Executive Summary

Draft Programmatic EIS Overview

This I-70 Mountain Corridor Draft Programmatic Environmental Impact Statement (PEIS) provides an independent and systematic process of developing and analyzing the need for – and the associated effects of – transportation capacity alternatives for the I-70 Mountain Corridor (Corridor). The primary purpose for conducting a Tier 1 analysis is to determine what mode(s) of transportation will operate in the Corridor from the fringes of the Denver metropolitan area to Glenwood Springs, the general alternative alignments, and the general nature of the infrastructure needed to accommodate the mode(s). This Tier 1 document evaluates a host of environmental and community effects of the alternatives under consideration.

Existing congestion along the I-70 Mountain Corridor impedes travel for Colorado residents, tourists, and businesses, as well as freight-related services and interstate traffic.

Travel demand in the Corridor is projected to increase by more than 10 million trips at EJMT over the next 25 years.

This Draft PEIS presents an evaluation of alternatives and a grouping of preferred alternatives. Public hearings will be held during a 90-day review period on the Draft PEIS. A Final PEIS will be prepared in response to comments on this Draft PEIS. A preferred alternative will be identified in the Final PEIS. Public hearings will be held during a 30-day review period on the Final PEIS. A Tier 1 Record of Decision (ROD) presenting the selected alternative will be prepared following the Final PEIS. Subsequent site-specific Tier 2 National Environmental Policy Act (NEPA) documents (such as categorical exclusions, environmental assessments, or environmental impact statements) would present more detailed design and environmental analysis for the selected alternative. See the inside cover or tab for a chart illustrating the steps to complete the PEIS.

The 144-mile corridor under study stretches across the central Rocky Mountains of Colorado along Interstate 70 from Glenwood Springs to C-470 near Golden, and is considered to be of statewide and national importance. Figure ES - 1 is a map of I-70 across the US with the Corridor highlighted.

Figure ES - 1. I-70 Across the US

In 1989, the Colorado Department of Transportation (CDOT) released the findings of a feasibility study that determined the need for capacity improvements in Clear Creek County, primarily in the areas of greatest congestion, Floyd Hill to the Twin Tunnels and to US 40. This study was to be followed up by the appropriate environmental study. Instead, a planning study covering the entire Mountain Corridor was initiated in 1996 – the I-70 Mountain Corridor Major Investment Study (MIS). The MIS was commissioned by CDOT to identify the short- and long-term mobility solutions within the Corridor. The MIS, completed in 1998, represented a starting point for developing alternatives for this PEIS, and resulted in a 50-year multimodal transportation "vision." The MIS vision included a desire to change Corridor visitors' travel behavior in a meaningful way with the introduction of transit. The MIS vision resulted in an integration of various transportation elements centered on a high-speed Fixed Guideway Transit (FGT) to serve the Corridor. While following the multimodal intent of the MIS vision for the Corridor, this PEIS provides an independent screening and analysis of alternatives and effects to be compliant with NEPA and other applicable federal laws. Also in compliance with NEPA, this PEIS determines the reasonableness of alternatives in terms of affordability, a factor not heavily considered in the MIS.

Preparation of the I-70 Mountain Corridor PEIS was initiated in 2000, in response to the recommendation of the MIS to evaluate broad policy implications, alternatives and their impacts, as well as cumulative impacts of future growth and travel demand projections associated with changing the transportation infrastructure. The descriptions and comparisons of alternatives presented in this document have resulted from public and agency involvement, committee and stakeholder participation, and from screening and alignment studies, travel demand modeling, technical and cost analyses, and environmental impact assessments and mitigation strategies.

Purpose and Need Summary

Interstate 70 is the only east-west interstate crossing Colorado and is the only continuous east-west highway in the study area. The Corridor serves as the lifeblood of east-west travel in Colorado, providing for the movement of people, goods, and services across the state. It is a major corridor for access to many of Colorado's recreation and tourism destinations. In addition, it is a link in the national interstate highway system, the principal purposes of which are to connect major metropolitan areas and industrial centers by direct routes, and to provide a dependable highway network to serve in national emergencies.

Existing transportation congestion along I-70 is degrading the accessibility of mountain travel for Colorado residents, tourists, and businesses. Congestion is impeding freight-related services and affecting the connectivity of intra- and interstate travel. Tight curves, steep grades, and outmoded interchanges and other safety issues present in various locations along the Corridor contribute to a degradation of mobility. Travel demand in the Corridor is projected to increase over the next 25 years and beyond. Congestion along I-70 is believed to be impeding economic growth in the Corridor communities, which is highly reliant on weekend tourism.

The need to relieve this congestion is especially acute for extended weekend travelers seeking access between the Denver metropolitan area and US 40 (to Grand County), as well as through the Eisenhower-Johnson Memorial Tunnels (EJMT) to the Western Slope. The need primarily results from the number of travelers bound for Corridor destinations from the Denver metropolitan area and from out of state. Motor carriers, which provide freight services necessary to serve mountain residents, businesses, and visitors, as well as interstate commerce, also add to the I-70 traffic.

Regulatory Background

- The PEIS is being prepared at a Tier 1 level under the National Environmental Policy Act (NEPA), and the NEPA regulations issued by the Council on Environmental Quality (CEQ) regulations (40 CFR parts 1500-1508), and FHWA regulations (23 CFR Part 771). As a Tier 1 document, this draft programmatic EIS was prepared in compliance with CEQ regulations at 40 CFR 1501.7, and as authorized by 40 CFR 1502.20 and 23 CFR 771.111(g). The purpose for conducting an environmental impact statement at a programmatic or Tier 1 level is to take a broad, comprehensive view of the transportation issues and the potential alternatives, along with their associated impacts and mitigation strategies.
- The Federal Highway Administration (FHWA), in cooperation with CDOT, issued a Notice of Intent to prepare this Tier 1 programmatic EIS on January 13, 2000.
- Federal cooperating agencies include the Federal Transit Administration, Federal Railroad Administration, Federal Aviation Administration, Motor Carriers Safety Administration, Army Corps of Engineers, US Fish and Wildlife Service, US Forest Service, and Bureau of Land Management. The Environmental Protection Agency has been participating as a member of the PEIS Federal Interdisciplinary Team, and other state and federal agencies have participated as noted in Chapter 6, Public and Agency Involvement.
- A broad public outreach program has included more than 250 meetings involving the public, agencies, and I-70 committees.
- Other federal regulations, such as Section 106 of the National Historic Preservation Act, Section 404(b)(1) of the Clean Water Act, and Section 7 of the Endangered Species Act, have been followed as they apply to Tier 1 studies.

Weekday commuting traffic into and within the western portions of the Corridor is also becoming congested, particularly in previously more rural Eagle County. In contrast, the portion through Jefferson County is within the greater metropolitan Denver area, where congestion is an acknowledged circumstance.

The underlying **need** represents the transportation challenges of the Corridor:

- Increased capacity
- Improved accessibility and mobility
- Decreased congestion

The overall **purpose** of the proposed action will be to determine the future capacity, mode choice(s), and general location(s) for the future travel demand of the I-70 Mountain Corridor, in a manner that addresses the underlying need, while providing for and accommodating:

- Environmental sensitivity
- Respect for community values
- Improvements to Corridor safety conditions, such as tight curves and lane drops
- Ability to implement – technical feasibility and affordability in terms of capital costs, maintenance and operational costs, user costs, and environmental mitigation costs

These purposes will be considered in the identification of a preferred alternative.

Alternatives that meet the need would accommodate the projected 2025 travel demand for the Corridor and could also address the continued growth beyond 2025. Before the preferred alternative is identified for the Final PEIS, a decision will be made as to whether to plan for accommodating transportation needs projected for 2025 or beyond 2025 (50-year vision).

This determination will involve weighing the tradeoffs among the various alternatives and reviewing public comments on the Draft PEIS. CDOT and FHWA will consider these comments, evaluate new information as appropriate, and meet with the federal cooperating agencies and other key stakeholders to weigh the pros and cons of the various alternatives. The outcome of this process and the identification of a preferred alternative will influence the 50-year vision of this Corridor.

Grouping of Preferred Alternatives

Figure ES - 2 illustrates the I-70 Mountain Corridor PEIS study process and alternatives. This figure includes a map of the termini of alternatives, the alternative screening and evaluation process, a list of the alternatives that have been fully analyzed in the PEIS, and the criteria and listing of the preferred group of alternatives. In addition to the No Action alternative, the 20 action alternatives listed on Figure ES - 2 have been fully analyzed in the PEIS.

For additional information related to grouping of alternatives, see:
- Section 2.3 – Comparison of Alternatives (for comparison of costs and ability to meet travel demand)
- Section 2.4 – Grouping of Alternatives
- Chapter 5 – Financial Considerations

The rationale for grouping the alternatives is provided in the box below. Environmental criteria were a key component of developing, screening, and refining alternative footprints and alignments to minimize or avoid impacts on environmental and community resources. Direct and indirect environmental impacts of alternatives are disclosed in Chapter 3, and Cumulative Impacts are disclosed in Chapter 4.

A group of **preferred alternatives** has been identified in the Draft PEIS on the following basis:
- CEQ requires that "An agency must disclose preferred alternative or alternatives in the draft environmental document if known."
- There has been support for learning sooner in the PEIS process rather than later which alternatives seem most viable.
- Grouping alternatives during the Draft PEIS process will allow an earlier and more focused discussion on how to shape I-70 transportation system for the future.
- The group of preferred alternatives will be narrowed to a preferred alternative for selection in the Final PEIS.

Preferred alternatives are defined as:
- Those that best meet the underlying need and are reasonable from an economic affordability point of view.

Other alternatives would include:
- Those that do not meet the underlying need as well
- Those that may not be reasonable due to technical and/or economical infeasibility.

Important Next Steps:
- For the Final PEIS, alternatives determined not to be preferred in the Draft PEIS could move into the preferred category with new information or may be modified.
- The group of preferred alternatives will be narrowed to the identification of a preferred alternative in the Final PEIS and the selection of a preferred alternative in the Record of Decision (ROD).

Due to the commitments made to the public, both those alternatives found to be reasonable and those found to be unreasonable have been fully evaluated in this PEIS for full disclosure of the tradeoffs among all 20 alternatives (plus No Action). Therefore, the reasonable and unreasonable alternatives have been separated into two groups: a "preferred" group and an "other" group. Alternatives identified as "preferred" are those that best meet the underlying need – the ability of an alternative to meet a minimum of the 2025 Baseline travel demand projections – and that are reasonable from an economic affordability point of view – having a capital cost of less than $4 billion.

The reason for focusing on "reasonable alternatives" for grouping is due to regulations set forth by the Council on Environmental Quality (CEQ) in its guidelines implementing NEPA. NEPA requires that "reasonable alternatives" are to be fully evaluated in the NEPA document. As part of CEQ's oversight of NEPA, CEQ wrote: "In determining the scope of alternatives to be considered, the emphasis is on what is 'reasonable' rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint, and using common sense, rather than simply desirable from the standpoint of the applicant." (See *Forty Most Asked Questions Concerning CEQ's NEPA Regulations,* March 23, 1981).

The consideration of the environmental sensitivity and community values purposes have shaped many of the alternatives evaluated. See Chapter 3 for discussions of how this has occurred for each resource. Preliminary findings of the environmental and community value impacts were disclosed to the Corridor stakeholders during September and November 2003, when the discussion involving the grouping of preferred alternatives occurred. This information was disclosed so that the CDOT and FHWA decision makers would be fully informed about the public concerns (as represented by the Advisory Committee members and the federal interdisciplinary team), issues, and consequences of the alternatives considered, before deciding which alternatives would be in the "preferred" group and which would be in the "other" (not preferred) group.

The affordability criterion was based on the likelihood of funding availability, as follows:
- **Committed funds.** The Transportation Commission has committed approximately $1.6 billion of the Strategic Corridor Investment Program to the I-70 Mountain Corridor. This amount represents the funding that may be available over the next 20 years.
- **Uncommitted funds.** Additional funds necessary for implementation of all but the Minimal Action alternative remain uncommitted. A $4 billion amount has been set as a cost threshold for evaluating alternatives in terms of "reasonableness" from an economic affordability point of view. This threshold was set in order to not preclude alternatives that may be affordable if funding sources greater than the $1.6 billion were to be secured.

Alternatives determined not to be preferred in the Draft PEIS could move into the preferred category with new information or may be modified for the Final PEIS.

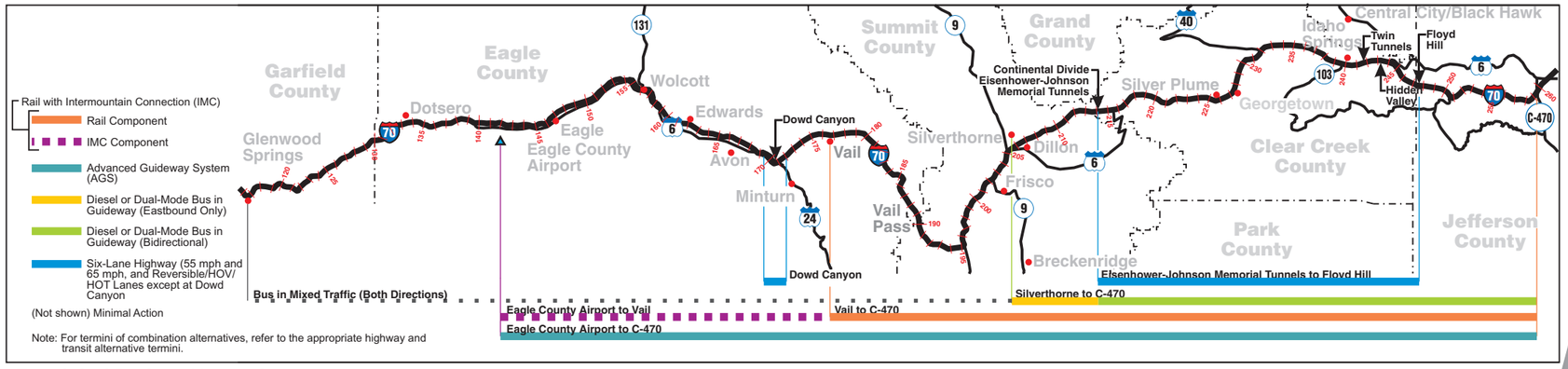
When the PEIS was initiated, CDOT and FHWA made a commitment that the PEIS would fully evaluate, at a Tier 1 level of detail, alternatives in the following categories: Minimal Action, Transit (Bus, Advanced Guideway System, and Rail), and Highway (in addition to No Action). This commitment was made so that the tradeoffs among these alternatives would be fully explored, despite concerns over very high costs or technical infeasibility. Having made this commitment meant that some alternatives might be fully evaluated even though they did not meet the definition of "reasonableness." This did, indeed, happen with the alternatives that had a very high capital cost and those that would not meet future Baseline travel demands. Therefore, CDOT and FHWA have the responsibility to inform the public which alternatives are reasonable.

The proposed group of preferred alternatives was announced before this Draft PEIS was published, in keeping with the proactive public involvement approach taken during this process. The Mountain Corridor Advisory and Technical Committees (MCAC/TAC) and the federal interdisciplinary team participated through the review of comparative cost, travel demand, and environmental and community values impact data developed for the alternatives and in subsequent discussions about their views of what would meet the need and constitute a "reasonable" and "affordable" alternative.

To assist in the identification of the group of preferred alternatives, the MCAC/TAC and federal interdisciplinary team participated in the following activities:
- A number of meetings and workshops were held to discuss the concept of preferred alternatives, as well as the costs, mobility impacts, and environmental and community values impacts.
- A 100-page report, *I-70 PEIS Summary of Preliminary Findings* (September 2003), was provided to all MCAC/TAC and federal interdisciplinary team members for review. This report contained preliminary comparative cost, mobility, and community values and environmental data, as well as mitigation strategies, and formed the foundation for this Draft PEIS.
- A Listening Forum and a followup federal interdisciplinary team meeting were held with key stakeholders and CDOT and FHWA's decision-makers. This allowed the decision-makers to gain the perspectives of these stakeholders regarding the alternatives under consideration.
- In addition, newsletters were mailed to more than 10,000 stakeholders to inform them of the grouping decision to be part of the Draft PEIS. The project website was also updated with this information.

The following is a list of the alternatives, grouped as to whether they are **preferred** or **not preferred.**

Preferred Group of Alternatives	Other (Not Preferred) Group of Alternatives
Transit Alternatives	Minimal Action (as a stand-alone alternative)
Dual-Mode Bus in Guideway	**Transit Alternatives**
Diesel Bus in Guideway	Rail with IMC
Highway Alternatives	AGS
Six-Lane Highway 55 mph	**Combination Alternatives (Build Simultaneously)**
Six-Lane Highway 65 mph	Six-Lane Highway with Rail and IMC
Reversible/HOV/HOT Lanes	Six-Lane Highway with AGS
Preservation Alternatives	Six-Lane Highway with Dual-Mode Bus in Guideway
Build Six-Lane Highway and Preserve for Rail with IMC	Six-Lane Highway with Diesel Bus in Guideway
Build Six-Lane Highway and Preserve for AGS	**Preservation Alternatives**
Build Six-Lane Highway and Preserve for Dual-Mode Bus in Guideway	Build Rail with IMC and Preserve for Highway
Build Six-Lane Highway and Preserve for Diesel Bus in Guideway	Build AGS and Preserve for Highway
	Build Dual-Mode Bus in Guideway and Preserve for Highway
	Build Diesel Bus in Guideway and Preserve for Highway



Termini of Project Alternatives

Alternatives Screening and Evaluation Process

PUBLIC AND AGENCY INVOLVEMENT PROGRAM

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LEVEL 1 SCREENING - PROJECT NEED

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LEVEL 2 SCREENING

- Capacity
- Accessibility
- Mobility
- Implementation
- Safety
- Environmental Sensitivity
- Community Values

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LEVEL 3 SCREENING

- Travel Demand
- Alignments
- Community and Environmental Impacts

Alternatives Remaining After Screening (Fully Analyzed in PEIS)

NO ACTION - (Retained per NEPA Requirement)

MINIMAL ACTION COMPONENTS
- Transportation Management
- Interchange Modifications
- Auxiliary Lanes
- Curve Safety Modifications (Curve Smoothing)

Combined with Transit, Highway and Combination alternatives as appropriate.

TRANSIT
- Rail with Intermountain Connection (IMC)
- Advanced Guideway System (AGS)
- Dual-Mode Bus in Guideway
- Diesel Bus in Guideway

HIGHWAY
- Six-Lane Highway 55 mph
- Six-Lane Highway 65 mph
- Reversible and HOV/HOT Lanes

COMBINATION OF HIGHWAY AND TRANSIT
- Six-Lane Highway with Rail and IMC (build simultaneously)
  - Build rail / preserve for highway
  - Build highway / preserve for rail
- Six-Lane Highway with AGS (build simultaneously)
  - Build AGS / preserve for highway
  - Build highway / preserve for AGS
- Six-Lane Highway with Dual-Mode Bus in Guideway (build simultaneously)
  - Build dual-mode bus / preserve for highway
  - Build highway / preserve for dual-mode bus
- Six-Lane Highway with Diesel Bus in Guideway (build simultaneously)
  - Build diesel bus / preserve for highway
  - Build highway / preserve for diesel bus

Preferred Group of Alternatives (Based on Project Need and Affordability)

NO ACTION - (Retained per NEPA Requirement)

TRANSIT
- Dual-Mode Bus in Guideway
- Diesel Bus in Guideway

HIGHWAY
- Six-Lane Highway 55 mph
- Six-Lane Highway 65 mph
- Reversible and HOV/HOT Lanes

COMBINATION OF HIGHWAY AND TRANSIT
- Build highway / preserve for rail
- Build highway / preserve for AGS
- Build highway / preserve for dual-mode bus
- Build highway / preserve for diesel bus

Key Criteria in the Grouping of Alternatives (Project Need and Affordability)

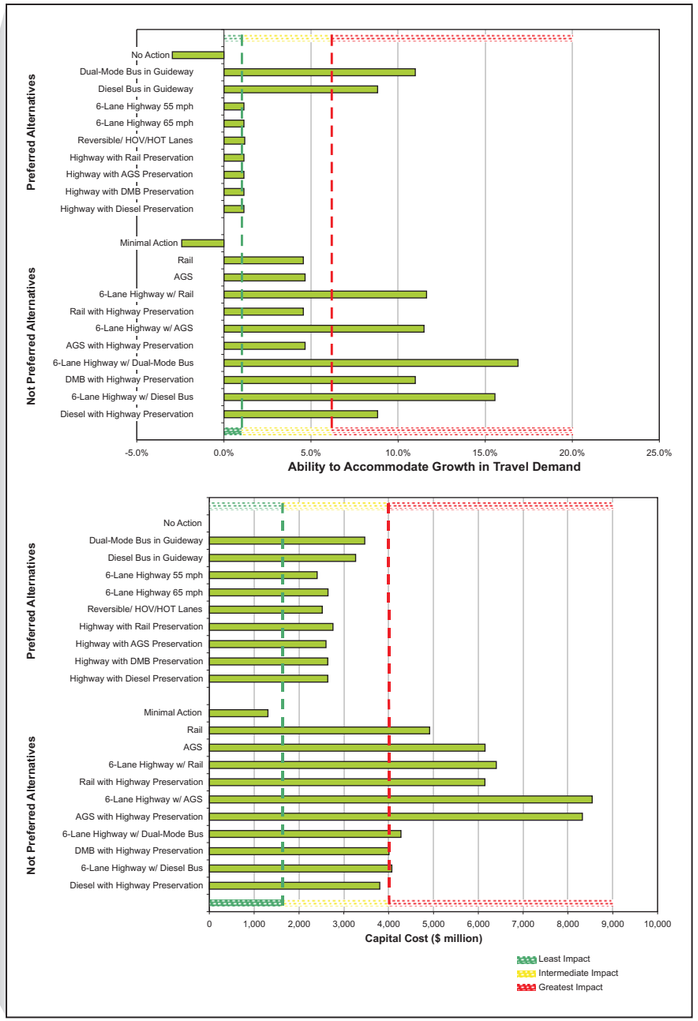


Figure ES-2. Study Process and Alternatives

Travel Demand

Forecasts for 2025 traffic in the I-70 Corridor were developed through the I-70 PEIS travel demand model. The model predicted the travel demand for 2025, which is called the **Baseline.** Trip purposes were established to assign volumes of travel and determine future demand based on the reasons that people travel in the Corridor. Travel demand is described for trip purposes on representative model days, showing the contrast between 2000 and 2025 person trip distribution.

Trip Purposes and Representative Model Days

The **trip purposes** displayed on these charts include:

- **Truck and Recreational Vehicle (RV) External** trips – person trips made by trucks, RVs, and other heavy vehicles, plus automobiles from external locations (for example, from the Front Range or out of state)
- **Stay Over and Colorado Non-Work** trips – longer distance and overnight person trips, both by Coloradoans and by out-of-state visitors traveling to Colorado via Denver International Airport. These travelers may stay overnight at a resort or hotel, a second home in the Corridor, or the home of a friend or relative. This purpose includes overnight stays in the Corridor and person trips to the Denver Front Range made by Corridor residents
- **Day Recreation** trips – day person trips by Front Range residents traveling to and from the Corridor for recreational purposes, and day recreation by Corridor residents
- **Gaming** trips – person trips destined for gambling locations in Central City or Black Hawk
- **Local Non-Work** trips – person trips that include shopping, medical and social person trips, as well as the "Non-Home-Based" person trips found in urban travel demand models
- **Work** trips – person trips to or from the Corridor, the Roaring Fork Valley, or the Denver metropolitan area for the purpose of employment

Three **representative model days** were selected to represent weekday and peak weekend travel patterns. **Summer Thursday westbound** travel was selected to represent weekday travel. **Winter Saturday westbound** and **summer Sunday Eastbound** travel patterns were selected because they represent peak weekend travel conditions.

Bar charts showing the number of person trips, by purpose, for six trip purposes are shown on Chart ES - 1 through Chart ES - 3. The changes in trip purpose and volume are described in percentages of **person trips.** A person trip is a trip by one person in any mode of transportation. If more than one person is on the trip, each person is considered to be making one person trip. For example, four persons traveling together in one auto account for four person trips.

The number of trips by purpose and the 2025 Baseline forecast are presented in Chart ES - 1 for westbound winter Saturday, Chart ES - 2 for eastbound summer Sunday, and Chart ES - 3 for westbound summer Thursday. Each of these charts shows the distribution of trips at focal points within 10 study segments (described in Chapter 1, Purpose of and Need for Action) throughout the Corridor.

Changes from 2000 and 2025 Baseline

An overall growth in person trips is expected from 2000 to 2025, as illustrated in Table ES - 1.

Table ES - 1. Projected Growth in Annual Person Trips at 10 Locations Within the Corridor (in Thousands)

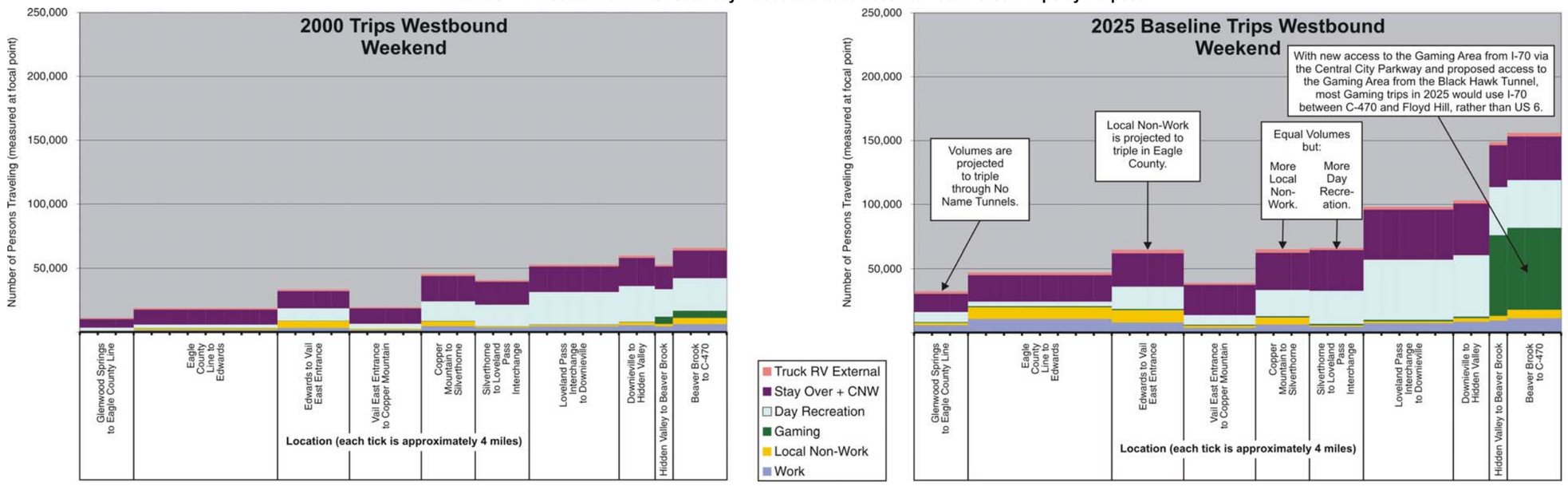
Year	No Name Tunnels	East of Eagle	Dowd Canyon	Vail Pass	West of Silverthorne	EJMT	East of Empire Junction	Twin Tunnels	Top of Floyd Hill	Genesee
2000	10,600	13,200	20,700	12,000	22,200	18,500	22,500	25,700	24,600	35,700
2025	16,000	29,900	37,000	21,800	33,200	30,600	36,900	39,600	61,700	71,600

Winter Saturday Westbound Travel – 2000 and 2025 Baseline

Baseline 2025 winter Saturday travel patterns generally are projected to include a doubling of the 2000 trips. Corridor-wide travel is dominated by **Stay Over and Colorado Non-Work,** with **Day Recreation** and **Gaming** accounting for the major trip purposes in some segments. The following observations can be made about the distribution of trip purposes for the 2025 Baseline westbound on winter Saturdays:

- The greatest percentage gain in person trips would be in the segment from Beaver Brook to C-470, with the introduction of **Gaming** person trips.
- The next greatest gain in person trips would occur between Hidden Valley and the Eisenhower-Johnson Memorial Tunnels (EJMT), with near equal shares of **Day Recreation** and **Stay Over and Colorado Non-Work** person trips.
- **Local Non-Work** and **Work** person trips are projected to make up a far greater percentage of Eagle County trips on 2025 winter Saturdays than in 2000 (triple in some locations) due to projected population and employment growth.
- By 2025, total person trips between Copper Mountain and Silverthorne are projected to be approximately equal to those between Silverthorne and Loveland Pass interchange. However, most trips between Silverthorne and Loveland Pass interchange will be for **Day Recreation** and **Stay Over and Colorado Non-Work,** and fewer will be for **Local Non-Work.**

Chart ES - 1. Westbound Winter Saturday – 2000 and 2025 Baseline Total Person Trips by Purpose

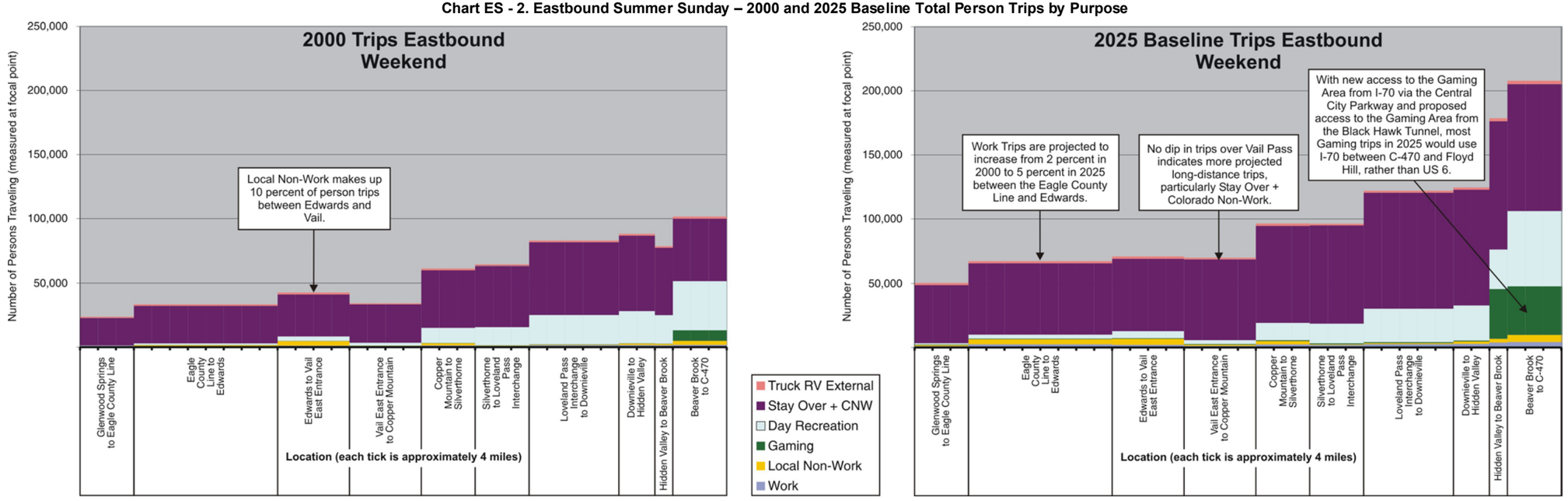


Summer Sunday Eastbound Travel – 2000 and 2025 Baseline

Generally, 2025 Baseline summer Sunday volumes are projected to exceed those of 2025 winter Saturday at almost all focal points.

- **Day Recreation** and **Stay Over and Colorado Non-Work** travel is projected to dominate throughout the Corridor, primarily due to travelers staying overnight and returning to the Denver metropolitan area on Sunday.
- **Local Non-Work** and **Work** trips are projected to make up a greater percentage of Eagle County person trips (especially in the Eagle County Line to Edwards segment) on 2025 summer Sundays than in 2000 due to projected population and employment growth.
- Whereas travel peaks between Edwards and Vail East Entrance in 2000, travel by 2025 is projected to be fairly constant for a greater distance for all of Eagle County.

Chart ES - 2. Eastbound Summer Sunday – 2000 and 2025 Baseline Total Person Trips by Purpose

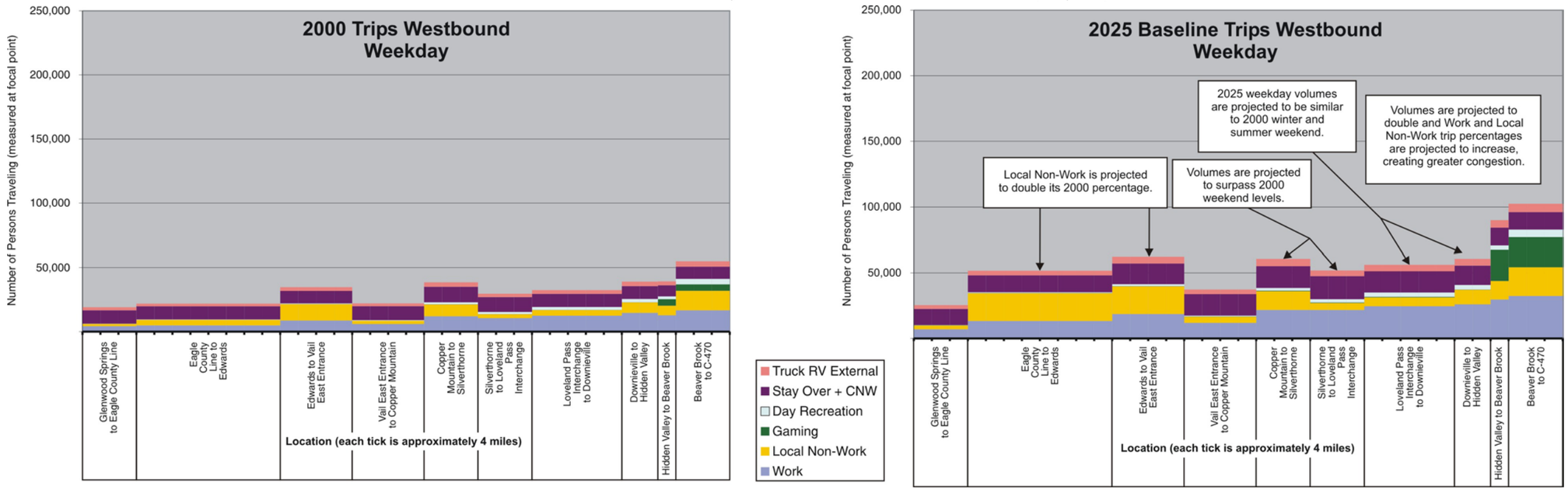


Summer Thursday Westbound Travel – 2000 and 2025 Baseline

While the percentages of each trip purpose are projected to remain the same between 2000 and 2025, person trip volumes are projected to double from 2000 to 2025 on summer Thursdays, mirroring or exceeding 2000 *weekend* peak travel conditions. The following observations can be made about the distribution of trip purposes for the 2025 Baseline on summer Thursdays:

- Projected summer Thursday travel conditions reflect the dominance of **Work** and **Local Non-Work** trips.
- Person trips on weekdays in 2025 are projected to be more than double the 2000 volumes for winter *weekends* between the Eagle County Line and Edwards. Vehicle trip growth would be even greater, because weekday trips are more likely to be lower-occupancy **Work** and **Local Non-Work** person trips, due to projected population and employment growth.
- Weekday **Stay Over and Colorado Non-Work** trips are projected to increase shares by 2025 from Hidden Valley to Copper Mountain.
- **Truck RV External** trips are projected to double throughout most of the Corridor.
- Weekday travel for **Day Recreation** is projected to have little change in share by 2025, in contrast to weekend travel, for which **Day Recreation** is the biggest contributor.

Chart ES - 3. Westbound Summer Thursday – 2000 and 2025 Baseline Total Person Trips by Purpose



Need Analysis and Problematic Areas

Tourism

Tourism is the second-largest industry in Colorado and constitutes approximately 12 to 14 percent of Colorado's economy. The Corridor is integral to Colorado's tourism economy due to its access to world-class destinations. The Corridor economy is driven by tourism and recreation, which has resulted in the creation of employment for nearly 125,000 persons, $4.8 billion in annual personal income, and the contribution of more than $8.3 billion to Colorado's Gross State Product in 2000.

More than 1 million vehicles traveled through the Eisenhower-Johnson Memorial Tunnels (EJMT) in July 2004, the busiest month in its 31-year history.

As of July 31, 2004, the total number of vehicles traveling through the EJMT for the year was 6,283,138. This was 72,996 more vehicles than the 2003 travelers through the tunnels as of July 31 of that year.

The I-70 Corridor traverses two national forests, the White River National Forest (WRNF) and the Arapaho and Roosevelt National Forests (ARNF), which are the most visited forests in the US. Recreational travel to these forests is the largest contributor to peak I-70 traffic, especially during summer and winter weekends. The WRNF provides 13 percent of the nation's downhill skiing and 64 percent of the downhill skiing in Colorado. More than 8.9 million people visited the WRNF in 1997, which represents an 85 percent increase in visitation in a little more than a decade. This increase is influenced by increases in local and regional population and by the WRNF's close proximity to the Front Range. More than 6.2 million people visited the ARNF in 2000. Recreational activity in the ARNF is heavily influenced by its close proximity to the Front Range. Between 2000 and 2025, summer recreation visitor days are predicted to increase by 76 percent, and skier visits are anticipated to increase by 13 percent. National forest visitation projections by the WRNF and ARNF did not include consideration of I-70 travel demand capacity.

According to a Longwoods International travel study performed in 2001, Colorado was ranked first in the nation for 2001 overnight ski trips at 16.9 percent of total trips to US ski areas. Colorado consistently has more than 11.5 million skiers annually, more skiers than California and Utah combined, according to Colorado Ski Country USA, the official recorder of statewide skier visits for Colorado's ski areas (CSCUSA 2004).

The most popular Colorado attractions located on the Corridor, according to the Center for Business and Economic Forecasting (CBEF) and Longwoods International's Colorado Visitors Study 2001, are shown on Figure ES - 3. As the map in Figure ES - 3 indicates, many of Colorado's most popular destinations are reached only by traveling on the Corridor.

