



Task 3 Technical Memorandum Summary of Existing Studies Draft

September 2008





Table of Contents

Section	Page
Introduction.....	3
1.0 I-70 Mountain Corridor Major Investment Study.....	4
1.1 Development and Analysis of Rail Alternatives.....	4
1.2 Description of the Fixed Guideway Transit Alternative.....	6
1.3 Recommended Vision Strategy.....	6
2.0 I-70 Draft Programmatic Environmental Impact Statement.....	8
2.1 Development and Analysis of Rail Alternatives.....	8
2.1.1 Level 1 Alternative Screening	9
2.1.2 Level 2 Alternative Screening	11
2.1.3 Level 3 Alternative Screening	11
2.2 Rail Alternatives Advanced in the Draft PEIS	12
2.2.1 Rail with Intermountain Connection (IMC)	12
2.2.2 Advanced Guideway System.....	12
2.2.3 Combination Six-Lane Highway and Rail with IMC	13
2.2.4 Combination Six-Lane Highway with Advanced Guideway System.....	13
2.2.5 Combination Alternatives – Preservation Options	13
2.3 Results.....	14
3.0 Colorado Mag-Lev Project	15
3.1 Scope.....	15
3.2 Overview.....	15
3.2.1 Route.....	15
3.2.2 Capacity	16
3.2.3 Vehicle Selection	16
3.2.5 Stations.....	18
3.3 Conclusions.....	19
4.0 National Forest Management Plans	21
4.1 Arapaho National Forest.....	22
4.1.1 Overview.....	22
4.1.2 Goals and Objectives	22
4.2 White River National Forest.....	24
4.2.1 Overview.....	24
4.2.2 Goals and Objectives	24
5.0 I-70 Coalition Preferred Alternative	26
5.1 Overview.....	26
5.2 Preferred Alternative.....	26
6.0 I-70 Collaborative Effort.....	28
6.1 Overview.....	28
6.2 Recommendations.....	28
7.0 I-70 Context Sensitive Solution Project.....	30
8.0 Summary of Opportunities and Barriers.....	31



Introduction

The I-70 mountain corridor from Denver to Glenwood Springs has been the focus of a number of transportation studies. These studies have generally focused on improving mobility and congestion relief. Additionally, the US Forest Service (USFS) has completed management plans for National Forest lands along the corridor.

Task 3 of the I-70 Coalition Land Use Planning Study includes reviewing these various documents and plans for relevant information. The following documents and plans were reviewed:

- I-70 Mountain Corridor Major Investment Study (MIS)
- I-70 Programmatic Environmental Impact Statement (PEIS)
- Colorado Mag-Lev Study
- Arapahoe and White River National Forest Management Plans
- I-70 Coalition Preferred Alternative
- I-70 Collaborative Effort
- I-70 Context Sensitive Solution Project

Summaries of the above documents are provided following this introduction. The summaries focus on aspects related to this land use study and include: 1) project purpose and status, 2) fixed rail transit aspects, 3) alignment aspects, 4) station locations and types, 5) preferences for service, and 6) major recommendations or conclusions.



1.0 I-70 Mountain Corridor Major Investment Study

The I-70 MIS was completed in 1998 and was prepared to identify the short- and long-term mobility solutions for I-70 from Denver International Airport (DIA) to Glenwood Springs. The project need was to address the anticipated doubling of traffic volumes that were forecast to occur every 11 to 35 years, depending on location in the corridor. The combination of projected growth and present-day operating constraints, both safety and mobility oriented, led to the initiation of the I-70 MIS.

The I-70 MIS was unique when compared to a traditional MIS for the following reasons:

- The study had a 50-year planning horizon.
- Alternatives were not limited to proven technologies.
- A budget was not created due to the 50-year planning horizon.
- Due to the length of the corridor, as well as its varied land uses, the evaluation was more qualitative in nature.

1.1 Development and Analysis of Rail Alternatives

The MIS examined an array of alternatives that considered all modes. This summary focuses on the evaluation of fixed guideway transit alternatives (FGT). There were participating groups involved in the development of alternatives: the project team, the citizen's workshop committee, and the oversight committee, consisting of a mix of public agencies, municipalities and private interests. Through brainstorming sessions, the groups developed 640 total alternatives. These were then refined to 20 alternatives. Of those alternatives the following four FGT alternatives were selected for study.

- FG 1 – High speed rail from West Denver to Vail.
- FG 2 – Local rail service from West Denver to Vail with minimal tunneling.
- FG 3 – Emerging/innovative FGT, West Denver to Vail.
- FG 4 – Winter Park Ski Train with extension from State Bridge to I-70.

Table 1 details the four FGT alternatives and their respective performance within the conceptual screening process.



Table 1: Results of MIS Alternative Screening

Alternative	Description	Disposition	Comments
FG 1- High speed rail from West Denver to Vail.	High speed electrified train with grades <3%. Necessitating significant tunneling.	Screened Out	Screened out due to environmental concerns regarding tunneling.
FG 2 - Local rail service from West Denver to Vail with minimal tunneling.	Conventional diesel technology with rack and pinion technology to climb steep grades and minimize tunneling.	Screened Out	Travel speeds deemed to slow to be competitive.
FG 3 - Emerging/innovative FGT, West Denver to Vail	Assumes the same alignment as FG 2, but can negotiate the grades while maintaining a competitive speed.	Advanced	Expanded to include all emerging technologies.
FG 4 - Winter Park Ski Train with extension from State Bridge to I-70	Extend the existing ski train route to extend to Vail.	Screened Out	Not beneficial to the corridor.

Source: Adapted from I-70 MIS, 1998

Alternative FG 3 was advanced to detailed evaluation along with several other non-rail alternatives. In addition to Alternative FG 3, a combination alternative featuring FGT and selected highway improvements was evaluated. This combination alternative would include the entire rail component and add one travel lane in each direction along I-70, from Floyd Hill to U.S. Highway 40 (US 40) at Empire Junction.

Detailed evaluation of each alternative examined the potential impacts and benefits to the environment, community values, mobility/safety and financing. **Table 2** illustrates the conclusions reached.

Table 2: Conclusions of Detailed Evaluation

Concepts with Broad Support	Concepts with Limited Support	Concepts with either Neutral and/or Undetermined Results
<ul style="list-style-type: none"> ▪ FGT ▪ Transportation System Management (TSM)/ Transportation Demand Management (TDM) ▪ Carpool incentives ▪ Mobility options ▪ Change travel behavior ▪ Safety improvements 	<ul style="list-style-type: none"> ▪ Highway widening (as Vision strategy) ▪ Conventional transit ▪ Congestion pricing ▪ No-build ▪ Measures that compromise safety 	<ul style="list-style-type: none"> ▪ Flex lanes ▪ Tolls

Source: Adapted from I-70 MIS, 1998



1.2 Description of the Fixed Guideway Transit Alternative

The FGT alternative that received broad support for detailed evaluation stretches from West Denver to Glenwood Springs. Service could originate at DIA or Denver Union Station. Service to DIA, while assumed, did not have a preferred alignment identified between DIA and West Denver. The section between West Denver and Vail would be high-speed and new construction. The section between Vail and Glenwood Springs would use the existing Union Pacific railway and be a traditional commuter rail system.

