

CHAPTER 8 PHASED PROJECT IMPLEMENTATION

8.1 INTRODUCTION

This chapter presents the three phases of the Preferred Alternative and documents that applicable environmental laws and requirements will be adhered to for each of the project phases before and as they are constructed. This phased approach is necessary because the identified transportation improvements are estimated to cost more to implement than the funding that is currently identified in the relevant fiscally-constrained regional transportation plans.

What's in Chapter 8?

Chapter 8 – Phased Project Implementation

- 8.1 Introduction
- 8.2 Identification of Project Phases
- 8.3 Detailed Discussion of Project Phases
- 8.4 Implementation of Future Project Phases
- 8.5 Mitigation

The Preferred Alternative (see **Figure 8-1**) is expected to cost approximately \$2.18 billion (in 2009 dollars). There are currently limited existing funding sources available to fund construction of North I-25 corridor transportation improvements. These funding sources are summarized in **Section 6.1.5 Current Allocated Funding**. The North Front Range 2035 Regional Transportation Plan (NFRMPO 2007) identifies \$357 million in funding for improvements to the I-25 corridor. The Upper Front Range 2035 Regional Transportation Plan (UFRRPC, 2008) includes \$6 million (the Upper Front Range Region includes a portion of US 85). The Denver Regional Council of Governments Fiscally Constrained 2035 RTP (DRCOG, 2011) identifies \$268 million in funding for improvements along I-25 and \$58 million for the I-25/SH 7 interchange. These fiscally-constrained regional transportation plans identify \$688 million for improvements creating an approximately \$1.5 billion funding shortfall. Further discussion on these three transportation planning regions and their boundaries is included in **Section 1.6 Relationship to the Transportation Planning Process**.

Metropolitan Planning Regulation (23 Code of Federal Regulations [CFR] 450.322) and the Clean Air Act (CAA) Transportation Conformity Rule (40 CFR 93.104) work together to require that a project located in a Metropolitan Planning Area and/or in a CAA nonattainment or maintenance area, be contained in a conforming, fiscally-constrained long-range regional transportation plan. Through a phased Record of Decision (ROD), FHWA can approve project improvements that are included in conforming, fiscally-constrained regional transportation plans.

After this Final EIS has been made available to the public and the review period concludes, FHWA and CDOT will identify an initial phase for the ROD. Phase 1, as identified in this chapter, is proposed as Phase 1 for the ROD. Consideration of the Final EIS and the first ROD will be part of future implementation of projects. Improvements included in Phase 2 and Phase 3 can be re-evaluated, as necessary, based on future safety needs, funding availability, and transportation needs and identified in subsequent RODs as additional funding becomes available. Phases 2 and 3 do not necessarily need to be selected in their entirety or in order in subsequent RODs. This will be determined at the time of a subsequent ROD, considering available funding, priorities at that time, and the results of any reevaluation that may be needed.

1 The identification of a Preferred Alternative for the entire project in this Final EIS is consistent
2 with FHWA's objective of analyzing and identifying transportation solutions on a broad enough
3 scale to provide meaningful analysis and to avoid segmentation. The identification of an initial
4 phase for implementation is consistent with FHWA requirements to have funding for projects
5 identified before final decisions are made. As funds become available, it is the intent of FHWA
6 and CDOT to work toward implementation of the Preferred Alternative in its entirety through
7 this phased approach.

8 **8.2 IDENTIFICATION OF PROJECT PHASES**

9 To accommodate funding limitations, the Preferred Alternative has been separated into three
10 phases. This section describes:

- 11 ▶ the process used to prioritize projects
- 12 ▶ the reasoning behind the prioritization of improvements to be included in Phase 1

13 **Section 8.3 *Implementation of Future Project Phases*** describes the process that will be used
14 to implement future phases as additional funding becomes available.

15 **8.2.1 Decision Making Process**

16 The need for developing a phasing plan is because there is currently a short fall of funds and
17 CDOT is unable to build the entire Preferred Alternative at once. Phasing for Package A and
18 Package B could also be developed in a similar manner and, given that all three build
19 alternatives could be phased, identification of the Preferred Alternative was not based on
20 phasing considerations. To develop the phasing plan, the first discussion with the stakeholders
21 described the funding limitations in detail, and also described the implications of phasing. The
22 first phase needs to identify a subset of components that amount in cost equal to the identified
23 project funds in the fiscally-constrained, conforming long range plans (2035). It was also
24 clarified that staging of components in subsequent phases could be re-evaluated as funding
25 and needs change over time regardless of the phase that the improvements have been
26 included. Given this information, the stakeholders were first tasked with identifying phasing
27 criteria. The stakeholders developed the phasing criteria by referring to the defined elements
28 of purpose and need, as well as their community and agency values. In addition, CDOT
29 provided guidance regarding the need for a cohesive system for each major phase. A
30 collaborative decision making process ensued with the stakeholders over a series of meetings.
31 In the end, consensus was achieved on a recommended three phase implementation plan.

32 More detail describing the development of the phasing plan is provided below and in
33 **Appendix B.**

34 **8.2.2 Project Prioritization Process**

35 CDOT and FHWA established a prioritization based on comments received on the Draft EIS
36 and input from the Regional Coordination Committee (RCC) and Technical Advisory
37 Committee (TAC) (described in **Chapter 9 *Public and Agency Involvement***). The RCC/TAC
38 provided input into the development of the Preferred Alternative phasing by providing guidance
39 on the communities' priorities for allocating the limited resources available to the project. The
40 RCC/TAC provided a prioritized list of factors that were important to their communities when
41 developing a phasing plan for the Preferred Alternative. These included:

- 1) Preservation of Infrastructure
- 2) Address Safety Concerns
- 3) Improve Mobility
- 4) Coordinate with Community Plans
- 5) Consider Long-Term with Near-Term Implementation
- 6) Implement Cost Effective Solution

The first three are consistent with the project's Purpose and Need (described in **Chapter 1 Purpose and Need**). The project's Purpose and Need statement identifies a need to replace aging infrastructure on I-25, address safety concerns on I-25, improve mobility and provide modal options. The last three reflect the communities' desire to ensure consistency with their current plans and consideration of commuter rail in the Preferred Alternative.

Following identification of the phasing plan priorities, the RCC/TAC prioritized projects as near-, mid- or long-term improvements. Key results of this exercise were:

- ▶ Bus services included in the Preferred Alternative (express bus on I-25 and commuter bus on US 85) had substantial support for inclusion as a near-term project due to the lack of immediate funding availability for commuter rail and the expected timeframe for implementation of RTD's North Metro and Northwest Rail Lines.
- ▶ Commuter rail projects included in the Preferred Alternative were rated as long-term improvements due to the lack of immediate funding availability.
- ▶ I-25 widening and reconstruction of the interchanges north of SH 66 were the most strongly supported near-term improvements due to a desire to address critical safety, mobility, and aging infrastructure problems in this part of the corridor.
- ▶ Widening I-25 south of SH 66 was divided between mid- and long-term.

Consequently, the following guiding principles for identification of the Phase 1 of the Preferred Alternative were developed:

- ▶ Address concerns on I-25 north of SH 66 – This principle is consistent with the project's Purpose and Need and the committees' strong desire to address safety, capacity and infrastructure issues on this stretch of I-25.
- ▶ Include bus transit – This is consistent with the project's Purpose and Need to increase modal options, and the committee's desire to see bus service implemented in the near-term.
- ▶ Include a commitment to commuter rail – This is also consistent with the projects' Purpose and Need to increase modal options, and the committee's desire to ensure that near-term solutions are considering the long-term vision.

35

8.2.3 Prioritization of Improvements for Phase 1

Based on the guiding principles identified above, the following Phase 1 improvements have been identified in coordination with the RCC/TAC:

- 1) Widen I-25 between SH 56 and SH 66 with one tolled express lane in each direction. This would:
 - Replace seven miles of pavement with no remaining service life
 - Reconstruct two substandard interchanges (I-25/SH 56 and I-25/CR 34)
 - Address geometric safety concerns
 - Improve mobility by increasing capacity
 - Increase modal options by providing a lane for carpools and bus service
 - Address the committees' desire to improve safety and mobility north of SH 66 in the near-term
- 2) Widen I-25 between SH 14 and SH 392 with continuous acceleration/deceleration lanes that would ultimately become part of the eight-lane cross-section. This would:
 - Replace seven miles of pavement with no remaining service life
 - Reconstruct two substandard interchanges (I-25/SH 14 and I-25/Prospect)
 - Address geometric safety concerns
 - Improve mobility by increasing capacity
 - Address the committees' desire to improve safety and mobility north of SH 66 in the near-term
- 3) Construct an interchange at US 34/Centerra Parkway (LCR 5), which is part of the Preferred Alternative configuration for the I-25/US 34 interchange. This would:
 - Improve accessibility and mobility by improving interchange operation
- 4) Widen I-25 between 120th Avenue and approximately US 36 with one buffer-separated tolled express lane in each direction. This would:
 - Address geometric safety concerns along I-25
 - Improve mobility by increasing capacity
 - Increase modal options by providing a lane for carpools and bus service
- 5) Interchange reconstruction at I-25/SH 7, which would be constructed to its ultimate configurations. This would:
 - Improve accessibility and mobility by improving interchange operation

6) Commuter rail right-of-way preservation – All right-of-way necessary to construct the ultimate commuter rail configuration would be purchased as part of Phase 1, which would address the committees' desire to consider the long-term vision in the near term. It is important to note that the purchase of right-of-way for commuter rail is not eligible for federal aid funding until construction funds for commuter rail have been identified in a fiscally-constrained regional transportation plan.

