CHAPTER 7 EVALUATION OF ALTERNATIVES

This chapter summarizes the evaluation of alternatives pursuant to FTA (New Starts) guidance and procedures. The two build packages, including specific modal and geographic area components of each package, are described in detail in **Chapter 2** *Alternatives*. The purpose of this chapter is to provide clear information about trade-offs that would occur if different choices are made between packages or components of modal and geographic areas. Information is provided in terms of their ability to meet the purpose and need criteria presented in **Chapter 1,** key environmental and other impacts described in **Chapter 3** *Environmental Consequences* and **Chapter 4** *Transportation Impacts* (including both adverse impacts and benefits), as well as project costs, which are described in **Chapter 6** *Financial Analysis* and **Chapter 2** *Alternatives*.

What's in Chapter 7?

7.1 EVALUATION FRAMEWORK

Factors used to evaluate the No-Action Alternative and Packages A and B include:

- Effectiveness in improving mobility and accessibility
- Effectiveness in improving safety
- Effectiveness at replacing aging highway infrastructure
- Effectiveness at expanding transportation modes of travel
- Environmental consequences
- Costs (both capital and operating)

7.2 TRADE-OFFS

This section compares the No-Action Alternative to the Build Packages, the two Build Packages to each other and various components of the Build Packages to other components of the Build Packages.

7.2.1 No-Action versus Build Packages

Compared to the No-Action Alternative, the Build Packages best address the purpose and need for the project. The Build Packages both improve mobility and accessibility, improve safety, replace aging highway infrastructure, expand transportation modes of travel and respond to local agency plans for economic growth.

Compared to the No-Action Alternative, the Build Packages both would provide faster travel times (10% to 45% faster), improved level of service on I-25, reduced accident rates on I-25,

replacement of aging bridges and drainage structures, and expansion of transportation modes to include rail transit and/or bus transit. Both Build Packages would also slightly increase vehicle miles traveled, although this travel would occur at a slightly higher speed. Both Build Alternatives would be consistent with the policy goal of the North Front Range MPO to "provide a multi-modal transportation system."

The No-Action Alternative would maintain the status quo with respect to the transportation and development trends currently being experienced in the North Front Range. The dependence on the single occupant vehicle for travel would continue and would thus detract from the region's transportation and air quality goals. Over time, travel times and congestion would increase, accident rates would continue to grow, and aging infrastructure would deteriorate.

Compared to the Build Packages, the No-Action Alternative would result in very little physical impact to existing social and environmental resources. Air pollution related to traffic congestion would grow and noise impacts from increased traffic would also grow. The Build Packages would have greater impacts as a result of residential and business relocations, and greater impacts to natural resources, such as wetlands, wildlife habitat, threatened or endangered species, historic resources, parks, and other resources. The Build Packages would provide increased transit ridership, enhanced mobility, and a positive influence on economic development in the regional study area.

Overall, the benefits derived from the Build Packages would outweigh the adverse environmental impacts associated with their construction. Although there would be minimal capital cost associated with the No-Action Alternative, ($57 million), there also would be minimal benefits to the traveling public. The Build Packages would include new highway and transit facilities and service for capital costs ranging from $2.0 billion to $2.4 billion and annual operating costs ranging from $20 million to $43 million.

7.2.2 Package A versus Package B

Package A would provide three different modes of travel (commuter rail, bus service, and general purpose lanes) on three different north/south corridors (US 287, I-25, and US 85) while Package B would concentrate travel improvements primarily on I-25 in two different modes (tolled express lanes and bus rapid transit).

From a highway mobility perspective, in 2030, Package A would provide faster vehicle travel time than Package B (seven minutes faster than Package B) just from SH 1 to E-470. Package A would provide more travel lanes for the general purpose highway user, which would attract more general purpose lane users. Package A would provide more modal options for travelers. Package A would more noticeably reduce travel on parallel arterial streets, resulting in 4 percent to 10 percent more reduction in traffic than Package B. From a transit ridership perspective, Package A would produce 10,850 riders per day (3,400 more riders than Package B), including those using the rail system, commuter bus routes, and feeder bus routes. Package A feeder routes account for the difference, as they attract 8,000 daily riders compared to 1,600 daily riders on Package B feeder routes. Package A would result in fewer traffic noise impacts (from I-25), fewer acres of encroachment on floodplains, fewer water quality impacts, fewer wetland impacts, fewer impacts to both terrestrial and aquatic habitats, and fewer impacts to parks and recreational properties.