While a technology was not identified, for purposes of cost estimation and impact analysis, it was assumed to be electrified high speed train, similar to the French Trains-a-Grande Vitesse. Ultimately, the technology selection will be based on numerous, although yet to be determined, criteria, such as average speed, climbing capabilities, passenger capacity and environmental impacts. The trains were expected to operate on 60-minute headways during the week and 20-minute headways in peak-period, peak-direction on the weekend. **Table 3** lists the locations of stations that were assumed for the study.

Table 3: MIS Station locations

West Denver to Vail	Vail to Glenwood Springs
West Metro Denver	Minturn
Idaho Springs	Avon
Georgetown	Edwards
Loveland	Wolcott
Dillon/Silverthorne	Eagle
Frisco	Gypsum/Eagle County Regional Airport
Copper Mountain	Dotsero
Vail	Glenwood Springs

Source: I-70 MIS, 1998

It was assumed that these stations would not include parking. The stations would be served by feeder bus systems located in Jefferson, Clear Creek, Summit, Eagle, and Garfield Counties.

1.3 Recommended Vision Strategy

The result of the I-70 Mountain Corridor MIS was a vision that combined a number of elements, of which FGT was the anchor. **Table 4** details the elements contained in the recommended vision strategy. These elements represent what the stakeholders believed was the best response to the stated project mission: the safe movement of people and goods through the use of innovative technologies, preservation of visual character, and a balance between economic development, and environmental protection.



Table 4: Recommended Vision Strategy Elements

Element	Description
FGT	Rail from West Denver to Glenwood Springs, with a technology shift in Vail. Connection to DIA assumed.
TSM Build Elements	Flex lanes, geometric improvements, interchange improvements and new interchanges.
TSM Operational Elements	Intelligent transportation system (ITS), incident management, trucking operations and improved maintenance.
TDM	Change travel behavior, parking management and intermodal transfer centers.
Aviation	Continuous improvements to existing facilities.
Bus Transit	Intermountain bus service, skier express service and improvements to existing transit systems.
Alternate Route Suggestions	Not all alternate routes were analyzed since affected communities were not represented, so alternative screening evaluation should be forwarded to the statewide planning process.
Continued Public Review	Continued outreach and public involvement via meetings and workshop.

Source: Adapted from I-70 MIS, 1998



2.0 I-70 Draft Programmatic Environmental Impact Statement

The I-70 Draft PEIS was completed in 2004 and took a broad view of the transportation issues and developed alternatives to reduce future congestion and improve mobility within the I-70 corridor. The DRAFT PEIS was a Tier 1 analysis and encompasses I-70 from C-470 to Glenwood Springs, a distance of approximately 150 miles. A Tier 1 analysis is a systems, or program level approach, whereas site-specific and more detailed analyses would occur during the Tier 2 level (a subsequent study to the PEIS). It should be noted that a programmatic record of decision has not yet been completed.

The I-70 Draft PEIS examined the purpose and need, potential alternatives, the affected environment, environmental consequences, and impacts and mitigations for the alternatives. The project needs included increasing capacity, improving accessibility and mobility, and decreasing congestion. An alternative that improved travel time, reduced congestion, offered mode choice(s) and addressed capacity and mobility challenges was considered to meet the needs.

2.1 Development and Analysis of Rail Alternatives

There were numerous rail alternatives originally considered. These included a mix of technologies, propulsion systems and potential alignments. These alternatives were then subjected to several phases, or levels, of alternatives screening, with each alternative being compared against specific criteria. Using this sequential process, the rail alternatives were narrowed down to two options. The following is a description and summary of the rail alternatives screening process:

- Level 1: This was a broad screening that identified which alternatives met the study's purpose and need. The focus was on mode and technology, therefore other factors, such as environmental or community values were not considered.
- Level 2: Using the results from the Level 1 analysis, this screening incorporated the elements of Level 1, but also included such parameters as cost, constructability, environmental, and community values. Additionally, the approximate footprint was considered.
- Level 3: A refinement of the remaining alternatives and their design allowed for an increased level of detail to be assessed regarding environmental and community impacts, as well as overall performance. Alternatives which were retained after the Level 3 screening were included for analysis within the Draft PEIS.

Throughout Levels 1 and 2 screening all alternatives were grouped into families. All rail alternatives were placed in the Fixed Guideway Transit (FGT) family. Within this family were six vehicle technologies, some with several potential propulsion technologies including:



- Light Rail
- Heavy Rail
 - Electric multiple unit (EMU)
 - Diesel multiple unit (DMU)
- Passenger railroad, this included the use of existing railways, such as the proposed Intermountain Connection (IMC), Winter Park Ski Train or the Amtrak Glenwood Springs Service.
 - Diesel locomotive hauled coach
 - EMU
- Advanced Guideway System (AGS)
 - High speed maglev
 - Low speed urban maglev
 - Colorado Intermountain Fixed Guideway Authority monorail
- Conventional monorail (double track)
- Automated Guideway Transit

All of the above alternatives were examined at a 4% and 6% grade, with light rail and AGS also examined at a 7% grade, the maximum grade along I-70. To maintain a consistent 4% or 6% grade, the alignment would have to deviate from the highway alignment, potentially posing constructability issues based on environmental impacts or community concerns. Single track and double track options were examined as well. **Figure 1** illustrates how each identified alternative fared throughout the screening process.

2.1.1 Level 1 Alternative Screening

Level 1 screening criteria included:

- Capacity: The maximum passengers per hour.
- Accessibility: The ability to access communities along the corridor.
- Mobility: The average speed and travel time. This included station dwell times.
- Congestion: The ability of the alternative to reduce congestion during peak period.
- Safety: Presence of an operator should an emergency arise. This became a critical test since an incident, especially on a new mode within the corridor, would have cascading impacts, affecting automotive mobility, safety and access.



Figure 1: Results of DRAFT PEIS Alternatives Analysis

Transit Alternatives	Screened - Level 1 Screening	Screened - Level 2 Screening	Screened - Level 3 Screening	Retained for Draft PEIS
Rail and Advanced Guideway System Alternatives				
Existing I-70 Alignment (7% Grade) - Diesel Power				
Light Rail Transit - Single Track		X		
Light Rail Transit - Double Track			X	
Existing I-70 Alignment (7% Grade) - Electric Power				
Light Rail Transit - Single Track		X		
Light Rail Transit - Double Track			X	
Advanced Guideway System (AGS) (Formerly CIFGA Monorail)(mp 142-260)				●
AGS/High Speed Maglev	X			
Automated Guideway Transit	X			
Heavy Rail Transit - Double Track (Moved from 6% Alignment)(mp 176-260)				●
6% Grade Alignment - Diesel Power				
Light Rail Transit - Single Track		X		
Light Rail Transit - Double Track		X		
Heavy Rail Transit - Single Track		X		
Heavy Rail Transit - Double Track		X		
Passenger Railroad - Locomotive Hauled - Single Track		X		
Passenger Railroad - Locomotive Hauled - Double Track		X		
6% Grade Alignment - Electric Power				
Light Rail Transit - Single Track		X		
Light Rail Transit - Double Track		X		
Heavy Rail Transit - Single Track		X		
Passenger Railroad Electric Multiple Unit - Single Track		X		
Passenger Railroad Electric Multiple Unit - Double Track			X	
Advanced Guideway System - Conventional Monorail - Double Track			X	
4% Grade Alignment - Diesel Power				
Light Rail Transit - Single Track		X		
Light Rail Transit - Double Track		X		
Heavy Rail Transit - Single Track		X		
Heavy Rail Transit - Double Track		X		
Passenger Railroad - Locomotive Hauled - Single Track		X		
Passenger Railroad - Locomotive Hauled - Double Track		X		
4% Grade Alignment - Electric Power				
Light Rail Transit - Single Track		X		
Light Rail Transit - Double Track		X		
Heavy Rail Transit - Single Track		X		
Heavy Rail Transit - Double Track		X		
Passenger Railroad Electric Multiple Unit - Single Track		X		
Passenger Railroad Electric Multiple Unit - Double Track		X		
Advanced Guideway System - Double Track		X		
Existing Rail Facility				
Intermountain Connection (mp 142-176)				●
Passenger Railroad - Winter Park Service Track		X		
Passenger Railroad - Glenwood Springs Service Track		X		

Source: I-70 DRAFT PEIS

All alternatives, with the exception of AGS and automated guideway transit were retained upon completion of the Level 1 screening, although both a variation of AGS and automated guideway transit were advanced.