7) I-25 express bus service – Express bus service connecting Fort Collins and Greeley to downtown Denver and Denver International Airport (DIA) would be initiated. Four transit stations would be constructed as part of Phase 1. This would:

- Increase modal options by providing bus service
- Address the committees' desire to see bus service implemented in the near-term

8) US 85 commuter bus service – Commuter bus service along US 85 connecting Greeley to downtown Denver would be implemented in Phase 1. This would:

- Increase modal options by providing bus service
- Address committees' desire to see bus service implemented in the near-term

Phase 1 would cost approximately \$670 million (2009 dollars) and is planned to be completed by 2035. A Cost Estimate Review (CER) was conducted on the Preferred Alternative by CDOT with guidance from FHWA. The results of the CER are described in more detail in **Chapter 6 Financial Analysis** and in the *North I-25 Project Cost Estimate Review Report* (FHWA and CDOT, 2010). The CER included construction of the interchange at US 34/Centerra Parkway (LCR 5), in the Preferred Alternative configuration for the I-25/US 34 interchange, but did not include it in Phase 1 as it was added to Phase 1 after the CER was completed. The CER will need to be updated during preparation of the project financial plans.

Phase 1, Phase 2 and Phase 3 improvements are described in **Section 8.4 Detailed Discussion of Project Phases**.

The CAA requires air quality conformity to be demonstrated for major transportation projects in non-attainment areas. Regional air quality conformity for Phase 1 is demonstrated in its inclusion in the fiscally-constrained North Front Range 2035 Regional Transportation Plan, the Upper Front Range 2035 Regional Transportation Plan and the DRCOG 2035 RTP. The regional emissions analysis conducted for the Preferred Alternative is discussed in **Section 3.5 Air Quality**. The fiscally-constrained regional transportation plan and transportation improvement program must identify all projects that are expected to receive federal funds or that will require FHWA or FTA approval.

8.3 IMPLEMENTATION OF FUTURE PROJECT PHASES

Total funding for the Preferred Alternative (Phases 2 and 3) has not been identified at this time. Phases 2 and 3 of the Preferred Alternative are not included in a fiscally-constrained regional transportation plan. As additional funding becomes available, subsequent phases will be included in the relevant fiscally-constrained regional transportation plans for the purpose of air quality conformity. Projects identified in Phases 2 and 3 could be implemented sooner if funding is identified earlier. It must be noted that these are current priorities. Priorities may

1 change, especially with regard to how phases may fit with future funding amounts. In addition,
2 actions to improve safety (for example, bridge replacement) could occur separately from this
3 effort and will be funded at that time by safety funds and/or other funding sources.

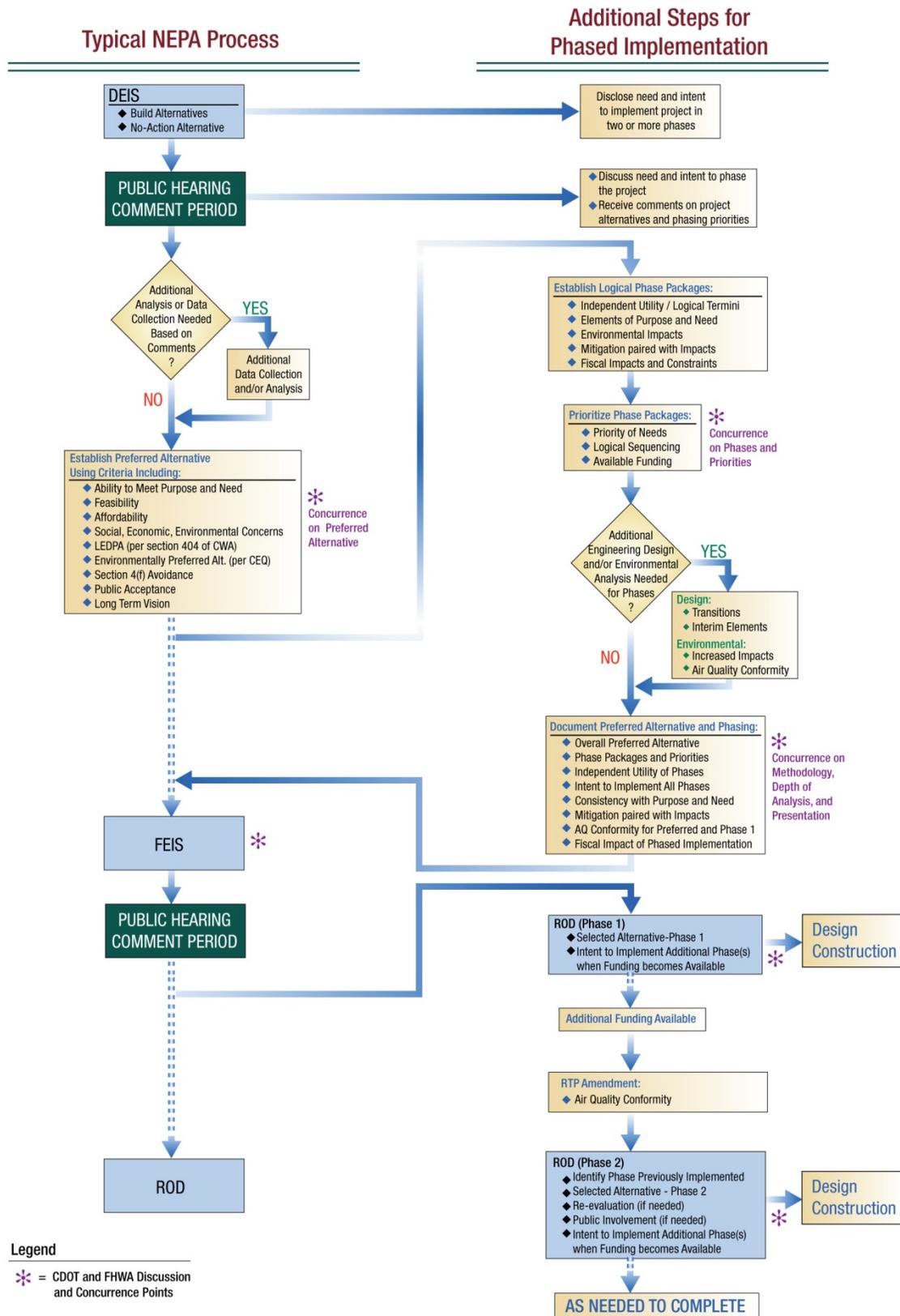
4 To provide more information and opportunity for public comment, as well as to satisfy the
5 requirements for fiscal constraint, FHWA and CDOT have developed a process to be used for
6 this project to support phased implementation. This approach, which is illustrated in
7 **Figure 8-2**, allows for disclosure and discussion of project phasing during the NEPA process.
8 With this process, the analysis of alternatives and identification of a Preferred Alternative is
9 fully consistent with the typical NEPA process for transportation projects. However, in this
10 approach additional detail is provided regarding phasing, as an enhancement to the typical
11 NEPA process because only what is included in the fiscally constrained plan can be approved
12 in the ROD due to Clean Air Act requirements. Each additional phase of the project will have to
13 be in the 20-year fiscally constrained regional transportation plan as additional project phases
14 are funded, with at least a portion placed in the STIP. This process, including preparation of a
15 ROD as funds become available, will be repeated until the entire Preferred Alternative
16 identified in the Final EIS is completed as noted previously. Phases 2 and 3 do not necessarily
17 need to be selected in their entirety or in order for subsequent RODs. Project development will
18 be subject to the state and MPO planning process. Subsequent RODs will consider available
19 funding, priorities at the time, and the results of any reevaluation that may be needed. Key points
20 in the process at which CDOT seeks concurrence from FHWA are indicated on **Figure 8-2**.

21 The first phased ROD will be consistent with the projects identified in the fiscally-constrained
22 North Front Range 2035 Regional Transportation Plan, the Upper Front Range 2035 Regional
23 Transportation Plan, and the DRCOG 2035 RTP. Projects required to implement the Preferred
24 Alternative not included in the first phased ROD are anticipated to be identified in future RODs,
25 which would be prepared as funding is identified. These projects would be designed to
26 minimize interim pieces and to build to the ultimate configuration.