Package B would result in more reliable, uncongested travel for users of the tolled express lanes over time. Package B would provide greater travel time savings compared to Package A, 64 minutes in the tolled express lanes compared to 101 minutes for Package A. This would be 37 minutes faster than with Package A. Package B also would provide noticeable savings in travel time for transit users from Greeley and Fort Collins, to DUS, a savings of 21 minutes from Fort Collins and 32 minutes from Greeley when compared to Package A commuter rail. In comparison to Package A, Package B would result in fewer relocations of residences and businesses (35 fewer residences and 17 fewer businesses), impact 4 fewer historic properties, and result in no noise or vibration impacts from commuter rail. Package B is $426 million less expensive to build than Package A and has operating costs that would be $23 million less expensive annually.

7.2.3 Highway Components versus Transit Components

The highway related components of both packages would clearly provide the most benefit from a mobility perspective, while transit components would provide a clear choice for the traveler and more reliable travel that is less affected by congestion, weather, and incidents.

Improvements to I-25 would provide the most highway travel time savings and the greatest capacity for user trips, address existing highway safety problems, and replace aging highway infrastructure. Improvements to I-25 also would serve the longer distance interstate traveler better and would be more responsive to the needs of the trucking industry.

Bus or rail infrastructure improvements would be most responsive to the need to provide a choice of transportation modes and would be consistent with the NFRMPO goals to provide a multi-modal transportation system. Bus or rail improvements would provide a viable alternative for those people who are dependent on transit because they do not own a private automobile or are elderly or disabled. Bus or rail improvements also can be more supportive of certain land use goals (related to inducement of transit oriented development) and goals related to reducing energy consumption. Bus or rail components of the two packages would have less of an impact on wetlands, water resources, floodplains, park properties, farmland, residences, businesses, and floodplains compared to the I-25 widening components.

Rail transit improvements would provide generally safer operations. National data show that passenger rail systems result in noticeably fewer annual injuries per 100 million passenger miles traveled than highway facilities. Commuter rail had an average of 18 annual injuries over a 4-year period (from 2002 to 2006) while highways resulted in an average of 59 injuries. Bus facilities have similar statistics to highways.

In Package A, highway components account for about half the capital cost of the package, $1.29 billion, while Commuter Rail would cost about $1.10 billion and Commuter Bus about $0.03 billion. In Package B, highway components account for the majority of the capital cost of the package, about $1.86 billion, while BRT components would cost about $0.12 billion. However, highway components of the two packages would have a much lower cost per user than transit components, as operating and maintenance costs are lower, and a far greater number of travelers use the highway.

7.2.4 General Purpose Lane Components versus Tolled Express Lane Components

Package A would provide additional general purpose (plus auxiliary) lanes to I-25 while Package B would provide additional capacity in the form of tolled express lanes intended to be used by buses, carpools, and vanpools, as well as single-occupant vehicles willing to pay a toll. Initially, the general purpose lanes in Package A would be less congested than those in Package B, as more lanes that are free to all travelers are provided, and the Package B tolled express lanes depend on a certain level of congestion in the adjacent GP lanes before they attract travelers. However, over time, travel time reliability in Package A would deteriorate as the general purpose lanes filled up. Meanwhile, Package B would always provide a more reliable, faster travel time in the tolled express lanes as the numbers and type of vehicles in those lanes would be managed by regulation and pricing.