The AGS alternative included the monorail and the Low Speed Urban MagLev. As of 2003, the monorail had not proceeded beyond the concept phase, and therefore could not be adequately examined to meet the purpose and need and was eliminated from further consideration. Maglev was recognized as operating at such a high speed as to be unable to operate along the highway corridor. At the urging of the advisory committee, a low-speed version was retained.



Automated guideway transit systems are designed to perform without an operator present. In a controlled environment, with emergency services nearby, this creates a functional and safe system. Along I-70, the distance from emergency services means this alternative does not meet the safety requirement. A long-haul version with an operator was advanced, but was reclassified as either passenger rail or AGS.

2.1.2 Level 2 Alternative Screening

Level 2 screening criteria included the following:

- Capacity: Seats provided for all passengers during peak-period in the peak direction.
- Mobility: The average speed and travel time (including station dwell times).
- Safety: Relative potential for crashes.
- Accessibility: The need for transfers between modes.
- Implementation: Constraints regarding constructability, cost, technology and energy.
- Environmental sensitivity: Impacts to water quality, wetlands, wildlife, and geologic resources.
- Community values: Impacts for noise, recreation, historic and visual resources.

A majority of alternatives were eliminated during Level 2 analysis, with only the following six alternatives advancing: light rail, two versions of AGS (the Colorado Intermountain monorail and conventional monorail), electrified heavy rail, passenger railroad, and the use of the IMC.

The major reasons for elimination were cost and poor operating capability for the given conditions. Due to the high cost of construction, caused by having to deviate from the highway corridor, all alternatives operating on a 4% grade were eliminated. At a 6% grade, diesel powered heavy rail and passenger rail alternatives were eliminated due to poor operating capability. The Winter Park Ski Train and Glenwood Spring service were eliminated since increasing service levels on the existing Union Pacific Railroad infrastructure was deemed impractical.

2.1.3 Level 3 Alternative Screening

Level 3 screening once again focused on capacity and mobility. The light rail alternatives were eliminated due to limited capacity. Passenger railroad and heavy rail were eliminated for slower travel times and impacts/conflicts with local land uses.

Retained for consideration in the Draft PEIS were AGS and electrified heavy rail, running on the IMC and on new railway between Vail and C-470. These alternatives, along with the No Action, rubber tire transit, highway and a combination of highway and transit alternatives, were all studied to quantify their ability to meet both the purpose and need and quantify their impacts on the local environment.



2.2 Rail Alternatives Advanced in the Draft PEIS

Station locations considered for the rail alternatives are summarized in **Table 5**.

Table 5: Draft PEIS Station locations

I-70/C-470 area El Rancho Floyd Hill/I-70 & US 6 Interchange area Idaho Springs Georgetown Loveland Ski Area Silverthorne/Dillon Frisco	Copper Mountain Vail Minturn (for IMC only) Avon Walcott (for IMC only) Eagle Eagle Airport
--	---

Source: I-70 Draft PEIS

2.2.1 Rail with Intermountain Connection (IMC)

The Rail with IMC Alternative extends from C-470 to Eagle County Airport. The railway would be double-track from the eastern end-of-line station, the I-70/C-470 area, through to Frisco. After the Frisco, it would be single track, with sidings for passing trains, until the western end-of-line station, the Eagle County Regional Airport. The Vail Transportation Center would represent a switch in engine systems, with routes eastbound powered by an EMU platform, and westbound trains powered by a DMU platform.

The majority of railway between I-70/C-470 area and the Vail Transportation Center would be at grade. Approximately 35 miles would be elevated; this would occur when the train needed to move from one side of the highway to another or where physical constraints dictate an elevated track. Between the Vail Transportation Center and the Eagle County Airport, new track would be required from Vail to Minturn; otherwise the alignment would follow the IMC.

The success of this system would require investment/improvement in the transit services currently serving the mountain corridor. Additionally, it is assumed that the rail operator would provide a shuttle service from Empire Junction to Winter Park Resort.

The construction impacts were rated intermediate. A majority of the railway construction would not directly impact I-70, thereby limiting traffic disruptions.

2.2.2 Advanced Guideway System

The AGS Alternative would serve from C-470 to Eagle County Airport, but would be elevated for its entire length. The AGS under consideration in the Draft PEIS was magnetic levitation (maglev) system, currently under study by the FTA. The varied operating environment, extending from foothills to alpine passes, would require additional performance considerations to handle snow on the track, switch freezing and third rail icing. These are not unique to maglev and would pose challenges for any rail-based transit.



The AGS system would require considerable coordination with local transit providers for feeder service requirements. The faster speeds of AGS combined with overall system attractiveness, was anticipated to increase ridership over the Rail with IMC Alternative.

The construction impacts were rated intermediate. A majority of the railway construction would not directly impact I-70, thereby limiting traffic disruptions.

2.2.3 Combination Six-Lane Highway and Rail with IMC

This alternative would provide six general purposes lanes at select locations within the corridor, as well as Rail with IMC service from C-470 to Eagle County Airport. The additional lanes would be located in Dowd Canyon and from the Eisenhower Johnson Memorial Tunnel (Eisenhower Tunnel) to Floyd Hill.

The construction difficulties of the combination rail alternatives pose some of the most significant construction challenges of all the alternatives. Construction would occur both within the I-70 template, including medians, and beyond the highway template, inflicting significant traffic disruption. Once complete, this alternative would provide maximum capacity and highest average speeds.

2.2.4 Combination Six-Lane Highway with Advanced Guideway System

This alternative simply exchanges AGS for Rail with IMC. The alternative would provide six general purposes lanes at select locations within the corridor as well as AGS service from C-470 to Eagle County Airport. The additional lanes would be located in Dowd Canyon and from the Eisenhower Tunnel to Floyd Hill.

The construction difficulties of the combination rail alternatives pose some of the most significant construction challenges of all the alternatives. Construction would occur both within the I-70 template, including medians, and beyond the highway template, inflicting significant traffic disruption.

2.2.5 Combination Alternatives – Preservation Options

The Draft PEIS noted the opportunity for combination alternatives in which both the highway and transit option may not be built simultaneously, but the required space would be preserved so as to not preclude future construction. There were two scenarios identified.