Trends in Recreational Activities and Management

Colorado's 2003 Statewide Comprehensive Outdoor Recreation Plan (SCORP) (Colorado State Parks 2003) emphasizes the connection between Colorado's population growth and growth in recreational use. The SCORP indicates that the Western Slope (including Summit, Eagle, and Pitkin counties) will continue to have one of the fastest rates of growth due to recreational amenities that attract second home construction and retirees.

The National Survey on Recreation and the Environment (NSRE) 2000, published by the US Forest Service (USFS), indicates that the continuing growth in outdoor recreation outstrips population growth rates. To effectively evaluate outdoor recreation trends, the NSRE examined activities within each state. The 2003 SCORP includes summaries of NRSE information, as well as data from Colorado State Parks and US Fish and Wildlife Service (USFWS) surveys. Highlights of Colorado recreational activity trends according to the SCORP include:

- More than 94 percent of state residents participate in outdoor recreation activities. People most often participate in trails and driving pursuits, viewing/learning activities, and social pastimes.
- The largest percent increase in outdoor recreation from 1995 to 2003 is seen in individual sports, snow and ice activities, boating, and trails/driving activities.
- Swimming and team sports are the only activities declining relative to population growth.
- Kayaking, rafting, and jet-skiing are the biggest factors in growth of water-based recreation.
- Snowboarding, snowmobiling, and ice fishing are the major influences increasing winter recreation participation. Snowmobile recreation continues to grow, with an average annual increase in registration of 4.4 percent from 1998 to 2002.
- Family gatherings, walking for pleasure, outdoor sports events, visiting nature centers, sightseeing, picnicking, and wildlife viewing engage the highest percentage of the population.
- Ascents of 14,000-foot peaks ("fourteeners") increased by 300 percent in the past decade, from 65,000 to 200,000.
- Off Highway Vehicle (OHV) registrations have increased 223 percent from 1995 to 2003, with an average increase of 18 percent annually.
- Recreation participation rates are increasing faster than the rate of population growth.
- Of the eight states within the USFWS Mountain Region, Colorado attracts the most anglers and hunters.
- Cycling downhill at Colorado ski areas is becoming a major recreation attraction. More than 699,000, or half of all summer visitors, biked at one of the ski areas in the state. Seventy percent of bicycling tourists at ski areas were from out of state.
- More than 90 percent of state residents are trail users, and the average family uses trails 78 times a year. Since 1990, the number of trail climbers has increased by 10 percent per year.
- During FY 2001-02, more than 13,500 people participated in "festivals" focusing specifically on viewing Colorado's wildlife.

Recreation use is becoming more popular and diverse due to changes in technology (USDA 2004). This is supported by the fact that in 1970, mountain bikes, ATVs, snowmobile mountain recreation, fourteener climbing, and paragliding did not exist to any substantial degree. In addition, while sports like snowshoeing, rock climbing, and kayaking were relatively uncommon in 1970, they are now common recreation activities. According to a Longwoods International Travel Study (2001), Colorado is ranked first in the nation for overnight ski trips, at 16.9 percent of total trips to US ski areas.

Growth in Population and Employment

The 2025 population growth (increasing by 45 percent of year-2000 population) projected by the Colorado Department of Local Affairs (DOLA) for the Denver Front Range – to approximately 5 million – will create a substantial increase in future travel demand in the Corridor for summer and winter recreation. In addition, the 101 percent projected 2025 population growth in the nine-county Corridor region (Clear Creek, Eagle, Garfield, Gilpin, Grand, Lake, Park, Pitkin, and Summit counties) to approximately 340,000 will place additional travel demand on the Corridor.

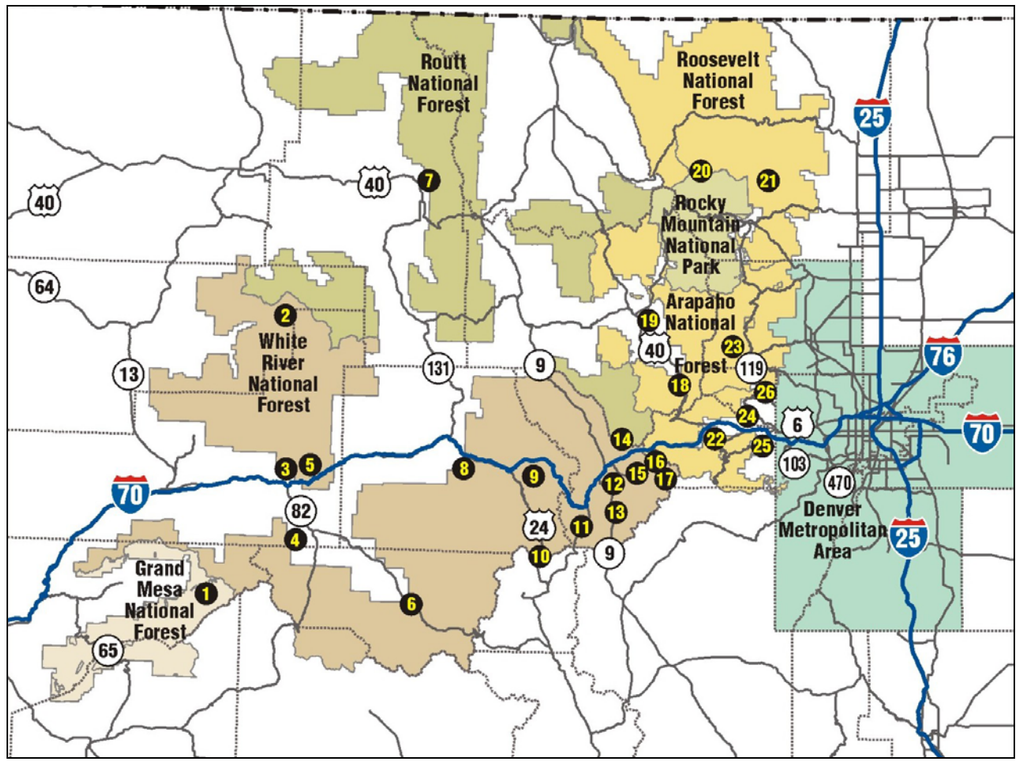
There is a high percentage of second home (non-local) ownership in the Corridor – approximately 50 percent in Eagle County and 65 percent in Summit County. Over time, owners of these homes are expected to generate more jobs, increased traffic/transportation system requirements, and the need for more services and infrastructure. The percentage of second home ownership in the Corridor is expected to increase over the next 10 to 15 years.

There is also an imbalance of population and employment in the Corridor region, resulting in worker commuting patterns that utilize I-70, adding to the traffic congestion in the Corridor. Employment is projected to increase by 109 percent in the Corridor region by 2025. Summit and Eagle counties are projected to have higher employment growth in comparison with population growth – with Eagle County's demand for employment growing by more than 200 percent – causing additional demand on the transportation system for cross-county commuting.

Water Supply

The water supply in the Corridor and in the Front Range (which gets much of its supply from Corridor sources) is a major concern in terms of both availability and quality. The additional Corridor population projected for 2025, along with the estimated peak seasonal population (tourism, recreation, and second home residents), is estimated to increase Corridor water demand by almost 100 percent, or double the existing demand. Any increases in population beyond the 2025 projections for the Corridor, as a result of the inducement from some alternatives, will further stress the water supply.

Figure ES - 3. Colorado Destinations Reached by I-70



Legend (west to east):

1. Grand Mesa National Forest
2. White River National Forest
3. Glenwood Springs/Hot Springs/Pool
4. Ski Sunlight
5. Glenwood Canyon
6. Aspen/Snowmass/Buttermilk/Aspen Highlands
7. Steamboat
8. Arrowhead Ski Area
9. Vail/Beaver Creek
10. Ski Cooper
11. Copper Mountain
12. Frisco
13. Breckenridge
14. Silverthorne
15. Keystone
16. Loveland Ski Area
17. Arapahoe Basin Ski Area
18. Winter Park/Mary Jane Ski Areas
19. Sol Vista
20. Rocky Mountain National Park
21. Arapaho and Roosevelt National Forests
22. Georgetown (including Georgetown Loop Railroad)
23. Eldora Ski Area
24. Idaho Springs
25. Mount Evans
26. Central City/Black Hawk

Problematic Areas

Problematic areas identified in the Corridor (as described in Chapter 1, Purpose of and Need for Action, section 1.6) include capacity deficiencies and roadway deficiencies. Capacity deficiencies would occur where interchange congestion backs onto mainline I-70, or at roadway locations where more than 365 (4 percent annual) hours of congestion would occur under the Baseline conditions. Roadway deficiencies affecting congestion include sharp curves, steep grades, and interchange limitations. These are shown in Figure ES - 4. The 10 study segments are described in detail in Chapter 1 and are illustrated in context of the Corridor on Figure ES - 4.

The following areas in the Corridor are considered "problematic" in terms of congestion and travel time (see Chapter 1 for details):

Capacity deficiency

- Individual interchanges at the following mileposts: 116, 140, 147, 163, 167, 171, 173, 195, 201, 203, 205, 226, 228, 232, 234, 238, 239, 240, 241, 244, 247/248, 256, and 259
- Congested mainline segments at the following mileposts: 166 to 173, 180 to 190, 213.5 to 260

Roadway deficiency

- Individual interchanges at the following mileposts: 171, 195, 198, 205, 216, 232, 238, and 244
- West of Wolcott – sharp curves from mileposts 155 to 156
- Dowd Canyon – sharp curves from mileposts 170 to 173
- West side of Vail Pass – climbing capacity and grade limitations from mileposts 180 to 190
- Straight Creek – steep grades from mileposts 208 to 213
- Continental Divide – eastbound lane drop mileposts 213 and 215 .5
- Loveland Pass interchange to Floyd Hill – capacity limitations from milepost 216 to 245
- Top of Floyd Hill – lane drop milepost 246
- Mount Vernon Canyon – steep grades and sharp curves from mileposts 252 to 259

Without transportation improvements, severe traffic congestion would occur in the Corridor under the 2025 Baseline travel demand. For example, under the Baseline traffic projections, the duration of a trip during winter weekend peak hours from C-470 to Vail (84 miles) is estimated to nearly triple in time from an estimated 1 hour and 38 minutes to 3 hours and 52 minutes.

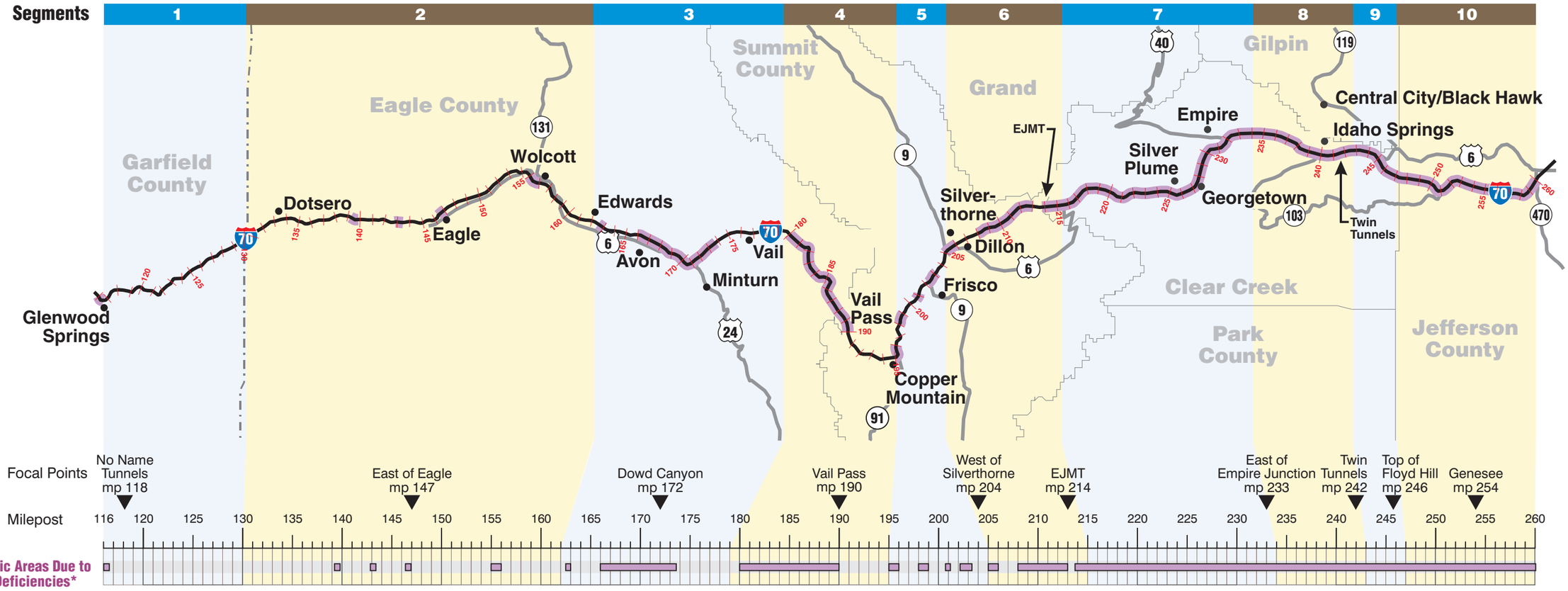


Figure ES-4. Problematic Areas

Description of Alternatives

In addition to the No Action alternative, a total of 20 action alternatives are being considered in this I-70 Draft PEIS. These alternatives include a Minimal Action alternative, four Transit alternatives, three Highway alternatives, and 12 Combination alternatives. These alternatives are described on the following pages. Several elements are common to the action alternatives. These are described in the box on this page.

No Action

The No Action alternative would consist of projects on the existing network. This would include ongoing highway maintenance and any other projects that have a committed source of funding within the 20-year plan, including the Eagle County Airport Interchange, SH 9, Gaming Area Access, and Hogback Parking Facility. Corridor-wide maintenance would include safety and signage improvements, bridge reconstruction and replacement, road resurfacing, rockfall mitigation, tunnel enhancement projects, sediment control, and routine maintenance. Components of the No Action alternative would include:

- **Ongoing highway maintenance.** Corridor-wide maintenance would include safety and signage improvements, bridge reconstruction and replacement, road resurfacing, rockfall mitigation, tunnel enhancement projects, sediment control, and routine maintenance.
- **Access to the Gaming (Gambling) Area of Gilpin County.** This access assumes two new connections to the gaming areas via I-70, both within Clear Creek County:
  - **Black Hawk Tunnel –** a new tunnel connection to I-70 at US 6 is assumed for travel demand modeling purposes. A *Gaming Area Access Draft Environmental Impact Statement* (EIS) with transportation improvements to the gaming areas of Black Hawk and Central City is under development.
  - **Central City Parkway –** A new roadway connection at the existing Hidden Valley interchange has been under construction since 2003 and is expected to be completed in 2004/05.
- **Hogback Parking Facility.** The existing Hogback Parking Facility in Jefferson County is an important strategic site and supports the MIS vision to maximize the utility of I-70 without major capacity changes. This carpool lot is highly utilized and is well recognized as a strategic location for ridesharing. Two of the four existing parking lots located at the I-70/US 40/SH 26-interchange area will be redeveloped, increasing parking from approximately 500 to approximately 1,000 spaces. An environmental assessment and a design have been completed. This project awaits construction funding.
- **Eagle County Airport Interchange.** Direct access between Eagle County Airport and I-70 is intended to provide a direct link between I-70 and the airport and to bypass the population centers of Eagle and Gypsum. Increases in airport passengers, especially for winter recreation and appreciable increases in area population, necessitate this link. Projections of traffic volumes to 2025 indicate that without the direct access to the Eagle County Airport, severe traffic congestion will occur on local road systems. This project has been evaluated under an environmental assessment.
- **SH 9 – Frisco to Breckenridge.** Upgrading SH 9 to four lanes is the selected alternative as approved in the project Record of Decision released in 2004. The first project, which involves a new roundabout at SH 9 and Park Avenue, is intended to be under construction in 2004.

Minimal Action

(Not Preferred as a Stand-Alone Alternative)

The Minimal Action alternative is designed to more fully maximize the capacity of existing I-70 without major capacity improvements, yet it still represents a suppression of travel demand. Strategies applied with this alternative include:

- A transportation management program that includes Travel Demand Management (TDM), Transportation System Management (TSM), and Intelligent Transportation Systems (ITS)
- Interchange modifications throughout the Corridor
- Auxiliary lanes for slow-moving vehicles, primarily in Jefferson, Clear Creek, and Eagle counties
- Curve safety modifications primarily in Clear Creek and Eagle counties
- Sediment control programs primarily in Clear Creek, Eagle, and Summit counties
- High-frequency bus service in mixed traffic throughout the Corridor

Due to the interest in addressing I-70 travel demand for the long term, this alternative is not preferred as a stand-alone alternative because it would not accommodate the Baseline 2025 demand. However, certain components of this alternative would be incorporated into the other action alternatives. Impacts discussed in the Comparison of Alternatives reflect the combination of these components with the action alternatives. See Chapter 2, Description and Comparison of Alternatives for included components.

Common Elements Among Alternatives

The following elements are common to the action alternatives. Details of these elements can be found in Chapter 2, Description and Comparison of Alternatives:

Inclusion of Minimal Action Components. Each of the action alternatives (all alternatives except No Action and Minimal Action) contains certain components of the Minimal Action alternative. See Chapter 2 for details. The cost of including these components is included in the capital costs cited.

Third Tunnel Bores. Third tunnel bores are part of all action alternatives at the Continental Divide alongside the existing Eisenhower-Johnson Memorial Tunnels (EJMT) and at the Twin Tunnels.

Elevated Structures Through Idaho Springs. To minimize the footprint through Idaho Springs, a "structured" concept has been assumed for the AGS, Highway, Bus in Guideway, and Combination alternatives. For this PEIS, except for AGS, the eastbound lanes would be located on an elevated structure, while westbound lanes would remain on grade.

Termini/Location of the Alternatives.

Transit: The AGS and Rail with Intermountain Connection (IMC) alternatives would intersect with major transit connections, and terminate in the vicinity of Eagle County Airport at the west end and at C-470 in Jefferson County at the east end (often referred to as "Jefferson Station"). These alternatives would be located within the median or to either side of I-70. The Bus in Guideway alternatives would include the construction of a transit-only guideway in the median of I-70 between Silverthorne and C-470 with buses traveling in mixed traffic for the remainder of their trips.

Highway: The termini of the Highway alternatives would cover Dowd Canyon in Eagle County and the entire reach of Clear Creek County. The 65 mph alternative would build additional tunnels in Dowd Canyon and in isolated locations in Clear Creek County. The 55 mph alternative third tunnel bores would be limited to the Continental Divide and Twin Tunnels.

Rail with IMC

(Not Preferred)

Rail with Intermountain Connection (IMC) would consist of (1) an on-grade electrified facility with elevated sections where needed for wildlife crossings and geologic hazards between Vail and C-470, combined with (2) a mode shift to the diesel-powered Intermountain Connection (IMC), which would involve use of the Union Pacific Railroad (UPRR) track from the Minturn interchange to Eagle County Airport (requires new track from Vail to Minturn and from west of Eagle to Eagle County Airport). The Rail with IMC alignment would be adjacent to I-70, with portions in the median.

Although the Rail with IMC alternative would meet the project need, this alternative is not preferred because it is not considered to be a reasonable alternative due to its capital cost of $4.92 billion and the environmental and community impacts ranging from intermediate to greatest impacts.

Photo simulation of the Rail with IMC alternative in the vicinity of Silver Plume.

AGS

(Not Preferred)

The Advanced Guideway System (AGS) alternative would be a fully elevated system that would use new or emerging technologies providing higher speeds than the other transit technologies under study. The AGS is based on an urban magnetic levitation (maglev) system researched by the Federal Transit Administration (FTA). The system uses High Speed Surface Transportation (HSST) vehicles developed in Japan over the past 25 years, with a history of proven performance and certification by the Japanese government, but would need to be heavily modified to meet the constraints of the Corridor. Another system considered under AGS, a monorail system, was proposed by the former Colorado Intermountain Fixed Guideway Authority and has not been tested to verify its performance. Nevertheless, either system serves as an example of the types of systems to be evaluated if the AGS alternative were to be identified as the preferred alternative.

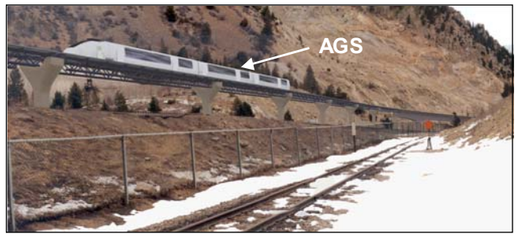


Photo simulation of the AGS alternative in the vicinity of Silver Plume.

Although the AGS would meet the project need and offer environmental and community impacts primarily in the least to intermediate range for many of the evaluated resources, it is not preferred because it is not considered to be a reasonable alternative due to its high capital cost of $6.15 billion.

Bus in Guideway

(Preferred)

The Bus in Guideway system would consist of a single 14-foot wide guideway (including guiding rails) eastbound from Silverthorne to the west portal of the EJMT, and a bi-directional 24-foot-wide guideway (including guiding rails) from the EJMT to C-470. From Silverthorne west, the bus would continue in mixed traffic. This system would use guidewheels to provide steering control, thus permitting a narrow guideway and improving operations. The dual-mode buses would use electric power in the guideway and diesel power outside the guideway. The diesel buses would use diesel power at all times.

Photo simulation of the Bus in Guideway alternative in the median in Lawson.

The use of electric power would enable the dual-mode bus to reach Corridor speeds of up to 70 mph. For a vehicle to be authorized to use the guideway, the vehicle operator must have a Commercial Driver's License with Passenger Endorsements, and the vehicle must be equipped with compatible guidance mechanisms, as the lack of shoulders and presence of barriers would prevent other vehicles from using the guideway.

The Bus in Guideway alternatives (diesel and dual-mode) are preferred due to their ability to meet the project need, with a least to intermediate range of environmental and community impacts, and a more affordable capital cost of $3.26 billion to $3.47 billion.

Six-Lane Highway 55 mph

(Preferred)

The Six-Lane Highway 55 mph alternative would include additional traffic lanes in select locations within the Corridor: Dowd Canyon, with two additional lanes between mileposts 160 and 173, and Continental Divide to Floyd Hill with two additional lanes between milepost 213.5 (EJMT) and milepost 247 (Floyd Hill).

This alternative is among the preferred group due to its ability to meet the project need, with environmental and community impacts ranging from least to greatest (depending on the resource evaluated), and a more affordable capital cost of $2.41 billion. See the box on page ES-10 for more information about this alternative.

Photo simulation of the Six-Lane Highway (55 and 65 mph) alternatives in Idaho Springs.

Six-Lane Highway 65 mph

(Preferred)

The Six-Lane Highway 65 mph alternative would more directly address Corridor safety issues with the utilization of new tunnels in addition to widening the existing template as proposed above. Features of this alternative would include the following:

- In Eagle County, two new tunnel bores would be constructed through Dowd Canyon to accommodate six lanes of I-70 in lieu of widening the existing roadway.
- In Clear Creek County, one new tunnel bore to accommodate westbound traffic would be constructed from Twin Tunnels to Hidden Valley, with the addition of one new tunnel bore for eastbound I-70 between Hidden Valley and Floyd Hill.
- In addition, highway curve safety modifications would occur near the new tunnels and at Fall River Road in Clear Creek County.
- I-70 would be widened to six lanes throughout the remainder of Clear Creek County as described in the box on page ES-10.

The Six-Lane Highway 65 mph alternative is among the preferred group due to its ability to meet the project need, with environmental and community impacts ranging from least to greatest (depending on the resource evaluated), and a more affordable capital cost at $2.65 billion.

Reversible/HOV/HOT Highway Lanes

(Preferred)

A reversible lane facility has the capability to change traffic flow directions as needed to accommodate peak direction demand. Reversible lanes would be built from the west side of the EJMT to just east of Hyland Hills. From the EJMT to just east of the US 6/base of Floyd Hill interchange, two additional lanes would be provided in the center between the two eastbound and two westbound general-purpose lanes, separated by a barrier. One of the lanes would provide access to/from US 6/Clear Creek Canyon, and the other would continue east along I-70, ending between Hyland Hills and Beaver Brook. The only entrance and exit from the reversible lanes evaluated for Tier 1 studies would be at the termini, at US 6, and at the Empire Junction interchange. Tunnel requirements would be the same as those for the Six-Lane Highway 55 mph alternative. Two additional general-purpose lanes in Dowd Canyon (mileposts 170 to 173), but not barrier separated or reversible, would also be part of this alternative.

This alternative is among the preferred group due to its ability to meet the project need, with environmental and community impacts ranging from least to greatest (depending on the resource evaluated), and a more affordable capital cost at $2.52 billion.

Combination Alternatives

(Includes Preferred and Not Preferred)

All Combination alternatives combine a stand-alone transit alternative with the stand-alone Six-Lane Highway 55 mph alternative. For example, the stand-alone Rail with IMC alternative, as described above, from Eagle County Airport to C-470 is combined with the stand-alone Six-Lane Highway 55 mph alternative, as described above, in Dowd Canyon and in Clear Creek County between EJMT and Floyd Hill.

Three sets of Combination alternatives have been considered:

	1. Build Highway and Transit Simultaneously	2. Build Transit and Preserve for Highway	3. Build Highway and Preserve for Transit
Combination Six-Lane Highway with Rail and IMC	Not Preferred	Not Preferred	Preferred
Combination Six-Lane Highway with AGS			
Combination Six-Lane Highway with Dual-Mode Bus in Guideway			
Combination Six-Lane Highway with Diesel Bus in Guideway			

Most environmental effects of the Preservation alternatives have been based on the total footprint of the combined (build both) alternative, although there are exceptions, which are noted below. For Preservation alternatives, the "need" (mobility) analysis accounts for only the portion being built. The impacts of resources that are dependent on capacity for analysis (such as noise and air quality) are also reported just for the portion to be built. All other resources assume the same impacts as if both modes were to be built simultaneously. Cost estimates have been modified to reflect the cost of building the build portion only, plus the cost to not preclude the future mode.

- **Not Preferred – Build both modes simultaneously.** The capital cost of these alternatives (ranging from $4.17 billion to $8.64 billion) eliminated these alternatives as being reasonable. These alternatives would best meet the mobility need of the project but would carry the greatest levels of environmental and community impacts.
- **Not Preferred – Build the Transit first and preserve the option for expanding the Highway later.** Capital cost estimates of $3.8 billion to $8.32 billion eliminated the alternatives that would build Rail with IMC or AGS first as being reasonable. In addition, due to the need to reconstruct the highway in many areas to provide the additional space for both Six-Lane Highway and a new Bus in Guideway system, building the Bus in Guideway first and only preserving for highways was viewed as infeasible from an implementation standpoint.

  The Combination Six-Lane Highway with Rail and IMC and Combination Six-Lane Highway with AGS alternatives also would carry the greatest levels of environmental and community impacts. The Combination Six-Lane Highway with Bus in Guideway alternatives would carry greater levels of impacts, but to a lesser degree than the combinations with AGS or Rail. These alternatives would meet the project's mobility need.
- **Preferred – Build the Highway first and preserve the option for building Transit later.** There are four types of highway with transit preservation alternatives in the preferred group, including 6-Lane Highway with (1) Rail and IMC preservation, (2) AGS preservation, (3) Dual-Mode Bus in Guideway preservation, and (4) Diesel Bus in Guideway preservation. Total estimated capital costs for building the highway first and preserving for transit range from $2.87 billion to $3.03 billion. For example, the cost to construct two additional lanes and preserve for a future Bus in Guideway is estimated to be $2.91 billion, making it a reasonable cost. These alternatives would meet the project's mobility need but would carry a greater level of environmental and community impacts than their stand-alone components.

Preservation Defined

At the Tier 1 level of the NEPA process, the following concepts for "inclusion" or "nonpreclusion" of future transit in the I-70 Mountain Corridor PEIS are under consideration. The decision of where and when to preserve space for the future transit mode would be made at the Tier 2 analysis level.

Preservation – Inclusion Option

The Inclusion Option would involve planning and designing the initial transportation mode, while "preserving" the three-dimensional space for the future mode. The "space" for the future transportation mode would be developed at the time that the selected 20-year build alternative is implemented. This could require right-of-way acquisitions, making interchange modifications, or installing walls that would be sized and located to be compatible with the ultimate multimodal transportation template.

Preservation – Nonpreclusion Option

The Nonpreclusion Option for the preservation of transit would be to plan and design the initial transportation mode in such a manner as to "not preclude" a future mode. With this approach, a six-lane highway would be developed as a part of the 20-year plan, in a manner that would *not* involve interchange modifications or developing the space for a future transit system as with the Inclusion Option. This approach would minimize the initial investment in the future mode, and delay impacts associated with space preservation, until such time when it is implemented.

Comparison of Alternatives

A summary comparison of the alternatives is provided in this section, based on mobility, safety, costs, environmental sensitivity, and community values criteria. These include individual comparisons of alternatives for each separate criterion and resource, which are presented in a comparative format, emphasizing the key criteria used in the grouping of alternatives (See Grouping of Preferred alternatives). Figure ES - 5 provides a map of the Corridor for reference. Quantitative comparisons are provided among alternatives for the following topics:

Mobility

- **Ability to Accommodate Growth in Travel Demand**
- **Highway Travel Time**
- **Transit Travel Time**
- **Annual Hours of Congestion**

Safety

- **Areas of Safety Concern**

Cost

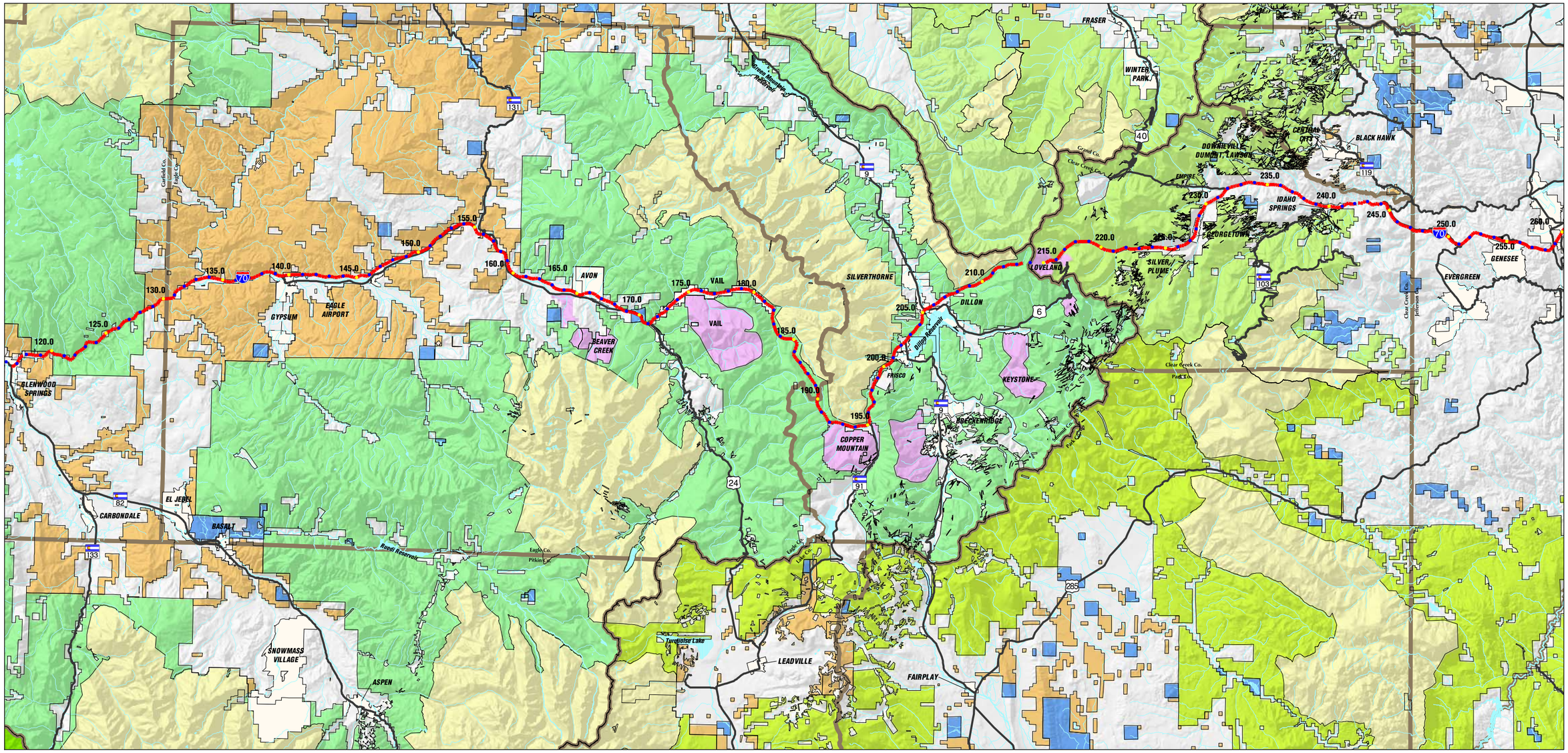
- **Cost Comparisons**
  - Capital Costs
  - Transit O&M Costs
  - Subsidy versus Fares
- **Cost-Effectiveness**

Environmental Sensitivity

- **Air Quality**
  - Carbon Monoxide
  - Re-Entrained Dust
  - Visibility
- **Key Wildlife Habitat and Wildlife Movement**
- **Threatened and Endangered Species and Species of Special Concern**
- **Water Quality - Stormwater Runoff**
  - Total Suspended Solids (TSS)
  - Phosphorus
  - Copper
  - Zinc
- **Water Quality - Winter Maintenance**
  - Increase in Use of Traction Sand
  - Increase in Use of Deicer
- **Fisheries**
- **Streams**
- **Wetlands**
- **Other Waters of the US**
- **Riparian Areas**

Community Values

- **Economics**
- **Visual Resources**
- **Currently Developed Lands**
- **Right-of-Way Requirements**
- **Historic Properties**
- **Recreation Properties**
- **Preliminary 4(f) Properties**
- **Noise**
- **Paleontological Resources** (no summary provided here, but information can be found in section 3.17)
- **Energy**
  - Operational Energy Consumption
  - Operational Energy Cost



General Features

- I-70 Mileposts
- I-70
- State & Federal Highways
- Rivers & Streams
- Lakes & Water Bodies
- County Boundaries
- Cities & Towns

Jurisdiction

- Arapaho and Roosevelt NF
- White River NF
- Bureau of Land Management
- Pike/San Isabel NF
- NF Wilderness
- State of Colorado
- Ski Areas
- Private Lands

N W E S

4 0 4 Miles

SCALE - 1:471,000 or 1" = 39,250'

Figure ES-5. Corridor Map

Back to Table of Contents

Ability of Alternatives to Meet Need and Reasonableness Criteria

The following pages compare the ability of the alternatives to meet the project need, as defined by the following measures:

- **Mobility**
  - Ability to Accommodate Growth in Travel Demand
  - Highway Travel Time
  - Transit Travel Time
  - Annual Hours of Congestion
- **Safety**
  - Areas of Safety Concern
- **Cost**
  - Cost Comparisons
  - Capital Costs
  - Transit O&M Costs
  - Subsidy versus Fares
  - Cost-Effectiveness

Mobility Comparison

Mobility – Ability to Accommodate Growth in Travel Demand

The I-70 PEIS travel demand model provides a forecast for 2025 for the Baseline scenario and the project alternatives. The Baseline scenario is based on a theoretical assumption that travel demand is not suppressed – that demand will grow in line with population and employment projections and recreation use without consideration of the limitations of I-70. The **2025 Baseline demand** defines the project need, as described in Chapter 1, Purpose of and Need for Action. The Baseline scenario and the No Action alternative are based on the same highway network. It is important to note, however, that the No Action and Minimal Action alternatives would accommodate less (or suppressed) travel than the projected 2025 Baseline demand, while the other alternatives are forecast to result in varying degrees of induced demand.

The premise of the PEIS underlying need statement is that alternatives that meet the need:

- Would accommodate the projected 2025 travel demand for the Corridor, and
- Could also address the continued growth beyond 2025.

Suppression and inducement of travel is a central factor in the analysis of travel performance by alternatives in the Corridor. Improved travel times associated with alternatives could encourage Corridor travelers to make additional trips – that is, to induce travel – and possibly induce land use growth in the Corridor beyond that projected for Baseline conditions. Conversely, with no improvements made to I-70 (other than the projects included in the No Action alternative), increased congestion is expected to result, as population and travel demand increase. This could cause some travelers to forgo trips, resulting in trip suppression.

These two criteria, therefore, are assessed for each alternative.

Ability to Accommodate Annual 2025 Baseline Demand

Thresholds. The thresholds for the ability to accommodate annual travel demands are:

- Baseline demand or greater – more than 0 percent (induced trips)
- Less than Baseline demand – less than 0 percent (suppressed trips)

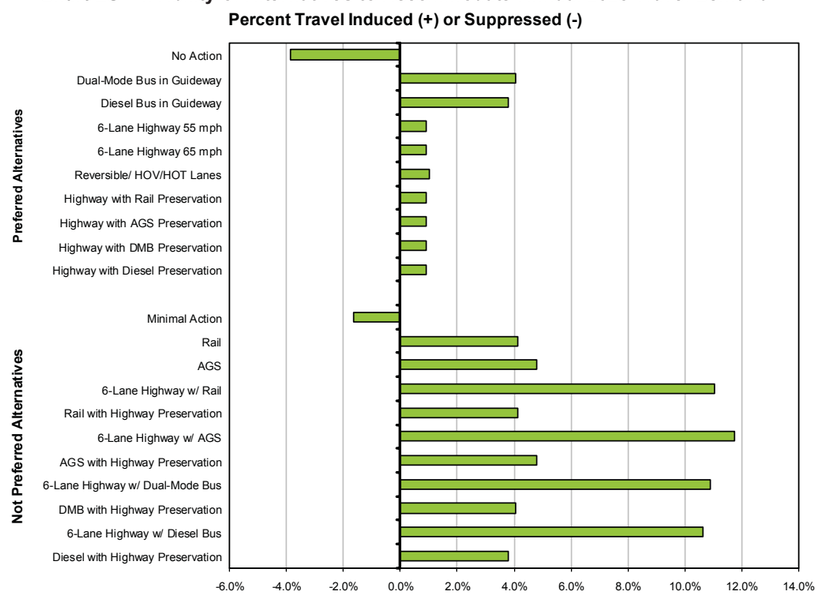
Only two categories are shown for this comparative analysis because an alternative that would accommodate the Baseline demand (and no more) would meet this need criterion.