27 The following general considerations will be taken into account when determining the scope of
28 future RODs: CDOT will consider equity issues in the corridor and will be cognizant of the
29 need to balance the construction of improvements throughout the corridor. If funding becomes
30 available to local agencies, such as earmarks or private funds, projects may be identified for
31 inclusion in future RODs.

32

1 Figure 8-2 Phased Implementation Process



2

1 When additional state and/or federal funds become available, FHWA and CDOT will identify
2 projects to include in future RODs based on the following priorities. The first priority will be
3 given to replace aging infrastructure and/or addressing safety issues. The replacement of
4 aging infrastructure will be given priority when the infrastructure deteriorates to such an extent
5 its conditions affect operations of the corridor or safety of the traveling public. Projects arising
6 from safety considerations may be given priority when safety data indicate higher than average
7 crash rates at a particular location or when a substandard area or pinch point has been
8 identified which adversely impacts the public. After addressing critical aging infrastructure and
9 safety needs, improvements will be prioritized using the Purpose and Need and stakeholder
10 input.

11 In determining the scope of future phased RODs, stakeholder input will be considered via the
12 standard state and MPO planning processes. Additionally, as a project is advanced through
13 the design process, input would be sought from those local agencies affected as is typical in
14 CDOT project development. Once funding has been identified for additional projects, there will
15 be a re-evaluation of changes in the context, affected areas, impacts, and mitigation. Future
16 RODs that are anticipated to be prepared would identify impacts and appropriate mitigation
17 measures that are associated with those actions, including air quality conformity for the portion
18 of the Preferred Alternative approved in the ROD.

19 **8.4 DETAILED DISCUSSION OF PROJECT PHASES**

20 This section describes Phases 1, 2 and 3 of the Preferred Alternative. Phase 1 has been
21 described in more detail than Phases 2 and 3 because it is expected to be included in the
22 fiscally-constrained and conforming long-range plans prior to the ROD. Independent utility has
23 been established for the infrastructure investment of Phase 1. The detailed analysis for Phase
24 1 includes traffic analysis results and a list of mitigation measures for impacts caused by
25 Phase 1. Less detailed analysis was undertaken for Phases 2 and 3 because elements from
26 these phases are not included in the fiscally constrained conforming plans. When elements
27 from Phases 2 and 3 are ready to be implemented in the future when funding is identified, and
28 elements are included in the fiscally-constrained conforming plans, CDOT anticipates
29 completing a reevaluation of the elements for consideration in future RODs. These future
30 RODs would include any additional analysis and mitigation for impacts of these elements.
31 Because of the NEPA /404 merger process and potential resulting permit, wetland mitigation
32 will be completed for the entire Preferred Alternative in advance of Phase 1 implementation.

33 Based on past revenue projections, the three phases of the Preferred Alternative are currently
34 projected for completion in years 2035, 2055, and 2075, respectively. As described above,
35 Phases 2 and 3 do not necessarily need to be selected in their entirety or in the specified order
36 in subsequent RODs. This will be determined through the planning process and available
37 funds.

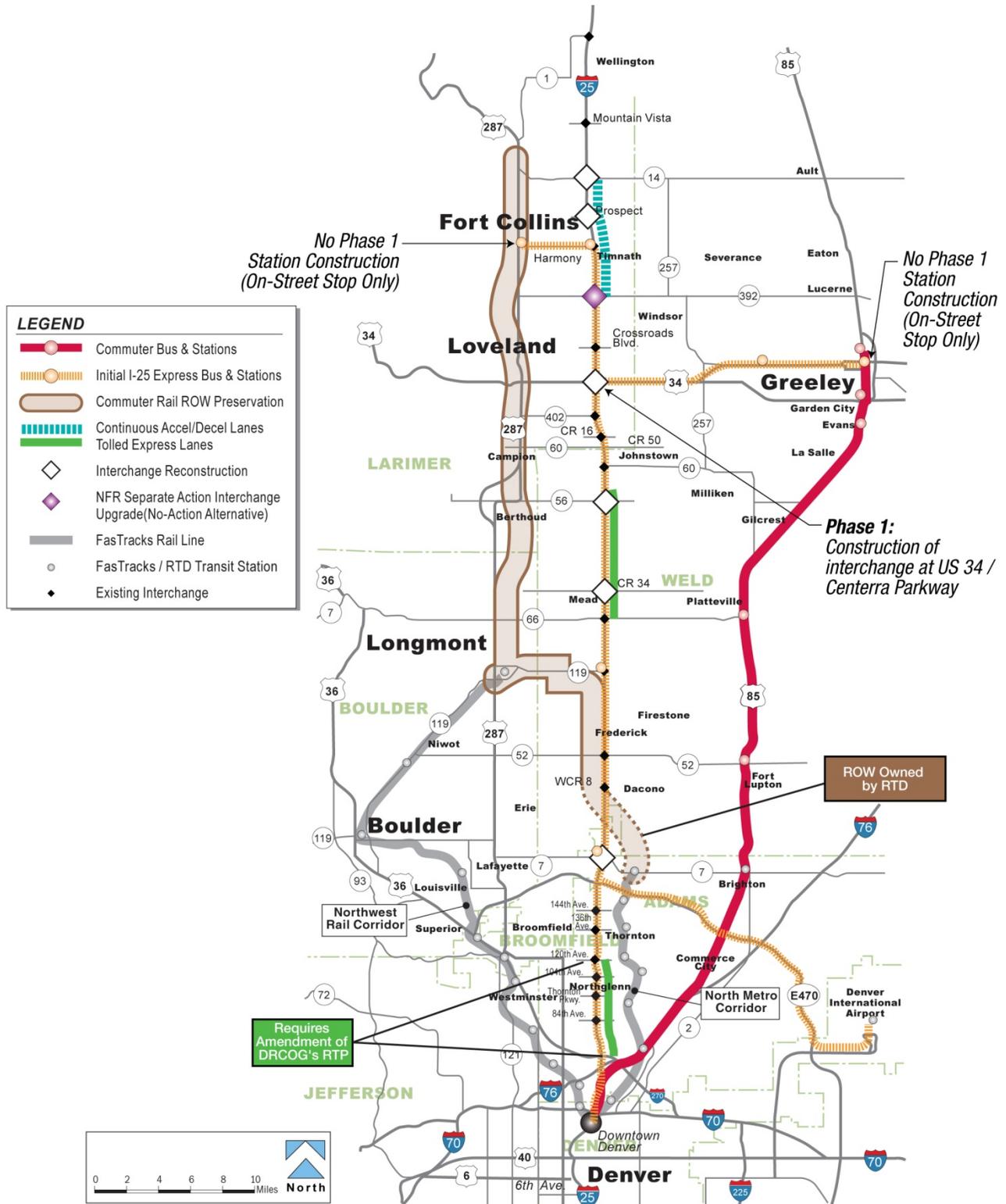
8.4.1 Phase 1

List of Elements and Estimated Cost

The effort described above resulted in development of the Phase 1 of the Preferred Alternative (see **Figure 8-3**). As shown, Phase 1 includes the following elements.

- ▶ Widening I-25 between SH 14 and SH 392 (approximately seven miles). This improvement would include full reconstruction of the existing cross section plus pavement to accommodate the Preferred Alternative TELs. While the additional pavement would ultimately be used for TELs, as an interim improvement it will be used as continuous acceleration/deceleration lanes. This would avoid potential operational problems associated with a southbound lane drop at SH 392. Widening would include water quality ponds and median barrier features necessary to accommodate this improvement. Right-of-way purchase associated with the ultimate Preferred Alternative cross-section is also included.
- ▶ Widening I-25 between SH 56 and SH 66 (approximately seven miles) with one tolled express lane in each direction. Widening would include water quality ponds and median barrier features as well as the right-of-way purchase associated with the ultimate Preferred Alternative cross-section.
- ▶ Widening I-25 between approximately US 36 and 120th Avenue (approximately six miles) with one buffer-separated tolled express lane in each direction and interchange modifications, as necessary. Widening would include noise and sound walls, water quality ponds, and median barrier features as well as the right-of-way purchase associated with the ultimate Preferred Alternative cross-section.
- ▶ Replacement and reconstruction of interchanges – I-25/SH 14, I-25/Prospect, I-25/SH 56, I-25/CR 34, and I-25/SH 7 would be constructed to their ultimate configurations. SH 392 and 84th Avenue would be completed as part of separate projects. A first phase of improvements to the I-25/US 34 interchange would be completed, which includes a single point urban interchange (SPUI) at the US 34/Centerra Parkway intersection.
- ▶ Replace or construct forty-six structures, modify two existing structures, and rehabilitate (minor) two structures (see **Table 8-1**).
- ▶ Installation of six carpool lots at I-25 interchanges (I-25/SH 14, I-25/Prospect Road, I-25/Harmony Road, I-25/SH 56/WCR 44, Firestone, and I-25/SH 7). Several of these carpool lots are shared with the I-25 express bus transit stations.
- ▶ Preservation of commuter rail right-of-way – All right-of-way necessary to construct the ultimate commuter rail configuration would be purchased as part of Phase 1.
- ▶ I-25 express bus – Regional express bus service connecting Fort Collins and Greeley to downtown Denver and DIA would be initiated. Four transit stations would be constructed as part of Phase 1 (I-25/Harmony Road, US 34/SH 257, Firestone, and I-25/SH 7), and 27 buses would be purchased.
- ▶ US 85 commuter bus – Commuter bus along US 85 connecting Greeley to downtown Denver would be implemented in Phase 1. This would include construction of five stations and the purchase of five buses. The entire US 85 commuter bus system identified in the Preferred Alternative would be implemented in Phase 1.