1. **Preservation-Inclusion:** In this scenario the planning for the initial mode would occur and space preserved for the secondary mode. This could include the improvements within the corridor, such as retaining walls or interchange modifications, to accommodate the future alternative. Analysis of the affected environment would include the total footprint of both modes, with exclusion for cost estimates and mobility analyses, which would only include the initial mode being constructed.
2. **Preservation-Nonpreclusion:** In this scenario the initial mode would be planned so as not to preclude the future alternative. The six-lane highway would be constructed but would



not include improvements required for the future mode. All costs associated with the future mode would then be borne during the installation of the future mode.

2.3 Results

The Draft PEIS placed all remaining alternatives into one of two groups (see **Table 6**):

- **Preferred**, those that are best suited to meet the “need while achieving purposes to varying degrees and,
- **Other**, those that do not meet the need and/or are not reasonable due to cost of technological constraints.

Table 6: Draft PEIS Alternative Groupings

Preferred Group of Alternatives	Other Group of Alternatives
<ul style="list-style-type: none"> ▪ No Action ▪ Dual-Mode Bus in Guideway ▪ Diesel Bus in Guideway ▪ Six-Lane Highway 55 mph ▪ Six-Lane Highway 65 mph ▪ Reversible/HOV/HOT Lanes ▪ Build Six-Lane Highway and Preserve for Rail with IMC ▪ Build Six-Lane Highway and Preserve for AGS ▪ Build Six-Lane Highway and Preserve for Dual-Mode Bus in Guideway ▪ Build Six-Lane Highway and Preserve for Diesel Bus in Guideway 	<ul style="list-style-type: none"> ▪ Minimal Action ▪ Rail with IMC ▪ AGS ▪ Six-Lane Highway with Rail and IMC ▪ Six-Lane Highway with AGS ▪ Six-Lane Highway with Dual-Mode Bus in Guideway ▪ Six-Lane Highway with Diesel Bus in Guideway ▪ Build Rail with IMC and Preserve for Highway ▪ Build AGS and Preserve for Highway ▪ Build Dual-Mode Bus in Guideway and Preserve for Highway

Source: Adapted from I-70 Draft PEIS, 2004

It should be noted that while no fixed guideway alternatives were included in the group of preferred alternatives, they may still be included in the Final PEIS. A change, either technological, cost or in the ability of the alternative to meet the project need, could shift an alternative into the preferred group in the final document.



3.0 Colorado Mag-Lev Project

3.1 Scope

The Colorado MagLev Project was a cooperative study between the Colorado Department of Transportation (CDOT) and the Federal Transit Administration (FTA). The study was completed in 2004 and complemented the I-70 Draft PEIS and examined the viability of using a magnetically levitated (maglev) transit system along the I-70 corridor from DIA to Eagle County Airport. Like the I-70 Draft PEIS, the maglev study looked to address problems of congestion and mobility on I-70 during peak use, which are summer and winter weekends.

FTA and CDOT worked together on the project, but each agency had different goals for the study. CDOT's involvement, based on the then ongoing I-70 Draft PEIS, was a comparative analysis of a maglev transit versus other alternatives, such as highway widening or traditional locomotive hauled coach, for addressing the mobility needs along the I-70 mountain corridor. FTA's focus was solely on maglev technology and whether such technology could be deployed in the mountain corridor to help address the projected mobility and capacity concerns. FTA's involvement was through the Urban Magnetic Levitation Transit Technology Development Program. This program was designed to support the further development of maglev technology, recognizing the importance of reliability, cost and environmental impacts.

The differences between the information presented in the maglev study and the I-70 Draft PEIS are attributable to the separate project schedules and different needs. The I-70 Draft PEIS is a broad study examining a range of alternatives to address transportation needs along the corridor. The maglev study is more technical, offering a detailed analysis of a specific technology and whether or not its use would be feasible for the given operating environment. It is important to note that the AGS, which was studied in the I-70 Draft PEIS, is not the same as the maglev system. The AGS was presented with less technical information and did not undergo as rigorous analysis as the maglev system.

3.2 Overview

Maglev transit systems possess numerous technical capabilities that would allow for their operation along the I-70 corridor. These systems use magnetic fields to create a gap between the vehicle and guideway. This gap creates a frictionless interface between the vehicle and guideway, allowing for a quiet and smooth ride. Since the braking is no longer being friction-based the vehicle can operate in a diverse environment, such as the Colorado Rockies, and maintain braking ability. Additionally, maglev vehicles can climb 7 % grades without performance degradation and then up to grades of 18 % with degraded performance.

3.2.1 Route

The study corridor extended from DIA to Eagle County Airport, a distance of approximately 160 miles. It was assumed that the entirety of the corridor would be elevated and construction would



occur in the highway median whenever possible to minimize right-of-way needs. The corridor was divided into the following three segments for study:

- DIA to Golden
- Golden to Idaho Springs
- Idaho Springs to Eagle County Airport

From DIA the alignment was assumed to follow I-76 and connect to I-70 north of Denver. The alignment would then follow the existing interstate alignment to Golden, offering service to Front Range communities. The segment from Golden to Idaho Springs would follow the existing I-70 alignment, although an alternative alignment at the Idaho Springs twin tunnels would be possible. FTA expects that alternatives be considered to avoid the cost of tunneling.

The Idaho Springs to Eagle County Airport segment is both the longest and most technically challenging segment, reaching altitudes of approximately 12,000 feet and 10,600 as it crosses two mountain passes. The alignment would follow the I-70 alignment with one exception, a deviation near the Eisenhower Tunnel to minimize tunneling expense, as shown in **Figure 2**. Only cost and engineering feasibility were considered when developing this alternative, permitting and environmental factors were not analyzed.