Comparisons. All action alternatives (Transit, Highway, and Combination alternatives) would accommodate Baseline demand and would, therefore, fall into the "meets Baseline demand or greater" category, while Minimal Action and No Action would not accommodate Baseline demand and would fall in the "less than Baseline" category.

Alternatives rank in the following order, from worst-performing to best-performing for their ability to accommodate 2025 Baseline demand:

- The No Action and Minimal Action alternatives would suppress trips at an annual rate of 4 percent and 2 percent, respectively, and would not meet the underlying need to accommodate 2025 Baseline demand.
- The Highway alternatives would each induce Baseline demand by about 1 percent more person trips.
- The Transit alternatives would induce the next most travel after the Combination alternatives. Within the Transit alternatives, AGS, Rail with IMC, and Dual-Mode Bus in Guideway would induce slightly more travel than Diesel Bus in Guideway (4 percent versus 3 percent) for reasons similar to those for the Combination alternatives.
- The Combination alternatives would induce the greatest increase in trip making (10 to 11 percent), measured in terms of annual person trips averaged over the 10 focal points.

Chart ES - 4. Ability of Alternatives to Accommodate Annual 2025 Travel Demand

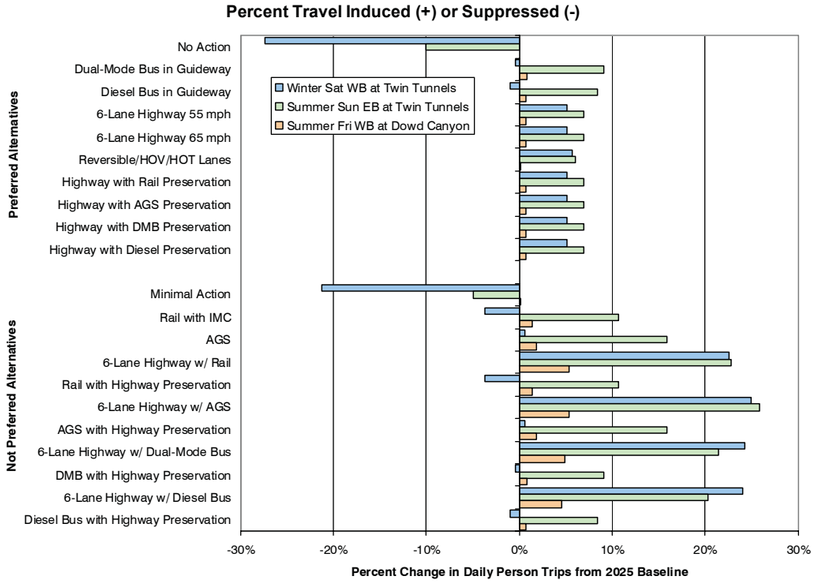


Y-axis Represents Baseline 2025 Demand (0% travel induced)

Ability to Accommodate 2025 Travel Demand on Selected Model Days

In contrast to annual travel demand shown on Chart ES - 4, Chart ES - 5 illustrates the ability of alternatives to accommodate travel demand on selected model days, including winter Saturday westbound and summer Sunday eastbound at Twin Tunnels, and summer Friday westbound at Dowd Canyon. The percentage of travel induced or suppressed on these selected days and seasons would be more pronounced than they would be on an annual basis. For example, trips would be suppressed up to 27 percent by the No Action alternative, and up to 21 percent by the Minimal Action alternative. The Highway alternatives would induce trips by up to 6 to 7 percent beyond Baseline, while the Combination alternatives would induce the greatest number of trips: more than 20 percent above Baseline.

Chart ES - 5. Ability of Alternatives to Accommodate 2025 Travel Demand on Selected Model Days



Ability to Address Continued Growth Beyond 2025

The ability of an alternative to address continued growth beyond 2025 is measured based on two sets of assumptions. The **"trend"** forecast of year at capacity is based on assuming no change in vehicle occupancy, transit share, or tolerance to congestion after 2025. The **"optimistic"** forecast assumes increases in each of these variables. This analysis measures capacity for the Corridor at the EJMT for an eastbound summer Sunday. Chart ES - 6 shows the year that the Corridor would reach network capacity under each alternative.

Thresholds. For the network capacity analysis, alternatives accommodating expected demand beyond 2050 are considered to have long-term capacity. Alternatives with insufficient capacity to accommodate demands beyond 2030 are considered to have short-term capacity because construction of major action alternatives is not expected to be completed before 2025, and any action alternative should have a reasonable "life" before further improvements are needed.

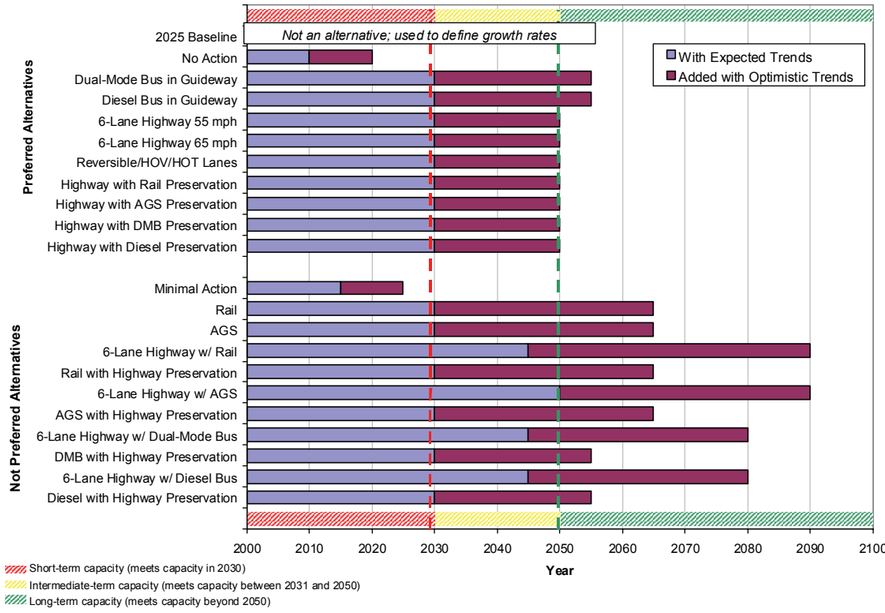
Comparison Based on Trend Assumptions. Using the "trend" assumptions to calculate the year in which Corridor demands would reach the network capacity of I-70, the following is the ranking of alternatives, from worst-performing to best-performing:

- With no improvements to I-70, under the "trend" assumptions, the Corridor would reach capacity in 2010 under the No Action alternative. The Minimal Action alternative would reach capacity in 2015.
- The Highway alternatives and the Transit alternatives would accommodate travel demand to about 2030, resulting in short-term capacity for the Corridor under "trend" assumptions.
- The Combination "build simultaneously" alternatives would accommodate the expected travel growth between 2045 and 2050, providing intermediate-term capacity.

Comparison Based on Optimistic Assumptions. Using the "optimistic" assumptions to calculate the year in which Corridor demands would reach the ultimate capacity of I-70, the following is the ranking of alternatives, from worst-performing to best-performing:

- Under the "optimistic" assumptions, the No Action alternative would have capacity available until 2020 if vehicle occupancies and tolerances to congestion increased. The Minimal Action alternative would have capacity available up to 2025 travel demand.
- The Highway alternatives would reach network capacity at 2050 under the "optimistic" assumptions, providing intermediate-term capacity for the Corridor.
- The Transit alternatives would reach network capacity in 2055 (Bus in Guideway alternatives) or 2065 (Rail with IMC and AGS alternatives) under "optimistic" assumptions, providing long-term capacity for the Corridor.
- The Combination "build simultaneously" alternatives would also provide long-term capacity for the Corridor under the "optimistic" assumptions.

Chart ES - 6. Year that the Corridor Would Reach Network Capacity Under Each Alternative



Total Person Trips on Selected Model Days

A comparison of alternatives based on daily travel demand on selected model days and locations described below and illustrated on Chart ES - 7. Selected model day peak-hour person trips are shown for the following three key days, seasons, and focal points:

Summer Friday – Dowd Canyon. Summer Friday is the peak day for either direction of I-70 at Dowd Canyon. Under the 2025 Baseline scenario, about 73,300 person trips are made eastbound and 75,300 person trips westbound here on summer Friday. The No Action alternative would accommodate the same number of person trips; that is, no suppression would occur with the No Action alternative on summer Friday. The greatest peak day inducement at Dowd Canyon would occur with the Combination Six-Lane Highway with Rail and IMC "build simultaneously" alternative and the Combination Six-Lane Highway with AGS "build simultaneously" alternative.

Summer Sunday – West of Silverthorne. Under the 2025 Baseline, there are 96,500 summer Sunday (the peak day) person trips eastbound West of Silverthorne, and 64,900 person trips westbound on winter Saturday (summer Saturday is the peak westbound day with 75,100 person trips). The greatest peak day inducement here would occur with the Combination Six-Lane Highway with AGS "build simultaneously" alternative, which was also the case with Dowd Canyon, but more person trips would be induced than in Dowd Canyon. The Combination Six-Lane Highway with AGS alternative would result in 29 percent more westbound person trips than Baseline, and 21 percent more eastbound person trips.

Winter Saturday – Twin Tunnels. As at Dowd Canyon and West of Silverthorne, the greatest trip inducement at the Twin Tunnels would occur with the Combination Six-Lane Highway with AGS "build simultaneously" alternative. On the peak eastbound day, summer Sunday, about 124,600 person trips are forecast for the 2025 Baseline scenario, and 156,800 person trips for the Combination involving AGS, which would be a 26 percent inducement. The westbound inducement for this Combination alternative would be almost as large: the forecast 128,700 person trips would be 25 percent more than the 103,000 winter Saturday person trips for the 2025 Baseline.

Weekday Peak-Hour Travel Demand

While examining weekend travel demand provides an overview of how I-70 might behave under heavy volumes, summer Thursday demand forecasts provide an indication of more everyday travel patterns – when Work and Local Non-Work trips make up most of the traffic, rather than recreational trips. Weekday travel has a greater percentage of local trips. Between 2000 and 2025, the population of both Clear Creek and Summit counties are projected to increase by about 85 percent. Clear Creek County employment is forecast to increase by about 58 percent during the 25 years, and Summit County employment is projected to increase by about 90 percent.

Westbound summer Thursday travel at the Twin Tunnels grows at about the same rate as Clear Creek County employment; the 2025 Baseline demand of about 60,500 person trips would be about 55 percent more than the 2000 level (about 39,000 person trips). Under different alternatives, the growth in westbound summer Thursday person trips at the Twin Tunnels would range from about 46 percent with No Action to about 68 percent under the Combination Six-Lane Highway with AGS "build simultaneously" alternative. By comparison, the growth in westbound winter Saturday person trips from 2000 to the 2025 Baseline would be about 72 percent here – more than the growth of summer Thursday person trips seen under any alternative.

Although trip suppression would occur westbound on summer Thursday for these two focal points under No Action, there would be no trip suppression eastbound. This result suggests that the suppressed trips would likely be some of the few recreational trips heading from the Front Range to Corridor communities to get an early start on the weekend. Summer Thursday travel time under No Action westbound from Downieville to Loveland Pass is projected to be 34 to 48 minutes, which would be more than the 2000 winter Saturday travel time for the same westbound segment.

Role of Transit in the Corridor

Chart ES - 7 compares the role that transit would play in the Corridor under each of the alternatives. It illustrates the transit share of daily person trips in the Corridor that is projected for each alternative, based on travel demand for selected model days. As shown with lighter colors and dotted lines on the chart, for Combination alternatives where the Highway would be built first with preservation for Transit, the potential transit share would be the same percentage for the Transit portion when it would be eventually built as it would be for the Transit portion if both portions were built simultaneously.

Chart ES - 7. 2025 Transit Share of Person Trips

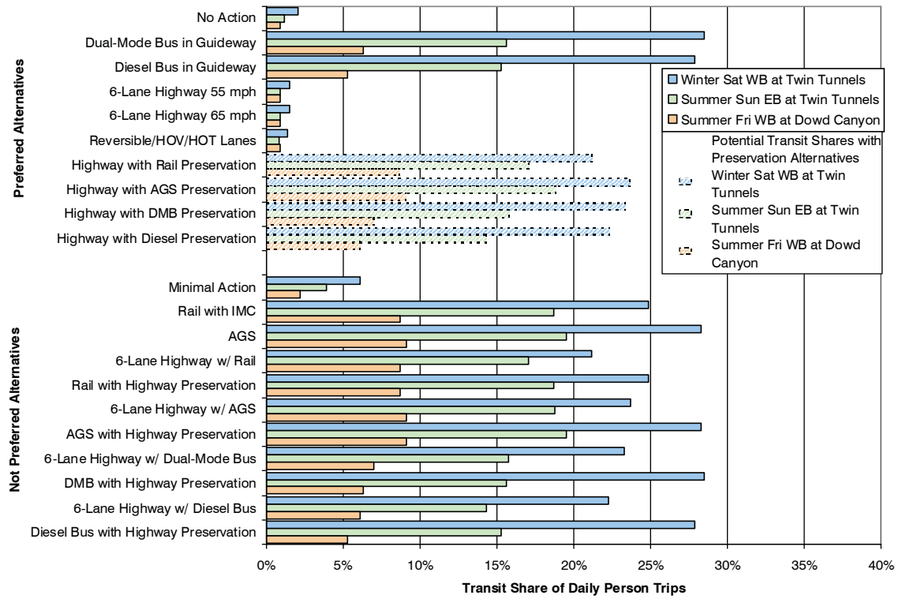
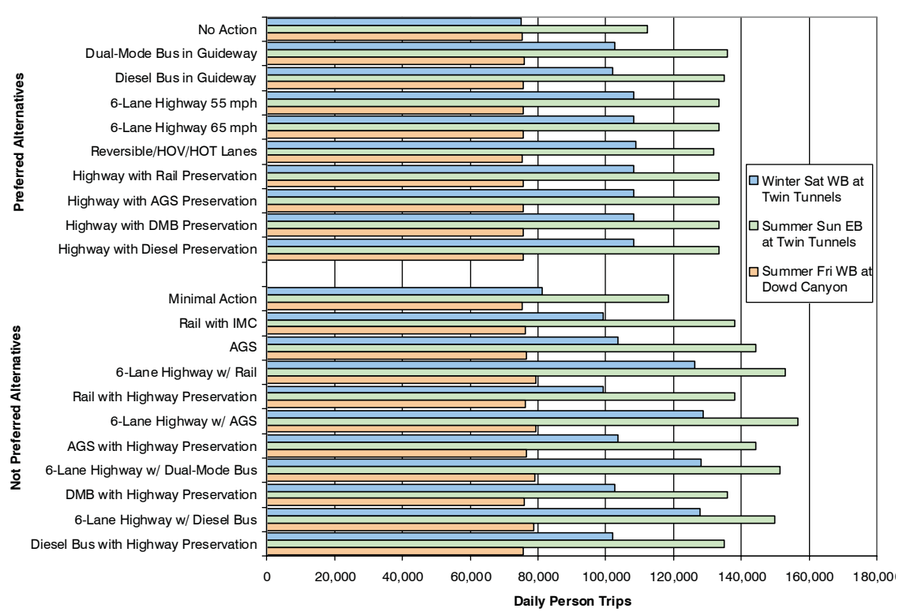


Chart ES - 8. Total Person Trips at Selected Focal Points on Selected Model Days



Mobility – Highway Travel Time

The highway travel times provide a common measure for comparing the performance of all alternatives. Two types of comparisons are evaluated for highway travel time for all alternatives:

- **Selected model day peak-hour travel time –** indicates the changes to travel time for a particular alternative on the model days examined. This measure of travel time represents the time projected in either the eastbound or westbound direction, and for model days with typically heavy demand. Selected model day peak-hour travel time represents only one of 8,760 hours in a year.
- **Annual average peak-hour travel time –** represents the average of peak-hour travel times for all 365 days in the year, which provides a broader picture of alternative performance. Note that the annual average peak-hour travel time will reflect a large number of weekdays, when congestion in the Corridor is less severe than weekends (including Friday evenings).

Transit travel times are also provided by alternative. For transit alternatives (Rail with IMC, AGS, Dual-Mode or Diesel Bus in Guideway, and the Combination Six-Lane Highway with Transit alternatives) the highway travel times demonstrate the positives and negatives that would result from overall growth in traffic, but from fewer trips on the existing and, in some cases, widened highway due to the introduction of transit into the Corridor. Travel time in transit is also provided as an indicator of changes to Corridor travel time in this mode.

The following model days were selected to provide continuity in the comparison of peak hour travel times for alternatives:

In the eastern part of the Corridor, from Copper Mountain to C-470:

- Winter Saturday – westbound
- Summer Sunday – eastbound

For the western part of the Corridor, from Glenwood Springs to Copper Mountain:

- Summer Friday – eastbound and westbound

Highway versus Transit Travel Time

Highway travel times are a major input factor to the mode choice module in the I-70 travel demand model, which determines the mode choice in a multimodal transportation system. If the highway travel time would be greater than the transit travel time, then the propensity for taking the transit would increase. Otherwise, the opposite would take place. The model is capable of reaching a balance between various modes of transportation. Therefore, highway travel time comparisons provide a complete travel time performance for a multimodal environment.

- Highway travel time is calculated for travel between two points on I-70, given the improvements of the specific alternative, whether it is a Highway, Transit, or Combination alternative. (Note that for the Transit alternatives, about 70 percent or more people – depending on day and location – are forecast to travel by auto.)
- Transit travel time is the amount of time expected for travel on the transit system in the case of Transit and Combination alternatives. A number of factors that can affect travel times, including the demand on a particular day or the grade of the terrain in a particular direction, have been included in the calculations.

The winter Saturday and summer Sunday model days were selected to evaluate the performance of alternatives from Copper Mountain (milepost 195) to C-470 (milepost 260), where weekend recreation trips dominate the travel demand. The summer Friday model day was selected to evaluate the performance of alternatives west of Copper Mountain, where work trips and local non-work trips dominate the travel demand.

Understanding Demand. Because of the extensive travel demand modeling pursued for this study, measures of induced versus suppressed demand were also evaluated. As capacities increase (with the Combination build simultaneously alternatives), so does demand. Therefore, demand varies among the alternatives, and an assumption that better travel times or fewer hours of congestion would be realized with the higher capacity alternatives is not necessarily achieved, because additional demand (inducement) consumes the additional capacities. A "worst case" approach was taken to convey the changes in travel time and congested hours due to the interest in addressing I-70 travel demand for the long term.

Thresholds. Thresholds were defined based on the average speed of travel, rather than based on travel time. Because each segment under study has a unique length, thresholds defined in time units would not have a comparable meaning across the segments. Because 50 mph is the speed limit within the environmentally constrained Glenwood Canyon, where no physical improvements are contemplated, this speed was adopted as the minimum for which a segment would fall in the best travel time category. The threshold between intermediate travel times and worst travel time was set at 30 mph because this average speed would reflect considerable queuing within a segment.

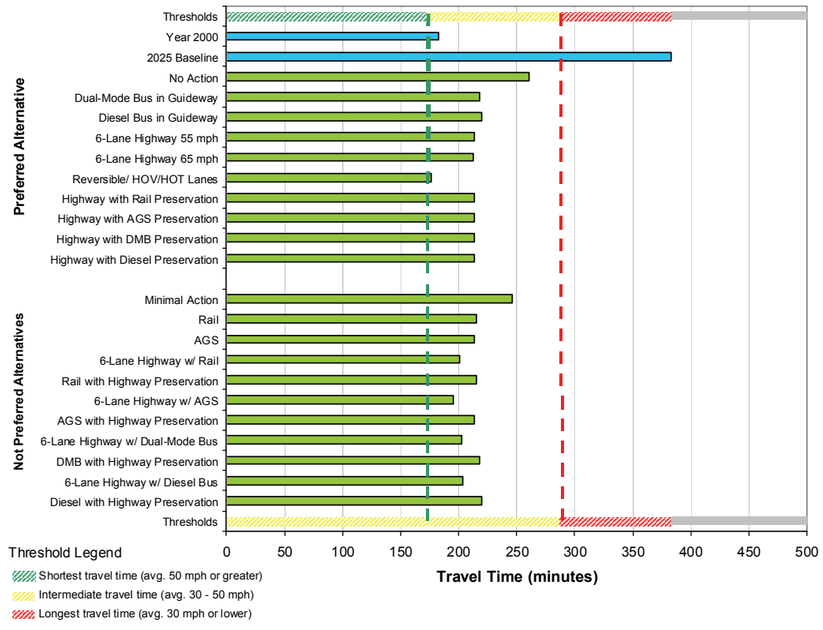
Corridor Summary: Annual Average Peak-Hour Travel Time

On a Corridor-wide basis, the annual average peak-hour travel times of all of the alternatives would be lower than Baseline, under the best to intermediate travel time thresholds. However, the improvement in travel time over the Baseline by the No Action and Minimal Action alternative would result from suppressed trips and lower vehicle volumes than Baseline demand. With lower volumes of traffic than under the Baseline projections, the travel performance of the No Action and Minimal Action alternatives would not accommodate the future Baseline projections. The No Action travel time would be helped by the contribution of a continuous climbing lane from the assumed Black Hawk Tunnel at US 6 in Clear Creek County to the top of Floyd Hill.

Peak-Hour Highway Travel Time – Westbound

For westbound travel on winter Saturday (from C-470 to Copper Mountain) and summer Friday (from Copper Mountain to Glenwood Springs), the alternatives would have a similar ranking as they have for eastbound highway travel time, with the exception of the Reversible/HOV/HOT Lanes alternative and the AGS alternative, which would offer shorter relative travel times. Highway travel times on a winter Saturday westbound in 2025 would be similar to or greater than current times for all alternatives except the Reversible/HOV/HOT Lanes alternative. Chart ES - 9 provides a comparison of the peak-hour highway travel time, westbound from C-470 to Glenwood Springs.

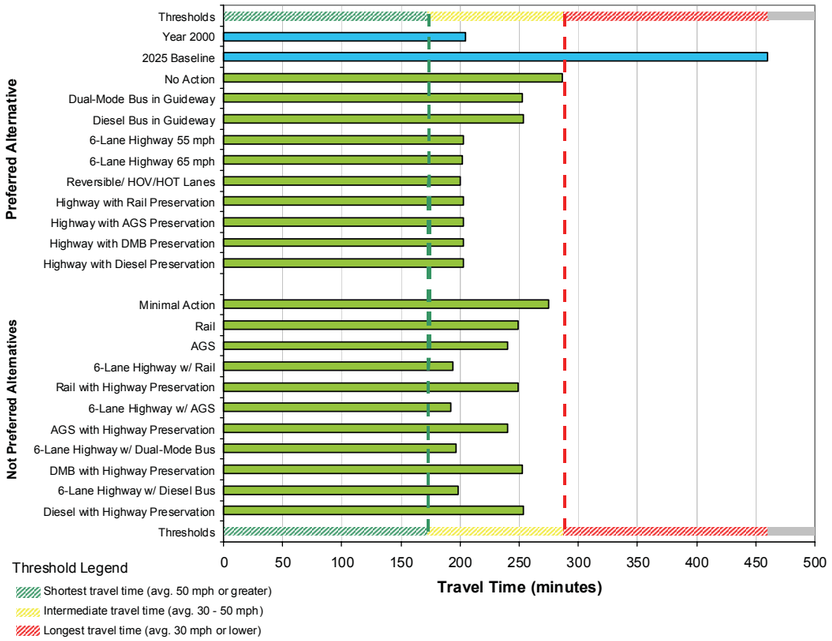
Chart ES - 9. Selected Model Day, Peak-Hour Highway Travel Time (Westbound: C-470 to Glenwood Springs)



Peak-Hour Highway Travel Time – Eastbound

Alternative eastbound travel times for the length of the Corridor (Glenwood Springs to C-470) would range from 192 minutes with the Combination Six-Lane Highway with AGS "build simultaneously" alternative to 286 minutes with the No Action alternative. Travel times under each alternative compared to the Baseline benchmark time of 460 minutes, or just over 7.5 hours. The Baseline travel time would falls within the longest travel time range for peak-hour travel time for summer Friday (Glenwood Springs to Copper Mountain) and summer Sunday (Copper Mountain to C-470). The Baseline eastbound travel time (460 minutes) would be about 20 percent more than the Baseline westbound (383 minutes). Chart ES - 10 provides a comparison of peak-hour travel time, eastbound from Glenwood Springs to C-470.

Chart ES - 10. Selected Model Day, Peak-Hour Highway Travel Time (Eastbound: Glenwood Springs to C-470)



Mobility – Transit Travel Time

Travel times for Transit alternatives are provided as an indication of the performance of the transit systems within the Corridor, and their ability to accommodate the mountainous grades and sharp curves along I-70. Chart ES - 11 and Chart ES - 12 provide a comparison of peak-hour transit travel time, from Glenwood Springs to C-470, for selected model days.

Chart ES - 11. Selected Model Day, Peak-Hour Transit Travel Time (Eastbound: Glenwood Springs to C-470)

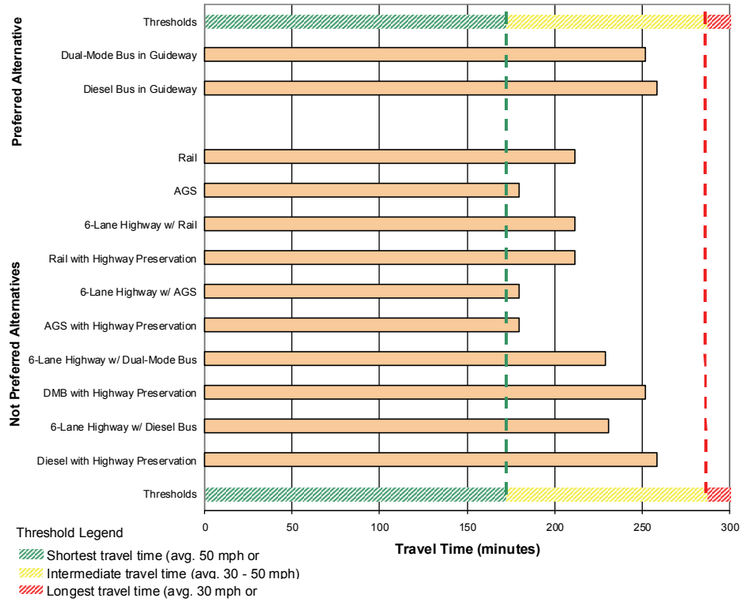
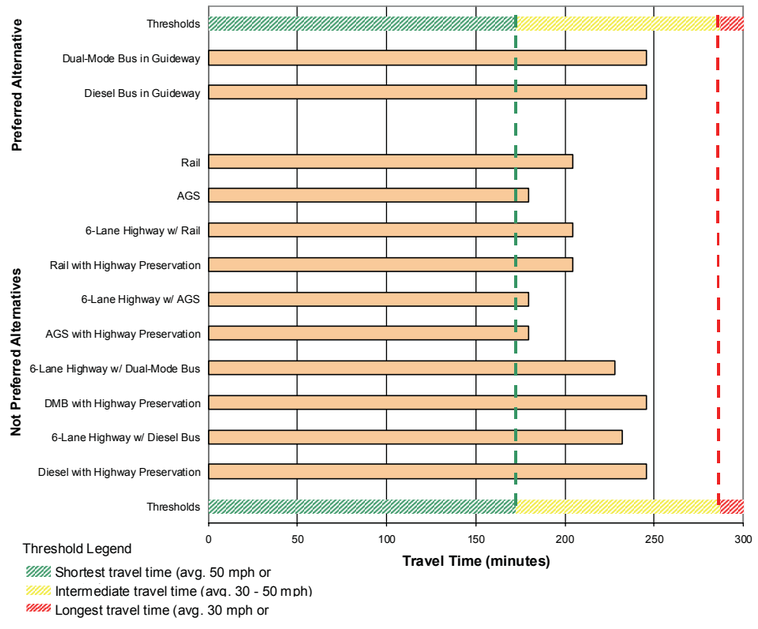


Chart ES - 12. Selected Model Day, Peak-Hour Transit Travel Time (Westbound: C-470 to Glenwood Springs)



Example of Travel Times for a Complete Trip Between Vail and Denver Metropolitan Area

An analysis of travel between Vail Transportation Center (near Vail Village) and an RTD transit center from the Denver Tech Center (DTC) characterizes an entire trip from the Denver metropolitan area to a major destination resort in the Corridor. This example provides a comparison of travel times between transit trips and auto trips, as illustrated on Chart ES - 13 and Chart ES - 14. The following combinations of transportation modes evaluated include:

- Using highways all the way (shown by blue bars on the charts)
- Using auto access within the Denver metropolitan area, parking at a proposed Jefferson Station (assumed to be in the vicinity of the I-70, US 6 and US 40 area), and riding transit in the Corridor (shown by yellow bars on the charts)
- Using transit for entire trip (shown by red bars on the charts)

This travel time analysis was calculated based on the following assumptions noted in section 2.3.

Summary. The highway travel times for trips from DTC to Vail under the 2025 Baseline scenario would be considerably longer (approximately 300 minutes westbound and 400 minutes eastbound) than those shown for year 2000 (approximately 150 minutes westbound and 170 minutes eastbound). The No Action and Minimal Action alternatives would have travel times up to 190 minutes westbound and up to 270 minutes eastbound, with a considerable suppression of trips, and would not accommodate 2025 travel demand projections. In contrast, travel times for many of the action alternatives would result in travel times approaching those of today, while accommodating the increased travel demand projected for 2025.

Westbound trips. Chart ES - 13 shows that for westbound trips on a winter Saturday, travel time would be similar among the alternatives for highway-all-the-way trips by auto, on the transit system alternatives that would utilize the park-and-ride at Jefferson Station, and on the Combination highway and transit system alternatives (134 to 171 minutes). The highway-all-the-way travel times on the unimproved highway with the Transit alternatives (195 to 207 minutes) would be longer than the for the Six-Lane Highway (55 or 65 mph) alternatives. Trips that would use transit systems for the entire distance from DTC to Vail would be the longest in duration (199 to 216 minutes).

The following are the projected duration of westbound trips for comparison to the 2000 travel time (150 minutes):

- AGS – using park-and-ride at Jefferson Station (132 minutes)
- Reversible/HOV/HOT Lanes alternative – highway all the way (134 minutes)
- Combination Six-Lane Highway with AGS – utilizing park-and-ride at Jefferson Station (142 minutes)
- Combination Six-Lane Highway with Rail and IMC – utilizing park-and-ride at Jefferson Station (161 minutes)
- Bus in Guideway – using park-and-ride at Jefferson Station (170 minutes)
- Six-Lane Highway 55 and 65 mph – highway all the way (171 minutes)

Eastbound trips. Chart ES - 14 shows that eastbound trips on a summer Sunday would be more varied in travel time among alternatives than the westbound trips described above. Highway travel times for Vail to Denver Tech Center trips would be similar for the Highway alternatives and the Combination alternatives (156 to 165 minutes). In contrast to the winter westbound trips, the highway-all-the-way travel times on the unimproved highway with the Transit alternatives (195 to 207 minutes) would be longer than for the Highway alternatives. Trips that would use transit from Jefferson Station would vary in travel times from 139 minutes on AGS to 193 on Diesel Bus in Guideway. Transit-all-the-way trips from Vail to Denver Tech Center would be generally longer than the other types of trips (199 to 231 minutes).

The following types of eastbound trips would have travel times under the year 2000 travel time (172 minutes):

- AGS – using park-and-ride at Jefferson Station (139 minutes)
- Combination Six-Lane Highway with AGS – using park-and-ride at Jefferson Station (139 minutes)
- Combination Six-Lane Highway with Rail and IMC – using park-and-ride at Jefferson Station (156 minutes)
- Rail with IMC – using park-and-ride at Jefferson Station (161 minutes)
- Highway alternatives – highway all the way (162 to 165 minutes)
- Combination Six-Lane Highway with Bus in Guideway – using park-and-ride at Jefferson Station (173 to 174 minutes)
- Bus in Guideway – using park-and-ride at Jefferson Station (188 to 193 minutes)

Chart ES - 13. Comparison of Travel Time for Trips from Denver Tech Center to Vail – Winter Saturday Westbound

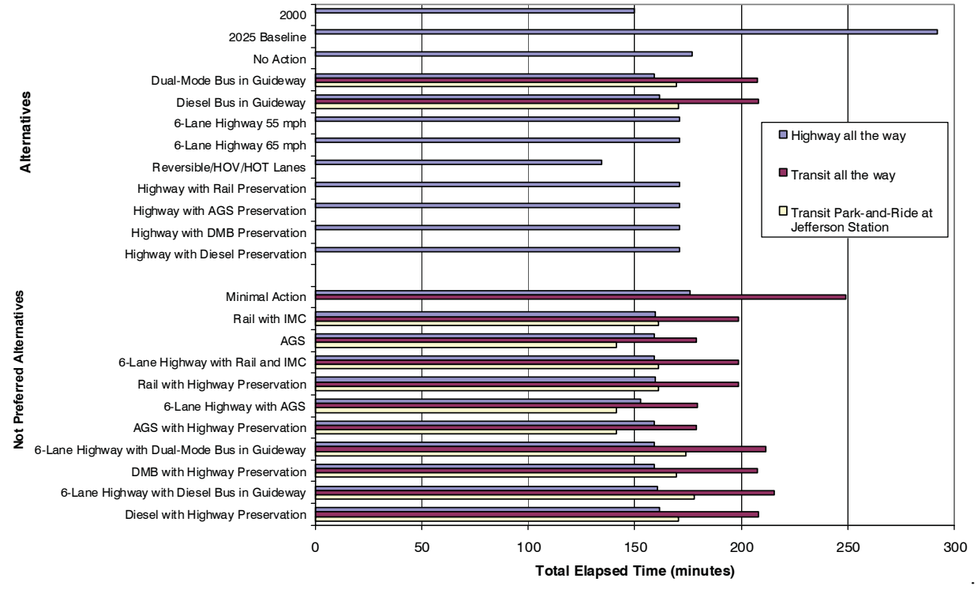
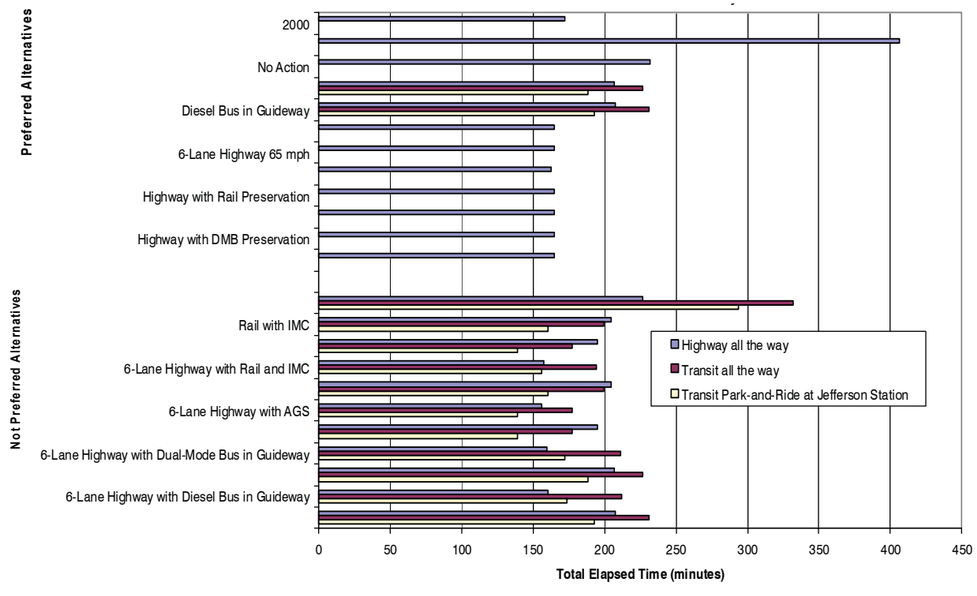


Chart ES - 14. Comparison of Travel Time for Trips from Vail to DTC - Summer Sunday Eastbound



Mobility – Hours of Congestion

Annual Hours of Congestion

Another criterion for the mobility comparison among the alternatives is the duration, in annual hours, of congestion at 10 focal points along the I-70 Corridor. These focal points are listed and described in Chapter 1, Purpose of and Need for Action.

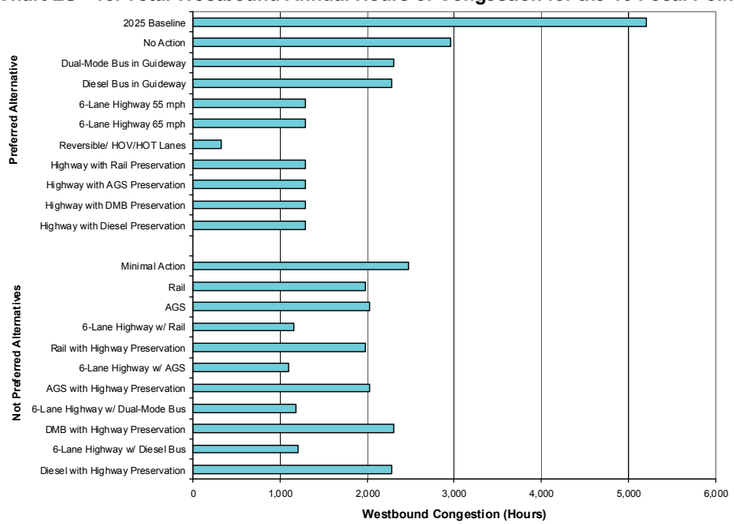
Thresholds. For the annual hours of congestion at a location, 365 hours per year was selected as the threshold for the greatest category because it represents the point at which congestion (stop-and-go traffic) could occur for a substantial period (over half a day – 6 hours or greater per day) during 60 peak days of the year. The 365-hour threshold was also used to define the problematic areas in Chapter 1, Purpose of and Need for Action.

