line as it currently exists has been completed. RFTA will also implement a program of public interpretation and education in stations along the line per recommendations contained in *Reading the Roaring Fork Landscape: An Ideabook for Interpretation and Environmental Education* (SAIC, 1999). This plan includes provision for interpretation and public education regarding the Roaring Fork Valley's cultural heritage. In addition, CDOT has recommended specific topics on the significance the historic railroad had on the Roaring Fork Valley. These interpretive topics include:

1. The D&RGW RR as a prospecting railroad, going to promising mining camps all over Colorado, including Aspen.
2. The heritage of bridge engineering in the valley, including the Satank Bridge, the Wingo Trestle , and the Hardwick Bridge.

3. Carbondale as the rail hub of the valley, including the D&RGW RR, Colorado Midland RR, and the Crystal River RR.
4. Selling the valley and the railroad's role in enticing settlers during the early 1900s.
5. "Wealth from the earth," the role of the railroad in transporting precious minerals (silver, coal, marble, etc.)
6. The "rich and famous" who used the railroad, including Teddy Roosevelt and other celebrities.

Determinations of No Effect and No Adverse Effect have been made by the SHPO for the seven remaining NRHP-eligible or listed sites in the vicinity of the proposed Rio Grande Trail. No additional actions are required.

11.3 BRT Alternative

The BRT Alternative will utilize the existing Highway 82 laneage and will not directly or indirectly affect any cultural resources not already affected by Highway 82. This alternative will connect to the pre-approved LRT alternative outside of Aspen and will either utilize the LRT or in lieu of the completion of that project will utilize the approved right-of-way for that project entering into and through Aspen. The use of buses in the LRT right-of-way is expected to have the same or fewer noise effects on the Aspen Commercial Core Historic District (5PT113). No additional right-of-way will be acquired in the Historic District. The SHPO has concurred with a determination of Conditional No Adverse Effect for the Aspen Commercial Core Historic District (5PT113), conditional upon installation of monitoring devices to measure construction vibration. This condition only applies if the BRT Alternative utilizes the LRT location in lieu of LRT construction. No additional actions are required at this time.

11.4 Rail Alternative

A Determination of No Adverse Effect has been made by the SHPO for the D&RGW Railroad (5EA198/5GF1661, 5PT123) for the Rail Alternative. The current project stipulations and design guidelines will result in no adverse effects on the railroad. These stipulations and the project design are being conducted in accordance with the Secretary of the Interior's Guidelines for Rehabilitation to preserve the historic qualities of the railroad. No additional actions are required.

Determinations of No Adverse Effect have also been made by the SHPO for six additional NRHP listed or eligible resources adjacent to the proposed Rail alternative. No additional actions are required for these sites. Determinations of Conditional No Adverse Effect, conditional upon installation of monitoring devices to measure construction vibration, have been made for the following four sites: Satank Bridge (5GF1282), Emma School (5PT27), Wheatley School (5PT57), and the Aspen Commercial Core Historic District (PT113). No additional actions are required at this time.

Should any evidence of historic or archeological resources be discovered during construction of any of the alternatives, the work will be stopped in that vicinity until a CDOT staff archeologist and the SHPO representative fully evaluate the importance of the resources.

12. Paleontological Resources - no mitigation required

No paleontological resources of significance were found in the areas most recently examined and there is a low probability that any significant paleontological resources will be encountered during the construction phase of this project. If any such resources are uncovered during construction of any of the alternatives, work in the immediate vicinity will cease. The CDOT staff paleontologist will be notified and the material will be evaluated and coordinated with the SHPO.

13. Section 4(f) Resources – no mitigation required

No Section 4(f) "use" or take is anticipated for any of the Build alternatives. No mitigation is required.

14. Farmland Resources – no mitigation required

There is no prime or unique farmland in the Project Corridor. Only, the Rail Alternative may have minor effects on irrigated hayfields which are classified as state-wide important farmland. Potential for impact to 7.28 hectares (18 acres) of irrigated hayfields, state-wide important farmland, has been identified for the Rail Alternative. This represents less than one percent of the irrigated cropland adjacent to the Project Corridor.

BMPs as defined by the NRCS, National Agricultural Land Evaluation and Site Assessment (LESA) Handbook (LESA, 1983) will prevent unnecessary disturbance, or conversion of these lands to nonagricultural uses. Coordination with the NRCS will continue with the completion of Form AD-1006. Alignment details that minimize farmland fragmentation and do not change historic drainage patterns should reduce or eliminate most impacts to irrigated hayfields.

15. Noise and Vibration Impacts – mitigation described below

15.1 Potential for Mitigation of Noise Impacts

Mitigation was investigated for all receivers where the potential for impact or severe impact was identified. Mitigation considerations are general in nature; the purpose being to identify whether or not mitigation is likely to be successful and/or cost-effective in each location. Considerations of mitigation are discussed below, and a recommendation is made as to whether it should be considered further in the design of the proposed facilities. Barriers are evaluated under feasibility and reasonableness criteria. Feasibility deals with the engineering and site considerations that would allow a barrier to be constructed that would yield a substantial reduction (at least 5dBA) of noise levels. Reasonableness is a more subjective criterion, and considers issues as overall noise levels, noise level increases, and cost benefit.

Mitigation recommendations will be further investigated upon alternative selection. Commitments regarding the type and location of noise and vibration mitigation strategies will be made during design. No noise impacts or mitigation are associated with the new Rio Grande Trail.

15.1.1 No Action/Committed Projects Alternative. Except for a receiver site identified in the *Entrance to Aspen FEIS*, no noise impact locations have been identified for this alternative. The LRT warning horn noise was also identified in the previous study as a potential source of noise. Mitigation for the horn noise could come from a different type of horn, e.g., quieter, with a flashing light. A noise berm was discussed for the intersection of 7th and Main Streets in Aspen. Receptor A4 (see discussion below) is the representative sensitive receptor in this segment of the alignment.

Mitigation of impacts at this location is associated with the Entrance to Aspen LRT project portion of the No Action/Committed Projects Alternative.

15.1.2 BRT Alternative. The BRT-Bus sub-alternative will run along the same right-of-way as the proposed LRT in lieu of the LRT. See discussion below in **Section 15.1.4: Project-Related Ancillary Facilities** for mitigation of station noise impacts.

15.1.3 Rail Alternative. A total of 89 receiver sites were identified that satisfied the criteria of impact or severe impact based on the FTA methodology. Discussion of mitigation issues relative to anticipated noise impacts at each receiver site is presented below. A separate study was conducted for the City of Aspen. Twelve monitoring sites have been identified in Table III-43. Individual receiver sites were not identified in the Aspen Study. Sites listed below as A4-A11 are actually monitoring locations that may represent multiple receivers as noted below.

Noise barrier implementation is the result of an analysis for feasibility and reasonableness for each location. Feasibility relates to the potential effectiveness of the mitigation measure based on the ability to minimize the number of openings in a noise barrier and the ability to provide a reduction of at least five decibels. Reasonableness is directly related to cost per receptor. Impacted receivers are grouped below by location. Barrier height is considered to be three meters (ten feet) and costs are estimated at $272 per square meter ($25 per square foot). See discussion below in **Section 15.1.4 Project-Related Ancillary Facilities** for mitigation of station noise impacts.

Receiver R19. This residence is located on School Street in Glenwood Springs. This site is anticipated to have a future level that will be two dBA over the impact criteria. The location receives some shielding from buildings between the RFTA right-of-way and the residence. The estimated cost for a three-meter (ten foot) high barrier, 46 to 61 meters (50 to 200 feet) in length, would be $37,500 to $50,000 for one receptor. This cost is considered marginal to unreasonable. The location of this site on the outside of a curve makes feasibility of mitigation questionable. <u>*Recommendation:*</u> *barrier construction is marginal with further investigation required during preliminary engineering.*

Receiver R28. This residence is located on 11th Street near Glenwood Springs High School. A noise barrier would have a good chance for success given the location 15.2 meters (50 feet) from the RFTA right-of-way. Insertion loss of greater than five dBA should be easily attainable. The site is anticipated to have a future level which will be three dBA over the onset-of-impact criteria and just three dBA over the existing level. The estimated cost for a three meter (ten foot) high barrier, 46 to 61 meters (50 to 200 feet) in length would be $37,500 to $50,000 for one receptor. Although a noise barrier is feasible at this location, the ratio of cost per receptor is marginal to unreasonable. <u>*Recommendation:*</u> *barrier construction is marginal with further investigation required during preliminary engineering.*

Receivers R60 - R70. These receivers are residences located immediately adjacent to the RFTA right-of-way along Park Drive in Glenwood Springs. All receivers except for R70 fall in the severe impact category according to the FTA analysis. Additional second-row receivers would also benefit from the construction of a noise barrier. A barrier would have to be approximately 396 meters (1,300 feet) in length to cover the area. The cost per impacted receiver would be $29,545. <u>*Recommendation:*</u> *barrier construction is probably reasonable.*

Receivers R143 - R145. The receivers are located in the H Lazy F Mobile Home Park immediately adjacent to the RFTA right-of-way and Highway 82. All of the receivers fall within the onset-of-impact category according to the FTA analysis. In fact, their existing noise level associated with Highway 82 (65 dBA) is greater than the projected impact level associated with the operation of rail (62 dBA). The future level associated with the rail operation is one dBA over the FTA onset of impact level. Mitigation has a high likelihood of success in this area; greater than five dBA of insertion loss should be easily attainable. A noise barrier would reduce noise from the rail operations and Highway 82 traffic. It would also provide some reductions for second-row receivers that do not fall within the onset-of-impact category. A barrier would have to be approximately 168 meters (550 feet) in length to cover the area. Cost effectiveness is marginal at $45,830 per receptor since only three of the mobile homes are affected at this location. *Recommendation:* *barrier construction is marginal, with further investigation required during preliminary engineering.*

Receiver R361. This receiver is a single-family residence located just six meters (20 feet) from the RFTA right-of-way. The receiver falls into the severe impact category according to the FTA analysis. A noise barrier has a high likelihood of success in the area; greater than five dBA of insertion loss should be attainable. A second row receiver would also benefit from the reduced noise level. The cost effectiveness of the barrier is marginal, however, since only one receiver is affected. A barrier would have to be approximately 46 meters (150 linear feet) in length to cover the area, at a cost of $37,500. *Recommendation:* *barrier construction is marginal, with further investigation required during preliminary engineering.*

Receiver R387. The receiver represents approximately 17 mobile homes in the Mountain Valley Mobile Home Park adjacent to the RFTA right-of-way in Carbondale. The railroad alignment is located in a cut section adjacent to the mobile home park, hence, the impact may not be as great as anticipated. The future level is forecast to be just one dBA over the onset-of-impact criteria. A noise barrier has a high likelihood of success in the area, and several second-row receivers would also benefit from the noise reduction. The barrier would have to be approximately 381 meters (1,250 feet) in length to cover the area, but it should still be relatively cost-effective at $18,380 per receptor. *Recommendation:* *barrier construction is reasonable, with further investigation required during preliminary engineering.*

Receivers R391 - R409, R419, R420. These receivers include duplexes and single-family residences immediately adjacent to RFTA right-of-way off of Village Road in downtown Carbondale. Receivers R390 to R395 are projected to have future levels of three to four dBA over the onset-of-impact criteria. Receivers R396 to R406 are projected to have future levels over the severe impact criteria. Receivers R407 to R409 are projected to have future levels of one to four dBA over the onset of impact criteria. A noise barrier has a high likelihood of success; greater than five dBA of insertion loss should be easily attainable. In addition, several second row receivers would benefit from the noise reduction. The barrier would have to be approximately 473 meters (1,550 feet) in length in order to cover the area. The cost per impacted receiver would be $18,452. *Recommendation:* *barrier construction is probably reasonable.*

Receivers R424 - R426, R430 - R434. These receivers are single-family residences located off of 8th Street in downtown Carbondale, immediately adjacent to RFTA right-of-way. All receivers satisfy the onset of impact criteria with the exception of R425 and R426, which satisfy the severe impact criteria. A noise barrier has a high likelihood of success; greater than five dBA of insertion loss should be attainable. The barrier would have to be 229 meters (750 feet) in length in order to cover the area. Assuming a three meter (ten feet) high barrier, the cost per receiver would be $23,438. *Recommendation:* *barrier construction is probably reasonable.*

Receivers R442, R443, R445, R447, R448, and R453. These receivers are single-family residences immediately adjacent to the RFTA right-of-way off of 2nd Street in downtown Carbondale. All receivers except R453 fall in the onset of impact category. Receiver R453 falls in the severe impact category. Mitigation has a fairly low chance for success in this area due to access issues that prevent the construction of a continuous barrier. A continuous 152-meter (500-foot) long barrier could be constructed that would provide reasonable insertion loss for receivers R445, R447, and R448. The location of existing streets prevents construction of a continuous barrier for R442, R443, and R453. Cost per receiver for three residences is estimated at $41,660 each. *<u>Recommendation</u>: barrier construction is probably not feasible; further investigation is recommended during preliminary engineering.*

Receivers R454 - R457. These are single-family residences adjacent to RFTA right-of-way at the northern end of 2nd Street in downtown Carbondale. All receivers, except R455 fall into the onset of impact category. R455 barely satisfies the severe impact criteria. Mitigation has a low probability of success unless some access points are closed or altered. A continuous barrier cannot be constructed while maintaining current access locations. If a continuous barrier 183 meters (600 feet) in length could be constructed, its effectiveness would be much greater. A barrier is not feasible based on the existing access situation. Cost effectiveness is marginal at $37,500 per receiver even if a feasible design were found. *<u>Recommendation:</u> barrier construction is probably not feasible; further investigation is recommended during preliminary engineering.*

Receiver R478. This single-family residence is located on County Road 100 south of Carbondale. The receiver falls in the onset of impact category. A noise barrier has a moderate chance of success, but access locations prohibit construction of a barrier long enough to provide substantial insertion loss. Still, a barrier 61 meters (200 feet) in length may be able to achieve five dBA of insertion loss. Such a barrier would not be cost-effective at $50,000 for one receiver. *<u>Recommendation:</u> no barrier.*

Receivers R857 - R859, R861, R862. This cluster of single-family residences is located adjacent to the RFTA right-of-way and just south of the Holland Hills subdivision. All receivers except R861 fall within the onset of impact category, while R861 falls within the severe impact category. A noise barrier has a high chance of success since no vehicular access is provided across the railroad right-of-way in this area. A barrier approximately 290 meters (950 feet) in length would be able to provide over five dBA of insertion loss for all of these receivers. The cost per receiver would be marginal at $47,500. *<u>Recommendation:</u> barrier construction is marginal; recommend further investigation during preliminary engineering.*

Receivers R873, R876, R880, R881, R884, R885, R888 - R892, R902, R903, R906. Each of these receivers is a single-family home located on Lower River Road. Only one of the receivers falls within the severe impact category (R876). All of the other receivers fall within the onset-of-impact category. A noise barrier is not feasible as these receivers are scattered along Lower River Road and none are clustered together. Additionally, access to Lower River Road must be maintained for each site. Costs are marginal to unreasonable per receptor at $37,500 to $50,000 per location. *<u>Recommendation:</u> barriers are probably not feasible.*

Receivers R909, R911 - R913. These receivers are located in the Phillips Mobile Home Park along Lower River Road. All of the receivers fall within the onset-of-impact category. Mitigation has a low to moderate chance of success; however, the location and alignment of Lower River Road results in less than optimal conditions for the placement of a barrier. A noise barrier in this area could benefit some second-row receivers. A barrier approximately 427 meters (1,400 feet) in length would be necessary in order to provide reasonable insertion loss. Such a barrier, would not be cost-effective at a cost of $87,500 per receiver. *<u>Recommendation</u>: barrier is not feasible.*

Receiver A4. Rail transit noise impacts are anticipated to occur at all first-row sensitive receptors (both Category 2 and 3 land uses) on the south side of the alignment on West Main Street, between Maroon Creek Road and 7th Street. Receptor A4 is the representative sensitive receptor in this segment of the alignment. The main reason for the impacts is that the existing noise level in the area is low since existing Highway 82 is relatively distant. However, with construction of the project, the rail alignment would be located approximately 15 feet from receptors on the south side of the street; thus, the rail noise would be much more noticeable compared to the current condition. Traffic noise would also increase significantly in this area because the realigned Highway 82 for the project would be much closer to the sensitive receptors in the area. Six residential structures would be affected within this segment of the alignment. A sound barrier wall or berm, if there is sufficient right-of-way, has been recommended in the *Entrance to Aspen FEIS* and implementation would precede the current project. *<u>Recommendation:</u> no further action related to the current project.*

Receivers A5-A10. On Main Street between 7th and Galena Streets, only Category 2 land uses are anticipated to be affected. Because of the relatively high existing noise levels in this area due to vehicular traffic, even a slight rail transit noise contribution of approximately one dBA would exceed the FTA rail noise criterion for Category 2 land uses. All affected structures are located on the south side of the street, closer to the rail alignment. Included in this category are eight residential structures and five hotels located on the south side of the street, which is the side closer to the proposed alignment. Constructing continuous sound walls, the most effective mean of mitigating traffic noise, would cut off access to businesses and residences along the alignment. The only other possible mitigation measures may be the use of more effective traffic management and planning, and controlling the volume and speed of vehicles passing through town. These measures may be complemented by limiting the number of rail transit operations, particularly during late night-time hours. Effective noise mitigation measures are not feasible or practical in this area due to the locations of the receptors with numerous access openings in close proximity to the project. Cost was not evaluated since a feasible mitigation procedure has not been identified. *<u>Recommendation:</u> barrier is not feasible.*

Receiver A11. Along the alignment on Monarch Street, where only the LRT will operate, the existing noise levels are relatively low. On the east side of the street that is closer to the rail transit alignment, both Category 2 and Category 3 land uses would be affected. The affected structures will include two residential structures, three hotels, and a park located on the east side of the street. Effective noise mitigation measures are not feasible or practical in this area due to the locations of the receptors with numerous access openings in close proximity to the project. The primary reason for the impact is that the future rail transit noise will exceed the FTA criteria, which are based on existing noise conditions. Cost was not evaluated since a feasible mitigation procedure has not been identified. *<u>Recommendation:</u> barrier is not feasible.*

15.1.4 Project-Related Ancillary Facilities. Noise impacts associated with ancillary facilities associated with both the BRT and Rail Alternatives were identified for two receiver sites in downtown Carbondale (R449 and R480), representing nine individual receivers; and at four receiver sites in Basalt (R792 - R795), representing 23 individual mobile homes. Each of these locations was analyzed to determine if mitigation could provide substantial insertion loss at a reasonable cost.

Downtown Carbondale Station. The receivers identified as impacted in this location fall into the onset-of-impact category. None of the receivers are located within 33 meters (100 feet) of the edge of the station location and bus turnaround. Consequently, insertion loss of greater than five dBA will be difficult to achieve without constructing a barrier greater than eight feet in height. There does not appear to be feasible mitigation strategy for this location. Cost was not evaluated since a feasible mitigation procedure has not been identified. *Recommendation: barrier is probably not feasible.*

Basalt Station. The Town of Basalt has committed to redeveloping the mobile home park as part of the *Basalt River Master Plan* because the current park lies in flood danger. The Town has a 100 percent replacement housing policy that will guide redevelopment impacts to the pool of affordable housing. This redevelopment project is expected to occur prior to the implementation of the Basalt Station. In lieu of the town plan, the Basalt Transit Station would impact approximately 23 mobile homes at the Roaring Fork Mobile Home Park. The receivers identified as affected in this location fall into the severe impact category. This location is associated with both the BRT and Rail Alternative. The first row of receivers in the affected mobile home park is located approximately 15 meters (50 feet) from the edge of the bus turnaround associated with the station. *Recommendation: no mitigation necessary at this time.*

15.2 Potential For Mitigation of Ground-Borne Vibration Impacts

15.2.1 No Action/Committed Projects Alternative. No ground-borne vibration impacts will be associated with this alternative.

15.2.2 BRT Alternative. No ground-borne vibration impacts will be associated with this alternative.

15.2.3 Rail Alternative. The potential for vibratory impacts was identified at two receiver locations in the project area (R861 and R876). Both of these receivers were identified previously as falling into the severe impact category for airborne noise. A noise barrier to mitigate airborne noise impacts considered marginal for receiver R861 at Holland Hills and may be considered. No barrier to mitigate airborne noise impacts is recommended for receiver R876 on Lower River Road due to the unreasonable costs per receiver anticipated at that location.

Mitigation of airborne noise for receiver R861 will tend to reduce the potential for vibratory impacts at that location, depending on soil conditions. The recommended barrier should be designed to incorporate vibration-mitigating characteristics by increasing the depth of footers placed for barrier construction and possibly constructing a trench in association with the barrier construction. Vibratory mitigation measures may be necessary in lieu of a barrier at the location of receiver R876. This may include construction of an intervening trench to intercept vibration waves.

Future vibratory impacts at all locations will be managed by appropriate maintenance of the rails and vehicle wheels. Proper maintenance will tend to reduce the level of vibration associated with each of the pass-by events. More specific levels of impact and additional appropriate mitigation measures at these locations will be further investigated during the preliminary engineering phase of project development.

15.3 Potential Mitigation of Construction Noise and Ground-Borne Vibration Impacts

During periods of construction, temporary noise and vibration impacts would occur. There may also be minor cosmetic damages to structures in close proximity in Aspen; however, no building structural damage is expected. The following cultural resource sites may be subject to construction vibration impacts under criteria for fragile historic buildings due to their proximity to the Rail Alternative: the Satank Bridge (5GF1282), Emma School (5PT27), Wheatley School (5PT57), and the Aspen Commercial Historic District (5PT113). See **Section 11: Cultural Resources** in this chapter for additional information on these sites.

The following control measures will be implemented in order to minimize noise and vibration disturbances at sensitive receptors during periods of construction:

15.3.1 Equipment Noise and Vibration Control

1. Use newer equipment with improved noise muffling and ensure that the manufacturers' recommended noise abatement measures, such as mufflers, engine covers, and engine vibration isolators intact and operational on each item. Newer equipment will generally be quieter in operation than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and the presence of noise control devices (e.g., mufflers and shrouding, etc.).
2. Utilize construction methods or equipment that will provide the lowest level of noise and ground vibration impact.
3. Use hydraulic tools instead of pneumatic impact tools, to the extent feasible.
4. Conduct truck loading, unloading and hauling operations so that noise and vibration is kept to a minimum.
5. Turn off idling equipment.
6. Use and relocate temporary noise barriers as needed, to protect sensitive receptors against excessive noise from construction activities. Noise barriers can be made of heavy plywood, or moveable insulated sound blankets.

15.3.2 Administrative Measures

1. Implement a construction noise and vibration monitoring program to limit the impacts.
2. Conduct a detailed pre-construction survey on all historic buildings along the alignment to assess the existing condition and identify cracks and other physical damages.
3. Limit construction activities to weekday daytime hours, 7:00 a.m. to 7:00 p.m. Night-time or late evening construction shall not be allowed near noise sensitive receptors. No noise generating construction activities shall take place on Saturdays, Sundays, and holidays.
4. Plan noisier operations during times of least sensitivity for receptors.
5. Keep noise levels relatively uniform and avoid impulsive noises.
6. Permit truck deliveries and haul-off between only the hours of 7:00 a.m. and 7:00 p.m. Heavy truck routes shall be routed over streets that will cause the least disturbance to residences or businesses in the vicinity of the project site.
7. Maintain good public relations with the community to minimize objections to the unavoidable construction impacts. Provide frequent activity updates on all construction activities
8. Select a combination of mitigation techniques for equipment noise and vibration control as well as administrative measures which, when properly implemented, can provide the most effective means to minimize effects of the construction activity impacts. Application of the mitigation measures will reduce the construction impacts; however, temporary increase in noise and vibration would likely to occur, and building damage may occur due to the close proximity of some buildings.

16. Visual Impacts- no mitigation required after implementation of BMPs

No new or adverse visual impacts are anticipated for the No Action/Committed Projects Alternative. The Trail, the BRT, and the Rail Alternatives will add new visual impacts. The construction of new stations associated with both the BRT and Rail Alternatives will create visual changes in the environment. Retaining walls and bridge structures associated with the Rail Alternative will also alter the viewshed for the area around the improvement.

Best management practice visual impact mitigation measures include but are not limited to:

- revegetation of all disturbed areas with natural species to reduce soil erosion and minimize color contrasts caused by exposed soil surfaces;
- creating slopes that approximately match existing slopes;
- using building materials that approximate the natural tones and textures of the area being traversed;
- using aesthetically pleasing poles, station designs, and embedded track pavement surfacing, where applicable, to reflect and enhance the land forms and character of the area; and
- coordination with local communities of above-mentioned measures.

These mitigation measures would directly benefit the design quality of the BRT and Rail Alternatives. In addition to increased design quality through enhancement of the natural setting, sensitive design and detailing could also enhance the project design quality. Significant sections of retaining walls may be enhanced by the wall layout, texture, color, and vertical profile; this may integrate with the landscape or accent unique natural or historical features, as well as building types and features within the project area.

17. Potential Hazardous Waste Sites - testing and mitigation described below

No additional hazardous waste sites have been identified in association with the No Action/Committed Projects or BRT Alternative. Note that footprints for proposed station locations have not been analyzed for hazardous waste sites. Two sites may be associated with the construction of the new Rio Grande Trail:

Site 9: Surficial soil staining at the 4th Street crossing in Carbondale, and
Site 13: The Former Lumber Yard

Additional sampling with indicated health and safety planning or mitigation should be performed at site 9. No right-of-way is needed in the vicinity of site 13 for the construction of the trail alone; therefore, no additional work is recommended.

Thirty-two potential hazardous waste sites were identified for the Rail Alternative, rail alignment. Of those, ten were eliminated from historic use and interviews. Another 11 sites were sampled and eliminated. Construction was completed and impacts, if any, mitigated for one site under the No Action/Committed Projects Alternative. The remaining ten sites may need sampling during preliminary engineering, health and safety planning, or mitigation during construction. Mitigation measures include sampling of all areas not previously sampled; a health and safety plan for workers, (which includes information on hazardous waste or materials, should they be encountered); dust suppression measures; and a stormwater plan for construction, which includes those sites noted previously with visible staining or contamination. CDOT's standard special provision titled "Section 250 Environmental Health and Safety Management" or equivalent specification would be utilized during construction. See **Section C.2 Water Resources and Water Quality** above for additional information on water quality mitigation.

Additional sampling with indicated health and safety planning or mitigation should be performed at the following sites:

Site 1: West Glenwood to Wye rail storage
Site 9: Surficial soil staining at the 4th Street crossing in Carbondale

Health and safety planning or mitigation should be planned for the following sites, should additional property acquisition be necessary:

Site 3: Fattor Petroleum
Site 5: Amoco Station at 2205 Grand Avenue, Glenwood Springs
Site 13: The Former Lumber Yard
Site 18: The Pitkin County Airport
Site 19: The RFTA Bus Maintenance Facility
Site 20: The Aspen Airport Business Center
Site 21: 435 E. Main Street - Aspen
Site 22: 506 E. Main Street - Aspen

While technically not hazardous waste, domestic sewage systems and/or methane gas from existing sewage systems can pose a hazard. These systems may be encountered where residences closely abut the corridor. Any bridge crossings that may parallel Highway 82 and any railroad bridges crossing waterways will be sampled for lead-based paint prior to any activities that would allow humans or the environment to be exposed. Any bridge that will be removed or reconstructed will be evaluated for the presence of lead paint and, if it is present, appropriate worker and environmental safeguards and protocols will be specified. Expansion or reconstruction of maintenance facilities at West Glenwood Springs, Carbondale and Aspen will require appropriate hazardous waste treatment.

18. Public Safety and Security – no project level mitigation required

Local accessibility may be affected due to poor levels of service at park-and-rides and station locations associated with the No Action/Committed Projects Alternative, as well as the BRT and Rail Alternatives. Congestion solutions will be necessary regardless of the proposed action, because these impacts are also associated with the No Action/Committed Projects Alternative in the same order of magnitude. Implementation of Build alternatives will not noticeably change the levels of service these congested locations. Mitigation possibilities are discussed in **Chapter IV: Transportation Impacts.** Mitigation measures could include implementation of ITS elements, installation of new traffic signals, adjustments to signal timing or the addition of turn lanes. Full intersection studies will be appropriate at heavily congested locations.

Except for the congestion problems noted above, no adverse public safety and security impacts have been identified for any of the project alternatives.

19. Energy Impacts - no mitigation required

No adverse energy impacts have been identified for any of the project alternatives.

20. Construction Impacts - no mitigation required after implementation of BMPs

Types of construction impacts for the No Action/Committed Projects Alternative will be mitigated with BMPs identified for those pre-approved projects. The BRT Alternative does not require construction except for activities associated with station locations and the new Rio Grande Trail. BMPs described for the construction of the Rail Alternative can be applied as appropriate to the BRT and trail.

During the construction of the Rail Alternative, RFTA and CDOT will utilize appropriate traffic management techniques to minimize delays and inconvenience to the traveling public. This may be accomplished through phased construction of the transportation improvements, restricting the timing of construction activities, and limiting traffic stoppages to off-peak traffic hours. Whenever feasible, provisions will be included to minimize effects on RFTA buses. Construction delays will be limited to 20-25 minutes duration whenever possible. Construction activities can have effects on numerous resources as listed below. Implementation of BMPs will minimize these impacts. As with all construction projects, there is no mitigation for perceived inconvenience by the traveling public. Maximized use of BMPs should minimize perceived inconvenience.

20.1 Air Quality

Potential air quality impacts will be mitigated using BMPs, by minimizing construction activities during the critical winter air pollution season, and by pre-wetting cuts and fills when necessary. De-watering techniques reduce fugitive dust associated with construction activities.

20.2 Water Quality

BMPs for mitigation of potential water quality effects include turbidity curtains, sediment traps, straw bales, etc. Maintaining vegetated buffer zones between waters of the U.S. and construction areas also preserves water quality. Additional information on water quality mitigation is found in **Section C.2.1** above.

20.3 Traffic Safety

Traffic safety impacts are related to construction activities next to active traffic lanes. Construction of rail crossings may create conflicts for adjacent roadway traffic. These impacts can be minimized by implementing traffic control measures including signs, pavement markings, barriers, and flagging, as well as increased enforcement of traffic rules.

20.4 Geology and Soils

A balance of earthwork (equal amounts of fill material and cut material) is feasible for the construction of the rail and trail alignments. Additional information and BMPs for geology and soils effects are found in **Section C.4** above.

20.5 Noise and Ground-Borne Vibration

Details on mitigation of construction noise effects are found in **Section C.15.3** above.

20.6 Utilities

Relocation of utilities that might conflict with construction activities will preclude any adverse effects on the utilities. Both underground and overhead utilities may be affected.

20.7 Hazardous Waste Sites or Construction-Created Spills

Construction in potential hazardous waste areas described in **Section C.17** above will include implementation of dust suppression and worker protection programs. Mitigation will follow appropriate state and federal guidelines. Newly-identified sites or construction-created spills will be investigated and mitigated as appropriate.

20.8 Traffic Patterns

When construction activities conflict with existing traffic, several techniques will be utilized to minimize delays. These include:

- establishment of detours adjacent to work zones on Highway 82 to allow continuous traffic flows outside the work area;
- inclusion of specifications in construction contracts to prohibit traffic stoppages during the morning and evening commuter and tourist (peak) periods;
- inclusion of specifications in construction contracts that do not allow any traffic stoppages for longer than a specified number of minutes (20-25), with a penalty clause to the contractor for violation;
- provision for traffic control coordination between construction projects or work zones to ensure that cumulative traffic delays are minimized;
- specifying night construction periods when appropriate to minimize interference with traffic;
- use of local radio and newspaper notices to inform local commuters of specific construction activities that could result in traffic delays and to recommend ways to avoid them;
- inclusion of construction specifications that minimize the stoppage of RFTA buses and provide the opportunity to allow the buses to proceed to the front of construction traffic delay queues;
- inclusion of construction specifications that avoid the stoppage of emergency vehicles and allow the emergency vehicles to proceed to the front of construction traffic delay queues;
- encouragement of car and van pooling, and use of expanded bus service to promote increased usage of high occupancy vehicles;
- establishment of contract incentives for early completions of critical work; and
- establishment of contract penalties for delays in completion of critical or specialty work.

These traffic management techniques have been used successfully on many projects to minimize the inconveniences of construction. Traffic management will be a primary consideration in assessing the planning, design, and construction phases to ensure that traffic is safely and efficiently maintained.

D. SUMMARY OF MITIGATION LEVELS REQUIRED

Table VII-2 summarizes mitigation levels by resource category.

Table VII-2
Mitigation Level Summary Table

Environmental Resource Category	No Mitigation Required	No Mitigation Required with Best Management Practices	Mitigation Required
SOCIAL ENVIRONMENT			
1. Neighborhood Impacts	X		
2. Relocation and ROW			X
3. Environmental Justice			X
4. Services	X		
5. Recreation	X		
6. Land Use	X		
ECONOMIC ENVIRONMENT			
1. Economic Base	X		
2. Commercial growth Trends	X		
3. Employment	X		
4. Income and Housing	X		
5. Financing	X		
PHYSICAL ENVIRONMENT			
1. Air Quality	X		
2. Water Quality		X	
PHYSICAL ENVIRONMENT			
3. Floodplains		X	
4. Geology and Soils		X	
5. Upland and Floodplain Vegetation		X	
6. Wetlands			X
7. Fisheries		X	
8. Wildlife		X	
9. Wild and Scenic Rivers	X		
10. Threatened & Endangered Species		X	
11. Cultural Resources	X		
12. Paleontological Resources	X		
13. Section 4(f) and 6(f) Resources	X		
14. Farmlands	X		
15. Noise and Ground-Borne Vibration			X
16. Visual Character		X	
17. Potential Hazardous Waste Sites			X
18. Traffic Safety	X		
PHYSICAL ENVIRONMENT			
19. Energy	X		
20. Construction		X	
Total Resources Requiring Mitigation	17	9	5

VIII. FINANCE

A. CAPITAL COSTS

This section describes capital cost estimating methods and compares the results for each of the CIS alternatives.

1. Cost Estimating Methods

1.1. General Approach

Capital cost estimates for the CIS alternatives have been prepared in accordance with the FTA *Guidance for Transit Financial Plans* and the *Intelligent Transportation Systems (ITS) Joint Program Unit Cost Database*. Some costs for the ITS elements were also derived from the Denver Regional Transportation District's Guidance Manual. Localized rates for cost escalation for construction and right-of-way elements take into account experience from CDOT Region 3 and RFTA.

1.2 Unit Costs

Detailed unit-cost estimates for major capital cost elements were originally prepared as part of the supporting technical analyses for this project in January 2001. These unit costs have been supplemented with subsequent technical analyses for transit center and park-and-ride costs, ITS costs, and transit vehicle costs. Costs have been adjusted to year 2002 dollar amounts, unless otherwise stated. A detailed description of unit costs can be found in the *Glenwood to Aspen CIS/EIS, Financial Technical Memoranda*, dated December 17, 2002, noted in Chapter **X: Availability of Technical Reports**.

1.3 Localized Cost Analyses

Based on the unique operating conditions in the Roaring Fork Valley (e.g. high altitude, heavy snowfall, wide seasonal temperature variations, etc.), the planning team completed localized cost analyses for transit centers, park-and-rides, bus maintenance facilities, ITS elements, and transit vehicle purchases.

Park-and-ride and transit center costs were prepared based upon preliminary project assumptions regarding number of parking spaces provided, transit center design (e.g., existing, new, upgraded), transit facility assumptions (stop only, canopy shelter, benches, etc.), provision of a pedestrian undercrossing of the adjacent highway, and number of bus bays.

Maintenance facility costs take into account the results of a recently-constructed facility in West Glenwood Springs, and converted actual costs into unit costs per square foot to estimate the cost of new facilities.

ITS elements including queue bypass lanes, transit signal optimization, transit/HOV priority systems, AVL system, bus scheduling systems, automated fare collection systems, video surveillance, permanent traffic data collection station, and incident management program were specifically evaluated for the CIS alternatives.

Transit vehicle acquisition assumptions for the cost of purchasing new vehicles, salvage value from existing vehicles, and the timing of vehicle purchases were prepared after conducting a detailed analysis of transit patronage and overall RFTA operating system requirements.

1.4 Rio Grande Trail

Construction of the Rio Grande Trail is included in all of the Build alternatives. Trail construction costs at build-out are estimated at $30 million, assuming construction of a trail that runs parallel to the rail tracks along the full length of the RFTA right-of-way. Construction of the trail would likely be phased in a manner to reduce near-term costs. Actual construction phasing will depend upon available local, state, and federal funding levels.

1.5 Levels of Uncertainty

Cost estimates are considered to be at the conceptual stage in project development, and will be refined as the project moves into preliminary engineering and final design. Therefore, a detailed cash flow model has been prepared to allow for changes in capital cost elements regarding the timing of capital investments, transit vehicle purchases, and capital cost escalation rates. A detailed description of the cash flow model can be found in the *Glenwood to Aspen CIS/EIS, Financial Technical Memoranda*, dated December 17, 2002, noted in Chapter **X: Availability of Technical Reports.**

2. Cost Estimation Results

Table VIII-1 summarizes the capital cost estimates for the Build alternatives. The capital cost estimates shown in Table VIII-1 are intended to reflect major construction and right-of-way cost elements and transit vehicles sufficient to accommodate projected year 2008 ridership levels. Capital funding contingencies have been budgeted into all estimates for construction costs, including materials, labor, rolling stock, right-of-way, design, and permitting. A capital cost contingency of 20 percent has been used at this stage of planning.

Table VIII-1:
Summary of Capital Cost Elements – Year 2008 Operations*
(Millions, adjusted to 2002 Constant Dollars)

	BRT/Bus	BRT/LRT	Rail	Notes/Sources within the Technical Memoranda
ROW & relocations (main line)	$ 0.0	$ 0.0	$ 14.6	MK Centennial memo, 11/23/98
ROW & relocations (stations)	1.2	1.2	1.2	MK Centennial fax, 8/18/99
Civil construction	6.9	6.9	128.0	MK Centennial spreadsheet, 8/2/99
Stations/transit centers/ park-and-ride facilities	20.7	16.6	20.1	Otak spreadsheet, 6/26/02
Feeder/collector stops	0.5	0.5	0.5	MK Centennial spreadsheet, 8/2/99
Vehicles (mainline)	39.1	37.0	124.9	TDA Technical Memo, 12/09/02
Vehicles (feeder)	2.9	3.5	3.2	TDA Technical Memo, 12/09/02
Maintenance facilities	19.3	18.3	5.6	TDA Technical Memo, 12/09/02
ITS applications	11.6	11.6	8.5	Carter-Burgess Draft Report, 7/26/02 (rail estimate excludes queue bypass and transit/HOV priority system costs)
Total**	**$102.2**	**$ 95.6**	**$ 306.6**	

* *Assumes annual escalation rate of 3.1% for capital projects and fleet purchases, and 9.0% for right-of-way.*

*** Costs do not reflect construction of new Rio Grande Trail, which is included in all Build alternatives at a cost of $30 million*

2.1 No Action/Committed Projects Alternative

This alternative assumes current RFTA bus service is enhanced with specific projects identified in the RFTA Transit Development Plan (LSC Consultants, 2002), CDOT State Transportation Improvement Program (CDOT, 2003), and the RFTA founding IGA (RFTA, 2000). The No Action/Committed Project alternative is described in detail in **Chapter II: Alternatives**.

The Entrance to Aspen LRT or busway link has been documented in the *Entrance to Aspen FEIS* (FHWA, 1997). The project assumes construction of a locally-funded LRT or busway between downtown Aspen and the Pitkin County Airport, the site of a park-and-ride facility and transfer station. The LRT project is estimated to cost $71 million (in 2001 dollars) for transit capital improvements.

The Aspen LRT or busway link is assumed to be funded by existing voter-approved funding sources, including the existing Pitkin County one-half percent sales and use tax, and Aspen paid parking and general fund revenues. Potential RFTA operational savings combined with farebox revenues are expected to cover any change in LRT annual operations costs over and above the cost of existing bus service between the airport and downtown Aspen.

2.2 BRT-Bus Alternative

This alternative is estimated to cost approximately $60.2 million to construct (excluding the cost of the new Rio Grande Trail) plus another $42 million for purchase of transit vehicles. Major capital cost elements include civil construction at $6.9 million; construction of transit stations/centers, park-and-rides and stops at $21.2 million; maintenance facilities at $19.3 million; ITS applications at $11.6 million, and right-of-way acquisition at $1.2 million.

2.3 BRT-LRT Alternative

This alternative is estimated to cost approximately $55.1 million to construct (excluding the Rio Grande Trail) plus another $40.5 million for purchase of transit vehicles. Major capital cost elements include civil construction at $6.9 million; construction of transit stations/centers, park-and-rides, and stops at $17.1 million; maintenance facilities at $18.3 million; ITS applications at $11.6 million; and right-of-way acquisition at $1.2 million.

2.4 Rail Alternative

The Rail Alternative is estimated to cost $178.5 million to construct (excluding the new Rio Grande Trail) plus an additional $124.9 million for rail vehicles and $3.2 million for buses. In addition to the cost of rail vehicles, the major capital cost elements include civil construction of track beds and support structures at $128 million; transit stations/centers, park-and-rides, and stops at $20.6 million; maintenance facilities at $5.6 million; ITS applications at $8.5 million; and right-of-way acquisition at $15.8 million.

2.5 Trail

Construction of the Rio Grande Trail is included in all of the Build alternatives. The trail is contained within the RFTA right-of-way from its connection to the Glenwood Springs River Trail at 23rd Street in Glenwood Springs to its connection to the existing Rio Grande Trail at Woody Creek in Pitkin County. The ultimate cost of the trail when sharing portions of the RFTA right-or-way with the Rail Alternative is estimated at $30 million. This cost is associated with the need for a larger total cross section and safety considerations for the shared right-of-way.

If the Rail Alternative is not selected, the trail could initially be constructed for as little as $4.5 million. This savings results from a reduction in the total typical section required in the RFTA right-of-way and the elimination of safety considerations for a shared right-of-way. It also allows the trail to utilize the rail bed to avoid environmental impacts that could create added costs, such as geological hazards and wetland areas. If the Rio Grande Trail were to be constructed in this manner, any future use of the RFTA right-of-way for rail would include the cost of relocating the trail.