3.2.2 Capacity

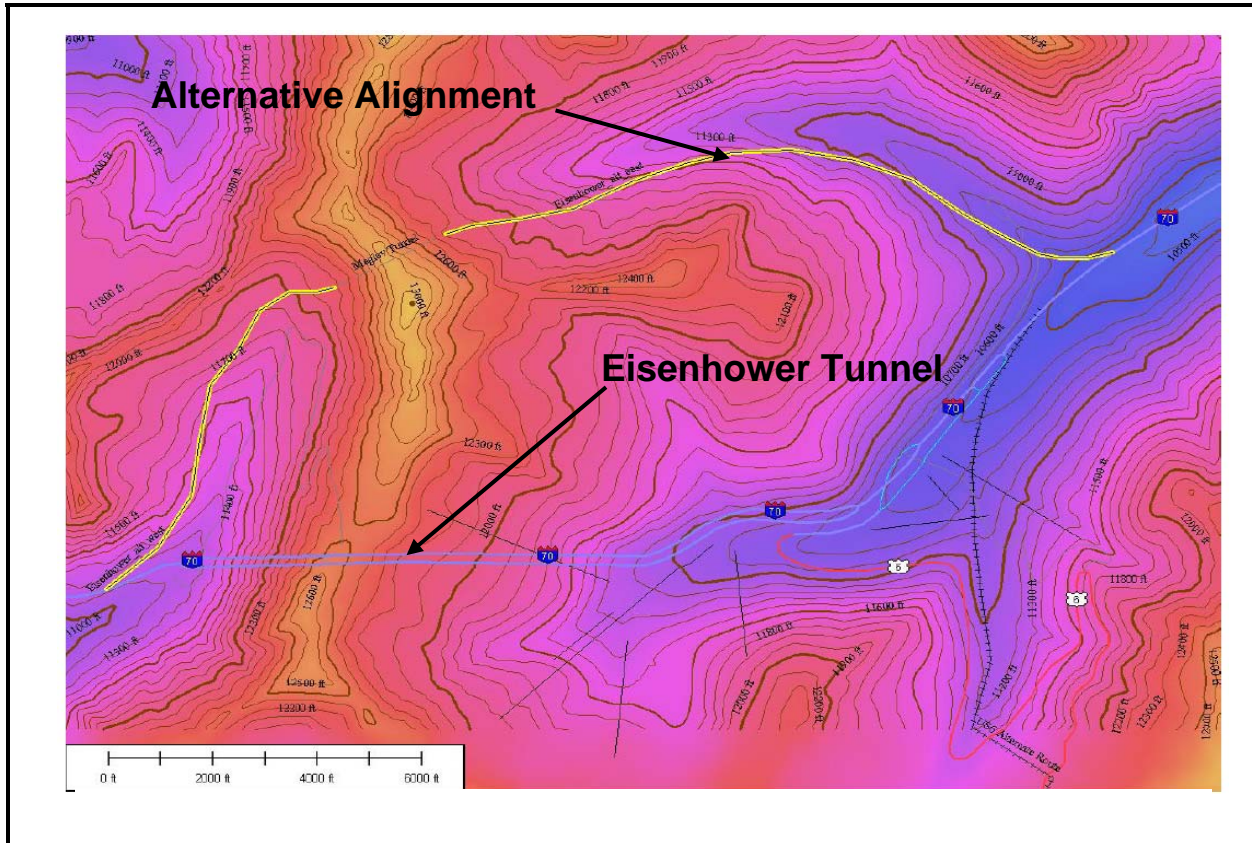
Travel models were completed using the same model as that of the I-70 Draft PEIS. It is important to note that this model included the Denver metropolitan area, but not communities further north and south who may use the maglev system to access mountain-based recreation opportunities.

Winter and summer Saturday travel represented peak use, with an estimated ridership of 40,000 persons per day, 20,000 in each direction. A three-hour AM and PM window, aligned with the operating hours of ski resorts, would comprise 60%, 12,000 persons, of the daily ridership. The system is designed to have a capacity of 6,000 persons per hour per direction, operating at a minimum headway of two minutes. This travel forecast dictated the vehicle capacity and headway times.

3.2.3 Vehicle Selection

Maglev systems are divided into two categories, low speed/local and high speed/inter-city. The maglev study examined each system to better understand which would prove more effective given the demands along the I-70 corridor.

Figure 2: Colorado MagLev Alignment Alternative at the Eisenhower-Johnson Memorial Tunnel (Eisenhower Tunnel)



Source: maglev study, 2004

Low Speed/Local

Low speed systems are typically used in urban areas, where stops are frequent and the overall length of the corridor is short. Speeds on this system type range from 37 to 75 miles per hour (mph). Low speed systems are often powered by a linear induction motor, which is a propulsion system located on the vehicle as opposed to the guideway.

The maglev study examined the existing Japanese Chubu High Speed Shuttle Transport (CHSST) to determine if such a system could meet the corridor's needs.

High Speed/Inter-City

High speed systems are used in corridors with limited stops and can attain speeds exceeding 300 mph. High speed systems often use a linear synchronous motor, which places the propulsion system on the guideway. The linear synchronous motor is highly efficient, but electrification costs are higher, as are overall system costs since the motors are located along the entire length of the corridor and not just on the vehicle.



The German Transrapid was selected for study. It has been deployed at Shanghai’s Pudong Airport, connecting the airport and the city center, making the 18 mile trip in a little over 7 minutes.

Conclusions

Based on operational analyses, the maglev study determined that the CHSST system served as the ideal baseline for the study, although the vehicle would be designed to attain higher speeds. The resulting concept was the Colorado 200 vehicle, which would be used on what was described as an intermediate speed/urban-suburban-rural system. The Colorado 200 vehicle had a top speed of approximately 125 mph and capacity to carry 200 passengers, could achieve headways of two minutes and serve the needs of recreationalists and mountain-based commuters alike. This vehicle was used for all subsequent analysis in the maglev study.

3.2.5 Stations

The maglev study identified 14 potential stations between DIA and Eagle County Airport. **Table 7** lists the stations and general locations.

Table 7: Maglev Study Potential Stations

Station	Mile	Service Area
DIA	0.0	Eastern terminus, services DIA.
Rolla	16.6	96 th Street & I-76, services north Denver.
Downtown Denver	25.0	I-25 & I-70, services northern Front Range cities.
Golden	37.0	I-70 & Colfax, services points south of Denver, such as Colorado Springs.
Evergreen	47.4	Bergen Park & Route 74, providing access to open space and developed areas along Route 74.
Idaho Springs	59.0	Provides access to Idaho Springs, as well as servicing the town’s population.
Georgetown	70.7	Serves three communities, Empire, Georgetown and Silver Plume.
Loveland Pass	82.4	Provides access to Loveland Ski Area.
Silverthorne	91.9	Serves the City of Silverthorne and Town of Dillon, as well as provides ski access.
Frisco	97.9	Serves the Town of Frisco and provides local ski access.
Copper Mountain	103.3	Serves Copper Mountain Ski Resort and also provides transit options to the city of Leadville.
Vail	122.5	Serves the communities located in the Vail Valley as well as the ski resort.
Avon	131.9	Serves Eagle Valley, Avon and Edwards.
Eagle County Airport	156.3	The western terminus, serving both Eagle and Wolcott and providing access to the airport as well as Beaver Creek Ski Resort.

Source: Adapted from maglev study, 2004



Due to highly variable weather along the corridor the maglev study recommended that all stations be enclosed. The corridor will feature a mix of local and express service, meaning not all trains will stop at each station, creating a potential hazard as trains pass through. To restrict access to the guideway, elevator style doors would align with train doors to allow passengers to enter and exit the trains, yet deter guideway trespass.

The maglev study identified the following three station types to serve the corridor:

- **Terminal Station:** Located at both DIA and Eagle County Airport, these stations would be designed to accommodate mode change, such as plain to train or train to bus, while minimizing station-specific automotive traffic.
- **Urban/Suburban Collector Station:** Located at major automotive interchanges, these stations, typified by the I-70 & I-25 station or Golden station, would serve to move travelers from the highway system onto the maglev system.
- **Rural Destination Station:** Located throughout the mountain corridor, this station type would primarily serve users along the Front Range accessing mountain-based recreation areas. Although a minority ridership, mountain-based commuters with eastern destinations would be served as well. Parking would be minimal at these station types, with connectivity achieved via bus, shuttle and rental car opportunity.

Each station would have a docking system, allowing for trains to be removed from the main guideway for storage, maintenance or change of direction. Due to the corridor length, select stations would be staffed with maintenance personnel. In addition to personnel, replacement parts and other maintenance needs would be available. This dispersed maintenance model allows for the quickest response to maintenance needs.