A lower threshold of 120 hours per year was selected to distinguish intermediate congestion from least congestion because that quantity of congestion corresponds to 60 peak days (about the current number of weekends with congestion) having 2 hours of congestion each.

Westbound. All alternatives would reduce the Corridor-wide annual hours of congestion from the Baseline scenario in the westbound direction. Chart ES - 15 illustrates this overall improvement over the Baseline scenario. Baseline scenarios for six key westbound focal points are in the greatest hours of congestion range. Alternatives rank in the following order from worst-performing to best-performing:

- While No Action and Minimal Action would result in a reduction in annual hours of congestion, they would not accommodate the Baseline travel demand.
- The Transit-only alternatives would reduce congestion over the Baseline, although congestion at the greatest and intermediate ranges would occur at Genesee, Top of Floyd Hill, Twin Tunnels, and Dowd Canyon focal points.
- The Six-Lane Highway (55 mph or 65 mph) alternatives and Combination alternatives would be similar and would result in uncongested travel conditions at each focal point except at the Top of Floyd Hill, where congestion would remain at the greatest range. Annual hours of congestion for the Highway alternatives would exceed the projected Baseline annual hours of congestion at the Top of Floyd Hill.
- The Reversible/HOV/HOT Lanes alternative would operate in the least hours of congestion range at each of the key focal points, except at the Top of Floyd Hill, where annual hours of congestion levels would be at the intermediate range. The Reversible/HOV/HOT Lanes alternative would result in the lowest annual hours of congestion at the Top of Floyd Hill compared to the Baseline and all other alternatives.

Chart ES - 15. Total Westbound Annual Hours of Congestion for the 10 Focal Points

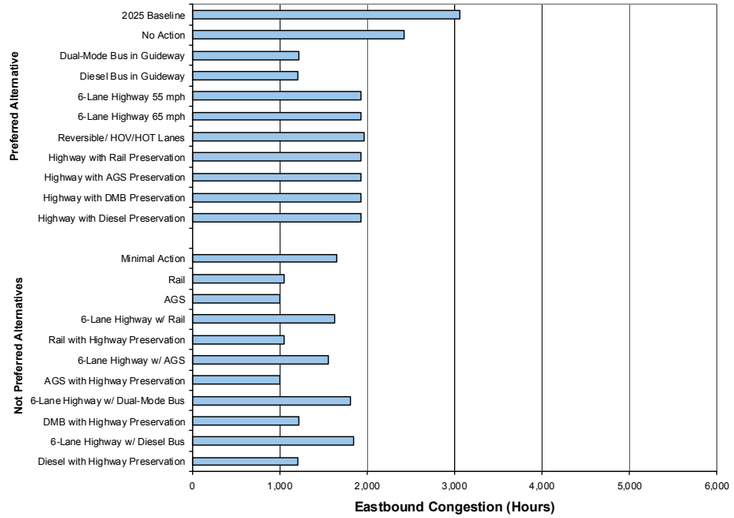


Note: Thresholds are not shown on charts because they apply only to the times at the separate focal points, not to the times at the 10 focal points added together.

Eastbound. All alternatives would reduce Corridor-wide annual hours of congestion from the Baseline scenario in the eastbound direction. Chart ES - 16 illustrates that the overall eastbound annual hours of congestion for Baseline travel would be about one-third of that in the westbound direction. At two focal points, West of Silverthorne and the Top of Floyd Hill, Baseline would fall into the intermediate hours of congestion range. At Dowd Canyon, Baseline would be in the least hours of congestion range. Eastbound Baseline travel would be in the greatest hours of congestion range at four of the focal points: EJMT, East of Empire Junction, Twin Tunnels, and Genesee. Alternatives rank in the following order from worst-performing to best-performing:

- While No Action and Minimal Action would result in a reduction in annual hours of congestion, they would not accommodate the Baseline travel demand.
- Highway and Combination alternatives would result in a considerably higher level of congestion than Baseline at the Top of Floyd Hill and Genesee.
- The Transit-only alternatives would operate in the intermediate range of annual hours of congestion at the Top of Floyd Hill and Genesee.

Chart ES - 16. Total Eastbound Annual Hours of Congestion for the 10 Focal Points



Note: Thresholds are not shown on charts because they apply only to the times at the separate focal points, not to the times at the 10 focal points added together.

Hours of Congestion on Selected Model Days

Charts ES-17 and 18 illustrate the westbound and eastbound hours of congestion on selected model days at selected focal points.

Chart ES - 17. Selected Model Day Hours of Congestion: Westbound

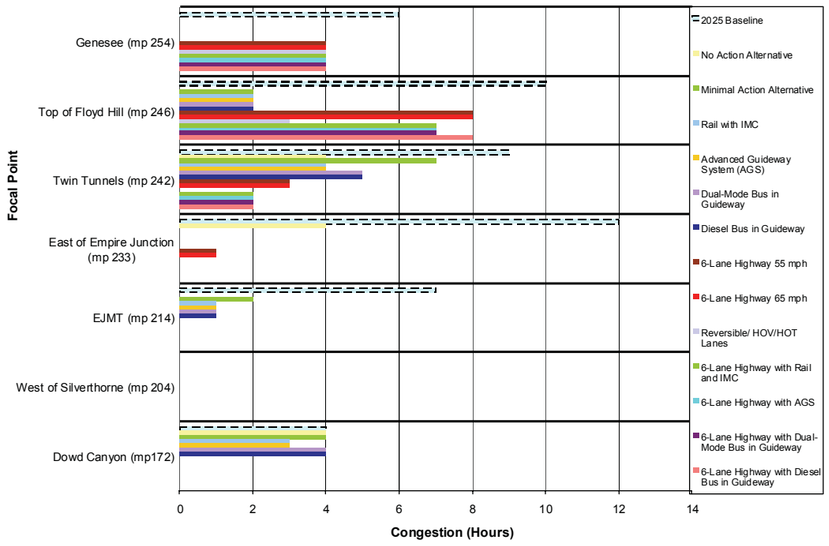
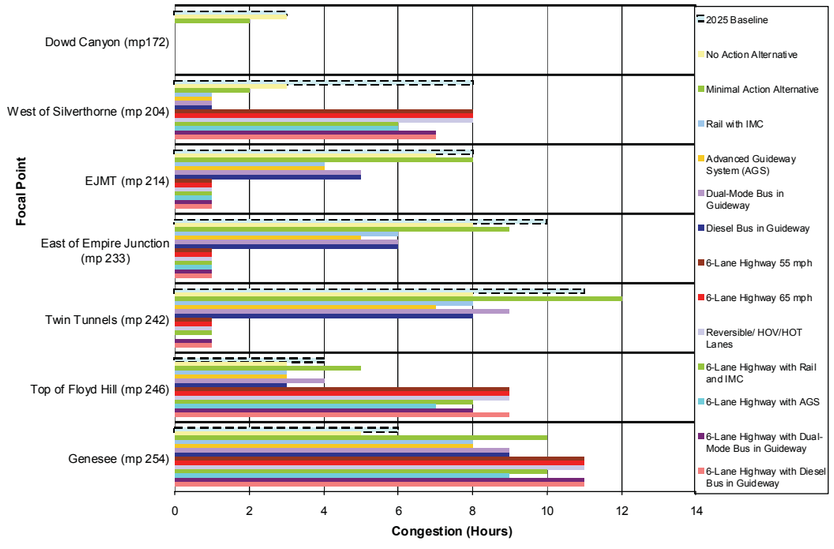


Chart ES - 18. Selected Model Day Hours of Congestion: Eastbound



Areas of Safety Concern

Providing for safe travel is one of the purposes to be achieved by this PEIS. Factors such as roadway geography, weather, traffic volumes, and "driver expectancy" can contribute to increased accident rates. "Driver expectancy" is an important factor that influences highway safety rates. Driving is a mentally demanding task in which people acquire information about the roadway and their surroundings, process that information, and take appropriate action to control and guide their vehicles. Elements of I-70 in the Corridor that may challenge driver expectancy include:

- Unexpected and sharp curves, and steep grades associated with mountainous conditions
- Wide variation in the speeds of vehicles on the roadway
- Changes in posted speed limits (regulatory or advisory)
- Disabled vehicles, fallen rocks, animals, or other obstacles on the roadway
- Left-side on- and off-ramps, and other nonstandard geometric features
- Inclement weather conditions, including icy roads and bridges, and particularly, the ability of out-of-state residents who are not familiar with the I-70 mountainous roadway to respond to these
- The presence of large, fast-moving (or slow-moving) vehicles

Areas of safety concern were identified by a weighted hazard index (WHI) greater than zero, which indicates an above-average accident rate. WHIs were calculated for interchanges and mainline sections between interchanges. Locations with safety concerns along the Corridor are:

- Wolcott curve (milepost 156)
- Curves in Dowd Canyon (mileposts 170 to 173)
- West side of Vail Pass (mileposts 180 to 190)
- Copper Mountain interchange (milepost 195)
- Officers Gulch interchange (milepost 198)
- Silverthorne interchange (milepost 205)
- Portion of I-70 between Loveland Pass and Bakerville (mileposts 216 to 221)
- Georgetown Hill (mileposts 226 to 228)
- Empire Junction to Downieville (mileposts 232 to 234)
- Curves near Fall River Road (mileposts 237 to 238)
- Curves and grades from the Twin Tunnels to the Hyland Hills interchange (mileposts 242 to 247)

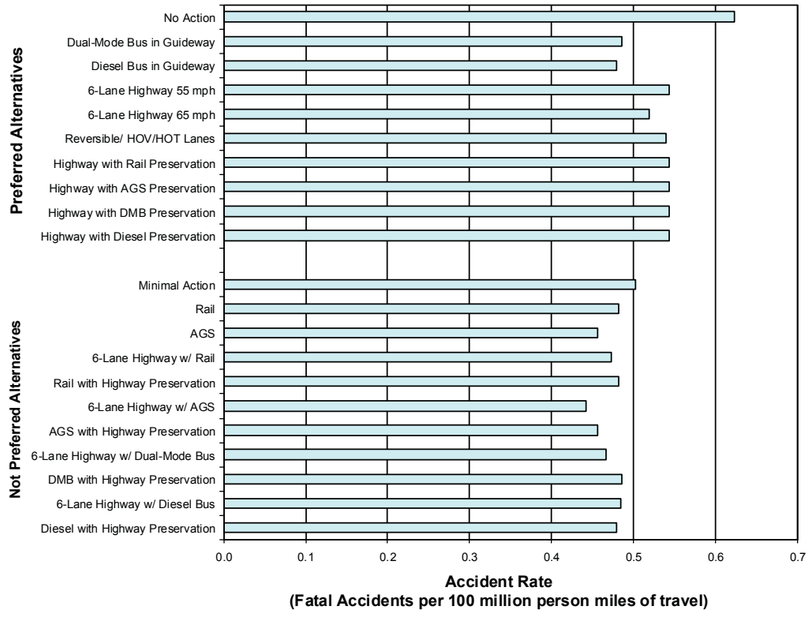
Safety involves avoiding property damage, personal injury, and fatalities while traveling. For highway travel, high-accident locations are often associated with the geometric design and physical constraints of the roadway and inclement weather conditions. For transit, safety is influenced by the mode's technology and certain operational parameters. Accidents are typically classified in three levels of severity: fatalities, injuries to persons, and other events, including:

- "Property damage only" in the highway context (for example, colliding with another vehicle, or with obstacles on or near the roadway)
- "Incidents" in the transit context (including collisions, fires, and going off the roadway, track, or guideway)

Roadway improvements such as curve realignment, additional through lanes, and climbing lanes were identified and incorporated into alternatives. A comparison of alternatives for safety (by fatality rates) is provided on Chart ES - 19. The fatality rate per 100 million person miles, expected for the different alternatives, are:

- The No Action alternative, with 0.62 fatalities per 100 million person miles, would not address the existing highway safety issues in the Corridor.
- The Minimal Action alternative, with 0.50 fatalities per 100 million person miles, would provide local highway safety improvements.
- The Six-Lane Highway 55 mph alternative and the Reversible/HOV/HOT Lanes alternative are both expected to experience 0.54 fatalities per 100 million person miles.
- The fatality rate for Six-Lane Highway 65 mph alternative is 0.52 fatalities per 100 million person miles. This is a reduction in fatalities from the Six-Lane Highway 55 mph alternative (0.54 fatalities per 100 million person miles). This alternative would provide new alignments of I-70, often requiring tunnels, to increase the design speed at certain high-accident locations, such as Dowd Canyon and the area near Hidden Valley and Floyd Hill.
- The Transit alternatives would be slightly safer than the Six-Lane Highway 55 mph alternative, and would have predicted fatality rates in the range of 0.46 to 0.49 fatalities per 100 million person miles. In general, the fatality rates among transit riders (up to 0.11 fatalities per 100 million person miles) are much lower than those who use private vehicles on the current I-70 alignment (0.44 to 0.63 fatalities per 100 million person miles).
- The range of fatality rates among the Combination alternatives, 0.44 to 0.49 fatalities per 100 million person miles, is very similar to the range for the Transit alternatives. The Combination Six-Lane Highway with AGS alternative is the safest of all the alternatives. Whether an alternative involving Dual-Mode Bus in Guideway is safer than one involving Diesel Bus in Guideway seems to be quite sensitive to the transit ridership and trip inducement patterns of the alternative.

Chart ES - 19. Fatal Accident Rate of Alternatives



Cost Comparisons

Cost comparisons include capital cost, transit operation and maintenance (O&M) costs requiring subsidy, and cost-effectiveness.

Capital Cost

Establishing capital costs for alternatives began with the alignments and design concepts for each alternative. The major construction items for Highway alternatives included structures, walls, earthwork, pavement, base course, special structures, tunnels, and interchanges. The Rail with IMC and AGS alternatives were developed by combining many of the same items shown above with rolling stock, electrification, track, and propulsion system costs. The Dual-Mode and Diesel Bus in Guideway alternatives were developed in a similar fashion to the Highway alternatives, with the addition of capital cost of the bus fleet.

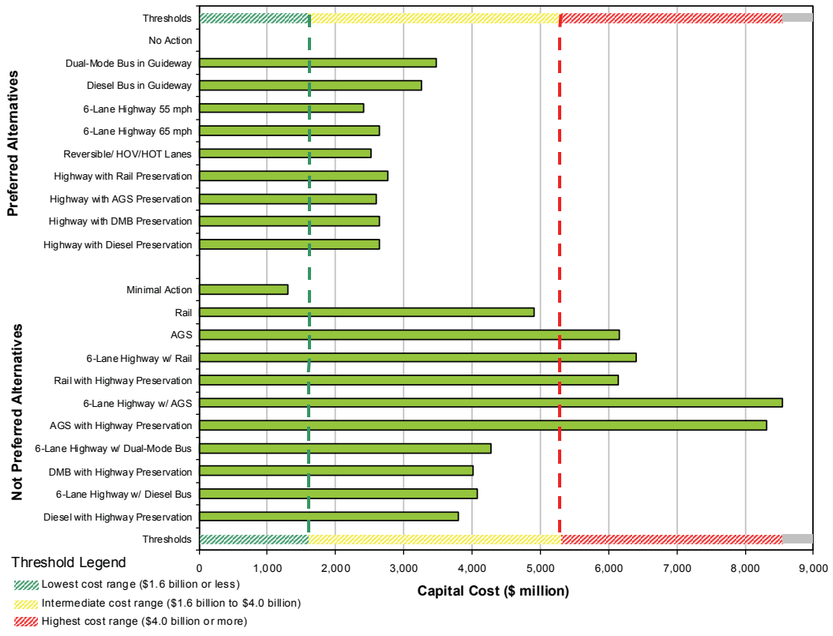
Once these quantities were derived, they were placed in a cost-estimating spreadsheet that adds percentages for other items in lieu of known quantities. These items include such factors as contingencies for construction, engineering, traffic management, drainage (sediment control), and contingencies for unknowns.

The capital cost comparison thresholds were based on the likelihood of funding availability, as follows:

- **Committed funds –** The Transportation Commission has committed approximately $1.6 billion of the Strategic Corridor Investment Program to the I-70 Corridor. This amount represents the funding that may be available over the next 20 years.
- **Uncommitted funds –** Additional funds necessary for implementing project alternatives remain uncommitted. A $4 billion amount has been set as a cost threshold for evaluating alternatives in terms of "reasonableness" from an economic affordability point of view. This threshold was set in order to not preclude alternatives that may be affordable if funding sources over and above the $1.6 billion were to be secured.

As a result of the ranges of likely funding, the following thresholds were established for capital costs: Lowest cost range, $1.6 billion or less; Intermediate cost range, $1.6 billion to $4.0 billion; and Highest cost range, $4.0 billion or more. Chart ES - 20 illustrates the capital costs for each alternative.

Chart ES - 20. Capital Cost in Millions



Transit O&M Costs Requiring Subsidy

In addition to the capital costs, a key cost item for Transit alternatives would be the annual cost required to subsidize the O&M of the systems under study. The annual subsidy required for Transit alternatives is based on the O&M costs that are not covered by farebox receipts. Table ES - 2 provides the range of annual transit O&M costs and annual subsidy costs for the Transit alternatives. The percent of transit O&M costs requiring subsidy is presented on Chart ES - 21. The percent of O&M costs requiring subsidy varies from 7 percent (Combination Six-Lane Highway with Dual-Mode Bus in Guideway) to 53 percent (alternatives involving AGS). Because no new Corridor transit system would be introduced with the Highway alternatives or the No Action alternative, these alternatives are not shown.

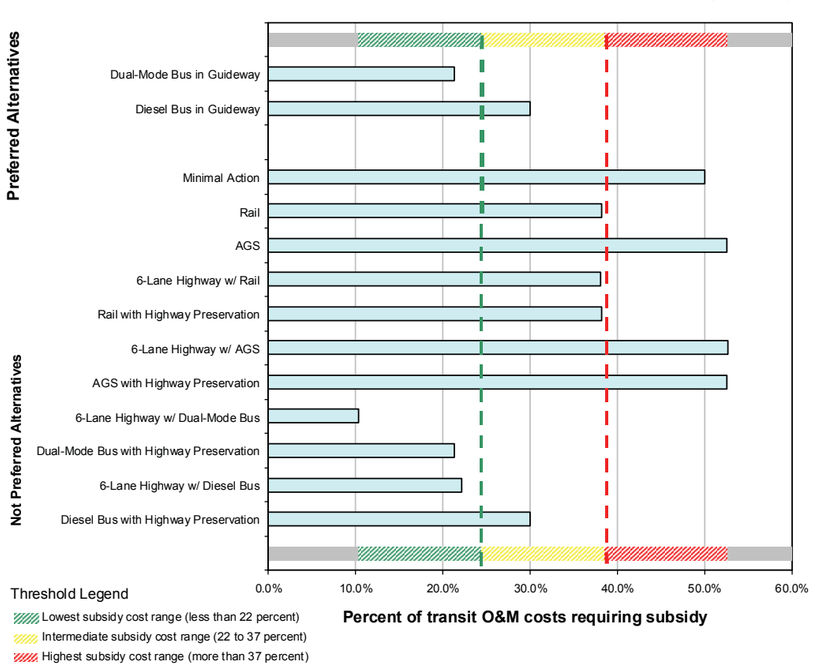
Table ES - 2. Annual Transit O&M Costs and Transit Subsidy Costs

Transit Alternatives	Annual Transit O&M Costs		Annual Transit Subsidy Costs	
	Transit Only	Combination – Build Simultaneously	Transit Only	Combination – Build Simultaneously
Minimal Action - Bus In Mixed Traffic	$31 million	N/A	$16 million	N/A
Rail with IMC	$135 million	$142 million	$52 million	$54 million
AGS	$180 million	$200 million	$95 million	$105 million
Dual-Mode Bus in Guideway	$94 million	$83 million	$20 million	$9 million
Diesel Bus in Guideway	$99 million	$93 million	$ 30 million	$21 million

Note: Costs presented reflect the Transit-only alternatives and the Combination build simultaneously alternatives. The annual transit subsidy and operation and maintenance costs for all alternatives are provided in Appendix B.

Thresholds for the ratings were established by dividing the range of subsidy percentages into thirds as follows: Lowest subsidy cost range, less than 22 percent; Intermediate subsidy cost range, 22 to 37 percent; Highest subsidy cost range, more than 37 percent. Chart ES - 21 presents the percent of transit operation and maintenance costs requiring subsidy.

Chart ES - 21. Percent of Transit Operation and Maintenance Costs Requiring Subsidy



Cost-Effectiveness

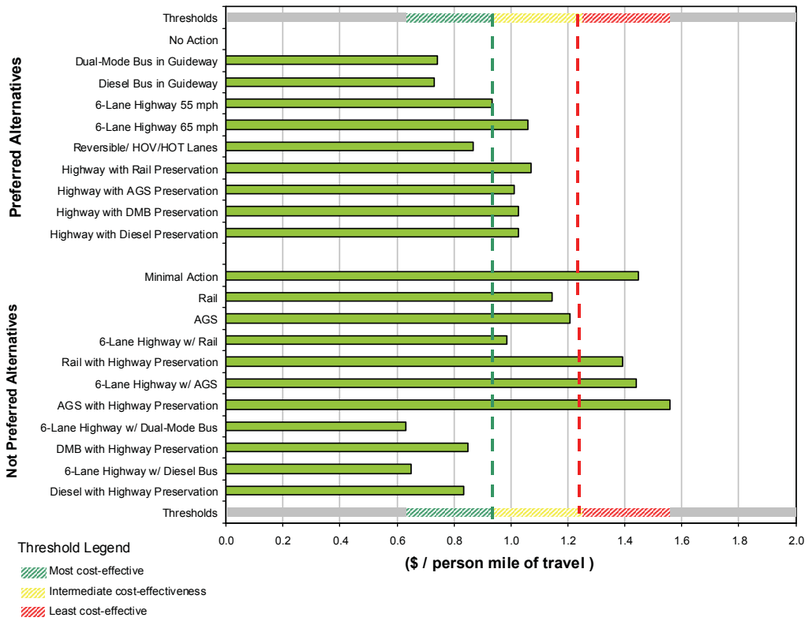
The lower the cost per person mile of travel, the more cost-effective is that mode of transportation. The cost-effectiveness analysis considers capital costs (annualized at 7 percent of the total capital cost, based on standard annualization techniques), and O&M costs, less transit farebox receipts. Increased transportation capacity could result in more trips being made in the Corridor and also in longer trips to a greater number of potential destinations. Therefore, person miles of travel (PMT) provide the multimodal denominator for PEIS cost-effectiveness indices.

The cost-effectiveness index is based on the ratio of the difference in costs between an alternative and No Action, divided by the corresponding difference in PMT. Mathematically, this cost-effectiveness index is defined as:

$$Cost\text{ - }Effectiveness\ Index_{Alternative} = \frac{Cost_{Alternative} - Cost_{\text{No Action}}}{PMT_{Alternative} - PMT_{\text{No Action}}}$$

The comparisons of alternatives by cost-effectiveness are shown on Chart ES - 22.

Chart ES - 22. Cost of Alternatives Per Person Mile of Travel



Ability of Alternatives to Address Project Purposes

While the proposed action should address the underlying need, safety issues, and technical feasibility, it also should provide for and accommodate the following project purposes:

- **Environmental Sensitivity.** A full spectrum of environmental resources, including stream sedimentation, water quality, wildlife crossings, and impacts on wetlands, will be considered in the identification of a preferred alternative in the Final PEIS.
- **Respect for Community Values.** Issues associated with air quality, historic resources, noise, visual resources, and social and economic values, as well as the impact of the transportation system's footprint on the mountain communities, will be considered in the identification of a preferred alternative in the Final PEIS. The possible growth changes and economic effects that might occur, depending on the ease or difficulty of access, will also be disclosed.

The following sections summarize the alternatives' impacts on environmental and community resources. The results of the environmental assessment were used to rank the alternatives at a resource level. The evaluation criteria were divided into three categories from "least" to "greatest" to provide a relative measurement of the level of impact.

Bar charts in the following pages display the impacts of the alternatives on each resource evaluated, with the color-coded "least" to "greatest" thresholds shown on the charts. These thresholds are derived by taking the range of impacts from lowest to highest and dividing that range in thirds:

- **Red** indicates "greatest" environmental impact
- **Yellow** indicates "intermediate" environmental impact
- **Green** indicates "least" environmental impact

Air Quality

Affected Environment

The primary pollutants of concern in the Corridor are **particulate matter** less than 10 microns in diameter **(PM_{10})** and **carbon monoxide (CO)** emissions from motor vehicles. To compare the air quality impacts among the various alternatives, total daily CO and particulate emissions were calculated for each alternative. Because emissions of both pollutants are directly related to vehicle miles traveled in the Corridor, alternatives with higher vehicle miles traveled generally have higher total daily emissions.

For more information on air quality, see:
- Section 3.1, Air Quality
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data

CO emissions are also influenced by speed and traffic congestion. CO emissions are highest at both high, free-flow speeds (60 to 70 mph) and low, congested speeds (15 to 20 mph). There is a wide variation in speed and congestion in the Corridor depending on season, day of the week, time of day, and weather conditions. Total daily CO emissions were calculated based on average running speeds for four time periods: morning peak, midday off-peak, afternoon peak, and night off-peak periods. CO emissions were based on the Environmental Protection Agency's (EPA) MOBILE6 emission factor model.

The primary source of particulate matter emissions (a complex mix of solid particles and liquid droplets found in the air) from motor vehicles is **re-entrained road dust** (material resuspended in the air by vehicles) associated with highway sanding in winter. Other direct vehicle sources of PM_{10} include tailpipe exhaust and brake and tire wear. Urban **air toxics,** also known as hazardous air pollutants, are those pollutants that cause or may cause cancer or other serious health effects or adverse environmental and ecological effects. In the Corridor, most air toxics would originate from on-road mobile sources (cars, trucks, or buses).

Visibility is also considered an important resource in Colorado. Impaired visibility affects aesthetic perceptions, recreational experience (particularly in scenic mountain settings), property values, and tourism – but has no quantitative federal standard. The visibility impacts of the project alternatives were analyzed by comparing future (2025) emissions of direct motor vehicle pollutants (tailpipe exhaust plus brake and tire wear) and re-entrained road dust with existing (2000) emissions. Current monitoring indicates very good to excellent visibility in Class I Wilderness Areas. The median Standard Visual Range of over 140 miles for the Eagles Nest Wilderness Area is among the best in the US (USFS 2002).

Environmental Consequences

In March 2001, the EPA issued regulations for the producers of urban air toxics to decrease the amount of these pollutants by target dates in 2007 and 2020. Under these regulations, on-highway emissions of air toxics will be reduced by 67 to 76 percent, and on-highway diesel particulate matter emissions will be reduced by 90 percent.

For CO it is important to note that while some alternatives are rated as resulting in "greatest impact" relative to other alternatives, projected CO concentrations for all alternatives would be less than the National Ambient Air Quality Standards. According to the Air Pollution Control Division of the Colorado Department of Public Health and Environment, CO standards are not currently exceeded in the study area. CO hot spot modeling was completed to determine the "worst-case" CO concentrations in the Corridor. CO concentrations were modeled along I-70 through Idaho Springs. Idaho Springs was selected because of the close proximity of residences and businesses to the highway. Worst-case modeling conditions were based on Saturday traffic volumes in winter and used the highest projected future (2025) traffic volumes for any of the project alternatives. The hot spot modeling was completed according to EPA modeling guidance. The highest modeled 8-hour average CO concentrations were 4.0 to 5.0 ppm for receptors located 20 feet from the edge of the outside travel lane. The 8-hour average CO standard established by EPA is 9.0 ppm. Therefore, no exceedances of federal CO standards would occur in the Corridor for any of the alternatives, including the No Action alternative.

As illustrated in Chart ES - 23 and Chart ES - 24, the Minimal Action, Rail with IMC, AGS, and Dual-Mode and Diesel Bus in Guideway alternatives would have the least impact with respect to CO and re-entrained dust. Note that the overall level of CO emissions would be lower with the Transit and Combination alternatives than that anticipated for the No Action and Minimal Action alternatives. Re-entrained dust for the Transit and Combination alternatives would also be lower than for the No Action alternative. Because the Reversible/HOV/HOT Lanes alternative would address peak travel directions, which allows for greater trip volumes at these peak times, the Reversible/HOV/HOT Lanes alternative is anticipated to result in slightly higher CO emissions. In the case of PM_{10}, the comparison of all alternatives shows that the relative impacts would be similar to those for CO.

A comparison of the impacts of the alternatives on visibility is illustrated in Chart ES - 25. Total daily emissions in 2025 of all pollutants that contribute to visibility impairment would be less than emissions in 2000, although 2025 traffic volumes will be higher. Future emissions of tailpipe exhaust pollutants would be lower because of stricter standards on vehicle emissions and the lower sulfur content of diesel fuel. Therefore, the future impacts on visibility from traffic on I-70 would be less than existing conditions. None of the project alternatives would contribute to any deterioration in visibility in Class I areas.

Note: CO emissions in Chart ES - 23 are a relative comparison. The emissions on a 24-hour basis are modeled from the EPA MOBILE6 air quality model, which provides a relative comparison between alternatives in terms of emissions on a daily basis. These do not represent concentrations. The 8-hour standards apply to concentrations, which are reported separately. All alternatives would fall below the 8-hour standard.

Chart ES - 23. Carbon Monoxide (CO)

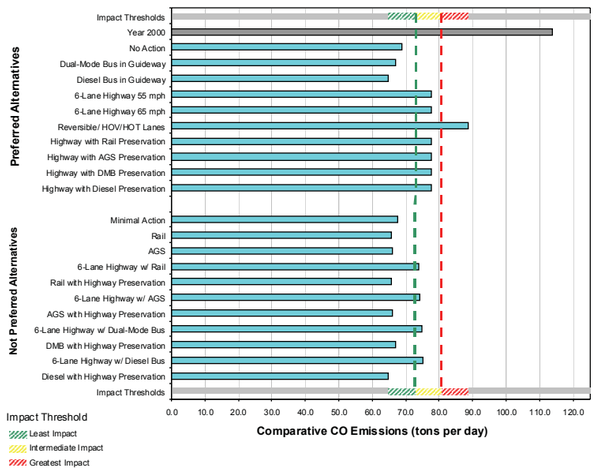


Chart ES - 24. Re-Entrained Dust

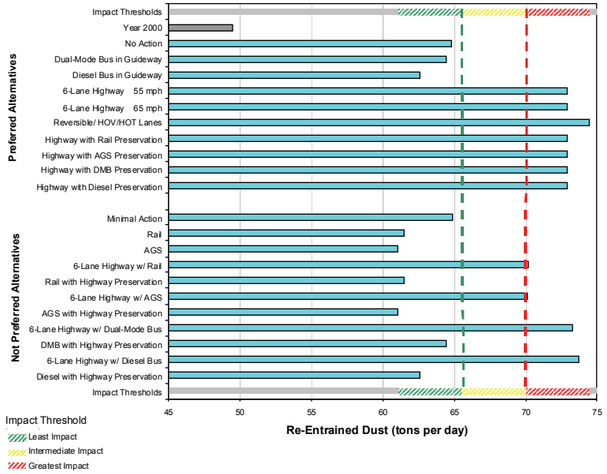
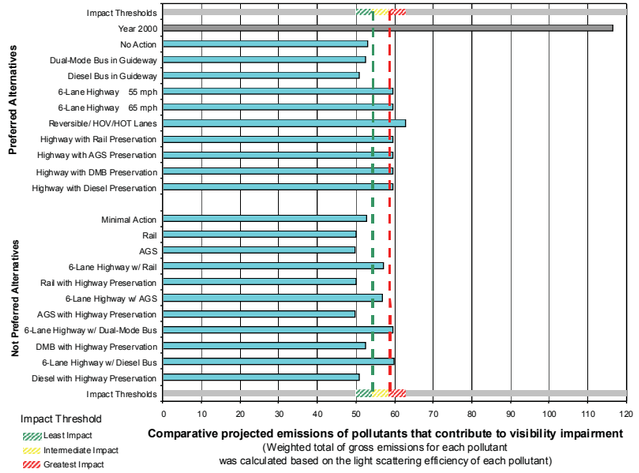


Chart ES - 25. Visibility



Note: While some alternatives are rated as resulting in "greatest impact" relative to other alternatives, all alternatives would fall below the National Ambient Air Quality Standards.

Key Wildlife Habitat and Wildlife Movement

Affected Environment

From an ecological standpoint, the I-70 Corridor presents several complex issues for transportation planning and impact assessment. Project alternatives may affect a wide variety of ecological resources, including but not limited to the following: **wildlife migration patterns; key wildlife habitats,** including summer and winter ranges; and **surface and groundwater systems,** including wetlands and fens. The Corridor contains a diversity of vegetation types that correspond to changes in elevation (approximately 11,200 feet at the west side of EJMT to 6,000 feet at C-470), as well as geographic variability along the 144-mile Corridor. The project area is characterized by "life zones" that differentiate broad changes in vegetation communities with increasing elevation of the mountains (Marr, 1961; Nelson, 1977), and include Foothill, Montane, Subalpine, and Alpine zones. These life zones are characterized by specific vegetation and animal species.

For more information on key wildlife habitat and wildlife movement, see:
- Section 3.2, Biological Resources
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data
- Appendix F, Biological Resources and Wetlands Documentation

The Colorado Division of Wildlife has mapped habitats of **elk, mule deer,** and **bighorn sheep** for areas along the Corridor. Direct and indirect disturbance to these habitats is likely to adversely affect these species, due to planned and induced growth, and due to those areas directly affected by project alternatives. Although elk populations have increased over the last 20 to 25 years, this species is still affected in parts of the Corridor by winter range reduction and disturbance to calving habitat (for example, by recreational users; USFS, 2002). Mule deer populations have been declining, probably in response to management that favors elk and livestock. However, maturation of forest habitats in the absence of frequent fires, and competition for fawning grounds and winter range with elk are also thought to be factors in recent mule deer population decreases (USFS 2002). Bighorn sheep have generally increased through reintroductions into historic habitat, but suitable habitat is limited, and lambing habitat is especially critical to most populations (USFS 2002).

I-70 currently crosses many traditional wildlife movement and migration routes, creating a barrier or restricting wildlife movement and reducing access to critical habitat. These areas are termed wildlife linkage zones. CDOT and FHWA enlisted four other state and federal agencies — CDOW, Bureau of Land Management (BLM), US Forest Service (USFS), and US Fish and Wildlife Service (USFWS) — to participate in a program to address the barrier effect issues of the Corridor. This committee, named the "ALIVE Committee" (A Landscape Level Inventory of Valued Ecosystems), identified wildlife crossings or other mitigation at 14 critical wildlife linkage zones along the Corridor between C-470 and Glenwood Springs, where wildlife movements are impeded by the highway.

Environmental Consequences

Habitat Loss

Impacts on key habitat (deer, elk, bighorn sheep, and quality songbird habitat) are summarized in Chart ES - 26. The potential habitat loss is directly related to the width of the footprint of each alternative, as well as the length of the Corridor over which it would occur. Of the Transit alternatives, the Rail with IMC alternative would permanently affect the most habitats, much of which is key bighorn sheep range. Of the Highway alternatives, the Reversible/HOV/HOT Lanes alternative would affect more habitat than the Six-Lane Highway (55 or 65 mph) alternatives. The widest footprint is associated with the Combination Six-Lane Highway with Rail and IMC alternative; consequently, it would affect the most habitats, with Combination Six-Lane Highway with AGS having the second widest footprint.

As documented in the impact data tables in Appendix B, Transportation Analysis and Data, bighorn sheep key habitat would be affected more than elk or deer by project alternatives; elk would be affected least. High-quality songbird habitat (aspen and riparian forest) also would be one of the least affected of the key habitats analyzed, primarily because much of this habitat type along the Corridor occurs on the Western Slope (aspen) or because riparian habitats were avoided as much as possible in planning the alignments.

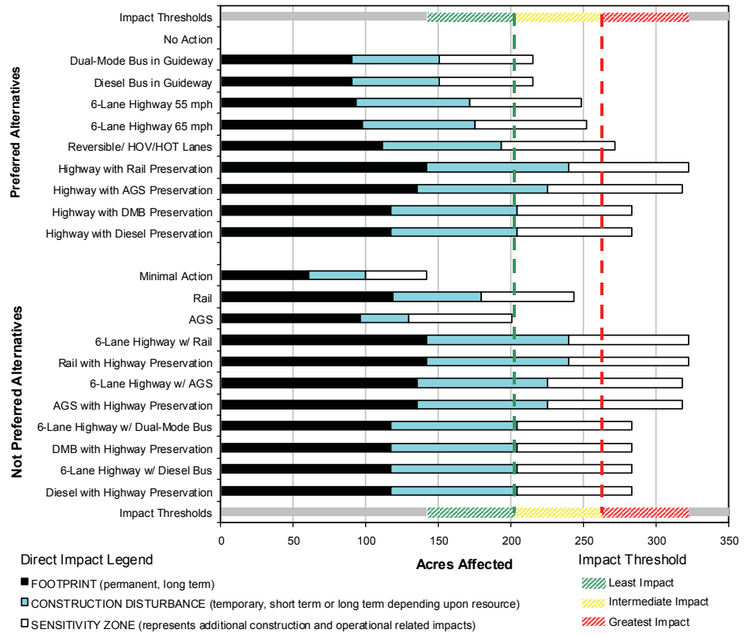
Barrier Effect to Wildlife Movement

Most of the alternatives would increase the barrier effect of I-70. The exception may be the AGS alternative, if additional safety barriers are not required at grade underneath the structure, or gaps are provided for wildlife. Additional highway lanes also would not in themselves create physical barriers as compared to the Rail with IMC, Bus in Guideway, and Combination alternatives, but additional lanes of traffic would increase the barrier effect during high traffic volumes. Measures to reduce the barrier effect and animal-vehicle collisions have been developed by the ALIVE committee. These measures include placing overpasses and underpasses at key locations in linkage interference zones that would allow animals to more easily cross I-70, and installing and repairing wildlife fencing that would reduce contact with vehicles and help channel wildlife to crossing structures. Existing barriers would be altered if they were encountered by an alternative.