Package A would provide more relief to parallel arterials than Package B, resulting in reductions of traffic volume that would be 4 percent to 10 percent greater than with Package B. This would reduce road maintenance and improvement responsibilities allocated to local governments. Package A also would result in slightly less congestion in the general purpose lanes of I-25. Because the pavement width for Package A is smaller than Package B (due to the barrier and shoulders needed for the TEL lanes), impacts to many environmental resources would be less. Package A highway costs would be substantially (about $575 million) lower than Package B highway costs.

In addition to providing more travel reliability over time in the tolled express lanes, Package B would offer the following advantages:

- Ability to jointly use the tolled express lanes for BRT and vanpools.
- Ability to provide travel time savings for carpools and vanpools.
- Slightly less total regional and freeway VMT.
- Slightly less freeway VHT.
- Slight reduction in daily volumes on the southern arterials.
- Slightly lower auto travel time, including that on the tolled express lanes.
- More improvement to interchange operations south of E-470.

7.2.5 Rail Transit Components versus Bus Rapid Transit Components

Rail transit would serve the population centers of Fort Collins, Loveland, Berthoud, and Longmont, while bus rapid transit would serve the population centers of Greeley and Fort Collins, as well as destinations along I-25 and DIA. Commuter bus would serve destinations along US 85 and also would provide access to DIA along E-470. Both rail and bus would have feeder bus service that generally follows east-west streets to rail or BRT stations.

Considering the main regional transit routes, BRT would have faster travel times and result in about the same number of riders per day as commuter rail and commuter bus combined. Bus (including BRT) transit is generally more flexible than rail, so that routes could be altered as land uses change. BRT would have lower capital costs and operating costs per

passenger mile than commuter rail. BRT would have fewer impacts to most environmental resources than commuter rail since it is not on a separate alignment. Buses would be more subject to weather delays and incident delays.

Commuter rail would provide a more comfortable ride, with typically larger seats, more leg room, and more space per passenger. Rail would be more reliable because it has less potential to be affected by weather, less potential to be affected by congestion, and is on an exclusive guideway. Rail would have greater maximum capacity because trains could easily be added as ridership demands increase. Rail tends to be more of a catalyst for transit oriented development and would be more consistent with community plans to revitalize the downtown areas of Fort Collins, Loveland, Berthoud, and Longmont. Rail tends to be better supported in public opinion polls in the North Front Range area. Rail would serve more households within a half mile of stations than bus rapid transit (9,050 compared to 7,650) and would provide access to more community centers and facilities than bus rapid transit. Commuter rail also has typically fewer (41) injuries per 100 million passenger miles traveled per year than bus transit (averaged over 4 years).

Commuter Rail is the most expensive transit alternative to build, as well as to operate and maintain. BRT, while attracting about the same number of users as Commuter Rail and Commuter Bus combined, would have the lowest cost per user, about 88 percent lower than Commuter Rail, and about 28 percent lower than Commuter Bus.

7.2.6 Rail Transit Component from Fort Collins to Longmont versus from Fort Collins to Thornton

The two different commuter rail components could stand alone. The component from Fort Collins to Longmont could connect directly to the Northwest Rail corridor, which is a part of the FasTracks system. Rail Transit from Fort Collins to Thornton (components A-T1 and A-T2) could stand alone as a piece of rail that would connect Fort Collins to the North Metro FasTracks corridor.

Component A-T1, from Fort Collins to Longmont, would produce most of the transit ridership (77%) for 58% of the cost. This component would clearly have fewer impacts to wetlands and jurisdictional waters, fewer relocations of residences and businesses, fewer Section 4(f) impacts, cause noise and vibration impacts to fewer residences, and result in fewer effects to wildlife habitat.

7.2.7 Evaluation of Commuter Rail Maintenance Facilities

Seven sites for the proposed rail maintenance facility were identified throughout the corridor using a set of screening criteria that assessed the sorts of impacts that may be exacted by implementation and construction. Initial screening included consideration of size, configuration, property impacts, environmental impacts, operational efficiencies, and stakeholder input. Through initial screening efforts, two proposed rail maintenance facilities were selected under Package A, one located at E. Vine Dr. and N. Timberline in Fort Collins and one at the southwest corner of US 287 and LCR-46 in Berthoud. Only one of these sites will be selected. The proposed rail maintenance facility would service trains that run between Fort Collins and the proposed North Metro FasTracks corridor.