2.6 Comparative Discussion

There are slight differences between the two BRT alternatives that account for the $6.6 million variation in capital costs. These differences relate to the assumption under the BRT-LRT Alternative that the Entrance to Aspen LRT system is in place and carrying passengers from Buttermilk Ski Area to Rubey Park in downtown Aspen. The BRT-Bus Alternative includes the cost of transit centers that would have to be built in the absence of the LRT system. The BRT-Bus Alternative is also expected to require a slightly higher investment in main line rolling stock and related maintenance facility requirements to account for bus operations between Buttermilk and Rubey Park.

The Rail Alternative assumes a completely new transport mode (rail), with an integrated feeder bus system. As such, this alternative would require the highest investment in right-of-way, capital construction, and rolling stock. The potential to utilize committed investments associated with the Entrance to Aspen LRT project is expected to help lower required maintenance facility costs for this alternative.

3. Implementation Schedule

The conceptual implementation and phasing schedule assumes the following:

- Year 2004 preliminary engineering
- Year 2005 final design and permitting
- Year 2006 project construction
- Year 2007 project completion
- Year 2008 first full year of project operation

Please refer to **Section H** of this chapter for additional discussion on implementation.

B. OPERATIONS & MAINTENANCE (O&M) COSTS

1. Cost Estimating Methods

Operations and Maintenance (O&M) costs for existing RFTA transit serves as the basis for the O&M cost analysis for the No Action/Committed Projects and BRT alternatives. RFTA O&M costs are updated annually and documented in annual budget reports. The *2002-2003 Transit Development Plan Update* (RFTA, 2001), provides additional detail on RFTA O&M expenses and near-term service commitments. Rail O&M costs were derived from comparable cost comparisons with

Denver's Regional Transportation District (RTD) experience, and compared to other rail systems in the United States to account for differences between LRT and DMU rail transit technologies.

The method used to determine O&M costs for the alternatives generally included the following steps:

1. Confirm policy service levels.
2. Determine ridership projections.
3. Determine trunk and feeder routes and service hours.
4. Determine rolling stock requirements.
5. Estimate operating hours and unit costs (cost per hour).
6. Factor in policy headways, schedule assumptions, operating speeds, peak hour passenger loads, employment estimates, and maintenance facility requirements.

2. Existing RFTA O&M Costs

Budgeted O&M expenses for the 2002 fiscal year include $12.18 million in basic O&M expenses and an additional $422,000 in other operating expenses, for a total of $12.6 million.

3. O&M Costs for CIS Alternatives

Future O&M costs take into account existing and forecast transit ridership and service level goals. This assumption is important because it takes into account an adopted Entrance to Aspen TM program for "limiting vehicles in 2015 to levels at or below those of 1994."

Table VIII-2 summarizes the major operating expense items for each alternative. Annual O&M costs (excluding debt service) at the end of year 2008 are forecast to be $17.9 million for the BRT-LRT Alternative, $20.9 million for the BRT-Bus Alternative, $21.7 million for the No Action/Committed Projects Alternative, and $29 million for the Rail Alternative.

Table VIII-2
Annual O&M Costs by Alternative
Forecast Year 2008 (constant 2002 dollars in millions)

Expenditures	Base ('02)	No Action/ Committed Projects	BRT/Bus	BRT/LRT	Rail
Local Service	$ 4.5	$ 5.3	$ 5.3	$ 5.3	$ 5.3
New Local Service	0.0	0.0	4.4	3.6	9.4
Regional Service	7.1	14.9	9.7	7.5	12.8
Other	1.4	1.5	1.5	1.5	1.5
Subtotal O&M	**13.0**	**21.7**	**20.9**	**17.9**	**29.0**
Capital (debt)	1.7	3.8	6.0	5.8	12.9
Total	**$ 14.7**	**$ 25.5**	**$ 26.9**	**$ 23.7**	**$ 41.9**

3.1 No Action/Committed Projects Alternative

The No Action/Committed Projects Alternative includes significant fixed-guideway improvements between Pitkin County (Buttermilk station) and downtown Aspen in conjunction with CDOT improvements to Highway 82, as described in the *Entrance to Aspen FEIS*. The RFTA bus ridership forecast includes person-trips shifted from the automobile to transit to achieve the "zero" traffic growth policy objectives, as described above.

O&M costs for the No Action/Committed Projects Alternative are projected to increase from $13.0 million during 2002 (base year) to $21.7 million in 2008 (in constant 2002 dollars). Annual debt service combined with O&M is forecast to increase annual obligations to $25.5 million. As indicated in Table VIII-2, the major operating expense items for this alternative during year 2008 include new regional trunk service described in the RFTA IGA ($14.9 million) and local O&M contract service ($5.3 million). Annual capital financing requirements are estimated to include an additional $3.8 million.

3.2 BRT-Bus Alternative

This alternative assumes construction and operation of a new Bus Rapid Transit trunk system between West Glenwood Springs and Buttermilk, with a dedicated busway from Buttermilk to Aspen.

O&M costs for this alternative are projected to increase from the baseline of $13.0 million during 2002 to $20.9 million in 2008 (without debt service) in constant 2002 dollar amounts. As indicated in Table VIII-2, major operating expense items include regional service ($9.7 million), local O&M contract service ($5.3 million), and new local service ($4.4 million). Annual capital financing requirements are estimated to add another $6.0 million.

3.3 BRT-LRT Alternative

This alternative assumes construction and operation of a new Bus Rapid Transit trunk system between West Glenwood Springs and Buttermilk, with a transfer to LRT service between Buttermilk to Aspen.

O&M costs for this alternative are projected to increase from the baseline of $13.0 million during 2002 to $17.9 million (excluding debt service) in constant 2002 dollars. As indicated in Table VIII-2, the major operating expense items include regional service ($7.5 million), local O&M contract service ($5.3 million), and new local service ($3.6 million). Annual capital financing requirements are estimated to include an additional $5.8 million.

3.4 Rail Alternative

This alternative assumes construction and operation of a new rail system between West Glenwood Springs and Aspen. The rail system would include DMU vehicles which could operate with mixed LRT service between Buttermilk and Aspen. Since this alternative would eliminate the need for large articulated (65 passenger) buses, it would require fewer buses than is assumed under any of the other project alternatives.

O&M costs are projected to increase from the baseline of $13.0 million to $29.0 million by year 2008 (excluding debt service) in constant 2002 dollar amounts. As indicated in Table VIII-2, major operating expenses include regional service ($12.8 million), new local bus service ($9.4 million), and local contract service ($5.3 million). Annual capital financing requirements are estimated to include an additional $12.9 million.

3.5 Comparative Discussion

The BRT-LRT and BRT-Bus alternatives are forecast to achieve relatively comparable annual O&M costs of approximately $17.9 and $20.1 million, respectively by year 2009 (excluding annual debt service). This $2.2 million difference in annual O&M costs between the two BRT alternatives is attributed primarily to the difference in route termini for the alternatives. BRT-Bus terminates at Rubey Park in downtown Aspen. BRT-LRT terminates at the Buttermilk Transit Center. The O&M cost of moving passengers between Buttermilk and Aspen under this alternative is assumed to be an element of the Entrance to Aspen LRT system.

The No Action/Committed Projects Alternative is forecast to have an O&M cost comparable to the two BRT alternatives. Forecast annual ridership for the No Action/Committed Projects alternatives in 2008 is 1.48 million boardings, compared to 3.89 million boardings for BRT-LRT and 4.78 million boardings for BRT-Bus. Thus the cost per boarding for the No Action/Committed Projects Alternative is significantly higher than the other alternatives using bus technology.

The Rail Alternative emerged as the most expensive action alternative, with a forecasted annual O&M cost of $29 million (excluding debt service). In addition to requiring a completely new regional rail system for operations, staffing and maintenance, the Valley-wide rail service would also require the most extensive feeder bus service network.

C. EXISTING O&M REVENUES

A breakdown of RFTA transit revenues for year 2002 is provided in Table VIII-3. Major components of O&M revenue include farebox revenues, service contracts, and sales and use tax revenues.

Table VIII-3
RFTA Annual Operating Revenue

Expenditures	2002 Budget	Percent of Total
Pitkin County Sales and Use Tax Revenues	$ 4,148,030	30%
Other RFTA Sales and Use Tax Revenues	2,029,590	15%
Service Contract Revenues	4,406,410	32%
Farebox Revenues	2,724,750	20%
FTA Section 5311 Operating Assistance Grant	172,800	1%
Housing Rental Revenue	107,580	1%
Other Operating Revenue*	207,040	1%
Total Operating Revenue	**$ 13,796,200**	**100%**

** includes federal, state, and local grants; advertising, and interest revenues.*

1. Farebox Revenues

RFTA service contracts with the City of Aspen and the Aspen Skiing Company generate the majority of contract revenues. Farebox revenues (including local service contracts) are expected to generate $7,223,000 during year 2002. Farebox revenues (excluding service contracts) generate approximately $2.7 million in revenue. Most of these revenues are collected for regional service in the Project Corridor. Forecast farebox revenues for the analysis are conservatively estimated at 36 percent of operating costs for the routes described for all of the Build alternatives.

2. Non-Farebox Revenues

2.1 Sales and Use Taxes Dedicated to Transit

RFTA's primary source of funding is derived from sales and use tax revenue. Regional sales and use taxes are expected to generate about $10.5 million in dedicated transit revenue during 2002. Current sales and use tax authority limits are discussed below.

2.1.1 Pitkin County Transit Sales and Use Taxes. Pitkin County levies a total of 1.5 percent in transportation sales and use taxes (including a one percent sales tax and a 0.5 percent sales and use tax), of which 0.7125 percent (approximately 48.1 percent of the total collected) is paid to RFTA. These funds are subordinate to, and applied towards, debt issued by the County for assets transferred to RFTA. This debt payment is approximately $1 million annually.

2.1.2 RFTA Sales and Use Tax. Pursuant to Title 43, Article 4, Part 6, Colorado Revised Statutes and subject to voter approval, RFTA is empowered to levy a sales tax rate up to a maximum of one percent. The Colorado Department of Revenue has determined that this does not include sales tax on automobiles sold within the RFTA taxing area that are registered outside of the taxing area. The RFTA September 12, 2000 IGA specifies that a portion of the maximum rate (subject to voter approval) may be collected as follows:

- 0.4 percent in the City of Glenwood Springs
- 0.5 percent in the Town of Carbondale, with 0.1 percent dedicated to improvements within the Town of Carbondale
- 0.2 percent in the Town of Basalt

Voters approved these rates in November 2000.

2.1.3 Eagle County 0.5 percent Transit Sales Tax. Eagle County currently levies a 0.5 percent transit sales tax rate, and pays to RFTA the portion collected within the Eagle County portion of Basalt and unincorporated areas of Eagle County within the RFTA service area. Ten percent of the amount collected from the Eagle County sales tax is dedicated to trails within Eagle County.

2.2 Historic and Projected Growth in Sales and Use Taxes

As a destination location for both in-state and out-of-state residents, communities within the Roaring Fork and Colorado River Valleys attract significant levels of retail sales. According to the State of Colorado Department of Revenue, retail sales in the Roaring Fork Valley amounted to $1.26 billion during year 2001, as shown in Table VIII-4. From 1991 through 2001, taxable retail sales within the RFTA boundaries grew by an annual average of 6.7 percent, and varied from 3.1 percent (2000 to 2001) to 10.2 percent (1992 to 1993). For forecasting purposes, it is estimated that taxable sales will grow at the rate of inflation plus population growth (approximately 1.3 percent annually), for a combined annual nominal growth rate of 4.4 percent.

Table VIII-4
Retail Sales, 2001

Jurisdiction	2001 Retail Sales	Jurisdiction	2001 Retail Sales
Aspen	$ 377,945,300	Garfield County	$ 44,663,724
Pitkin County	109,587,900	Glenwood Springs	376,465,034
Snowmass Village	105,435,300	New Castle	11,678,000
Basalt	61,938,241	Rifle	49,241,000
Eagle County	50,006,600	Silt	11,755,000
Carbondale	61,425,172	Garfield County	44,663,724
Total 2001 Retail Sales			**$1,260,141,271**

Source: State of Colorado Department of Revenue (Does not include automobile sales that are registered outside of the RFTA taxing area).

Table III-8 includes all sales for select areas.

2.3 Other Local Revenue Sources

Miscellaneous RFTA revenue sources include housing rental revenues; advertising revenue; federal, state, and local grants; and interest income. These sources are expected to generate $331,000 in revenue during 2002.

3. Federal O&M Revenue Sources

Federal revenue sources include FTA Section 5311 Operating Assistance grants, which are expected to amount to $172,800 during 2002. Federal funding for transit operations is not anticipated to be a stable or reliable source of funding in the future.

D. CAPITAL AND OPERATING SHORTFALLS

The method for forecasting capital and operating funding shortfalls takes into account the estimated capital funding requirements for the Build alternatives as described in **Section A.2**, existing local funding sources, cost escalation rates, RFTA budget authority, and RFTA/Pitkin County debt service obligations.

1. Existing Sources of Capital Funding

Existing capital funding sources include Pitkin County bond proceeds and other local, state, and federal funding, together with service contracts with the Aspen Skiing Company.

In year 2000, Pitkin County voters approved $10.2 million in Transit Revenue Bonds for the purpose of supplementing existing debt authorization of $8.1 million and other local, state, and federal funding to accomplish the following projects:

- Participate with CDOT in the completion of the improvements to Highway 82 from Buttermilk to 7th and Main Street in Aspen, including a cut-and-cover tunnel, new bridges over Maroon Creek, and realigning the highway to connect directly with the 7th and Main Street intersection;
- $7 million in Snowmass Village transportation improvements;
- $1.5 million for safety improvements to Pitkin County bus stops; and
- $7.5 million for buses, maintenance facility improvements, and affordable housing for RFTA.

In recent years, RFTA and the Aspen Skiing Company have negotiated capital contributions of approximately $330,000 to cover a portion of depreciation and bus replacement expenses associated with bus vehicle expenses.

2. Debt Service

RFTA's current payments for debt service are approximately $1 million annually. These payments are for Pitkin County debt issued for assets transferred to RFTA, and are funded by sales tax revenues generated in Pitkin County. Debt service payments are anticipated to decline to approximately $700,000 in 2007 due to a portion of existing debt being retired. The existing debt is fully retired by 2015.

The Pitkin County sales tax revenues dedicated to RFTA (excluding the portion of sales taxes split between Aspen and Snowmass Village) total about $4.1 million, and provide a coverage ratio in excess of four to one compared to debt service. Total RFTA sales tax revenues for regional purposes total about $6.2 million, and provide a coverage ratio in excess of a 6 to 1 coverage ratio.

Based on current revenues and payments, debt coverage ratios of 1.5 to 2.0 would allow debt service payments of $3.1 to $4.1 million annually. After subtracting existing debt payments of $1 million, the remaining debt service would roughly provide for $21 to $31 million of net debt proceeds.

E. ADDITIONAL REVENUE SOURCES

Historically, state and federal sources funded the largest share of regional highway improvements and also provided funding for transit operations and construction. In recent years, state and federal sources have been shrinking nationally as revenues have been constrained and competing demands for infrastructure investment heightened. Selecting an alternative and committing local revenues will be essential to attracting the maximum amount of state and federal funding. Regardless of the level of potential federal and state funding, new revenue sources will be required to fund capital requirements of the Build alternatives. This section describes potential federal, state, and local funding sources and anticipated funding amounts.

1. Federal Funding

Federal grants, particularly FTA Section 5309 New Start grants, are an important source of funding for fixed-guideway transit systems such as LRT and BRT. Federal funding for transit-related capital improvements has declined in its proportion of total project costs from up to 85 percent in the 1970s and 1980s to a much lower share of project costs today. In recent years, increased competition for available federal transit grants has raised the non-federal share of most fixed-guideway transit construction financing to 50 percent or more. Fixed-guideway projects are now subjected to high levels of scrutiny by FTA, which has improved cost-effectiveness and quality of projects nationwide. Local agencies are required by FTA to secure local matching revenues and to identify local operating revenues prior to any approval of transit systems constructed with federal grants.

At this stage in the conceptual planning process, it is assumed that the Build alternatives would be eligible for a 50:50 federal/non-federal match using FTA Section 5309 New Start grant funding. Potential non-federal funding sources are described below.

2. Non-Federal Funding Sources

2.1 State Funding

The precise amount of CDOT and federal funding is not known at this time. At this stage in the conceptual planning process, it is assumed that the 50 percent non-federal funding match will split evenly between local and state funding sources.

2.2 Local Funding

During the course of the CIS, and the *Entrance to Aspen FEIS*, a great deal of information regarding funding sources has been collected and related financial analysis conducted. On the basis of this work, each of the following funding sources has been explored as they may relate to funding for the Build alternatives:

- Sales-based revenue (additional sales and use tax revenue)
- Real Estate-based revenues (impact fees, developer contributions, joint development, station leases, corporate/private donations)
- Property value-based revenues (property tax levy, special assessment districts)
- Use or service charge-based revenues (visitor use/service fee, vehicle registration fee, passenger facility charges, fare structure, highway user fee)

The local funding sources identified in Table VIII-4 have the potential of generating between $14 and $24 million annually, if approved by local voters and/or jurisdictions. This amount of annual funding could be used to finance a capitalized value of between $126 and $204 million in debt service.

Table VIII-5 provides a summary evaluation of local revenue sources that are available for funding transportation improvements. The table indicates that there are a wide variety of revenue sources available, in addition to the existing public revenues dedicated to transit by the local governments. Although most of the revenue sources could be adopted unilaterally by each jurisdiction in the Project Corridor, a regional approach to funding would be more beneficial, assuring a broad revenue base and improving equity considerations.

Table VIII-5 also provides an estimate of current funding potential for each of the local funding sources presented. The amounts quoted are based upon current underlying economic activity or tax base and an assumption regarding a levy. Review of this information indicates a substantial amount of funding potential in the Project Corridor is available within reasonable limits on tax or cost burdens placed upon businesses, visitors, and residents of the Project Corridor. The numbers are all expressed in constant (2002) dollars of purchasing power.

Table VIII-5
Possible Local Funding/Revenue Sources, 2005-2020

Source/Mechanism	Annual Revenue Potential	Total Capitalized Revenue Potential	Application (capital, O&M, or both)	Local Logistical Issues
Sales tax increase*	$8M to $10M	$72M to $91M	Both	Public vote required
Development impact fees	$1M to $2M	$9M to $18M	Both	Local support is critical; legal issues
Special assessment districts	$250K to $500K	$3M to $5M	Both	Local support is critical; legal issues
Developer contributions	$500K to $2.0M	$2M to $8M	Capital	Usually associated with developer benefits
Corporate/private donations	$500K to $1.0M	$2M to $4M	Capital	Requires establishment of 501-c3 non-profit entity
Station area lease revenues	$250K to $500K	$2M to $5M	Both	Requires RFTA land ownership
Visitor use tax	$1M to $3M	$9M to $27M	Both	May include "tax" on lodging beds, ski lift tickets or greens fees
Property tax levy	$1.5M to $2.5M	$14M to $23M	Both	Public vote required (Amt. = +/-$23/yr per $250k home)
Vehicle registration fee	$400K to $450K	$3.6M to $4.1M	Capital	May have associated costs
Airport passenger facility charges	$1M to $2M	$9 to $18M	Capital	Usually for airport-related facilities only
Total	**$14M to $24M**	**$126M to $204M**		

Other Potential Funding/Financing Sources:

- Eagle County Sales and Use Tax
- 501(c)3 formulation for tax deductible donations for pathway construction
- Enhanced advertising
- Turn-key construction (e.g. design/build/finance)
- Issuance of Certificates of Participation
- Cross-border leasing of capital assets

**Revenues adjusted to exclude additional sales tax revenues available to Pitkin County that would be used to finance the Aspen to Pitkin County LRT project.*

2.3 Sales-Based Activities Revenues

Sales-based activities revenues are derived from the purchase of retail goods, lodging, and other items. At the present time, sales and use taxes are the largest single revenue source for local governments in the Project Corridor.

The economic base of sales-based revenues includes expenditures by visitors, residents, and employees. Each of these sources represents a different aspect of the local economy and has unique characteristics regarding expenditure profile, growth potential, and response to infrastructure improvements. The largest portion of sales is currently derived from short-term visitors whose expenditures include short-term lodging, retail goods, equipment rentals, and food. These expenditures are not only the basis of the largest public revenue source but are also nearly the entire basis of the local economy – the businesses and employers who are located in the Roaring Fork Valley.

In addition to projected growth in existing RFTA sales tax revenues, increased sales tax revenues are possible. The tax levies could be phased, depending on the actual costs and timing of the selected alternative. The taxes include any additional sales taxes not described above would require legislative authority, in addition to voter approval. No estimate has been made of the potential for this revenue source, due to its uncertainty.

2.3.1 Increase in RFTA Sales and Use Tax. Subject to voter approval, RFTA is authorized to levy up to the maximum of a one percent sales and use tax rate within its boundaries. One source would be an increase in the tax rates currently specified in the IGA, approved by voters and currently levied by RFTA in Glenwood Springs, Carbondale, and Basalt. Up to a maximum of an additional $3 million annually could be collected (based on 2001 taxable sales), plus future growth.

2.3.2 Additional Authority Sales Tax from Other RFTA IGA Participants. Other participants in the RFTA IGA currently dedicate a portion of a county transit tax. These jurisdictions could vote to levy up to a one percent RFTA sales and use tax rate in Aspen, Snowmass Village, and unincorporated portions of Pitkin County and Eagle County, contingent upon voter approval. This could add an additional $5.3 million annually, plus future growth.

2.3.3 Additional Authority Sales and Use Tax from Non-IGA Participants. Subject to voter approval, RFTA could levy up to a one percent sales and use tax rate on areas within RFTA's boundaries that currently do not participate in funding specified in the IGA, but who receive transit service from RFTA. These include Rifle, New Castle, Silt, and unincorporated portions of Garfield County, for a total of $1.1 million annually, plus future growth.

2.3.4 Additional County-wide Transit Sales Tax from IGA Participants. Pitkin County and Eagle County are authorized by state law to levy an additional 0.5 percent sales tax rate county-wide. This additional rate would add $3.2 million annually, plus future growth. A substantial portion of the Pitkin County revenue, or $2.9 million in potential annual revenue, may be required for the Aspen to Pitkin County link project, and therefore unavailable for the Build alternatives.

2.3.5 Additional County-wide Transit Sales Tax from Non-IGA Participants. An additional tax rate of 0.5 percent within the RFTA portion of Garfield County would add an estimated $1.1 million annually, plus future growth.

2.4 Real Estate Development-based Revenues

Real estate development-based revenues are derived from development as it occurs. All sources depend directly upon development activity and the underlying real estate market. A wide range of public revenues can be derived from development as it occurs, including impact analysis-based mitigation measures (exactions), ordinance-based impact fees, and land-secured assessments and bonds. All of these funding sources can be used to pay for public infrastructure required or used by new development.

There is an economic limit to development-based sources. Since in all cases these funding sources are a "cost" to development projects, they must be "internalized" into project economics. At some point project costs will exceed an amount that permits a reasonable economic return, thus deterring the attractiveness of the project to developers, bankers, and underwriters.

2.4.1 Impact Fees. At the present time impact fees are not charged for transportation or transit impacts anywhere in the Project Corridor. Although local jurisdictions have the authority to levy development impact fees, there is also potential to pursue a "regional fee," that is, a fee that is charged consistently throughout the Roaring Fork Valley for selected regional transportation and transit improvements.

Because of the direct link to development activity, and the related uncertainty of revenue, impact fees are best used for funding capital items and improvements on a cash (or reimbursement) basis.

A fee study conducted for the RFTA Board Finance Workshop (August 15, 2002) calculated an impact fee based upon rational nexus principles and a given level of required capital improvements. The fee was based on the capital costs for buses and park-and-ride facilities generated by employment trips, and varied by area to avoid overlap with other fee programs. The revenue estimate assumes a uniformly-applied fee structure. The fee could potentially generate $3.7 million annually, if applied on a regional basis. It is unlikely that this level of annual funding would be realized in light of the fact that local jurisdictions may not opt to adopt local impact fees and given the annual fluctuations in real property markets. Hence, a conservative estimate of $1 to $2 million in potential annual funding from impact fees was used for this funding analysis.

2.4.2 Developer Contributions and Fees. Developer capital contributions, typically made through exactions or mitigations, refer to those payments or infrastructure projects constructed by developers to mitigate impacts resulting from their development projects. Exactions and mitigations are normally determined as a part of the environmental review process, or as a part of normal discretionary approval of rezoning or subdivision maps by local governments. Mitigations can also be required from government agencies.

Because developer capital contributions through exactions and mitigations must be linked directly (through technical analysis) to the infrastructure and services demands generated by the proposed new development, they are generally of limited usefulness for large-scale infrastructure improvements. Similar to impact fees, they are also uncertain, depending as they do upon the actual timing of development activity.

The value of capital contributions reflects potential private funding of pedestrian-related capital facilities at future transit stations locations, and ranges from $2 to $8 million.

2.4.3 Public/Private Joint Development, Financing and Station Area Leases. Public/private financing has become a popular method of creating public infrastructure as sources of state and federal funding have diminished. Public/private financing takes on many forms; however, in all cases it assumes that a mutual benefit can be derived through cooperation and joint financing of public infrastructure. All public/private ventures require a positive, entrepreneurial approach on the part of local government.

Any of the Build alternatives could be conceived as a public/private project, with the possibility that a transportation vendor would provide a "turn-key project," including design and engineering, financing, construction, and even operation of the transit system, in return for financial guarantees from the local governments (e.g., the dedication of the sales tax revenues).

Public/private financing can also apply to various components of the system. Perhaps the best example would be joint development of transit stations and parking facilities. Since these facilities often become the center of urban activities, they can create real estate value. Developers may be willing to invest in the public infrastructure if this value can be captured. So long as such development is consistent with land use planning policies, it is in the public interest to pursue such approaches.

It is also likely that RFTA could receive land or building area lease revenues from developers or vendors within transit properties and facilities. Private development on public land or within public buildings is a significant revenue producer for transit agencies and highway agencies.

It is possible that a portion of station area costs could be funded directly or indirectly through cooperation with private sector development in and around station areas. The amount of potential funding is uncertain pending further, more detailed analysis. At this stage it is estimated that annual funding from land/station lease revenues can range from $250,000 to $500,000.

Additional analysis of potential public/private partnership opportunities should build upon station area planning and visioning work conducted for the CIS. See **Chapter IX** for the public involvement process and **Chapter X** for additional technical studies. Next steps would include evaluating the market potential and land use plan consistency for joint development projects; and estimating ability (or willingness) of the private sector to fund certain Project components. Revenue potential from joint-development is generally included in the calculation of corporate capital contributions.

2.4.4 Corporate/Private Donations. Rail stations and, in limited cases even rolling stock, have been partially funded through corporate and private donations. In most cases, the asset must be owned by a not-for-profit entity that meets Internal Revenue Service criteria for receiving tax deductible donations, such as a 501(c)3 corporation. The sale of engraved bricks/pavers, commemorative plaques, and even rail vehicles have generated significant funding for transit projects across the United States.

Given the presence of wealthy individuals and corporate executives who own property in the Roaring Fork and Colorado River Valleys, there is good potential for donations from corporate/private sponsors. It is estimated that such donations would be focused on specific transit stations, and to a lesser extent funding for bus or rail rolling stock. Total capital funding from donations is expected to range from $2 to $4 million.

2.5 Property Value-Based Activities

2.5.1 Property Tax Levy. Property taxes are a primary source of funding for local governments throughout Colorado (as well as other states). The use of general obligation bonds (bonds that are funded with a property tax levy) is also a common source of funding infrastructure (particularly schools) nationwide. In the Roaring Fork valley property taxes support school districts, special districts, the county government, and the municipalities.

Within statutory revenue and expenditure restrictions local governments can raise property taxes (e.g., general obligation bonds require majority voter approval). Current tax rates throughout the Project Corridor are relatively low (although recent legislation shifting the burden of property taxes toward commercial property has yielded a proportionately high rate for commercial properties). Also, there is a limit, based upon a jurisdiction's total assessed valuation, to the amount of general obligation debt that can be incurred.

RFTA was formed through an election to include and expand transit services that were previously provided by the founding jurisdictions. This regional agency could establish a property tax mil rate for transit operations support as well as a general obligation bond authorization. There are substantial merits to such a regional transit funding solution, including the opportunity to economize through consolidation of existing transit operations, the creation of a stable, broad-based source of funding to subsidize transit operations, and creation of a low-cost source of capital improvement financing.

Table VIII-6 shows the assessed value for 2001 for areas within the Roaring Fork Valley that are currently within RFTA's tax base totaling $1.13 billion. Assessed value of $869 million within Pitkin County, which represents 77 percent of the total, grew an estimated 2.2 percent from the prior year. Each mil (0.1 percent) tax rate would generate $ 1.8 million in Pitkin County alone. If expanded to include the other jurisdictions, annual revenues could increase to $2.1 million.

Table VIII-6
2001 Property Values and Tax Revenue

Jurisdiction	2001 Taxable Value	Mill Levy	Tax Revenues
Pitkin County	$1,771,577,340	1.00	$1,771,577
Eagle County RFV	56,529,130	1.00	56,529
Carbondale	82,644,100	1.00	82,644
Glenwood Springs	140,742,672	1.00	140,743
Total	**$2,051,493,242**		**$2,051,493**

Source: Economi c and Planning Systems

2.5.2 Special Benefit Assessment Districts. Special benefit assessment districts have been established by local jurisdictions that desire to "capture" a portion of an anticipated increase in land value that is attributed to a public investment, and then utilize such assessed revenues to help finance capital improvements. Special assessments typically require a rational nexus between the value of the public improvement and the amount of benefit received by specific property owners. Once the nexus of value and benefit has been determined, the assessment district can be established with a "value capture" mechanism tied to land area, building area, traffic/trip generation, parking stalls, dwelling units, or other appropriate factors of development.

While a more detailed analysis of the legal issues for establishing special benefit assessment districts is recommended along with an analysis of station area development potential, it is conservatively estimated that annual special benefit assessment revenues could range from $250,000 to $500,000.

2.6 User or Service-Charge-Based Activities

User charges are direct payments for services provided by a government agency. Transit fares and parking fees are key examples of user charges. User charges are priced differently depending upon the objective sought by local government. In some instances charges are set to achieve "full cost recovery," as is often the case with building permit and engineering review fees. In other instances prices are set below costs to promote use and/or to achieve a public purpose.

2.6.1 Visitor Use Services Fee. A "visitor tax" could be charged by the municipalities under their home rule powers. Such "one-time" (i.e. entrance, exit) taxes are common in other countries, particularly small countries with large visitor components of their economies. Apparently, visitor taxes are commonly charged in European resort communities to fund a variety of visitor services and facilities.

Such a tax could be charged through short term lodging and could be linked to a "service card," providing "free" access to various services and facilities in the community (e.g., transit rides) library privileges, museum entrance, commercial discounts, etc.

A "visitor fee" assessed upon occupied lodging "beds" could generate substantial revenue, even at relatively low rates. Based on an estimated $154.8 million in annual room revenues in Pitkin, Garfield, and Eagle Counties, a one percent bed tax would raise $1.5 million annually. The visitation estimate is calculated using conservative estimates of room occupancies; the fee potential could be higher than shown.

2.6.2 Transit Fare Structure. RFTA currently has a variety of "fare instruments" for Valley services, including full fare, punch passes (43 percent discount, i.e. 20 $1.00 punches for $11.50 or 40 $1.00 punches for $23.00) and zone passes (each of which provides a 47 to 72 percent discount depending on the zone and the season), and monthly passes (from 13 to 44 percent discount, depending on the zone). Discount amounts for zone and monthly passes assume that people are riding 22 round-trips per month paying the cash fare from each zone in comparison to using a zone pass for that zone or a monthly pass. Full fares are based upon a seven-zone system, and range from $1.00 (for trips within individual communities) to $3.00 (for trips between Aspen, Snowmass, and unincorporated Pitkin County), up to $6.00 for a one-way trip between Aspen and Glenwood Springs.

RFTA implemented a 15 percent increase in the cost of punch passes, zone passes, and monthly passes in December 2001. According to the Transit Development Plan, fares on the Valley services may be near the upper limit of passengers' "willingness to pay." Any fare increases will work at cross purposes to the community's desire of encouraging transit use. Moreover, if future conditions require an increase in passenger fare revenues, a "fare increase" should be made through an increase in the price of a punch pass, rather than through an increase in full fare. For the purposes of this financial analysis, no change in fare structure has been assumed.

2.6.3 Parking Charges. As with other user charges, parking charges (on street meters or parking lot fees) can be priced by local governments to achieve different policy objectives. In this instance there is a general policy assumed that single occupancy vehicles, especially those used by commuters, should be discouraged from traveling Up Valley to employment.

The City of Aspen's paid parking program produced a surplus of revenue (revenue minus collection and administrative costs) of approximately $229,000 in 1995, and $850,000 in 2002. This revenue is used to fund local Aspen transit service, TM programs, and transportation planning activities.

Revenue could also be generated at the paid parking lots planned as a part of the Entrance to Aspen Project (e.g., at Brush Creek, the Airport area, and at Buttermilk). However, this revenue may be required to help fund a portion of the capital requirements for the Aspen LRT project.

Revenue could also be generated from paid parking at the lots defined for each of the Build alternatives.

2.7 Other Local Revenues

2.7.1 Tax on Registered Vehicles. Vehicle registration fees are an important source of transportation funding for many states and regions. The number of total motor vehicle registrations in the four county region was 39,307 in 2001. Assuming an average growth rate consistent with population forecasts and a tax of $10 per vehicle, this source could raise between $400,000 and

$450,000 annually. The State Rural Transportation Authority Enabling legislation allows for collection of a vehicle registration fee of up to $10.00.

2.7.2 Highway Users Fee. Nationally and around the state, funding for highway improvements is limited. Current gas taxes do not cover the full costs of highway use; the public is becoming increasingly aware that highways are not a free public commodity. The FTA is interested in approaches to generating transportation funds from the users of transportation systems. Because of the challenges of implementing highway user fees in an equitable and efficient manner, this revenue source is considered low priority; however it is included for discussion purposes.

Approximately 12,400 motor vehicles per day (each direction) currently travel Highway 82 at Cemetery Lane. Assuming a fee of $0.25 per vehicle, $1.1 million could be raised annually.

2.7.3 Airport Passenger Facility Charges (PFCs). A relatively new funding mechanism for fixed-guideway projects includes airport passenger facility charges that are assessed on airport tickets sold to travelers arriving/departing at a particular airport location. This funding source requires approval from the Federal Aviation Administration and can only be used for capital expenses that increase value of airport facilities (land and buildings), increase air transportation capacity, and can be used "exclusively" by air passengers and employees. As such, only the potential for airport facility charges appears limited to action alternatives that provide facilities at Aspen/Pitkin County airport. Potential capitalized revenue from a PFC is preliminarily estimated to range from $9 to 19 million.

2.7.4 Other Potential Local Funding Sources. In addition to key potential local funding sources described above, additional local funding and financing sources are identified in Table VIII-6. Other funding sources include: Eagle County sales tax revenues, formulation of a not-for-profit 501(c)3 corporation for Rio Grande Trail construction (supports additional private contributions and donations) and enhanced advertising revenues. These miscellaneous funding sources are considered ancillary to the specific sources listed in Table VIII-6.

In addition, creative construction procurement practices in combination with innovative financing methods provide additional means for constructing and financing fixed-guideway improvements. Procurement techniques such as turn-key construction can be utilized with or without private financing and interim operations/maintenance agreements. The benefits from private turnkey construction often relate to completing projects on an accelerated basis, which according to the FTA leads to the following benefits:

- Potentially lower unit costs from larger order sizes
- Reduced risk of higher future prices attributed to inflation or environmental compliance
- Lower operating costs from accelerated retirement of older vehicles and maintaining a more standardized fleet
- Higher quality of service to the public and potentially increased patronage
- Better conformance with mandates for air quality, or service to persons with disabilities
- Net cost savings from interest earned on cash balances

Innovative financing techniques such as the issuance of Certificates of Participation (COPs) or lease-backed bonds are one method public agencies can use to better match the flow of revenues with planned expenditures or outlays for construction. COPs, backed by future flows of federal or local funds can provide additional sources of front-end funding for constructing fixed-guideway improvements or purchasing vehicle rolling stock. The framework for implementing federally-funded COPs transactions is based upon *FTA's Final Rule on Capital Leases* (49 CFR 639, October 15, 1991).

A cross-border lease is another finance mechanism that permits investors in a foreign country to own assets used in the United States. The foreign investors essentially own all or a portion of the asset and lease it to an American entity (such as a transit authority) while receiving tax benefits under the laws of their home country. This mechanism is allowed by the home country, typically when it involves assets produced in and purchased from the home country, such as ABB-Sweden railcars or German rail cars (as long as equipment complies with FTA Buy America content requirements.) The cross-border lease is another means to provide "up-front" cost savings to a public agency acquiring rolling stock or other assets. Its benefit will vary based on several factors such as interest rates, duration of the lease, international tax laws, and initial transaction costs.

F. CASH FLOW ANALYSIS

This section identifies the forecasted cash flows of expenditures and revenues for the CIS alternatives. The following discussion summarizes the forecasted operations and capital expenditures in comparison to revenues from farebox/service contracts and existing locally approved funding sources. The purpose of this analysis is to identify the potential order of magnitude for funding requirements and "gaps" for incremental time periods. The following are key assumptions in the cash flow analysis::

- Local capital funding sources include dedicated local sales taxes, and a portion of service contracts.
- Annual growth rates assumes 3.1percent annual inflation rate, and an O&M cost escalation rate of 4.1 percent.
- Service contracts are assumed to grow at 5.1percent annually.
- Debt service is based upon 6.0 percent interest, 3.0 percent issuance cost, 10 percent reserves, and a 12-year amortization.
- Capital funding allocation assumes 50percent federal, 25 percent state, and 25 percent local shares.

The approach used to conduct the financial cash flow analysis summarized in Tables VIII-9 through VIII-12 included the following steps.

1. Forecasting of annual operations and capital funding shortfalls that would occur under each of the CIS alternatives, if no additional local operating revenue and debt are added.
2. Adding of new/additional local revenue at a level necessary to cover forecasted operations and capital funding shortfalls.

Potential additional local funding amounts were assumed to vary by alternative and increase to a level near "break-even," as long as additional local funding levels did not exceed $24 million per year (the maximum amount of local funding identified in **Section 5.2**. All amounts expressed below are in constant year 2002 dollars.

1. No Action/Committed Projects Alternative

This alternative is considered to be financially feasible. The financial analysis summarized in Table VIII-7 indicates that a long-term operating and capital funding surplus could occur if we assume between $2 million and $15 million in average annual local additional funding. However, it is questionable whether this amount of additional local funding would be committed to bus service if there is not a significant improvement in service or travel times relative to current operations.

2. BRT/Bus Alternative

This alternative is considered to be financially feasible. The cash flow analysis summarized in Table VIII-8 forecasts an average annual operations and capital funding surplus of $3.3 million over the 2002 to 2025 time period. This alternative is expected to require additional local revenue of $11.8 million per year on average over the 2002-2025 time period. Initial increases in local revenue would need to be approximately $7 million per year until year 2015. After 2015, average annual local revenues would need to increase to between $13 and $23 million per year to achieve break even.

3. BRT-LRT Alternative

This alternative is also considered to be financially feasible. The cash flow analysis summarized in Table VIII-9 forecasts an average annual operations and capital funding surplus of $7.5 million over the 2002 to 2025 time period. This alternative is expected to require additional local revenue on the order of $9.4 million per year on average over the projection time period. Initial increases in local revenue would need to be on the order of magnitude of $7 million per year until year 2020. After 2020, average annual local revenues would need to increase to approximately $18 million per year to achieve or exceed break even requirements.

4. Rail Alternative

This alternative is also considered to be marginally financially feasible. The cash flow analysis summarized in Table VIII-10 forecasts an average annual operations and capital funding surplus of $8.0 million over the 2002 to 2025 time period. This alternative is expected to require additional local revenue on the order of $20.2 million per year on average over the projection time period. Initial increases in local revenue would need to be approximately $13 million per year until year 2010. After 2010, average annual local revenues would need to increase to approximately $24 million per year to achieve or exceed break-even requirements.

Table VIII-7
Financial Cash Flow Analysis, No Action/Committed Projects Alternative
(Constant 2000 dollars in millions)

	YEARS				
	2002 to 2010	**2010 to 2015**	**2015 to 2020**	**2020 to 2025**	**All Years**
Average Annual Operations and Capital Balance*	($1.2)	($9.6)	($12.7)	($16.1)	($8.8)
Average Annual Potential New Local Revenues**	$2.0	$10.0	$15.0	$15.0	$9.4
Avg. Annual Net Cash Flow Balance	$0.8	$0.4	$2.3	($1.1)	0.6
Net Cash Flow Balance for Period	$6.4	$2.0	$11.5	($5.5)	$14.4
Carryover Surplus (if any) from prior period	$0.0	$6.4	$8.4	$19.9	$1.5
Total Net Cash Flow Balance for Period	**$6.4**	**$8.4**	**$19.9**	**$14.4**	**$15.9**

* *Assumes no change in existing sources of RFTA/RTA revenue sources, with increased operations and capital costs attributed to the CIS alternatives.*

Source: Glenwood to Aspen CIS/EIS, Financial Technical Memoranda (Otak, et. al., 2002)

Table VIII-8
Financial Cash Flow Analysis, BRT-Bus Alternative
(Constant 2000 dollars in millions)

	YEARS				
	2002 to 2010	**2010 to 2015**	**2015 to 2020**	**2020 to 2025**	**All Years**
Average Annual Operations and Capital Balance*	($1.2)	($11.3)	($17.2)	($23.3)	($11.7)
Average Annual Potential New Local Revenues**	$7.0	$7.0	$13.0	$23.0	$11.8
Avg. Annual Net Cash Flow Balance	$5.8	($4.3)	($4.2)	($0.3)	$0.1
Net Cash Flow Balance for Period	$46.4	($21.5)	($21.0)	($1.5)	$0.0
Carryover Surplus (if any) from prior period	$0.0	$46.4	$24.9	$3.9	$3.3
Total Net Cash Flow Balance for Period	**$46.4**	**$24.9**	**$3.9**	**$2.4**	**$3.3**

* *Assumes no change in existing sources of RFTA/RTA revenue sources, with increased operations and capital costs attributed to the CIS alternatives*

*** Source: Glenwood to Aspen CIS/EIS, Financial Technical Memoranda* (Otak, et. al., 2002)

Table VIII-9
Financial Cash Flow Analysis, BRT- LRT Alternative
(Constant 2000 dollars in millions)

	YEARS				
	2002 to 2010	**2010 to 2015**	**2015 to 2020**	**2020 to 2025**	**All Years**
Average Annual Operations and Capital Balance*	($0.8)	($8.5)	($13.7)	($19.1)	($9.3)
Average Annual Potential New Local Revenues**	$7.0	$7.0	$7.0	$18.0	$9.4
Avg. Annual Net Cash Flow Balance	$6.2	($1.5)	($6.7)	($1.1)	$0.1
Net Cash Flow Balance for Period	$49.6	($7.5)	($33.5)	($5.5)	$3.1
Carryover Surplus (if any) from prior period	$0.0	$49.6	$42.1	$8.6	$4.4
Total Net Cash Flow Balance for Period	**$49.6**	**$42.1**	**$8.6**	**$3.1**	**$7.5**

* *Assumes no change in existing sources of RFTA/RTA revenue sources, with increased operations and capitalcosts attributed to the CIS alternatives*

***Source: Glenwood to Aspen CIS/EIS, Financial Technical Memoranda* (Otak, et. al., 2002)

Table VIII-10
Financial Cash Flow Analysis, Rail Alternative
(Constant 2000 dollars in millions)

	YEARS				
	2002 to 2010	**2010 to 2015**	**2015 to 2020**	**2020 to 2025**	**All Years**
Average Annual Operations and Capital Balance*	($4.9)	($24.6)	($28.5)	($31.7)	($20.1)
Average Annual Potential New Local Revenues**	$13.0	$24.0	$24.0	$24.0	$20.2
Avg. Annual Net Cash Flow Balance	$8.1	($0.6)	($4.5)	($7.7)	$0.0
Net Cash Flow Balance for Period	$64.8	($3.0)	($22.5)	($38.5)	$0.8
Carryover Surplus (if any) from prior period	$0.0	$64.8	$61.8	$39.3	$7.2
Total Net Cash Flow Balance for Period	**$64.8**	**$61.8**	**$39.3**	**$0.8**	**$8.0**

* *Assumes no change in existing sources of RFTA/RTA revenue sources, with increased operations and capitalcosts attributed to the CIS alternatives*

***Source: Glenwood to Aspen CIS/EIS, Financial Technical Memoranda* (Otak, et. al., 2002)

G. CONCLUSIONS

1. Key Findings

Based upon the assumptions described in this chapter, it is evident that all of the project alternatives, including the No Action/Committed Projects alternative, would have local cost and financing implications. Additional local funding would be necessary under all of the alternatives.