1 **Figure 8-3 Preferred Alternative Phasing – Phase 1**



2

1 **Table 8-1 Phase 1 – Structures**

Replacement or Reconstruction		Modification	Rehabilitation
▶ I-25 over Niver Creek (CBC)	▶ I-25 SB over SH 56	▶ Wagon Road HOV Ramp	▶ Community Center Drive over I-25
▶ RTD Pedestrian Overpass	▶ US 34 WB By-Pass over LCR 5	▶ I-25 over Preble Creek (CBC)	▶ Wagon Road HOV Ramp
▶ 88th Avenue over I-25	▶ US 34 over LCR 5		
▶ Pedestrian Overpass	▶ US 34 EB By-Pass over LCR 5		
▶ I-25 over Farmers Highline Canal	▶ I-25 over Cache la Poudre Floodway (CBC)		
▶ Pedestrian Underpass (CBC)	▶ I-25 SB on Ramp over Cache la Poudre Floodway (CBC)		
▶ I-25 over S. Fork Preble Creek (CBC)	▶ LCR 36 (Kechter Road) over I-25		
▶ Bull Canal (CBC)	▶ LCR 36 over Cache la Poudre Floodway (CBC)		
▶ SH 7 over I-25	▶ Kechter Rd over Cache la Poudre Floodway (CBC)		
▶ I-25 NB over WCR 32	▶ I-25 over Cache la Poudre Floodway (CBC)		
▶ I-25 SB over WCR 32	▶ Harmony Road over I-25		
▶ WCR 34 over I-25	▶ I-25 NB over Cache la Poudre River		
▶ I-25 over North Creek (CBC)	▶ I-25 SB over Cache la Poudre River		
▶ I-25 NB over GWRR	▶ I-25 NB over GWRR		
▶ I-25 SB over GWRR	▶ I-25 SB over GWRR		
▶ I-25 over Drainage (CBC)	▶ Prospect Road over I-25		
▶ WCR 38 over I-25	▶ Lake Canal (CBC)		
▶ I-25 NB over Valley Road	▶ Timnath Ditch (Cache la Poudre Reservoir Inlet) (CBC)		
▶ I-25 SB over Valley Road	▶ Box Elder Creek (CBC)		
▶ I-25 over Draw (CBC)	▶ SH 14 over I-25		
▶ I-25 NB over Little Thompson River	▶ SH 14 over Frontage Road Connector		
▶ I-25 SB over Little Thompson River	▶ I-25 NB over GWRR		
▶ I-25 NB over SH 56	▶ I-25 SB over GWRR		

1 Some elements of Phase 1 are in an interim location and will need to be reconstructed as
 2 future phases are completed, which would result in irretrievable losses of labor, funding,
 3 energy, and materials. These interim pieces of Phase 1 have been minimized where possible.
 4 The decision to proceed in phases was made due to existing funding limitations. The decisions
 5 of what elements to include in Phase 1 were based on funding constraints, the project Purpose
 6 and Need, and concerns of the local jurisdictions. The elements of Phase 1, including the
 7 tolled express lanes, continuous acceleration/deceleration lanes, and interchange
 8 improvements, are anticipated to provide a substantial benefit to corridor users and would
 9 offset the irreversible impacts.

10 **Table 8-2** summarizes the estimated cost by Phase 1 element.

11 **Table 8-2 Phase 1 – Estimated Cost by Element**

Element	Estimated Cost (2009 dollars)
Widen I-25 between SH 66 and SH 56	\$119.7 million
Widen I-25 between SH 392 and SH 14, including Prospect interchange	\$133.3 million
Widen I-25 between approximately US 36 and 120th Avenue	\$138.3 million
Replace and reconstruct interchanges – I-25/SH 14, I-25/SH 56, and I-25/SH 7	\$157.1 million
Install six carpool lots at I-25 interchanges	\$2.3 million
Preserve commuter rail right-of-way	\$26.4 million
Initiate I-25 express bus and US 85 commuter bus	\$63.1 million
Construct intersection at US 34/ Centerra Parkway (LCR 5)	\$29.7 million
Total	\$669.9 million

12 **Purpose and Need**

13 The project Purpose and Need, as described in **Chapter 1**, would be addressed by
 14 implementation of the Preferred Alternative in its entirety. Phases 1, 2 and 3 individually would
 15 not fully address the Purpose and Need, but each phase would contribute by incrementally
 16 addressing elements of the Purpose and Need. The Purpose and Need would be fully
 17 addressed once all phases have been implemented.

18 Phase 1 would incrementally contribute to addressing elements of the project Purpose and
 19 Need as follows.

20 ▶ *Need #1: Reduce crashes on portions of I-25 that have worse than average safety*
 21 *performance.*

- 22 • Widening I-25 between SH 56 and SH 66 would correct existing substandard shoulders
 23 and stopping sight distance to provide continuous, safe refuge for stopped vehicles and
 24 emergency use and would correct deficiencies in the horizontal alignment.
- 25 • Widening I-25 between SH 392 and SH 14 would correct deficiencies in the horizontal
 26 alignment between SH 392 and Harmony Road.

- 1 ▶ *Need #2: Improve mobility and accessibility along the I-25 corridor.*
- 2 • Reconstructing the I-25/SH 7 interchange would replace an interchange that does not
3 have the capacity to safely or efficiently accommodate the higher traffic volumes
4 anticipated by 2035.
- 5 • Reconstructing the I-25/SH 14, I-25/Prospect, I-25/SH 56, and I-25/CR 34 interchanges
6 would improve capacity and therefore enhance accessibility at these locations.
- 7 • Widening I-25 between SH 66 and SH 56, SH 392 and SH 14, and 120th Avenue and
8 approximately US 36 would improve mobility along the I-25 corridor.
- 9 ▶ *Need #3: Replace aging and functionally obsolete infrastructure.*
- 10 • Reconstructing the I-25/SH 14, I-25/Prospect, I-25/SH 56, and I-25/CR 34 interchanges
11 would replace structures that were constructed prior to 1966.
- 12 ▶ *Need #4: Provide modal alternatives.*
- 13 • Constructing six carpool lots at I-25 interchanges, preserving right-of-way for the
14 commuter rail, initiating express bus service along I-25 and implementing commuter
15 bus service along US 85 would provide modal alternatives.

16 These improvements are considered a reasonable expenditure of funds and would
17 incrementally contribute to addressing the Purpose and Need of the project, even if no
18 additional transportation improvements are made in the area. The improvements proposed in
19 Phase 1 would not restrict consideration of alternatives for other reasonably foreseeable
20 transportation improvements. The transportation improvements to be constructed in Phase 1
21 would have independent utility in that they would provide transportation benefits, be a
22 reasonable expenditure even if no additional improvements are made in the area, and each
23 element connects logical termini. Because this EIS addressed the regional transportation
24 needs, the study considered environmental matters on a broad scope.

25 The purchase/preservation of right-of-way for commuter rail, which is included in Phase 1,
26 would not have independent utility because the commuter rail system would not be
27 constructed until future funds are identified. State funds will be used for the purchase of
28 commuter rail right-of-way in Phase 1, and this right-of-way preservation identified in Phase 1
29 will not be included in the ROD because it is not eligible for federal funds until the commuter
30 rail project is included in the fiscally-constrained conforming plan. State expenditures for this
31 purpose may become eligible for use as a credit towards the state's share of a federal aid
32 project in the future at the time of commuter rail implementation, in accordance with applicable
33 federal regulations [23CFR710.501(b); 23CFR630.112(c)(1)].

34 **Traffic Analysis**

35 A traffic analysis for Phase 1 for the year 2035 was completed. The 2035 traffic analysis
36 evaluates traffic conditions at the completion of Phase 1 in 2035, since all of Phase 1 is not
37 expected to be constructed until 2035. For the 2035 traffic analysis, it was assumed that all
38 Phase 1 improvements would have been implemented.