The proposed maintenance facility in Berthoud would result in an increase of activity and visual impacts to the single-family residential subdivision adjacent to the BNSF rail line in the

northernmost portion of Berthoud. The maintenance facility would magnify the presence of rail and introduce an industrial component to the neighborhood. The site has been identified by the City of Berthoud for development of an Industrial Area.

Berthoud Elementary School is located within 0.25 mile of the proposed Berthoud maintenance facility. Frequency of trains would result in minor delays and out-of-direction travel for patrons of the school. There would be visual impacts for students playing outside in the school yard. This maintenance facility would, however, be closer to the metro area depending on how the commuter rail service is phased. Access to this facility would require less deadhead mileage if a first phase began in Longmont, limiting operational inefficiencies.

In contrast, the proposed Fort Collins maintenance facility would have fewer effects to residential areas but would be farther north.

Both maintenance facilities would have a moderate visual effect to their surrounding neighborhoods, because both facilities would be visible to the surrounding neighborhoods and change the visual character of the area. Both rail maintenance facilities are expected to generate the same number of auto trips for employees and visitors. The resulting traffic impacts would be minimal because auto trips would typically occur outside of peak periods.

When comparing the results of the criteria screening, only the Fort Collins site met all of the criteria established through the screening process. The Berthoud site differed in that it would not help to limit non-revenue travel, because it is not located at the end of the line, and it would not limit the number of additional layover sites that may be needed to help with operational efficiency.

7.2.8 Evaluation of Bus Maintenance Facilities

Eleven preliminary sites for the proposed commuter bus/BRT maintenance facility were identified throughout the corridor using site screening criteria similar to that used for the rail maintenance facility. Additional criteria were applied to limit viable sites. These criteria included:

- Is there an alternate site available in the immediate area?
- Is the site within 5 miles of the end-of-line station?
- Is the site not in a rapid developing urban growth area?
- Does the site have any known environmental impacts?
- Does the site have strong support from committees and stakeholders?

Two sites for the potential maintenance facility sites were selected through the second screening, one at US 34 and US 85 in Greeley, one in Fort Collins at Portner Road and Trilby Road. Only one site will be selected. The maintenance facility would service the commuter bus fleet associated with Package A or the bus rapid transit (BRT) fleet associated with Package B.

The commuter bus maintenance facility is expected to generate the same number of vehicle trips for employees, visitors, and bus trips. The BRT maintenance facility will generate approximately 10% more vehicle trips than the commuter bus facility. The resulting traffic impacts would be minimal because these trips would typically occur outside of peak travel periods.

Both proposed maintenance facilities would have a moderate visual effect on the surrounding neighborhoods, because each would be visible to the surrounding neighborhood, changing the visual character of the area.

The bus maintenance facility site proposed at US 34 and US 85 can be employed regardless of which bus transit mode is chosen. It is located close to the end-of-line station, which would cause little or no environmental impacts.

The site at Portner Road and Trilby Road in Fort Collins can be used in conjunction with Package B only. It is located adjacent to an existing transit center and other uses for the site are unlikely. The site has strong support from city staff.

7.3 SUMMARY OF EVALUATION

Table 7-1 summarizes information about the relative responsiveness of the three alternatives to the factors used in this evaluation as shown in **Section 7.1**. Not all environmental factors are included, rather just those that show a clear difference among alternatives. **Section 3.28** of this DEIS includes a summary of all impacts.

The Federal Transit Administration has established a grant program called the New Starts (Section 5309) program. This program evaluates and rates candidate transit projects for FTA funding. FTA uses two major categories of rating a project: Project Justification and a Financial Rating. The Project Justification criteria are:

- Mobility improvements
- Environmental benefits
- Cost effectiveness
- Transit-supportive existing land use, policies, and future patterns
- Other factors including economic development

The Financial Rating includes the local financial commitment and an assessment of the capital and operating financial plan for the project.