Alternatives that would extend through the greatest length of the Corridor (for example, Rail with IMC, AGS, Combination Six-Lane Highway with Rail and IMC, and Combination Six-Lane Highway with AGS) would offer the greatest opportunities to mitigate the existing barrier effects in the linkage interference zones. Therefore, the longer an alternative, the more existing barriers would be mitigated. If an existing barrier were not encountered by an alternative, then the barrier would be altered only through partnering opportunities with other stakeholders. The No Action alternative would have the greatest impacts on wildlife crossings because it is assumed that the existing conflict areas would not be addressed.

Encroachment on wildlife habitat can result in loss or fragmentation of areas sensitive to breeding, rearing of young, and winter concentration. Note that past, present, and future planned development, irrespective of project alternatives, is expected to affect up to 51 percent of large game habitat (deer, 51 percent; elk, 39 percent; and bighorn sheep, 8 percent) within the Corridor.

Chart ES - 26. Impacts on Key Habitats



Threatened and Endangered Species and Species of Special Concern

Affected Environment

Threatened, endangered, and special status (TES) species include the following: species federally listed as threatened or endangered and those that are proposed or are candidates for listing in accordance with the Endangered Species Act (ESA) of 1973 (16 U.S.C. §§ 1531 1544 as amended); species listed by the Colorado Division of Wildlife (CDOW) as threatened, endangered, or as species of concern under the Wildlife Commission Regulations, Chapter 10; and species included on sensitive species lists developed by Region 2 of the US Forest Service (USFS) or by the Bureau of Land Management (BLM). Species identified by the Colorado Natural Heritage Program (CNHP) are also included.

For more information on TES species, see:
- Section 3.3: Threatened, Endangered, and Other Special Status Animal and Plant Species
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data

The I-70 Corridor traverses through important lynx habitat, especially along Vail Pass; however, many areas above 8,000 feet along the Corridor are considered lynx habitat, which could be affected by construction activities. The ALIVE committee focused on designating key wildlife and Canada lynx habitat, characterizing linkage interference zones and wildlife crossings as mitigation in areas common to both key wildlife habitats and lynx habitats. The ALIVE committee and its recommendations are discussed in section 3.2, Biological Resources.

The likelihood of occurrence of each TES animal species initially listed as potentially occurring in the area of potential effect (APE) was determined by the presence of suitable habitat, known distribution records, and relative abundance. Numerous TES animal species were determined to be "unlikely to occur in the APE," and further consideration of these species is not included in the PEIS. The likelihood for each TES plant species to occur in the APE was primarily based on habitat affinities and habitat distribution. The chances of TES plants occurring near I-70 are limited because major highway rights-of-way are typically subject to large amounts of disturbance during construction and subsequent maintenance-related activities that reduce habitat suitability for these species. TES mammal, herpetile (reptile and amphibian), fish, invertebrate, and plant species deemed likely to occur in the APE are described in section 3.3, Threatened, Endangered, and Other Special Status Animal and Plant Species.

Identifying specific locations of TES plant species in the Corridor requires in-depth field surveys of appropriate habitats. Such surveys would occur in conjunction with specific construction plans during Tier 2 studies to avoid areas containing these species. Most of the habitats containing TES species occur in undisturbed areas some distance from the I-70 right-of-way; thus, direct impacts from all of the alternatives are expected to be low.

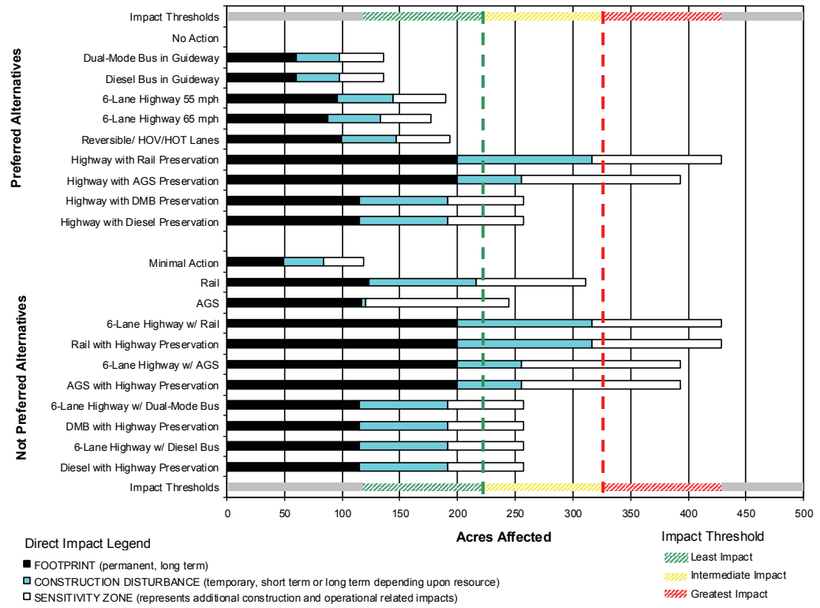
Environmental Consequences

Impacts on TES are summarized in Chart ES - 27.

Direct impacts are quantified based on identified TES habitat within the APE and project alternative footprint/construction disturbance/sensitivity zones. The least direct impacts (outside of No Action) would be associated with Minimal Action (approximately 84 acres of impact) and the Bus in Guideway alternatives (approximately 97 acres). The greatest direct impacts on TES species habitat would be associated with Combination Six-Lane Highway with Rail and IMC (317 acres) and Combination Six-Lane Highway with AGS (256 acres).

Indirect impacts on TES species would include the loss or fragmentation of habitat and the barrier effect of the highway or transit facility that would restrict wildlife movement or reduce access to habitat. The lowest indirect impacts (outside of the No Action and Minimal Action alternatives) would be associated with the Transit alternatives (Rail with IMC, AGS, Dual-Mode Bus in Guideway, and Diesel Bus in Guideway).

Chart ES - 27. Impacts on TES Habitat



Water Quality – Stormwater Runoff

Affected Environment

For more information on water quality, see:
- Section 3.4, Water Resources
- Chapter 4, Cumulative Impacts
- Appendix A: Environmental Analysis and Data
- Appendix G, Water Resources

As the Corridor becomes more urbanized, irrespective of changes to I-70, and natural vegetation is replaced by impervious surfaces such as parking lots, roadways, and buildings, the volume of stormwater runoff is likely to increase, ultimately affecting the stability and characteristics of nearby stream channels. In addition, runoff from developed areas is likely to contain pollutants that can affect the water quality of streams. Sediment from construction sites is the predominant contributor of runoff pollutants from development and urbanization, according to the EPA Nonpoint Source Management Program (EPA 1990).

Section 303(d) of the Clean Water Act requires states to identify waters that do not or are not expected to meet water quality standards with technology-based controls alone. Straight Creek and Black Gore Creek are listed on 303(d) as water-quality-impaired due to sedimentation from I-70 runoff. Three water-resource-related programs were established to gather information on water resources within the Corridor. These programs included the Sediment Control Action Program (SCAP) for Black Gore Creek and Straight Creek, the Stream and Wetland Ecological Enhancement Program (SWEEP), and the Storm Water Quality Monitoring Program.

Environmental Consequences

FHWA has identified typical pollutants in highway runoff that are of concern in the Corridor, including total suspended solids (TSS), phosphorus, chloride, copper, and zinc. Trace metals copper and zinc are two primary metals of concern in Corridor streams due to the sensitivity of coldwater aquatic life to these metals. Stormwater runoff associated with existing I-70 affects water quality within the Corridor. To varying degrees, project alternatives would result in increased impervious surface, causing increased runoff and increased pollutant loads. The potential for increased sedimentation from project alternatives is measured by increases in levels of TSS and phosphorus. Phosphorus loading in water supply reservoirs receiving runoff water from the Corridor is regulated under phosphorus control regulations. These water supply reservoirs include Standley Lake, Bear Creek Reservoir, and Dillon Reservoir. I-70 may also contribute phosphorus loading to these water supply reservoirs via sediment transport processes. A 1998 water quality study of Georgetown Lake, immediately downstream from the town of Georgetown (USGS 2000), concluded that the lake effectively removes chloride, sodium, certain metals (magnesium and manganese), and sediment from Clear Creek. Concentrations of dissolved copper and zinc, however, increase with distance downstream as a result of historic mining influences. Georgetown Lake does not currently have high nutrient levels.

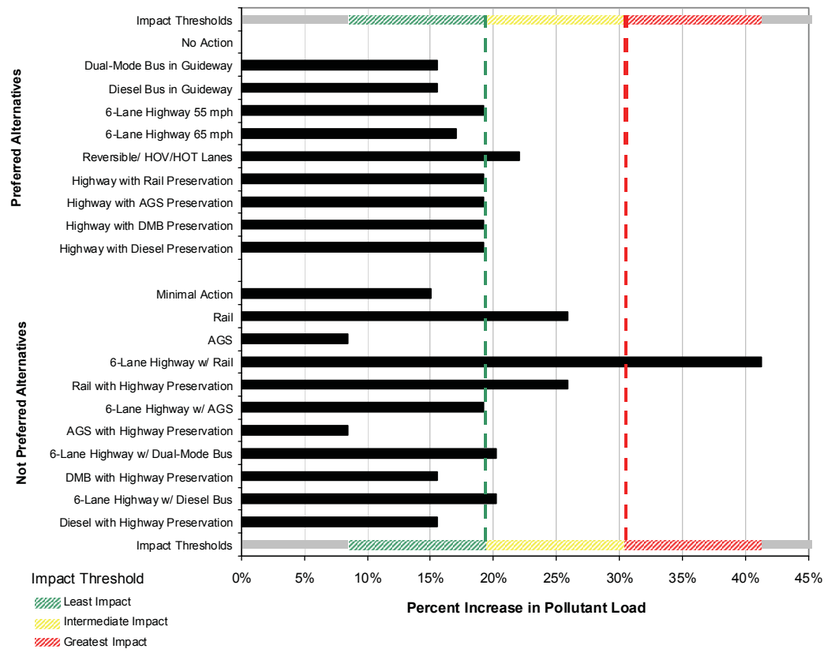
Lower segments of Clear Creek are impaired for certain uses due to heavy metals from abandoned mine runoff. Ongoing monitoring of Clear Creek is required for protection of uses for water supplies, recreation, and aquatic habitat.

The Driscoll model, a FHWA water quality model, was used to determine potential stormwater runoff impacts from project alternatives. Stormwater runoff modeling focused on selected water quality indicators, including TSS, phosphorus, chloride, copper, and zinc. Stormwater runoff impacts from project alternatives were evaluated as percent increase, from existing conditions, in pollutant load for these selected water quality indicators.

Impacts on water quality – stormwater runoff are summarized in Chart ES - 28. Because increases in stormwater load are generally the same for all these pollutants, they are represented by one chart.

AGS would result in the least increase in levels of water quality indicators (8 percent increase in pollutant load). The greatest increase in stormwater impacts would be associated with the Combination Six-Lane Highway with Rail and IMC alternative (41 percent increase in pollutant load). Intermediate stormwater impacts (15 to 26 percent increase in pollutant load) would be associated with all of the other action alternatives.

Chart ES - 28. Impacts on Water Quality – Stormwater Runoff (Increase in Total Suspended Solids, Phosphorus, Copper, and Zinc)



Water Quality – Winter Maintenance

Affected Environment

The Colorado mountain climate is a major factor in the operation and maintenance of I-70 during the winter months, when ice and snow accumulation is prevalent. Snow accumulates at higher elevations in the Corridor throughout the winter and must be removed from the highway to maintain safe mobility. CDOT winter maintenance crews also apply sand and deicers to I-70 to maintain road traction and a safe, ice- and snow-free road surface.

For more information on winter maintenance, see:
- Section 3.4, Water Resources
- Chapter 4, Cumulative Impacts
- Appendix A: Environmental Analysis and Data
- Appendix G, Water Resources

Highway maintenance activities are known to increase sediment (from traction sand application) and contaminants from deicers (such as sodium chloride or magnesium chloride) in runoff to adjacent waterways. This occurs as snowmelt and runoff from precipitation events are drained from the highway and shoulder areas into waterways and streams.

Existing use of sand on I-70 has affected nearby streams and water quality. Section 303(d) of the Clean Water Act requires states to identify waters that do not meet or are not expected to meet water quality standards with technology-based controls alone. Clear Creek and the Eagle River have been listed on 303(d) as water-quality limited due to historic mining activities. Straight Creek and Black Gore Creek are listed on 303(d) as water-quality impaired due to sedimentation from I-70 runoff.

Environmental Consequences

Impact thresholds were established based on the range of impact data divided into three equal parts, corresponding to least, intermediate, and greatest potential for impact.

The increase in winter maintenance materials was estimated based on existing application rates of sand and liquid deicers, and projected increases associated with additional project alternative attributes such as additional highway lanes and transit guideway. Bus guideways are not associated with any increase in sand usage due to maintenance and operations issues; however, increased deicer usage is assumed in order to provide travel safety. This increase was examined for project alternatives in the Eagle River, Blue River, Clear Creek and Upper South Platte watershed areas.

Potential increases in use of traction sand associated with project alternatives are summarized in Chart ES - 29 and increases in use of deicers are summarized in Chart ES - 30. The least increase in sand and deicer usage would be associated with the Rail with IMC, AGS, and Minimal Action alternatives (0 to 8 percent increase in sand, 0 to 8 percent increase in deicer). The greatest increases in deicer usage would be associated with the Bus in Guideway and Combination Six-Lane Highway with Bus in Guideway alternatives. The greatest increase in sand usage would be associated with the Reversible/HOV/HOT Lanes alternative.

CDOT maintenance plans exist for several Corridor areas requiring heightened attention to ensure the mobility and safety levels that the traveling public and communities along the Corridor demand. These plans generally include sediment collection areas to capture sand, preventing it from moving into streambeds. PEIS studies indicate that a 39 to 69 percent reduction in TSS and phosphorus loading could be achieved through sediment control best management practices (BMPs) with all alternatives.

Chart ES - 29. Percentage Increase in Use of Traction Sand

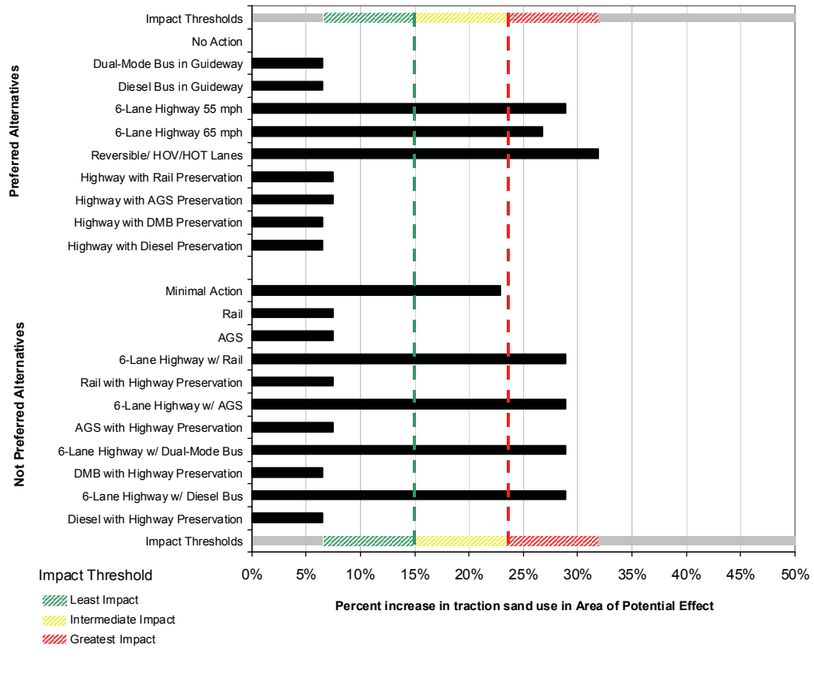
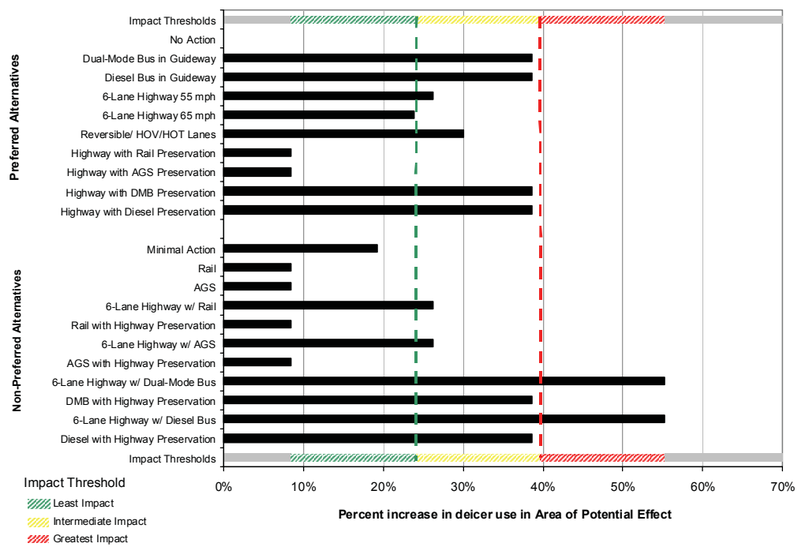


Chart ES - 30. Percentage Increase in Use of Deicer



Fisheries

Affected Environment

Several species of fish inhabit the rivers, streams, and lakes (reservoirs) of the Corridor. Several of these species are considered important recreational species, and some are considered management indicator species by the USFS. The benthic invertebrate communities that are known to inhabit or that may potentially inhabit the Corridor's major watersheds are composed primarily of the major clean-water taxa, including *Ephemeroptera* (mayflies), *Plecoptera* (stoneflies), *Tricoptera* (caddisflies), and *Diptera* (midges). The distribution of these taxa and the number of organisms within each taxon vary in response to the human-generated influences throughout the Corridor.

For more information on fisheries, see:
- Section 3.5, Fisheries
- Chapter 4, Cumulative Impacts
- Appendix A: Environmental Analysis and Data
- Appendix G, Water Resources
- Appendix H, Fisheries
- Appendix K, Overview of Water Availability and Growth, and Forest Service Land Management
- Resource Map 3.5-1, Highly Valued Fisheries and "Gold Medal" Rivers and Streams

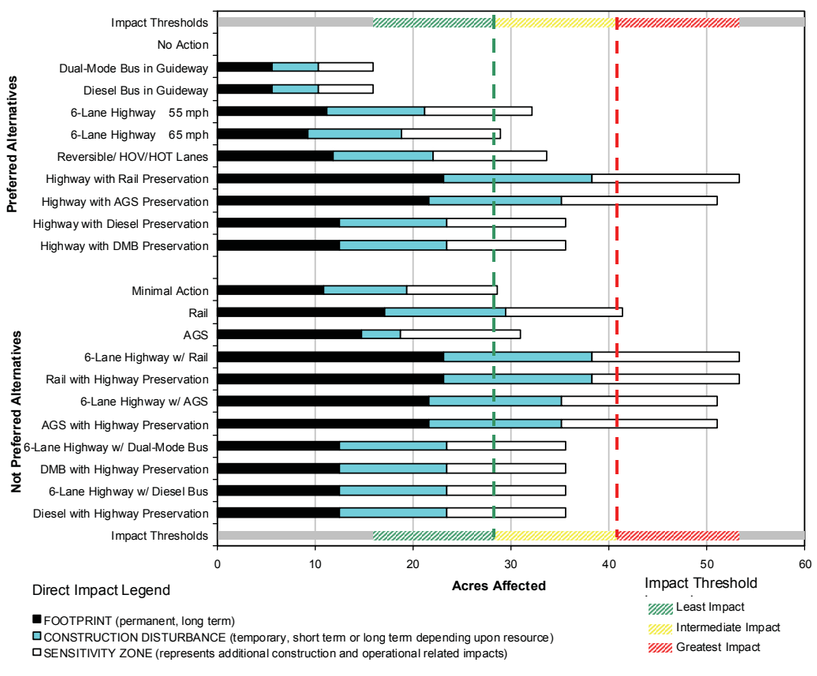
Environmental Consequences

Impacts on fisheries are summarized in Chart ES - 31. Impacts on fish species are examined within each of the Corridor watersheds: Colorado River, Eagle River, Blue River, Clear Creek, Dillon Reservoir, and Georgetown Lake.

The impacts on fisheries were examined in terms of the number of acres of disturbance by each alternative on "high-value" fisheries, Gold Medal fisheries, and species of special concern. Each of these categories was separately identified within the Eagle River, Blue River, and Clear Creek watershed areas. Impacts on fisheries would occur primarily in the Eagle River and Clear Creek watersheds.

The least-ranking direct impact on fisheries (outside of the No Action alternative) would be from the Dual-Mode and Diesel Bus in Guideway alternatives. Direct impacts of Minimal Action on fisheries would rank intermediate among alternatives. The greatest impacts would be associated with the Combination Six-Lane Highway with Rail and Combination Six-Lane Highway with AGS alternatives.

Chart ES - 31. Impacts on Fisheries



Streams

Affected Environment

Historic impacts on water quality and streams are associated with the placer mining technique used extensively along Clear Creek, which decimated the creek, and with the accessibility of transportation routes through the Corridor. The stream valleys adjacent to I-70 have been used for transportation since the 1800s, when wagon roads and railroads were constructed to access the rich ore deposits of the Colorado Mineral Belt.

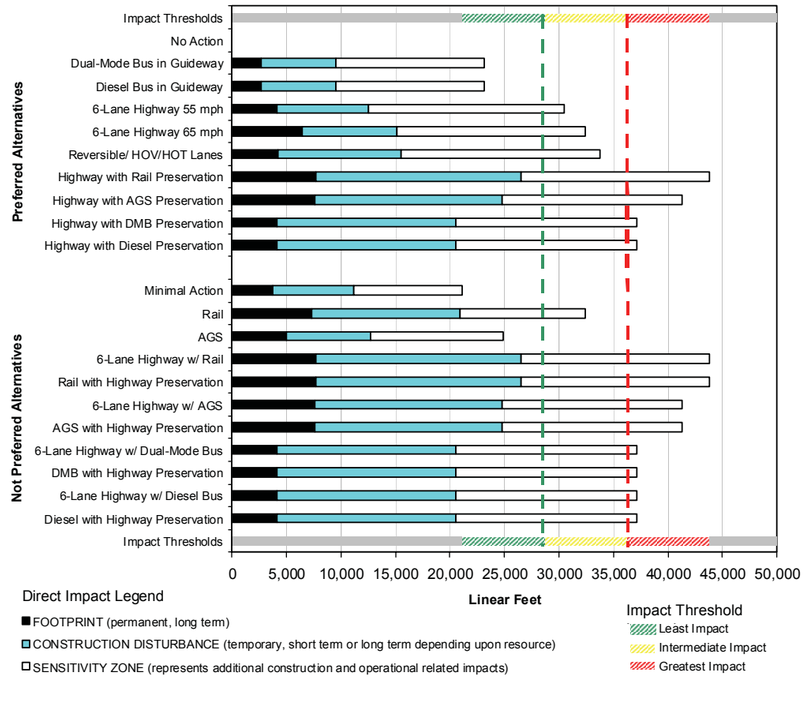
Existing I-70 is primarily located in stream valleys due to the steep terrain and rugged nature of the mountainous environment in the Corridor area. The Corridor's mountain climate is a substantial issue in relation to travel safety and water quality; winter mountain conditions require snow removal and highway winter maintenance using sand or deicers, which can discharge to waterways. Heavy rainfall events that occur in the mountains can cause naturally occurring sediment to collect on highway surfaces, as well as causing sedimentation of streams. The historic construction of I-70 has resulted in channelization of 17 percent of the streams in the immediate vicinity of I-70. Disturbance of stream channels and changes in hydrologic functions would cause additional impact.

Environmental Consequences

Impacts on streams are summarized in Chart ES - 32. Impacts on streams would occur primarily in the Eagle River and Clear Creek watersheds, due to the encroachment of an alternative into adjacent stream channels.

Outside the No Action and Minimal Action alternatives, the least impacts on streams would result from three of the Transit alternatives: Dual-Mode Bus in Guideway, Diesel Bus in Guideway, and AGS. The greatest impacts would be associated with the Combination alternatives. Impacts on streams were calculated in terms of linear feet of streams affected. The total linear distance affected by these alternatives would be in the range of 23,111 to 24,870 feet.

Chart ES - 32. Impacts on Streams



Wetlands

Affected Environment

Wetlands consist of areas that are inundated or saturated by surface- or groundwater at a frequency and duration sufficient to support, under normal circumstances, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (EPA, 40 CFR 230.2).

For more information on wetlands, see:
- Section 3.6, Wetlands, Other Waters of the US, and Riparian Areas
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data
- Appendix F, Biological Resources and Wetlands Documentation·

Fens and fen-like features (seeps and springs) were mapped separately from other wetlands. Springs/fens are wetlands that are afforded special protection because of their rarity and the difficulty of mitigation and restoration. Specially protected fens are most abundant or likely to occur at the higher elevations of West Tenmile Creek, especially near the summit of Vail Pass, and are likely to occur in areas where perennial drainages join West Tenmile Creek.

The steep canyon walls and numerous valleys in the Corridor have necessitated the construction of towns and most highways and roads in areas along stream valleys and adjacent to drainage systems. This has resulted in appreciable changes to the drainage configurations and flow regimes, and losses of wetland area and functional value from fill placement and changes in hydrology. Additionally, winter maintenance activities for Corridor highways and roads include the use of traction sand and deicers, which has caused decreased functional qualities to wetlands due to degraded water quality.

Environmental Consequences

Impact thresholds were established based on the range of impact data divided into three equal parts, corresponding to least, intermediate, and greatest potential for impact.

Although wetlands and other waters of the US along the Corridor may appear to be similar, species composition varies substantially with elevation changes. Potential impacts on wetlands and other waters of the US from project alternatives would include loss or fragmentation of wetland areas, effects from winter maintenance activities (sedimentation and water quality degradation), and changes in hydrology and water quality (such as from inflows, sedimentation, or winter maintenance) on specific wetland functions. Section 404(b)(1) of the federal Clean Water Act requires the identification of the practicable alternative that is least environmentally damaging to aquatic systems, including wetlands. CDOT established a program for resource stakeholders known as Stream and Wetland Ecological Enhancement Program (SWEEP) to identify issues throughout the Corridor. The work of this committee will be especially important during Tier 2 analysis to fully integrate design with water resource needs.

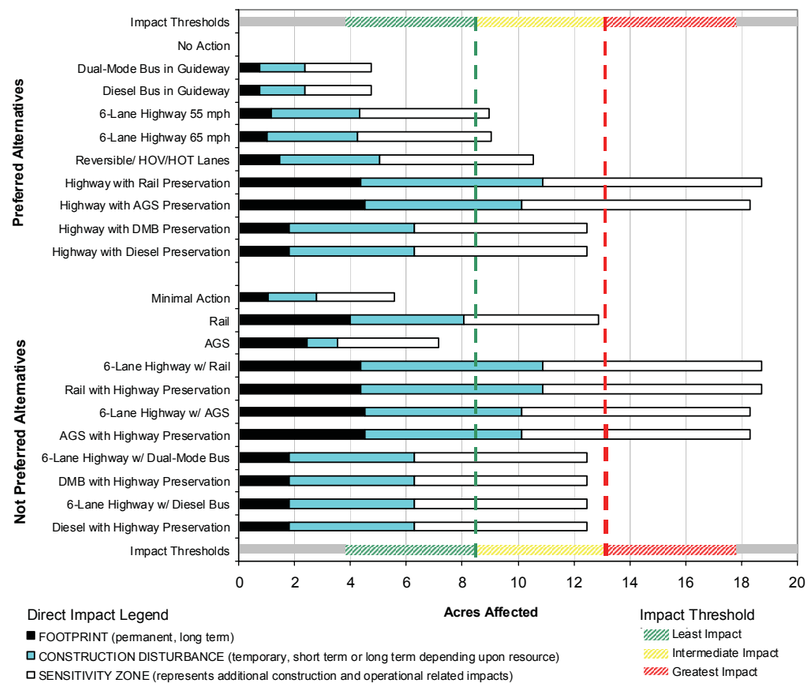
Wetlands

Most wetlands disturbances and impacts would occur in the Clear Creek and Eagle River watersheds. Impacts on wetlands are summarized in Chart ES - 33. The Dual-Mode Bus in Guideway and Diesel Bus in Guideway alternatives would have the least direct impacts on wetlands. The greatest impacts would be associated with the Combination Six-Lane Highway with Rail and Combination Six-Lane Highway with AGS alternatives.

Springs/Fens

Fens are an Army Corps of Engineers (COE) specially protected resource. The USFWS considers fens irreplaceable in this Region, and furthermore, consider that there is no acceptable mitigation of impacts to this resource. Springs/fens would have the most potential to be affected in the Vail Pass area. While some alternatives were calculated to result in small impacts to fens within the footprint, construction disturbance, or sensitivity zone, these impacts are anticipated to be avoidable. See section 3.6 for details.

Chart ES - 33. Impacts on Wetlands



Other Waters of the US

Affected Environment

Other waters of the US are classified as either channel/riverine, navigable waters and their tributaries, or water storage features (CE, 33 CFR 328.3). Other waters exist as open waters of each stream system that occurs along the Corridor, as well as some ponds and lakes (such as Black Lakes Reservoirs).

For more information on other waters of the US, see:
- Section 3.6, Wetlands, Other Waters of the US, and Riparian Areas
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data
- Appendix F, Biological Resources and Wetlands Documentation·

Other waters of the US have been affected by land use development as residential and commercial entities have expanded along with communities. Over the last 40 years, recreational development has included ski areas and, more recently, golf courses. Even if these activities do not directly create impacts on other waters of the US through infilling/displacement, development activities often cause indirect impacts from increased sedimentation and runoff.

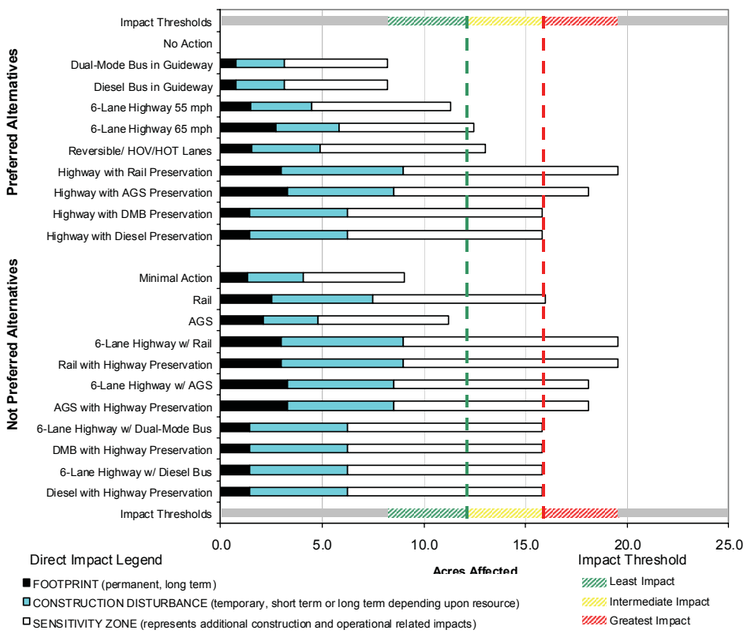
Due to the steep terrain and rugged nature of the central Colorado Rockies, most of the Corridor was constructed in valleys that parallel major streams, including the Eagle River, Black Gore Creek, Gore Creek, Tenmile Creek, Straight Creek, and Clear Creek.

As with wetlands, Section 404(b)(1) of the federal Clean Water Act requires the identification of the practicable alternative that is least environmentally damaging to aquatic systems.

Environmental Consequences

Impacts on other waters of the US are summarized in Chart ES - 34. The No Action, Minimal Action, AGS, Bus in Guideway and Six-Lane Highway 55 mph alternatives would have the least impact on other waters of the US. Note that the Bus in Guideway alternatives would affect fewer acres (8.2) than the Minimal Action alternative. The Combination Six-Lane Highway with Rail and IMC would have the greatest impact on other waters of the US.

Chart ES - 34. Impacts on Other Waters of the US



Riparian Areas

Affected Environment

Riparian areas are on the banks of streams, rivers, ponds, lakes, and springs. Riparian areas are usually transitional areas between wetland and upland and often comprise much of the associated floodplain. They provide critical and unique wildlife habitat areas, which are especially important in arid and semiarid regions.

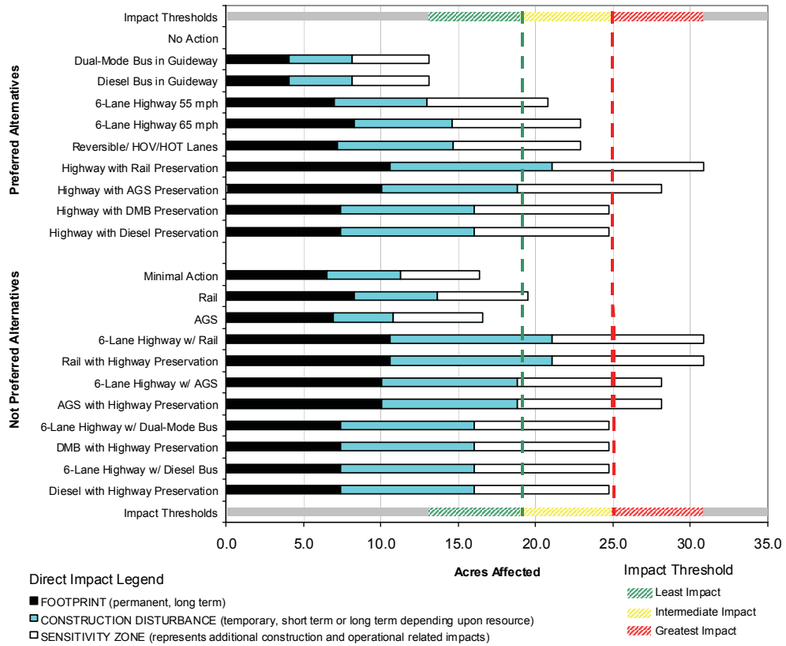
For more information on riparian areas, see:
- Section 3.6, Wetlands, Other Waters of the US, and Riparian Areas
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data
- Appendix F, Biological Resources and Wetlands Documentation·

Environmental Consequences

Impacts on riparian areas are summarized in Chart ES - 35. Possible impacts on riparian areas would be loss or fragmentation of riparian corridors along streams, and changes in the floodplain.

Aside from No Action, the Bus in Guideway, Minimal Action, and AGS alternatives would have the least impact on riparian areas. The Bus in Guideway alternatives would have the least impact besides the No Action alternative, affecting 13.1 acres containing riparian areas. The greatest impacts would be associated with the Combination Six-Lane Highway with Rail and Combination Six-Lane Highway with AGS alternatives.

Chart ES - 35. Impacts on Riparian Areas



Economics

Affected Environment

Tourism is the second largest industry in Colorado, behind manufacturing and ahead of agriculture, and constitutes approximately 12 to 14 percent of Colorado's economy. The Corridor is an integral part of Colorado's tourism economy due to its world-class destinations (ski resorts and national parks). Tourism spending injects approximately $8.3 billion into Colorado's economy annually. Of the $1 billion spent on recreational tourism in the state each year, 35 percent is spent on ski-related recreation (of which the vast majority occurs in the Corridor).

For more information on economics, see:
- Section 3.9, Social and Economic Values
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data
- Appendix J, Social and Economic Values

Population and employment projections for 2025 were developed by the Colorado Department of Local Affairs (DOLA). An economic model, REMI® (Regional Economic Models, Inc.), was applied to forecast the tourism economy of the Corridor region (Garfield, Eagle, Pitkin, Summit, Lake, Grand, Clear Creek, Gilpin, and Park counties).

The Corridor economy is driven by tourism and recreation, resulting in the creation of employment for nearly 125,000 persons and the generation of $4.8 billion in total annual personal income and $1.7 billion in tourism income (DOLA 2000). Five Corridor resorts in Summit, Eagle, Grand, and Pitkin counties (Aspen, Vail, Breckenridge, Snowmass Village, and Winter Park) are ranked in the top seven resorts for the state's tourism retail sales. The tourism industry is the most significant industry/service in the Corridor and generates 41 percent of the jobs and 38 percent of the total income. Eagle, Pitkin, and Summit counties contribute 77 percent of the Corridor's tourism income. Tourism represents 51 percent of these resort counties' employment and 76 percent of their total income.

Environmental Consequences

Indirect economic impacts in the Corridor involve many different factors. The primary factors directly related to I-70 travel were evaluated and include the change in the number of visitors (translated to change in tourism spending) associated with the alternatives (due to an increase or a decrease in travel capacity) and the change in the ability to travel to work and to deliver goods and services (due to an increase or a decrease in travel capacity and travel time/access). See the value of time (VoT) definition below.

These I-70-related factors and variables were used in a REMI® conjoined econometric/input-output model of the nine-county Corridor region to predict economic impacts of the alternatives. The REMI® model incorporates DOLA population and employment projections for the 2025 economic Baseline in developing the basis for projecting demographic and economic impacts using selected indicators including gross regional product (GRP), employment, and personal income. Impacts on GRP are shown on Chart ES - 36. Impacts on employment and personal income are illustrated in section 3.9, Social and Economic Values.