Annual farebox and service contract revenues currently cover approximately 55 percent of RFTA's annual O&M expenses (excluding debt service). The sales and use tax, combined with RFTA farebox and contract service revenue, currently cover operating expenses, as well as debt service for capital expenses.

Each of the CIS alternatives would require increased levels of authorized local funding. Potential additional local funding sources, including enhanced sales and use tax revenues, a visitor use tax, development impact fees, a property tax levy, development contributions, airport passenger facility charges, vehicle registration fee increase, and other sources have been identified and evaluated as part of the CIS financial analysis. These potential local funding sources, if implemented, could generate an additional $14 to $24 million in annual funding to help address the funding shortfall.

The No Action/Committed Projects Alternative is financially feasible. This alternative is expected to be comparable in local costs to the BRT-LRT Alternative. While federal and state funding requirements would be minimal, additional average annual funding levels of $9.4 million over the 2002 to 2025 time frame would be expected to cover anticipated induced operating and capital requirements.

Assuming federal/state/local capital funding allocations of 50/25/25 percent, both of the BRT alternatives are expected to achieve the highest level of financial viability of the Build alternatives.

The BRT-LRT Alternative is expected to require the lowest amount of additional federal, state and local funding resources. This alternative, which assumes a Downvalley regional bus trunk line with a transfer to LRT at the Pitkin County Airport, is expected to require federal and state funding commitments on the order of $62.8 million and $31.4 million, respectively. Additional average annual local funding levels of $9.4 million would be required over the 2002 to 2025 time frame to cover anticipated operating and capital funding requirements. This local funding requirement does not include the cost of building or operating the Entrance to Aspen LRT system.

The BRT-Bus Alternative is expected to require more bus transit operating hours than the BRT-LRT Alternative, since buses would continue beyond the Pitkin County Airport into Aspen. Increased operating hours combined with slightly higher capital costs (attributed primarily to higher station facility and vehicle costs) is expected to result in slightly greater required funding levels for this alternative. Federal and state funding commitments would need to be approximately $66.1 million and $33 million, respectively. Additional average annual local funding levels of $11.8 million would be required over the 2002 to 2025 time frame to cover anticipated operating and capital funding requirements.

The Rail Alternative is considered to have marginal financial feasibility. It is the most expensive alternative, and is estimated to require federal and state funding commitments of approximately $168.3 million and $84.2 million, respectively. Additional average annual local funding levels of $20.2 million would be required over the 2002 to 2025 time frame to cover anticipated operating and capital funding requirements.

2. Risk & Uncertainty

At this stage in the financial planning process, risk and uncertainty are important factors that must be considered to avoid unanticipated cost increases and/or revenue shortfalls. The financial analysis described herein has attempted to account for risk and uncertainty in the following ways:

- A capital cost contingency of 20 percent is included for cost estimating.
- The full capital cost of the Rio Grande Trail ($30 million) has been assumed in the cash flow analysis, even though this project can be constructed for as low as $4.5 million for the initial phase.
- Right-of-way costs assume a nine percent annual escalation rate.
- O&M costs assume a real cost increase of 1.3 percent above inflation.
- Farebox recovery is conservatively estimated at 36 percent of operating costs.
- Potential local revenue sources have been adjusted to exclude Pitkin County sales and use tax revenues that are available but assumed to be committed to finance the Aspen to Pitkin County link LRT or busway project.

The cost estimates and funding/financing analyses have been prepared and reviewed by engineers, economists, and transit operations specialists on the Study Team with experience in planning and constructing bus and fixed guideway transit systems. The preparation of independent analyses of cost elements, including civil construction, station/transit center construction, rolling stock, maintenance facilities, intelligent transportation systems, and transit operations, as well as cash flow financial forecasting is expected to provide a series of checks and balances early in the financial planning process, thereby reducing risk and uncertainty.

H. IMPLEMENTATION

A detailed implementation and financing plan is premature at this stage in the planning process. Once public comment is received on this CIS and the RFTA Board selects a preferred alternative, an implementation and financing plan will be prepared as a part of preliminary engineering. An outline of project activity from CIS to revenue service will be detailed in this later plan.

1. Preliminary Engineering and Environmental Clearances

RFTA has secured FTA funding to initiate preliminary engineering and complete the environmental document for the Project Corridor. These funds were appropriated by Congress in Federal Fiscal Year (FFY) 2001 and FFY 2002 and are anticipated to be carried over in the FTA FFY 2003 budget.

Prior to September 30, 2003 RFTA must submit a Request to Enter Preliminary Engineering to FTA and obtain FTA approval to obligate the appropriated federal funding.

The current project scope and schedule originally anticipated the preparation of an Environmental Impact Statement due to the potential for environmental consequences and mitigation requirements of the Rail Alternative. However, if the BRT Alternative is selected, the environmental consequences may not be significant and a Categorical Exclusion or an Environmental Assessment (EA) and a Finding of No Significant Impacts (FONSI) from FTA or FHWA may be appropriate.

2. Secure Local Funding

All of the alternatives require additional local funding. It is anticipated that this local funding will have to be secured prior to the commitment of state and federal resources for final design, right-of-way acquisition, and construction. This would require voter approval in the jurisdictions that comprise RFTA. This election could occur as early as November 2004.

3. Secure State Funding

CDOT has ranked the Valley's transit project as one of the top priority strategic, unfunded, projects in the Intermountain Transportation Planning Region (see **Chapter 1: Purpose and Need**) as part of the 2003 Strategic Project Plan. As part of the Strategic Plan, this project would be eligible at some point for S.B. 97-001 funds. Originally not more than ten percent of the S.B. 97-001 funds could be used for transit purposes; however, H.B. 02-1310 was recently passed by the legislature, requiring that at least ten percent be used for transit or transit-related purposes. The amount of funds generated by this ten percent is estimated to be between $20 million and $30 million per year initially. The state is also allowed per TEA-21 to flex federal highway dollars to transit.

4. Secure Federal Funding

This project is authorized as a New Start project in the Transportation Equity Act for the 21st Century (TEA-21). Congress has appropriated federal funding for planning, environmental analysis, and preliminary engineering, and to date RFTA has expended both federal and local resources on planning and environmental analysis. RFTA is required to secure permission from FTA to enter into preliminary engineering prior to obligating federal funds for preliminary engineering. A Request to Enter Preliminary Engineering will be submitted in 2003. Once environmental clearances have been secured, RFTA will request FTA approval to enter into Final Design. During the Final Design process, RFTA will negotiate a Full Funding Grant Agreement (FFGA).

5. Final Design, Right-of-Way Acquisition, Procurement, and Construction

Once RFTA has obtained environmental clearances, the agency can commence right-of-way acquisition. Final design will commence upon FTA approval. Procurement of vehicles and other equipment and construction would commence upon a FFGA with the FTA.

6. Initiation of Revenue Service

Assuming the completion of construction in 2007, RFTA would initiate revenue service on the selected alternative. The first full year of revenue service is currently anticipated in 2008.

7. Trigger Points for Possible Future Phases

While it is premature to anticipate the selection of a preferred alternative, if a BRT alternative is selected RFTA would have the opportunity to anticipate possible future phases to transit service in the Project Corridor.

Depending on the decisions of voters in Pitkin County and Aspen, a BRT alternative could provide regional bus service into downtown Aspen or connect to the Entrance to Aspen LRT system. If light rail were not in place in the short term, the construction of the rail system from downtown to Brush Creek Road would be a logical next step. Incremental extension of rail from Brush Creek Road to Basalt, El Jebel, Carbondale, and Glenwood Springs could occur as need and funding availability warrant.

The decision to move from bus to rail would be made by the voters of the Roaring Fork Valley. This commitment was made when the governments of the Valley approved the Intergovernmental Agreement that led to the Valley-wide vote on the creation of RFTA. Once the voters decide to pursue rail, it will be up to RFTA, local governments, and the State of Colorado to secure the federal funding to implement that decision.

There are differing views on the implementation of rail transit in the Roaring Fork Valley. Proponents of rail want some certainty that BRT is a first phase towards rail. Others are reluctant to commit to a schedule for building a rail system, desiring some certainty that rail would be needed if built. Rather than a schedule, RFTA has developed "trigger points" – measurable conditions that would trigger consideration of the next phase in transit development. The following are suggested as a starting place for discussion:

A vote of the people. "The Authority shall not finance rail construction unless and until the electors of the Authority, or of the area of the Authority in which the funding is to be generated, specifically approve such financing." (*Roaring Fork Transportation Authority Intergovernmental Agreement*, September 12, 2000).

Highway capacity. It is reasonable to assume, for reasons of cost and Valley character, that Highway 82 cannot be expanded beyond four lanes. As a bus system would be impacted by highway congestion, rail should be considered between points that are connected by a section of Highway 82 that has a volume to capacity ratio of 1.0 or higher in the peak hour or peak three hours of the day. The volume to capacity ratio is the relationship between the designed capacity of a section of highway in vehicles per hour and the actual traffic volume in vehicles per hour.

Best one-way peak trip time. Best one-way trip times forecast for BRT and Rail service do not take into account weather, mechanical breakdown or accidents. RFTA can gather data related to actual (vs. forecast) trip times that would factor in these considerations, as well as actual rather than predicted levels of traffic congestion. Rail should be considered when the best one-way trip times from each community increase by ten percent over 2003 levels.

I. Summary of Costs and Financing Options

Table VIII-11 provides a summary of costs and financing options

Table VIII-11
Summary of Costs and Financing Options

	No Action/ Committed Projects	Trail	BRT/Bus	BRT/LRT	Rail
2008 CAPITAL COST ELEMENTS (in millions)					
ROW & Relocations (Mainline)	--	--	$ 0.0	$ 0.0	$ 14.6
ROW & Relocations (Stations)	--	--	1.2	1.2	1.2
Civil Construction	--	--	6.9	6.9	128.0
Stations/Transit Centers/ Park-n-Ride Facilities	--	--	20.7	16.6	20.1
Feeder/Collector Stops	--	--	0.5	0.5	0.5
Vehicles (Mainline)	--	--	39.1	37.0	124.9
2008 CAPITAL COST ELEMENTS (in millions)					
Vehicles (Feeder)	--	--	$ 2.9	$ 3.5	$ 3.2
Maintenance Facilities	--	--	19.3	18.3	5.6
ITS Applications	--	--	11.6	11.6	8.5
Total	**$71 (ETA only)**	**$4.5 - $30**	**$102.2**	**$ 95.6**	**$306.6**
2008 O&M COSTS (in millions)					
Local Service	$ 5.3	--	$ 5.3	$ 5.3	$ 5.3
New Local Service	0.0	--	4.4	3.6	9.4
Regional Service	14.9	--	9.7	7.5	12.8
Other	1.5	--	1.5	1.5	1.5
Subtotal O&M	**21.7**		**20.9**	**$ 17.9**	**29.0**
Capital (debt)	3.8	--	6.0	$5.8	12.9
Total	**$ 25.5**	**Not applicable**	**$ 26.9**	**$ 23.7**	**$ 41.9**
TOTAL NET CASH FLOW BALANCE (in millions of constant 2002 dollars)					
2002-2010	$ 6.4	--	$ 46.4	$ 49.6	$ 64.8
2010-2015	8.4	--	24.9	42.1	61.8
2015-2020	19.9	--	3.9	8.6	39.3
2020-2025	14.4	--	2.4	3.1	0.8
All Years	$ 15.9	Not applicable	$ 3.3	$ 7.5	$ 8.0

Table VIII-11
Summary of Costs and Financing Options

Conceptual Project Implementation Schedule

- Year 2004 preliminary engineering
- Year 2005 final design and permitting
- Year 2006 project construction
- Year 2007 project completion
- Year 2008 first full year of project operation

Revenue Source Types:

- Farebox revenues
- Sales and use taxes dedicated to transit
  - Pitkin County transportation sales taxes
  - Initial (RFTA) authority sales tax
  - Eagle County 0.5 percent transportation sales tax

Existing capital funding sources include:

- Pitkin County bond proceeds (includes debt service)
- Aspen Skiing Company service contracts
- Additional local, state and federal funding
- Federal grants, especially FTA Section 5309 New Start grants (needs 50 percent match from local/state sources)
- State funding (assumed to be 50 percent of local/state match)
- Local funding
  - Sales-based activities revenues
  - Additional sales and use tax revenues
  - RFTA sales and use tax
  - Real estate development-based revenues
  - Property value-based activities
  - Use or service charge-based activities
  - Other local revenues (including tax on registered vehicles, highway users fees, airport passenger facility charges)

IX. PUBLIC INVOLVEMENT

A. INTRODUCTION

Through the Roaring Fork Rail Holding Authority (RFRHA) and with the support of state and federal agencies, local governments purchased the Denver and Rio Grande rail right-of-way for transit, trail, and conservation uses. RFRHA initiated the CIS as owner of the rail corridor. During the course of study, local governments and voters took actions to consolidate the existing Roaring Fork Transit Agency (RFTA) bus system and RFRHA into a single regional agency. In November 2000, voters in seven jurisdictions approved creation of a regional transportation authority, and dedicated taxes to funding additional regional transit service. The Roaring Fork Transportation Authority (RFTA) now has responsibilities for long-range planning, right-of-way ownership, and regional transit services. Between December 2000 and April 2002, RFRHA and RFTA officials worked to complete the legal and financial work necessary to consolidate the two agencies into the new RFTA. The merger and transfer of the rail corridor asset to RFTA was completed in June, 2002. Responsibility for the completion of the CIS and implementation of transit improvements reside with RFTA.

The Roaring Fork Valley has long had a strong interest in transportation planning as evidenced by the numerous transportation-related votes, studies, and meetings conducted over the years. RFRHA, RFTA and the Study Team, in cooperation with the region's local governments, conducted an extensive public involvement program as an integral part of this study. Using a wide variety of tools and forums, the public involvement program provided numerous opportunities for concerned citizens and stakeholders to learn about and be involved in the CIS.

Specific groups that participated on an ongoing basis included a Staff Resource Group, four Citizen Task Forces (CTFs) organized by geographic region, a Regional Citizen Task Force (RTF), a Rio Grande Trail Task Force, Policy Committee, RFRHA Board, RFTA Board and local elected boards.

The public involvement process went far beyond what is generally required for a CIS. The goal of the process was to identify public issues and priorities at the start, and to provide an opportunity for citizens to participate in resolution of those issues throughout the course of study. For that reason, citizens and local elected officials were involved in establishing project objectives, developing measures for screening Alternatives, and assessing the strength of Alternatives against the project objectives and measures. The public involvement process allowed for multiple forms of input and addressing new issues as they arose.

In addition to the efforts outlined above, the public involvement program also included the following techniques:

- Scoping meetings (five community meetings and an agency meeting)
- Open house public meetings and workshops (ten open houses and five workshops)
- Focus group meetings with property owners along the corridor
- City Council and County Commission briefings
- Slide presentations to discuss with community, civic, and business groups
- Hispanic/Latino Outreach

    - A Latino outreach survey, door-to-door canvassing in Hispanic/Latino neighborhoods, and an open house specifically for Hispanic/Latino residents in the region
    - Study Team members and interpreters riding on buses to discuss transit with Hispanic/Latino riders
    - Spanish speaking interpreters on hand at public open houses
- Newspaper inserts and periodic newsletters
- Issue briefs and fact sheets
- Weekly informational columns in valley newspapers
- Ongoing media coverage through numerous local papers, Grass Roots TV (public access), and local radio stations.
- One-on-one meetings and e-mail correspondence with interested citizens and organizations
- A regional public opinion survey
- Transit-oriented community design workshops to discuss station location options and integration with local land use plans
- Rio Grande Trail plan open houses

B. SCOPING COMMENTS AND KEY ISSUES

Scoping meetings were held in five communities throughout the Project Corridor in February 1998. Scoping meeting locations included Rifle, Glenwood Springs, Carbondale, Basalt, and Aspen. Scoping comments were also sought from members of Citizen Task Forces. Comments were recorded and organized into key issues for the study, as described below.

Capital and Operating Cost. The most frequent scoping comments related to requests for ensuring a thorough study of both capital and operating costs for transit improvements. In addition, there was a desire to examine costs through a life cycle analysis of up to 50 years. Analysis of capital and operating costs, including life cycle costs, may be found in **Chapter VIII: Finance**.

Impact on Traffic. The second most frequent comment related to seeking a transit system that would have the greatest benefit to controlling traffic growth. Comments included the need for reasonable pricing for riders, support for transit demand management, and the need for competitive travel times. Analysis of traffic impacts may be found in **Chapter IV: Transportation Impacts.**

Connection to Entrance to Aspen Light Rail. There were questions about the connection between valley transit and the Entrance to Aspen light rail system. There was a desire to integrate the systems into a single, seamless transit system. Based on comments, the Project Corridor was expanded on April 29, 1999 to include analysis of bus or rail vehicles into downtown Aspen. The Build Alternatives were adjusted to accommodate these changes. Descriptions of the Build Alternatives may be found in **Chapter II: Alternatives.**

Safety and Reliability. A frequent comment noted the accident rate on Highway 82 and the need for a safe alternative mode of travel. It was also noted that the travel time varies greatly on Highway 82 depending on weather and accidents. There was a desire for predictable transit travel times and reliable schedules. Analysis of safety effects may be found in **Chapter IV.E: Safety** and **Chapter V:18: Public Safety and Security.** Analysis of travel times is found in **Chapter IV.C.2: Travel Times.**

Alignment (Basalt). There was concern that the existing rail corridor was too far from the center of Basalt. There was a desire to support more intense and diverse land uses around a transit center closer to downtown Basalt. The *Town of Basalt Comprehensive Plan* calls for low-density housing in the area of the existing rail corridor. In response to this issue, an alternative alignment for the Rail Alternative was configured to leave the existing rail corridor and follow Highway 82 through Basalt in accordance with the town's plan. The reconfigured alignment (Alignment C) of the Rail Alternative is displayed in Figure II-3**.**

Noise. There was concern about the possible impact of whistles and noise from rail vehicles during hours of operation on adjacent homes in Carbondale. The noise impact analysis may be found in **Chapter V.C.15: Noise and Vibration Impacts.** Figure V-4 displays the locations of affected receivers.

Community Planning. There was a desire for transit to serve local community growth plans. An opportunity to link future development and transit was identified. It was noted that the rail corridor historically provided the basis for locating several of the towns in the valley and that the corridor is central to existing population centers. The analysis of impacts to community planning may be found in **Chapter V.A.6: Land Use Impacts.**

Connections to Colorado River Valley Communities. Comments noted that population growth is expected to be significant in the communities of New Castle, Silt, and Rifle. There was a desire to ensure that adequate and convenient service could be provided in the future. There was also a desire to plan for linkage of any future rail system along the I-70 corridor from Denver. A discussion of linkages to other transportation systems may be found in **Chapter I.B.2: Transportation Facilities** and **Services in the Corridor.**

Crossing of Highway 133 (Carbondale). The rail right-of-way currently crosses Highway 133 at grade. There were concerns about potential automobile and transit conflicts if the crossing remains at grade. The Rail Alternative includes a grade-separated crossing of Highway 133, which is depicted in Figure II-9.

Wildlife. There were concerns about possible rail and/or Rio Grande trail conflicts with wildlife habitat. Analysis of wildlife impacts may be found in **Chapter V.C.8: Wildlife Impacts** and **Chapter V.C.10: Threatened and Endangered Species.**

Growth. There were questions about developing long-term projections of future population growth in the region and whether those projections could be accurate enough upon which to make a capital investment. Two scenarios for future growth were developed to respond to this issue. Trend and Planned Growth scenarios were developed to indicate the result of continued growth according to recent trends and growth according to adopted local plans and land use policies. Population projections are displayed in Table III-4.

Quality of Life and Community Character. Much of the discussion around preserving quality of life and community character had to do with the impact of the automobile on daily life, including- traffic congestion, pollution, and ineffective or unsafe pedestrian access to community centers and transit stops. There was a desire for clean-fuel transit vehicles connected to comprehensive pedestrian and/or bus collector systems.

The issues above and others developed by the Citizen Task Forces were translated into project objectives and criteria used in the screening process for comparing alternatives. These project objectives are summarized in **Chapter I: Purpose and Need.**

C. PUBLIC INVOLVEMENT GROUPS

Each of the task forces and groups identified below was provided with detailed project information by the Study Team and asked to make recommendations to the Study Team and the Policy Committee throughout all phases of the project. Citizens and local elected officials interacted with technical information and environmental analysis at each stage of the review in order to allow them to participate in managing their issues. This process created a well-educated public regarding the issues and opportunities to expand transit in the region.

The Resource Group and the Citizen Task Forces generally reviewed technical reports and analysis first, followed by review and input by the Regional Task Force and the Policy Committee. The result was a recommendation to the RFRHA Board for establishing project objectives, developing Alternative assessment criteria, and assessing Alternative alignments, propulsion, and technologies. The RFRHA Board, and later the RFTA Board, made final study decisions. Participation on the CTFs and Rio Grande Trail Task Force was open and voluntary, but guidelines were developed in each task force group to determine how much participation would be required to participate in recommendation votes.

The formal Task Force portion of the public involvement process ended on October 8, 1999 when the RFRHA Board voted unanimously to approve the unanimous recommendation of the Policy Committee, the Regional Task Force, and four Citizen Task Forces. The RFRHA Board recommended the Rail Alternative on Alignment C.

In January 2001, the RFRHA board directed study consultants to develop a phased bus-to-rail implementation plan for the Rail Alternative. In November 2001, meetings were held in Basalt and Glenwood Springs with members of the Citizen Task Forces to share phasing concepts and information about Bus Rapid Transit (BRT). Attendees endorsed using BRT as the bus Build alternative in the CIS and endorsed further study of BRT as a bus-to-rail phasing option. A series of public open houses was held to update the public on the status of the CIS, and to solicit public input on the Alternatives and phasing scenarios during late January and early February, 2002.

Information on the general membership and function of each group is provided in the following paragraphs.

1. Citizen Task Forces

Four Citizen Task Forces (CTFs) were created to provide representation and ongoing issue management throughout the Valley. The CTFs consisted of individuals in the downvalley area (Glenwood Springs, Rifle, and New Castle), the Carbondale area, the Mid Valley area (El Jebel and Basalt), and the Upper Valley area (Aspen and Snowmass). At least once a month, the Study Team met with each of the CTFs to provide information and solicit input. CTFs provided recommendations on project objectives and measurement criteria, as well as extensive review of technical methodology and results. At the conclusion of the comparative screening process, each of the CTFs was asked to make a recommendation on an alignment and a technology for their area to be evaluated as the Build Alternative in the CIS. During this process, each of the CTFs was asked to make a recommendation on a Preferred Alternative. Each CTF developed a process for making recommendations. A total of 92 CTF meetings were held between January 19, 1998 and October 6, 1999.

2. Regional Citizen Task Force

In order to address conflicting or contradictory recommendations from the four local task forces, a Regional Citizen Task Force (RTF) was created. Each local task force elected two representatives to the RTF. Representatives from the Regional Task Force made a presentation to the Policy Committee on the recommended Build alignments and technologies to be evaluated in the CIS, and on their preferred Alternative. A total of 16 RTF meetings were held between March 12, 1998 and October 7, 1999.

3. Staff Resource Group

The Staff Resource Group consisted of professionals from each of the governmental entities in the Roaring Fork Valley and RFTA staff. They were an integral part of the process, providing local insight and information on all aspects of the study. The Resource Group also aided the Study Team by helping to correct errors, reviewing new information, and planning better methodological strategies. A total of 26 Resource Group meetings were held between February 25, 1998 and November 15, 1999. The Staff Resource Group continues to meet to provide advice on technical issues.

4. Rio Grande Trail Task Force

A Rio Grande Trail Task Force was developed specifically to provide input on the trail portion of the study. This task force met several times early in the study process and several more times during the winter of 1999 to help finalize the planning effort documented in the Ultimate and Interim Trail plans. A total of six Trail Task Force meetings were held between October 15, 1998 and April 22, 1999.

5. RFRHA Policy Committee

The RFRHA Policy Committee provided policy direction for the study. The Policy Committee included two representatives from every member government of RFRHA and funding partners in the acquisition of the rail corridor. The Policy Committee took input and recommendations from the CTFs, the RTF, the Resource Group, the general public, elected officials, and others. The Policy Committee also made formal recommendations to the RFRHA Board regarding Build alternatives to be studied further and the Locally Preferred Alternative. A total of 26 Policy Committee meetings were held between December 19, 1997 and October 8, 1999.

6. RFRHA Board

The RFRHA Board included representatives of local governments responsible for the corridor and made final recommendations regarding the Build alternatives to be studied in the CIS. The RFRHA Board was the final decision-making authority during the development of Alternatives. A total of 61 RFRHA Board meetings were held that discussed this project between July 11, 1997 and December 13, 2000.

7. RFTA Board

The RFTA Board includes a member and alternates from all seven member governments (Eagle and Pitkin Counties, the Cities of Aspen and Glenwood Springs, and the Towns of Snowmass Village, Basalt, and

Carbondale). The RFTA Board became the local decision-making authority for the study in 2001. In February 2002, the RFTA Board approved a resolution endorsing the study work to date and supporting transit improvements and analysis of phased improvements toward an ultimate system.

8. RFTA Citizen Advisory Committee

The RFTA Citizen Advisory Committee was established in January 2002 to provide recommendations to the RFTA Board.

D. MEETINGS AND WORKSHOPS

1. Agency Coordination Meetings

Numerous coordination meetings were held with partner agencies for this project, including FTA, FHWA, and FRA. These meetings coordinated the technical work being conducted, the public process, and the CIS. These meetings occurred between August 13, 1998 and March 11, 2003.

2. Scoping Meetings

Six formal scoping meetings were held in Denver, Rifle, Carbondale, Basalt, Glenwood Springs, and Aspen between January 6, 1998 and February 24, 1998.

3. General Open Houses

Ten public open houses were held in the valley to update the public on the status of the project and to obtain public input. Six of these were held between November 30, 1998 and May 6, 1999. An additional four open houses were held between January 31, 2002 and February 7, 2002 to update the public on progress and seek additional input on the Alternatives.

4. Transit-Oriented Community Design Workshops

These workshops were conducted as part of the CIS to develop conceptual plans and input into design of station areas and to identify links between transit improvements and land use plans. The results of these workshops are displayed in **Chapter II.C.2.2.4: Stations and Park-and-Rides** and **CIII.2.4 in Figures II-7 to II-16**. Several group meetings led up to three public workshops held between February 9, 1999 and February 22, 1999. Additional information on transit-oriented development can be found in **Chapter V.A.6**.

5. Other Group Meetings and Presentations

Other meetings and presentations included:

- Six presentations to the Elected Officials Transportation Committee (includes representatives from Pitkin County, City of Aspen, and Snowmass Village) between May 12, 1998 and August 10, 1999.

- Public presentations to elected boards of the towns of Glenwood Springs, Carbondale, Basalt, Snowmass Village, Aspen, and Garfield, Eagle, and Pitkin counties regarding status of project and agreement on various decision points.
- A railroad freight workshop was held in Glenwood Springs on November 19, 1998 to discuss the opportunity of providing railroad freight on the RFRHA rail corridor. This related to overall transportation options in the Roaring Fork Valley.
- A trail workshop was held on May 20, 1998 to review trails information developed in conjunction with the Rio Grande Trail Task Force
- Eleven Planning Commission work sessions were held between February 20, 1998 and October 13, 1998 with the various Planning Commissions in the Roaring Fork Valley.
- A tourism and transit workshop was held with local business leaders and Chambers of Commerce on July 12, 1999.

E. LOW-INCOME AND MINORITY OUTREACH

Low-income and minority community members are significant publics when considering transportation system improvements in the Roaring Fork Valley. Special efforts were implemented to reach out to these publics. The Spanish-speaking and Latino public is the most populous minority in the region. Therefore, public outreach activities were designed specifically to reach them. For more information on the demographics of low-income and minority populations, see **Chapter III.A.2.2: 2000 Race Characteristics of County Populations and A.3: Environmental Justice.**

1. Open Houses

In addition to having Spanish-speaking interpreters available at open houses, two open houses for Spanish-speaking citizens were held on March 24, 1999 and May 8, 1999 to update the Hispanic/Latino community on the project and to scope issues. Spanish speakers presented study findings to date and facilitated a discussion of the alternatives. Advertising for the open houses and additional scoping was provided by door-to-door canvassing in Hispanic/Latino neighborhoods and participation in radio talk shows on Hispanic/Latino radio programs.

2. Hispanic/Latino Bus Riders

Members of the Study Team, in conjunction with Asistencia Para Latinos, a local Latino social service organization, spent two days riding on valley bus routes to answer questions and survey Hispanic/Latino community members who would be affected by the proposed transit improvements.

3. Scoping Comments

Scoping comments and issues from the low-income and minority outreach were included in the scoping issues listed previously. Among participants in this outreach, there was greater emphasis on the need for employer incentives to provide transit passes, an emphasis on serving employment centers, and an emphasis on reliability. For transit-dependent publics, system reliability was tied to one's ability to arrive at work on time and avoid tardiness penalties imposed by employers. In particular, winter reliability was a concern for current bus riders.

X. AVAILABILITY OF TECHNICAL REPORTS

A. TECHNICAL REPORTS

Numerous sections of the CIS include summaries of technical memorandums and reports prepared by members of the Study Team. These more detailed technical reports are listed below and are available for agency and public review upon request. Local government planning documents can be found at the applicable government offices.

1. Access Management

Roaring Fork Railroad Holding Authority. June 24, 1999. *Roaring Fork Railroad Access Control Plan*, (Note: this is included in *A Comprehensive Plan for the Aspen Branch of the Denver & Rio Grande Western Railroad Corridor* listed below.)

2. Alternative Evaluation

MK Centennial and DeLeuw, Cather. September 10, 1998. *Glenwood Springs to Aspen CIS/DEIS/CP Phase 1 Report, Alternatives Screening Analysis*, MK Centennial and DeLeuw, Cather. May 3, 1999. *Glenwood Springs to Aspen CIS/DEIS/CP Phase 2 Report, Alternatives Screening Analysis*, and *Appendices A & B,*

3. Comprehensive Plan

Roaring Fork Railroad Holding Authority. November 3,1999. *A Comprehensive Plan for the Aspen Branch of the Denver & Rio Grande Western Railroad Corridor.*

4. Cultural Resources

Chambellan, Collette C. and Mehls, Steven F. March 24, 2000. *A Class III Cultural Resources Survey of the Roaring Fork Railroad Holding Authority Environmental Impact Statement Glenwood Springs to Brush Creek Transportation Corridor, Eagle, Garfield and Pitkin Counties, Colorado.* Prepared for the Parsons Transportation Group and the Colorado Department of Transportation, Prepared by Western Cultural Resource Management Inc.

Chambellan, Collette C. and Mehls, Steven F. October 5, 2000. *A Historical Resources Survey of the Lower River Road in Pitkin County, Colorado.* Prepared for the Colorado Department of Transportation, Prepared by Western Cultural Resource Management, Inc.

5. Environmental Impact Statements and Records of Decision

Colorado Department of Transportation. *1997. State Highway 82 Entrance to Aspen, Final Environmental Impact Statement, Section 4(f) Evaluation*. Colorado Department of Transportation. 1998. *State Highway 82 Entrance to Aspen, Record of Decision.*

Colorado Department of Transportation. 1993. *State Highway 82 East of Basalt to Buttermilk Ski Area: Final Environmental Impact Statement, Volume One, Technical Reports and Record of Decision.*

6. Finance

Otak, Inc., TDA, Inc., and Carter & Burgess. December 17, 2002. *Glenwood to Aspen CIS/DEIS Financial Technical Memoranda*

7. Future Transportation Demand Models

Parsons Transportation Group, Inc. June 2000. *Technical Report on Travel Forecasting Demand Model.* Parsons Transportation Group, Inc. June 2000. *Travel Forecasting Model Trip Tables.*

Parsons Transportation Group, Inc. June 2002. *Glenwood Springs to Aspen CIS/DEIS Completion, Technical Memorandum – Travel Forecasts for CIS/DEIS Alternatives.* (Note: this is included in *West Glenwood Springs to Aspen CIS/DEIS, Transportation Impacts, Supporting Technical Information* listed below.)

Parsons Transportation Group, Inc. December 2002. *Glenwood Springs to Aspen CIS/DEIS Completion, Addendum to Technical Memorandum – Travel Forecasts for CIS/DEIS Alternatives.* (Note: this is included in *West Glenwood Springs to Aspen CIS/DEIS, Transportation Impacts, Supporting Technical Information* listed below.)

Carter and Burgess. 2003. *West Glenwood Springs to Aspen CIS/DEIS, Transportation Impacts, Supporting Technical Information.*

8. Noise and Vibration

MK Centennial. June 2000. *Glenwood to Aspen/Pitkin County Airport Noise and Vibration Technical Report*.

Parsons Engineering Science, Inc. December 2000. *City of Aspen LRT and DMU Noise Evaluation*.

9. Operations

TDA, Inc. January, 2001. *Technical Report on Operations, Corridor Investment Study, Roaring Fork Corridor.*

10. Trails

Landplan Design Group. June 1999 *Aspen Branch Denver & Rio Grande Western Railroad: Recreational Trails Plan, Glenwood Springs to Aspen CIS/DEIS/CP,*_ (Note: this is included in *A Comprehensive Plan for the Aspen Branch of the Denver & Rio Grande Western Railroad Corridor* listed above.)

Scientific Applications International Corporation (SAIC). July 15,1999. *Reading the Roaring Fork Landscape: An Ideabook for Interpretation and Environmental Education,* (Note: this is included *in A Comprehensive Plan for the Aspen Branch of the Denver & Rio Grande Western Railroad Corridor* listed above.)

11. Transit-Oriented Community Design – Station Location

Otak, Inc. February 2000. *Glenwood Springs to Aspen/Pitkin County Airport Corridor Investment Study Transit Oriented Community Design Report*.

12. Travel Characteristics

Charlier Associates, Inc. December 14, 1998. *Through Traffic Study, City of Glenwood Springs*.

13. Wetlands

SAIC. December 2000. *Wetland Assessment, West Glenwood Springs to Aspen, Colorado CIS/DEIS/CP.*

B. REPORT LOCATION

Copies of these reports are on file at the following location:

Roaring Fork Transportation Authority
766 Industrial Place
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XI. LIST OF PREPARERS

The following people contributed to the preparation of the *West Glenwood Springs to Aspen Corridor Investment Study* (CIS):

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Roaring Fork Transportation Authority (RFTA)
(formerly Roaring Fork Railroad Holding Authority (RFRHA)

Dan Blankenship,Executive Director, Roaring Fork Transportation Authority. Mr. Blankenship has 19 years of transit management experience. He was the General Manager of the Roaring Fork Transit Agency for 11 years before it became the region's transportation authority in November 2000. Mr. Blankenship has also managed transit systems in Waukesha, Wisconsin, and Durango, Colorado.

Alice Hubbard, Director of Development, Roaring Fork Transportation Authority. Ms. Hubbard has a B.A. in Political Science and graduate work in Sociology with an emphasis on energy and the environment. Ms. Hubbard has 16 years experience with citizen participation programs, and over ten years experience with community-based energy and transportation planning.

Tom Newland, RFRHA Executive Director through February 2001. Mr. Newland holds a B.S. of Natural Resources. He has over 15 years of experience in public sector planning and engineering projects.

Mike Davis, Director of Planning, Roaring Fork Transportation Authority. Mr. Davis holds a B.S. in Geography, a B.S. in Urban Planning and an M.S. in Urban Planning. He is a certified planner and has over seven years of experience in transportation planning.

Mike Hermes, Director of Properties and Trails, holds a B.A. from Colorado State University in Business Finance and Real Estate. Mike Hermes has 12 years experience in the construction industry and seven years experience in property management.

Consultant Study Team, 2001-2003

Roger Millar, Otak. Project Manager (2001-2003). Deputy Project Manager (1998-2001) Mr. Millar holds a B.S. in Civil Engineering and is a registered Professional Engineer in Colorado, Wyoming, Oregon, Washington, and Idaho and is a Certified Planner. He has 24 years of experience in transportation, land use, and environmental planning and transportation engineering.

Joanna Morsicato, Joanna Morsicato and Associates. Environmental Specialist – NEPA and Section 106 Compliance Manager, Document Editor and Production Co-Manager. Ms. Morsicato holds a B.A. in Anthropology and an M.A. in Geography. She has 28 years of experience in project management, documentation, and environmental compliance for transportation projects.

Robert Schultz, Robert Schultz Consulting. A strategic planning and issue management consultancy with an emphasis on ecology and development of sustainable public policy. Mr. Schultz holds a B.A. in Philosophy. He has ten years of experience focused on public land policy, issue management, and strategic planning.

Jennifer Heisler, Carter and Burgess has over 22 years of experience in the management of multimodal transportation projects. She has conducted major investment and corridor planning studies, transit feasibility studies, and regional transportation planning efforts. Ms. Heisler has a Masters Degree in City Planning from the University of Pennsylvania.

Linda Schuemaker, The WordSmith. Document Production Co-Manager. Ms. Schuemaker has more than 25 years experience in writing, editing, graphic design, and production, including eight years as owner of The WordSmith, specializing in transportation and public process.

Craig Gaskill, Carter & Burgess. Mr. Gaskill holds B.S. and M.S. degrees in Civil Engineering and is a registered Professional Engineer in Colorado. Mr. Gaskill is also a certified Professional Planner. He has over 18 years of experience in planning, design, and environmental analysis of transportation facilities. CIS Project Manager from 1998-2000.

Chris Primus, Carter & Burgess is a senior transportation planner with 11 years in travel demand forecasting. Previously, he was with the Denver Regional Council of Governments where his primary responsibilities were operation, maintenance, and documentation of the regional travel demand model and preparation of transportation plans. Mr. Primus holds a M.S. in Transportation and a M.S. in Computational Mathematics

Gina McAfee, Carter and Burgess , has 26 years of experience in environmental planning for transit, and highway projects. She has expertise in NEPA document preparation for DOT and FTA projects and has worked in 13 different states preparing NEPA documents. She was the Project Manager for the Southeast Corridor MIS and the EIS.

Mike Davis, RFTA, (see above).

Roger Koester, Parsons Transportation Group. Project Administrator. Mr. Koester has 36 years of experience in transportation engineering with a focus on project management of interdisciplinary projects.

Public Involvement and Facilitation

Tom Baker, Town of Basalt. Mr. Baker holds a B.S. in City and Regional Planning and an M.A. in Public Administration. He is a trained facilitator with over 23 years of experience in facilitation and public administration.

Robert Schultz, Robert Schultz Consulting (see above).

Alice Hubbard, RFTA (see above).

Maro Zagoras has 12 years of experience in facilitation at the local, state and federal level in land use, transportation and water issues. Formerly a facilitator with the National Civic League, Ms. Zagoras currently serves as an ECR Roster Facilitator for the US Institute for Environmental Conflict Resolution.

Roger Millar, Otak (see above).

Resource Expertise

Access

Roger Millar, Otak (see above).

Scot Siegel, Otak (see above).

John Sleavin, Otak. Mr. Sleavin holds a B.S. in Civil Engineering. He has 15 years of experience in transportation-related engineering and is a registered Professional Engineer in Oregon, Washington, and Colorado.

Air Quality Analysis

John Bender, formerly of Washington Infrastructure Services, Inc. Mr. Bender holds a B.A. in Geography and an M.S.in Urban and Regional Planning. He has 2 years of experience in transportation planning.

Alignment/Technology Studies

Roger Millar, Otak (see above).

Craig Gaskill, Carter and Burgess (see above).

John Bender, formerly of Washington Infrastructure Services, Inc. (see above).

Robert Hertz, formerly of Washington Infrastructure Services, Inc.. Mr. Hertz holds a B.S. degree in Economics and a M.S. degree in Urban and Regional Planning. Mr. Hertz is a certified Professional Planner. He has over 9 years of experience in planning and environmental analysis of transportation facilities.

Matthew Kinsella, Washington Infrastructure Services, Inc.. Mr. Kinsella holds a B.S. degree in Civil Engineering, and has 5 years of experience in traffic engineering and transportation planning.

Michelle McGinn, formerly of Washington Infrastructure Services, Inc.. Ms. McGinn holdss a B.S. degree in Civil Engineering. She has 6 years of experience in transportation planning and highway noise analysis.