At this point in time, the North I-25 project does not appear to be a candidate for New Starts funding, for the following reasons:

- Projected bus and rail transit ridership (at 4,300 for commuter rail and 5,650 for BRT) is relatively low. As a comparison, three FasTracks corridors that are planned for New Starts funding have the following estimated daily ridership:
  - West Corridor: 29,698
  - Goldline: 20,100
  - East Corridor: 30,000 to 35,000
- Lack of local financial commitment and lack of a capital and operating financial plan for the project.

Table 7-1 Summary of Alternatives Evaluation

	No-Action Alternative	Package A	Package B
Improving Mobility and Accessibility			
Regional Vehicle miles of travel (VMT)	48.68 million	49.15 million	49.12 million ✓
Regional Vehicle hours of travel (VHT)	1.53 million	1.53 million	1.53 million
Freeway VMT	15.7 million	16.6 million	16.1 million ✓
Freeway VHT	325 thousand	330 thousand	327 thousand ✓
Average speed	31.8 mph	32.2 mph ✓	32.1 mph
Transit ridership (commuter services)	N/A	5,850	5,850
Transit market share (to downtown Denver)	<1%	55% ✓	50%
Highway travel time (AM peak hour, SH 1 to 20th Street)	128 minutes (GPL) 112 minutes (TEL)	118 minutes (GPL) 101 minutes (TEL)	113 minutes (GPL) 65 minutes (TEL) ✓
Transit travel time (Fort Collins South Transit Center to DUS)	130 minutes (bus in GPL and TEL where available)	93 minutes (rail)	72 minutes (BRT) ✓
Congested miles on I-25 (PM peak hour)	53 miles	22 miles ✓	22 miles ✓
Interchange ramp terminals operating at LOS E or F (AM)	20 ramp terminals	3 ramp terminals	2 ramp terminals ✓
Improving Highway Safety	N/A	3,466 crashes	3,410 crashes ✓
Transit Safety (annual injuries)	N/A	18 ✓	59
Replacing Aging Infrastructure	24 minor rehabilitations	84 new structures	96 new structures ✓
	2 major rehabilitations	13 modifications of existing structures	23 modifications of existing structures ✓
		2 major rehabilitations ✓	0 major rehabilitations
		6 minor rehabilitations ✓	1 minor rehabilitation
Expansion of Transportation Modes of Travel	Does not expand	Commuter rail, commuter bus, and feeder bus added	BRT and feeder bus added
Responsiveness to Economic Development	Not responsive	Responsive to needs along I-25 and BNSF ✓	Responsive to needs along I-25
Environmental Consequences			
Relocations	None	59 residences 33 businesses	24 residences 16 businesses ✓
Traffic noise sites impacted	626 sites	623 sites ✓	756 sites
Transit noise sites impacted	N/A	167 residences	None ✓
Vibration sites impacted	N/A	87 residences	None ✓
Wetlands and jurisdictional waters impacted	None	19.34 acres ✓	20.38 acres
Water Quality: acres of impervious surface area	None	1,946✓	2,001
Floodplains impacted	None	12.8 acres ✓	13.5 acres
Historic and archaeological properties adversely affected	None	5	1✓

Table 7-1 Summary of Alternatives Evaluation (cont'd)

	No-Action Alternative	Package A	Package B
Environmental Consequences (cont'd)			
Parks and recreational properties impacted	None	7 ✓	8
Wildlife and aquatic species habitat	None	2.01 acres terrestrial 1.82 acres aquatic✓	2.35 acres terrestrial 2.25 acres aquatic
Threatened, endangered, state sensitive & protected species habitat affected	None	283.35 acres ✓	358.98 acres
Cost (2005 dollars)			
Capital cost	$57 million	$2.43 billion	$2.00 billion ✓
Annual operating cost	$4 million	$43 million	$20 million ✓
Annualized cost per user per trip	$0.03	$0.76	$0.58 ✓

✓ = Build alternative that performs better
N/A = Not Applicable

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