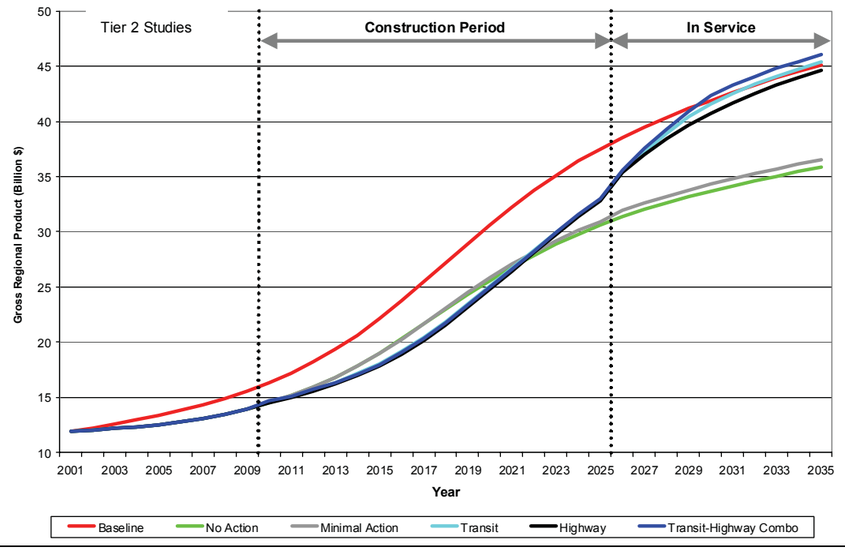
Although consideration of regional construction impacts is included in the REMI® model study, localized project alternative construction impacts are expected to be most prominent in Clear Creek County. Primary construction impacts on Clear Creek County would be localized to I-70 communities (community resident commuters, resident local travelers, and retail businesses). However, because the bulk of the county's population is located along the eastern border of the county, these residents/commuters (and the personal income they generate) are not expected to incur substantial impacts from I-70 construction. Implementation of construction mitigation plans (formulated during Tier 2) would minimize localized construction impacts on I-70 communities.

The No Action and Minimal Action alternatives are not expected to meet (and may fall well below) Baseline economic predictions, based on Colorado DOLA population and employment projections. The other action alternatives are predicted to meet and possibly exceed Baseline economic predictions for the Corridor (nine-county area).

Businesses may be affected by travel delays and decreased access (interference in the delivery of goods and services) if I-70 capacity is not increased. Under the No Action and Minimal Action alternatives, commuters and tourists would be affected by travel delays and decreased access. Such impacts would be reflected in decreases in economic indicators.

Baseline predictions indicate that considerable economic growth could take place between 2001 and 2035. Economic growth in specific counties will be related to overall regional impacts (reflected in economic indicators: GRP, personal income, and employment).

Chart ES - 36. Impacts on Gross Regional Product
(20 Percent No Action Suppression, -5 percent and +10 percent VoT)



Gross Regional Product (GRP) is the total value of new goods and services produced in a year (the regional equivalent of the US Gross Domestic Product). The Corridor region shown on this chart is a nine-county region – Garfield, Eagle, Summit, Clear Creek, Grand, Gilpin, Lake, Park, and Pitkin counties.

VoT (value of time) is reflected in both decreased wages and increased production costs (-5 percent and +10 percent, as used in the analysis). For example, traffic congestion is a major source of wasted time and loss of income for both commuters and travelers who could be doing other things with their time. Traffic delay while commuting to work or traveling to a recreation destination is considered a cost in terms of time taken away from other activities.

Trip suppression. The No Action alternative is assumed to represent suppression of projected 2025 Baseline economic growth due to increased highway congestion and reduced access to recreational and tourist amenities. The degree of suppression is based on transportation model data that provide an estimate of trip suppression based on a range of travel times that travelers are willing to accept. A range of 20 percent to 34 percent No Action suppression of recreation-oriented trips during peak season/peak days was used for the economic analysis.

Visual Resources

Affected Environment

For more information on visual resources, see:
- Section 3.13, Visual Resources
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data
- Appendix L, Visual Resources

I-70 passes through mountainous terrain with dramatic ecological and elevation changes and unique geologic formations, offering views of historic mountain towns and occasional glimpses of wildlife. The 144-mile route from C-470 to Glenwood Springs climbs from an elevation of 6,400 feet above mean sea level (AMSL) to a maximum elevation of 11,000 feet AMSL at the EJMT. Sightseeing and recreation are major activities throughout the Corridor. An I-70 user study survey conducted in the summer of 1999 and winter of 2000 indicated that most trips surveyed in both summer and winter are for recreational purposes. The WRNF and ARNF estimate that between 17 and 37 percent of these trips were for the purpose of sightseeing (USFS 2001). Corridor communities, visitors, and public land managers are dedicated to, and have a vested interest in, protecting the natural beauty along the Corridor.

In this PEIS, the visual characteristics of distinct areas along the Corridor have been described in terms of landform character, vegetation, and community values or sense of place. These discrete areas are called Scenery Analysis Units. Travelers on I-70 experience a wide range of scenery characteristics. The Corridor includes a variety of landscapes that range from mountains and valleys, to canyons, to foothills. While the entire Corridor provides scenic interest, there are specific locations along the highway that are especially impressive and dramatic, and exhibit high scenic integrity. These unique locations across the Corridor are categorized into three types of vantage points:

- **Gateway views** provide a sense of entry or arrival to key portions of the Corridor.
- **Focal point** or dramatic views are dominated by a central identifying feature that provides a notable landmark.
- **Canyon views** are outstanding examples of canyon environments in the Corridor. These areas provide a sense of enclosure and dramatic settings.

Figure ES - 9 depicts Scenery Analysis Units throughout the Corridor, and locations and photographs of key roadway views with high scenic integrity throughout the Corridor. Figure ES - 6 through Figure ES - 8 provide illustrations of three project alternatives in Idaho Springs. Additional illustrations throughout the Corridor are provided in Appendix L, Visual Resources.

Environmental Consequences

Impacts on visual resources are summarized in Chart ES - 37. All project alternatives would result high visual impact in select locations along the Corridor. Visual resources were ranked in terms of miles of greatest visual impact. An impact would occur when the changes resulting from building a particular alternative would result in changes to the visual characteristics of the landscape. Such changes vary in degree: they may or may not attract attention, and may dominate the setting, or be subordinate to it. For this comparison, the ranking of visual impacts is based on those changes resulting in the greatest impacts. Greater visual impacts generally occur when project components result in strong or very strong contrast in proximity to sensitive views. The greatest visual impacts would result from construction of the AGS or Combination Six-Lane Highway with AGS alternatives. The AGS alternative would be a completely elevated system, with piers spaced every 80 to 100 feet. The AGS alternative would result in the greatest extent of high and moderate to high impacts, between Eagle County Airport and C-470. The least impacts on visual resources outside of the No Action alternative would result from construction of the Minimal Action alternative. The Bus in Guideway and Highway alternatives would have among the least impacts on visual resources compared to the other alternatives.

Chart ES - 37. Impacts on Visual Resources

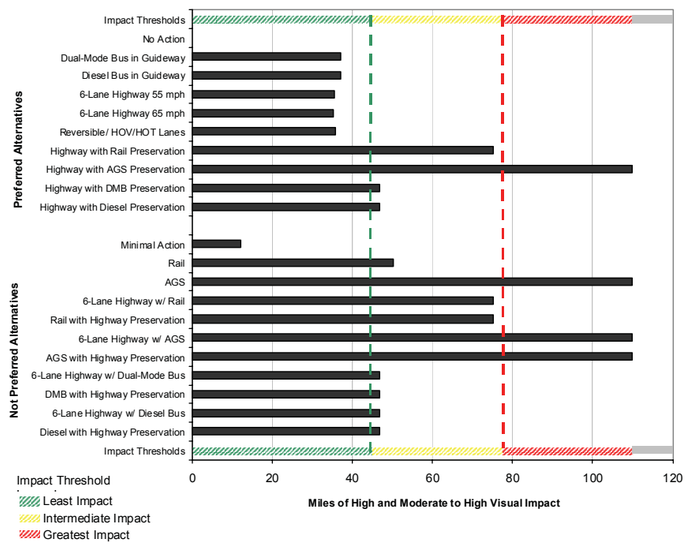
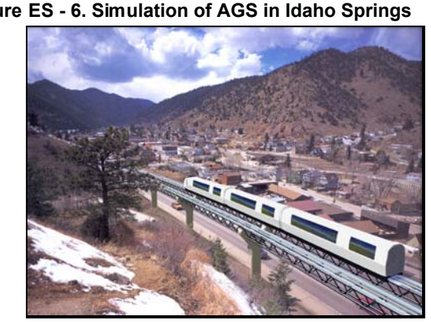
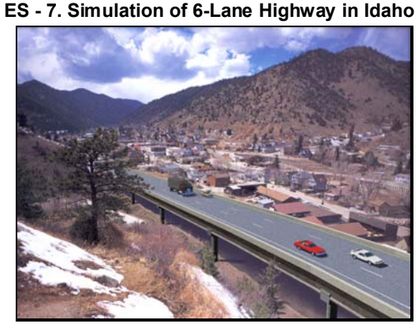


Figure ES - 6. Simulation of AGS in Idaho Springs



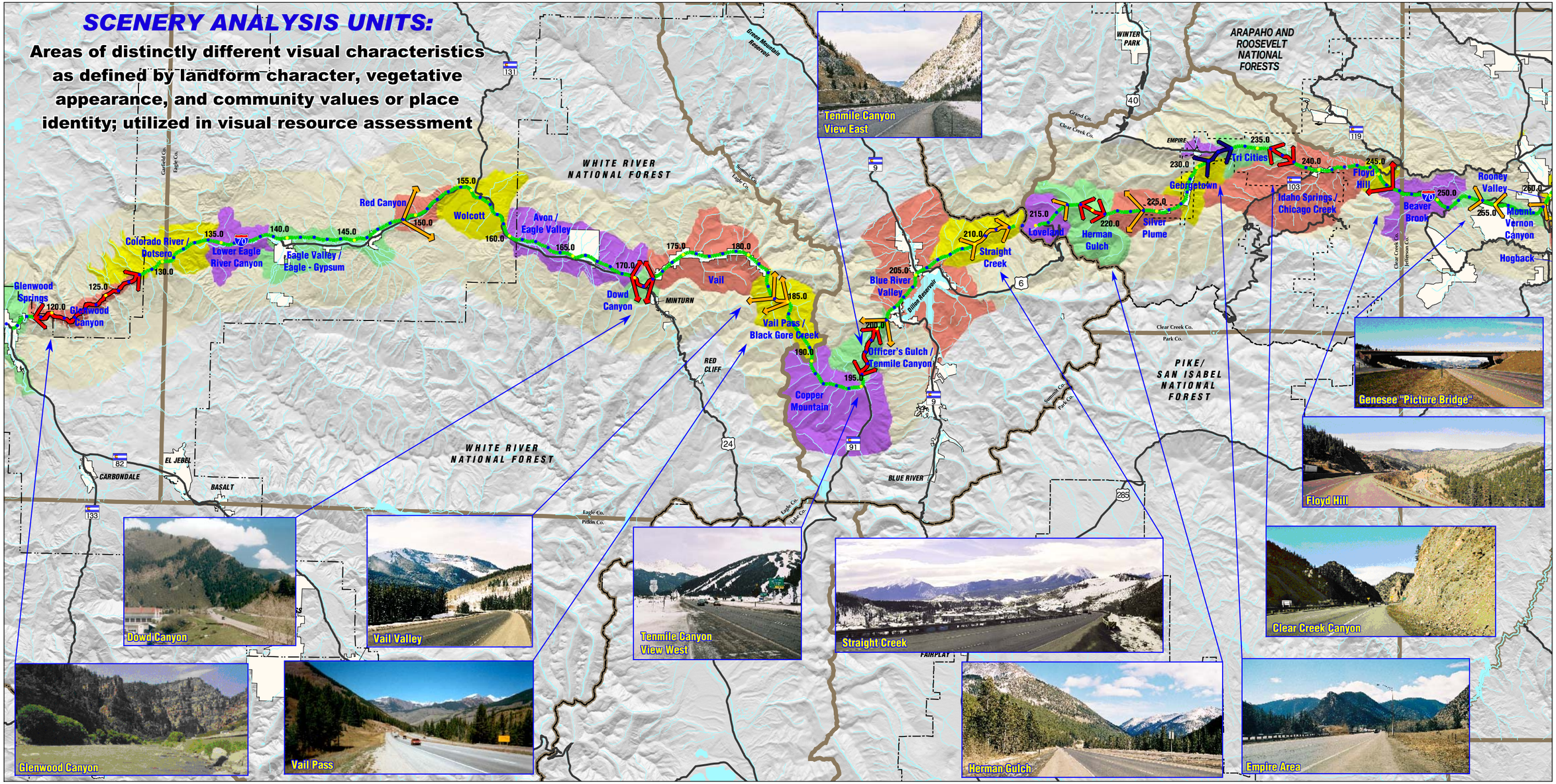
View northwest.

Figure ES - 7. Simulation of 6-Lane Highway in Idaho Springs



View northwest. Three eastbound lanes are visible from this view.

Figure ES - 8. Simulation of Rail with IMC in Idaho Springs



Scenery Analysis Units

Scenic Analysis Units
(Colors visually distinguish units and do not represent rank or visual quality; units are named based upon cultural associations and do not represent jurisdictional boundaries.)

Scenic Views

Focal Views - Dramatic views dominated by a central identifying feature, providing a notable landmark.

Gateway Views - Provide a sense of entry or arrival to key protions of the Corridor.

Representative Views - Provide a sense of the typical natural or cultural character of different sections of the Corridor.

General Features

I-70 Mileposts
I-70
State & Federal Highways
County Boundaries
Cities & Towns

4 0 4 Miles

SCALE - 1:471,000 or 1" = 39,250'

Figure ES-9. Scenery Analysis Units- Corridor Wide

Currently Developed Lands

Affected Environment

The potential area of influence for land use centers on I-70 from Glenwood Springs to C-470, includes communities immediately adjacent to I-70, and extends beyond the immediate geographic area to address indirect consequences of alternatives. This area includes the counties traversed by I-70 (Garfield, Eagle, Summit, Clear Creek, and Jefferson), as well as counties that are adjacent to the Corridor counties (Pitkin, Lake, Grand, Park, and Gilpin).

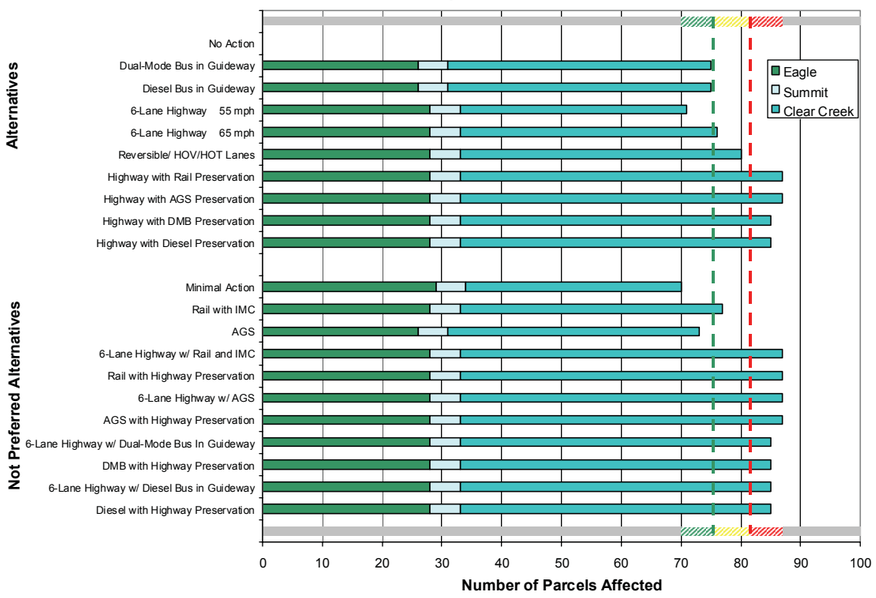
For more information on currently developed lands and right-of-way requirements, see:
- Section 3.10, Land Use
- Chapter 4, Cumulative Impacts

Environmental Consequences

Developed lands may be affected by encroachment and/or disturbance from project alternatives. The degree of impact is based on the number of parcels affected. It should be noted that conceptual interchange footprints are responsible for the greatest portion of impacts on parcels and that Tier 2 design refinements might avoid or minimize these impacts.

Impacts on currently developed lands would be primarily related to property edge encroachment. All alternatives would follow the current I-70 alignment, and during conceptual design, efforts were taken to minimize harm to sensitive resources such as communities. Corridor-wide impacts on currently developed lands would range from 70 properties for the Minimal Action alternative to 87 properties for the Combination Six-Lane Highway with Rail and IMC alternative and the Combination Six-Lane Highway with AGS alternative.

Chart ES - 38. Impacts on Parcels



Right-of-Way Requirements

Affected Environment

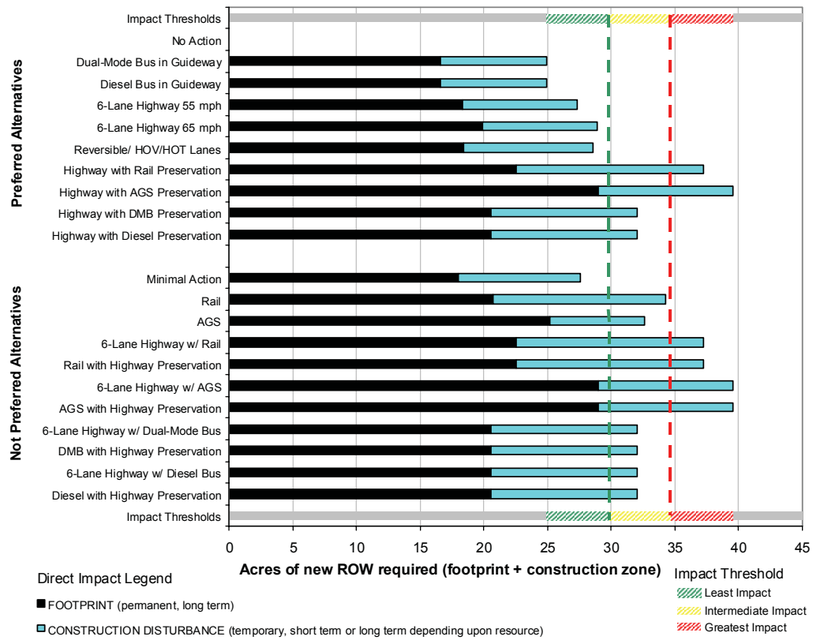
The Corridor consists of lands under several jurisdictions including WRNF, ARNF, BLM, State Lands Board, CDOW, and privately owned lands (municipal and unincorporated jurisdictions). CDOT owns right-of-way through privately owned lands, whereas it occupies an easement through USFS and BLM lands.

Environmental Consequences

The existing I-70 right-of-way and easement are wider than the existing highway footprint; consequently, project alternatives could largely be constructed within the existing right-of-way (or easement as applicable). In select locations, however, project alternatives could require acquisition of additional right-of-way and/or easement, especially at interchange locations. Chart ES - 39 summarizes right-of-way requirements associated with each project alternative. Project alternative footprint/construction disturbance outside the existing I-70 right-of-way would range from 24.8 acres (Bus in Guideway alternatives) to 39.5 acres (Combination Six-Lane Highway with Rail and IMC). The greatest impacts (associated with all alternatives) would be in unincorporated Eagle County.

Total impacts on WRNF lands outside the Designated Utility Corridor easement would range from 0.9 acre (Six-Lane Highway 65 mph) to 5.8 acres (Combination Six-Lane Highway with Rail and IMC). On ARNF lands, all action alternatives, except the Minimal Action alternative, would affect 0.37 acre outside the existing easement in the vicinity of the Loveland Ski Area along the north side of I-70.

Chart ES - 39. Impacts on Right-of-Way



Historic Properties

Affected Environment

Historic Properties and Native American Consultation. The I-70 Corridor area is rich in history and contains many recorded and unrecorded sites and properties of historic significance, such as Toll House (see Figure ES - 10). The historic properties of the Corridor are protected under a series of federal, state, and local laws and regulations, which recognize the values of these properties and the cultural heritage of Native Americans.

For more information on historic properties, see:
- Section 3.15, Historic Properties
- Section 3.16, Section 4(f) Evaluation
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data
- Appendix N, Historic Properties
- Appendix O, Section 4(f) and 6(f) Evaluation — Coordination

The Tier 1 level agency coordination was initiated with the Office of Archaeological and Historic Preservation, State Historic Preservation Officer, Advisory Council on Historic Properties, Department of the Interior, National Park Service, and Colorado Commission of Indian Affairs, through a series of nine historic properties and 4(f)/6(f) committee meetings held between April 2001 and March 2003 (See Chapter 6, Public and Agency Involvement).

The Tier 1 process for historic properties included the following elements:

- A Reconnaissance Survey of the I-70 Mountain Corridor resulted in a file search for the identification of historic sites listed on or eligible for listing in the National Register of Historic Places (NRHP).
- An analysis of potential use of 4(f) properties was conducted by overlaying the footprint and construction disturbance zone of alternatives over the inventoried properties.
- Section 106 consultation was initiated through a series of agency meetings held between January and August 2004 with the State Historic Preservation Officer and staff and the National Park Service. Additional meetings were held with agencies and consulting parties starting in August 2004.
- Coordination also occurred with local agencies through the Mountain Corridor Advisory Committee (MCAC) and with local historic representatives.

Native American Consultation. In April 2001, 16 federally recognized tribes with an established interest in one or more of the counties bisected by the Corridor were contacted. Eleven tribes expressed interest in the project, and nine sent representatives to a January 2002 consultation meeting. A Programmatic Agreement was drafted to formalize the consultation process. The Programmatic Agreement (signatures in progress) is included in Appendix N, Historic Property Survey, Native American Consultation, and Paleontological Resources.

Area of Potential Effect (APE). For the I-70 PEIS, a flexible APE has been defined at this Tier 1 level as a result of coordination with the Committee and consulting parties. Generally, the APE extends up to 3 miles either side of the interstate, to follow ridgelines for the I-70 viewshed area (area from which I-70 can be seen). In addition to individual sites, the APE includes the Georgetown-Silver Plume National Historic Landmark (NHL) District, two additional historic districts and two potential historic areas. Properties identified within the APE included 184 historic properties listed on or eligible for the National Register of Historic Places or the State Register. Fifty-seven of these properties have point numbers directly related to their inclusion in the Georgetown-Silver Plume NHL District. Additional individual properties are also in the Georgetown-Silver Plume NHL District. An additional 29 properties were identified as the result of the windshield survey and local input.

Environmental Consequences

Potential Direct Effects. Direct effects associated with project alternatives were identified for up to 11 historic properties. The number of properties and types of direct effects would vary depending on the alternative. The Rail with IMC and AGS alternatives would have the most potential effects. The Transit alternatives (Rail with IMC, AGS, Dual-Mode and Diesel Bus in Guideway) would potentially damage or alter up to 11 properties. Potential damage or alteration due to Highway alternatives has been identified for up to 12 properties. Potential direct effects due to the Combination alternatives have been identified for up to 12 properties. Detailed discussion of potential effects on historic properties is provided in section 3.15, Historic Properties and Native American Consultation.

Potential Noise Effects. Potential noise-related effects were identified based on the noise analysis presented in section 3.12, Noise. Existing and predicted noise levels were measured at four historic community locations: Silver Plume; Georgetown; Lawson, Downieville, and Dumont; and Idaho Springs. Noise predictions based on alternatives would result in the following increases in noise levels measured in decibels with an A weighting (dbA) as follows:

- Silver Plume: 1 to 4 dB(A)
- Georgetown: 1 to 4 dB(A)
- Lawson, Downieville, Dumont: 1 to 4 dB(A)
- Idaho Springs: 1 to 10 dB(A)

The Highway and Combination alternatives would generate the highest increases in "loudest hour" noise levels. Noise level increases would range from 3 to 8 dB(A) for the Highway alternatives, and from 3 to 10 dB(A) for the Combination alternatives. Where noise level increases of 3 dB(A) would occur, the increase would begin to be perceptible to people in the historic communities, while increases of 5 dB(A) would be noticeable. The addition of location and topography factors greatly increase noise impact potential for Idaho Springs. Noise impacts and mitigation strategies are described in detail in section 3.12, Noise.

Potential Visual Effects. Visual-related potential effects could occur with a change to a property's setting that contributes to its historic significance and/or with the introduction of visual elements that could diminish the integrity of the property's significant historic features. All action alternatives are anticipated to result in impacts ranging from low to high depending on the level of visual contrast anticipated within the setting and the proximity in which it is viewed. The AGS alternative, which would be a completely elevated system, is anticipated to result in the greatest visual impacts throughout the Corridor. The Minimal Action alternative would result in localized changes and changes that do not attract attention and would be subordinate to the setting (weak contrast). The Minimal Action alternative is anticipated to result in the least visual impacts. Additional discussion can be found in section 3.15.3.3.

Conclusions. At the Tier 1 conceptual level of study, direct effects on historic properties (including districts and historic areas) in the Corridor have the potential to be avoided and minimized. Final determination of direct, noise, and visual effects on the significance of historic properties will be made in Tier 2.

Figure ES - 10. Toll House, Mine Manager's House (5CC.13)

Recreation Properties

Affected Environment

The Corridor provides access to recreation sites within publicly owned and federally managed lands of the Bureau of Land Management (BLM), the White River National Forest (WRNF), and the Arapaho and Roosevelt National Forests (ARNF), as well as access to many sites under the jurisdiction of adjacent counties and municipalities.

For more information on recreation properties, see:
- Section 3.14, Recreation Resources
- Section 3.16, Section 4(f) Evaluation
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data
- Appendix M, Recreation Resources
- Appendix O, Section 4(f) and 6(f) Evaluation — Coordination

Skiing and outdoor recreation are two of the top three tourism categories that provide jobs in Colorado. Skiing provides 14.3 percent of all tourism-related jobs, and other outdoor recreation provides 13.1 percent of all tourism-related jobs. More than 4 million trips were made to Colorado in 2001 for the purposes of skiing, outdoor recreation, and resorts (Colorado Visitors Study 2001, Final Report May 2002). Recreational travel is the most predominant contributor to peak I-70 traffic, especially during summer and winter weekends.

Project alternatives have the potential to affect recreation use in the Corridor. Potential effects would include suppressed, relief of suppressed, or induced recreation visitation depending on the associated alternative travel characteristics. With the potential for improved or increased access on I-70 and higher numbers of visitors on public lands comes the potential for a deterioration of resources and visitor experiences. These possible impacts are of particular concern to public land managers, such as BLM, ARNF, and WRNF.

Environmental Consequences

The following potential direct impacts on recreation resources would result from the project alternatives.

All project alternatives, except the No Action and Minimal Action alternatives, would include third tunnel bores at the Continental Divide (EJMT) and Twin Tunnels and would, consequently, affect two recreation resources in close proximity to these tunnels: the Loveland Ski Area and the Scott Lancaster Memorial Bike Path/Colorado Bikeway Route. The third bore at the EJMT would likely require a cut-and-cover tunnel trench that would conflict with the ski run "The Face" at the Loveland Ski Area, and may also conflict with the access tunnel under I-70 that provides return to the base area from the north to the south side of I-70. The approach to the third tunnel bore at Twin Tunnels would require crossing over the Scott Lancaster Memorial Bike Path/Colorado Bikeway Route. One option to be further explored in Tier 2 studies would be to span this trail to mitigate this impact.

The Dual-Mode and Diesel Bus in Guideway alternatives would result in the least impacts on recreation resources, affecting a total of six recreation sites, of which four would be considered temporary impacts. Alternatives with the greatest impacts on recreation resources would include the Combination alternatives, the Rail with IMC alternative, and the AGS alternative, which would affect up to 12 recreation sites.

Potential indirect impacts on recreation resources were evaluated based on predicted increased/decreased national forest destination trips (in relation to USFS projections) to WRNF and ARNF by project alternative. Projections include the following: WRNF Baseline winter RVDs would be 5.13 million, with 8.67 skier visits; Baseline summer RVDs would be 7.10 million. For ARNF, Baseline winter RVDs would be 2.05 million, with 2.37 million skier visits; Baseline summer RVDs would be 4.32 million.

For the I-70 WRNF districts by alternative, the No Action and Minimal Action alternatives are predicted to suppress forest destination trips and affect winter and summer Recreation Visitor Days (RVDs) and skier visits. The Highway alternatives are predicted to slightly increase WRNF nonresident forest destination trips, while the Transit and Combination alternatives are predicted to induce forest destination trips and affect skier visits and winter and summer RVDs by 0.6 million winter trips and 0.5 million summer trips for Transit alternatives, and 1 million winter trips and 0.8 million summer trips for Combination alternatives. Possible induced growth associated with the Combination alternatives is predicted to increase annual resident forest use by 0.3 million winter trips and 0.2 million summer trips in 2025. Possible induced growth associated with the Transit and Combination alternatives would increase pressures on recreational resources.

For the indirect impact analysis for the ARNF, the No Action and Minimal Action alternatives are predicted to suppress RVDs and skier visits. The Highway alternatives are predicted to slightly increase ARNF visitation over Baseline projections, while the Transit and Combination alternatives are predicted to induce forest destination trips and affect skier visits and winter and summer RVDs by 0.21 million winter trips and 0.23 million summer trips for Transit alternatives, and 0.39 million winter trips and 0.43 summer trips for Combination alternatives. Possible induced growth is not indicated for any of the project alternatives in the area of the ARNF (Corridor counties of Clear Creek and Gilpin), and induced resident trips are not expected.

Preliminary 4(f) Properties

For more information on 4(f) properties, see:
- Section 3.14, Recreation Resources
- Section 3.15, Historic Properties and Native American Consultation
- Section 3.16, Section 4(f) Evaluation
- Chapter 4, Cumulative Impacts
- Appendix A, Environmental Analysis and Data
- Appendix M, Recreation Resources
- Appendix N, Historic Properties, Native American Consultation, and Paleontological Resources
- Appendix O, Section 4(f) and 6(f) Evaluation — Coordination

The general approach for the 4(f) analysis appropriate for a Tier 1 analysis was coordinated through a 4(f)/6(f) committee that included the National Park Service, US Forest Service (USFS), Bureau of Land Management (BLM), Advisory Council on Historic Preservation, the State Historic Preservation Officer (SHPO), and the Colorado Commission of Indian Affairs. The committee defined the Tier 1 level of study and the Area of Potential Effect (APE) for historic properties. Coordination also occurred with local agencies through the Mountain Corridor Advisory Committee (MCAC) and with local historic representatives.

The Tier 1 process for 4(f) included the following elements:

- The identification of historic sites, publicly owned public parks, recreation areas, or wildlife and waterfowl refuges, as well as recreational lands where Land and Water Conservation funds (LWCF) were used, was conducted within 3 miles on either side of I-70 throughout the study Corridor.
- A Reconnaissance Survey of the I-70 Mountain Corridor resulted in a file search for the identification of historic sites listed on or eligible for listing in the National Register of Historic Places (NRHP).
- An analysis of potential use of 4(f) properties was conducted by overlaying the footprint and construction disturbance zone of alternatives over the inventoried properties.

Eleven historic properties were found to have a potential 4(f) use, including Hot Springs Historic District, Hot Springs Lodge and Pool, Glenwood Springs Viaduct, Georgetown-Silver Plume NHL District (including Dunderberg Mine and Mendota Mine), Toll House or Mine Manager's House (see Figure ES - 10), Big Five Mines, Darragh Placer, Two Barns in Lawson, and Loveland Ski Area Lease.

Three recreation properties were found to have a potential 4(f) use: Loveland Ski Area, Prospector Trail and USFS Visitor Center Parking Lot/Trailhead, and Charlie Tayler Water Wheel Park.

The alternatives advanced for analysis in the PEIS have been selected through screening and alignment studies, as described in Chapter 2, Description and Comparison of Alternatives, which took into consideration the potential use of 4(f) resources. As documented in section 3.16, Section 4(f) Evaluation, the preliminary design of alternatives and determination of use of 4(f) resources considered all possible planning to minimize harm to the extent that the level of detail available at this Tier 1 stage allows. During subsequent Tier 2 NEPA studies, avoidance, minimization of harm, and mitigation measures will continue to be investigated.

By placing the alignments of alternatives along the existing I-70 alignment, the use of 4(f) properties would be minimized. There is the potential for use under Section 4(f) of up to 13 properties, of which 3 are recreation properties and 11 are historic properties. One of these 13 properties, the Loveland Ski Area, is both a recreation and a historic property and is included in both tallies.

Noise

Affected Environment

Potential increases in noise from alternatives were evaluated as to their impact on various receptors (such as residential, recreational, and cultural). Noise is most commonly described on the decibel scale, which ranges from 0 decibels (dB) (threshold of audibility) to 140 dB (threshold of pain). In addition to level or loudness, sound has a frequency component (pitch). An "A-weighting" network was developed and is applied to measured or predicted noise levels to simulate the relative response of the human ear to frequency. Resulting noise levels are expressed as dB(A).

For more information on noise, see:
- Section 3.12, Noise
- Appendix A, Environmental Analysis and Data

Increased traffic is generally associated with an increase in noise level around highways. Noise from short-duration spikes is an issue of concern, particularly noise from truck traffic, including unchecked engine brakes ("jake brakes") Due to the steep grades of I-70 in much of the Corridor, engine braking is common. Today, more than 70 percent of trucks are equipped with an engine brake, and more than 80 percent of the trucks being produced have them. When engaged, these brakes utilize pressure from the truck's engine to slow the vehicle. Engine brakes do not have a separate exhaust, so the noise produced by the braking system is vented though the truck's standard muffler. Engine brakes are considered a key safety component, particularly in the Corridor. Given this, the key to reducing the noise from engine brake use is the inspection of and maintenance of standard mufflers on all large trucks.

Environmental Consequences

The proposed transportation improvements will increase noise levels in the Corridor. The increase at any one location is dependent on changes to the source of noise (for example, the addition of a rail system and/or the increase in the number of highway lanes), and on topography (for example, the proximity and relative elevation of homes and businesses to the transportation system, the presence of barriers, and the presence of cliffs).

Three (3) decibels is the threshold where a change in noise levels begins to be perceptible. Table ES - 3 summarizes predicted noise levels at seven locations throughout the Corridor. Noise levels were predicted for the "loudest hour" at a distance of 250 feet. This table provides general quantitative information by alternative for the seven Corridor locations mapped and discussed in this section.

Table ES - 3. Predicted Noise Levels

Area (West to East)	Alternative	Existing "Loudest Hour" Noise Level 250 Feet from Center of I-70 (dB(A))[1]	2025 "Loudest Hour" Noise Level 250 Feet from Center of I-70 (dB(A))	Comments
Dowd Canyon	No Action	60	62	Assumes transit on existing RR line
	Minimal Action		62	
	Rail with IMC		67	
	AGS		63	
	6-Lane Highway (55 mph) and Reversible/HOV/HOT Lanes		63	
	6-Lane Highway (65 mph)		Decrease*	
	Combination 6-Lane Highway with Rail and IMC		68	
	Combination 6-Lane Highway with AGS		63	
Vail	No Action	65	67	Assumes transit in median
	Minimal Action		67	
	Rail with IMC		69	
	AGS		68	
	Combination 6-Lane Highway with Rail and IMC		**	
	Combination 6-Lane Highway with AGS		**	
Dillon Valley (Assumes construction of noise wall)	No Action	59	60	All alternatives would be behind the existing noise wall
	Minimal Action		60	
	Rail with IMC		61	
	AGS		60	
	Dual-Mode Bus in Guideway		60	
	Diesel Bus in Guideway		61	
	Combination 6-Lane Highway with Rail and IMC		**	
	Combination 6-Lane Highway with AGS		**	
Silver Plume	No Action	57	58	Assumes existing noise wall remains or is rebuilt
	Minimal Action		58	
	Rail with IMC		59	
	AGS		58	
	Dual-Mode Bus in Guideway		58	
	Diesel Bus in Guideway		59	
	Highway Alternatives		60	
	Combination 6-Lane Highway with Rail and IMC		61	
	Combination 6-Lane Highway with AGS		60	
Georgetown	No Action	53	54	Location analyzed is 350 feet from center of I-70, near the Loop RR depot in Georgetown
	Minimal Action		56	
	Rail with IMC		55	
	AGS		54	
	Dual-Mode Bus in Guideway		54	
	Diesel Bus in Guideway		55	
	Highway Alternatives		56	
	Combination 6-Lane Highway with Rail and IMC		57	
	Combination 6-Lane Highway with AGS		56	
Lawson, Downieville, and Dumont	No Action	65	66	Assumes transit in median
	Minimal Action		66	
	Rail with IMC		67	
	AGS		66	
	Dual-Mode Bus in Guideway		66	
	Diesel Bus in Guideway		67	
	Highway Alternatives		68	
	Combination 6-Lane Highway with Rail and IMC		69	
	Combination 6-Lane Highway with AGS		68	
Idaho Springs	No Action	65	65	
	Minimal Action		65	
	Rail with IMC		67	Assumes structured elements
	AGS		66	
	Dual-Mode Bus in Guideway		66-72	
	Diesel Bus in Guideway		67-72	
	Highway Alternatives		68-73	
	Combination 6-Lane Highway with Rail and IMC		69-75	
	Combination 6-Lane Highway with AGS		69-75	
	Combination 6-Lane Highway with Bus in Guideway		69-75	

[1] *Values modeled for year 2000 using year 2000 data, for the purpose of providing an appropriate comparison point.*

* *Noise levels would decrease. The amount of reduction would depend on what becomes of the abandoned section of I-70.*
** *No highway improvements in this area; therefore, the "loudest hour" noise level would be the same as the single-mode alternative.*

Energy

Affected Environment

Energy would be used during construction of transportation facilities as well as during their operations. The energy that is used in the construction of various facilities is inclusive of the manufacture and transport of materials and equipment comprising each alternative, as well as the operations of construction equipment. Operational energy consumption is the amount of fuel and electricity used to power the vehicles using the transportation facility.

Environmental Consequences

Impacts on energy are summarized in Chart ES - 40 and Chart ES - 41, which provide the following:

- Change in Operational Energy Consumption Relative to No Action
- Change in Operational Energy Cost Relative to No Action

Construction impacts are the direct result of the operation of construction equipment as well as delivery of materials to the site. The No Action, Minimal Action, Six-Lane Highway 65 mph, and Reversible/HOV/HOT Lanes alternatives are anticipated to have the lowest total construction energy consumption. AGS, Combination Six-Lane Highway with AGS, and Combination Six-Lane Highway with Rail and IMC alternatives are anticipated to have the highest total construction energy consumption.