39

1 **Figure 8-4** presents the level of service (LOS) for each segment of I-25 during the morning
 2 (AM) and evening (PM) peak hours for Phase 1. In the No-Action Alternative most of the
 3 corridor operated with LOS E and F conditions. Under Phase 1, travel demand forecasts are
 4 similar to the No-Action Alternative, but I-25 capacity would only be enhanced in a few
 5 locations which results in LOS E and F conditions in much of the corridor.

6 For the Phase 1 analysis, a total of 25 freeway segments were analyzed. Forecasted volumes
 7 result in 15 segments in one or both directions operating at LOS E or F in the AM peak hour
 8 and 17 segments in the PM peak hour. **Table 8-3** equates these congested segments to miles
 9 of I-25 operating with congested conditions and compares Phase 1 miles of congestion to
 10 miles of congestion for the No-Action Alternative. As shown in the table, Phase 1 capacity
 11 enhancements provide some reduction in miles operating at LOS E or F for segments north of
 12 E-470. Improved operations occur from SH 14 to SH 392 where continuous auxiliary lanes
 13 would be implemented and between SH 56 and SH 66 where a toll lane and improved
 14 geometric conditions would provide some additional capacity.

15 **Table 8-3 Miles of I-25 Operating at LOS E or F (General Purpose Lanes)**

Component	AM Peak Hour		PM Peak	
	No-Action	Phase 1	No-Action	Phase 1
SH 1 to SH 14	0	0	0	0
SH 14 to SH 60	22	17	29	20
SH 60 to E-470	17	10	24	21
E-470 to US 36	17	15	22	22
Total	56	42	75	63

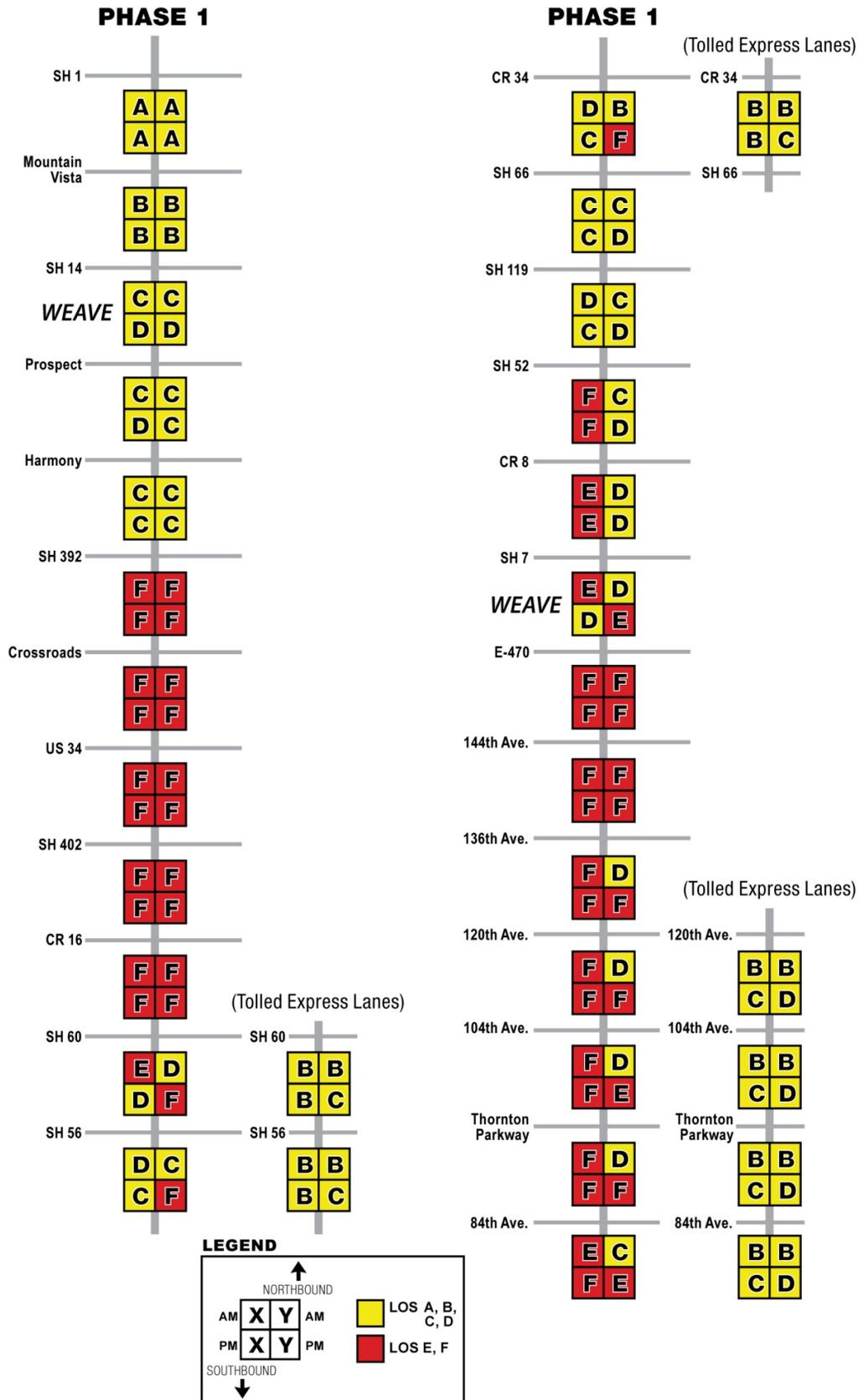
16 **Travel Time**

17 **Table 8-4** illustrates travel time anticipated for users in the general purpose lanes and for
 18 users of the tolled express lanes (where available) with the completion of Phase 1. As shown,
 19 travel in the general purpose lanes would be improved by eight minutes between SH 1 and
 20 20th Street in the AM peak hour southbound. Travel in the tolled express lanes would improve
 21 from 116 minutes to 107 minutes over that same section of I-25.

22 **Table 8-4 2035 Phase 1 Travel Time**

	Travel Time in Minutes	
	No Action	Phase 1
General Purpose Lanes		
SH 1 to E-470	69	69
E-470 to 20th Street	64	56
Total	133	125
TEL Lanes where available		
SH 1 to E-470	69	69
E-470 to 20th Street	47	38
Total	116	107

1 Figure 8-4 Phase 1 - I-25 Mainline Level of Service (LOS)



1 **Transit Ridership**

2 **Table 8-5** summarizes the anticipated regional transit ridership with the completion of Phase 1.
3 As shown, the initial I-25 bus service is expected to attract 2,000 boardings daily. The US 85
4 commuter bus would attract an additional 200 riders daily. These numbers represent about
5 one third of the regional transit ridership anticipated with the Preferred Alternative.

6 **Table 8-5 2035 Phase 1 Weekday Transit Ridership**

Phase 1	Daily Riders
US 85 Commuter Bus to/from Downtown Denver	200
Initial I-25 Express Bus: North Front Range to/from Downtown Denver and DIA	2,000
Total Regional Riders	2,200

7 **Environmental Impacts**

8 The environmental impacts of Phase 1 are discussed in **Section 8.5 Environmental Impacts**
9 *and Mitigation*.

10

8.4.2 Phase 2

As shown in **Figure 8-5**, Phase 2 includes the following elements.