R.A. Plummer, formerly of Washington Infrastructure Services, Inc.. Mr. Plummer holds a B.S. degree in Civil Engineering. He has 6 years of experience in transportation planning and design.

Jerry Waterman, Washington Infrastructure Services, Inc. Mr. Waterman holds an Associates degree in Mechanical Design and has 15 years of experience in civil engineering and design.

Bridge Analysis

Isan Fan, Washington Infrastructure Services, Inc.. Mr. Fan holds a B.S. in Civil Engineering and a M.S. in Civil Engineering. He has 19 years of professional experience in the design and construction of structure projects.

Cultural Resources

Collette Chambellan, Western Cultural Resources Management. Ms. Chambellan holds M.A. and B.A. degrees in Anthropology. She has over 25 years of experience in archaeology.

Tom Lennon, President, Western Cultural Resources Management. Dr. Lennon holds Ph.D and M.A. degrees in Anthropology as well as an M.A. in Communications and B.A. in History. He has over 25 years of experience in cultural resource management in the western United States.

Steve Mehls, Western Cultural Resources Management. Dr. Mehls holds Ph.D, M.A., and B.A. degrees in History. He has 22 years of experience in public history.

Joanna Morsicato, Joanna Morsicato and Associates (see above).

Ecological Assessment

Rob Cavallaro, Science Applications International Corporation. Mr. Cavallaro holds a B.S. in Forestry and Wildlife. He has 11 years of experience in the analysis of fisheries, wildlife, threatened and endangered species, and habitat.

Robert Henke, Science Applications International Corporation. Mr. Henke holds a B.S. in Forest Management and Fisheries and Wildlife Management, a B.S. in Forestry, and an M.S. in Wildlife Biology. He is a professional Wetland Scientist, Certified Ecologist, and Certified Wildlife Biologist. He has 18 years of experience in the natural resources field.

Rich McEldowney, Science Applications International Corporation. Mr. McEldowney holds a B.S. in Wildlife Biology and an M.S. in Rangeland Ecosystem Science. He has four years of experience with the analysis of wetlands and riparian and upland vegetation.

Gene Weglinski, Science Applications International Corporation. Mr. Weglinski holds an A.S. in Biology, a B.S. in Botany, and a M.S. in Horticulture. He has 12 years of experience with wetlands and riparian and upland vegetation.

Finance

E. Todd Chase, Otak. Mr. Chase holds a B.S. in Economics and is a Certified Professional Planner. He has 12 years of experience in transportation planning and economics.

Walter Kieser, Managing Principal of Economic and Planning Systems, Inc., has over 25 years of experience in revenue forecasting and preparing financial analyses of transportation and land use plans, and has been involved in transportation planning in the Roaring Fork Valley for nearly ten years.

Richard Berkson, Principal of Economic and Planning Systems, Inc., has developed revenue forecasts, cash flow models, and feasibility analyses for numerous public agencies for more than 20 years.

Roger Millar, Otak. (see above.

Floodplain Analysis

Rob Cavallaro, Science Applications International Corporation (see above).

Future Travel Demand Modelling

David Adams, Parsons Transportation Group. Mr. Adams has over 4 years of experience as a transportation engineer.

Everett Bacon, Parsons Transportation Group (see above).

Steve Decker, Cambridge Systematics. Mr. Decker holds a B.A. in International Relations and a M.C.P in City Planning. He has 13 years of experience in travel demand modeling and application.

Greg Gaides, Parsons Transportation Group. Mr. Gaides has over 6 years of experience in travel demand forecasting and transportation planning.

David Kurth, Parsons Transportation Group. Mr. Kurth has 21 years of experience in transportation planning, travel demand forecasting, and design and management of travel surveys.

Bruce Robinson, Kittleson and Associates. Mr. Robinson holds a B.S. in Civil Engineering and a M.S. in Engineering. He has 13 years of experience in transportation planning, traffic engineering, construction and research projects.

Smith Myung, Parsons Transportation Group. Mr. Myung holds a B.A. in Political Science and History and a M.A. in Urban and Regional Planning. He has 8 years of experience in transportation planning and travel demand forecasting.

Hazardous Materials Analysis

Gail Saxton, P.E., has a B. A. in Math/Physics/Chemistry from Wilson College and a B. S. in Civil engineering from the Colorado School of Mines. Ms. Saxton has 16 years experience in hazardous material investigation, property acquisitions, and clean ups for transportation projects, corridor studies, utilities, superfund sites, and other industrial facilities.

Land Use

Roger Millar, Otak (see above).

Stephen Helfenbein, formerly of Otak. Mr. Helfenbein holds a B.A. in Political Science and Public Policy. He has three years of experience with graphics, planning, and G.I.S.

Lex Ivey, formerly of Otak. Mr. Ivey has a B.A. in Geography, Environmental Conservation and in Environmental Population and Organismic Biology. He has seven years experience specializing in creating, manipulating, and analyzing geographic data.

Justin Healy, Otak. Mr. Healy has a BA in Geology and Professional Certifications in Geographic Information Systems and Internet Design and Programming. He has seven years experience in environmental science, data collection, and GIS applications

Noise and Vibration Analysis

Areg Gharabegian, Parsons Engineering Science, Inc. Mr. Gharabegian holds B.S. and M.S. degrees in mechanical engineering. He has 22 years of experience. His experience includes noise and vibration analysis and project management for highways, transit systems, airports, and industrial plants.

Robert Hertz, formerly of Washington Infrastructure Services, Inc. (see above).

Joanna Morsicato, Joanna Morsicato and Associates (see above).

Paleontological Resources Survey

Fred Olsen, C.P.G. Paleontological Investigations.

Rail Design

Doug DeBerg, Washington Infrastructure Services, Inc.. Mr. DeBerg has over 38 years of experience in the railroad industry. His experience includes construction and maintenance of rail facilities.

Deter Lippert, VRR Public Transit Agency. Mr. Lippert holds a degree in Economics. He has 30 years of experience with public transit agencies in Germany.

Social and Economic Analysis, and Environmental Justice

Joanna Morsicato, Joanna Morsicato and Associates (see above).

Robert Schultz, Robert Schultz Consulting (see above).

Roger Millar, Otak (see above).

Alice Hubbard, RFTA (see above).

Everett Bacon, Parsons Transportation Group. Mr. Bacon has over 10 years of experience in transportation planning including regional, subarea, and corridor modeling; environmental analysis; and transit alternative analysis.

Lex Ivey, formerly of Otak (see above).

Dave Michaelson, formerly of Otak. Mr. Michaelson holds a MS in Urban and Regional Planning, as well as Public Policy and Administration. He also holds a B.S. in Political Science and Environmental Studies. He has 13 years experience as a senior planner.

Stacey Sacher-Goldstein, Otak. Ms. Sacher-Goldstein holds a B.A. in Law and Society, and a M.S. in City and Regional Planning. She has eight years experience specializing in permitting, growth management, and land use planning.

Scot Siegel, Oak. Mr. Siegel holds a B.S. in Geography and a M.S. in Urban and Regional Planning. He has 11 years of experience in growth management, development permitting, and land use code writing.

Soil Studies

William Sitarz, Science Applications International Corporation. Mr. Sitarz holds a B.S. in Geology and a M.S. in Applied Geochemistry. He has five years of experience in the analysis of geology and soils.

Trails

Ann Dixon, Science Applications International Corporation. Ms. Dixon holds a B.A. in History, a Master in Landscape Architecture and a Master in Public Administration. She has 12 years of experience in planning for transportation and trail projects.

Paul Hellmund, Hellmund Associates. Mr. Hellmund holds a B.S. in Landscape Horticulture and a Master in Landscape Architecture. He has 21 years of experience in the planning and design of alternative transportation facilities.

Mike Hermes, RFTA (see above).

John Paliga, Landplan Design. Mr. Paliga holds a B.S. in Environmental Biology and a B.S. in Landscape Architecture. He has over 11 years of experience is recreation planning and design for public and private entities.

Transit Operations

William Baldyga, TDA. Mr. Baldyga holds a B.S. in Communication. He has 4 years of experience in data collection and analysis for transportation planning and engineering projects.

Dan Blankenship, RFTA (see above).

E.Todd Chase, Otak, (see above).

Mike Davis, RFTA (see above).

Bill Eager, TDA. Mr. Eager holds a B.S. in Civil Engineering, a M.S. in Civil Engineering, and a Doctorate of Engineering. He has over 31 years of experience in transportation engineering projects around the world.

David Leahy, TDA. Mr. Leahy holds a B.S. in Civil Engineering. He has 26 years of experience in freeway corridor planning, design, construction operation, and transit planning.

Roger Millar, Otak (see above).

John Schumann, LTK Engineering Services. Mr. Schumann holds a B.A. in Business Administration and an M.S. in Civil Engineering. He has over 26 years of experience in a variety of transit system technologies and applications in the U.S. and other countries.

Transit-Oriented Community Design

Steve Dixon, Otak. Mr. Dixon holds a B.S. in Landscape Architecture. His professional background includes 19 years of experience in all aspects of landscape design.

Martin Glastra van Loon, Otak. Mr. Glastra van Loon received his education in the Netherlands, majoring in Planning and Urban Design. He has nine years of experience working as an urban designer/planner in both the Netherlands and the United States.

Roger Millar, OTAK, Principal (see above).

Alice Hubbard, RFTA (see above).

Transportation Management and New Starts

Roger Millar, Otak (see above).

Jennifer Heisler, Carter & Burgess (see above).

Alice Hubbard, RFTA (see above).

Chris Primus , Carter & Burgess (see above).

Craig Gaskill, Carter & Burgess (see above).

Joe Tempel, CDOT (see above).

Visual Quality Analysis

Joanna Morsicato, Joanna Morsicato and Associates (see above).

John Bender, formerly of Washington Infrastructure Services, Inc (see above).

Water Quality Analysis

Robert Henke, Science Applications International Corporation (see above).

Rob Naeser, Science Applications International Corporation. Mr. Naeser holds a B.S. in Economics and a M.S. in Water Resource Economics and Management. He has 7 years of experience with water resources.

Wildlife, Threatened and Endangered Species

Rob Cavallaro, Science Applications International Corporation (see above).

Bill Doering, Science Applications International Corporation. Mr. Doering holds a B.A. in Biology and a M.S. in Zoology. He has 7 years of experience with fisheries, wildlife and threatened and endangered species.

Robert Henke, Science Applications International Corporation (see above).

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Linda Schuemaker, The WordSmith (see above).

Robert Schultz, Robert Schultz Consulting (see above).

Chris Primus, Carter and Burgess (see above).

XII. Glossary

A

AABC	Aspen Airport Business Center
AADT	Average Annual Daily Traffic
ACC/MVM	Accidents Per Million Vehicle Miles Traveled
ACOE	Army Corp of Engineers
ADA	Americans with Disabilities Act
ADT	Average Daily Traffic
AF-2	Agriculture and Forest
APE	Area of Potential Effect
AST	Above-ground Storage Tank
AVL	Automatic Vehicle Locate
AVO	Average Vehicle Occupancy

B

BBFEIS	*Basalt to Buttermilk Final Environmental Impact Statement*
BEA	Bureau of Economic Analysis
BMP	Best Management Practice
BOCC	Board of County Commissioners
BOD	Biological Oxygen Demand
BRT	Bus Rapid Transit
BTEX	Benzene, toluene, ethyl-benzene, and xylenes
BTRT	Boreal Toad Recovery Team
BTU	British Thermal Units

C

C	Degrees Centigrade
C1	Category 1
C2	Category 2
C3	Category 3
C	Conservation
CC	Commercial Core
CAAA	Clean Air Act Amendments
CAC	Citizen's Advisory Committee
$CaCO_3$	Calcium Carbonate
Cd	Cadmium
CDH	Colorado Department of Health
CDOH	Colorado Department of Highways
CDOT	Colorado Department of Transportation
CDOW	Colorado Division of Wildlife
CDPHE	Colorado Department of Public Health and the Environment
CERCLIS	Comprehensive Environmental Response, Compensation and Liability Information System
Cfs	Cubic feet per second
CIS	Corridor Investment Study
Consists	sets of rail cars
Cms	Cubic meters per second
CMC	Colorado Mountain College
CNHP	Colorado Natural Heritage Program
CO_3	Carbonates
COGAP	Colorado Gap Analysis Program
COPS	Certificates of Participation
CP	Comprehensive Plan
Cr	Chromium
CR	County Road
CTF	Citizen Task Force
CWA	Clean Water Act
CWQCC	Colorado Department of Water Quality Control Commission

D

dBA	Decibels - average noise fluctuations over an hour
D&RGW	Denver and Rio Grande Western Railroad
DDT	Dichloro-disphenyl-trichloroethane
DEIS	Draft Environmental Impact Statement
DERA	Designated Emergency Response Authority
DLA	Department of Local Affairs
DMU	Diesel Multiple Unit
Downvalley	The portion of the Roaring Fork Valley from El Jebel North to Glenwood Springs
DSEIS	Draft Supplemental Environmental Impact Statement
DSI	Detailed Site Investigation

E

ECRTA	Eagle County Rail Transit Authority
EDR	Environmental Data Resources
EIS	Environmental Impact Statement
EJ	Environmental Justice
EO	Executive Order
EOTC	Elected Officials Transportation Committee
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ETA	Entrance to Aspen

F

FAA	Federal Aviation Administration
FAC	Facultative Plants
FACU	Facultative Upland Plants
FACW	Facultative Wetland Plants
FC	Federal Candidate for Listing
FE	Federal Endangered
FEIS	Final Environmental Impact Statement
FEMA	Federal Emergency Management Agency
FFGA	Full Funding Grant Agreement
FFY	Federal Fiscal Year
FHWA	Federal Highway Administration
FIRM	Flood Insurance Rate Maps
FRA	Federal Railroad Administration
FS	Federal Sensitive
FT	Federal Threatened
FTA	Federal Transit Administration
FTAM	FTAs *Transit Noise and Vibration Impact Assessment* Manual

G

GIS	Geographic Information System
GOCO	Greater Outdoor Colorado
G/S 1	CNHP global/state 1 critically imperiled
G/S 2	CNHP global/state 2 imperiled
GSE	Glenwood Springs Electric
GSFD	City of Glenwood Springs Fire Department

H

HASP	Health and Safety Plan
HCM	Highway Capacity Manual
Hg	Mercury
HOV	High Occupancy Vehicle
HPC	Historic Preservation Commission
HUTS	Highway and Underground Transit Solution

I

I	Industrial
IGA	Inter-Governmental Agreement
ISA	Initial Site Assessment
ISTEA	Intermodal Surface Transportation Efficiency Act
ITPR	Intermountain Transportation Planning Region
ITS	Intelligent Transportation System

K

km/h	Kilometers Per Hour
KWH	Kilowatt Hours

L

L_{dn}	Day-night noise level, which takes into account the increased sensitivity of people to noise during sleeping hours. The L_{dn} is a 24-hour L_{eq}, but with a 10 dB penalty assessed to noise events occurring at night (10:00 p.m. to 7:00 a.m.).
L_{eq}	A calculated average of noise produced by different activities over a period of time.
LOS	Level of Service
LUST	Leaking Underground Storage Tank
LRT	Light Rail Transit
LRV	Light Rail Vehicle

M

MAC	Metcalf Archaeological Consultants
Mg/l	Milligrams per Liter
Midvalley	The portion of the Roaring Fork Valley which includes Basalt/El Jebel
MMP	Materials Management Plan
MM	Mile Marker
MP	Milepost
MPH	Miles Per Hour
MTBE	Methyl Tertiary Butyl Ether
MUTCD	Manual of Uniform Traffic Control Devices

N

N/A	Not Applicable, Not Available
Na	Sodium
NAAQS	National Ambient Air Quality Standards
NAC	Noise Abatement Criteria
NDPES	National Pollutant Discharge Elimination System
NEPA	National Environmental Policy Act of 1969
NHD	National Historic District
NHP	Natural Heritage Program
NHPA	National Historic Preservation Act
NPDES	National Pollutant Discharge Elimination System
NR-B	Non-rural Arterial
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
NWI	National Wetland Inventory

O

OAHP	Office of Archaeology and Historic Preservation
OBL	Obligate Wetland Plants
O&M	Operation and Maintenance

P

P	Park
Pb	Lead
PCB	Polychlorinated Biphenyls
PEM1C	Palustrine Persistent Emergent Seasonally Flooded
PFA	Post-fledgling family area
PFC	Passenger Facility Charge
PFO1C	Palustrine Forested Broadleaved Deciduous Seasonally Flooded
pH	Potential of Hydrogen – a measure of the acidity or alkalinity of a solution
PHWS	Potentially Hazardous Waste Sites
PM_{10}	Particulate matter 10 microns or smaller in diameter
PMH	Permanent Moderate Housing
PPV	Peak Particle Velocity
PRT	Personal Rapid Transit
PSI	Preliminary Site Investigation
PSS1C	Palustrine Scrub-Shrub Broadleaved Deciduous Seasonally Flooded
PUD	Planned Unit Development
P&R	Park-and-Ride

R

R-A	Rural Regional Highway
R-6	Medium Density Residential
R-15	Moderate Density Residential
R-30	Low Density Residential
R/MF	Residential Multi-family
RCRA	Resource Conservation and Recovery Act
RETT	Real Estate Transfer Tax
RFRHA	Roaring Fork Railroad Holding Authority
RFTA	Roaring Fork *Transit Agency*, prior to June, 2002; currently Roaring Fork *Transportation Authority*
RMFRES	Rocky Mountain Forest and Range Experiment Station
RMS	Root-Mean-Square Amplitude
RTA	Regional Transit Authority
RTF	Regional Task Force
RTMS	Remote Traffic Microwave Sensor
ROD	Record of Decision
ROI	Region of Influence
ROW	Right-of-Way
RPZ	Residential Parking Zone

S

SADT	Summer Average Daily Traffic
SAIC	Scientific Applications International Corporation
SCI	Service/Commercial/Industrial
SCS	Soil Conservation Service
S3	CNHP State 3 vulnerable throughout range
Se	Selenium
SE	State Endangered
SEL	Sound Exposure Level
SH 82	State Highway 82
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
SOC	State Species of Concern
SO_4	Sulfates
SOV	Single Occupant Vehicle
ST	State Threatened
SQG	Small Quantity Generator
SRK	Steffen, Robertson and Kirsten
Study Team	RFTA Staff and independent consultants contracted to research and complete the CIS/DEIS
Surficial	Relating to a surface
SVOC	Semi-volatile Organic Compound
SWMP	Stormwater Management Plan

T

T&E	Threatened and Endangered
TAC	Technical Advisory Committee
TAZ	Traffic Analysis Zone
TCLP	Toxicity Characteristic Leachate Procedure
TDM	Transportation Demand Management
TDP	Transit Development Plan
TEA-21	Transportation Efficiency Act for the 21st Century
TH	Test Hole
TM	Transportation Management
TOD	Transit-Oriented Development
TPH	Total Petroleum Hydrocarbons
TPR	Transportation Planning Region
TRPH	Total Recoverable Petroleum Hydrocarbons
TSM	Transportation System Management
TSS	Total Suspended Solid
TVH	Total Volatile Hydrocarbons
TVS	Table Value Standards

U

UPRR	Union Pacific Railroad
Upvalley	The portion of the Roaring Fork Valley from Basalt South to Aspen
USACOE	United States Army Corps of Engineers
USC	United States Code
USDA	United States Department of Agriculture
USDOT	United States Department of Transportation
USEPA	United States Environmental Protection Agency
USFS	United States Forest Service

USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
UST	Underground Storage Tank

V

Valley	A shortened reference to the Roaring Fork Valley
VdB	Vibration Decibel - Average Vibration Fluctuations Over an Hour
VMT	Vehicle Miles Traveled
VOC	Volatile Organic Compound
VPD	Vehicles Per Day
VPH	Vehicles Per Hour

W

WADT	Winter Average Daily Traffic
WCRM	Western Cultural Resource Management
WHI	Weighted Hazard Index
WQCC	Water Quality Control Commission
wye	The "Y" shaped track used to reverse directions of trains or rail cars

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APPENDIX A: COORDINATION

A. AGENCY COORDINATION FOR THIS PROJECT

AGENCIES (FHWA/FTA/FRA/CDOT):

FTA/FRA/FHWA Coordination Meeting	August 13, 1998 January 9, 2002	February 19, 2002
FTA/FHWA Coordination Meeting	September 10, 1998	
FRA/FTA Track Inventory and Improvement Cost Review	November 16, 1998	
FTA/FHWA Coordination Meeting	January 12, 1999	
FTA/FHWA Agency Update	February 18, 1999	
FHWA Environmental Clearance	March 18, 1999	
FTA/FHWA Status Meetings	July 29, 1999 November 12,1999 December 28, 1999 January 26, 2000 July 27, 2000	August 20, 2000 February 15, 2001 November 6, 2001 December 4, 2001 January 9, 2002

RFRHA

Note: *RFRHA was absorbed into the new Roaring Fork Transportation Authority in November, 2000. After that date, meetings were no longer focused solely on the current project.*

• Board of Directors	July 11, 1997	
• Roundtable	July 31, 1997 August 1, 1997 August 15, 1997 August 29, 1997 September 12, 1997	September 25, 1997 September 26, 1997 October 3, 1997 October 10, 1997 October 24, 1997
• Retreat	November 13, 1997 November 21, 1997	December 5, 1997
• Subcommittee Meetings	December 10, 1997 December 19,1997 January 9, 1998 January 23, 1998 January 30, 1998 February 13, 1998 February 27, 1998 March 20, 1998 April 10, 1998 May 15,1998 June 5, 1998 June 15, 1998	June 25, 1998 July 24, 1998 August 21, 1998 October 2, 1998 October 16, 1998 September 18, 1998 November 20, 1998 December 18, 1998 January 22, 1999 February 5, 1999 February 19, 1999

RFRHA, *continued*

• Work Sessions with the Pitkin County Open Space and Trails Board	May 21, 1999 June 11, 1999 June 25, 1999 July 23, 1999 August 6, 1999 September 10, 1999 October 8, 1999 October 29, 1999 November 17, 1999 December 10, 1999 December 17, 1999 January 19, 2000	February 3, 2000 February 29, 2000 March 15, 2000 April 20, 2000 May 17, 2000 June 22, 2000 July 19, 2000 August 18, 2000 September 20, 2000 October 18, 2000 November 8, 2000
Joint Meetings: RFRHA Board and RFRHA Policy Committee	December 19, 1997 January 23, 1998 February 27, 1998 March 20, 1998 April 10, 1998 May 1, 1998 May 22,1998 June 19, 1998 July 30, 1998 August 28, 1998 October 9, 1998 October 27, 1998 November 13, 1998	December 18, 1998 January 6, 1999 (Site trip) January 29, 1999 February 26, 1999 April 2, 1999 April 22, 1999 April 30,1999 May 14, 1999 May 21, 1999 June 18, 1999 September 10, 1999 September 24, 1999 October 8, 1999
Regional Citizen Task Forces (RCTFs)	March 12, 1998 April 2, 1998 April 23, 1998 May 14,1998 June 4, 1998 September 9, 1998 October 15, 1998 November 12,1998	December 17, 1998 May 17,1999 June 17, 1999 July 8, 1999 August 12, 1999 September 23, 1999 October 7, 1999
Citizen Task Forces (CTFs)		
• Downvalley (Glenwood Springs/Garfield County)	January 19, 1998 February 2, 1998 March 2, 1998 March 23, 1998 April 13, 1998 May 4, 1998 June 1, 1998 July 13, 1998 August 10, 1998 September 21, 1998 October 5, 1998 November 2, 1998	December 15, 1998 January 18, 1999 March 1, 1999 April 21, 1999, May 10, 1999 June 7, 1999 July 13, 1999 August 9, 1999 August 23, 1999 September 13, 1999 September 28, 1999 November 13, 2001

Citizen Task Forces, *continued*

• Upvalley (Aspen)	January 21, 1998 February 4, 1998 March 25, 1998 April 15, 1998 May 6, 1998 June 3, 1998 July 15, 1998 August 12, 1998 October 7, 1998 November 4, 1998 December 4, 1998	January 20, 1999 March 3, 1999 April 14, 1999 May 19,1999 June 9, 1999 July 15, 1999 August 11, 1999 August 25, 1999 September 15, 1999 September 29, 1999
• Midvalley (Basalt)	January 26, 1998 February 9, 1998 March 9, 1998 March 30, 1998 April 20, 1998 May 11, 1998 June 8, 1998 July 20, 1998 August 17, 1998 September 28, 1998 October 12, 1998 November 9, 1998	December 7, 1998 January 25, 1999 March 3, 1999 April 19, 1999 May 17, 1999 June 14, 1999 July 20, 1999 August 9, 1999 August 30, 1999 September 20, 1999 October 4, 1999 November 12, 2002
• Carbondale	January 28, 1998 February 11, 1998 March 11, 1999 April 2, 1998 April 22, 1998 May 13,1999 June 10, 1998 July 22, 1998 August 19, 1998 September 30, 1998 October 14, 1998	November 10, 1998 December 9, 1998 January 26, 1999 March 1, 1999 April 20, 1999 May 12, 1999 June 16, 1999 August 11, 1999 September 1, 1999 September 22, 1999 October 6, 1999

RTA

Planning Commission Work Sessions	September 17, 1998	
• Roaring Fork Regional (Eagle County) Garfield County/Glenwood Springs Staff interview Notes	February 25, 1998 August 21, 1998	September 22, 1998
• Carbondale Staff Interview Notes	February 23, 1998 August 27, 1998	September 10, 1998
• Basalt Staff Interview Notes	February 20, 1998	October 6, 1998
• Aspen and Pitkin County	October 6, 1998	October 13, 1998

OTHER PUBLIC MEETINGS

Open Houses		
• Basalt	November 30, 1998	
• Glenwood Springs	December 1, 1998	January 30 2002
• Basalt	May 3, 1999	February 7, 2002
• Aspen	May 4, 1999	February 6 2002
• Glenwood Springs	May 5, 1999	
• Carbondale	May 6,1999	Jan 31 2002
Latino Open House	March 24, 1999	May 8, 1999
Scoping Meetings		
• Denver	January 6, 1998	
• Rifle	February 17, 1998	
• Carbondale	February 18, 1998	
• Basalt	February 19, 1998	
• Glenwood Springs	February 23, 1998	
• Aspen	February 24, 1998	
Freight Workshop, Glenwood Springs	November 19, 1998	
Eagle Valley Presentation	October, 1998	
Transit-Oriented Community Design (TOCD) Workshops		
• Glenwood Springs	February 9, 1999	
• Carbondale	February 11, 1999	
• Midvalley (Basalt	February 22, 1999	
Trails Workshop	May 20,1998	
Trails Task Force	October 15, 1998	February 17, 1999
	January 19, 1999	March 9, 1999
	February 9, 1999	April 22, 1999
Access Task Force	January 12, 1999	February 16, 1999
	January 28, 1999	March 8, 1999
Citizens for a Small Town Aspen	April 22, 2003	

NEWSLETTERS

- *Roaring Fork Region Study Findings Corridor Investment*, October 21, 1999, Summary of Regional Task Force Findings
- *RFRHA Issue Briefs:*

1. What is RFRHA? History, Information About the Corridor and the Project, Board Members
2. What is the Roaring Fork CIS? Who is Involved in the Process? Time Frame, How Can I Influence the CIS?
3. CIS Project Objectives (Affordability and Economic Viability, Community-Based Planning, Environmentally Sound, Flexibility, Increased Transportation Choices, Integrated Approach to Transportation Planning, Livability, Safety, Traits and Recreational Resource)
4. CIS Transportation Alternatives: Busway or Rail? Other Alternatives, Key Study Findings
5. Potential Transit Alignments for Busway or Rail, Key Findings
6. *RFRHA - Issue Brief No. 7*: The Preferred Build Alternative: Why Was Rail Chosen Over a Busway? What Kind of Rail Technology is Being Considered? Next Steps (Preferred Local Alternative) April 1999.

- *An End to Gridlock: The Preferred Alternative for the Entrance to Aspen;* City of Aspen, August 1998.
- Description of Project, How We Got to Where We Are, Transportation Future, Community-Based Solution, What Citizens Can Do.
- *Valleywide Rail: Answers to Your Questions;* May 1998. Towns of Basalt, Carbondale, Glenwood Springs, and Aspen. Answers to FAQ's Concerning Ridership, Parking, Cost Comparison, Funding, Environment, Buses, Cost to Operate, Stops, Growth, Trails, Convenience, and Maintenance.
- *Going Places;* RFRHA; Vol. I, No. 2, February 1998. Construction Update, It's Your ROW - Help Plan Its Future, Transportation Picture, Q&A, Transportation Issues, CIS/EIS, Community Input/Involvement.

SURVEYS

Latino Outreach Survey, November 13, 1998.
Methodology: 136 interviews with Latinos riding RFTA buses on October 7, 8, and 21, 1998 between 7 a.m. and 8 p.m. Three interpreters used; interviews with 18 English-as-a-second-language students; general comments recorded and highlighted when heard repeatedly. Issues addressed: Why do people use transit and how often? Would they use train over bus? Key themes to consider in designing transportation.

B. AGENCY BOARD AND TASK FORCE MEMBERS

ROARING FORK TRANSPORTATION AUTHORITY BOARD MEMBERS

Helen Klanderud - Aspen
Tony Hershey (A)
Jacque Whitsitt - Basalt
Jonathan Fox-Rubin (A)
Susan Darrow - Carbondale
Scott Chaplin (A)
Rick Davis, Glenwood Springs
Dan Richardson (A)
Michael Gallagher - Eagle County
Dorothea Farris - Pitkin County
Shelley Roy (A)
Arnie Mordkin - Snowmass Village
Bill Boineau (A)

ROARING FORK RAILROAD HOLDING AUTHORITY BOARD MEMBERS

George Roussos, Chairman, Eagle County
John Martin, Garfield County
Joe Tempel, Colorado Department of Transportation
Jim Markalunas, City of Aspen
Georgeann Waggaman, Pitkin County at-large
Steve Solomon, Basalt
Mark Fuller, Eagle County at-large
John Tripp, Glenwood Springs
Dorothea Farris, Pitkin County
John Starr, Pitkin County Open Space
R. Hunt Walker, Snowmass Village
Brad Hendricks, Town of Carbondale

POLICY COMMITTEE

John Bennett, City of Aspen
Dave Beckhouse, FTA
Walt Brown, Garfield County
Dorthea Farris, Pitkin County
Steve Fender, FRA
Mark Fuller, Eagle County at-large
Ted Grenda, Snowmass Village
Shellie Roy Harper, Pitkin County
Reid Haughey, Aspen Valley Land Trust
Brad Hendricks, Town of Carbondale
James Johnson, Eagle County
Michael Kulbacki, FHWA
Eva LaDow, FHWA
Jim Markalunas, City of Aspen
John Martin, Garfield County Commission
Krista Paradise, Town of Carbondale
George Roussos, Eagle County
Will Shafroth, Great Outdoors Colorado

Steve Solomon, Basalt
Sam Skramstad, Glenwood Springs
John Starr, Pitkin County Open Space
Rick Stevens
Lou Trapani, Intermountain TPR
Ralph Trapani, CDOT
Jon Tripp, Glenwood Springs
Georgeann Waggaman, Pitkin County at-large
R. Hunt Walker, Snowmass Village

CITIZEN TASK FORCE MEMBERS

Upper Valley

Howard Adams
Tom Allspaugh
Richie Cohen
Francois Coturier
Lanny Curtis
Charlie Eckart
Marc Friedberg
Steve Goldenberg
Jim Heywood
Heidi Hoffman
Roger Hunt
Chris Kiley
Helen Klanderud
Ron Long
Ramona Markalunas
Nathan Morse
Rick Neiley
Paul Rudnick
Doug Smith
Eric Sween
David Swersky
Charlie Tarver
Bob Vhrin
Jeff Wertz
Camia Young

Carbondale

Jim Breasted
Joe Casteel
Mark Chain
Susan Darrow
Olivia Emery
Davis Farrer
Pat Griffin
Bruce Hazzard
Dorie Hunt
John Laatsch
Belinda Leve
Ron Long
Jane Lucas
Bob Lucas
Katie Marshall
Joan Matranga
Kenny Osier
Kay Philip
Doc Philip
Ted Reed
Nancy Smith
Katie Soden
Steve Wolfe

Glenwood Springs

Elise Belvedere
Bob Boyle
Dennis Carey
Leslie Casanova
Dawn Dexter
Vic Faust
Patrick Fitzgerald
Victoria Giannola
Jan Girardot
Bill Grant
William Grant
Doug Harr
Jeff Houpt
Carter Jackson
Shelley Kaup
TJ Krest
Terry LaFrenz
Emmy Lerma
Dean Moffatt
Jodie Noel
Paul Rutledge
Steve Smith
Stan Stevens
Dave Sturges
Hal Sundin
Bruce Wampler
Phil Wheelock

Mid-Valley

Cindy Ashcroft
Greg Baker
Tracy Bennett
Ted Borchelt
Sally Cole
Michael Dawkins
Jonathan Fox-Rubin
Bob Fridstein
Donna Grauer
Ted Guy
Carter Holmes
John Katzenberger
Cathy Kulzer
Dwight Maurin
Joan Mecseri
Michael Munroe
Denise Mytty
Dave Reed
Bob Schiller
Lori Tompkins
Vern Twombly
Jeanne White

Resource Group

Larry Abbott, CDOT
Dave Beckhouse, FTA
Stan Berryman, Pitkin County
Dan Blankenship, RFTA
Mike Claffey, ACOE
Mark Chain, Carbondale
Stan Clauson, City of Aspen
Randy Cote, DOW
Steve Fender, FRA
Kim Gambrill, CDOT
Victoria Giannola, Garfield County
Jane Ellen Hamilton, Pitkin County Open Space
Glen Hartmann, Basalt
Reid Haughey, AVLT
Rob Iwamoto, USFS
Chris Kiley, Aspen Ski Company
Michael Kulbacki, FHWA
Andrew McGregor, Glenwood Springs
Susan Philip, Basalt
Randy Ready, Aspen
Gene Reetz, EPA
Keith Rose, USFWS
George Roussos, Eagle
Larry Thompson, Glenwood
David Peckler, Snowmass Village
Alice Hubbard, RFRHA
Jack Baier, PUC

C. Correspondence and Notices

To	From	Date	Topic	Page
Not applicable	Federal Register	December 31, 1997	Notice of Intent	A-8
Not applicable	Federal Register	April 29, 1999	Revised Notice of Intent	A-10
Joanna Morsicato & Assoc. – J. Morsicato	Natural Resources Conservation Service	December 27, 2002	AD 1006 Coordination	A-11
CDOW – R. Velarde	Joanna Morsicato & Assoc. – J. Morsicato	November 18, 2002	Wildlife Coordination update	A-13
SAIC – R. Naeser	National Park Service	March 24, 2000	Wild and Scenic Rivers	A-17
MK Centennial – C. Gaskill	SAIC – R. McEldowney	June 5, 2000	Wetlands field work	A-18
CDOT – R. Wostl	CDOW – R. Velarde	December 13, 1999	Wildlife coordination	A-19
CDOT – R. Wostl	USFWS – R. Leachman	April 19, 2000	T&E Species List	A-21
SAIC – R. Henke	US Army Corps of Engineers – G. McNure	November 20, 2000	Wetland boundaries	A-23
FTA – L. Mraz	FRA - D. Tisor	April 22, 1999	RR crossing and safety issues	A-26
APCD-CDPHE – M. Perkins	CDOT – R.Vickers w/ signed concurrence line	May 29, 2001	Air quality	A-30
Ute Mountain Ute Tribe – J. Knight-Frank	CDOT – D. Jepson	October 9, 2002	Native American Consultation	A-31
R. Vickers –CDOT	SHPO – G. Contiguglia	September 10, 2001	Section 106 – Sanders Ranch and Glenwood Ditch	A-33
R. Vickers – CDOT	SHPO – G. Contiguglia	May 21, 2002	Wingo Trestle	A-36
SHPO – G. Contiguglia	CDOT – R. Vickers w/ concurrence line	June 25, 2002	Documentation for 226 RR features.	A-37
SHPO – G. Contiguglia	R. Vickers – CDOT	January 10, 2003	Complete Section 106 for Trail, Rail and BRT	A-39
R. Vickers – CDOT	SHPO – G. Contiguglia	January 22, 2003	Concurrence with CDOT's determination of eligibility and effect	A-59

testing is 10 percent, and the data received under the MIS reporting requirements for that calendar year indicate that the violation rate is equal to or greater than 0.5 percent but less than 1.0 percent, the FAA Administrator must increase the minimum annual percentage rate for random alcohol testing to 25 percent.

When the minimum annual percentage rate for random alcohol testing is 25 percent or less, and the data received under the MIS reporting requirements for that calendar year indicate that the violation rate is equal to or greater than 1.0 percent, the FAA Administrator must increase the minimum annual percentage rate for random alcohol testing to 50 percent.

When the minimum annual percentage rate for random drug testing is 50 percent, the FAA Administrator may lower the rate to 25 percent if data received under the MIS reporting requirements for two consecutive calendar years indicate that the positive rate is less than 1.0 percent.

When the minimum annual percentage rate for random drug testing is 25 percent, and the data received under the MIS reporting requirements for any calendar year indicate that the reported positive rate is equal to or greater than 1.0 percent, the Administrator will increase the minimum annual percentage rate for random drug testing to 50 percent.

There is a one year lag in the adjustment in the minimum annual percentage rates for random drug and alcohol testing because MIS data for a given calendar year is not reported to the FAA until the following calendar year. For example, MIS data for 1996 is not reported to the FAA until March 15, 1997, and any rate adjustments resulting from the 1996 data are not effective until January 1, 1998, following publication by the FAA of a notice in the **Federal Register.**

The minimum annual percentage rate for random alcohol testing was 25 percent for calendar year 1996. In this notice, the FAA announces that it has determined that the violation rate for calendar year 1996 is less than one-half of one percent positive, at approximately 0.08 percent. The 1995 violation rate was also less than one-half of one percent. Since the violation rate is less than 0.5 percent for two consecutive calendar years, the minimum annual percentage rate for random alcohol testing for aviation industry employers for calendar year 1998 will be lowered to 10 percent.

The minimum annual percentage rate for random drug testing was also 25 percent in calendar year 1996. Therefore, the FAA is also announcing that it has determined that the positive rate for calendar year 1996 is less than 1 percent, at approximately 0.71 percent, and that the minimum annual percentage rate for random drug testing for aviation industry employers for calendar year 1998 will remain at 25 percent.

Dated: December 23, 1997.

Jon L. Jordan,

Federal Air Surgeon.

[FR Doc. 97-33982 Filed 12-30-97; 8:45 am]

BILLING CODE 4910-13-M

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Federal Transit Administration

Environmental Impact Statement: Pitkin, Eagle and Garfield Counties, CO

AGENCY: Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), DOT.

ACTION: Notice of intent and public scoping meetings.

SUMMARY: The FHWA and FTA are jointly issuing this notice to advise the public that an environmental impact statement/4(f) evaluation will be prepared for transportation improvements in Pitkin, Eagle and Garfield Counties, Colorado.

Five scoping meetings will be held from 7:00 pm to 9:00 pm at the following locations and dates as part of the preparation of the EIS/4(f) evaluation:

Tuesday, February 17, 1998: Rifle City Hall, 202 Railroad Avenue, Rifle, CO

Wednesday, February 18, 1998: Carbondale Town Hall, 511 Colorado Avenue, Carbondale, CO

Thursday, February 19, 1998: Basalt High School, 150 Cottonwood Drive, Basalt, CO

Monday, February 23, 1998: Garfield County Courthouse, 109 8th Street, Glenwood Springs, CO

Tuesday, February 24, 1998: Aspen City Hall, 130 South Galena, Aspen, CO

A 45-day scoping period will begin on January 6, 1998 and conclude on March 2, 1998.

FOR FURTHER INFORMATION CONTACT:

Michael Kulbacki, FHWA Colorado Division, 555 Zang Street, Room 250; Lakewood, Colorado 80228, Telephone (303) 969-6730

Dave Beckhouse, FTA Region VIII, 216 16th Street, Suite 650; Denver, Colorado 80202, Telephone (303) 844-3242

Joe Tempel, Colorado Department of Transportation, 4201 East Arkansas, Room 212: Denver, Colorado 80222, Telephone (303) 757-9771

SUPPLEMENTARY INFORMATION: The FHWA and FTA in cooperation with the Federal Railroad Administration (FRA), the Colorado Department of Transportation (CDOT) and the Roaring Fork Railroad Holding Authority (RFRHA) will prepare an environmental impact statement (EIS) and Section 4(f) evaluation on a proposal to make major transportation improvements in the Roaring Fork Valley from Glenwood Springs to the Aspen Airport, a distance of approximately 40 miles. The purpose of these improvements is to accommodate current and projected travel demands through the corridor. The proposed improvements will be identified in a Corridor Investment Study which will be combined with the EIS. At a minimum, the alternatives to be considered in the EIS/4(f) evaluation include the following:

(1) The No Build Alternative—This will include transportation improvements previously cleared.

(2) A Transportation System Management (TSM)—This will consist of low cost improvements to the existing transportation system to maximize its capacity and efficiency.

(3) Improved Bus Alternative—This will consist of adding additional buses to the existing bus system in the Roaring Fork Valley. HOV and Exclusive Bus Lane alternatives will be addressed.

(4) Multimodal Alternatives—These will consist of trail, rail and highway improvements. Various alignments, Station locations, technologies and access control plans (highway and rail) will be assessed along the rail corridor and SH82. Transportation Demand Management (TDM) elements will be incorporated into all of the Multimodal Alternatives to maximize the efficiency of the transportation system. Initial scoping meetings with local agencies and the general public will begin in January and be completed in March 1998. Letters will be sent to the appropriate federal, state and local agencies describing the proposed action and requesting comments. The general public will receive notices on location and time of the scoping meetings through newspaper advertisements and individual correspondence. These scoping meetings provide a forum for interaction between the public and government officials during the EIS/4(f) development. To ensure that a full range of issues related to this proposed action are addressed and all significant issues identified, comments and suggestions are invited from all interested parties. Comments or questions concerning this

proposed action and the EIS/4(f) evaluation should be directed to the Colorado Department of Transportation at the address provided above.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program)

Issued on: December 22, 1997.

Ronald A. Speral,

Environmental/ROW Program Manager, Colorado Division, Federal Highway Administration, Lakewood, Colorado.

Louis F. Mraz Jr.,

Regional Administrator, Federal Transit Administration, Region VIII, Denver, Colorado.