3.3 Conclusions

The following provides some additional findings and conclusions from the maglev study:

- A maglev system provides for schedule dependability to offset the growing congestion on the I70 Mountain Corridor. The schedule dependability provided by the maglev system may induce additional transit use due to the variable impacts and delays of highway congestion.
- The maglev study can be staged in such a fashion as to provide transportation capacity relief jointly with the highway widening from Golden to the Eisenhower Tunnel, listed as the first priority of CDOT in this corridor.
- The transit system guideway can be used to carry a high capacity, safe and economical transmission line for needed additional electric capacity for the I-70 Mountain Corridor.
- The Colorado 200 Car, with modification to the standard CHSST propulsion motor, is capable of sustained operation at speed for 7% grades and can operate easily under a degraded speed for 12% grades. The maximum grade potential is 18%. With this grade



climbing capability the Eisenhower Tunnel can be avoided and a new shorter tunnel of 701 meters (2300 feet) is possible north of the Eisenhower Tunnel existing bore.

- The maglev study system is automated with no operating personnel on trains, although maintenance personnel will be assigned to each station allowing for virtually immediate response to situations at stations and in-between stations.

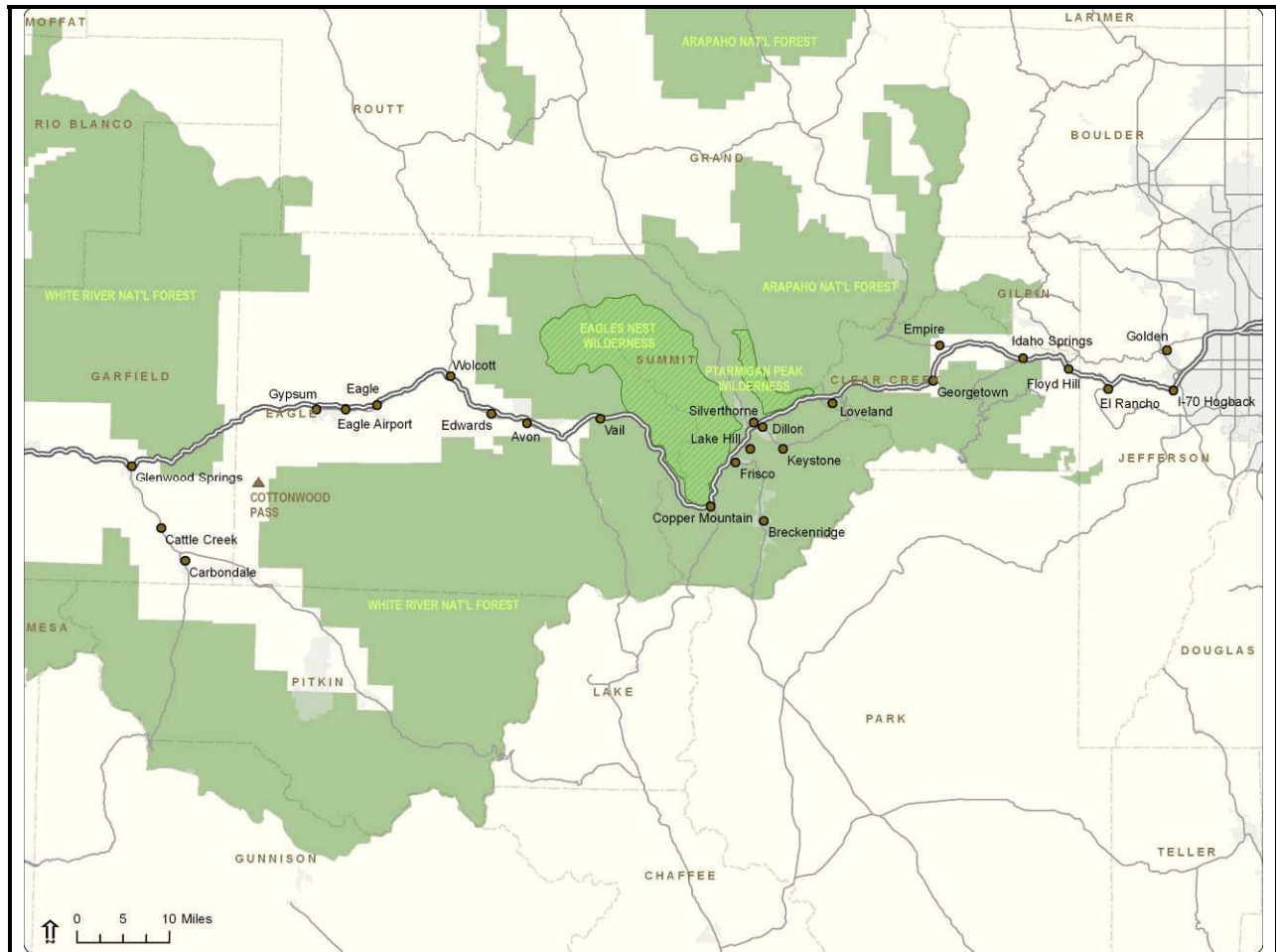


4.0 National Forest Management Plans

I-70, between Denver and Glenwood Springs, passes through two national forests, the Arapaho National Forest (NF) and White River NF (see **Figure 4**). These forests are subject to a myriad of uses, and are governed by land and resource management plans (forest plans).

Forest plans are amended on a 10 year cycle or not more than 15 years maximum. The Arapaho NF, which is managed in conjunction with the Roosevelt NF and Pawnee National Grassland (Arapaho/Roosevelt NF), amended its plan in 1997. The White River NF plan was amended in 2002. Each of these amendments was accompanied by an environmental impact statement (EIS). The EISs provided the analysis used to develop the forest plans.

Figure 4: I-70 Corridor National Forest Regional Map





4.1 Arapaho National Forest

4.1.1 Overview

I-70 either bisects or is adjacent to the Arapaho NF in the extreme southern portion of the management unit. The Arapaho/Roosevelt NF Forest Plan was revised in 1997 and guides the management of over 1.5 million acres of federal lands that stretch from the continental divide to the eastern plains.

The Arapaho/Roosevelt NF is some of the most heavily used lands in the national forest system. Off-road vehicle use, hiking, skiing, scenic byways and historic resources, combined with easy access from Front Range communities of Colorado, all lend them themselves to an intensively used federal resource. From an ecological perspective the Arapaho/Roosevelt NF provides water to many Front Range communities, offers a variety of wildlife habitat and contains one Wild and Scenic River and eight designated wilderness areas.

4.1.2 Goals and Objectives

Forest-wide goals and objectives indicate the desired state of the Arapaho/Roosevelt NF and the management priorities and the steps required to attain that condition.

The Arapaho/Roosevelt NF Forest Plan placed its goals beneath five headings: physical resources, biological resources, disturbance processes, managing for recreational users and administration. These goals, while not precluding construction within the forest, set forth specific guidelines to protect the natural environment that would impact construction. The following examples, taken directly from the Forest Plan, illustrate some of these goals:

- Construct roads and other disturbed sites to minimize sediments into streams, lakes and wetlands.
- Establish or maintain landscape linkages, where needed and feasible, which provide connections among large, contiguous blocks of late-successional forest.
- Require reciprocal grants where needed when granting rights-of-way easements across National Forest lands.
- Consolidate occupancy of transportation and/or utility corridors and sites whenever possible and compatible.

Travel management was one the issues which led to the USFS revising the Forest Plan. While much of the travel management plan focused on off-highway vehicle (OHV) use, the above goals could affect regional transit alignments.

Geographic Area Direction

Beyond forest-wide direction, the Forest Plan focused on geographic areas. The geographic area direction provided goals, standards, desired condition and wildfire suppression strategy, among



other attributes, to discrete areas within the national forest. This represented the most detailed level of management provided within the Forest Plan.