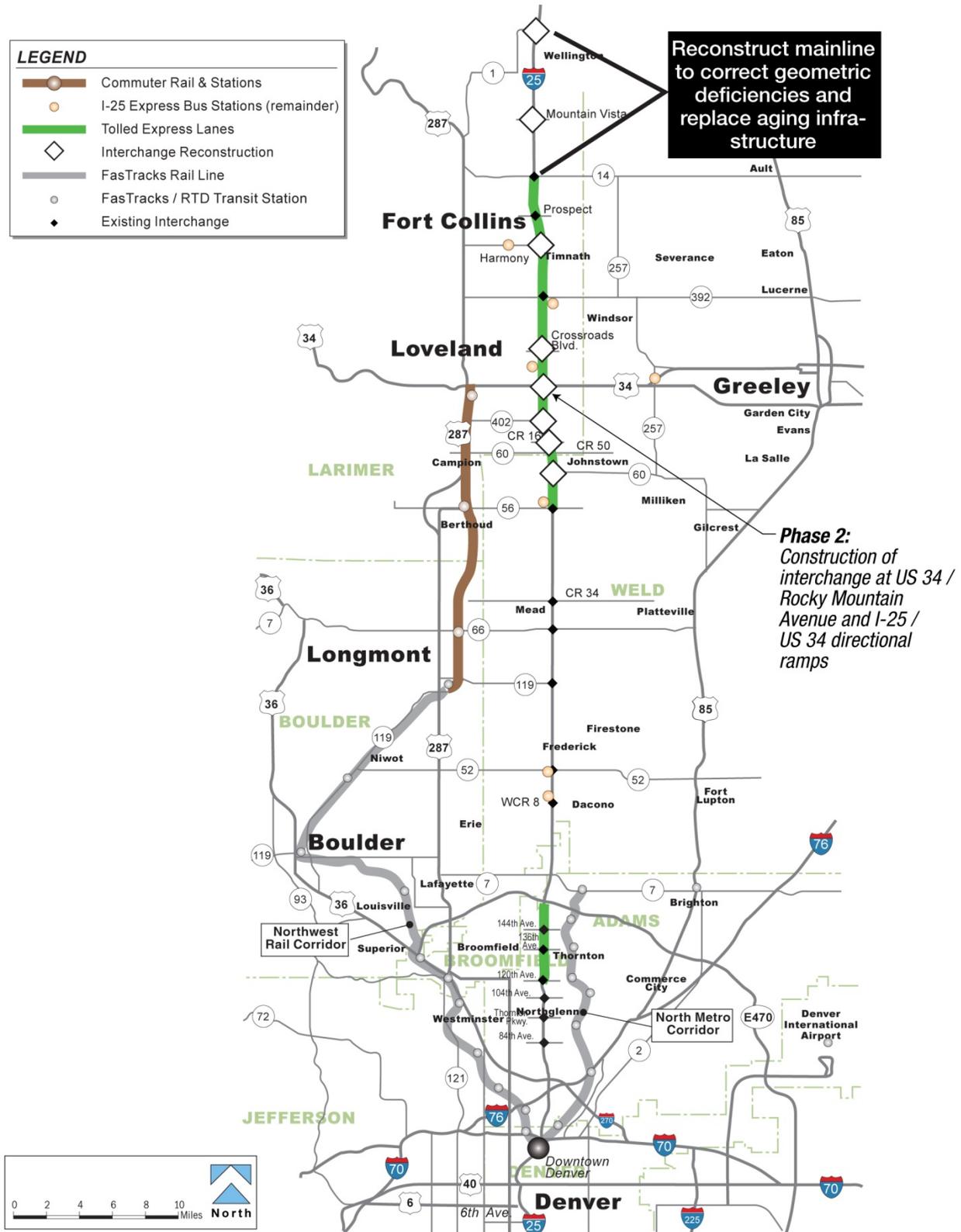
- ▶ Reconstruct I-25 mainline from SH 1 to SH 14
- ▶ Widen/reconfigure I-25 with a tolled express lanes from SH 14 to SH 56
- ▶ Reconstruct I-25 with a tolled express lanes from E-470 to 120th Avenue
- ▶ Replace and reconstruct interchanges – I-25/CR 16, I-25/SH 60, I-25/SH 402, I-25/Crossroads, I-25/Harmony, I-25/Mountain Vista, I-25/SH 1, would be constructed to their ultimate configurations. A second phase of the I-25/US34 interchanges upgrades would be constructed.
- ▶ Replace or construct forty structures, modify eight existing structures, and rehabilitate five existing structures
- ▶ Construct the commuter rail line from Longmont to Loveland and construct the associated commuter rail maintenance facility

Table 8-6 summarizes the estimated cost by Phase 2 element.

Table 8-6 Phase 2 – Estimated Cost by Element

Element	Estimated Cost (2009 dollars)
Reconstruct I-25 mainline from SH 1 to SH 14	\$141.7 million
Widen/reconfigure I-25 with tolled express lanes from SH 14 to SH 56	\$392.9 million
Reconstruct I-25 with tolled express lanes from 120th Avenue to E-470	\$88.9 million
Replace and reconstruct interchange– I-25/Harmony	\$38.9 million
Construct commuter rail line (Longmont to Loveland) and maintenance facility	\$379.3 million
Install express bus stations and bus maintenance facility	\$48.6 million
Total	\$1.090 billion

1 Figure 8-5 Preferred Alternative Phasing - Phase 2



2

1 **Purpose and Need**

2 Phase 2 would incrementally contribute to addressing elements of the project Purpose and
3 Need as follows.

4 ▶ *Need #1: Reduce crashes on portions of I-25 that have worse than average safety*
5 *performance.*

6 • Reconstruct I-25 between SH 1 and SH 14 would correct existing substandard
7 shoulders and stopping sight distance to provide continuous, safe refuge for stopped
8 vehicles and emergency use.

9 ▶ *Need #2: Improve mobility and accessibility along the I-25 corridor.*

10 • Reconstructing the I-25/Harmony, I-25/Crossroads, and I-25/US 34 interchanges would
11 replace interchanges that are considered functionally obsolete and do not have the
12 capacity to safely or efficiently accommodate higher traffic volumes.

13 • Widening I-25 between SH 56 and SH 14 and between 120th Avenue and E-470 would
14 improve mobility along the I-25 corridor.

15 • Reconstructing the I-25/CR 16, I-25/SH 60, I-25/SH 402, I-25/Mountain Vista, and
16 I-25/SH 1 interchanges would improve capacity and therefore enhance accessibility at
17 these locations.

18 ▶ *Need #3: Replace aging and functionally obsolete infrastructure.*

19 • Reconstructing the I-25/CR 16, I-25/SH 60, I-25/SH 402, I-25/Mountain Vista, and
20 I-25/SH 1 interchanges would replace structures that were constructed prior to 1966.

21 ▶ *Need #4: Provide modal alternatives.*

22 • Completing express bus service on I-25 and constructing an initial commuter rail
23 corridor segment between Longmont and Loveland would provide modal alternatives.

24 **Environmental Impacts**

25 The environmental impacts of Phase 2 are discussed in **Section 8.5 Environmental Impacts**
26 *and Mitigation*

27

8.4.3 Phase 3

As shown in **Figure 8-6 Preferred Alternative Phasing – Phase 3**, Phase 3 includes the following elements.

- ▶ Completion of commuter rail line (Fort Collins to Loveland and Longmont to North Metro)
- ▶ Widening/reconfiguration of I-25 with tolled express lanes and general purpose lanes from SH 14 to E-470
- ▶ Completion of the I-25/US 34 interchange
- ▶ Replace or construct eight new structures, modify 14 structures, and rehabilitate 9 existing structures

Table 8-7 summarizes the estimated cost by Phase 3 element.

Table 8-7 Phase 3 – Estimated Cost by Element

Element	Estimated Cost (2009 dollars)
Completion of commuter rail line	\$243.7 million
Widening/reconfiguration of I -25 with tolled express lanes/general purpose lanes from SH 14 to E-470	\$123.8 million
Completion of the I-25/US 34 interchange	\$50.8 million
Total	\$418.3 million

Purpose and Need

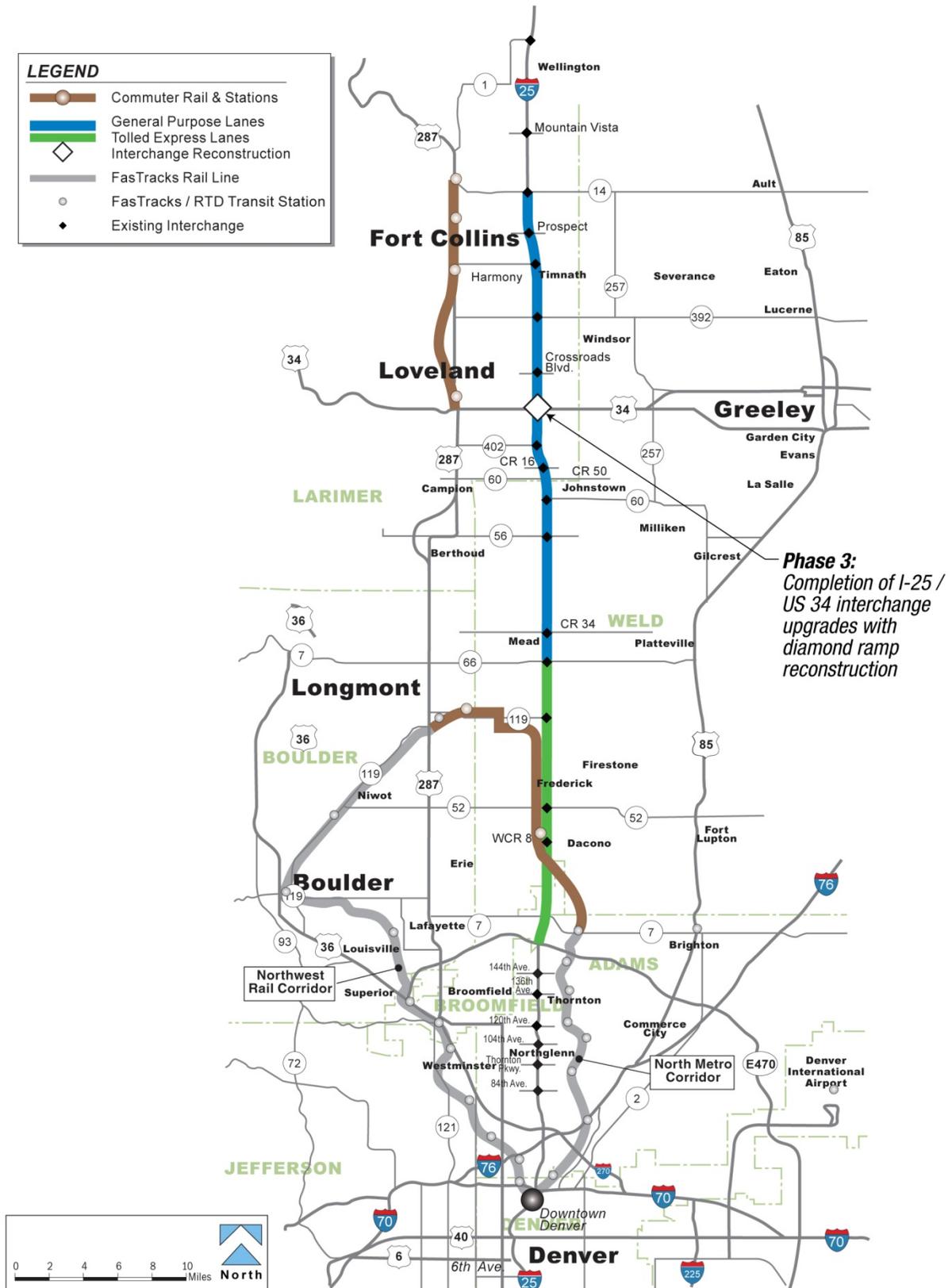
Phase 3 would incrementally contribute to addressing elements of the project Purpose and Need as follows.