[FR Doc. 97–34043 Filed 12–30–97; 8:45 am]

BILLING CODE 4910–22–M; 4910–57–M

DEPARTMENT OF TRANSPORTATION

Surface Transportation Board

[STB Finance Docket No. 32940 (Sub-No. 1)]

Buffalo & Pittsburgh Railroad, Inc.; Trackage Rights Exemption—Pittsburg & Shawmut Railroad, Inc.

Pittsburg & Shawmut Railroad, Inc. (PSR), a Class III rail carrier, has agreed to grant overhead trackage rights to Buffalo & Pittsburgh Railroad, Inc. (BPRR), a Class II rail carrier, over approximately 7.4 miles of rail line in the State of Pennsylvania on PSR's Laurel Subdivision between milepost 60.0, near Falls Creek, and milepost 67.0, near East Dubois, together with approximately 2,200 feet of connecting track between PSR's Laurel Subdivision and BPRR's Wharton Subdivision (at approximately mileposts 3.3 and 3.4) (collectively, the subject lines).[1]

The purpose of the trackage rights is to allow BPRR to shift traffic from a portion of its Wharton subdivision that is in need of rehabilitation to the subject lines that are in better condition, and to allow BPRR to continue to serve its local customers in a safe and more efficient manner.

As a condition to this exemption, any employees affected by the trackage rights will be protected as required by 49 U.S.C. 11326(b), subject to the procedural interpretations of the analogous statutory provisions at 49 U.S.C. 10902 contained in the Board's decision in *Wisconsin Central Ltd.—Acquisition Exemption—Lines of Union Pacific Railroad Company*, STB Finance Docket No. 33116 (STB served Apr. 17, 1997) (*WCL Exemption*).

The transaction is scheduled to be consummated on or after December 22, 1997.[2]

This notice is filed under 49 CFR 1180.2(d)(7). If it contains false or misleading information, the exemption is void *ab initio*. Petitions to revoke the exemption under 49 U.S.C. 10502(d) may be filed at any time. The filing of a petition to revoke will not automatically stay the transaction.

An original and 10 copies of all pleadings, referring to STB Finance Docket No. 32940 (Sub-No. 1) must be filed with the Surface Transportation Board, Office of the Secretary, Case Control Unit, 1925 K Street, N.W., Washington, DC 20423–0001. In addition, a copy of each pleading must be served on Eric M. Hockey, Esq., Gollatz, Griffin & Ewing, P.C., 213 W. Miner Street, P.O. Box 796, West Chester PA 19381–0796.

Decided: December 22, 1997.

By the Board, David M. Konschnik, Director, Office of Proceedings.

Vernon A. Williams,

Secretary.

[FR Doc. 97–34021 Filed 12–30–97; 8:45 am]

BILLING CODE 4915–00–P

[1] The trackage rights agreement filed in STB Finance Docket No. 32940 (Sub-No. 1) will amend the trackage rights agreement between the parties, dated May 2, 1996, to include these additional rights.

[2] The notice to employees discussed in *WCL Exemption* and recently adopted as a requirement for certain transactions in *Acquisition of Rail Lines Under 49 U.S.C. 10901 and 10902—Advance Notice of Proposed Transactions*, STB Ex Parte No. 562 (STB served Sept. 9, 1997), does not apply to exempt trackage rights transactions.

DEPARTMENT OF TRANSPORTATION

Surface Transportation Board

[STB Docket No. AB–312 (Sub–No. 2X)]

South Carolina Central Railroad Company, Inc., d/b/a Carolina Piedmont Division— Abandonment Exemption—in Greenville County, SC

On December 12, 1997, South Carolina Central Railroad Company, Inc., d/b/a Carolina Piedmont Division (CPDR), filed with the Surface Transportation Board (Board) a petition under 49 U.S.C. 10502 for exemption from the provisions of 49 U.S.C. 10903 to abandon two segments of a line of railroad extending from: (1) railroad milepost AJK 585.34, in East Greenville, SC, to railroad milepost AJK 588.63 in Greenville, SC; and (2) railroad milepost 0.0 to railroad milepost 2.0 in Greenville, a total distance of 5.29 miles, in Greenville County, SC. The line traverses U.S. Postal Service Zip Codes 29602 and 29607. CPDR has indicated that there are no stations on the line.

The line does not contain federally granted rights-of-way. Any documentation in CPDR's possession will be made available promptly to those requesting it.

The interest of railroad employees will be protected by the conditions set forth in *Oregon Short Line R. Co.—Abandonment—Goshen*, 360 I.C.C. 91 (1979).

By issuance of this notice, the Board is instituting an exemption proceeding pursuant to 49 U.S.C. 10502(b). A final decision will be issued by April 1, 1998.

Any offer of financial assistance (OFA) under 49 CFR 1152.27(b)(2) will be due no later than 10 days after service of a decision granting the petition for exemption. Each OFA must be accompanied by a $900 filing fee. *See* 49 CFR 1002.2(f)(25).

All interested persons should be aware that, following abandonment of rail service and salvage of the line, the line may be suitable for other public use, including interim trail use. Any request for a public use condition under 49 CFR 1152.28 or for trail use/rail banking under 49 CFR 1152.29 will be due no later than January 20, 1998. Each trail use request must be accompanied by a $150 filing fee. *See* 49 CFR 1002.2(f)(27).

All filings in response to this notice must refer to STB Docket No. AB–312 (Sub-No. 2X) and must be sent to: (1) Surface Transportation Board, Office of the Secretary, Case Control Unit, 1925 K Street, N.W., Washington, DC 20423–0001; and (2) Karl Morell, Ball Janik LLP, 1455 F Street, N.W., Suite 225, Washington, DC 20005.

Persons seeking further information concerning abandonment procedures may contact the Board's Office of Public Services at (202) 565–1592 or refer to the full abandonment or discontinuance regulations at 49 CFR part 1152. Questions concerning environmental issues may be directed to the Board's Section of Environmental Analysis (SEA) at (202) 565–1545. [TDD for the hearing impaired is available at (202) 565–1695.]

An environmental assessment (EA) (or environmental impact statement (EIS), if necessary) prepared by SEA will be served upon all parties of record and upon any agencies or other persons who commented during its preparation. Other interested persons may contact SEA to obtain a copy of the EA (or EIS). EAs in these abandonment proceedings normally will be made available within 60 days of the filing of the petition. The

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Federal Transit Administration

Environmental Impact Statement: Pitkin, Eagle and Garfield Counties, Colorado

AGENCY: Federal Highway Administration (FHWA) and Federal Transit Administration (FTA), DOT.

ACTION: Revised notice of intent.

SUMMARY: The FHWA and FTA are jointly issuing this revised notice to advise the public that the project limits have been extended from the Pitkin County Airport to the City of Aspen, a distance of 3.7 miles; and from Glenwood Springs to West Glenwood, a distance of 2 miles. These extensions are in response to comments received at the public scoping meetings held in February 1998 and subsequent public meetings.

FOR FURTHER INFORMATION CONTACT: Eva LaDow, FHWA Colorado Division, 555 Zang Street, Room 250; Lakewood, Colorado 80228. Telephone (303) 969–6730 Extension 341. Dave Beckhouse, FTA Region VIII, 216 16th Street, Suite 650; Denver, Colorado 80202, Telephone (303) 844–3242. Joe Tempel, Colorado Department of Transportation, 4201 East Arkansas; Denver, Colorado 80222, Telephone (303) 757–9771.

SUPPLEMENTARY INFORMATION: The FHWA and FTA in cooperation with the Federal Railroad Administration (FRA), the Colorado Department of Transportation (CDOT) and the Roaring Fork Railroad Holding Authority (RFRHA) will prepare an environmental impact statement (EIS) and Section 4(f) evaluation on a proposal to make major transportation improvements in the Roaring Fork Valley from West Glenwood Springs to the City of Aspen, a distance of approximately 44.2 miles. The purpose of these improvements is to accommodate current and projected travel demands through the corridor. The proposed improvements will be identified in a Corridor Investment Study which will be combined with the EIS. The alternatives to be considered in detail in the EIS/4(f) evaluation include the following:

(1) The No Build Alternative—This alternative will include transportation improvements that are "committed" or currently approved transportation projects.

(2) An Improved Bus/Transportation System Management (TSM) Alternative—This alternative will include an optimal bus alternative on the existing SH 82 alignment and improvements beyond the No Build Alternative that enhance the utility of the existing and committed transportation improvements. A valley wide trail is also included from Glenwood Springs to Aspen.

(3) The Build Alternative—This alternative consists of rail improvements in the corridor, a feeder bus service to the rail stations and TSM improvements. A valley wide trail is also included from Glenwood Springs to Aspen.

Comments or questions concerning this proposed action and the CIS/EIS/4(f) evaluation should be directed to the Colorado Department of Transportation at the address provided above.

Issued on April 9, 1999.

Ronald A. Speral,

Environmental/ROW Program Manager, Colorado Division, Federal Highway Administration, Lakewood, Colorado.

Louis F. Mraz, Jr.,

Regional Administrator, Federal Transit Administration, Region VIII, Denver, Colorado.

[FR Doc. 99–10747 Filed 4–28–99; 8:45 am]

BILLING CODE 4910–22–M AND 4910–57–M

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

Automotive Fuel Economy Program, Report to Congress

The attached document, 23rd Annual Report to Congress on the Automotive Fuel Economy Program, was prepared pursuant to 49 U.S.C. 32916 et seq. which requires that "the Secretary shall transmit to each House of Congress, and publish in the **Federal Register**, a review of the average fuel economy standards under this part."

The 23rd Annual Report to Congress on the Automotive Fuel Economy Program summarizes the fuel economy performance of the vehicle fleet and the activities of the National Highway Traffic Safety Administration (NHTSA) during 1998. Included in this report is a section summarizing rulemaking activities during 1998. This report is available on the Internet at: *http://www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html*. To obtain paper copies of this document, you may contact NHTSA's Publications Ordering and Distribution Services on (202) 366–1566.

Issued on: April 20, 1999.

L. Robert Shelton,

Associate Administrator for Safety Performance Standards.

U.S. Department of Transportation

Automotive Fuel Economy Program

National Highway Traffic Safety Administration

Twenty-third Annual Report to Congress Calendar Year 1998

AUTOMOTIVE FUEL ECONOMY PROGRAM

TWENTY-THIRD ANNUAL REPORT TO CONGRESS

CALENDAR YEAR 1998

Table of Contents

Section I: Introduction

The 23rd Annual Report to Congress on the Automotive Fuel Economy Program summarizes the fuel economy performance of the vehicle fleet and the activities of the National Highway Traffic Safety Administration (NHTSA) during 1998, in accordance with 49 U.S.C. 32916 *et seq.*, which requires the submission of a report each year. Included in this report is a section

United States Department of Agriculture

NRCS Natural Resources Conservation Service

Glenwood Springs Field Office
401 23rd St Suite 106
Glenwood Springs, CO 81601

Phone (970) 945 5494 ext. 3 http://www.co.nrcs.usda.gov Fax (970) 945 0837

December 27, 2002

Joanna Morsicato
Joanna Morsicato and Associates
8579 Turkey Creek Road
Morrison, CO 80465

Ms. Morsicato:

In reviewing and discussing the Farmland Conversion Impact Rating with you, we decided to wait on completing the final Farmland Conversion Impact Rating until a final option is determined.

As discussed most of this project is on the old railroad right of way or easement or existing highway or trails between Glenwood Springs and Aspen, CO. Very little if any existing farmland will be impacted and then only irrigated pasture.

I agree that there is no prime and unique farmland in the project corridor. However, there maybe some farmland of state importance within the maximum of 18 acres that could be disturbed if site C is chosen.

Please keep us informed as to the site selected and exact area of impact of the selected site. Also the Glenwood Field Office provides service to that portion of Eagle County within the Roaring Fork Valley.

Sincerely,

Dennis Davidson

Dennis Davidson
District Conservationist
Glenwood Springs, CO

U.S. Department of Agriculture

FARMLAND CONVERSION IMPACT RATING

PART I *(To be completed by Federal Agency)*	Date Of Land Evaluation Request 11-25-02
Name Of Project W. Glenwood - Aspen CIS - DEIS	Federal Agency Involved FHWA and FTA
Proposed Land Use	County And State Garfield, Eagle + Pitkin, Colorado
PART II *(To be completed by NRCS)*	Date Request Received By NRCS Nov 29. 02

	Yes	No	Acres Irrigated	Average Farm Size
Does the site contain prime, unique, statewide or local important farmland? *(If no, the FPPA does not apply – do not complete additional parts of this form).*	☐	☒		

Major Crop(s) Hay land	Farmable Land In Govt. Jurisdiction Acres: %	Amount Of Farmland As Defined in FPPA Acres: 22 %
Name Of Land Evaluation System Used	Name Of Local Site Assessment System	Date Land Evaluation Returned By NRCS 12-27-02

	Maximum Points	Site A	Site B	Site C	Site D
PART III *(To be completed by Federal Agency)*		Alternative Site Rating			
A. Total Acres To Be Converted Directly		0	0	18.00	0
B. Total Acres To Be Converted Indirectly		0	0	0	0
C. Total Acres In Site		0.0	0.0	0.0	0.0
PART IV *(To be completed by NRCS)* Land Evaluation Information					
A. Total Acres Prime And Unique Farmland					
B. Total Acres Statewide And Local Important Farmland					
C. Percentage Of Farmland In County Or Local Govt. Unit To Be Converted					
D. Percentage Of Farmland In Govt. Jurisdiction With Same Or Higher Relative Value					
PART V *(To be completed by NRCS)* Land Evaluation Criterion Relative Value Of Farmland To Be Converted *(Scale of 0 to 100 Points)*		0	0	0	0
PART VI *(To be completed by Federal Agency)* Site Assessment Criteria *(These criteria are explained in 7 CFR 658.5(b)*	Maximum Points				
1. Area In Nonurban Use					
2. Perimeter In Nonurban Use					
3. Percent Of Site Being Farmed					
4. Protection Provided By State And Local Government					
5. Distance From Urban Builtup Area					
6. Distance To Urban Support Services					
7. Size Of Present Farm Unit Compared To Average					
8. Creation Of Nonfarmable Farmland					
9. Availability Of Farm Support Services					
10. On-Farm Investments					
11. Effects Of Conversion On Farm Support Services					
12. Compatibility With Existing Agricultural Use					
TOTAL SITE ASSESSMENT POINTS	160	0	0	0	0
PART VII *(To be completed by Federal Agency)*					
Relative Value Of Farmland *(From Part V)*	100	0	0	0	0
Total Site Assessment *(From Part VI above or a local site assessment)*	160	0	0	0	0
TOTAL POINTS *(Total of above 2 lines)*	260	0	0	0	0

Site Selected:	Date Of Selection	Was A Local Site Assessment Used? Yes ☐ No ☐

Reason For Selection:

Joanna Morsicato and Associates
8579 South Turkey Creek Road, Morrison, CO 80465
303-697-8108 (phone) 303-697-7482 (fax) EMAIL: JMorsicato@aol.com

Ron D. Velarde
Western Regional Manager
Colorado Division of Wildlife
711 Independent Avenue
Grand Junction, CO 81505

November 18, 2002

Re: CDOT Project #NH 0821-049, West Glenwood Springs to Aspen CIS-DEIS

Dear Mr. Velarde:

The project definition and CIS-DEIS have undergone refinement and clarification since project scoping comments, addressed to Roland Wostl at CDOT, were received on December 13, 1999. This updated letter is meant to re-establish coordination with CDOW for this project and to address concerns that were raised three years ago.

Subsequent to initial coordination, a portion of the $500,000 (25% of the RFTA GO Colorado lottery proceeds) associated with the wildlife quadrant of the Legacy Project Grant has been de-authorized. There is a discussion about an additional de-authorization in progress now. This could shift remaining project funding to another quadrant. Nonetheless, a total of $162,500 has been expended from the wildlife quadrant. Regardless of the funding situation, the project continues its commitment to wildlife issues in the corridor. Relevant to the Legacy Grant is the commitment to design a wildlife compatible trail, to protect the integrity of the natural systems while teaching users about wildlife and natural features. An attempt will be made to balance human impact to wildlife while enhancing visitor experience and education.

The current project definition includes three alternatives:

- No Action/Committed Projects Alternative,
- Bus Rapid Transit (BRT) Alternative (Runs additional buses on SH 82 and uses approved Aspen LRT corridor from Pitkin County Airport to downtown Aspen.) with associated trail in old D& RGW RR right-of-way (now owned by RFTA),
- Rail Alternative (Runs along RFTA right-of-way from Glenwood Springs to CR 100 where it runs north to Catherine Store to meet SH 82, runs along SH 82 to Wingo Junction where it returns to RFTA right-of-way to Gerbazbdale. At Gerbazdale, this alternative follows SH 82 right-of-way again until it connects to the Aspen LRT system at the Pitkin County Airport.) with associated trail that always remains within the RFTA right-of-way.
- Proposed station locations, park and ride lots and maintenance facilities are being studied for locations within existing commercial and industrial areas throughout the Project Corridor.

A combined corridor investment study and draft environmental impact statement (CIS-DEIS) is under going finalization at this time. The attached map illustrates the general project location. The project includes the following elements that may be of interest to your office:

- Roaring Fork Valley Land Cover Types Analysis,
- Noxious Weed Study and Management Planning,
- Wetlands analysis with proposed mitigation,
- Fisheries analysis,
- Wildlife, and
- Threatened, Endangered, Candidate and Other Special Concern Species analyses.

Most of the project will be constructed within existing rights-of-way and there will be little direct impact to established habitats within the railroad or highway corridors. The implementation of the proposed trail will require no additional right-of-way. Should the Rail Alternative be implemented, an additional 22.67 acres will be needed along the corridor. Station construction for the BRT and Rail Alternatives will require less than 30 acres from developed areas.

This letter is not meant to include all of the document detail, but rather to give you an update on the general issues that have been identified.

- **Roaring Fork Valley Land Cover Types Analysis**. Except for the minor additional right-of-way associated with the Rail Alternative, no impacts to upland and floodplain vegetation are expected. Approximately 63% of the adjacent land cover is irrigated cropland.
- **Noxious Weed Study and Management Planning**. Both CDOT and RFTA have implemented noxious weed management programs.
- **Wetlands Analysis with Proposed Mitigation**. Construction of the Rail Alternative would affect approximately 2 acres of wetlands (half are jurisdictional). Trail construction could affect up to 1.5 acres of wetlands, although it is possible to build on top the existing grade to avoid wetlands as long as the trail doesn't share the corridor with the Rail Alternative. Station construction in Basalt could affect less than a tenth of an acre of wetlands for both build alternatives. Mitigation is included in the CIS-DEIS.
- **Fisheries Analysis**. Fisheries impacts would be related to construction at stream crossings and are not anticipated with the implementation of best management practices at construction.
- **Wildlife Analysis.**
    - The BRT alternative will utilize the existing SH 82 and will not create new wildlife disturbance. The potential to decrease future vehicles miles of travel by automobiles will provide an indirect positive result for wildlife.
    - The Rail Alternative will affect one additional elk and one additional deer crossing over the existing SH 82 crossings. If selected, the re-introduction

of active rail to the corridor will also require a re-examination of existing game crossing treatment.

- At the last analysis (1999), an active red-tailed hawk nest and a great horned owl nest were identified adjacent to RFTA right-of-way and could be indirectly affected by the trail construction and operation. Only the owl nest was adjacent to the Rail Alternative.
- A golden eagle nest site along SH 82 is on the opposite side of the highway from the Rail Alternative and is not expected to be affected.
- A stick nest near SH 82 at Cattle Creek once used alternatively by prairie falcons and red-tailed hawks was inactive in 1999. The Rail Alternative will be on the other side of SH 82 from this site and is not expected to affect this site.

- **Threatened, Endangered, Candidate and Other Special Concern Species analyses.** A recent phone update was conducted with USFWS to assure that the project species list was current. Only Bald Eagles and Great Blue Herons have been identified as potentially affected by this project.

  - **Bald Eagles.** Three roost site buffer zones are intersected by the proposed Trail and Rail Alternatives: Cattle Creek, Wheatley Gulch and Catherine Store areas. An inactive nest site buffer zone is intersected by Trail and Rail options as well. This site, not productive for at least 8 years, at Aspen Glen (Carbondale) is 1250 feet from the RFTA ROW, and is in the midst of a residential development and golf course. Most of the right-of-way is behind an earth berm blocking the development and the nest from view. Project impacts are expected to be marginal. Recent discussions with Terry Ireland at US Fish and Wildlife Service and communications with Kevin Wright of CDOW indicate that this nest site will not be adversely affected by the proposed project.
  - **Great Blue Herons.** Two heronries are located along the RFTA right-of-way. The Rail and Trail will be on a bluff above and about 1500 feet from the Sander Ranch heronry. No project impacts are anticipated at this location. The Trail alignment only will pass by the Rock Bottom Ranch heronry. This heronry has declined from 22 nests to approximately 6 nests in the past few years due to changes in the water flow patterns and associated fisheries. Proximity to the trail is under investigation. The remaining nests may be as much as 1200 feet away.

The selection of the BRT alternative will not result in any known wildlife impacts. Implementation of the Rail Alternative is expected to require a full update of wetlands and wildlife impacts prior to completion of final design.

Relevant to the Legacy Grant is the commitment to design a wildlife compatible trail, to protect the integrity of the natural systems while teaching users about wildlife and natural features. An attempt will be made to balance human impact to wildlife while enhancing visitor experience and education. The project team recognizes that to some extent the development of the trail corridor within the old railroad right-of-way, that happens to parallel the Roaring Fork River and associated habitats, is not the ideal wildlife situation. The project team also recognizes that the preservation of the railroad corridor is preferable to abandonment and potential for the absorption of the property into adjacent land uses and developments. Trail construction will include the implementation of signage and interpretive sites throughout the corridor. Where appropriate, seasonal closures, leash requirements for dogs, and appropriate protection of sensitive areas is possible.

Your additional input is appreciated at this point in the project. Coordination with appropriate local CDOW staff will be helpful during trail and alternative design and construction. A draft CIS-DEIS is expected to be submitted for agency review early in 2003.

I am private consultant working for the Roaring Fork Transportation Authority (RFTA) on the aforementioned project. Feel free to contact me for further project information at 303-697-8108. You may also contact Alice Hubbard at RFTA at 970-963-9012.

Sincerely,

Joanna Morsicato

Joanna Morsicato
Joanna Morsicato and Associates

cc: Alice Hubbard, RFTA
Jerry Powell, CDOT

United States Department of the Interior

NATIONAL PARK SERVICE

INTERMOUNTAIN SUPPORT OFFICE - DENVER
12795 West Alameda Parkway
Post Office Box 25287
Denver, Colorado 80225-0287

Rob Naeser
SAIC
999 18th St., Suite 855
Denver, CO 80202

Dear Mr. Naeser:

No impacts to nationally significant river resources are expected from your proposed project along the Roaring Fork River.

Sincerely,

/s/ Duane Holmes

for Gary Weiner
National Rivers Program
March 24, 2000

Science Applications International Corporation
An Employee-Owned Company

June 5, 2000

Mr. Craig Gaskill
MK Centennial
10822 West Toller Drive
Littleton, CO 80127

Subject: West Glenwood to Aspen DEIS Wetland Concurrence Letter
CDOT Project: STA 0821-029 (10211) (SAIC Project No. 06-6055-01-9274-003)

Dear Mr. Gaskill:

As you know, a letter of concurrence regarding wetlands and their jurisdictional status is typically included in a Draft Environmental Impact Statement (DEIS). To this end, communication with Mr. Mike Claffey of the US Army Corps of Engineers (Region 8) began in early March 2000. Due to snow cover at that time of year, and the need for field verification of wetland boundaries, Mr. Claffey asked that we wait until late April-early May to go into the field and look at the wetlands within the study area. Since that time scheduling conflicts have prevented meeting with Mr. Claffey, and his subsequent concurrence. However, SAIC has scheduled June 28, 2000 to go in the field with Mr. Claffey, and hopes to receive a wetland concurrence letter from his office shortly thereafter.

Sincerely,

SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

Richard R. McEldowney

Richard R. McEldowney
Riparian/Wetland Ecologist

STATE OF COLORADO
Bill Owens, Governor
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE
AN EQUAL OPPORTUNITY EMPLOYER
John W. Mumma, Director
6060 Broadway
Denver, Colorado 80216
Telephone: (303) 297-1192

*For Wildlife-
For People*

December 13, 1999

Mr. Roland Wostl
Office of Environmental Services
Department of Transportation
4201 East Arkansas Ave.
Denver, CO 80222

RE: CDOT Project STA 0821-029 (10211) – Roaring Fork Valley Railroad Corridor DEIS Scoping Comments

Dear Mr. Wostl:

In accordance with our agency's jurisdiction over wildlife, the following species, issues, and resources are identified as you requested. Wildlife, wildlife habitat and wildlife programs through the Colorado Division of Wildlife (DOW) are featured very prominently in the Legacy Project Grant Agreement between the State Board of Great Outdoors Colorado Trust Fund and the Roaring Fork Railroad Holding Authority. Due to location, the corridor between Glenwood Springs and Carbondale has a very low possibility of creating wildlife issues since it is located next to the highway. As the corridor proceeds south towards Aspen from Carbondale, wildlife issues start to emerge.

For terrestrial wildlife, the greatest resource is the river bottom woodlands through which parts of the corridor are located. Numerous small mammals, songbirds, raptors, and migratory waterfowl use these areas. Maintenance of migratory pathways or corridors for big game between seasonal ranges, which cross the railroad corridor at a more or less perpendicular angle, is critical. High vehicular traffic counts and speeds on State Highway 82 currently affects this movement. Other developed uses involving vehicles, trains, or people will increase the likelihood that methods to allow for this movement will be needed. However, fencing the entire corridor would be potentially disastrous for mule deer and elk. There are currently several spots with serious road kill problems on State Highway 82. Human safety concerns as well as wildlife concerns indicate a need for fencing in combination with overpasses and underpasses for wildlife.

Aquatic wildlife resources benefit from a healthy, functioning floodplain associated with the Roaring Fork River. The floodplain on the river, influenced by the highway, railroad, and other alterations, affects river channel morphology, function and course. Remaining floodplain function is more important than ever for protecting water quality, channel morphology, and fish habitat. Design development should provide for methods to prevent gasoline, diesel fuel and other liquids from reaching the river.

Increases in wildlife programs including angling and wildlife viewing are expected. Careful planning will be necessary so increased use does not adversely affect resources to which users are drawn. Trails and high use public areas improperly located may displace affected wildlife to other less visible and less viable areas. Some wildlife will habituate to high-density use and continue use of the property while more popular and highly visible megafauna are less likely to do so.

Important species in the area include: Bald eagle, American peregrine falcon, northern goshawk, osprey, great blue heron, black swift, sage sparrow, mule deer, American elk, mountain whitefish, brown and rainbow trout, and chorus and northern leopard frogs. This list is not meant to be comprehensive.

It remains unclear what form of use or combination of uses will result when corridor ownership changes from Private Railroad Company to public trust. While one part of the grant agreement suggests the corridor will be declared "park land" other verbiage suggests the railroad may be re-established in part or whole. The final grant proposal prominently lists the protection of wildlife and wildlife habitats as a primary project purpose. Due to this, 25% of project funding was provided from the wildlife quadrant of GO Colorado lottery proceeds. We are concerned that the corridor may not be able to accommodate all public expectations while protecting and preserving wildlife habitat. Therefore, use of the affected corridor remains of keen interest to DOW as planning and development of the comprehensive management plan mandated by the grant is accomplished. It is our intent and expectation wildlife interests be part of the final plan.

These comments constitute scoping comments within NEPA guidelines and regulations promulgated for federal highway programs. Generally, scoping comments are submitted prior to DEIS preparation and are customarily addressed in the DEIS, including mitigation of unavoidable impacts. However, since this DEIS is completed these scoping comments are being submitted after the fact. We are confident that these comments will be addressed and look forward to reviewing the DEIS.

Information with much detail is available in the Legacy Project Grant Agreement, of which, hopefully, you have a copy of. You are also in receipt of Colorado Natural Heritage Program element occurrences and DOW seasonal range maps for many species, including some of those previously mentioned. If you need additional information or input, please contact Bill Clark, 970-255-6186.

Sincerely,

Ron D. Velarde

Ron D. Velarde
West Regional Manager

cc: S. Norris
P. Tucker
M. Grode

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
764 Horizon Drive, Building B
Grand Junction, Colorado 81506-3946

IN REPLY REFER TO:
ES/CO:CDOT
MS 65412 GJ

April 19, 2000

Roland Wostl
Office of Environmental Services
Colorado Department of Transportation
4201 East Arkansas Avenue
Denver, Colorado 80222

Dear Mr. Wostl:

The U.S. Fish and Wildlife Service has received your March 31, 2000, correspondence requesting a list of federally threatened, endangered, proposed and candidate species. The purpose of the request is for project planning and preparation of an environmental impact statement for the Transportation and Recreational Improvement Project in Garfield, Eagle and Pitkin Counties, Colorado.

Species lists are valid for 90 days only and should be updated by telephone or in writing when they have expired. The Fish and Wildlife Service can enter into formal section 7 consultation only with another Federal agency. Informal consultation or technical assistance (contacts, discussions, correspondence, etc.) can occur between the Service and a designated nonfederal representative. However, the Federal agency must make the appropriate "may affect/no affect" finding under section 7(a)(2) of the Act, and request formal consultation with the Service when required. Although applicants for a Federal permit or license may fill the role of a nonfederal representative, the ultimate responsibility for compliance with section 7 remains with the Federal agency. We are providing you with the following list of species which may be present in the concerned area.

FEDERALLY LISTED SPECIES

Bald eagle	*Haliaeetus leucocephalus*
Eskimo curlew	*Numenius borealis*
Mexican spotted owl	*Strix occidentalis lucida*
Southwestern willow flycatcher	*Empidonax trailii extimus*
Canada lynx	*Felis lynx canadensis*
Black-footed ferret	*Mustela nigripes*
Uncompahgre fritillary butterfly	*Boloria acrocnema*
Sclerocactus glaucus	Uinta Basin hookless cactus
Colorado pikeminnow	*Ptychocheilus lucius*
Razorback sucker	*Xyrauchen texanus*
Humpback chub	*Gila cypha*
Bonytail	*Gila elegans*

There are no populations of Eskimo curlews in Colorado. This species migrates in the spring and fall to reach summer and winter areas and may pass through the concerned area. Special attention should be considered when placing overhead lines to avoid potential collisions by these birds.

This is your future. Don't leave it blank. - ***Support the 2000 Census.***

Historically, the black-footed ferret occurred throughout Colorado. Literature and recent field studies document a close association between prairie dogs and black-footed ferrets. The standard that is used by the Service for determining possible project effects to black-footed ferrets is the disturbance of currently occupied prairie dog habitat. Should any activities associated with this project result in an impact to prairie dogs, black-footed ferret surveys may be necessary. As black-footed ferret surveys are considered valid for one year, prairie dog towns surveyed more than one year prior to construction may have to be resurveyed. Contact this office prior to scheduling any ferret searches.

FEDERAL CANDIDATE SPECIES

Boreal toad	*Bufo boreas boreas*
Penstemon debilis	Parachute penstemon
Phacelia submutica	De Beque phacelia

If the Service can be of further assistance, please contact Kurt Broderdorp at the letterhead address or (970) 243-2778.

Sincerely,

Robert E. Leachman
Acting Assistant Colorado Field Supervisor

cc: FWS/ES, Lakewood
CDOW, Grand Junction

Kbroderdorp:CDOTRrFk.ltr:041900

This is your future. Don't leave it blank. - *Support the 2000 Census.*

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

November 20, 2000

Regulatory Branch (200075476)

Mr. Robert Henke
Science Applications International Corporation
8100 Shaffer Parkway, Suite 100
Littleton, Colorado 80127

Dear Mr. Henke:

We are responding to your written request, on behalf of the Colorado Department of Transportation, the Federal Highway Administration and the Roaring fork Railroad Holding Authority, for a jurisdictional determination on the West Glenwood to the Aspen/Pitkin County Airport Rail Corridor. The project area is located along the Roaring Fork River between Glenwood Springs and Aspen in Garfield, Eagle and Pitkin Counties.

Based on a site inspection by Mr. Michael Claffey of this office on June 28, 2000 and the information included in your August 4, 2000 report, we determined that your wetland boundary delineation is accurate. The plans referenced below are an accurate depiction of the limits of Federal jurisdiction under Section 404 of the Clean Water Act. A total of 62 jurisdictional wetlands were delineated in the project area covering approximately 17.1 acres. We understand that additional non-jurisdictional wetlands were delineated in accordance with the requirements of the Federal Highway Administration. The plans referenced below include only waters of the United States including jurisdictional wetlands regulated under Section 404 of the Clean Water Act.

The plans are labeled:

Wetlands and other Waters of the United States within the Roaring Fork Valley Transportation Corridor, Attachments C-1 to C-36, Date: 7/31/00, Scale 1"=200' (included in the SAIC report of August 4, 2000)

This verification is valid for a period of five years from the date of this letter and is based on information supplied by you. If that information proves to be false or incorrect, we will adjust our determination accordingly. We have assigned number 200075476 to this determination. Please contact Mr. Michael Claffey and refer to this number if you have any questions regarding this matter and for permit requirements at (970) 243-1199, extension 13 or the address below.

Sincerely,

Grady L. McNure
Chief, Northwestern Colorado
Regulatory Office
402 Rood Avenue, Room 142
Grand Junction, Colorado 81501-2563

NOTIFICATION OF ADMINISTRATIVE APPEAL OPTIONS AND PROCESS AND REQUEST FOR APPEAL

Applicant: SAIC		File Number: 200075476	Date: 11-20-00
Attached is:			See Section below
	INITIAL PROFFERED PERMIT (Standard Permit or Letter of permission)		A
	PROFFERED PERMIT (Standard Permit or Letter of permission)		B
	PERMIT DENIAL		C
X	APPROVED JURISDICTIONAL DETERMINATION		D
	PRELIMINARY JURISDICTIONAL DETERMINATION		E

SECTION I - The following identifies your rights and options regarding an administrative appeal of the above decision. Additional information may be found at http://usace.army.mil/inet/functions/cw/cecwo/reg or Corps regulations at 33 CFR Part 331.

A: INITIAL PROFFERED PERMIT: You may accept or object to the permit.

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- OBJECT: If you object to the permit (Standard or LOP) because of certain terms and conditions therein, you may request that the permit be modified accordingly. You must complete Section II of this form and return the form to the district engineer. Your objections must be received by the district engineer within 60 days of the date of this notice, or you will forfeit your right to appeal the permit in the future. Upon receipt of your letter, the district engineer will evaluate your objections and may: (a) modify the permit to address all of your concerns, (b) modify the permit to address some of your objections, or (c) not modify the permit having determined that the permit should be issued as previously written. After evaluating your objections, the district engineer will send you a proffered permit for your reconsideration, as indicated in Section B below.

: PROFFERED PERMIT: You may accept or appeal the permit

- ACCEPT: If you received a Standard Permit, you may sign the permit document and return it to the district engineer for final authorization. If you received a Letter of Permission (LOP), you may accept the LOP and your work is authorized. Your signature on the Standard Permit or acceptance of the LOP means that you accept the permit in its entirety, and waive all rights to appeal the permit, including its terms and conditions, and approved jurisdictional determinations associated with the permit.
- APPEAL: If you choose to decline the proffered permit (Standard or LOP) because of certain terms and conditions therein, you may appeal the declined permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

C: PERMIT DENIAL: You may appeal the denial of a permit under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

D: APPROVED JURISDICTIONAL DETERMINATION: You may accept or appeal the approved JD or provide new information.

- ACCEPT: You do not need to notify the Corps to accept an approved JD. Failure to notify the Corps within 60 days of the date of this notice, means that you accept the approved JD in its entirety, and waive all rights to appeal the approved JD.
- APPEAL: If you disagree with the approved JD, you may appeal the approved JD under the Corps of Engineers Administrative Appeal Process by completing Section II of this form and sending the form to the division engineer. This form must be received by the division engineer within 60 days of the date of this notice.

E: PRELIMINARY JURISDICTIONAL DETERMINATION: You do not need to respond to the Corps regarding the preliminary JD. The Preliminary JD is not appealable. If you wish, you may request an approved JD (which may be appealed), by contacting the Corps district for further instruction. Also you may provide new information for further consideration by the Corps to reevaluate the JD.

U.S. Department
of Transportation

**Federal Railroad
Administration**

Region VI

City Center Square, Suite 1130
1100 Main Street
Kansas City, MO 64105

RECEIVED
FTA/TRO-8

April 22, 1999 1999 APR 26 P 3:23

99 APR 29 AM 11:00

Mr. Lou Mraz
Regional Administrator
Federal Transit Administration
Columbine Place, Suite 650
216 Sixteenth Street
Denver, Colorado 80202

Dear Mr. Mraz:

On November 18, 1998, Federal Railroad Administration (FRA) personnel inspected 16 miles of the Roaring Fork Railroad Holding Authorities (RFRHA) trackage between milepost 360 (Glenwood Springs, CO) south to approximately milepost 376. The track consists of timber crossties and steel rail of various sections which are not consistently anchored. This 16-mile segment of single main track is supported by various sizes of granite ballast or slag and soil mixed. It has no sidings available for meeting trains. There are 119 highway/rail grade crossings, 47 are public and 72 are private. A total of five public crossings are equipped with flashing lights. The remaining public and private crossings are equipped with cross bucks or no signage at all. There is no wayside signal system in place, and the line was operated as yard limit territory when last used by the Denver and Rio Grande Western Railroad Company. Only 16 miles of the track was assessable as heavy vegetation was present due to inactivity on the line. The anticipated length of the project is approximately 45 miles and will connect Glenwood Springs with Aspen, CO.

This track inspection, requested by your agency because of a possibility for operation of combined freight and passenger/commuter traffic, was to examine the track structure and evaluate its relative condition. The results of FRA's evaluation are as follows:

The existing trackage is currently below standards in certain areas for operation at FRA Class 2 track (25 mph freight). Considering Class 2 standards and freight/commuter passenger operation, FRA made the following observations:

1. The overall crosstie condition is fair. Crossties are generally old and in a deteriorated state. It is doubtful they will adequately restrain the track structure within acceptable geometry limits with increased loading and speeds.

2. Rail conditions vary from good 115# control cooled continuous welded rail to poor to fair 90# non-control cooled jointed rail. Additionally, there appears to be a considerable

amount of older non-control cooled rail in the track. Of particular concern is the 1121 OH and 1155 OH sections which, in local use, have shown to be prone to filet cracks. No filet cracks were observed; however, FRA is aware of the history of this type rail and the potential for filet cracks is highly probable under heavy traffic conditions. A more detailed examination of the rail would be necessary to determine if any cracks exist. This known rail problem could lead to high maintenance costs if it is not replaced.

3. There is no consistent rail anchoring pattern to control longitudinal movement of the rail on any of the rail or switches inspected. Effective rail anchoring is necessary to restrain the track structure longitudinally which will help to ensure proper alignment. It will also help keep track components in their proper place.

4. Tie plates are of mixed variety and design which causes concerns about uneven rail cant. Rail cant causes uneven stresses in the rail, resulting in service failures.

5. The subgrade is generally soft and water soaked with poor track drainage in many areas. A soft track bed situation can contribute to surface imperfections and premature decay of crossties.

6. Numerous small washouts and drainage facility breeches existed, and the potential for additional washouts and slides is high. The track structure ballast support system is subject to washout and track misalignment that can occur if drainage facilities are not properly maintained. Additionally, track vehicles will be subjected to potentially damaging obstructions in the track area if the surrounding fill materials are not stabilized.

7. The ballast section varies from poor to fair. A ballast section, which is inadequate, will not restrain the track laterally, vertically, or longitudinally. Misalignment of or surface deviations in the track structure to certain limits may cause poor ride quality and possible derailment of equipment.

8. Ditching, rock removal, and drainage improvement are necessary in numerous locations. Drainage facilities must be clear of obstructions which will impede water flow from the track structure. Obstructed drainage ditches can lead to subgrade saturation conditions similar to those outlined in item 6.

9. Uncontrolled vegetation exists at numerous locations on the line. This will contribute to poor visibility, signal and sign obstruction, and stumbling hazards that may interfere with equipment and make it difficult for employees to perform track side duties.

10. Cut widening and or slide fence protection may be needed at certain locations. If the existing high fills close to the track structure are not widened or removed, they can potentially collapse onto the track structure causing a derailment risk. Slide fences can mitigate the risk by interrupting the signal system if there is significant soil or rock movement. Train operating personnel will be made aware of the situation and service can be halted at that location.

Non-track related safety concerns include:

1. The track is near highway 82 in numerous locations which would subject it to snow drifts in cuts, snow from road plows, drainage, and subgrade saturation problems. These conditions contribute to poor visibility at times. Excessive snow on the track structure may influence vehicle performance and may cause drainage problems if not properly engineered. **Recommendation:** Install snow fence and a physical barrier to keep excessive snow accumulations off the track. Additionally, special consideration should be given to roadway drainage.

2. There are numerous private and un-signaled highway/rail grade crossings which present a high risk to both motor vehicle and railroad personnel and equipment. **Recommendation:** Coordinate with Colorado Public Utilities Commission (PUC) and Colorado Department of Transportation (CDOT) to examine the best possible warning device options or the potential for grade separation to ensure the maximum degree of safety possible.

3. The project design team is contemplating a trail system in close proximity to the rail line and there is no consistent positive physical separation of homes, a recreational trail and the railroad at Glenwood Springs. Additionally, the track is in close proximity to homes and other public properties in various locations, creating a potential for trespassing on the right of way in numerous locations. **Recommendation:** Careful consideration should be given to safeguarding the public and the railroad from trespassers by placing physical barriers between the public and private right of way and the railroad's property.

4. **Recommendation:** All bridges should be professionally evaluated by an engineering firm specializing in railroad bridge structures and maintenance to determine reliability and load capacity.

5. **Recommendation:** Close coordination between FRA and FTA relative to FRA compliant equipment and the Passenger Equipment Safety Standards to determine if temporal separation of light rail and freight traffic is appropriate.

It is our understanding that RFRHA desires to operate at FRA class 4 speeds. Track standards for this class have considerably tighter tolerances and requirements. It would take a considerable amount of restoration to upgrade the track for high speed passenger/freight operations at this level. Rehabilitating the existing trackage after removing the critical safety hazards is quite possible; however, there would be higher maintenance associated with the remaining older components and routine costs could be high.