The Loveland Pass Geographic Area, stretching from Georgetown to the Continental Divide above the Eisenhower Tunnel was the only geographic area in Arapaho/Roosevelt NF located along and/or bisected by the I-70 corridor. It is noted that I-70, while a significant access route through the area, also creates wildlife migration impediments and generates noise, trash and sedimentation due to snow removal activities.

Following were the goals associated with I-70 in this geographic area:

- Manage the I-70 corridor to protect the scenic quality of the area, provide viewing opportunities of the natural landscape, increase trailhead and day-use developed facilities, and improve universal access. Improve bicycling opportunities within the I-70 and US 6 corridors. Allow for low-impact telecommunication sites along the I-70 corridor. Continue to permit existing recreation residences.
- Work with CDOT to reduce impacts of I-70, emphasizing protection of soil and water quality and wildlife habitat.
- Protect the wildlife migration corridor over the Eisenhower Tunnel, which functions as a land bridge over I-70.

None of the stated goals for the Loveland Pass Geographic Area preclude construction of transit infrastructure, but do require consideration is given to environmental impacts. In particular, the protection of the migration corridor over the Eisenhower Tunnel may conflict with the alternative outlined in the Colorado Magnetic Levitation Project to place a tunnel above the existing Eisenhower Tunnel in effort to minimize the tunnel length.

Management Area Direction

Management area directions indicate the typical activities and outputs that can be expected within specific types of forest lands, comparable to zoning.

I-70 passes through two different management areas, scenery and ski based resorts. Neither of these designations would preclude construction, but visual impacts would need to be considered for transit alignments.

Wilderness and Research Natural Areas

No designated wilderness or research natural areas within the Arapaho/Roosevelt NF are found adjacent to the I-70 corridor. It is important to note, that above the Eisenhower Tunnel the Arapaho and White River NFs border one another. The White River NF side includes a minimal-use special interest area and a wilderness area, both of which are described in greater detail in the White River NF section of this document.



Transportation Considerations

The Forest Plan noted that highway use within national forest lands exists and that reconstruction can occur. As noted in the EIS:

“The Arapaho/Roosevelt NF occasionally receives requests from CDOT and the Federal Highway Administration for rights-of-way to accommodate reconstruction of existing highways crossing National Forest lands. After ensuring that the land transfer is in the best interest of the USFS and the public, as documented by a NEPA analysis, the USFS authorizes use of these lands for highway purposes through a Letter of Consent.

The Arapaho/Roosevelt NF will also pursue needed easements on existing state highway routes, where they are not currently in place.”

The above statement indicates a willingness on behalf of the USFS to cooperate with other agencies to maintain existing highways, although the Forest Plan makes no mention of new highway or transit construction.

4.2 White River National Forest

4.2.1 Overview

I-70 bisects the White River NF from the Eisenhower Tunnel to Vail, and through Glenwood Canyon (see **Figure 4**). The White River NF Forest Plan was completed in 1984 and then revised in 2002. The plan prescribes the management of one of the most heavily visited national forests in the country. Covering 2.3 million acres, the forest ranges from semi-arid desert to windswept alpine tundra. Home to eight wilderness areas, world-renowned ski resorts and the headwaters of numerous rivers, the forest sees year-round recreational use.

4.2.2 Goals and Objectives

Forest-wide Goals and Objectives

The White River NF Forest Plan placed its goals beneath five headings: physical resources, biological resources, disturbance processes, managing for recreational users and administration. Many of these goals do not preclude construction, but could impact corridor alignment and design options.

Geographic Area Direction

The White River NF Forest Plan does not use geographic area direction for management; it instead relies on management area direction.



Management Area Direction

A wide variety of management area types are located adjacent to the I-70 corridor, including wilderness, minimal-use special areas, elk habitat, deer and elk winter range, and ski areas. Each management area has specific standards and guidelines, but designated wilderness is recognized as the most stringent in terms of resource protection, and is found along I-70 in both Summit and Eagle Counties.

Wilderness and Research Natural Areas

Two wilderness areas, the Ptarmigan Peak Wilderness Area and Eagles Nest Wilderness Area are located nearly adjacent to I-70. The Ptarmigan Peak Wilderness Area is north of I-70, west of the Eisenhower Tunnel. An alternative with a tunnel located above the existing Eisenhower Tunnel would require design consideration so as to not impact the wilderness area.

There are no research natural areas along I-70, but the land above the Eisenhower Tunnel is a minimal-use special interest area. While this designation does not preclude construction, its guidelines regulate motorized and mechanized travel where necessary to protect the values for which the individual area was proposed or established.

In conjunction with the existence of forested landscape linkages, this area may represent one of the greater challenges in terms of meeting USFS management expectation while introducing transit to the I-70 corridor.

Transportation Considerations

The Forest Plan does not address congestion along the I-70 corridor, but it is noted in the EIS:

“Transportation and access to the mountain communities is a key concern from a planning and tourism standpoint. I-70 is a vital transportation corridor linking the Denver International Airport, the Denver metropolitan area, and other Front Range population centers to the resorts. The I-70 corridor is experiencing increasing congestion. According to CDOT, under current conditions, travel time from C-470 to Vail is 1 hour 55 minutes. If nothing is done to relieve congestion, the same trip will take 3 hours and 5 minutes by 2020. Growth in skier visits on the White River National Forest may eventually be limited by the capacities and convenience of Colorado’s overall transportation systems used to deliver skiers to the mountain resorts. The USFS is aware of this issue and is partnering with CDOT to analyze alternative ways to expand the capacity of the I-70 corridor. At the national level, ski areas in other regions that are located within reasonable distances of airports with good ground transportation systems are likely to become increasingly competitive with Colorado resorts due to lower transportation costs, reduced travel times, and greater convenience.”

The above statement indicates a willingness on behalf of the USFS to cooperate with other agencies to maintain existing highways, although the Forest Plan makes no mention of new highway or transit construction.



5.0 I-70 Coalition Preferred Alternative

5.1 Overview

The Coalition Preferred Alternative is a long-range, multimodal, sequenced alternative that addresses the transportation concerns of the I-70 corridor for at least the next 50 years. It is designed to align available funding with a sequenced plan to safely increase the long-range capacity of the corridor while addressing the concerns of local communities represented by the Coalition. The Coalition Alternative consists of five different components: highway, transit, aviation, alternate routes and non-motorized. Implementation of the Coalition Alternative requires balanced, concurrent planning of each of those components with constant community and Coalition involvement regarding the schedule, need and mitigation. This collaborative planning effort will allow local jurisdictions to coordinate their own improvements and land uses (i.e. future transit facilities, feeder lines, etc.) with CDOT. Concurrent and joint planning for each of these components should preclude doing any work in the corridor that will have to be replaced to accommodate subsequent actions. In addition, the Coalition Alternative includes steps for the logical reevaluation of the capacity requirements, technological advancements and available financing for the corridor. This reevaluation will help determine the sequencing of subsequent actions. The Coalition Alternative envisions Coalition and member involvement for any and all future transportation decisions affecting the I-70 corridor.