Total operational energy consumption of each alternative is compared as a percentage increase to the operational energy consumption of the No Action alternative (see Chart ES - 40). The variation in total operational energy consumption between the alternatives, as compared to the No Action alternative, would range from 1 percent lower than No Action to 15.5 percent higher. The Rail with IMC and AGS alternatives are each anticipated to consume 1 percent less energy than the No Action alternative. The Diesel Bus in Guideway and Combination Six-Lane Highway with Diesel Bus in Guideway would have the largest increases in operational energy consumption, being 10 percent and 15.5 percent higher, respectively, than the No Action alternative.

Chart ES - 41 gives estimated operational energy costs associated with each alternative, based on unit cost rates of $0.10 per kilowatt-hour of electricity, $2.278 for diesel fuel, and $2.007 for gasoline, as reported on November 1, 2004 for the Rocky Mountain Region by the US Department of Energy, Energy Information Administration. The differences in percentages relative to the No Action alternative when comparing energy consumption against energy costs result from variations in electrical vs. diesel/automotive fuel usage (and their different unit costs) between the alternatives. As illustrated in Chart ES - 41, the cost of alternatives that require diesel or automotive fuel would exceed the cost of systems that operate with electrical power.

This analysis does not take into consideration provisions for actually supplying the required energy in terms of fuel distribution; it was simply assumed that buses would be fueled at garages supplied by a fuel distributor. However, it does include provisions for high-voltage power transmission capacity through placement of transmission lines and appropriately spaced substations along the Corridor. The energy required to increase the overall generating capacity within the power grid, should that be required, was not taken into consideration. Also, Bus in Guideway would include transporting passengers to their final destinations. Passengers on AGS and Rail would only be transported to a station, so the extra fuel cost to transport these travelers to their final destination is not included in Chart ES - 41.

Chart ES - 40. Change in Operational Energy Consumption Relative to No Action

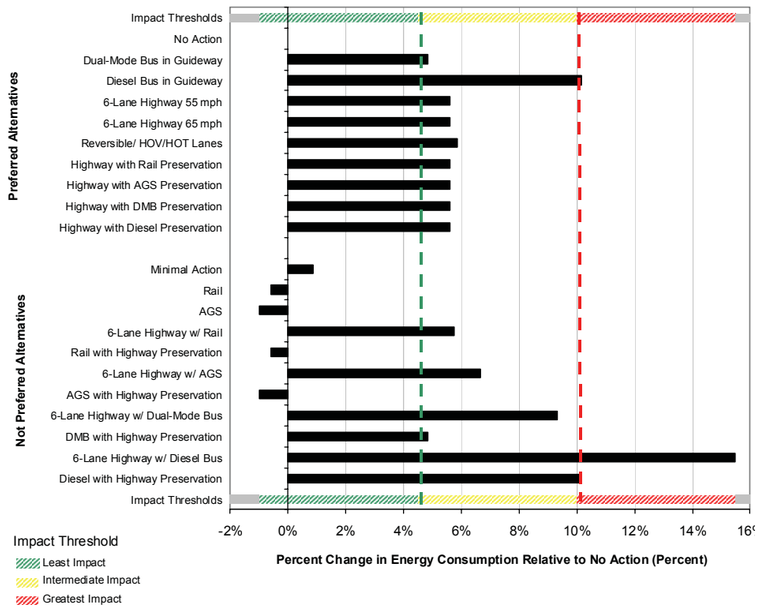
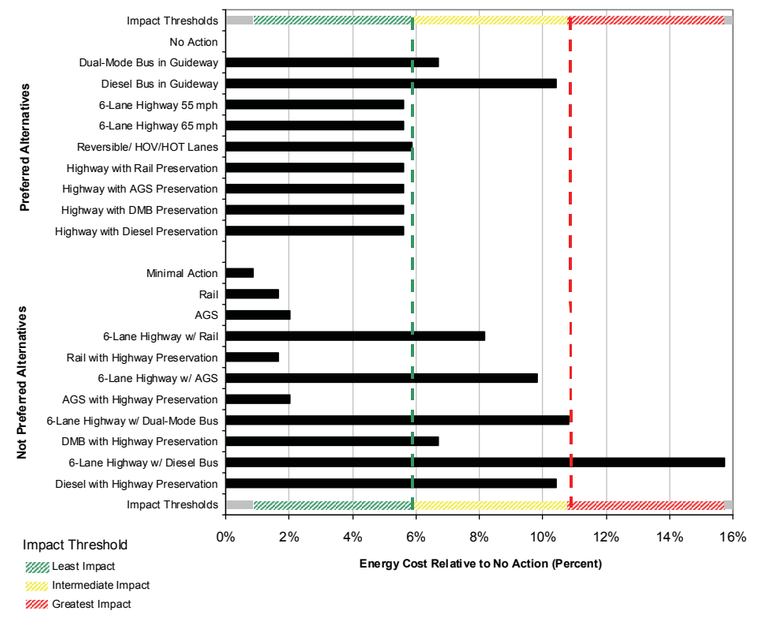


Chart ES - 41. Change in Operational Energy Cost Relative to No Action



Construction Impacts

Introduction

At this Tier 1 level of analysis, only broad assumptions regarding the construction of alternatives have been developed. This section provides assumptions on timing for construction, construction phasing and traffic management, and potential construction impacts. Environmental impacts associated with construction activities are described in Chapter 3.

Key Assumptions for Construction Timing, Phasing, and Traffic Management

The PEIS has established the following interrelated assumptions at the Tier 1 level:

- Construction of any alternative retained for full evaluation in the PEIS would be accomplished between the years 2010 and 2025. Implementing this assumption would necessitate completing Tier 1 and Tier 2 NEPA requirements and a meaningful amount of design work before 2010, so that some construction of a selected alternative from the ROD could start by 2010.
- Construction of any alternative would be phased in such a manner that the operation of the existing highway would be maintained throughout construction, although some limited interruptions to traffic could be expected during off-peak hours of operation. It is essential that traffic be managed through peak travel periods and seasonal conditions to meet the 15-year construction timeframe.
- Construction would be phased in a manner that prioritizes those areas of the Corridor that have the greatest need or add utility to the transportation system.

Overview

There would be a wide range of impacts in terms of potential traffic disruption and overall mobility along the corridor as a result of the construction of alternatives. These impacts would typically be directly correlated with the overall width of the construction footprint, although there will be exceptions to this premise. For example, construction of certain Minimal Action components such as local curve safety modifications, auxiliary lanes, or interchange improvements could cause short-term, site-specific traffic disruption.

Specific construction techniques and traffic management schemes would be developed during Tier 2 NEPA studies, project design, and construction planning. Other factors not taken into consideration at Tier 1 include availability of labor and materials resources. This discussion focuses on the broader implications of alignment, construction footprint, major structures (long bridges, tall retaining walls), and construction traffic control strategies associated with alternatives.

As indicated in the assumptions above, a premise of this study is that the highway would remain operational throughout the anticipated construction timeframe. This would require avoiding lane closures or reductions in the normal number of through lanes during peak travel times. During off-peak travel periods, reductions in the number of lanes, or even temporary total closures of the highway, would be inevitable due to construction activities that cannot reasonably and safely be accomplished any other way. Managing traffic during all stages of construction would be subject to detailed planning, including community involvement.

Comparative rankings of construction duration and potential traffic disruption are provided in Table ES - 4.

Table ES - 4. Comparison of Construction Duration and Potential Traffic Disruption

	Transit Alternatives					Highway Alternatives			Combination Highway/Transit Alternatives			
	1	2	3	4	5	6	7	8	9	10	11	12
	No Action Alternative	Minimal Action Alternative	Rail with IMC	Advanced Guideway System	Dual-Mode Bus in Guideway	Diesel Bus in Guideway	6-Lane Highway 55 mph	6-Lane Highway 65 mph	Reversible/ HOV/HOT Lanes	6-Lane Highway with Rail and IMC	6-Lane Highway with AGS	6-Lane Highway with Dual-Mode Bus in Guideway	6-Lane Highway with Diesel Bus in Guideway
										9 – Build Combination simultaneously	*10 – Build Combination simultaneously*	*11 – Build Combination simultaneously*	*12 – Build Combination simultaneously*
										9a – Build Transit and Preserve for Highway	*9a – Build Transit and Preserve for Highway*	*9a – Build Transit and Preserve for Highway*	*9a – Build Transit and Preserve for Highway*
										9b – Build Highway and Preserve for Transit	*9b – Build Highway and Preserve for Transit*	*9b – Build Highway and Preserve for Transit*	*9b – Build Highway and Preserve for Transit*
Construction Duration and Impact	1	1	2	2	3	3	3	3	3	3	3	3	3
										2	2	3	3
										3	3	3	3

Legend

Least construction impacts
Intermediate construction impacts
Greatest construction impacts

Cumulative Impacts

Cumulative impacts occur when the direct and indirect effects of the alternatives are considered in relationship to the other past, present, and reasonably foreseeable future impacts on the Corridor. Cumulative impacts on resources have been identified in proximity to I-70, as well as to the surrounding region. Many of the cumulative issues would be regional in nature, related to impacts from induced growth resulting from induced travel demand in the Corridor, as described in Chapter 4, Cumulative Impacts Analysis.

The Geographic Scope. The analysis of cumulative impacts encompasses the portions of the Eagle River, Blue River, and Clear Creek watersheds adjacent to I-70, for resources that are within the influence of future land use. In addition, cumulative effects to the regional economy and employment from alternatives are addressed within a nine-county region, including Garfield, Eagle, Pitkin, Summit, Lake, Park, Grand, Gilpin, and Clear Creek counties.

The Timeframe. The cumulative impact analyses extend from before construction of I-70, including the influences of historic mining, to future projections in 2025 or beyond. Social and economic values indicators are projected to 2035 to allow for extended influences on economic indicators beyond the construction period, planned to end in 2025. Timeframes analyzed include the following: before construction of I-70, the 15 years since the construction of I-70 (1985 to 2000), current (2000 or later), and projected future (2025 to 2035).

Corridor populations in mining areas have experienced "boom and bust" cycles from the 1850s to the 1890s. Access provided by the initial construction of I-70 spurred Corridor population growth from the late 1950s to the current time. Past trends in Corridor population growth and I-70 traffic are demonstrated in section 3.9 and Appendix J, Social and Economic Values.

Growth Effects. Corridor counties (nine-county area) are projected to grow by 100 percent from 2000 to 2025. Past trends in Corridor population growth and I-70 traffic are evident, based on population and Average Annual Daily Traffic (AADT) data since 1985, as described in section 3.9, Social and Economic Values. Eagle and Summit counties would be the most sensitive to population growth in relation to I-70 traffic growth. For example:

- In Eagle County, the Combination alternatives would induce up to a 100 percent increase in expected growth (2000-2025).
- In Summit County, Combination alternatives would induce up to a 65 percent increase in expected growth (2000-2025).
- In Clear Creek County, induced traffic from alternatives would not be expected to induce growth, based on past trends growth.

Land Use Changes. Corridor land use before I-70 construction was predominantly associated with the affects of early tourism, mining, and agriculture. I-70 has influenced growth and changes in land use patterns in the Corridor over the past 30 years. Changes in future travel demand would continue to affect land use in the region. Through coordination with local planners, the following assumptions were made regarding the distribution of induced growth:

- Transit alternatives would be expected to concentrate induced growth in urban areas surrounding transit centers in areas of existing or planned urban development.
- Highway alternatives would be expected to distribute growth based on existing trends for urban/rural development in each county, resulting in increased densities in rural areas of the Eagle and Blue River watersheds.
- Combination alternatives would divide the above two scenarios, also resulting in increased pressure on areas planned for rural development.
- Although Transit alternatives would have greater potential for induced population growth than the Highway alternatives, increased acreage impacts are expected to be less than those of the Highway alternatives due to the assumption that transit-related growth would take place in higher density existing and planned urban areas.

Summary of Cumulative Impact Issues and Impacts

The following environmental receptors were analyzed for their cumulative impacts. Listed with each resource are issues that were identified through a review of the lingering influences of past actions, present impacts, and induced growth effects from alternatives, as well as a summary of the cumulative impacts on each resource.

Air Quality

Issues. Possible cumulative effects from project alternatives were identified as increased emissions due to increased congestion and/or vehicles on I-70, increased winter maintenance and sanding, and increased emissions due to possible induced growth. This includes dust and particulates from I-70 winter maintenance, visibility, and emissions.

Impacts. Air quality parameters evaluated include CO, PM_{10}, $PM_{2.5}$, NO_x, nitrogen, SO_2, re-entrained dust, and air toxics (see section 3.1, Climate and Air Quality, and Appendix A, Environmental Analysis and Data). While cumulative impacts from re-entrained dust may occur, they are considered minimal because highway maintenance improvements and woodburning controls are expected to control re-entrained particulate matter. Cumulative impacts from vehicle emissions are not anticipated because emissions from mobile sources have decreased since 1970 due to reformulated gasoline and modern emission controls, and are expected to decrease in the future due to stricter regulatory standards and requirements.

Wildlife and Threatened, Endangered, and Special Status (TES) Species

Issues. I-70, human population centers, increasing development, and human intrusion act as barriers to wildlife that historically crossed the Corridor in their migration or daily movements to access key habitats that supply forage or prey, cover, and water; to repopulate additional areas; and to fulfill breeding and young-rearing requirements. Transportation corridors and the communities that have developed have been a prominent cause of habitat fragmentation in the Colorado mountains in general (WRNF 2002). Mountain valleys that contain important habitats and serve as wildlife migration and movement pathways are often subject to development. Cumulative impact issues include habitat loss, collisions, increased barrier impacts, effects of winter maintenance, and effects on high-value fisheries. The most important wildlife cumulative effects issues associated with project alternatives would include planned development in the Corridor, possible induced growth associated with alternatives, fragmentation of habitat, and barrier effects to wildlife movement.

Impacts. The No Action alternative would not address the existing barrier issues. Transit alternatives may increase Corridor impacts slightly (additional increase of less than 5 percent from expected habitat changes), due to possible induced growth (centered in urban areas) in the Eagle River watershed.

Highway alternatives have the potential to increase Corridor impacts moderately (additional increase of 1 percent to 22 percent from expected habitat changes) due to possible induced growth (in both urban and rural areas) in the Eagle River watershed.

Combination alternatives would have the greatest increase in Corridor impacts (additional increase of 3 percent to 39 percent from expected habitat changes), due to possible induced growth (in both urban and rural areas) in the Eagle River and Blue River watersheds.

Wetlands

Issues. The cumulative effects of stream channelization from highway construction and development within the Corridor have resulted in urbanized waterways and changes in stream morphology, including loss of wetlands and loss of functional value. Wetlands are often confined to narrow areas along the stream bank. Several streams along I-70 have these characteristics, especially as they pass through urbanized areas. The consequences of changes to stream channel morphology are generally long term and can translate into long-term potential cumulative impacts on wetlands.

Cumulative impact issues include loss of wetlands and decreases in functional value from changes in hydrology, increased sedimentation from accelerated erosion and runoff rates, and increased exposure to contaminants. Adding lanes to roads would require additional winter maintenance materials that could affect wetlands/other waters of the US at downstream locations. Additional disturbance from earthmoving could result in increased sedimentation, and additional impervious surfaces would result in increased runoff rates and contaminant input. Such effects are associated not only with the project alternatives but also with induced growth and expected development in general.

Impacts. Action alternatives are expected to have a negligible impact contribution (up to 0.3 percent of the developed area) when compared to potential impacts from future development. The greatest impacts on wetlands from project alternatives would be the result of possible induced growth and development (indirect impacts).

Transit alternatives would increase Corridor impacts slightly (additional increase of approximately 2 percent from expected growth) due to possible induced growth (centered in urban areas) in the Eagle River watershed. Direct impacts (primarily the Rail with IMC alternative) would have cumulative effects (additive to historic impacts) in the Clear Creek watershed.

Highway alternatives would increase Corridor impacts moderately (additional increase of approximately 13 percent from expected change) due to possible induced growth (in both urban and rural areas) in the Eagle River watershed. Direct impacts would have cumulative effects (additive to historic impacts) in the Clear Creek watershed.

Combination alternatives would have the greatest Corridor impacts (additional increase of approximately 28 percent from expected change) due to possible induced growth (in both urban and rural areas) in the Eagle River and Blue

River watersheds. Direct impacts (primarily the Combination Six-Lane Highway with Rail and IMC alternative) would have cumulative effects (additive to historic impacts) in the Clear Creek watershed.

Water Resources

Issues. Existing conditions represent impacts on water quality from runoff from historic mining waste materials, placer mining, mine drainage into streams, mineralized rock, and disturbance of mining materials from urbanization and highway construction.

Cumulative impact issues associated with alternatives include winter maintenance, water quality, stream morphology (channelization), and spills from transport on I-70. Water resources cumulative effects issues associated with the project alternatives include water quality impacts from roadway winter maintenance, highway stormwater runoff, stormwater runoff from existing and planned development, historic mining activities, water supply and growth issues, physical impacts on streams (encroachment and channelization), and impacts on stream hydrology and habitat.

Impacts. Existing and planned development would account for 46 percent of the evaluated watershed area of Eagle River. Planned development is expected to increase stream/open water/wetlands impacts by more than three times the existing acreage (comprising 32 percent of the evaluated area) in the Blue River watershed. Impacts on streams/open water/wetlands are expected to increase by more than four times existing conditions due to planned development in the Clear Creek watershed. This area amounts to 85 percent of the evaluated watershed area.

Most of the cumulative impacts on water quality in Corridor streams would be the result of planned urban and rural development, which increases both point and nonpoint source loads of total phosphorus.

Transit alternatives would increase Corridor impacts slightly (less than 7 percent) due to possible induced growth (centered in urban areas) in the Eagle River watershed.

Highway alternatives would increase Corridor impacts slightly (approximately 10 percent) due to possible induced growth (in both urban and rural areas) in the Eagle River watershed.

Combination alternatives would have the greatest Corridor impacts (increase of approximately 24 percent) due to possible induced growth (in both urban and rural areas) in the Eagle River and Blue River watersheds.

Social and Economic Values

Issues. Include project alternative footprint impacts on communities and growth-related impacts, such as cumulative effects on Corridor growth and development and on the Gross Regional Product (GRP) of the economy of the nine-county area.

Impacts. Transit alternatives are expected to support growth in GRP; however, moderate Corridor impacts may result from induced growth in Eagle County (additional increase of 22 percent from expected growth). Induced growth in Eagle County might also increase commuting and cause induced growth impacts on adjacent counties.

Highway alternatives are expected to support growth in GRP, although Corridor impacts (additional increase of approximately 22 percent in Eagle County from expected growth change) may result from increases to dispersed growth in rural areas of Eagle County. Induced growth in Eagle County might also increase commuting and cause induced growth impacts on adjacent counties.

Combination alternatives are expected to support or exceed growth in GRP and may result in the greatest impacts on the Corridor region (additional increase of approximately 100 percent in Eagle County and approximately 40 percent in Summit County from expected growth changes). Induced growth in Eagle and Summit counties might also increase commuting and cause induced growth impacts on adjacent counties.

Recreation

Issues. Increased accessibility to recreation areas. Recreation resources cumulative effects issues include possible increased pressure for recreational visitation to national forests associated with the project alternatives.

Impacts on WRNF. Transit alternatives might increase WRNF annual visitation by 1.2 million forest destination trips (from WRNF expected visitation growth) due to the additive effects of possible induced resident and nonresident recreational person trips.

Highway alternatives might increase WRNF annual visitation by 0.3 million forest destination trips (from WRNF expected visitation growth) due to the additive effects of possible induced resident and nonresident recreational person trips.

Combination alternatives might increase WRNF annual visitation by 2.4 million forest destination trips (from WRNF expected visitation growth) due to the additive effects of possible induced resident and nonresident recreational person trips.

Impacts on ARNF. Transit alternatives might increase ARNF annual visitation by 0.4 million forest destination trips (from ARNF expected visitation growth) due to the additive effects of possible induced nonresident recreational person trips.

Highway alternatives might increase ARNF annual visitation by 0.1 million forest destination trips (from ARNF expected visitation growth) due to the effects of possible induced nonresident recreational person trips.

Combination alternatives might increase ARNF annual visitation by 0.8 million forest destination trips (from ARNF expected visitation growth) due to the effects of possible induced nonresident recreational person trips.

Visual Resources

Issues. Currently 13 percent of the viewshed from I-70 is developed, and community plans indicate that much more of the Corridor area will be developed in the future. Planned future development (in addition to past and present development) will consume 32 percent of the Corridor viewshed area. Pressures for additional increased development from alternatives might alter the highly valued Corridor character from a rural mountain character to an urban character.

Cumulative impact issues associated with the alternatives include changes in the rural character of the landscape. Visual resources cumulative effects issues associated with the project alternatives include the visual impacts on I-70 travelers, recreational users, and residents.

Impacts. Changes to the rural character of the landscape of the central Rocky Mountains from induced development seen from I-70 travelers, recreational users, and residents vary by alternative.

The Transit alternatives could influence approximately an additional 9 percent of rural development in the area visible from I-70, primarily within the Eagle River watershed.

The Highway alternatives could influence approximately an additional increase of 10 percent in rural development of the area visible from I-70, also within the Eagle River watershed.

Combination alternatives would have the greatest potential for inducing growth and would, therefore, have the greatest potential for cumulative visual impacts over all of the alternatives (additional increase of approximately 45 percent in development of the area visible from I-70), within the Eagle River and Blue River watersheds.

Historic Communities

Issues. The community areas with historic areas studied for cumulative impacts are located within the historic mining areas of Clear Creek County, including Silver Plume; Georgetown; Lawson, Downieville, and Dumont: and Idaho Springs. Each community was directly affected by the construction of I-70 in the 1960s and experienced visual and noise impacts as a result of the construction and operation of the interstate adjacent to and through the communities.

Cumulative impact issues associated with the alternatives include cumulative effects to National Historic Landmarks, Districts, and historic areas. While individual properties may be subject to cumulative impacts, the scope of this analysis is on the historic communities.

Impacts. Due to the lingering past effects of the construction of I-70 (approximately 35 acres and an estimated 80 historic structures in Clear Creek County were lost to the original construction of the interstate), and the ongoing influence of I-70 to the historic communities in the Corridor, cumulative impacts for historic communities would result from the added perception of impacts on the sense of place to these communities related to:

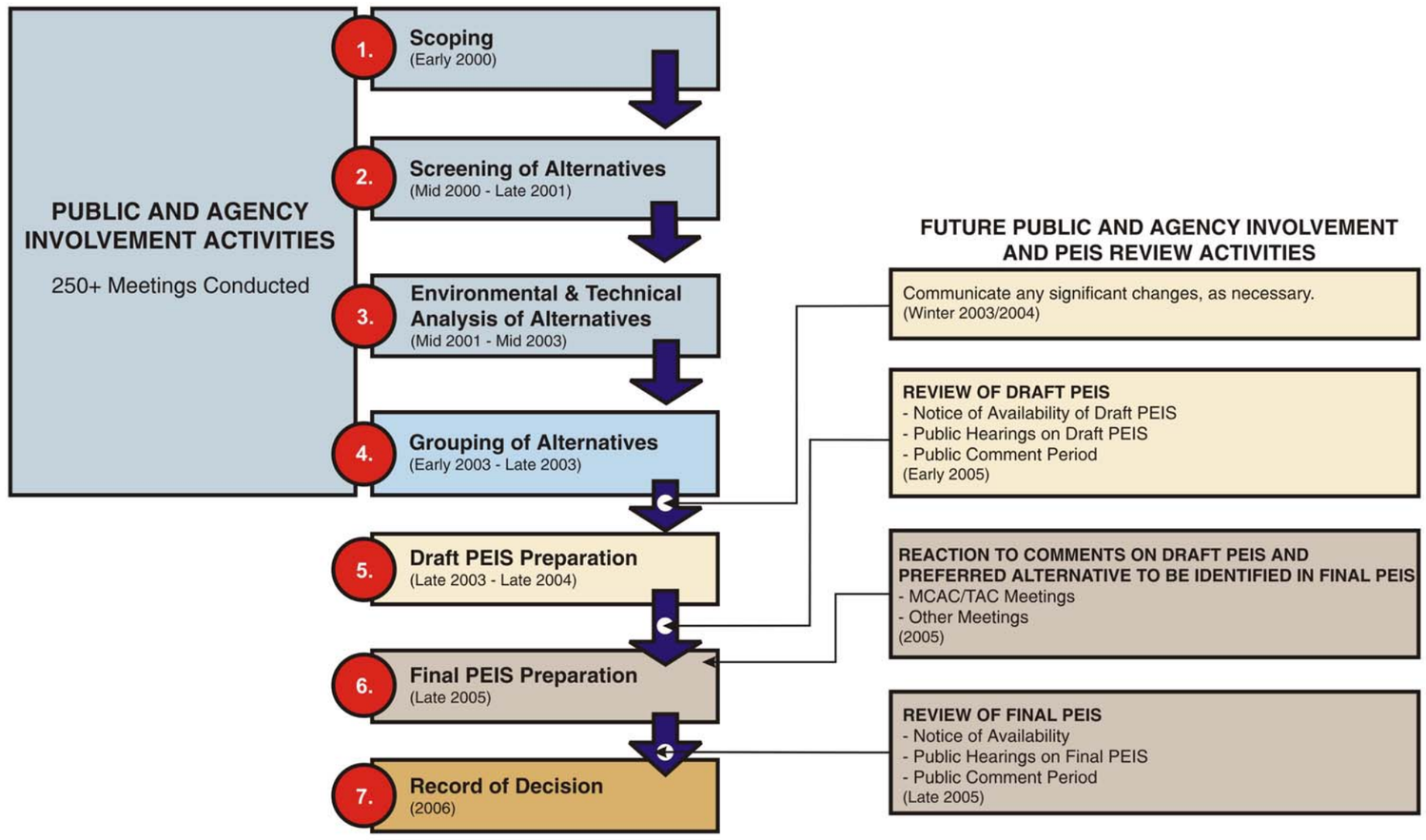
- Direct impacts on historic properties (loss of structures and property encroachment) in addition to those impacts associated with the initial I-70 construction. All direct effects would occur within existing I-70 right-of-way. Section 3.15, Historic Properties and Native American Consultation, provides an analysis of the direct impacts on historic properties in the Corridor.
- Visual impacts caused by changes to the historic setting within the communities, from construction of project alternatives in addition to those impacts associated with the initial I-70 construction. Section 3.15 also provides an analysis of the visual impacts on historic properties in the Corridor. This analysis is presented in context to the sense of place for communities. These impacts are highly variable depending on the existing physical relationship between the specific community, I-70, and the alternative.

Public and Agency Involvement

The public input to the I-70 Mountain Corridor PEIS is an integral component of the NEPA process to assist FHWA and CDOT in making informed decisions for future transportation planning in the Corridor. The purpose of the public involvement program is to communicate with the public and agencies; identify, document, and address the issues into the planning and decision-making process; and address the issues in appropriate documentation.

A Public Involvement Program (PIP) with specific goals and activities was produced and made available to two advisory committees. Public input was obtained at key milestones during the project, through a website, newsletters, letters and telephone calls, and publicized meetings. Public and agency comments were incorporated into the decision-making process during scoping, identification of alternative families, packaging of alternatives, the impact assessment process, and grouping of the preferred alternatives. Public input will continue to be a key factor throughout the review of the Draft PEIS and subsequent steps to the Record of Decision.

Figure ES - 11. NEPA Process



Areas of Controversy

This section identifies concerns that were expressed about the analysis performed for the I-70 PEIS. These concerns are listed and addressed by type of concern:

- Assessment assumptions
- Project termini
- Project alternatives
- Travel time
- Alternative grouping
- Cost
- Public involvement
- Historic preservation

Assessment Assumptions

Concern: Comparison of alternatives should be done in an equitable manner.

Response: The objective of a NEPA study is to disclose the impacts of each alternative, not to normalize the impacts of alternatives on a per-mile basis as has been suggested. In other words, even though project alternatives have various lengths and widths, they are evaluated equally according to direct impact methodologies. Some alternatives, like Transit, have longer termini to achieve ridership projects and to ensure intermodal connectivity. Other alternatives, like Highway, are shorter in length but satisfy the projected travel demand.

The methodology for achieving a multidisciplinary evaluation of all of the alternatives was employed for this PEIS and is built around the following components:

- Each alternative has been developed to satisfy the same project purpose and need.
- The assessment of environmental impacts, travel demand, costs, and safety is specific to each alternative.
- The assessment is examining the consequences of what it takes to address the same transportation issues with each alternative.
- Corridor-wide assessments are included in the transportation modeling process, the socioeconomic analyses of indirect impacts, and assessment of cumulative impacts.
- The assessment of direct impacts is associated with the footprint or vehicle volume of each alternative.

Concern: Current skier trends for out-of-state visitors are more modest than the assumptions in the PEIS.

Response: Current trends show a reduced attraction of out-of-state skiers to the Mountain Corridor, with in-state skiers more closely tracking with Front Range growth (as also assumed in the PEIS). Because the PEIS travel demand model projects long-term demand, the current rates of out-of-state skiers were assumed to have recovered to previous growth rates. This assumption provides a conservative approach, given the desire to develop alternatives that will provide sufficient utility long into the future.

Concern: An alternative that just addresses the critical pinch points like the congestion at the Twin Tunnels should have been considered, since congestion is mostly at this location and primarily on weekends.

Response: The section of highway between Floyd Hill and Empire Junction is currently over capacity. Long-term travel demand projections indicate conditions will worsen (by 2025) in the future during the off-peak and peak hour of travel. Merely addressing isolated locations such as the area of the Twin Tunnels would have no appreciable impact on Corridor congestion or travel times, and therefore would not meet the project purpose and need. By 2025, weekday traffic levels will meet or exceed 2000 weekend levels of traffic at many locations along the Corridor.

Capacities need to increase at logical points of departure (such as US 40, US 6/9, SH 9, or Vail). Alternatives that increase capacity between Floyd Hill to US 40 were screened out because they did not meet the long-term travel demand. Introducing an alternative that satisfied even less of a demand (for example, addressing only Floyd Hill to the Twin Tunnels) would likewise have been screened out also. Furthermore, increasing the capacity only in a limited area would push the congestion further downstream, a consequence that Clear Creek County wanted to avoid and one of the prime reasons Clear Creek County wanted the study to take a Corridor-wide view in this PEIS.

Concern: The AGS alternative provides two to three times as much carrying capacity as the additional highway lanes.

Response: The utility of any mode of transportation is a demand issue (mode choice, departure time choice) although capacity plays a very important role. AGS, operating at its minimum headway with all its seats filled, could possibly carry more people per minute than six highway lanes with five or six seats of every car filled. However, mode choice ultimately depends on the traveler, and travelers are not currently expected to fill AGS capacity due to the types of trips prevalent in the Corridor. The findings of the PEIS are that the majority of travel will still occur by car in 2025, even if the AGS or other Transit alternatives were in place. Similarly, travelers are not expected to change their departure times substantially from a predominance of weekend trips, so neither the full theoretical capacity utilization of the AGS nor the Six-Lane Highway would be achieved during all hours of every day.

Concern: The planning horizon for the I-70 PEIS should be long range – 2050, not the year 2025 as evaluated.

Response: The PEIS travel demand analysis includes an assessment of how each alternative accommodates future travel growth beyond 2025 and indicates the year in which the network capacity is anticipated to be reached.

Prior to the identification of the preferred alternative in the Final PEIS, a determination will be made regarding the level of transportation demand to be met given that some of the alternatives meet the demand for the next 20 years (to the year 2025) and others preserve options for meeting a greater level of demand, that is, beyond 2025.

Key to this determination will be the weighting of the pros and cons of the various alternatives. Understanding the public view of the pros and cons will occur through the solicitation of public review and comment on the Draft PEIS. CDOT and FHWA will consider these comments, evaluate new information as appropriate, and meet with the federal cooperating agencies and other key stakeholders to weigh the pros and cons of the various alternatives.

The outcome of this process and the identification of a preferred alternative will influence the 50-year vision of this Corridor.

Project Termini

Concern: The project termini should extend from Glenwood Springs to DIA.

Response: The PEIS established logical project termini from C-470 to Glenwood Springs based on the constriction of westbound travel that occurs at the top of Floyd Hill and reduced peak I-70 recreational travel east of Glenwood Springs. C-470 was established as the eastern terminus due to transit connectivity consideration with the urban Front Range. The travel demand model for this study includes demographic information for a large portion of Colorado between the urban Front Range and Grand Junction. Although DIA was included in the travel demand model analysis area, transportation planning for the Denver metropolitan area (including DIA) is the responsibility of the Denver Regional Council of Governments (DRCOG). DRCOG plans address rapid transit through the Denver metropolitan area. Various transit systems are included in the DRCOG plan and are assumed for the PEIS. The travel demand model showed no capacity deficiency between the town of Eagle and Glenwood Springs. All Bus in Guideway alternatives would include new bus services in mixed traffic as far west as Glenwood Springs. The Eagle County Airport was established as the western terminus for the Rail with IMC and AGS alternatives on the basis of connectivity between air and transit service. Further, there are localized capacity problems at the Glenwood Springs interchange (exit 116), which are addressed by the Minimal Action alternative.

Concern: Only the alternatives that involve rail or AGS provide a connection to the Eagle County Airport. In addition, a seamless connection to DIA should be incorporated into these alternatives.

Response: Bus in Guideway alternatives could provide service to DIA and to the Eagle County Airport via buses in mixed traffic throughout the Denver metropolitan area and from Silverthorne west. In addition, the Highway alternatives would provide direct access to the Eagle County Airport with the proposed interchange at this location. The Eagle County Airport interchange is included in the Baseline and the No Action alternative (see the No Action alternative description). While a direct connection to DIA was considered for transportation modeling purposes, this PEIS assumed the transit network approved by DRCOG's regional transportation plan, which includes transit connections between DIA and the Jefferson County area, but which does not include any advanced guideway system.

Project Alternatives

Concern: Clear Creek County representatives have expressed that none of the alternatives appropriately address their concerns for a preferred alternative. They have further expressed that their concerns center on the following aspects:

Vision: Solutions must maximize capacity and throughput, and fully utilize available technology.

Response: The process for identifying alternatives to be considered in the PEIS began with the I-70 Mountain Corridor Major Investment Study (MIS) completed in 1998. This MIS resulted in a vision for the next 50 years, with the recommendation to prepare a Programmatic Environmental Impact Statement (PEIS) to examine elements of the vision and potential impacts. The MIS vision includes an integration of the following transportation elements: Fixed Guideway Transit (FGT), Highway and Interchange Improvements, Transportation System Management (TSM), Alternate Routes, and Aviation. In addition to the strategies identified in the MIS, Rubber Tire Transit (RTT) was identified for consideration in the Corridor. Rigorous evaluation of available transit technologies (including cost and operational considerations) was performed during the PEIS. Preferred project alternatives must meet the stated project purpose and need, which includes economic and technologic feasibility. Impacts on environmental and community values have been assessed for each alternative.

Impacts: Solutions must minimize right-of-way acquisitions and environmental/community impacts.

Response: All project alternatives were designed (conceptual Tier 1 design phase) to avoid and/or minimize right-of-way acquisitions, environmental impacts, and impacts on community values. Project alternatives have made use of as much of the existing I-70 alignment, paved area, and right-of-way as possible. Encroachment outside the existing highway right-of-way or easements has been minimized.

Transit Alignments: Transit solutions must operate outside the highway alignment to avoid traffic congestion, vehicle accidents, weather-related, or other delays. Transit alternatives should offer an incentive to avoid such delays.

Response: Transit alternative alignments would include separate guideways/railways in areas most affected by Corridor congestion. Separate guideways for Bus alternatives were not needed to meet the project purpose and need west of Silverthorne.

Combination Alternative Components: Clear Creek County representatives object to the highway widening components that are part of the Combination alternatives. None of the current Combination alternatives would include a partial highway capacity improvement with the Transit component. For example, no Combination alternative was included in the study that would combine highway capacity from the existing pinch point at the Twin Tunnels to Floyd Hill ("limited highway concept") with transit from C-470 to Eagle County Airport.

Response: Highway improvement components of the Minimal Action alternative are included in the Transit alternatives. These Minimal Action components (described in Chapter 2, section 2.2, Description of Alternatives and Operations) would address localized capacity issues in Clear Creek County. The Combination Highway/Transit alternatives have been designed to address the problematic areas defined for I-70. The "limited highway concept" would not address these problematic areas. Improvements must begin and end at logical points to avoid creating local congestion.

Concern: The AGS alternative should be the CIFGA monorail alternative that seems to be favored by many of the Corridor communities instead of the magnetic levitation technology researched by the FTA.

Response: CIFGA originally supported a monorail system that was conceptual in design – never tested – but that offered great promise. Eventually, CIFGA turned to a magnetic levitation system that the Federal Transit Administration supported in a research study that included CIFGA involvement.

Like the I-70 Major Investment Study (MIS), the PEIS uses a performance-based standard to define this emerging technology alternative. The name of this alternative was changed from "monorail" to "Advanced Guideway System" to reflect the use of a performance-based standard. The HSST maglev studied by the FTA meets these standards, as does high-speed monorail. In fact, speeds attainable in the Corridor are limited by the mountain geography and the need to maintain passenger comfort in tight curves, more than by any specific mode technology. If this alternative were to be selected, a specific technology would be selected during Tier 2 studies.

Concern: Corridor stakeholders are not interested in a bus system, especially considering the failure of a bus guideway system in Germany due to its inability to operate during winter conditions.

Response: One of the findings of the MIS – the need to "change people's travel behavior" – has been integral to this PEIS, with a goal of pursuing transit in a serious way. The Bus in Guideway alternative is one of the preferred alternatives under consideration. The Bus in Guideway is a system in operation in various places around the world, such as Great Britain, Australia, and Brazil.