The alternative would be to build with new quality materials which would significantly lower maintenance costs, reduce safety risks, and provide superior ride quality. The issue of whether to rehabilitate the track or build new is solely the prerogative of the track owner. FRA's concerns relative to railroad safety at start up of the operation will be compliance with the Federal Track Safety Standards, other relevant Safety Regulations, and RFRHA's ability to maintain a safe physical plant thereafter.

These are all issues RFRHA, MK Centennial, CDOT, Colorado PUC and the FTA should carefully evaluate as the process continues. Please advise me if FRA can be of further assistance.

Sincerely,

Darrell Tisor
Regional Administrator

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9011

DOT
DEPARTMENT OF TRANSPORTATION

May 29, 2001

Margie Perkins
Director
Air Pollution Control Division
Colorado Department of Public Health and Environment
4300 Cherry Creek Drive South
Denver, CO 80222

Re: Glenwood Springs to Aspen Rail Corridor

Dear Ms. Perkins:

The Colorado Department of Transportation is preparing an Environmental Impact Statement for the proposed Glenwood Springs to Aspen rail corridor. The proposed project would provide passenger rail service between Glenwood Springs and Aspen. (See attached map.) The rail vehicles for the proposed project are individually-powered diesel multiple unit (DMU) vehicles. An expanded feeder bus system would also be implemented to serve communities between Aspen and Rifle.

The rail line would utilize much of the former Denver and Rio Grande Western Railroad (D&RGWRR) right-of-way between Glenwood Springs and Aspen. In 1997, the Roaring Fork Railroad Holding Authority purchased the D&RGWRR right-of-way between Glenwood Springs and Woody Creek. The section of rail right-of-way between Woody Creek and Aspen is owned by Pitkin County.

This project would reduce VMT and PM-10 emissions due to reentrained dust by five percent throughout the project area compared to the no-build/committed projects alternative. The expanded feeder bus system would encourage increased transit usage by serving communities downvalley from Aspen. Commuters to Aspen would be able to board a bus and transfer to rail vehicles at one of the rail stations along the corridor to complete their trip to Aspen and Pitkin County.

CDOT has calculated PM-10 emissions within the Aspen PM-10 nonattainment area. (See attached worksheet.) We have concluded that this project complies with the emissions budget in the Aspen PM-10 Redesignation Request and Maintenance Plan and the conformity provisions of the Clean Air Act Amendments of 1990. If you concur, please sign below and return this letter by June 15, 2001.

Thank you.

Very truly yours,

for Rebecca Vickers
Manager
Environmental Programs

I Concur: Margie M. Perkins
Margie Perkins, Director

6-13-01
Date

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
Environmental Programs
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

October 9, 2002

Ms. Judy Knight-Frank, Chairwoman
Ute Mountain Ute Tribe
General Delivery
Towaoc, CO 81334

Dear Ms. Knight-Frank:

SUBJECT: Section 106 Consultation with the Colorado Department of Transportation and Federal Highway Administration; Project NH 0821-049, West Glenwood Springs to Aspen EIS, Eagle, Garfield, and Pitkin Counties, Colorado

The Colorado Department of Transportation (CDOT) is presently gathering information for inclusion in an Environmental Impact Statement (EIS) that will develop a regional transportation solution addressing mobility needs along and near State Highway 82 in the Roaring Fork River valley between the communities of West Glenwood Springs and Aspen, Colorado (refer to enclosed location maps). The study incorporates an analysis of several transit alternatives, including increased bus capacity along the highway and rail service on both new and existing alignments. A multi-use trail is also included, to be located entirely within the former Denver & Rio Grande Western Railroad right-of-way (a "rails to trails" alternative), now under the jurisdiction and ownership of the Roaring Fork Transportation Authority (RFTA). Pursuant to the National Environmental Policy Act (NEPA) of 1969 and the Council on Environmental Quality (CEQ) implementing regulations (40 CFR 1500-1508), CDOT and the Federal Highway Administration (FHWA) are documenting the potential social, economic and environmental consequences of this action in an EIS.

CDOT and FHWA are seeking the participation of Native American tribes in cultural resources consultation for the present undertaking. If your tribe has specific interest in this undertaking and in cultural resources that may be of religious or cultural significance, we invite you to be a consulting party for the purposes of complying with Section 106 of the National Historic Preservation Act. As a consulting party, you are offered the opportunity to identify concerns about cultural resources and comment on how the project might affect them. Further, if it is found that the project will impact cultural resources that are eligible for inclusion on the National Register of Historic Places and are of religious or cultural significance to your tribe, your role in the consultation process may also include participation in resolving how best to avoid, minimize, or mitigate those impacts. It is our hope that by describing the proposed undertaking and the nature of known cultural sites that we can be more effective in protecting areas important to American Indian people.

The Area of Potential Effect (APE) established for this undertaking along State Highway 82 and the RFTA right-of-way has been surveyed for archaeological resources. One prehistoric site (5PT56) exhibiting limited evidence of Native American occupation is located within the project APE, as is one isolated artifact (5PT613). Site 5PT56, initially recorded in 1975 and reevaluated in 1988 and 2000, consists of a sparse scatter of chipped stone flakes located in a severely disturbed area adjacent to Highway 82. There is no physical integrity remaining at the locality and no indication that subsurface cultural remains are present; the State Historic Preservation Officer (SHPO) has therefore evaluated the site as not eligible for listing on the National Register of Historic Places. The isolated find, by definition, is not a National Register eligible resource, and the SHPO has concurred with this determination. No additional sites exhibiting indications of

Native American use or occupation are located within any of the highway, rail or trail alternatives being considered for this undertaking.

Both CDOT and FHWA take seriously any potential concerns regarding American Indians or American Indian issues on transportation projects in Colorado. We are committed to ensuring that you are informed of and involved in decisions that have a potential to impact places that may be culturally significant to your tribe. Please complete and return the enclosed Consultation Interest Response Form to me within 30 days at the address listed at the bottom of that sheet. I can also be reached via Email at daniel.jepson@dot.state.co.us., and my phone number is (303)757-9631. If you have any concerns regarding the confidentiality of information you might provide to us, please note that on the Interest Response Form and contact me so that we can discuss the best ways to respect those interests. Thank you for considering this request for consultation.

Sincerely,

Dan Jepson
Staff Archaeologist & Cultural Resource Manager

cc: T. Knight (Ute Mtn. Ute NAGPRA rep.)
C. Farrar/E. LaDow/E. Vinson (FHWA)
T. Smith (CDOT Region 3 RPEM)
J. Morsicato (Morsicato & Assoc.)
A. Hubbard (RFTA)
RF/CF

COLORADO
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September 10, 2001

Rebecca D. Vickers
Environmental Programs Manager
Colorado Department of Transportation
4201 East Arkansas Avenue
Denver, CO 80222

RE: West Glenwood Springs to Aspen Transportation Corridor CIS/DEIS, Project STA 0821-029

Dear Ms. Vickers:

Thank you for your correspondence dated August 7, 2001, and additional information provided in our September 5, 2001 meeting, concerning the above project having Federal Highway Administration involvement.

After reviewing the inventory forms you provided, we concur with your opinion that the following properties do not meet the National Register of Historic Places eligibility criteria:

Sanders Ranch (5GF2818)
Glenwood/Glenwood Springs Ditch (5GF1457)

We note that this project consists of several transportation activities, set forth in the following documents, which we have also consulted to assist us in commenting on the effects of these activities on historic properties:

- *Glenwood Springs to Aspen CIS/DEIS/CP Trails Plan* maps (December 1999)
- *West Glenwood to Aspen CIS/DEIS LPA Rail Alignment* maps (April 4, 2000)
- *Aspen Branch Denver & Rio Grande Western Railroad Recreational Trails Plan Glenwood Springs to Aspen CIS/DEIS/CP* (December 1999)
- *Reading the Roaring Fork Landscape: An Ideabook for Interpretation and Environmental Education* (July 15, 1999)
- Features associated with the Aspen Line of the D&RGW Railroad (November 1, 2000) - table)
- *Aspen Branch - D&RGW Level II Photographic Study* (October 9, 2000 - index to photos)
- Copies of USGS Quad maps of the West Glenwood to Aspen Transportation Corridor

At our September 5th meeting, we agreed that we could offer our opinion only on the effects of the proposed interim trail alignment at this time due to the need for additional information (discussed

OFFICE OF ARCHAEOLOGY AND HISTORIC PRESERVATION
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below) to enable us to comment on eligibility and effects determinations for the ultimate trail alignment and the rail alignment. However, after reviewing more carefully the *Trails Plan* maps, we became less certain of the interim trail route since, according to the map key, that alignment only appears as discontinuous segments on Maps 5 and 6. We were under the impression that the interim trail was proposed for the entire length of the corridor. Is it possibly what is discussed as the "Initial Trail", in combination with the "Interim Trail" discussed in Pitkin County in the document, *Aspen Branch Denver & Rio Grande Western Railroad Recreational Trails Plan Glenwood Springs to Aspen CIS/DEIS/CP* (December 1999)? Consequently, we will need the information indicated below before we can comment on the effects of this activity.

Interim Trail Alignment

- A map of the corridor with the interim trail highlighted - without reference to any other proposed trails - along with historic properties within the area of potential effects (APE) of the interim trail. Please indicate where this trail is congruent with the railroad grade, existing trails or roads.
- Plans and specifications for the proposed modifications to the Wingo Trestle (D&RG Bridge 384A, 5PT851). It is our understanding that this is the only historic property or feature that will be affected by the interim trail preparation, other than adding trail-surfacing material to the railroad grade itself.

Ultimate Trail Alignment and Transit Alignment

In order to comment on the above two activities, we request the following information, provided in separate sections for each activity, to enable our office to clearly distinguish between the cultural resources within the APE of each and the effects of each proposed activity on historic properties within the APE of each:

- A table of the cultural resources within the APE of the ultimate trail project and a separate table of those within the APE of the rail project, along with inventory forms for any such resources which have not been evaluated previously or re-evaluation forms for any whose formal eligibility status needs to be reconsidered and your agency's opinion regarding eligibility of these resources for inclusion in the National Register of Historic Places. Given the number of resources that may be involved, it would be helpful if each table listed the resources in site number order.
- A current photograph of any resource formally evaluated more than five years ago.
- A map of the corridor with the ultimate trail alignment highlighted - without reference to any other proposed trails - along with historic properties within the APE of the ultimate trail. Please indicate where this trail is congruent with existing trails or roads. Based on narrative on page 9 of the above plan, we are unsure whether the ultimate trail will involve portions of the historic railroad grade, or whether the railroad grade will be reserved for transit.
- A map of the corridor with the transit alignment highlighted - without reference to any other proposed alignments for trails - along with historic properties within the APE of the

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Rebecca D. Vickers

transit alignment. Please indicate where this proposed alignment diverges from the historic railroad grade. (Page 22 of the above-referenced document suggests that the new alignment may not be congruent totally with the historic grade.) If there is divergence, it will be necessary to discuss the disposition of those portions of the historic grade that will not serve transit.

- We are pleased that the introduction to the above plan also emphasizes preservation of open space, wildlife habitat protection, pastoral surroundings and views, as well as the railbed, ballast, ties and tracks. These elements are all part of the existing setting of the historic railroad grade. However, we note that the cross-sections shown throughout the document depict the introduction of up to a ten-foot-wide surfaced trail, a separate soft-surfaced equestrian trail and various vegetation elements to serve as buffers among trails and transit alignment where the corridor can accommodate these additional elements. Consequently, we must voice our concern about the potential for significant alterations to the historic setting through grading and vegetation removal/replanting. We encourage consideration of ways to minimize the introduction of visually intrusive elements out of character with the setting to avoid adversely affecting the historic railroad grade.

If we may be of further assistance, please contact Kaaren Hardy, our Intergovernmental Services Director, at 303/866-3398.

Sincerely,

Georgianna Contiguglia
State Historic Preservation Officer

Cc: Mike Hermes, Roaring Fork Transit Authority

COLORADO
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The Colorado History Museum 1300 Broadway Denver, Colorado 80203-2137

21 May 2002

Rebecca D. Vickers
Environmental Program Manager
Colorado Department of Transportation
Project Development Branch
4201 East Arkansas Ave.
Denver, CO 80222

RE: Project STA 0821-029, West Glenwood Springs to Aspen Transportation Corridor
CIS/DEIS, Aspen vicinity, Pitkin County

Dear Ms. Vickers:

Thank you for your recent correspondence dated 8 May 2002, concerning the proposed determinations of eligibility and effect for this project. Our office has reviewed the submitted plans and materials. There are three sites within the Area of Potential Effect: the Wingo Trestle (5PT.851), and two segments of the Denver and Rio Grande Western Railroad (5PT.123.3 and 123.4). The Wingo Trestle is eligible for the National Register of Historic Places. One segment of the D&RGW (5PT.123.3) contributes to the significance of the overall railroad (itself determined eligible for the National Register in 1988). The other segment, 5PT.123.4, does not contribute to the overall significance of the railroad.

The project involves the construction of a pedestrian trail along the grade of the abandoned D&RGW line. We find that the proposed work shall have no adverse effect on these historic resources.

If you have any questions, please feel free to contact Joseph Saldibar, Architectural Services Coordinator, at (303) 866-3741. We look forward to hearing from you.

Sincerely,

Mark Wolfe
for Georgianna Contiguglia
State Historic Preservation Officer, and
President, Colorado Historical Society

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STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION

Environmental Programs, Project Development Branch
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

June 25, 2002

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

Subject: Documentation of Denver & Rio Grande Western railroad features associated with CDOT Project STA 0821-029, West Glenwood to Aspen Transportation Corridor

Dear Ms. Contiguglia:

This letter constitutes CDOT's request for SHPO concurrence on the proposed methodology for the documentation of the 226 railroad features associated with the Denver & Rio Grande Western Railroad in Eagle, Garfield, and Pitkin Counties located in the project area referenced above. These features were originally identified as part of the Class III Cultural Resources Survey of the Roaring Fork Railroad Authority EIS completed in March 2000.

On June 14, 2002 Dale Heckendorn, Suzanne Doggett, and CDOT Staff Historian Lisa Schoch met to discuss the methodology for recording these railroad features. At that time, it was agreed that recordation of the features on individual site forms would not be necessary. Instead, CDOT will list the features on the site forms for the county railroad segments with which they are associated. Any existing photographs of representative examples of the individual features will be included with the forms for each railroad segment.

The 226 railroad elements will be listed as features for a particular railroad segment, but they will not be categorized as contributing or non-contributing. If at some future time there is a possibility that these features will be removed or impacted, they will be evaluated as part of impacts to the entire railroad segment with which they are associated. For the purposes of this project, however, it is doubtful that any of these features will be removed since the grade is being converted to trail use and the presence of the features helps to retain the feel of the old railroad.

In addition, at the June 14 meeting CDOT agreed to document some of the stand-alone railroad features on individual forms (e.g., bridges, irrigation ditch segments, etc). A preliminary review of the railroad feature list indicates that there are some resources that might qualify for individual recordation. CDOT has committed to developing a definitive list of the features that will be evaluated on individual site forms.

We hereby request your concurrence with the proposed methodology for these historic railroad features. A concurrence line has been included for your convenience, below. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act, and the Advisory Council on Historic Preservation's regulations.

Thank you in advance for your prompt attention to this matter. If you require additional information, please contact CDOT Staff Historian Lisa Schoch at (303)512-4258.

Very truly yours,

for Rebecca D. Vickers
Environmental Programs Manager

I Concur:______________________________
Georgianna Contiguglia Date

cc: Dale Heckendorn, OAHP
Suzanne Doggett, OAHP
Joanna Morsicato

STATE OF COLORADO

DEPARTMENT OF TRANSPORTATION
Environmental Programs
4201 East Arkansas Avenue
Denver, Colorado 80222
(303) 757-9259

DEPARTMENT OF TRANSPORTATION

January 10, 2003

Ms. Georgianna Contiguglia
State Historic Preservation Officer
Colorado Historical Society
1300 Broadway
Denver, CO 80203

RE: CDOT Project NH 0821-049, West Glenwood Springs to Aspen Corridor Investment Study/Draft Environmental Impact Statement

Dear Ms. Contiguglia:

This letter report and the attached enclosures constitute our request for concurrence on Determinations of Eligibility and Effect for the Colorado Department of Transportation project referenced above. Please note that due to the complexity of the project, a lengthy linear corridor (33.3 miles) involving three project transit alternatives and a proposed trail, as well as potential effects to adjacent historic resources, this letter is rather long and has been divided into the following subsections:

I. Background:
- A. OAHP Coordination Chronology.
- B. Project History and Development
- C. Area of Potential Effect (APE) - Definition
- D. Transit Station and Maintenance Facility Locations

II. Aspen Branch of the Denver and Rio Grande Western Railroad
- A. General Rail Alternative Impacts - Request for Concurrence with Determination of Effect
- B. Railroad Features - Request for Concurrence with Eligibility Determinations and Determination of Effect
- C. Trail System Impacts - Request for Concurrence with Determination of Effect

III. Historic Resource Properties within the APE
- A. Request for Concurrence with Eligibility Determinations
  Ineligible Properties Immediately Adjacent to the Rail Alternative and/or Trail.
  Eligible Properties Immediately Adjacent to the Rail Alternative and/or Trail
- B. Request for Determinations of Effect for Trail on Adjacent Historic Properties
- C. Request for Determinations of Effect for Rail Alternative on Adjacent Historic Properties
- D. Request for Determination of Effect for the BRT Alternative

I. Background

A. OAHP Coordination Chronology

Following is an overview of our efforts to coordinate the Section 106 process for this project to date.

- On March 24, 2000, Western Cultural Resource Management (WCRM) completed a survey report for the project entitled, "*A Class III Cultural Resource Survey of the Roaring Fork*

Railroad Authority Environmental Impacts Statement Glenwood Springs to Brush Creek Transportation Corridor, Eagle, Garfield and Pitkin Counties, Colorado." The report was forwarded to you along with a request for concurrence in April 2000. In correspondence dated May 15, 2000, your office provided eligibility determinations for the following properties in the project corridor:

1. Unnamed Trash Scatter (5EA1560) – not eligible
2. Unnamed Trash Scatter (5PT710) – not eligible
3. Denver & Rio Grande Western Railroad (5EA198/5GF1661/5PT123) – eligible
4. Woody Creek Railroad Siding (5PT476) – not eligible
5. Railroad Support Facilities Ruin (5GF2698) – needs data
6. 19 isolated finds – not eligible

- An additional project overlapping and therefore relevant to this undertaking required a survey by WCRM dated October 5, 2000 (*"A Historical Resources Survey of the Lower River Road in Pitkin County, Colorado."*) Your office provided determinations of eligibility and effect in correspondence dated November 6, 2000, and January 22, 2001 (Project NHB 082-052, Lower River Road Detour) for the following resources:

  1. A.B. Foster Ranch (5PT471) – eligible
  2. Aspen-Basalt Stage Road (5PT504) – not eligible
  3. Phillips Residence (5PT864) – not eligible
  4. Wheatley Homestead (5PT867) – not eligible
  5. Isolated Find (5PT1034) – not eligible
  6. Denver & Rio Grande Western Railroad Segment (5PT123.2) – contributing
  7. Wheatley School (5PT57) – eligible

- Pitkin County contracted Front Ranch Research Associates, Inc. to complete an *InventoryUpdate: Historic Resources Survey Pitkin County, Colorado 1999-2000,* including preparation of appropriate site forms. Due to the nature of this update and its funding, eligibility determinations were not officially reviewed by the OAHP. Nonetheless, this updated survey data is pertinent to the current project.

- In August 2001, our office sent determinations of eligibility and effect for resources located in the APE for the West Glenwood Springs to Aspen project. In September 2001, your office concurred with CDOT's finding that two resources—the Sanders Ranch (5GF2818) and Glenwood/ Glenwood Springs Ditch (5GF1457)—are not eligible to the National Register of Historic Places (NRHP). In this letter, you also requested additional information regarding the interim and ultimate trail alignment and rail transit alignment associated with the project.

- In April 2002, Joanna Morsicato, consultant for the Roaring Fork Transportation Authority, CDOT Staff Historian Lisa Schoch, and Kaaren Hardy of OAHP met and agreed on the additional research and coordination required to finalize the Section 106 consultation for the project. Detailed mapping of historic resources within the Project Corridor, clarification of the trail and rail definitions and tables of historic resources by eligibility status and alternative were provided to Ms. Hardy. These materials should be included in your files.

- Subsequent to the April 2002 meeting, Steve Mehls (WCRM) met with Suzanne Doggett of OAHP, per the recommendation of Kaaren Hardy, to discuss project details. The following decisions were carried forward from that meeting:

  - Twelve sites were reviewed:
    1. Ten Mile Station (5PT472)
    2. Woody Creek School (5PT474)
    3. Watson's Siding/Farmer's Alliance Hall (5PT477)
    4. Segment of the Alexis Arbaney Ditch (5PT594.1)
    5. Phillips/Ould/Gerbaz Ranch (5PT787)
    6. Cozy Point Ranch/True Smith Homestead (5PT 875)
    7. Aspen valley Vet Hospital/Orest A. Gerbaz Residence (5PT 876)
    8. Emma School (5PT27)
    9. Emma Historic District (5PT323)
    10. Mather Residence (5PT792)
    11. Wheatley School (5PT57)
    12. White River NF Supervisor's Warehouse (5GF2129)

  The following actions were requested for these properties:

  1. Reevaluation forms were to be prepared for the Woody Creek School (5PT474), Alexis Abernathy ditch (5PT594.1) and White River NF Warehouse (5GF2129).

  2. CDOT was asked to request formal determinations of eligibility on the Phillips Ranch (5PT787), Cozy Point Ranch (5PT875) and Aspen Valley Vet Hospital (5PT876). CDOT was also to request clarification regarding the relationship between the Mather Residence (5PT792) and the Emma Historic District (5PT323).

  3. Point numbers by county were requested for all 226 D&RGW RR features. [This request was revised in June 2002 after additional discussion between Dale Heckendorn (OAHP) and Lisa Schoch. See the final bullet item below regarding this issue.]

- In materials dated May 8, 2002, CDOT provided some of the requested information about the trail alignment and requested concurrence on the Wingo Trestle (5PT851) and two segments of the Denver & Rio Grande Railroad (5PT123.3 & 5PT123.4) that are located within the APE. In correspondence dated May 21, 2002, your office concurred with CDOT's findings regarding these resources.

- And finally, in a letter dated June 25, 2002, CDOT requested concurrence with the proposed methodology for the documentation of 226 features associated with the Denver & Rio Grande Railroad in Eagle, Garfield and Pitkin Counties; on July 3, 2002, your office concurred with this methodology. WCRM subsequently completed re-evaluation forms identifying railroad features by county segment and individual site forms for bridges and sidings.

B. Project History and Development

In June 1997 the Roaring Fork Railroad Holding Authority (RFRHA), a consortium of eight local governments, purchased 33.3 miles of the Aspen Branch of the Denver & Rio Grande Western Railroad right-of-way between Glenwood Springs and Woody Creek. This purchase was completed in conformance with Railbanking, per the National Trails System Act 16USC1247(d), which allows an out-of-service railroad to be used as a trail until it may again be used for rail service. The corridor is not considered abandoned, and can be sold, leased, or donated to a trail manager without reverting back to adjacent landowners. Co-use with a new rail system is also possible. In November 2000, the RFRHA became part of the newly approved regional transportation authority, and was renamed the Roaring Fork Transportation Authority (RFTA). Henceforth, references to the 33.3 mile Aspen Branch portion of the Denver and Rio Grande Western right-of-way or RFRHA right-of-way will be as the RFTA right-of-way. The Federal Highway Administration and the Federal Transit Administration are the lead agencies for the Draft EIS that includes three alternatives:

- No Action-Committed Project Alternative, includes the previously approved SH 82 Entrance to Aspen LRT project.
- Bus Rapid Transit (BRT) Alternative (utilizes existing SH 82 laneage from Glenwood Springs to the previously approved Entrance to Aspen LRT system) with Trail (in the RFTA right-of-way from Glenwood Springs to Woody Creek), and
- Rail Alternative (utilizes portions of the RFTA right-of-way and portions of SH 82 right-of-way) with Trail (in RFTA right-of-way from Glenwood Springs to Woody Creek).

Section 106 consultation was completed for the SH 82 Entrance to Aspen project and documented in the project FEIS (1997) and ROD (1998). Since the BRT Alternative utilizes existing SH 82 laneage or approved LRT routes, no additional affects to cultural resources in the highway or rail corridor are anticipated.

C. <u>Area of Potential Effect (APE)</u>

The Area of Potential Effect (APE) for this project is generally 100 feet on either side of the former Denver & Rio Grande Railroad grade (5EA198/5GF1661/5PT123), now known as the RFTA right-of-way, and the area 100 feet on either side of the portions of SH 82 right-of-way considered for rail alignment. The following barriers may limit this definition: Roaring Fork River, RR grade, SH 82 roadway or associated roadways. The project is not expected to result in any permanent disturbance beyond SH 82 or RFTA ROW.

D. <u>Transit Station and Maintenance Facility Locations</u>

No known historic resources have been reported within the general sites proposed for the transit station locations. Class I file searches have been completed and updated for these locations. A Class III pedestrian survey of each station location will be completed prior to final design and construction of stations. Three existing non-historic maintenance facilities will be upgraded within current site locations for both the BRT and Rail Alternatives.

II. Aspen Branch of the Denver and Rio Grande Western Railroad (D&RGW RR)

The Denver & Rio Grande Western Railroad (5GF1661/5EA198/5PT123) grade was determined eligible to the National Register under Criterion A for its association with the settlement of the Roaring Fork Valley and the 19th century development of Aspen's mining industry.

A. <u>General Rail Alternative Impacts - Request for Concurrence with Determinations of Effect</u>

The Rail Alternative will directly affect the existing historic railroad by rehabilitating the track, renovating associated historic features, and replacing or relocating other historic features. While some features may be destroyed, representative examples from all categories will be preserved. The transit plans include moving some historic features laterally out from the tracks as necessary to meet current safety and clearance standards. The relocations will be limited to only those needed to meet these standards. Also, deteriorated components will be replaced with similar materials and/or reused historic components on retaining walls, culvert faces, and similar features to preserve the setting and character of the railroad grade. CDOT finds that these actions, that seek to preserve as much of the original appearance of the railroad and insert only compatible materials for new elements, will have no adverse effect on the portions of the railroad grade that may be converted to a rail system. CDOT requests your concurrence with this determination of No Adverse Effect for the D&RGW RR sites numbered 5EA198, 5GF1661 and 5PT123.

B. Railroad Features - Request for Concurrence with Eligibility Determinations and Determinations of Effect.

As per correspondence dated June 25, 2002 (referenced in the opening paragraphs), CDOT agreed to list the 226 railroad features on the site forms for the county railroad segments with which they are associated, rather than assigning individual site numbers for each of these features. It was also agreed to document some of the stand-alone railroad features, including bridges and trestles, on individual forms. Table 1 identifies these individually documented stand-alone features, and this information supercedes and replaces the information provided by the WCRM Class III Survey (WCRM, March 24, 2000).

We originally evaluated the railroad sidings as stand-alone features of the railroad. Upon further consultation with Dale Heckendorn, however, it was determined that these sites should not be evaluated as individual sites, but rather should remain features of the railroad. The site forms for the sidings along with the railroad site form are attached. Please note that the Woody Creek Siding (5PT476) was previously evaluated as a stand-alone resource, so it is listed below in the table.

Table 1 includes the feature numbers associated with each county railroad segment, as well as bridges and trestles that were recorded on individual site forms. Individual sites are described below together with eligibility recommendations. Individual site forms for the railroad bridges are attached. CDOT requests your concurrence with the eligibility recommendations for the bridges, trestles, and one siding identified below. These sites are all associated with the Aspen Branch of the D&RGW Railroad; per OAHP's request, CDOT's consultant (WCRM) assigned individual site numbers to each site.

CDOT also requests that the finding of No Adverse Effect associated with the railroad itself for the Rail Alternative be extended to the features now identified as individual sites eligible to the National Register of Historic Places as noted in Table 1.

Table 1
Aspen Branch - Denver and Rio Grande Western Railroad Features by County

Railroad Segment	Associated Features	Site Number	Former Feature Number	Description	Eligibility
Garfield County 5GF1661	F-1 to F-137	5GF3005	F-9	Bridge	Eligible
		5GF3006	F-14	Bridge	Eligible
		5GF3011	F-63	Bridge	Eligible
		5GF3012	F-87	Bridge	Eligible
Pitkin County 5PT123	None	5PT476	None	Woody Creek Siding	Not eligible
	F-157 to F-226	5PT851	F-178	Wingo Trestle	Officially Eligible
		5PT1084	F-158	Bridge	Eligible

5GF3005, Bridge. The bridge was recorded as Feature 9 of the D&RGW (5EA198/5GF5GF1661/5PT123) by WCRM (March 24, 2000). This is a four span steel beam railroad bridge over the Roaring Fork River near downtown Glenwood Springs. Its estimated date of construction is sometime after 1890, when the narrow gauge railroad converted to standard gauge. The bridge was built as part of the Denver & Rio Grande Western Railroad, Glenwood Springs to Aspen Branch line. The rail line proper was built in 1887 and remained active in the post World War II period. Although the bridge lacks the engineering qualities to be considered eligible to the NRHP, it is considered eligible under Criterion A for its association with the Denver & Rio Grande Western Railroad, which is eligible to the NRHP.

5GF3006, Bridge. The bridge was recorded as Feature 14 of the D&RGW (5EA198/5GF5GF1661/5PT123) by WCRM (March 24, 2000). This is a single span steel beam railroad bridge over West 7th Avenue in downtown Glenwood Springs. The bridge can be considered eligible under Criterion A for its association with the Denver & Rio Grande Western Railroad, which is eligible to the NRHP.

5GF3011, Bridge. The bridge was recorded as Feature 63 of the D&RGW (5EA198/5GF5GF1661/5PT123) by WCRM (March 24, 2000). This is a framed bent, wooden railroad trestle over Cattle Creek. Built sometime after 1890, the bridge is considered eligible to the NRHP under Criterion A for its association with the Denver & Rio Grande Western Railroad.

5GF3012, Bridge. The bridge was recorded as Feature 87 of the D&RGW (5EA198/5GF5GF1661/5PT123) by WCRM (March 24, 2000). This single span Pratt Truss deck bridge with trestle approaches at both ends is located just outside of Carbondale. Built sometime after 1890, the bridge can be considered eligible to the NRHP under Criterion A for its association with the Denver & Rio Grande Western Railroad.

5PT851, Wingo Trestle (Bridge 384A). The Wingo Trestle is a deck truss 77 meter (222 foot) railroad bridge carrying one standard gauge track across the Roaring Fork River. Al noted above, the D&RGW constructed the Aspen Branch in 1887, and the current bridge was installed in 1917, fabricated from parts of structures originally located on other parts of the D&RG system. The bridge was recorded as Feature 178 of the D&RGW (5EA198/5GF5GF1661/5PT123) by WCRM (March 24, 2000). It was subsequently recorded and evaluated as a site by the Historic Buildings Survey sponsored by Pitkin County in 2000. As part of the D&RGW RR, determined eligible in 1988, the trestle is a contributing element. Pitkin County recommended that the bridge is eligible for inclusion in the NRHP. The SHPO concurred with this finding in May 2002.

5PT476, Woody Creek Siding. This badly deteriorated siding was determined not eligible in 1988 and re-evaluated by WCRM in 2000. CDOT has determined that there is no new information to change the prior determination. The re-evaluation form is attached.

5PT1084, Bridge. The bridge was recorded as Feature 158 of the D&RGW (5EA198/5GF5GF1661/5PT123) by WCRM (March 24,2000). This structure is a pile bent wooden trestle of three bents that crosses Sopris Creek. Built sometime after 1890, the trestle can be considered eligible to the NRHP under Criterion A for its association with the Denver & Rio Grande Western Railroad.

Table 2, below, provides a list of all known irrigation ditches and their associated D&RGW RR segments. Feature numbers have been retained and cross-referenced as appropriate. CDOT determined that when an irrigation ditch passed under the railroad, the supporting structures were treated as railroad features. Upon further analysis, it was determined that some of the irrigation ditches listed in the original inventory of 226 railroad features were found to run parallel to the railroad and on examination were not considered features of the railroad itself. These five irrigation ditches were subsequently removed from the list of railroad features. To prevent confusion, the feature numbers have been retained but the feature is listed as deleted.

Table 2
Irrigation Ditches that Pass Under the D&RGW RR within the Project Corridor

D&RGW RR Segment	Feature Number	Irrigation Ditch Name
Garfield County: 5GF1661	F-45	Unnamed ditch
	F-53	Glenwood Ditch (5GF1457 - Officially Not Eligible to the NRHP)
	F-74	
	F-83	Unnamed ditch
	F-84	Deleted
	F-118	Deleted
	F-127	Unnamed ditch
		Unnamed ditch
Eagle County: 5EA198	F-147	Deleted
	F-149	Unnamed ditch
	F-151	Unnamed ditch
	F-154	Unnamed ditch
	F-156	Unnamed ditch
Pitkin County: 5PT123	F-160	Deleted
	F-166	Home Supply Ditch
	F-216	Deleted

C. Trail System Impacts - Request for Determinations of Effect

The following interim and ultimate trail definitions are clarified for the project.

1. Both alignments are to be located totally within the former D&RGW RR (RFTA) right-of-way.

2. The differences between the interim and ultimate trail alignments are in alignment location only. The interim trail will be located on top of the existing rails only when other environmental constraints are identified within the remaining right-of-way, such as wetlands, or geological hazard. Should the corridor be returned to rail use under the proposed construction of a commuter rail line, these portions of the interim trail would need to be relocated adjacent to the operating rail line.

3. The trail has been given the same name, Rio Grande Trail, as the existing trail to which it connects at Woody Creek. The pre-existing portion of the Rio Grande Trail also runs within old D&RGW right-of-way in Pitkin County under different ownership.

There has been confusion about the proposed trail system for this project. Portions of the trail have been constructed in Pitkin County prior to completion of Section 106 consultation due to a misunderstanding about the need for impact analysis for the trail. RFRHA initially received approval to construct the trail from the Surface Transportation Board, as a railbanking initiative. Railbanking preserves abandoned railroad lines through interim conversion to trail use. Under 49 CFR Chapter X., Section 1152.29, the RFRHA applied for, and received, permission to build the trail. CDOT signed an intergovernmental agreement with RFRHA agreeing that the trail work could proceed without environmental clearance, which is why the CDOT Environmental Programs Office was never contacted to request SHPO concurrence for the potential impact to the historic railroad grade. (Note that even recently conversion of a railroad to trail use has been demonstrated as not subject to NEPA in *Citizens Against Rails to Trails v. Surface Transportation Board,* 267 F. 3d 1144 (D.C. Cir. 2001). However, Section 106 consultation remains necessary for this project because of the partial federal funding of the right-of-way purchase.

CDOT believes the trail will not have an adverse effect on the D&RGW RR or its associated bridges (Table I) and requests your concurrence for the following reasons:

- The railroad is significant as a historic transportation corridor (Criterion A), and any proposed trail improvements would retain the corridor for transportation purposes and thus would not adversely affect the qualities that make the railroad eligible to the National Register. The trail will result in no adverse effect to the setting and features of the railroad line, as it will not diminish the qualities that make the railroad eligible.

- Under the federal legislation cited above, railbanking is actually considered a beneficial use, as it preserves the rail corridor from abandonment that would have caused the right-of-way to revert back to adjacent property ownership. Abandonment could have resulted in the loss of some or all of the historic Aspen Branch railroad grade.

- Even in areas where the trail results in paving on top of the rail bed or a siding, it can be said that the alignment and profile of the existing rail bed or siding are being preserved from potentially erosive forces. The action does not alter any of the significance of the corridor, and will allow it to remain recognizable as a former railroad grade.

While mitigation is not required for a no adverse effect determination, we have completed a full photographic recordation of the line as it currently exists. These materials were forwarded to your office in August 2001. RFTA will also implement a program of public interpretation and education in stations along the line per recommendations contained in *Reading the Roaring Fork Landscape: An Ideabook for Interpretation and Environmental Education (SAIC, 1999).* This plan was also sent to your office in August 2001 and includes provision for interpretation and public education regarding the Roaring Fork Valley's cultural heritage. In addition, CDOT has recommended specific topics on the significance the historic railroad had on the Roaring Fork Valley. These interpretive topics include:

1. The D&RGW RR as a prospecting railroad, built to access promising mining camps all over Colorado, including Aspen.
2. The heritage of bridge engineering in the valley, including the Satank Bridge, the Wingo Trestle , and the Hardwick Bridge.
3. Carbondale as the rail hub of the valley, including the D&RGW RR, Colorado Midland RR, and the Crystal River RR.
4. Selling the valley and the railroad's role in enticing settlers during the early 1900s.
5. "Wealth from the Earth," the role of the railroad in transporting precious minerals (silver, coal, marble, etc.).
6. The "Rich and Famous" who used the railroad, including Teddy Roosevelt and other celebrities.

III. Historic Properties within the APE

A. Request for Concurrence with Eligibility Determinations

Not Eligible Properties Immediately Adjacent to the Rail Alternative and/or Trail

In addition to impacts to the rail line itself, historic properties adjacent to the Rail Alternative and/or Trail could potentially be affected by the project. Before determinations of effect are made, official determinations on eligibility are required for some of the resources. Your concurrence is requested regarding the eligibility of the six sites listed in Table 3 below. Site descriptions follow the table. No further action will be required for these sites.

Table 3
Sites within the Project APE Recommended as Not Eligible to the NRHP

Rail	Trail	Site Number	Description	Source	Determination
yes	no	5GF2129	White River National Forest Supervisor's Warehouse [1101 School Street, Glenwood Springs].	WCRM re-evaluation form attached.	Not eligible
yes	yes	5GF2698	Railroad Support Facilities Ruin	WCRM, March 24, 2000 form attached	Not eligible
yes	yes	5PT787	Philip/Ould/Gerbaz Ranch [1776 Emma Road, Basalt].	Pitkin County Survey - Grant #98-02-084, form attached	Not eligible.
yes	yes	5PT864	Phillips Residence/Joseph Diemoz Homestead (3558 Lower River Rd, Snowmass)	WCRM, October 5, 2000 form attached	Not eligible
yes	no	5PT875	Cozy Point Ranch/True Smith Homestead (34700 Highway 82, Snowmass)	Pitkin County Survey - Grant #98-02-084, form attached	Not eligible
yes	yes	5PT876	Aspen Valley Vet Hospital/Orest A. Gerbaz Residence (30875 Highway 82, Snowmass)	Pitkin County Survey - Grant #98-02-084, form attached	Not eligible

White River Supervisor's Warehouse (5GF2129). This building is the White River National Forest's Supervisor's Warehouse, located at 1101 School Street in Glenwood Springs. A one-story structure, rectangular in plan view with a hipped roof, dormer, and chimney, the original architect was the United States Army and dates of use are between 1948 and 1951. The building has been moved and is currently used for storage. It was recorded by the National Park Service in 1993, and was determined not eligible in 1997 by the OAHP because many of the outbuildings had lost their integrity due to recent modifications, and better, more intact examples of USFS Supervisor's garage sites exist in Colorado. A re-evaluation of this site was conducted in 2002. CDOT recommends that this property retain the evaluation of not eligible.

Railroad Support Facilities Ruin (5GF2698). This site, recorded by WCRM in 2000, contains building vestiges and other constructed features, pits, depressions, waste piles, an excavated feature and a debris scatter. The feature and debris are distributed across the top of a stream terrace. Features include three masonry building vestiges, six constructed features, five depressions or pits, three waste byproduct dumps, the remains of a coal stockpile and a filled trench. Debris on the site includes glass, metal, food cans, wood and some leather items. The OAHP database indicates that this site is officially needs data as of 2000. Based on the 2000 site form, CDOT recommends that it is not eligible as it lacks architectural integrity and archaeological potential.

Philip/Ould/Gerbaz Ranch (5PT787). This resource consists of a main house and associated agricultural buildings including a garage, sheds, metal shop, chicken coop, blacksmith shop and a grave. Some modifications have occurred over time: a barn, school and potato cellar have been torn down and a Tuff Shed was added in 1987. Research by the current owners found that at the time of the 1910 Census the family of W. D. Philip lived on the property. The original house was located by the creek and possibly used in the past as a chicken coop. A subsequent owner, Ould, also lived at the site before 1920. After 1920, the son of Ernest Gerbaz, Orest E. Gerbaz, lived in the house and farmed the land. He sold the house to the current owners, John and Elizabeth Gredig. The ranch was recorded and evaluated during a survey of historic buildings by Pitkin County in 1999 and recommended not eligible. Although the ranch is associated with the history of agriculture in Pitkin County, it has been altered by the removal of some historic outbuildings and structural modifications. CDOT concurs with the original Pitkin County recommendation of not eligible for this property.

Phillips Residence/Joseph Diemoz Homestead (5PT864). This historic structure is a large log house that was built in several phases, with associated outbuildings. Its estimated construction date is the 1930s. The original house was one story and an addition to the rear is two-storied. A series of bottles has been incorporated into the wall mortar that separates the first and second stories of this addition. Outbuildings include three large and two small sheds. The property was homesteaded by Joseph Diemoz, who filed his application in 1914, and was subsequently purchased by Ellamae and Concer Phillips, who built on to the cabin with several additions. It was evidently Ms. Phillips' idea to use bottles in the wall in place of glass blocks. The house is representative of the log construction popular in Colorado in this time period. However, it is neither unique nor associated with significant individuals in history. The homestead was recorded by the Historic Buildings Survey sponsored by Pitkin County from 1999 to 2000, and recommended not eligible for inclusion in the NRHP. It was reevaluated by WCRM in 2000 during a historic resources survey of the Lower River Road detour. WCRM concurred with the Pitkin County recommendation at that time and the SHPO concurred with this finding in 2000. CDOT does not recommend a change in this status.

Cozy Point Ranch/True Smith Homestead (5PT875). This complex includes two historic frame houses and a historic barn and a modern arena with stalls, sheds and outbuildings. The houses have been extensively altered, while the barn has been only slightly modified. The land was homesteaded by True A. Smith, who settled it in 1885. One house is estimated to have been built around 1900, while the other was most likely constructed in the 1930s. Because the railroad stop at Shale Bluffs nearby was called "Cozy Point," the ranch was also known as the Cozy Point Ranch. The homestead was recorded and evaluated as not eligible by the Historic Buildings Survey sponsored by Pitkin County from 1999 to 2000. The barn is the only historic structure on the homestead/ranch with any historic integrity. CDOT concurs with the Pitkin County assessment of this property and recommends that it is not eligible.