- ▶ *Need #2: Improve mobility and accessibility along the I-25 corridor.*
 - Widening/reconfiguration of I-25 with tolled express lanes from E-470 to SH 66 and widening/reconfiguration of I-25 with general purpose lanes from E-470 to SH 14 would improve mobility along the I-25 corridor.
 - Completion of the US 34 interchange would replace an interchange that is considered functionally obsolete and does not have the capacity to safely or efficiently accommodate higher traffic volumes.
- ▶ *Need #4: Provide modal alternatives.*
 - Completion of commuter rail service would provide modal alternatives.

Environmental Impacts

The environmental impacts of Phase 3 are discussed in **Section 8.5 Environmental Impacts and Mitigation**.

1 Figure 8-6 Preferred Alternative Phasing - Phase 3



8.5 ENVIRONMENTAL IMPACTS AND MITIGATION

The social and environmental consequences that would result from the Preferred Alternative are discussed in **Section 3.28 Summary of Direct and Indirect Impacts**. **Table 8-8** identifies the environmental impacts of the Preferred Alternative by phase.

Mitigation commitments for these impacts are provided in **Section 3.29 Mitigation Summary** for the Preferred Alternative. The mitigation measures associated with Phase 1 are presented along with the environmental impacts of Phase 1 in **Table 8-9**. In Phase 1, there would be 10 *de minimis* uses of Section 4(f) properties.

Irretrievable and irreversible commitments of labor, funding, energy, and materials would occur. Irretrievable and irreversible commitments of labor, funding, energy, and materials would occur during full build out of the North I-25 project. Some improvements to North I-25, would occur in phases prior to construction of the entire Preferred Alternative and would need to be reconstructed as part of the implementation of the entire Preferred Alternative. As a result, some elements of the Preferred Alternative would need to be reconstructed as phases are completed, which would result in irretrievable losses of labor, funding, energy, and materials. However, the decision to proceed this way was made due to existing funding limitations. The elements of Phase 1, including commuter bus and express bus stations, interchange reconstruction, and tolled express lanes, are anticipated to provide a substantial benefit to corridor users and would therefore offset the irreversible impacts.

20

1 **Table 8-8 Resources Impacted by Phase**

Resource	Preferred Alternative (Total Build-Out)	Phase 1	Phase 2	Phase 3
Land Use	Additional development opportunities, especially around transit stations	Additional development opportunities, especially around transit stations	Additional development opportunities, especially around transit stations	Additional development opportunities, especially around transit stations
Social Conditions	Relocation of 51 Residences	Relocation of 39 Residences	Relocation of 12 Residences	No relocation of residences
	20 residential low income/minority relocations	14 residential low income/minority relocations	6 residential low income/minority relocations	No residential low income/minority relocations
Economics	23 business displacements Creation of 11,400 temporary jobs	17 business displacements Creation of 3,500 temporary jobs	5 business displacements Creation of 5,700 temporary jobs	1 business displacement Creation of 2,200 temporary jobs
Right-of-Way (Acquisitions and Displacements)	Property acquired for right-of-way: 889 acres	Property acquired for right-of-way: 568 acres	Property acquired for right-of-way: 315 acres	Property acquired for right-of-way: 6 acres
	Displacements: 51 residences: 23 businesses	Displacements: 39 residences: 17 businesses	Displacements: 12 residences: 5 businesses	Displacements: No residences: 1 business
Air Quality	No substantive impacts	No substantive impacts	No substantive impacts	No substantive impacts
Noise and Vibration (without mitigation)	Category B Traffic Noise Sites: 18 additional impacts	Category B Traffic Noise Sites: 10 additional impacts	Category B Traffic Noise Sites: 8 additional impacts	Category B Traffic Noise Sites: 0 impacts
	Moderate to severely impacted rail transit noise sites: 2,215 residences, schools, and churches	Moderate to severely impacted rail transit noise sites: 0 residences, schools, and churches	Moderate to severely impacted rail transit noise sites: 1,386 residences, schools, and churches	Moderate to severely impacted rail transit noise sites: 829 residences, schools, and churches
	Moderate to severely impacted rail transit vibration sites: 40 residences, schools, and churches	Moderate to severely impacted rail transit vibration sites: 0 residences, schools, and churches	Moderate to severely impacted rail transit vibration sites: 26 residences, schools, and churches	Moderate to severely impacted rail transit vibration sites: 14 residences, schools, and churches
Water Resources	1,982 acres of impervious surface area	815 acres of impervious surface area	930 acres of impervious surface area	237 acres of impervious surface area
Wetlands and Waters of the US	18.18 acres of direct impacts	7.75 acres of direct impacts	6.02 acres of direct impacts	4.41 acres of direct impacts

2

1 **Table 8-8 Resources Impacted by Phase (cont'd)**

Resource	Preferred Alternative (Total Build-Out)	Phase 1	Phase 2	Phase 3
Floodplains	13.0 acres of floodplain encroachment	7.8 acres of floodplain encroachment	2.8 acres of floodplain encroachment	2.4 acres of floodplain encroachment
Vegetation	818 acres of vegetation impacts	337 acres of vegetation impacts	384 acres of vegetation impacts	97 acres of vegetation impacts
Noxious Weeds	269 acres of soil disturbance	111 acres of soil disturbance	126 acres of soil disturbance	32 acres of soil disturbance
Wildlife	57 raptor nest buffers impacted ¹	28 raptor nest buffers impacted ¹	24 raptor nest buffers impacted ¹	23 raptor nest buffers impacted ¹
	14 wildlife movement corridors impacted	3 wildlife movement corridors impacted	4 wildlife movement corridors impacted	7 wildlife movement corridors impacted
	1.54 acres of aquatic habitat impacted	0.71 acres of aquatic habitat impacted	0.55 acres of aquatic habitat impacted	0.28 acres of aquatic habitat impacted
	1.94 acres of sensitive riparian / wetland habitat impacted	1.41 acres of sensitive riparian / wetland habitat impacted	0.47 acres of sensitive riparian / wetland habitat impacted	0.06 acres of sensitive riparian / wetland habitat impacted
Threatened, Endangered, Other Federally-Protected, and State Sensitive Species	0.72 acres of occupied Preble's Meadow Jumping Mouse habitat impacted	0.25 acres of occupied Preble's Meadow Jumping Mouse habitat impacted	0.47 acres of occupied Preble's Meadow Jumping Mouse habitat impacted	0.00 acres of occupied Preble's Meadow Jumping Mouse habitat impacted
	231.20 acres of Bald Eagle forage habitat impacted	193.71 acres of Bald Eagle forage habitat impacted	28.99 acres of Bald Eagle forage habitat impacted	8.50 acres of Bald Eagle forage habitat impacted
	86.41 acres of black-tailed prairie dog colonies impacted	47.88 acres of black-tailed prairie dog colonies impacted	30.63 acres of black-tailed prairie dog colonies impacted	7.9 acres of prairie black-tailed dog colonies impacted
	Western Burrowing Owl habitat associated with prairie dog colonies indirectly affected.	Western Burrowing Owl habitat associated with prairie dog colonies indirectly affected.	Western Burrowing Owl habitat associated with prairie dog colonies indirectly affected.	Western Burrowing Owl habitat associated with prairie dog colonies indirectly affected.
	17.49 acres of Northern Leopard Frog and Common Garter Snake habitat impacted	8.03 acres of Northern Leopard Frog and Common Garter Snake habitat impacted	6.30 acres of Northern Leopard Frog and Common Garter Snake habitat impacted	3.16 acres of Northern Leopard Frog and Common Garter Snake habitat impacted
	0.38 acres of sensitive fish species habitat impacted	0.15 acres of sensitive fish species habitat impacted	0.17 acres of sensitive fish species habitat impacted	0.06 acres of sensitive fish species habitat impacted