The key advantages of this technology are its flexibility to operate inside or outside the guideway, its electric and/or diesel (or other) fuel power, its narrow footprint, its competitive speed, high ridership, and reduced transit transfers. It is the only Transit alternative whose required subsidy is more reasonable – $21 million annually for the diesel bus; up to $16 million annually for the dual-mode (electric and diesel) bus. In addition, the electrically powered bus can negotiate I-70's steep climbs at speeds that are competitive with those of the AGS alternative. Many options exist for the bus itself, including designs that mirror the sleekness and amenities found on trains, and "green" (environmentally friendly) fuel options.

The German system's failure was due to a 10 percent ramp grade that proved to be too challenging during the winter snow and ice conditions. On the I-70 Corridor, access points would be engineered to overcome such obstacles. Grades along mainline I-70, where the guideway would operate, do not exceed 7 percent.

Concern: There are too many challenges to deploy transit in the Corridor.

Response: As noted under "unresolved issues" later in this document, identifying an owner/operator and identifying a funding stream to cover the expected subsidization are the most significant challenges. The other serious challenge is devising a supporting local system to transport day recreation or overnight visit travelers to their destination. Modeling projections indicate that even with a healthy mode switch to either the AGS or Bus in Guideway mode, most travelers would still favor auto travel. However, a healthy mode switch could occur with the resolve of users to "change their travel behavior."

Additional challenges include third rail icing, motor failures, deep snow or ice on tracks or guideways, door operations, contaminations of mechanical and electrical components from snow, and track switch freezing. Many of these challenges are more pertinent to the AGS alternative than the Bus in Guideway alternative. With the flexibility afforded by the Bus in Guideway technology due to its ability to leave the guideway and travel on other roadways, the bus could travel in the regular lanes of traffic if the guideway were to be temporarily inoperable.

Concern: The AGS alternative (magnetic levitation or monorail) could operate at speeds higher than the one assumed for this study.

Response: AGS-type technology speeds are limited by the safety and comfort of passengers while taking the tight curves in the Mountain Corridor at high speeds. Human tolerance to acceleration changes also limits the ability of the AGS to attain its maximum cruise speed between the proposed stations.

Concern: An alternate route for access to the Mountain Corridor should be established.

Response: A total of 16 alternate routes were studied and screened out because they do not address the needs of the I-70 Corridor. Because the purpose and function of the alternate route was oriented toward resolving traffic problems on I-70, many of the alternate routes were screened from consideration because they would involve longer travel distances than does a comparable trip along I-70. Also, the new infrastructure along these existing routes would result in large social and environmental impacts as well as economic costs. This information was presented at public workshops in January 2001 and at Advisory Committee meetings in February 2001, with the recommendation that alternate routes be screened from further consideration. Attendees at each forum endorsed this recommendation; therefore, alternate routes have been screened out.

Concern: The proposed new Black Hawk Tunnel access at US 6 and I-70 and Central City Parkway from I-70 at Hidden Valley (as evaluated in the Gaming Area Access EIS) will overburden an area that is already a top safety concern along the Corridor.

Response: Concerns have been expressed about the impact on I-70 congestion and safety between Floyd Hill and the Hidden Valley interchange in Clear Creek County from the new gaming area accesses. Due to these new accesses to gaming and 2025 projections, the No Action alternative does not address safety and congestion along this stretch of I-70. However, the Transit, Highway, and Combination alternatives evaluated in the PEIS would provide increased capacity and curve safety improvements between Floyd Hill and Hidden Valley.

Concern: A frontage road between Floyd Hill and Hidden Valley needs to be constructed for Clear Creek County residents and for emergency response.

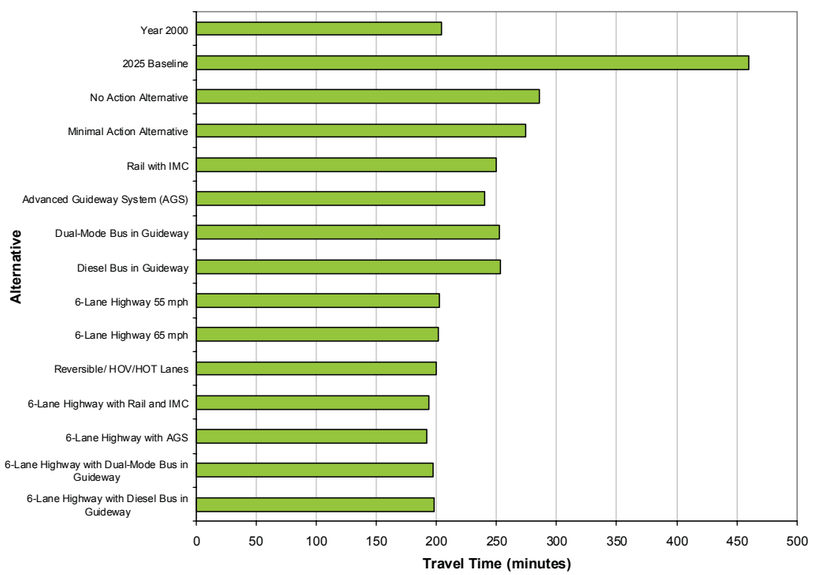
Response: Besides I-70, no access for local residents or emergency services occurs between Floyd Hill and the Hidden Valley interchange. The issue of emergency response access as it would relate to gaming access is being examined under the *Gaming Area Access EIS,* with consultation between Central City, Black Hawk, Clear Creek County, and CDOT. The narrow valley and steep topography makes the development of local access difficult through this portion of Clear Creek Canyon. Depending on the outcome of the I-70 PEIS, options of a frontage road could be examined as a part of the I-70 Tier 2 process. Initial cost estimates for frontage road connections between East Idaho Springs and Hidden Valley, and Hidden Valley to US 6 have been included in the PEIS for each alternative.

Travel Time

Concern: There will be little, if any, improvement (in 2025 as compared to today) in the travel time on I-70 under the Six-Lane Highway alternatives.

Response: It is not appropriate to simply compare the travel time of various scenarios without considering the difference in travel demand. Travel time is a function of travel demand and highway capacity. If the demand exceeds the capacity, a worse-than-normal travel time would result. If the demand is below the capacity, a better-than-normal travel time would result. According to DOLA, DRCOG, Northwest Colorado Council of Governments (NWCCOG), and other local planning organizations, the travel demand on the I-70 Mountain Corridor will experience a major growth by 2025. The average growth in next 20 years for winter Saturday peak hour travel in terms of person trips is 147 percent in Eagle, 100 percent at Vail Pass, 142 percent at Floyd Hill, and 90 percent at Genesee. If no major improvements were made (that means the capacity remains the same as current condition) along the Corridor, to accommodate this huge growth, the travel time between Glenwood Springs to C-470 for a distance of 144 miles would be approximately 460 minutes (See the 2025 Baseline scenario on Chart ES - 42). Please note that the No Action alternative would have a better travel time (290 minutes) than the Baseline scenario. It is very important to point out, however, that the No Action alternative would not accommodate the travel demand based on growth projections by DOLA, DRCOG and NWCCOG. The No Action alternative could only accommodate a slightly higher number of trips than the travel demand of year 2000. On the other hand, from Chart ES - 42, it is obvious that all action alternatives could provide a much better travel time than the Baseline scenario; and the travel demand with these alternatives is comparable to or greater than the Baseline.

Chart ES - 42. Selected Model Day Peak-Hour Highway Travel Time (Eastbound: Glenwood Springs to C-470)



Alternative Grouping

Concern: The recommendation of the preferred alternatives should have considered the environmental sensitivity and community value purposes instead of its focus on cost (affordability) and meeting the 2025 Baseline travel demand need.

Response: The Council on Environmental Quality (CEQ) set forth the regulations implementing the National Environmental Policy Act (NEPA). NEPA requires that "reasonable alternatives" are to be fully evaluated in the NEPA document, which in this case is the Draft PEIS. As part of CEQ's oversight of NEPA, CEQ wrote: "In determining the scope of alternatives to be considered, the emphasis is on what is 'reasonable' rather than on whether the proponent or applicant likes or is itself capable of carrying out a particular alternative. Reasonable alternatives include those that are practical or feasible from the technical and economic standpoint, and using common sense, rather than simply desirable from the standpoint of the applicant." (See *Forty Most Asked Questions Concerning CEQ's NEPA Regulations,* March 23, 1981).

When the PEIS was initiated, CDOT and FHWA made a commitment that the PEIS would fully evaluate – at a Tier 1 level of detail – alternatives in the following categories: Minimal Action, Transit (Bus, Advanced Guideway System, and Rail), and Highway (in addition to No Action). This commitment was made so that the tradeoffs among these alternatives would be fully explored, despite concerns over very high costs or technical infeasibility. Having made this commitment meant that some alternatives might be fully evaluated that did not meet the definition of "reasonable," which did, indeed, happen with the alternatives with a very high capital cost. Therefore, CDOT and FHWA have the responsibility to inform the public which alternatives are reasonable. For this project, a cost below the threshold of $4 billion was viewed as economically feasible or affordable.

In addition to identifying the "reasonable" alternatives, CDOT and FHWA have the responsibility to identify those alternatives that meet the future demand and those that do not. Two alternatives, Minimal Action and No Action, do not meet the project need. Either of these alternatives, if implemented, would result in a suppression of future travel demand, a prospect CDOT and FHWA found to be unreasonable, especially given the public's desire to resolve I-70's travel demand for the future.

The consideration of the environmental sensitivity and community values purposes have shaped many of the alternatives evaluated. See section 3.19, Mitigation Summary, for a discussion of how this has occurred. Preliminary findings of the environmental and community value impacts were disclosed to the Corridor stakeholders during September and November 2003, when the discussion involving the grouping of preferred alternatives occurred. This information was disclosed so that the decision-makers would be fully informed about the public concerns, issues, and consequences of the alternatives considered, before deciding which alternatives would be in the "preferred" group and which would be in the "other" (not preferred) group.

The treatment of alternatives in the Draft PEIS is in compliance with CEQ's NEPA regulations by (1) documenting the project purpose and need (Chapter 1, Purpose of and Need for Projects); (2) conducting public scoping and identifying issues (Chapter 6, Public and Agency Involvement); (3) considering a broad range of alternatives through an extensive public process, including those alternatives that are not within the jurisdiction of the lead agency, and providing disclosure of the rationale for those that were eliminated from further consideration (Chapter 2, section 2.1, Screening of Alternatives); (4) providing a description of each alternative (Chapter 2, section 2.2, Description of Alternatives and Operations); (5) conducting an environmental impact assessment of all reasonable alternatives and developing mitigation (Chapters 3 and 4); and (6) preparing a comparison of the alternatives that were retained for full evaluation (Chapter 2, section 2.3, Comparison of Alternatives).

Going the additional step and determining which of the reasonable alternatives best meets the project's environmental sensitivity and community value purposes will occur in the Final PEIS. This will allow for consideration of the public and agency comments on the alternatives disclosed and evaluated in the Draft PEIS. The public will have the opportunity to review and comment on the technical (mobility, safety, and cost) and environmental aspects of each alternative in the "preferred" and "other" groups of alternatives. Alternatives in the "other" (not preferred) group could be considered for the preferred alternative with new information about viable funding sources.

Cost

Concern: The PEIS has overestimated the cost of the AGS (estimated at $5.6 billion) since the Colorado Maglev Project research study estimated the cost of the low-speed magnetic levitation system to be $4.1 billion.

Response: Actually, the raw capital cost estimates of the AGS by PEIS and Colorado Maglev research study are very similar. The PEIS's raw capital cost estimate is $3,282 million and Colorado Maglev study $3,302 million. The difference of final cost estimates between PEIS and Colorado Maglev can be traced to various assumptions regarding contingency rates and what escalation factors should be considered. The Colorado Maglev Project assumes a flat 25 percent for contingencies, and does not individually address right-of-way, traffic control, mobilization, force account, utilities, environmental mitigation, permitting and preliminary engineering, and construction engineering costs. In contrast, the PEIS assumes 30 percent for contingencies, plus escalations of:

- 4 percent for drainage and utilities
- 1 percent for signing and striping
- 5 percent for construction signing and traffic control
- 7 percent for mobilization
- 2 percent for right-of-way
- 8 percent for force account, utilities, and miscellaneous items such as environmental mitigations (8 percent is applied to the escalated cost excluding right-of-way)
- 17 percent for preliminary engineering and construction engineering costs (applied to the combined escalated and force account, utilities and miscellaneous costs)

The above cost escalation factors were developed by CDOT Division of Transportation Development (DTD) based on CDOT's various transportation projects. DTD has found that the final project costs on these various transportation projects were within the proximity of the cost estimate resulting from these escalation factors.

Therefore, the $5.6 billion reported in the PEIS represents a reasonable estimate for the AGS. In addition, this cost estimating method was applied to all project alternatives.

Concern: If each alternative were compared on a cost-per-mile basis instead of by the overall capital cost, the AGS alternative would be reasonable, since its cost per mile is comparable to the highway and Bus in Guideway alternative.

Response: An alternative must be affordable to be considered reasonable. The capital cost of an alternative must be considered in its entirety because an evaluation of only cost per mile would not disclose to the public the true cost of implementation. However, a comparative measure of cost – cost-effectiveness – was considered to help assess the financial implications of each alternative. Cost-effectiveness considers capital, operating and maintenance, person miles of travel, and farebox recovery. The cost-effectiveness indices for AGS are $1.19 per person mile compared to $0.68 to $0.75 for Highway alternatives, and $0.37 to $0.41 for Bus in Guideway alternatives. See Chapter 2, Description and Comparison of Alternatives, for more information on cost-effectiveness. For purposes of this study, cost-effectiveness was derived through annualized capital cost of an alternative, divided by the amount that an alternative's person miles of travel exceeds the No Action person miles of travel.

Concern: The community's preference for an alternative that provides high-speed rail and offers a smaller footprint and the possibility of reduced noise and air pollution should weigh heavier in the decision than cost.

Response: CDOT and FHWA have the responsibility to put forth alternatives deemed reasonable, and cost is critical in determining reasonableness. Additionally, the Dual-Mode Bus in Guideway transit alternative offers similar benefit for noise and air quality, offers a transit service at a speed competitive with high-speed rail and highway, and would attract ridership similar to that attracted to AGS.

Concern: How has the cost of mitigating the effects of the alternatives been considered in determining the financial "reasonableness" of the alternatives?

Response: The cost of mitigation has been considered both in the line items estimated for the current capital cost estimates and in the percentages assumed for other anticipated costs. For example, the cost for minimizing the footprint is assumed in wall and structure costs that are included in the capital costs. Another example, the cost of sedimentation control, is assumed at the highest percentage in the range estimated for other CDOT projects involving "drainage." Finally, "contingencies" are also estimated at the highest percentage in the range estimated for other CDOT projects and are assumed to be robust enough to cover other mitigation costs.

Public Involvement

Concern: There hasn't been enough public involvement with the development of this PEIS.

Response: Extensive public and agency involvement activities have been conducted as part of the PEIS process, including meetings with the Mountain Corridor Advisory Committee (MCAC) and the Technical Advisory Committee (TAC), public open houses, and the federal interdisciplinary team. More than 250 public and agency meetings have been conducted as part of the PEIS process.

Due to the regional nature of this Corridor-wide PEIS, public involvement was more regionally based (and not as site-specific as desired by some Corridor communities). The preponderance of community meetings were held in Clear Creek County in recognition that this area would bear the greatest direct impacts from project alternatives.

Committee involvement in project studies has come from the following:

- Finance Committee
- 4(f) Committee
- Growth Committee
- ALIVE and SWEEP Committees
- TACand MCAC (see box at right for members of these committees)
- Section 106 of the National Historic Preservation Act, meetings with consulting parties (11 tribes and several other consulting parties)

Federal agency review has come from the federal cooperating agencies:

- US Forest Service
- US Fish and Wildlife Service
- Bureau of Land Management
- Federal Rail Administration
- Federal Transit Administration
- Federal Aviation Administration
- Corps of Engineers

Other federal agencies involved in the project include:

- Advisory Council on Historic Preservation
- Environmental Protection Agency
- Department of Interior
- National Park Service

Key state agency involvement has included:

- Colorado Department of Local Affairs
- State Historic Preservation Officer
- Colorado Department of Public Health and Environment
- Colorado Division of Wildlife

Transit coordination has come through meetings with:

- Colorado Fixed Guideway Authority (CIFGA, which sunsetted December 31, 2003)
- FTA Magnetic Levitation study group
- Colorado Association of Transit Agencies (CASTA)

Membership of the Technical Advisory Committee (TAC) and Mountain Corridor Advisory Committee (MCAC)

The TAC included a cross section of agency representation of federal, state, and local agencies. The TAC ensured effective agency communication and provided technical input to the project team at key milestones throughout the project.

- Clear Creek County Planners and Engineers
- Colorado Department of Public Health and Environment
- Colorado Geological Survey
- Colorado Department of Transportation
- Colorado Intermountain Fixed Guideway Authority
- Colorado Passenger Rail
- Colorado Public Utilities Commission
- Denver Regional Council of Governments
- Eagle County Planners and Engineers
- Environmental Protection Agency
- Federal Highway Administration
- Federal Railroad Administration
- Garfield County Planners and Engineers
- Jefferson County Highways and Transportation
- Jefferson County Planners and Engineers
- Regional Transportation District
- Summit County Planners and Engineers

Members of the MCAC included a cross section of people representing the user and host organizations in the Corridor with selected representation from the counties, municipalities, community associations, and special interest groups. The MCAC provided input from diverse points of view based on their knowledge of the area.

- Bicycle Colorado
- Canyon Area Residents for the Environment (CARE)
- City and County of Denver
- Clear Creek County Citizen
- Clear Creek County Commissioner
- Club 20
- Colorado Association of Realtors
- Colorado Association of Ski Towns
- Colorado Association of Transit Agencies
- Colorado Department of Transportation
- Colorado Highway Users Association
- Colorado Motor Carriers Association
- Colorado Public Interest Research Group
- Colorado Rail Passenger Association
- Colorado Ski Country USA
- Colorado Tourism Office
- Eagle County
- Eagle County Citizen
- Eagle County Commissioner
- Federal Highway Administration
- Garfield County Commissioner
- Garfield County Planning
- Georgetown Local Historic Resource Representative
- Gilpin County Commissioner
- Idaho Springs Local Historic Representative
- Idaho Springs Mayor
- Independence Institute
- Jefferson County Citizen
- Jefferson County Commissioner
- Sierra Club, Rocky Mountain Chapter
- Silverthorne Public Works Department
- Summit County Citizen
- Summit County Commissioner
- Summit County Engineer
- Summit County Planning
- Summit Stage
- Town of Aspen
- Town of Silverthorne Planning
- Town of Vail
- Transportation Commissioner
- Trout Unlimited

- Eagle County Regional Transportation Authority (ECO Transit)
- Colorado Rail Passenger Association
- Regional Transportation District
- Summit Stage

Small group meetings and communication with:

- Denver Regional Council of Governments
- Northwest Colorado Council of Governments
- The counties in the Corridor study area
- Municipal planners
- Elected officials

The I-70 PEIS Travel Demand Model Peer Review Team met on four occasions to review and critique the development of the I-70 Mountain Corridor travel demand modeling program.

In addition to meetings, newsletters and the project website serve to inform public and agency constituents of progress on the project.

Historic Preservation

Concern: All alternatives will impact Clear Creek County, an area which hosts a National Historic Landmark, and numerous historic communities, properties and sites linked to Colorado's mining heritage. The concern is that the alternatives examined and the impact evaluations (direct, indirect, and cumulative) will not demonstrate sensitivity to these cultural resources. There is also a desire for mitigation strategies and techniques to be utilized in order to avoid unintended degradation of cultural resources.

Response: CDOT and FHWA have been consulting with affected parties under Section 106 of the Historic Preservation Act. This Section 106 process is providing an additional venue for raising the issues that have also surfaced during the development of the PEIS as required under the National Environmental Policy Act (NEPA). The concerns regarding the alternatives have been presented throughout this section entitled *Areas of Controversy*. In addition, preliminary mitigation policies have been offered in this *Executive Summary* as well as in Section 3.19. A Programmatic Agreement (PA) will be developed with the consulting parties under Section 106. The development of the PA will provide an opportunity for the consulting parties representing the historic communities to help define the mitigation policies germane to Section 106 issues. This PA will help to govern Tier 2 NEPA processes that have an effect on historic properties and sites.

Unresolved Issues

This discussion identifies remaining unresolved issues regarding the decision to be made and its relationship to the purpose and need for agency action.

Source of Funding. At the time of the publication of this Draft PEIS, CDOT has committed approximately $1.6 billion that could be available over the next 20 years through CDOT's Strategic Funding Programs. Potential sources of the additional funding required to implement one of the alternatives from the preferred grouping are fully explored in Chapter 5, Financial Considerations. Prior to the identification of the preferred alternative, CDOT will continue to coordinate with those project stakeholders who might have access to substantial sources of funding.

Because the preferred alternative will be implemented in phases, the entire capital amount is not expected to be needed once the Tier 2 NEPA studies are completed. Phasing options will be identified, along with identification of the preferred alternative in the Final PEIS.

Determining a Corridor Transit Operator. If one of the Transit alternatives were to be selected as the preferred alternative, an owner/operator would have to be identified. Six potential owners and operators of a transit system exist and are fully described in Chapter 5, Financial Considerations, and are briefly described below:

Rural Transportation Authority. A separate political subdivision could be created representing municipalities and/or counties with a board of elected representatives of those entities. The state may participate with the governor's approval. The municipalities and/or counties must hold public hearings and an election to determine majority support to establish an authority. This authority would have the taxing and other revenue-raising abilities of its member organizations to cover the expected subsidy.

National or Private Entity. There is a possibility that the system could be owned and operated by a national entity, such as Amtrak, or a private entity, such as Greyhound, or some other private consortium. This option is not considered practical, as the transit system would have to be profitable to interest such entities.

Colorado Department of Transportation (CDOT). CDOT could operate and own the transit system, but it would be advisable to involve the state legislature to clearly establish CDOT's responsibilities and possible funding sources.

Special District. Each county with territory encompassing the transit system would review and approve the service plan of petitioners proposing a special district organization. A public hearing would be held and a percentage of taxpaying electors would need to submit a petition regarding the organization of a special district. An election would be held to approve or deny the formation of a special district. Fares could be collected and a rate of levy would be determined annually to cover the expenses of the transit system.

Regional Transportation District (RTD). For the Denver metropolitan area RTD to be expanded to cover some portion of the Corridor, the statutory definition of the District would need to be altered, as Jefferson County is the only area contiguous to any boundary of the district. To include additional counties, a petition would need to be signed by 100 percent of the landowners and/or a petition requesting an election would need to authorized by the RTD board of directors and follow other statutory requirements. Fares, taxing, and private and federal funds would be utilized to cover the expenses of the system.

Colorado Intermountain Fixed Guideway Authority (CIFGA). The state article upon which CIFGA was based expired in January 2004. New legislation would have to be passed to provide specific authority to operate a transportation system and provide a funding source.

Securing Funds to Cover the Transit Subsidy. The ability to cover the expected transit subsidy would be required to select a Transit alternative as the preferred alternative. Transit subsidies are often covered by local or state taxes, because revenues from fares rarely cover the entire cost of maintaining and operating a transit system.

The subsidies projected for the Transit alternatives examined vary from a low of $15 million per year for the Bus in Mixed Traffic – a component of the Minimal Action alternative – to a high of $105 million per year for the Combination Six-Lane Highway with AGS alternative. Of the preferred alternatives, Dual-Mode Bus in Guideway would require an annual subsidy of $16 million, with Diesel Bus in Guideway requiring $21 million annually.

Potential for Moving Ahead with Some "Early Actions" Prior to the Completion of the PEIS. Substantial congestion has been occurring along portions of I-70 during most weekends for over a decade. During this time, CDOT initiated and completed one study (the Major Investment Study), with a subsequent Corridor-wide study (this PEIS). However, another tier of environmental documentation (such as environmental assessments or environmental impact statements) would still have to occur before any substantial congestion relief could be constructed. These subsequent NEPA studies will not likely be completed before 2008 to 2010.

Recommendations from the Listening Forum. At the September 2003 Listening Forum that CDOT and FHWA held with the some of the Corridor stakeholders, a common theme from most participants was that I-70 users should not have to wait until all studies are completed before some action is taken. Recommendations were made to construct some elements of I-70 improvements as soon as was practical. CDOT and FHWA have been evaluating options for "early action," but those elements need to comply with the NEPA guidance that requires that any of these early actions not predetermine the selection of the preferred alternative. Actions that would fall into this category include:

- Implementation of elements from the No Action alternative, including further development of the Hogback Parking Facility and Eagle County Airport Interchange; continued progress on the Straight Creek and Black Gore Creek Sediment Control Action Plans; and design and construction of rockfall mitigation, particularly along Georgetown Hill.
- Development of a Transportation Management Organization of Corridor stakeholders to oversee and encourage peak spreading and other marketing initiatives.
- Implementation of a Courtesy Patrol during peak weekends between C-470 and Silverthorne to help offset some of the emergency response burden of the local agencies.
- Design and construction of ramp metering at the East Idaho Springs interchange.
- Design and construction of interchange upgrades throughout the Corridor.
- Limited highway improvement, such as lengthening or reconstruction of interchange ramps.
- Improvements (such as lighting) or expansion of the Twin Tunnels.

- Other safety or TSM improvements.
- Tier 2 NEPA studies, following the ROD for the PEIS, would occur for specific areas of improvement that would have independent utility and not preclude future action.

Transit Station Locations and Parking. The details of transit station locations and parking requirements, including specific station configurations, operational plans and designs will be addressed at the Tier 2 level of the NEPA process, depending on the needs of the alternative selected in the Tier 1 ROD.

Tier 1 versus Tier 2 Studies

This PEIS is a Tier 1 policy-level document. Site-specific Tier 2 NEPA studies will need to be completed for any future action. These processes could include environmental impact statements, environmental assessments, or categorical exclusions. The following describes these processes.

Tier 1 – PEIS

Products of the Federal Record of Decision (ROD):

1. Tier 1 ROD presents the selected alternative, which defines modification to the I-70 Corridor transportation system (for example, modal components, location(s) of changes, preliminary alignment(s) of the selected alternative).
2. It determines the immediate, planned (20-year), and longer-range modifications to be pursued.
3. The PEIS describes the general characteristics of the modes that will make up the transportation system.
   - For Rail, AGS, or Bus modes, it defines critical components of the system (general speed, elevated or not, capacity of system, necessary local transit support systems).
   - For Highway mode, it defines type of improvement.
   - For Minimal Action, it defines elements to be included.
4. Impacts (direct, indirect, and cumulative) of project alternative are evaluated and defined to a programmatic, Tier 1 level. Selected alternative and basis for decision are stated, identifying all alternatives considered, and documenting Section 4(f) and other regulatory requirements. The environmentally preferred alternative is identified. Consistency with 404(b)1 guidelines of the USACE (least environmentally damaging, practicable alternative [LEDPA]) is identified.
5. Means to avoid or minimize environmental harm and commitment to mitigation are stated, as well as the general environmental, safety, and maintenance mitigation and monitoring that will be implemented in the Corridor. Programmatic agreements with resource agencies are pursued.
6. Tier 1 determines the reasonable investment Colorado can expect for the transportation and mitigation plans.
7. Tier 1 also determines the implementation plan and the priority of improvements for the transportation system.
8. At the Tier 1 level, it is determined which parties are responsible for implementation of various elements (for example, lead agency responsibilities, transportation elements, and mitigation measures).
9. The level of Tier 2 environmental studies for subsequent actions is determined (for example, Environmental Assessment, Environmental Impact Statement, Categorical Exclusion, project limits).

Next Steps for Tier 1 PEIS

1. **Review and comment on the Draft PEIS.** The Draft PEIS will be available for a minimum 90-day review and comment period, and nine **p**ublic hearings will also be held.
2. **Identify a Preferred Alternative for the Final PEIS.**

   After the comments received on the Draft PEIS have been evaluated, and after subsequent discussions with the federal cooperating agencies and stakeholders, CDOT and FHWA will identify a preferred alternative. Key to the identification will be close adherence to achieving the underlying need and attaining the various project purposes to the greatest extent possible.

   The preferred alternative may become a hybrid of the alternatives examined in this PEIS as a result of public comment.

3. **Review and Comment on the Final PEIS.**

   The Final PEIS will identify a preferred alternative and will be available for a public review and comment period.

   The Final PEIS will identify a preferred alternative with consideration for the following:

   - Ability to meet the project purpose and need
   - Ability to meet Section 404 of the Clean Water Act (b)(1) guidelines for determination of the Least Environmentally Damaging Practicable Alternative (LEDPA)
   - Identification of the environmentally preferred alternative in accordance with CEQ
   - Ability to avoid or minimize uses to Section 4(f) properties
   - Ability to avoid or minimize any take as defined by the Endangered Species Act
   - Feasibility to be built
   - Affordability or ability to be financed over an acceptable period
   - Ability to meet the objectives of social, economic, and environmental concerns
   - Public acceptance of any changes to I-70

   The Final PEIS may be of an abbreviated or condensed form to reduce paperwork and the accumulation of extraneous data as recommended by CEQ regulations.

4. **Select a Preferred Alternative in the Record of Decision.**

   Pending the comments received on the findings of the Final PEIS, the FHWA will record its decision on the selected alternative in the project's Record of Decision (ROD).

Mitigation Policies

The environmental issues and mitigation described in this chapter are programmatic in nature. All alternatives could result in impacts on the resources under study, to varying degrees. The mitigation strategies are comprehensive in nature and crafted for this Corridor to address the types of resource impacts reported in sections 3.1 to 3.18.

The mitigation policies and strategies presented in this section will be shaped to the preferred alternative as a result of public comment and review on this Draft PEIS, and will be presented in the Final PEIS. These mitigation policies and strategies will undergo any necessary refinement as a result of public review and comment on the Final PEIS and will become specific mitigation commitments in the Tier 1 ROD.

At the Tier 2 level of the NEPA process, project-specific mitigation will be further shaped with design efforts to further avoid and minimize impacts to the greatest extent possible.

The following is a list of the mitigation policies to be carried out. During Tier 2 NEPA studies, CDOT and FHWA will:

1. Employ design strategies during Tier 2 to further minimize impacts on communities and the environment, including the following:

   1A – Utilize the general alignment and design elements selected during Tier 1, unless other reasonable and feasible alternatives with similar or fewer impacts were to surface.

   1B – In isolated instances, consider variances from standard designs to further minimize impacts, as long as the resulting alternatives were reasonable and feasible. The project alternatives are based on standard design parameters.

   1C – Utilize the principles of "Context Sensitive Design" including significant involvement of the affected communities in determining the ultimate footprint, aesthetic elements, and other features germane to the alternative.

   1D – Determine noise mitigation strategies with the affected communities, residents, and businesses.

   1E – Encourage interested parties to develop and evaluate a list of reasonable alternatives that would meet an affected community's ideal of aesthetically pleasing infrastructure.

2. Apply the conditions to be set forth in the Programmatic Agreement between the consulting parties involving Section 106 of the National Historic Preservation Act.
3. Fulfill their responsibilities as set forth in the ALIVE (A Landscape Level Inventory of Valued Ecosystem components) agreement and in the Biological Assessment to be developed in conjunction with the USFWS. The ALIVE program is designed to provide opportunities to address issues related to the improvement of wildlife movement and reduce habitat fragmentation within the Corridor. Mitigation measures will be developed to offset impacts on species that were identified in the WRNF and ARNF under the Biological Evaluation.

4. Meet the objectives of 404(b)(1) of the Clean Water Act. Engage stakeholders to continue the work of the Stream and Wetland Ecological Enhancement Program (SWEEP) committee in an effort to integrate water resource needs (such as water quality, fisheries, wetlands, or riparian areas) with design elements for construction activities and long-term maintenance and operations of the transportation system.
5. Integrate winter storm management and maintenance procedures into the template of the infrastructure. Highway alternative templates throughout Clear Creek County will include snow storage areas in select locations to capture snow and other road runoff, to reduce impacts on adjacent ecosystems.
6. Implement the Sedimentation Control Action Plans (SCAPs), which were developed specifically for Straight Creek and Black Gore Creek, to identify methods to control the existing transport of winter sanding materials.
7. Develop information systems (such as advertising campaigns to support local businesses, signage with hours of operation, detour plans) to inform affected communities, I-70 travelers, businesses and homeowners about construction activities and schedules.

Tier 2– Site-Specific Environmental Clearances

(EIS, EA, or Categorical Exclusion)

1. Depending on the types of alternative components selected in the Tier 1 PEIS, Tier 2 will determine where system components would be located (for example, refined alignment, interchanges, ramps, typical sections).
2. It will describe site-specific components of the system:
   If mode is Rail, AGS, or Bus in Guideway, specific technology will be determined. Transit support systems will continue to be refined.

   If mode is Highway, components will be defined.

   If mode is Minimal Action, the improvements will be defined more specifically.
3. Regarding a site-specific alignment or other components of the selected alternative, site-specific impacts of the selected alternative elements under study will be determined.
4. Tier 2 will determine more exactly where mitigation, monitoring, and enforcement will occur and what the extent of mitigation will be. Site-specific permits will be pursued.
5. A 20-year long-range constrained plan will be aligned with investment determined for a 20-year period.
6. Implementation plan will begin by programming projects into the six-year Statewide Transportation Improvement Program (STIP).
7. Responsible parties will ensure timely implementation of elements.
8. Appropriate environmental clearances will be pursued.

Subsequent Steps for Tier 2 Evaluation

1. Initiate Tier 2 NEPA documents to implement the selected alternative in the Tier 1 Record of Decision (ROD). Upon issuance of the ROD, CDOT will initiate Tier 2 NEPA studies to further evaluate independent projects from the Tier 1 selected alternative.
2. For those actions requiring a categorical exclusion (CE) or an environmental assessment (EA), an evaluation of the No Action alternative and the Tier 1 selected alternative will be carried out in accordance with CEQ. The Tier 2 level of analysis will concentrate on the issues specific to the subsequent action.
3. For those actions having significant impacts or requiring more detailed analyses because the significance of the impacts is not well defined, CDOT will initiate an EA or an environmental impact statement (EIS).
4. CEs are actions that do not individually or cumulatively involve significant social, economic, or environmental impacts. EAs are performed in the event that more detailed evaluations are required to determine the level of significance of impacts. In the event that significant impacts are anticipated, an EIS is prepared.
5. Further examine alignment options of the Tier 1 selected alternative.
6. Key during the Tier 2 analysis will be refinement of project alignments and other design issues that will help to further minimize and mitigate the impacts of the Tier 1 selected alternative. For example, several areas will need additional investigation, such as structured lanes in Idaho Springs, Twin Tunnels elevation to avoid 4(f) uses, and interchanges that have not been designed yet. Corridor stakeholders and permitting agencies would be invited to actively participate in Tier 2 refinements.
7. Further evaluate technology issues of the Tier 1 selected alternative.
8. Studies would also continue during Tier 2 to further the knowledge about any technical issues associated with the Tier 1 selected alternative.

List of Acronyms used in Executive Summary

- **AADT** Average Annual Daily Traffic
- **AGS** Advanced Guideway System
- **ALIVE** A Landscape Level Inventory of Valued Ecosystem Components
- **AMSL** Above Mean Sea Level
- **APE** Area of Potential Effect
- **ARNF** Arapaho and Roosevelt National Forests
- **BLM** Bureau of Land Management
- **BMP** Best Management Practice
- **CBEF** Center for Business and Economic Forecasting
- **CDOT** Colorado Department of Transportation
- **CDOW** Colorado Division of Wildlife
- **CERCLA** Comprehensive Environmental Response, Compensation and Liability Act
- **CE** Categorical Exclusion
- **CEQ** Council on Environmental Quality
- **CFR** Code of Federal Regulations
- **CIFGA** Colorado Intermountain Fixed Guideway Authority
- **CNHP** Colorado Natural Heritage Program
- **CO** Carbon Monoxide
- **Corridor** I-70 Mountain Corridor
- **CWA** Clean Water Act
- **DOLA** Department of Local Affairs
- **DRCOG** Denver Regional Council of Governments
- **DTC** Denver Tech Center
- **DTD** Division of Transportation Development
- **EA** Environmental Assessment
- **EIS** Environmental Impact Statement
- **EJMT** Eisenhower-Johnson Memorial Tunnels
- **EPA** Environmental Protection Agency
- **ESA** Endangered Species Act
- **FGT** Fixed Guideway Transit
- **FHWA** Federal Highway Administration
- **FTA** Federal Transit Administration
- **GRP** Gross Regional Product
- **HOT** High Occupancy/Toll
- **HOV** High Occupancy Vehicle
- **HSST** High Speed Surface Transportation
- **IMC** Intermountain Connection (rail service involving existing tracks)
- **ITS** Intelligent Transportation Systems
- **LWCF** Land and Water Conservation Fund
- **MCAC** Mountain Corridor Advisory Committee
- **MIS** Major Investment Study
- **MP** Milepost
- **NEPA** National Environmental Policy Act
- **NHL** National Historic Landmark
- **NRHP** National Register of Historic Places
- **NRSE** National Survey on Recreation and the Environment
- **NWCCOG** Northwest Colorado Council of Governments
- **OHV** Off Highway Vehicle
- **O&M** Operation and Maintenance
- **PA** Programmatic Agreement
- **PEIS** Programmatic Environmental Impact Statement
- **PMT** Person Miles of Travel
- **ROD** Record of Decision
- **ROW** Right-of-Way
- **RTD** Regional Transportation District
- **RTT** Rubber Tire Transit
- **RVD** Recreation Visitor Day
- **RV** Recreational Vehicle
- **SCAP** Sediment Control Action Plan
- **SCORP** Statewide Comprehensive Outdoor Recreation Plan
- **SHPO** State Historic Preservation Officer
- **STIP** Statewide Transportation Improvement Program
- **SWEEP** Stream and Wetland Ecological Enhancement Program
- **TAC** Technical Advisory Committee
- **TDM** Travel Demand Management
- **TES** Threatened, Endangered, and Special Status
- **TSM** Transportation System Management
- **TSS** Total Suspended Solids
- **UPRR** Union Pacific Railroad
- **USFS** US Forest Service
- **USFWS** US Fish and Wildlife Service
- **VoT** Value of Time
- **WHI** Weighted Hazard Index
- **WRNF** White River National Forest