Aspen Valley Vet Hospital/Orest A. Gerbaz Residence (5PT876). This resource consists of a one and one-half story rectangular frame structure built in 1932 by Orest A. Gerbaz. The property was homesteaded by Harvey W. Boyce in 1885 and subsequently purchased by Gerbaz. Although the Pioneer

Farmers' Sub Alliance Hall/Watson Hall/Gerbazdale Hall was originally located on the property, the building was split into two sections and moved in 1965. The homestead was recorded and evaluated as not eligible by the Historic Buildings Survey sponsored by Pitkin County from 1999 to 2000. The house is a bungalow style commonly used at the time of its construction. The resource is not unique and is not associated with significant events and individuals. CDOT concurs with the Pitkin County finding and recommends that this property is not eligible to the NRHP.

Eligible Properties Immediately Adjacent to the Rail Alternative and/or Trail

Official determinations of NRHP eligibility are needed for three sites noted in Table 4 below. Site descriptions follow the table.

Table 4
Sites within the Project APE Recommended as Eligible or that are Officially Eligible to the NRHP

Rail	Trail	Site Number	Description	Determination
yes	yes	5GF1167	Hardwick Bridge. See Fraser Design Re-evaluation (2000).	Eligible
yes	yes	5PT27	Emma School. See comments below.	Eligible
yes	yes	5PT792	Mather Residence [Emma Road, Basalt] See Pitkin County Survey - Grant #98-02-084*	Eligible
yes	yes	5PT57	Wheatley School	Officially Eligible

* Note that this site is already included in the Officially Eligible Emma Historic District 5PT323. This duplication may be unnecessary.

Hardwick Bridge (5GF1167). The bridge and one acre surrounding it were surveyed in 1983 by Rebecca Herbst of the Colorado Department of Highways. The first Hardwick Bridge was rebuilt in 1908, but was destroyed in 1923 when an excessive number of cattle were driven over it. A new bridge was constructed by the Monarch Engineering Company later that same year to serve as a vehicular bridge. Although it is one of the earliest constructed rigid Pratt through-truss bridges, it was originally found not eligible in November 1983 because its construction style was not unique. Attrition of this bridge type resulted in a revised eligibility recommendation by Fraser Design in 2000 as part of the Colorado Bridge Inventory. The bridge qualifies under Criterion A as a well-preserved example of county-level bridge construction using state design standards. It is also technologically significant as one of the last remaining examples of a what was once a common structural type.

Emma School (5PT27). This one story rectangular frame school was originally evaluated by the Bureau of Land Management in 1977; no official evaluation was made. It is estimated that the building was constructed sometime around 1900 and served as a focus of community events for local ranching families. It is associated with the history of education in the rural communities of Colorado and represents rural schools of the early 20th century. This property was re-evaluated as eligible for inclusion on the NRHP by the Pitkin County Reconnaissance Survey (SHF #98-02-084) conducted by Front Range Research Associates in October 1999. CDOT concurs with this finding.

Mather Residence (5PT792). The Mather house is a two-story painted brick building constructed in 1898 by Charles H. Mather, the second Emma postmaster. He also operated a general store and was a businessman associated with the history of Emma and the settlement of Pitkin County. The house is one of the more architecturally sophisticated 19th century buildings in the area. It was recorded and evaluated by the Historic Buildings Survey sponsored by Pitkin County from 1999-2000 and recommended as eligible for inclusion in the NRHP under Criteria A and C. The Mather Residence is also a contributing feature of the Emma Historic District (5PT323). CDOT concurs with the Pitkin County Survey results and recommends that this property is eligible to the NRHP. Note that this site is already included in the Officially Eligible Emma Historic District (5PT323), and this duplication may therefore be unnecessary. OAHP clarification regarding the separate listing of this property and, if appropriate, OAHP concurrence that this site is eligible as a separate property are requested.

Wheatley School (5PT57). Originally a one-room schoolhouse built of brick, this structure was built sometime before 1920. It is currently used as a residence and has been substantially modified. The school was originally recorded by Dykeman in 1974 and was subsequently reevaluated by Metcalf Archaeological Consultants (MAC) in 1996 during a survey for the Holy Cross Basalt to Aspen 115kv Rebuild Project, and WCRM in 2000 during the historic resources survey of the Lower River Road detour. Both MAC and WCRM concurred with the original 1988 official determination of not eligible; however the SHPO disagreed with this finding and requested additional information. In 2000 the Wheatley School was reevaluated by a Pitkin County Reconnaissance Survey and recommended eligible under the multiple property submission for rural schools. In January 2001, the Wheatley School was found officially eligible to the NRHP. CDOT believes this determination still applies to this resource.

B. Request for Determinations of Effect for Trail on Adjacent Historic Properties

The following CDOT determinations of effect are proposed for the pedestrian/bicycle Trail that will be located within RFTA right-of-way (Table 5). Descriptions of each site not previously described follow the table.

Table 5
Trail Alignment - Resources in APE
With Eligibility Status and CDOT Determinations of Effect

Site Number	Name/Address	NRHP Status	Date of Evaluation	CDOT Determination of Effects
5EA198/ 5GF1661/ 5PT123	D&RGW Railroad and associated features	Officially Eligible	1988, 2002	**No Adverse Effect.** See discussion above.
5GF1167	Hardwick Bridge	Field Eligible (see above)	1983 (Not Eligible), 1999-2000	**No Historic Properties Affected.** Bridge is separated from trail by CR 154.
5GF1282	Satank Bridge	Listed	Listed	**No Adverse Effect.** This bridge across the Roaring Fork River is less than 100' from the trail project. Trail construction and use will not affect this resource, which is adjacent to the RR ROW.
5GF1457	Glenwood Ditch	Officially Not Eligible	1988, 2001	**No Historic Properties Affected.**
5GF2698	Railroad Support Facilities Ruin	Field Not Eligible (see above)	2000	**No Historic Properties Affected.** *Eligibility Determination Requested Above.*
5GF2818	Sanders Ranch	Officially Not Eligible	2001	**No Historic Properties Affected.**

Site Number	Name/Address	NRHP Status	Date of Evaluation	CDOT Determination of Effects
5PT27	Emma School	Eligible	1999 (Pitkin County)	**No Adverse Effect.** Trail construction and use will not affect this resource which is adjacent to the RR ROW. *Eligibility Determination Requested Above.*
5PT57	Wheatley School	Officially eligible	1988, 1996, 2000 (Not Eligible), 2000 (Pitkin County-Eligible), Officially eligible 2001	**No Adverse Effect.** Trail construction and use will not affect this resource, which is adjacent to the RR ROW.
5PT323	Emma Historic District	Officially Eligible	1977, 1999 (Pitkin County)	**No Historic Properties Affected.** Buildings are separated from the trail by SH 82.
5PT472	Ten Mile Stage Station (torn down in 1887)	Officially Not Eligible	1988 Per OAHP no re-evaluation required.	**No Historic Properties Affected.** Adjacent to SH 82 not the trail alignment.
5PT474	Woody Creek School	Officially Not Eligible	1988,2002, re-evaluation attached	**No Historic Properties Affected.** Adjacent to SH 82 not the trail alignment.
5PT476	Woody Creek RR Siding	Officially Not Eligible	1988& 1998,2000	**No Historic Properties Affected.**
5PT477	Watson's Siding (Colorado Midland); Farmer's Alliance Hall (no evidence remaining)	Officially Not Eligible	1988 Per OAHP no re-evaluation required.	**No Historic Properties Affected.** Adjacent to SH 82 not the trail alignment.
5PT594.1	Segment of Alexis-Arbany Ditch	Officially Not Eligible	1993 Re-evaluation not possible within a gated community on private property.	**No Historic Properties Affected.** Does not cross RR right-of-way.
5PT612	Three Stone Cairns/ Magazines	Officially Not Eligible	1997	**No Historic Properties Affected.** Adjacent to SH 82 not the trail alignment.
5PT630	Potato Cellar	Officially Not Eligible	1996	**No Historic Properties Affected.**
5PT632.1	Grace An Shehi Ditch	Officially Not Eligible	1996	**No Historic Properties Affected.**
5PT864	Phillips Residence/ Joseph Diemoz Homestead-3558 Lower River Rd, Snowmass	Not Eligible (see above)	2000	**No Historic Properties Affected.** Trail construction and use will not affect this resource which is adjacent to the RR ROW *Eligibility Determination Requested Above*
5PT787	Philips/Ould/Gerbaz Ranch [1776 Emma Road, Basalt]	Not Eligible (see above)	1999	**No Historic Properties Affected.** Trail construction and use will not affect this resource which is adjacent to the RR ROW *Eligibility Determination Requested Above*

Site Number	Name/Address	NRHP Status	Date of Evaluation	CDOT Determination of Effects
5PT792	Mather Residence [Emma Road, Basalt]	Field Eligible	1977 (?), 1999 (Pitkin County)	**No Historic Properties Affected.** Building is separated from the trail by SH 82
5PT851	Wingo Trestle; Bridge 384A [Hwy 82 and Hoaglund Ranch Road]	Officially Eligible	1999-2000	**No Adverse Effect.** (SHPO concurrence on 05-21-02)
5PT876	Aspen Valley Vet Hospital/Orest A. Gerbaz Residence [30875 Highway 82, Snowmass]	Not Eligible (see above)	1999-2000	**No Historic Properties Affected** Trail construction and use will not affect this resource which is adjacent to the RR ROW *Eligibility Determination Requested Above*

Satank Bridge (5GF1282). This bridge was recorded by Clayton Fraser and Susan Cason of Fraser Design during a survey of Colorado bridges conducted by the Colorado Department of Highways (1983). The timber/steel Pratt through truss bridge was constructed by the Pueblo Bridge Company in 1900. It is one of the older roadway trusses in Colorado and the only remaining timber Pratt through truss in public use in the state. It was listed on the NRHP on February 4, 1985 and represents a significant vehicular bridge of the late 19th and early 20th centuries.

Glenwood Ditch (5GF1457). The Glenwood Ditch was recorded by Bill Kight of the BLM in 1988 during a Class III survey of the four hectare (one acre) Kinlaw Right-of-Way. It was avoided by the right-of-way, but a determination of eligibility was not made. The purpose of the ditch was to supply water to the town of Glenwood Springs. Construction on the ditch began on November 18, 1900, and the ditch was filed on March 7, 1901. It was 1.8 meters wide (6 feet) wide at the bottom and 2.4 meters (8 feet) wide at the high water mark and had a depth of 0.6 meters (two feet). This resource was officially determined not eligible in 2001 due to modern impacts and abandonment. We recommend that this evaluation remain unchanged.

Sanders Ranch (5GF2818). The main house is in poor condition overall and has undergone some apparent alterations. This ranch complex and the surrounding lands are significant for their association with the history of the settlement and development of farming and ranching within the Roaring Fork Valley. As a cultural landscape, the property is representative of, and associated with, the farming and ranching activities that have continued unabated in this area since the early 1880s. The structures that comprise the Sanders Ranch, with the exception of the main house, are less than 50 years old. While the complex may be of local or statewide significance, in its entirety it lacks the necessary integrity of location, materials and association that would make the property eligible for inclusion in the NRHP. This resource was officially determined not eligible in 2001, and we recommend that this evaluation stand.

Emma Historic District (5PT323). Emma was established as a railroad section stop and was reportedly named after Mrs. Emma Robinson Shehi, who cooked for railroad crews. Charles Mather (discussed above) was a postmaster at Emma who also operated a successful general store. The district was recorded by the Department of Highways in 1976 and officially determined eligible in 1977. This site was re-evaluated in October 1999 by Front Range Research Associates as part of the Pitkin County Reconnaissance Survey and was found field eligible at that time. It consists of the Mather Buildings, mercantile stores, a warehouse, residences and outbuildings. CDOT concurs with the findings of the Pitkin County re-evaluation and recommends that this site is eligible.

Ten Mile State Station (5PT472). This station was informally recorded by Ruth L. Mularz of Aspen on an unknown date. It was built in the 1880s by A.B. Foster, who also ran it, and was torn down after 1887 with the arrival of the railroad line. The Colorado SHPO determined the station not eligible in July 1988. Per an April 2002 meeting between Steve Mehls of WCRM and Suzanne Doggett of OAHP, it was determined that this property did not require a re-evaluation.

Woody Creek School (5PT474). The school was noted by Ruth L. Mularz of Aspen and, like 5PT472, was never officially recorded. It was built in the 1880s and used until 1947. The Colorado SHPO determined the school not eligible in 1988. It appears to have been re-evaluated in 2000 by Front Range Research Associates as not eligible. Re-evaluation of this site in 2002 by WCRM revealed that the schoolhouse no longer exists. CDOT recommends that this site is not eligible.

Woody Creek Railroad Siding (5PT476). The siding was informally recorded by Ruth Mularz on an unknown date. It is likely the siding was utilized from 1887 to the mid-20th century during the operating period of the D&RGW. Reevaluation by MAC (Spath et al. 1996) found the integrity of the site to be poor. The water tank, the central focus of the site, had been removed and all that remained was scattered railroad debris. It was officially determined not eligible to the NRHP in 1988. WCRM reevaluated this property in 2000 and determined that the finding of not eligible still applied. (March 24, 2000). CDOT concurs with this finding.

Watson's Siding/Farmer's Alliance Hall (5PT477). This site was recorded by MAC (Spath et al. 1996) and was the original location of the Farmers' Alliance Hall at the Colorado Midland Railroad Siding of Watson. The hall was built in 1891, but the exact location of the original building is unknown. It likely existed from 1891 to 1960, the date of the original site inventory form. No evidence of a structure could be found by MAC. Materials found on the surface consisted of historically late railroad related debris. The hall was officially determined not eligible in 1988. As per an April 2002 meeting between Steve Mehls of WCRM and Suzanne Doggett of OAHP, it was determined that this property did not require a re-evaluation.

Segment of the Alexis-Arbaney Ditch (5PT594.1). The ditch was recorded by MAC on the north side of the Roaring Fork River (Spath et al. 1996) and determined officially not eligible in 1993. It has been used from 1897 to the present and varies from .6 to 1.5 meters (2-5 feet) in width. Attempts at re-evaluation of this site were thwarted by its surrounding gated community and private property. This ditch does not cross under the D&RGW (RFTA) ROW. Re-evaluation by WCRM in 2002 was not possible due to private property issues. CDOT concurs with the original 1993 eligibility finding and recommends that this site remain not eligible.

Three Stone Cairns/Magazines (5PT612). The cairns were recorded in 1996 by MAC during a Class III inventory for the Holy Cross Basalt to Aspen 115kV Rebuild Project. Located along the base of a south-facing hill slope on a flat terrace above the Roaring Fork River, the features are circular and approximately two meters high. Materials include course rounded lichen-covered boulders of granite and red sandstone. The cultural affiliation and age of the cairns could not be determined. The site was officially determined not eligible by the Colorado SHPO in 1997. CDOT concurs with the 1997 finding and recommends that this site is not eligible.

Potato Cellar (5PT630). The cellar was recorded by MAC (Spath 1996) as measuring 7.6 by 4.6 meters (25 by 15 feet). The pole and timber portion of the building had collapsed, leaving the concrete façade in place. It is a common type of structure built in the 1940s and 1950s, and was determined officially not eligible on December 19, 1996. CDOT concurs with the 1996 finding and recommends that this site is not eligible.

Segment of the Grace An Shehi Ditch (5PT632.1). This segment of the ditch was recorded by MAC (Spath 1996) during a Class III inventory of the Roaring Fork Club South Planned Development. The channel is about 2.5 meters wide and one meter deep (8.2 feet wide and 3.2 feet deep). The first appropriation for the ditch was filed in April 1886, and it subsequently played an important role in the development of this portion of the Roaring Fork Valley. However, this segment was officially determined not eligible in 1996.

C. Request for Determinations of Effect for Rail Alternative

Since this alternative has not to date been selected as the preferred alternative, final plans for the project have not been prepared. The following determinations of effect were based on the proximity of the resource to the Rail Alignment, and on any pre-existing relationship between the resource and the railroad. For example, if the railroad used to pass behind an historic structure, CDOT determined that impacts would be similar to the original impacts of the railroad on the structure. Table 6 includes CDOT determinations of effect for eligible resources within the APE for the Rail Alternative. Descriptions of each site not previously described follow the table.

Table 6
Rail Alignment - Resources in APE
With Eligibility Status and CDOT Determinations of Effect

Site Number	Name/Address	NRHP Status	Date of Evaluation	CDOT Determination of Effects
5EA198/ 5GF1661/ 5PT123	D&RGW Railroad and associated features	Officially Eligible	1988,2002	**No Adverse Effect.** See discussion above.
5GF1167	Hardwick Bridge	Field Eligible	1983 (Not Eligible), 1999-2000	**No Historic Properties Affected.** This bridge across the Roaring Fork River is separated from the rail project by existing CR 154 and is over 200' from the rail. *Eligibility Determination Requested Above.*
5GF1282	Satank Bridge	Listed	Listed	**Conditional No Adverse Effect.** This bridge across the Roaring Fork River is less than 100' from the rail project. Conditional upon installation of monitoring devices to measure construction vibration.
5GF1457	Glenwood Ditch	Officially Not Eligible	1988, 2001	**No Historic Properties Affected.**
5GF2129	White River Natl. Forest Supervisor's Warehouse [1101 School St., Glenwood Springs]	Field Not Eligible	1993-NPS, 1997, 2002	**No Historic Properties Affected.** *Eligibility Determination Requested Above.*
5GF2698	Railroad Support Facilities Ruin	Field Not Eligible	2000	**No Historic Properties Affected.** *Eligibility Determination Requested Above.*
5GF2818	Sanders Ranch	Officially Not Eligible	2001	**No Historic Properties Affected.**

Site Number	Name/Address	NRHP Status	Date of Evaluation	CDOT Determination of Effects
5PT27	Emma School	Officially Eligible	?, 1999 (Pitkin County)	**Conditional No Adverse Effect.** Conditional upon installation of monitoring devices to measure construction vibration. Emma School is located adjacent to the RR (south side).
5PT57	Wheatley School	Officially Eligible	1988, 1996, 2000 (Not Eligible) 2000 (Pitkin County - Eligible) 2001	**Conditional No Adverse Effect.** Conditional upon installation of monitoring devices to measure construction vibration. Wheatley School is located adjacent to the RR (south side).
5PT113	Aspen Commercial Core Historic District	Listed	Listed	**Conditional No Adverse Effect.** Conditional upon installation of monitoring devices to measure construction vibration.
5PT323	Emma Historic District	Officially Eligible	1977, 1999 (Pitkin County)	**No Adverse Effect.** The District is separated from the rail project by SH 82 and is over 200' from the center of the RR.
5PT471	A.B. Foster Ranch	Officially Eligible	1988 & 2000 (WCRM)	**No Adverse Effect.** The ranch faces Lower River Road and is approximately 200' from the RR which will run along SH 82 in this area.
5PT504	Aspen to Basalt Stage Road	Officially Not Eligible	1988 & 2000	**No Historic Properties Affected.**
5PT542	Colorado Midland Railroad	Officially Eligible (10/13/88)	1988	**No Adverse Effect.** RR grade already affected by previous SH 82 construction and also Entrance to Aspen LRT. No additional impacts.
5PT594.1	Segment of Alexis-Arbany Ditch	Officially Not Eligible	1993	**No Historic Properties Affected.**
5PT612	Three Stone Cairns/ Magazines	Officially Not Eligible	1997	**No Historic Properties Affected.**
5PT787	Philips/Ould/Gerbaz Ranch [1776 Emma Road, Basalt]	Not Eligible	1999	**No Historic Properties Affected.** *Eligibility Determination Requested Above.*
5PT864	Phillips Residence/ Joseph Diemoz Homestead-3558 Lower River Rd, Snowmass	Not Eligible	2000	**No Historic Properties Affected.** *Eligibility Determination Requested Above.*
5PT875	Cozy Point Ranch/True Smith Homestead [34700 Highway 82, Snowmass]	Not Eligible	1999-2000	**No Historic Properties Affected.** *Eligibility Determination Requested Above.*
5PT792	Mather Residence [Emma Road, Basalt]	Field Eligible	1977 (?), 1999 (Pitkin County)	**No Adverse Effect.** The District is separated from the rail project by SH 82 and is over 200' from the center of the RR.

Site Number	Name/Address	NRHP Status	Date of Evaluation	CDOT Determination of Effects
5PT876	Aspen Valley Vet Hospital / Orest A. Gerbaz Residence [30875 Highway 82, Snowmass]	Not Eligible	2000	**No Historic Properties Affected.** *Eligibility Determination Requested Above.*

Aspen Commercial Core Historic District (Certified Local Historic District) (5PT113). The district was originally recorded in 1980 by the Pitkin County Planning and Zoning Office. Research indicates that this resource became a National Parks Service Certified District in 1984 and is considered eligible to the NRHP. The district consists of a number of buildings located within the area defined by Durant Avenue on the south, Hunter Street on the East, Main Street on the north and Monarch Street on the west.

The *SH 82 Entrance to Aspen FEIS* (CDOT 1997) and *Record of Decision* (CDOT1998) inadvertently overlooked the NRHP status of this site, identifying it as a local district only. Neither project will result in the physical taking of property from the district. The LRT will turn at Main and Monarch Streets and run south to Durant Street where it turns east and ends at Rubey Park. The Rail project extends along Main Street to its terminus at Hunter Street.

The LRT project will result in audible noise increases to receivers within the Historic District. The change in overall noise levels between the No-Build and Build cases for the LRT would be between 1 and 5 decibels (dBA) along Monarch Street. The LRT transit operations noise would be more dominant, especially at receptors on the east side of the street, because of the relatively low vehicular traffic volume expected on this street. This future LRT transit noise will exceed the Federal Transit Administration criteria, which are based on existing noise conditions. Effective noise mitigation measures are not feasible or practical in this area due to the locations of the receptors with numerous access openings in close proximity to the project. This level of noise impact is not expected to compromise the historic value of the district nor the current uses of the properties.

The proposed Rail Alternative for the current project will not result in noise impacts to receptors along Main Street. Additional information is available in the *City of Aspen LRT and DMU Noise Evaluation* (Parsons Engineering Science, Inc. 2000).

Neither project will result in vibration impacts due to operations activities. There is a potential for impact during construction and this can be monitored and appropriate mitigation or avoidance actions taken based on monitoring results.

We request a finding of No Adverse Effect for both projects for this resource, conditional upon installation of monitoring devices to measure construction vibration.

Foster Ranch (5PT471). Arthur Bertram Foster settled on the land that was to become his ranch in 1882. The house was built in 1887 when railroads were introduced into the Roaring Fork Valley. After residing there for 12 years, he sold the ranch to Jeremie J. Gerbaz, an immigrant from Italy. Besides ranching activities, Gerbaz was politically active, serving as a school board member, constable and Pitkin County Commissioner. He died in 1947 and his sons took over operation of the ranch until it was sold in 1955. The house is significant for its association with Arthur Foster and Jeremie Gerbaz, two pioneer ranchers and influential citizens of Pitkin County. It is also a well-preserved example of the late Victorian architecture popular among successful ranchers in the Roaring Fork Valley. It was officially determined eligible in 1988. A subsequent reevaluation of the ranch was conducted by WCRM in 2000 during the Lower River Road detour study and again with the Pitkin County Historic Buildings Survey of 1999-2000. The recent evaluations concur with the existing eligibility determination.

Aspen to Basalt Stage Road (5PT504). The stage road was described by Ruth Mularz of Aspen; however, it was never recorded. It was used from 1880/1881 to 1887 when the railroad arrived. The site was determined not eligible in 1988. This property was reevaluated in 2000 by WCRM and evaluated as not eligible to the NRHP. CDOT recommends that this site is not eligible to the NRHP.

Colorado Midland Railroad (5PT542). The Colorado Midland Railroad was recorded by the Colorado Department of Highways in 1989 for an EIS. Proposed construction involved widening the highway to four lanes for a 27.3 kilometer (17 mile) segment between Basalt and Aspen. The grade occupies the current route of Highway 82 and was built in 1883. It was determined eligible in 1988; it was the first standard gauge railroad to penetrate the Rockies, was associated with Jerome Wheeler, and was associated with early railroad history in Colorado. The Highway 82 Entrance to Aspen Preferred Alternative will take 0.23 hectares (0.57 acres). The SHPO determined No Adverse Effect for the site for the previous SH 82 Entrance to Aspen LRT project.

D. Request for Concurrence regarding Effect for the Bus Rapid Transit (BRT) Alternative

The Bus Rapid Transit (BRT) Alternative will utilize the existing State Highway 82 lanes and will not directly or indirectly affect any cultural resources not already affected by SH 82. This alternative will connect to the pre-approved LRT alternative outside of Aspen and will either utilize the LRT or, in lieu of the completion of that project, will utilize the approved right-of-way for that project entering into and through Aspen. The use of buses in the LRT right-of-way are expected to have the same or fewer noise effects on the Aspen Commercial Core Historic District. No additional right-of-way will be acquired in the Historic District. We request your concurrence for No Adverse Effect for the Aspen Commercial Core Historic District (5PT113), conditional upon installation of monitoring devices to measure construction vibration. This condition only applies if the BRT Alternative utilizes the LRT location in lieu of LRT construction.

We hereby request your concurrence with the Determinations of Eligibility and Effect outlined above. Your response is necessary for the Federal Highway Administration's compliance with Section 106 of the National Historic Preservation Act (as amended) and with the Advisory Council on Historic Preservation's regulations.

Thank you in advance for your prompt attention to this matter. If you require clarification or additional information in order to complete your review, please contact CDOT Staff Historian Lisa Schoch at (303)512-4958.

Very truly yours,

for Rebecca D. Vickers
Environmental Program Manager

Enclosures

cc: Tammie Smith, CDOT

Edrie Vinson, FHWA
Steve Mehls, Western Cultural Resource Management, Inc.
Joanna Morsicato, Joanna Morsicato and Associates
Suzannah Reid, Pitkin County
Amy Guthrie, City of Aspen
Glenn Hartmann, Town of Basalt
Andrew McGregor, City of Glenwood Springs
Alice Hubbard, RFTA
Mike Hermes, RFTA
File/CF/RF

COLORADO
HISTORICAL
SOCIETY

The Colorado History Museum   1300 Broadway   Denver, Colorado 80203-2137

23 January 2003

Rebecca D. Vickers
Environmental Program Manager
Colorado Department of Transportation
Project Development Branch
4201 East Arkansas Ave.
Denver, CO 80222

RE: CDOT Project NH0821-049, West Glenwood Springs to Aspen Corridor Investment Study/Draft EIS

Dear Ms. Vickers:

Thank you for your recent correspondence dated 10 January 2003, concerning determinations of eligibility and effect for the proposed West Glenwood Springs to Aspen project corridor. We concur with CDOT's determinations of eligibility and effect as outlined your letter dated 10 January 2003. If vibration monitoring is required as a condition of a "no adverse effect" finding, please submit information on this process to our office.

If you have any questions, please feel free to contact Joseph Saldibar, Architectural Services Coordinator, at (303) 866-3741. We look forward to hearing from you.

Sincerely,

For Georgianna Contiguglia
State Historic Preservation Officer, and
President, Colorado Historical Society

APPENDIX B: Project Corridor Maps

This appendix contains the following maps which show the West Glenwood Springs to Aspen CIS Project Corridor Rail Alternative alignment, Trail alignment, and proposed transit station locations for all Build alternatives.

West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment, and Proposed Transit Station Locations (all Build Alternatives)

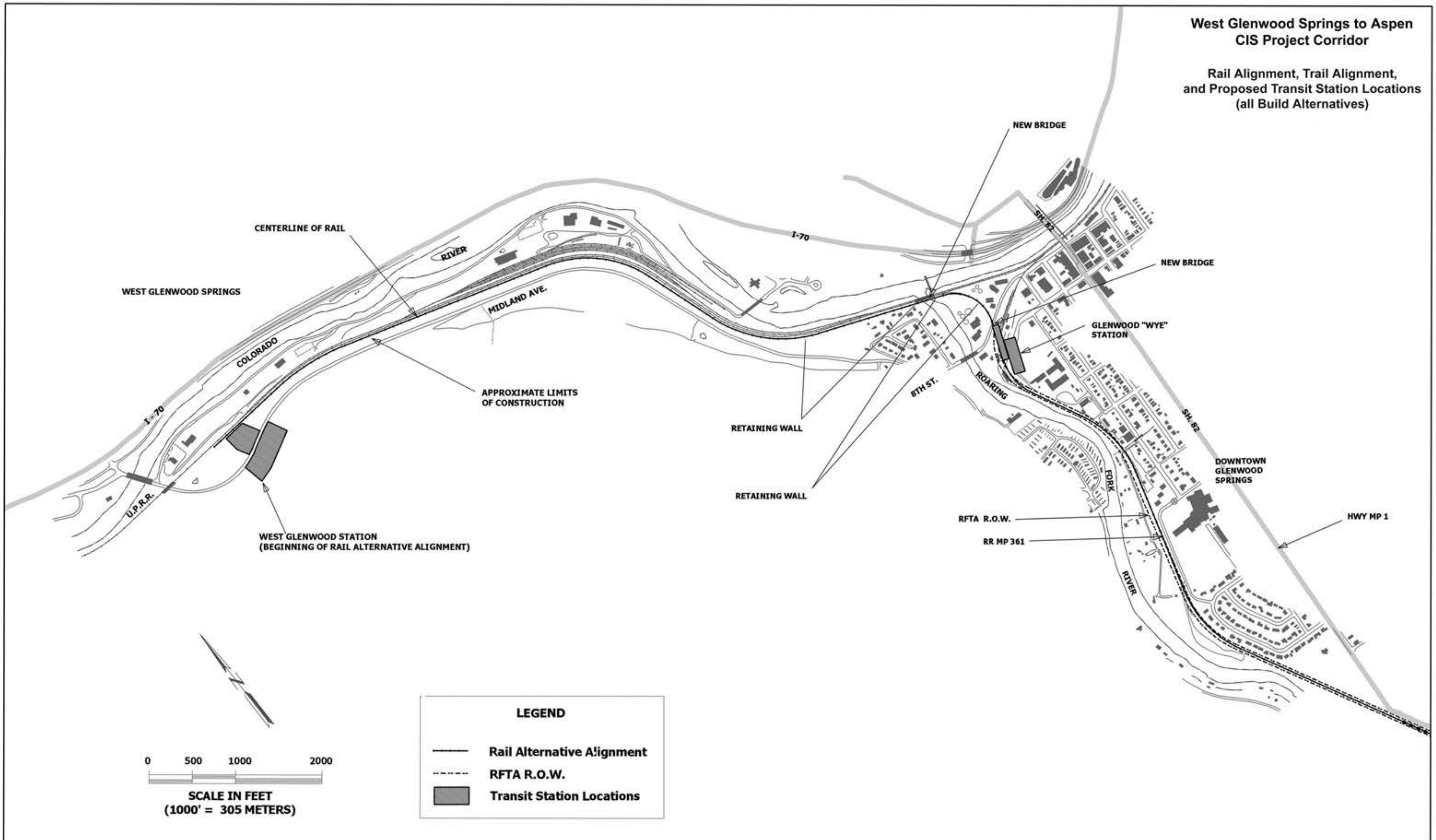


Figure B-1
Station 11+00 to 175+00

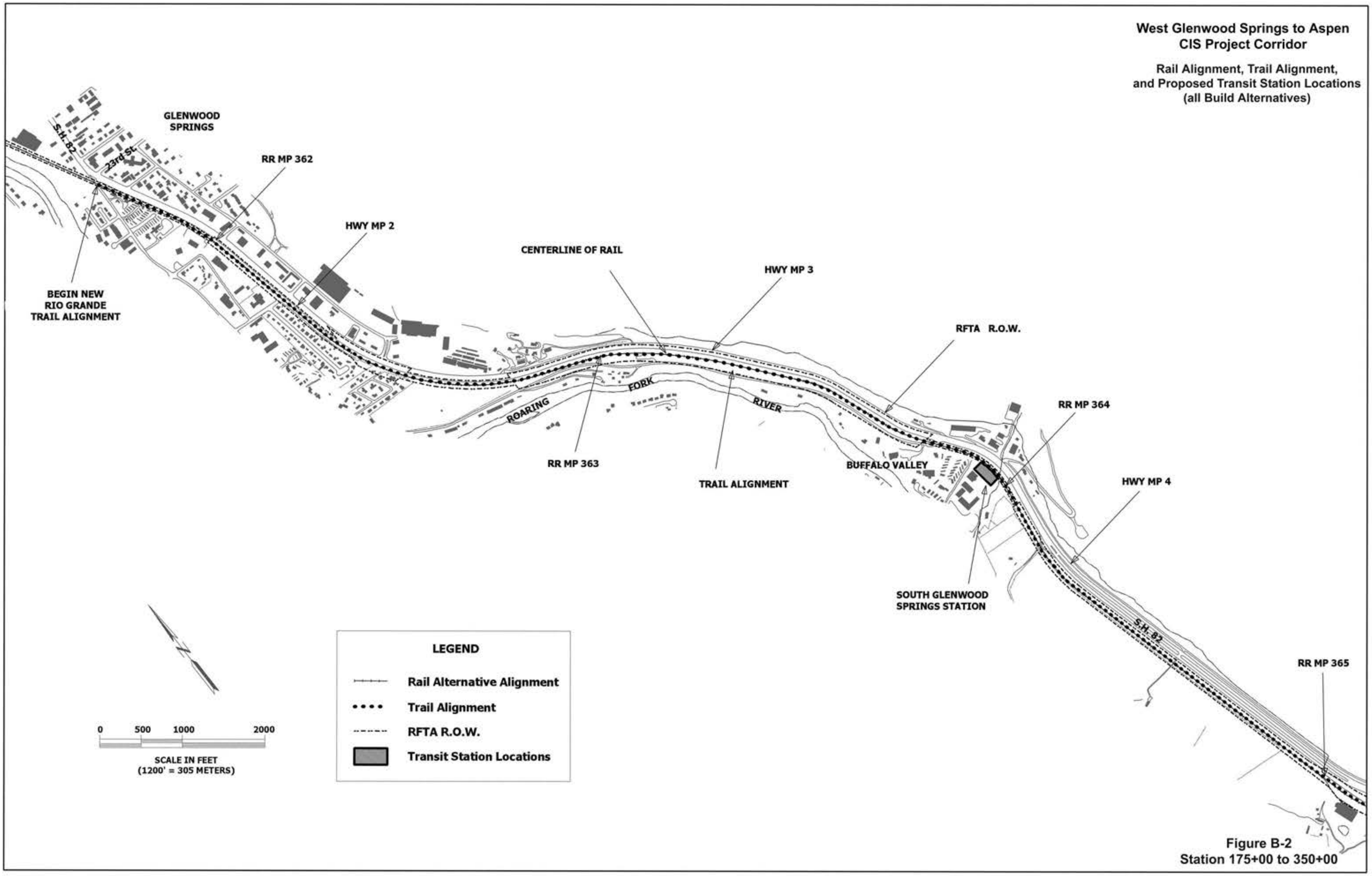


Figure B-2
Station 175+00 to 350+00

West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment, and Proposed Transit Station Locations (all Build Alternatives)

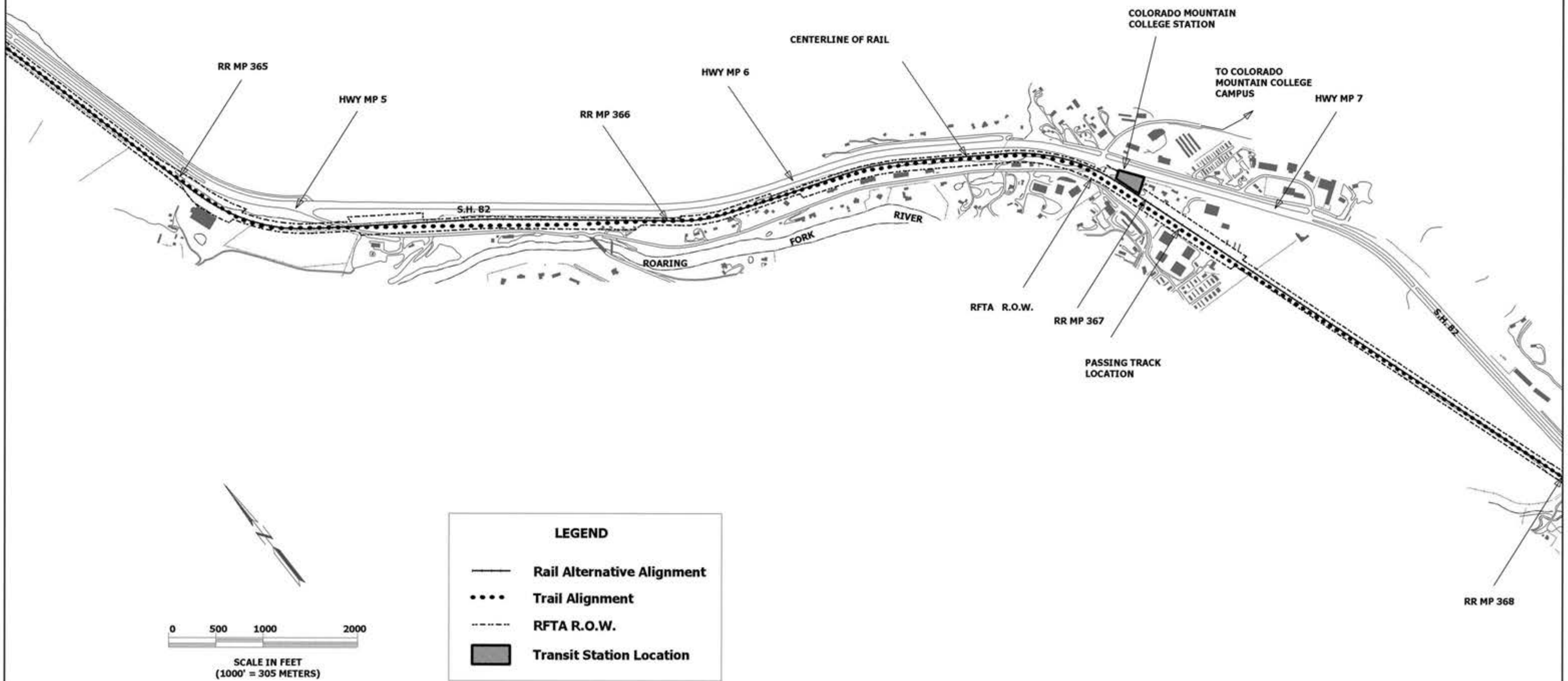


Figure B-3
Station 350+00 to 505+00

West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment,
and Proposed Transit Station Locations
(all Build Alternatives)

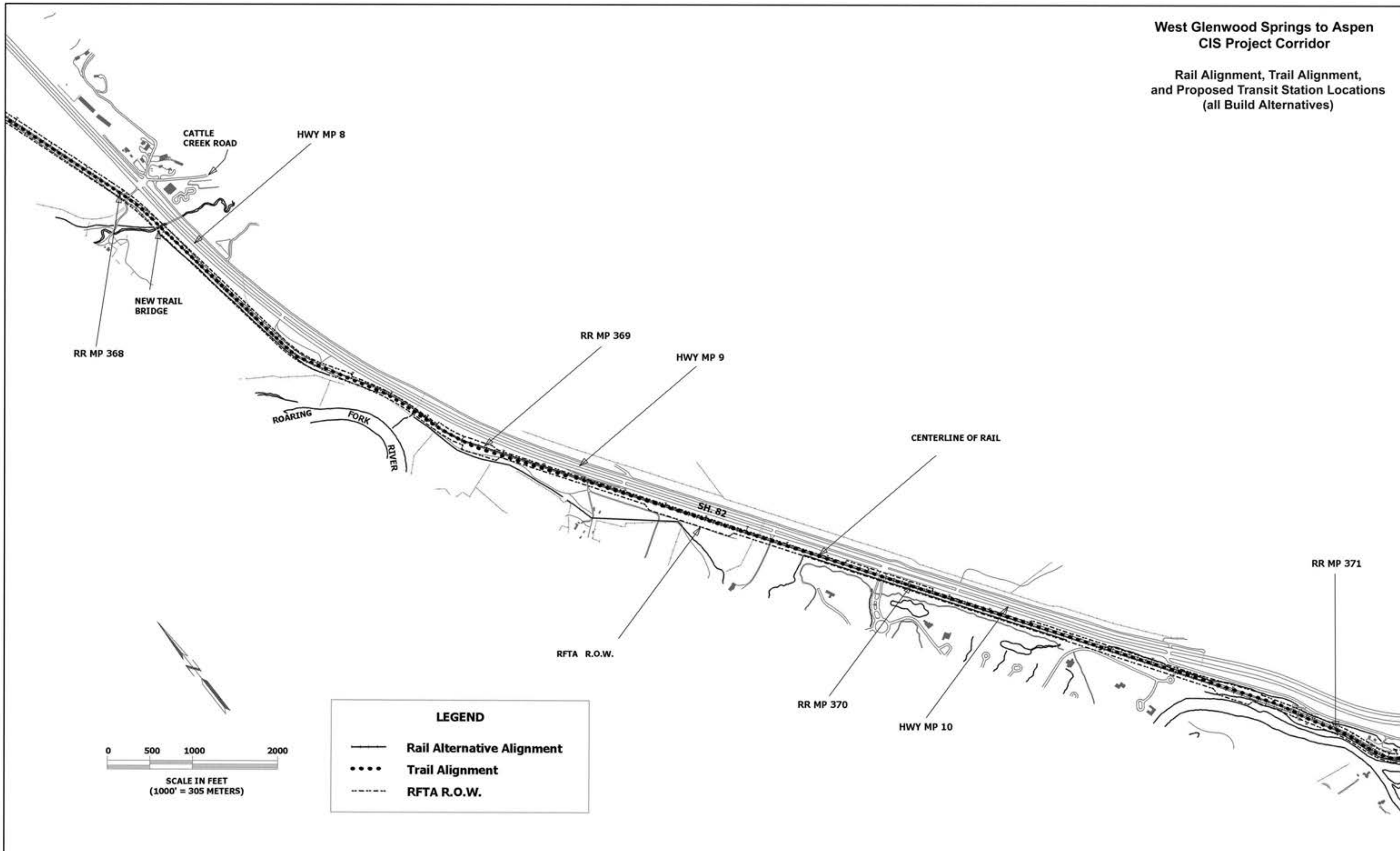
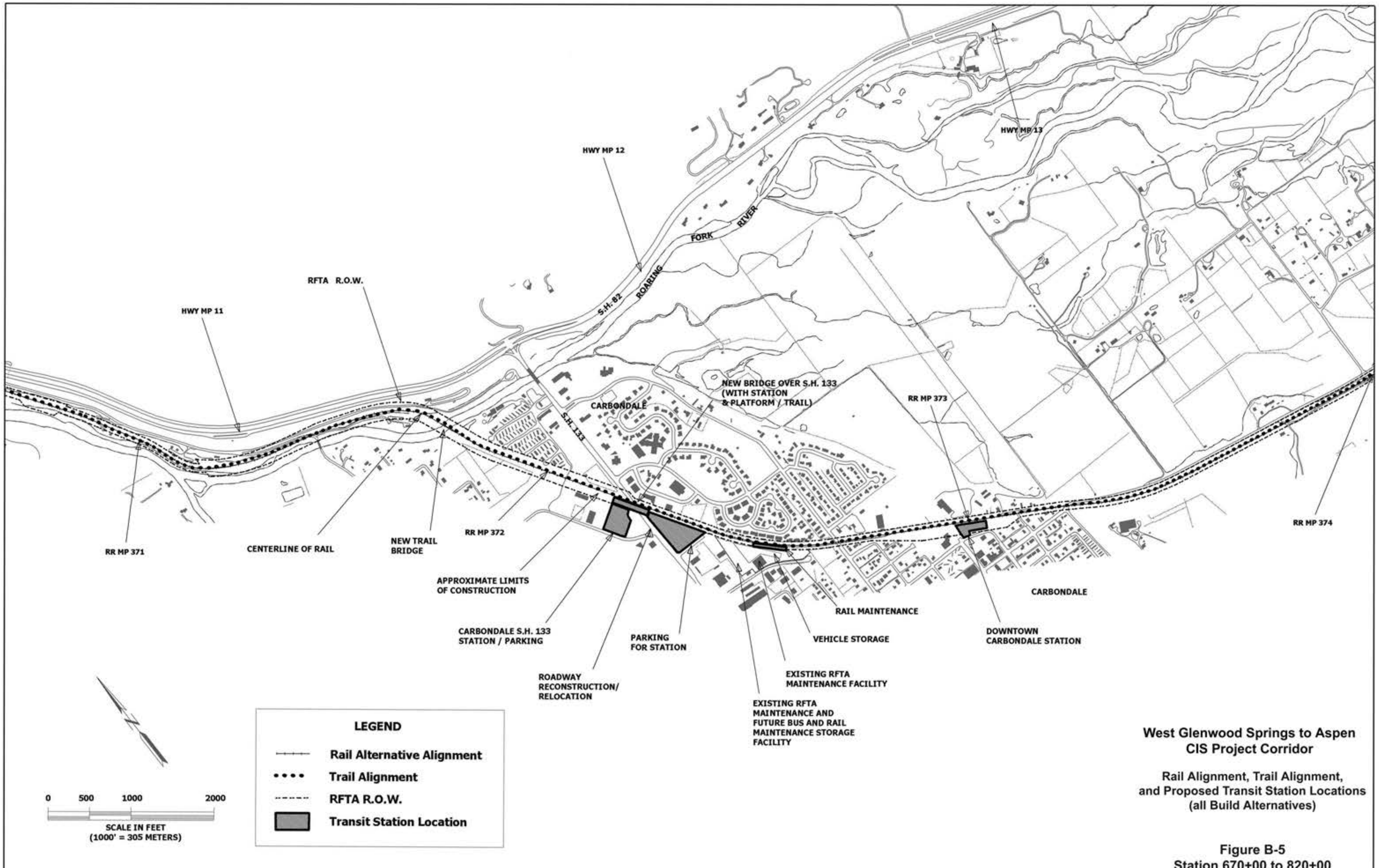