5.2 Preferred Alternative

The Coalition's Regionally Preferred Alternative is a comprehensive long-range plan for the I-70 corridor that evolved from the Coalition consensus on the following twelve macro-planning elements:

1. Transportation in the corridor is a system that must serve off-corridor communities as well as those on I-70. The system must be scenic in and of itself and not simply a way to move people and goods.
2. The system must be multi-modal and include highway, transit, aviation, alternate routes and non-motorized components.
3. The system must increase capacity.
4. Planning must be expanded to at least 50 years. The system cannot become obsolete in 25 to 30 years.
5. Planning for the components must be concurrent.
6. Solutions should be incrementally implemented and address the problem areas first.
7. No alternative should preclude any other component of transportation.
8. Transit must be alluring and at least as fast as the highway component, corridor-wide, networked to a system extending beyond the I-70 corridor and provide seamless connections to DIA.



9. Building a rapid transit component must be an essential element of a long range, integrated transportation system in the region.
10. Transit must move things in addition to people.
11. Mitigation must be implemented with each solution. Any plan must provide for the immediate mitigation of existing environmental and community impacts.
12. The artificial constraints of 25 years and \$4 billion do not address the needs of the corridor and should be eliminated as screening criteria.

The Coalition Alternative is a stand-alone alternative and is not a derivative of any single alternative discussed in the Draft PEIS; however, it is often described in terms of different parts of alternatives found in the Draft PEIS.



6.0 I-70 Collaborative Effort

6.1 Overview

The I-70 Collaborative Effort was an element of the I-70 PEIS process designed to facilitate stakeholders in discussions about the transportation alternatives for the I-70 mountain corridor. The Collaborative Effort Team consisted of a 27-member group that includes representatives of different interests in the 144 mile corridor, including local governments, highway users, transit, environmental, business and recreation, as well as state and federal agencies. Working with independent facilitators, the team met regularly at various locations in the corridor; the meetings were open to the public for observation with brief opportunities for public comment. The Collaborative Effort Team focused on:

- Agreeing on which key questions remained and identifying areas that need more information and analysis
- Building agreement around an alternative that identifies modes of travel and transportation improvement strategies
- Establishing processes to ensure stakeholder involvement in future decisions

In the spring of 2008, the Collaborative Effort Team completed their work in coming to agreement on a recommendation for transportation improvements to the I-70 mountain corridor. CDOT and the Federal Highway Administration (FHWA) were active participants in this group and committed to adopt the consensus recommendation as the preferred alternative in the Final I-70 PEIS.

6.2 Recommendations

The recommendation for I-70 through Colorado's mountain corridor is a multi-modal solution including non-infrastructure components, a commitment to evaluation and implementation of an Advanced Guideway System (AGS), and highway improvements. While the non-infrastructure components and highway improvements are critical aspects of the recommendation, only the AGS recommendations are summarized herein.

The AGS includes a commitment to the evaluation and implementation of AGS within the corridor, including a vision of transit connectivity beyond the PEIS study area and local accessibility to such a system. However, additional information is necessary to advance implementation of an AGS system within the corridor, including:

- Feasibility of high speed rail passenger service
- Potential station locations and local land use considerations
- Transit governance authority
- Alignment
- Technology



- Termini
- Funding requirements and sources
- Transit ridership
- Potential system owner/operator
- Interface with existing and future transit systems
- Role of AGS in freight delivery both in and through the corridor

Several studies currently underway will provide further information to assist stakeholders with evaluation and implementation of AGS. CDOT is committed to provide funding for studies in support of the additional information needs to determine the viability of AGS. The implementation plan included in the Final I-70 PEIS will identify roles and responsibilities, including actions and leadership required by agencies, municipalities and other stakeholders in addition to CDOT and FHWA.



7.0 I-70 Context Sensitive Solution Project

Context sensitive solutions (CSS) as defined by FHWA is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist. CSS principles include the employment of early, continuous and meaningful involvement of the public and all stakeholders throughout the project development process.

The I-70 CSS project is currently on-going. The CSS process will work with a broad range of stakeholders to discuss community concerns and goals for the corridor. It will guide the design and construction of transportation solutions that reflect and respect the natural surroundings and enhance the futures of the corridor communities. The project will also establish the processes that will be used to make future transportation planning, design engineering and construction decisions. The final product of the I-70 CSS will include a guidance manual and design guidelines that capture the context and core values for use by future plans and designs. Typically addressed during the CSS process are:

- Natural surroundings
- Aesthetic treatments
- Historic resources
- Community character
- Environmental stewardship
- Economic sustainability

An important aspect of the CSS project is coordination with other on-going studies along the I-70 corridor. CSS will provide guidance and integration with the I-70 PEIS project, the Collaborative Effort, the I-70 Coalition Land Use Study, along with other more local projects and studies.



8.0 Summary of Opportunities and Barriers

The following observations were made from the existing studies reviewed:

Station Locations

- The I-70 MIS, Draft PEIS, and Maglev Study generally support transit station locations at the municipalities and resorts adjacent to the I-70 right-of-way.
- The I-70 MIS, Draft PEIS, and Maglev Study did not give much consideration to serving communities and resorts off the I-70 right-of-way, such as Keystone and Breckenridge, because of higher costs and environmental impacts for alignment alternatives.
- It was unclear from reviewing the I-70 MIS, Draft PEIS, and Maglev Study how much community input went into the station selection process, if any.
- Proposed station locations at ski areas which are developed on USFS lands are not addressed or considered in USFS plans. Additional coordination with USFS for these locations may be required as part of the station planning process.
- The I-70 Coalition Preferred Alternative, Collaborative Effort, and CSS Project do not identify specific station locations, but encourage and support community involvement in the station selection process.
- The CSS Project provides a framework for the planning and design of station locations that fits within the context of the communities and environment.
- None of the studies appear to create strong opportunities or barriers to station location selection or screening. The studies do not appear to preclude the station planning process currently being undertaken for this study.

Transit Alignment

- The I-70 MIS, Draft PEIS, and Maglev Study generally support a transit alignment along the I-70 right-of-way because of reduced costs and lower environmental impacts.
- Highway widening alternatives in the I-70 Draft PEIS may cause localized constraints for transit alignments in locations where there is limited availability of land for transportation use.
- The Maglev study suggested an alternative alignment north of the Eisenhower Tunnel could be considered. However, the White River NF plan suggests that this area has sensitive environmental resources.



- The USFS plans indicated there may be opportunities to work with the USFS to identify alignment options that would serve both the communities and the USFS. Opportunities to relocate or establish energy transmission lines along a transit system alignment would benefit both the USFS and communities. Simultaneously optimizing transportation corridors and minimizing impacts to sensitive ecological areas would also serve both interests.
- Sensitive USFS lands such as the Eagle Nest and Ptarmigan Peak Wilderness Areas may create constraints to alignment alternatives in these areas. Other sensitive areas such as wetlands, wildlife migration routes, and visually scenic areas may create additional constraints.
- The I-70 Coalition Preferred Alternative, Collaborative Effort, and CSS Project do not identify specific transit alignments, but encourage and support community involvement in the identification process.
- The CSS Project provides a framework for the planning and design of a transit system alignment that fits within the context of the communities and environment.

General Land Use

- The studies reviewed did not substantially address land use issues in relation to station siting or transit alignments.
- The I-70 Draft PEIS only considered general land use impacts in relation to alignment alternatives. Evaluation of land use impacts in relation to proposed station locations was deferred to the Tier 2 analysis.
- None of the studies appear to create strong opportunities or barriers for land use planning. However, highway improvement alternatives in I-70 Draft PEIS could result in land use constraints from a widened facility.