Figure B-4
Station 505+00 to 670+00



West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment, and Proposed Transit Station Locations (all Build Alternatives)

Figure B-5
Station 670+00 to 820+00

West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment,
and Proposed Transit Station Locations
(all Build Alternatives)

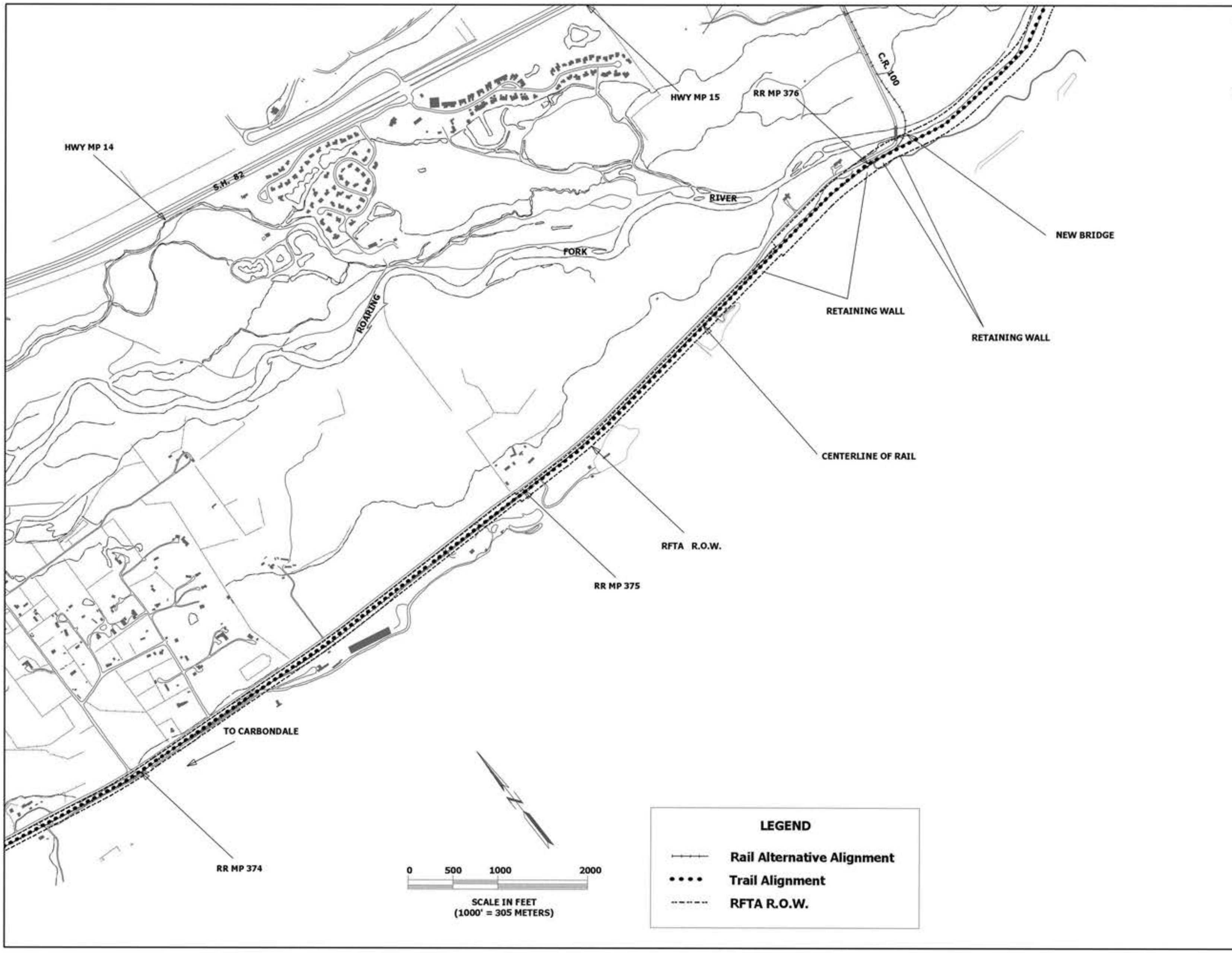
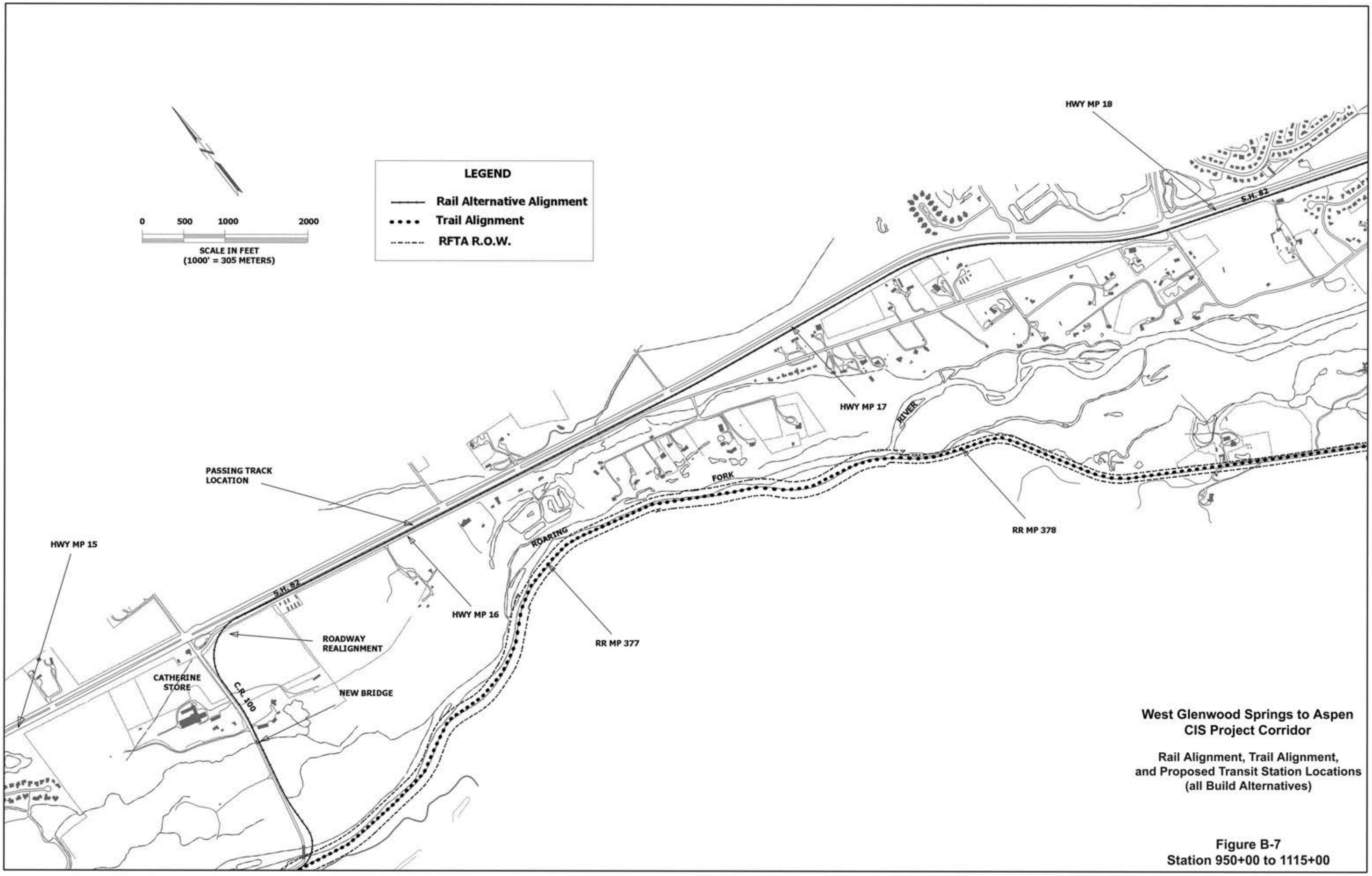


Figure B-6
Station 820+00 to 950+00



West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment,
and Proposed Transit Station Locations
(all Build Alternatives)

Figure B-7
Station 950+00 to 1115+00

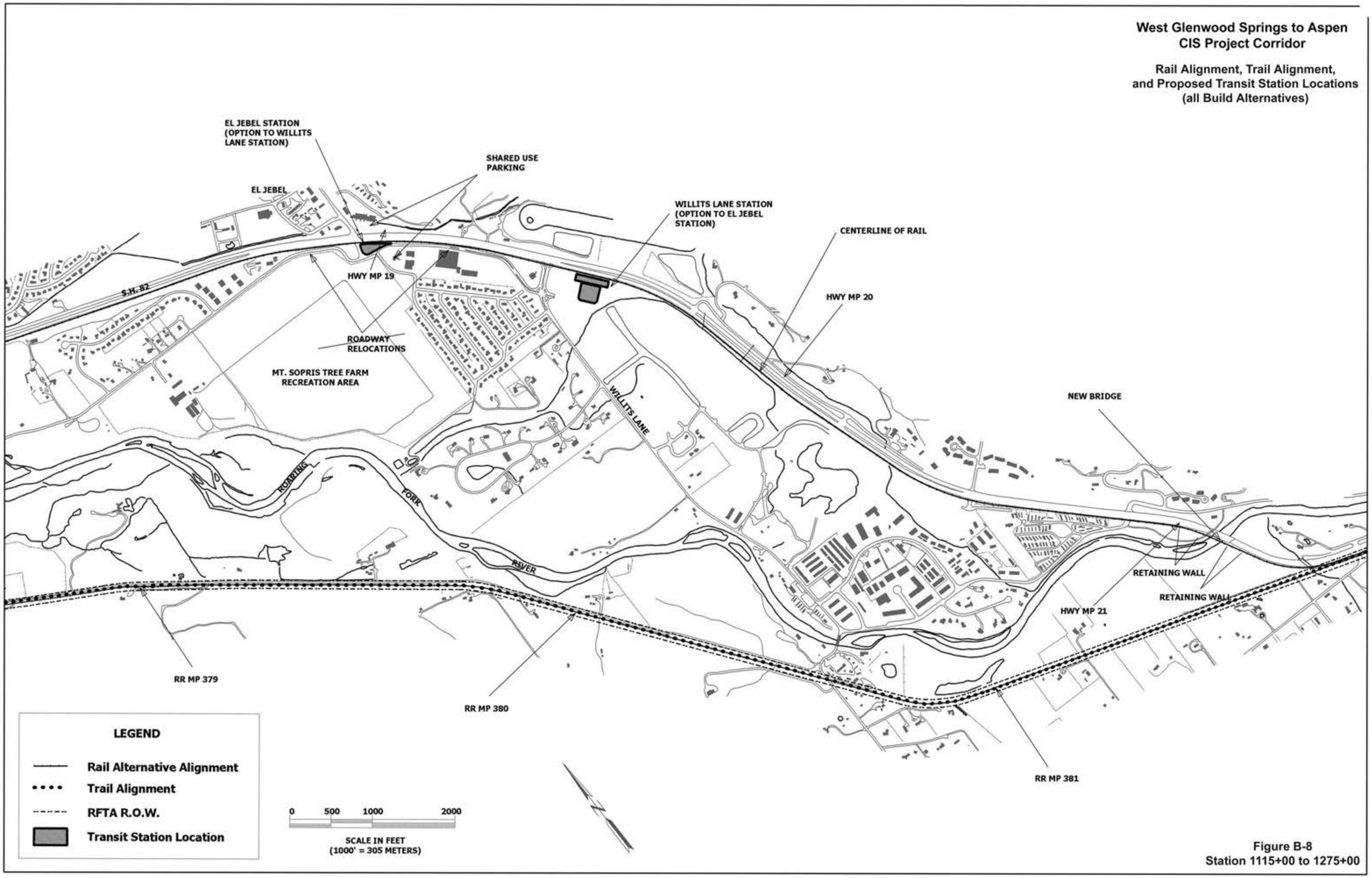
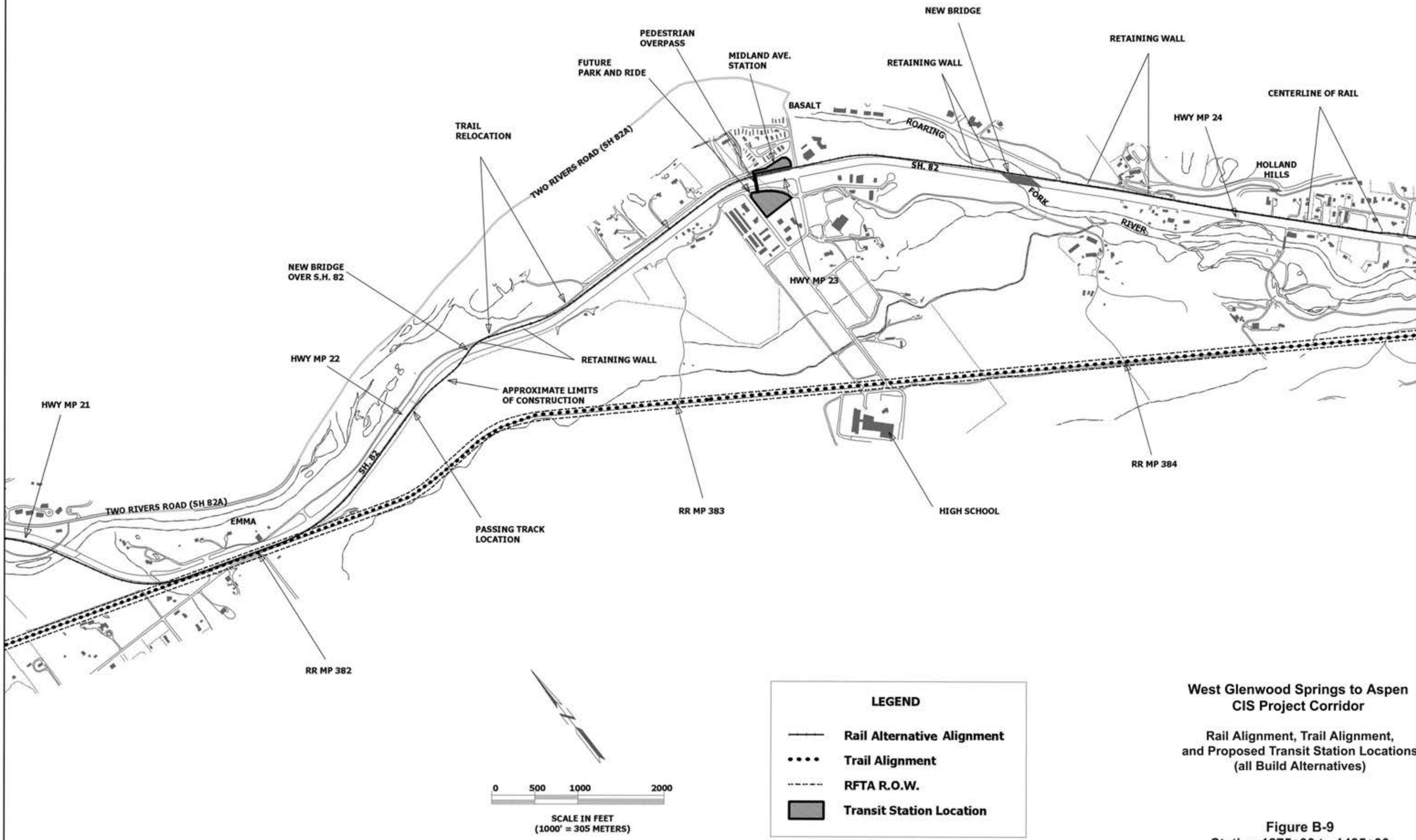


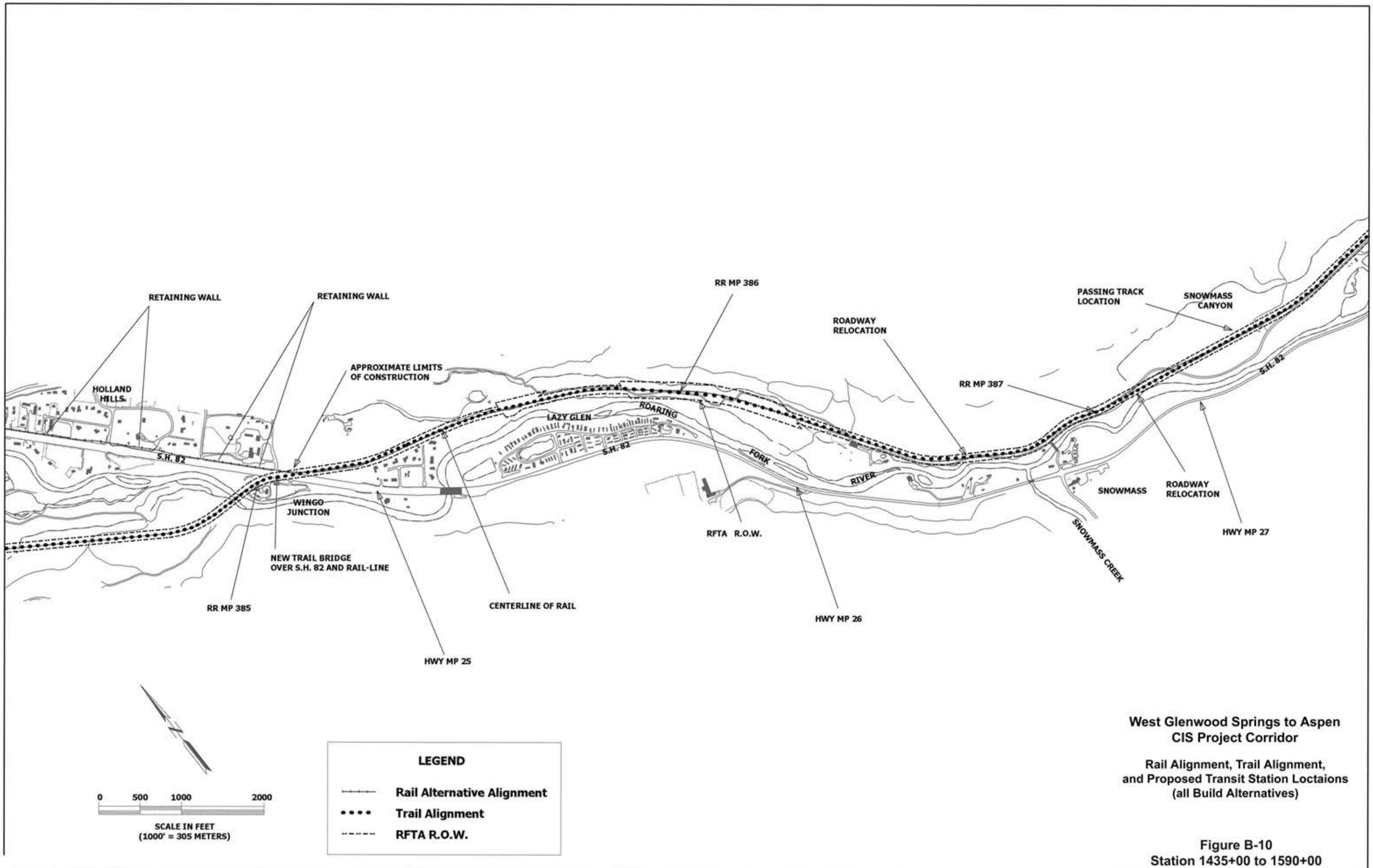
Figure B-8
Station 1115+00 to 1275+00



West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment, and Proposed Transit Station Locations (all Build Alternatives)

Figure B-9
Station 1275+00 to 1435+00



West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment, and Proposed Transit Station Loctaions (all Build Alternatives)

Figure B-10
Station 1435+00 to 1590+00

West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment, and Proposed Transit Station Locations (all Build Alternatives)

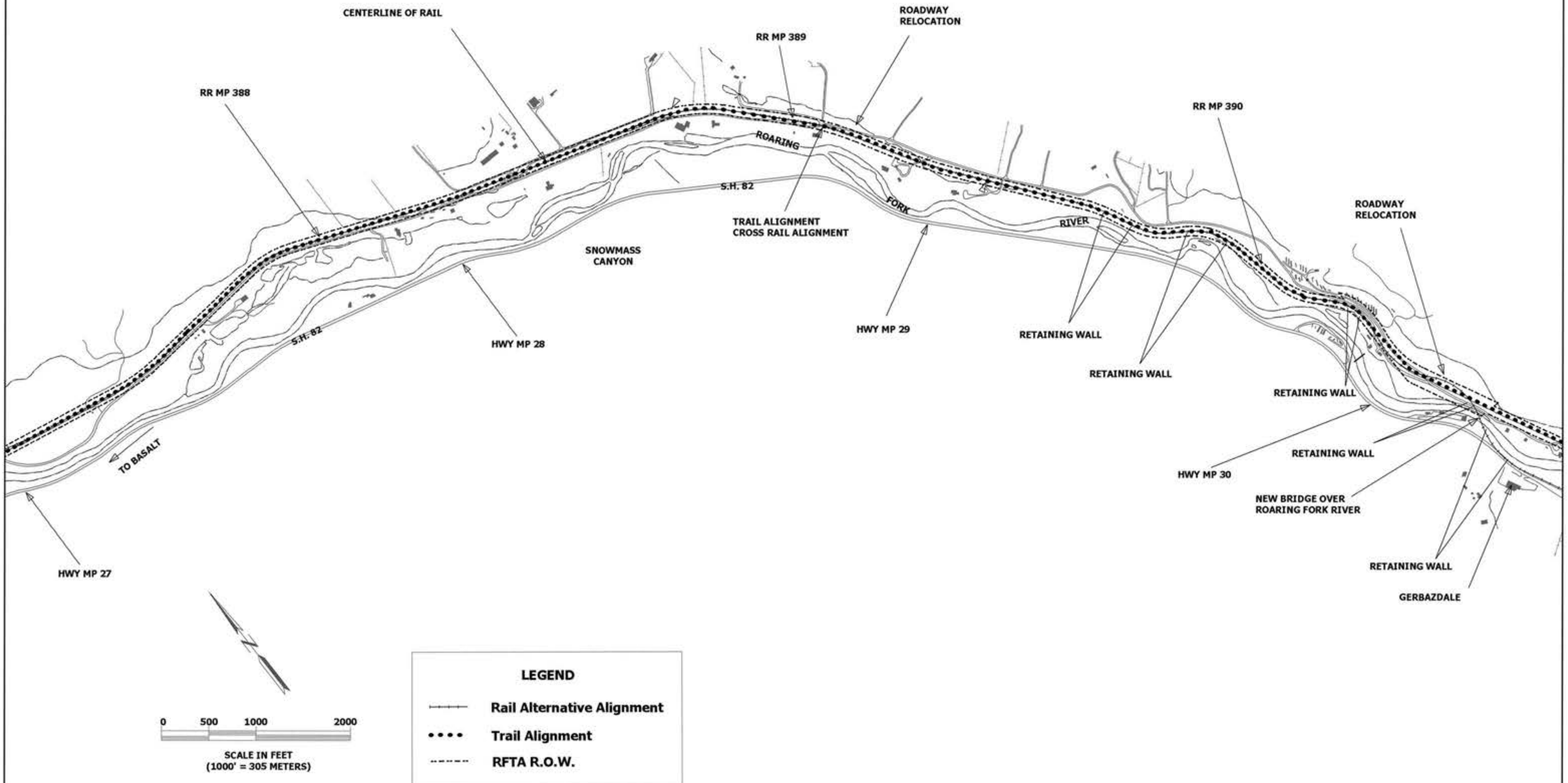


Figure B-11
Station 1590+00 to 1750+00

West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment, and Proposed Transit Station Locations (all Build Alternatives)

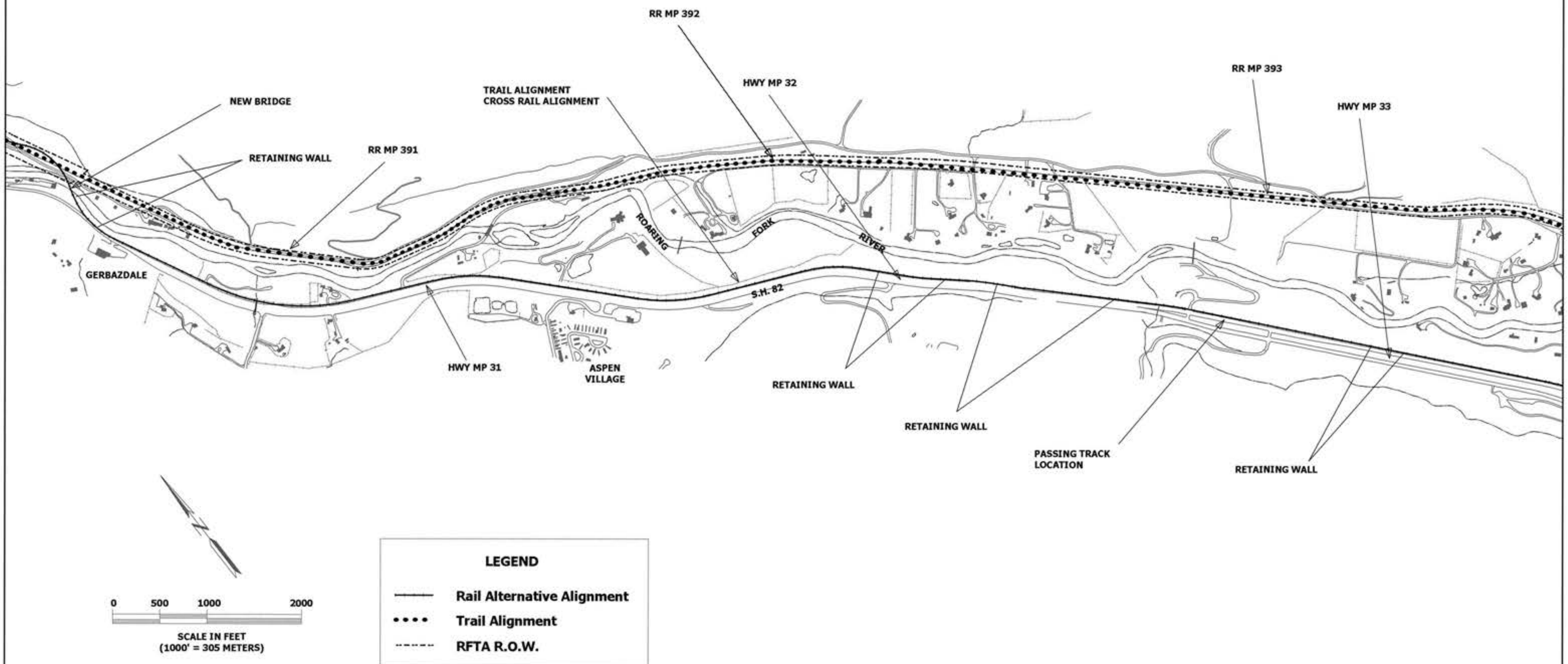


Figure B-12
Station 1750+00 to 1905+00

West Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment, and Proposed Transit Station Locations (all Build Alternatives)

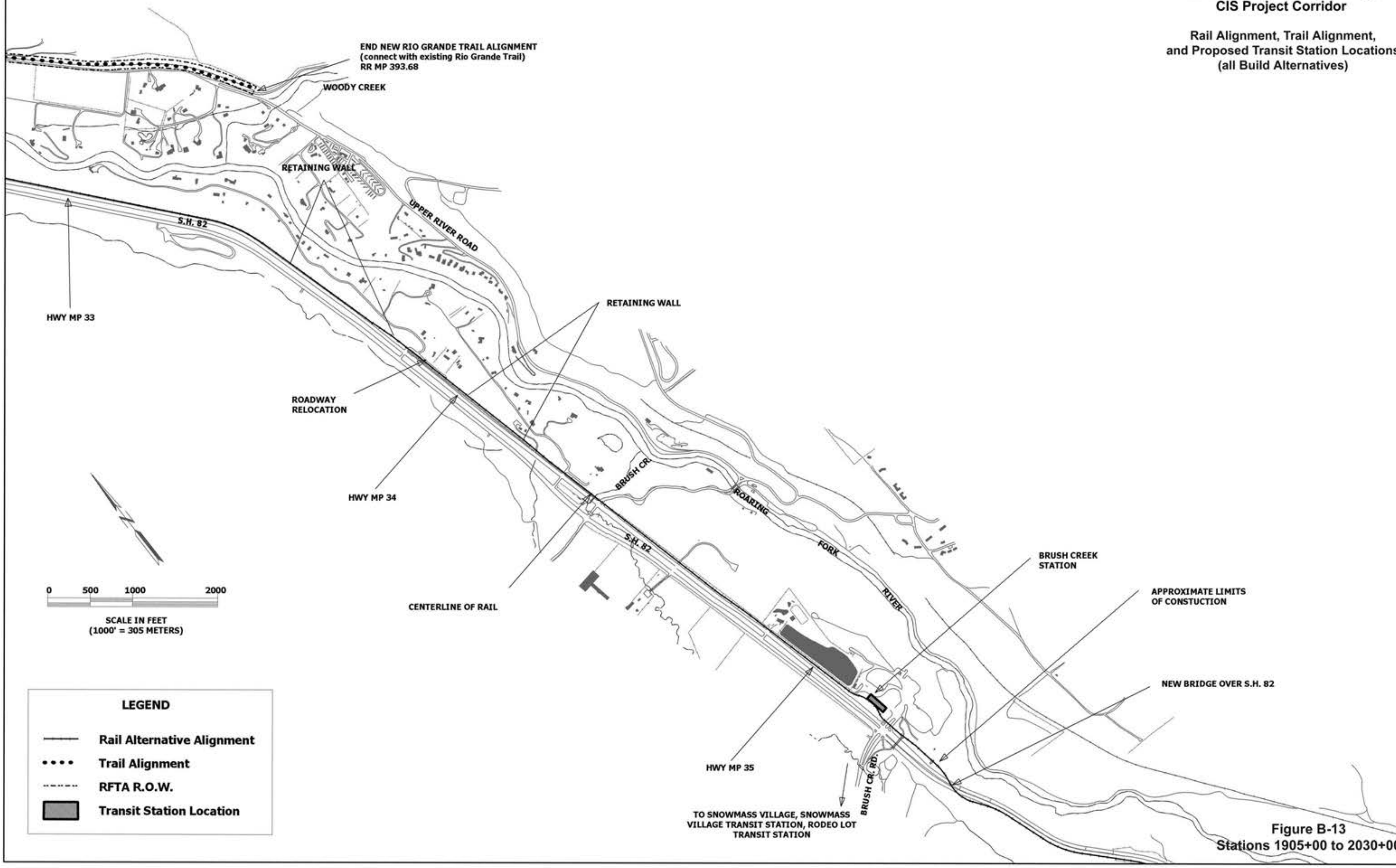


Figure B-13
Stations 1905+00 to 2030+00

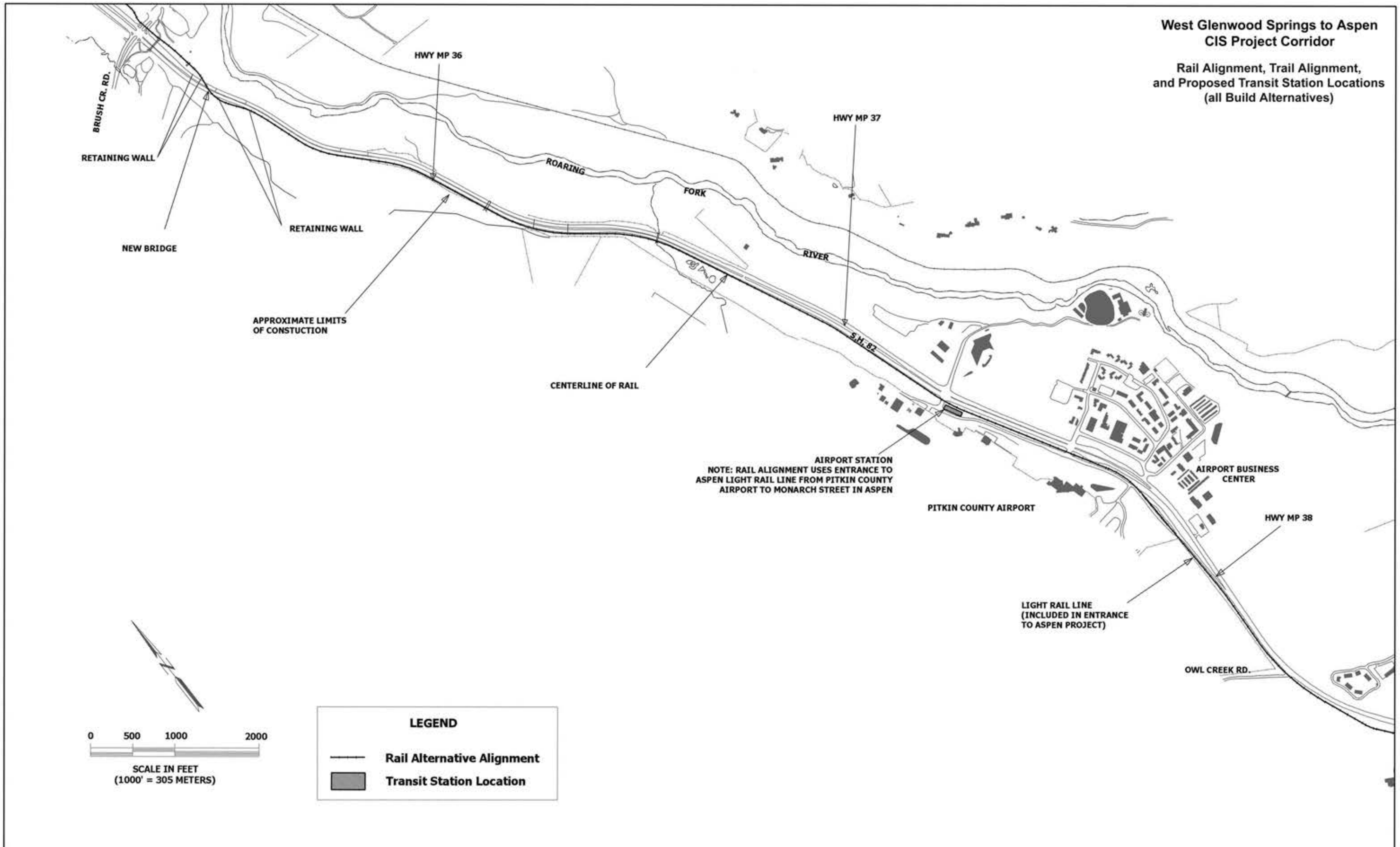
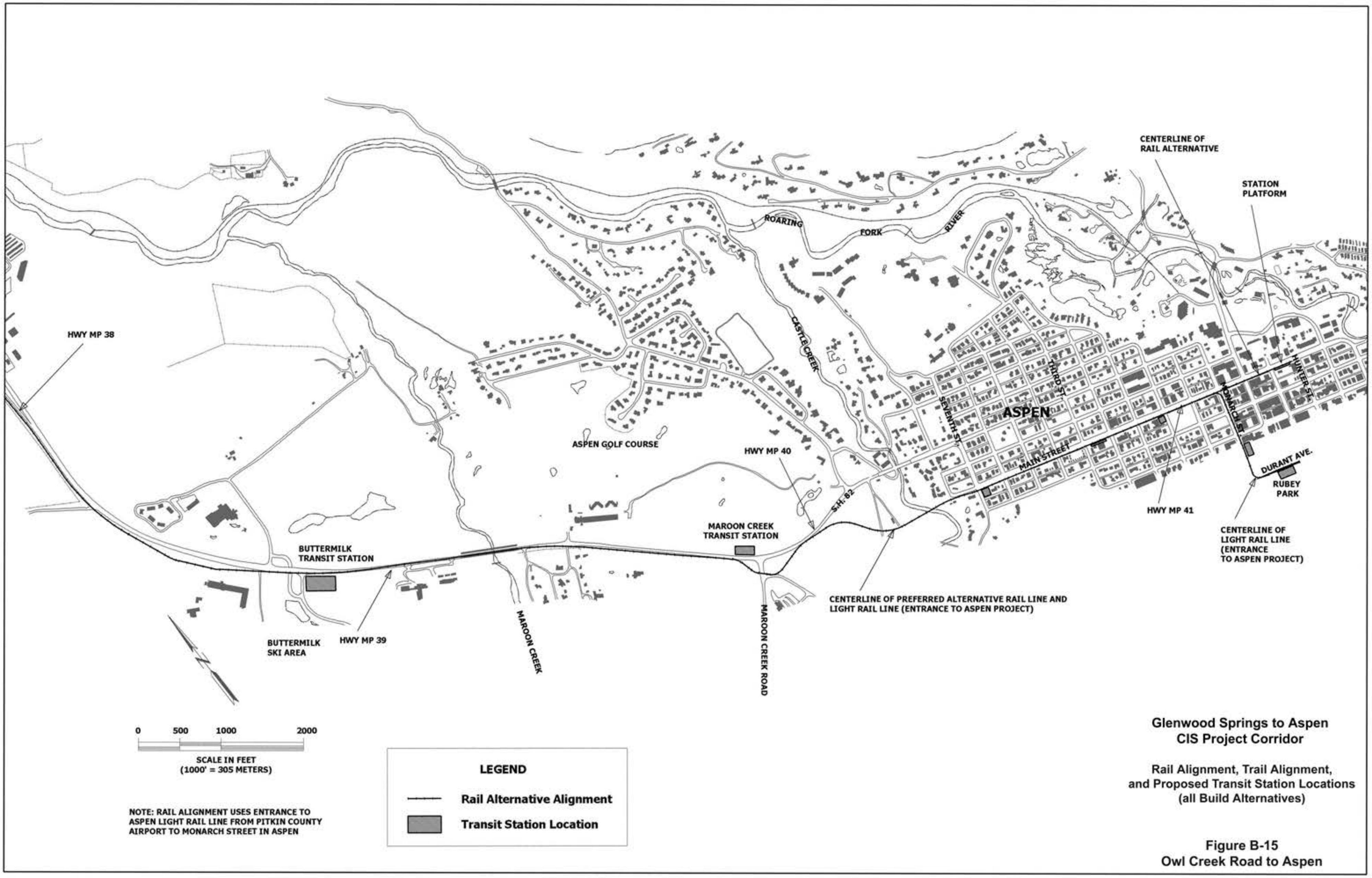


Figure B-14
Station 2030+00 to Owl Creek Road



Glenwood Springs to Aspen
CIS Project Corridor

Rail Alignment, Trail Alignment, and Proposed Transit Station Locations (all Build Alternatives)

Figure B-15
Owl Creek Road to Aspen

English-Metric Conversions

Length

inches	x	25.4	=	millimeters
inches	x	2.54	=	centimeters
feet	x	30.48	=	centimeters
feet	x	0.3048	=	meters
yards	x	0.9144	=	meters
miles	x	1.609344	=	kilometers

Area

square inches	x	6.4516	=	square centimeters
square feet	x	0.9290304	=	square meters
square yards	x	0.83612736	=	square meters
square miles	x	2.5899881	=	square kilometers
acres	x	0.404685644	=	hectares

(1 acre = 43,560 square feet)