2

1 **Table 8-8 Resources Impacted by Phase (cont'd)**

Resource	Preferred Alternative (Total Build-Out)	Phase 1	Phase 2	Phase 3
Visual Quality	Minor impacts include relocation of businesses, addition of station amenities, changes to overpasses, bridges, retaining walls, medians, and road grade	Minor impacts include relocation of businesses, addition of station amenities, changes to overpasses, bridges, retaining walls, medians, and road grade	Minor impacts include relocation of businesses, addition of station amenities, changes to overpasses, bridges, retaining walls, medians, and road grade	Minor impacts include relocation of businesses, addition of station amenities, changes to overpasses, bridges, retaining walls, medians, and road grade
Historic Preservation	4 adverse affect National Register Historic Places (NRHP) listed or eligible sites	No adverse affect NRHP listed or eligible sites	1 adverse affect NRHP listed or eligible site	3 adverse affect NRHP listed or eligible sites
	23 no adverse affect NRHP listed or eligible sites ²	6 no adverse affect NRHP listed or eligible sites ²	16 no adverse affect NRHP listed or eligible sites ²	6 no adverse affect NRHP listed or eligible sites ²
Paleontological Resources	3,224 acres of ground disturbance with potential for paleontological resources	1,328 acres of ground disturbance with potential for paleontological resources	1,515 acres of ground disturbance with little potential for paleontological resources	381 acres of ground disturbance with potential for paleontological resources
Hazardous Materials	67 parcels with potential environmental conditions and 20 parcels with known environmental conditions	50 parcels with potential environmental conditions and 15 parcels with known environmental conditions	14 parcels with potential environmental conditions and 4 parcels with known environmental conditions	3 parcels with potential environmental conditions and 1 parcel with known environmental conditions
Parks and Recreation	6 park or recreation resources impacted	2 park or recreation resources impacted	2 park or recreation resources impacted	2 park or recreation resources impacted
Section 6(f) Resources	No effects on any 6(f) resources	No effects on any 6(f) resources	No effects on any 6(f) resources	No effects on any 6(f) resources
Farmlands	977.2 acres of conversion of farmlands	402.8 acres of conversion of farmlands	459.3 acres of conversion of farmlands	115.1 acres of conversion of farmlands
Energy	Use approximately 0.9 percent more energy than No-Action	Use approximately 0.9 percent more energy than No-Action	Use approximately 0.9 percent more energy than No-Action	Use approximately 0.9 percent more energy than No-Action
Public Safety and Security	70 percent reduction in at grade crossing collisions	No reduction in at grade crossing collisions	Reduction in at grade crossing collisions along constructed commuter rail line	Reduction in at grade crossing collisions along constructed commuter rail line

2

1 **Table 8-8 Resources Impacted by Phase (cont'd)**

Resource	Preferred Alternative (Total Build-Out)	Phase 1	Phase 2	Phase 3
Construction	Temporary impacts to traffic patterns and congestion, noise and vibration, air quality, and visual presence	Temporary impacts to traffic patterns and congestion, noise and vibration, air quality, and visual presence	Temporary impacts to traffic patterns and congestion, noise and vibration, air quality, and visual presence	Temporary impacts to traffic patterns and congestion, noise and vibration, air quality, and visual presence
Section 4(f) Properties	4 National Register of Historic Places (NRHP) listed or eligible sites with land permanently incorporated into transportation infrastructure		1 NRHP listed or eligible site with land permanently incorporated into transportation infrastructure	3 NRHP listed or eligible sites with land permanently incorporated into transportation infrastructure
	23 NRHP listed or eligible site with <i>de minimis</i> uses ²	6 NRHP listed or eligible sites with <i>de minimis</i> uses ²	16 NRHP listed or eligible sites with <i>de minimis</i> uses ²	6 NRHP listed or eligible sites with <i>de minimis</i> uses ²
	1 park with land permanently incorporated into transportation infrastructure		1 park with land permanently incorporated into transportation infrastructure	
	3 parks with <i>de minimis</i> uses	2 parks with <i>de minimis</i> uses		1 park with <i>de minimis</i> uses
	3 trails with <i>de minimis</i> uses 2 trails with temporary occupancy	3 trails with <i>de minimis</i> uses	2 trails with temporary occupancy	

2 ¹Several of the 57 existing raptor nest site buffer areas overlap more than one Phase of the Preferred Alternative
3 resulting in two or more impacts to that raptor nest site buffer

4 ²The sum of Historic Resources with a No Adverse Effect determination, when totaled by Phase, is greater than the
5 number listed in the Preferred Alternative Total Build-out because some resources have multiple segments that are
6 impacted by separate phases.
7

1 Table 8-9 Phase 1 Impact and Mitigation Summary

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Land Use	
<p>Improvements to existing interchanges could stimulate some growth, but not as much as would be the case if completely new interchanges were proposed.</p> <p>Because they are beside I-25, the express bus stations are more likely to attract new development.</p> <p>Non-urban stations would help realize plans for more urban development that otherwise would not occur.</p>	<p>No mitigation required.</p>
Social Conditions	
<p>Impacts associated with Phase 1 would include:</p> <ul style="list-style-type: none"> ▶ Relocation of 39 residences ▶ Increased noise and visual impacts ▶ A slight increase in air emissions (but below National Ambient Air Quality Standards) relative to the No Action Alternative <p>Benefits associated with Phase 1 would include:</p> <ul style="list-style-type: none"> ▶ Enhanced regional connections between communities ▶ Improvements in mobility, safety, and emergency response ▶ Improved mobility for transportation-disadvantaged populations <p>Environmental Justice</p> <p>Impacts to minority and low-income residents include 14 residential displacements.</p> <p>Benefits associated with the Phase 1 would include:</p> <ul style="list-style-type: none"> ▶ Express bus and commuter bus transit would result in moderate improvements in mobility and would improve regional connectivity ▶ Safety and emergency response time would improve ▶ Short-term and long-term employment opportunities would occur during the construction of the facilities as well as their ongoing operation and maintenance. ▶ Shoulders and sidewalks would better accommodate bicycle and pedestrian travel 	<p>CDOT will provide advance notice to emergency service providers, local schools, home owners associations, and the public of upcoming activities that are likely to result in traffic disruption. Such notifications will be accomplished through radio and public announcements, newspaper notices, on-site signage, and CDOT's website. Where feasible, retaining walls have been identified for construction along I-25 to minimize impacts to residential development.</p> <p>Mitigation for construction related impacts to minority and low-income populations could include the provision of reduced price bus passes during construction, acceptable access modifications, and translated information on construction processes and alternate modes available during construction and pre-opening day.</p>

2

1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Economic Conditions	
<p>Impacts associated with Phase 1 include:</p> <ul style="list-style-type: none"> ▶ Relocation of 17 businesses ▶ The loss in tax base. ▶ Temporary construction-related detours, delays, and out-of-direction travel. ▶ Temporary impacts to existing freight operations during construction. <p>Benefits associated with Phase 1 would include:</p> <ul style="list-style-type: none"> ▶ Potential for long-term growth of property tax base and revenues as a result of transit-oriented development. ▶ Some access revisions; transit would improve access to businesses and expand employment opportunities. ▶ Creation of 3,500 temporary jobs over the construction period. 	<p>New access will be provided for properties where existing accesses are removed. To avoid disruption of business activities during construction, the new access will be provided before the existing access is removed.</p> <p>To minimize disruption to traffic and local businesses, construction activities will be staged and work hours varied. Throughout the construction stage, access will be preserved for each affected business.</p> <p>Where feasible, retaining walls have been identified for construction along I-25 to minimize impacts to commercial development.</p>
Right of Way	
<p>Would require 39 residential relocations and 17 business relocations.</p> <p>All property impacts, including displacements and partial acquisitions, would require a total of 568 acres for the implementation of Phase 1 of the Preferred Alternative.</p>	<p>Acquisition of those property interests required for the project will comply fully with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended (the Uniform Act) and other applicable relocation assistance programs.</p> <p>The Uniform Act also provides for numerous benefits to individuals who occupy improvements that must be acquired, to assist them both financially and with advisory services related to relocating their residence or business operation to a replacement site.</p>

2

1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Air Quality	
<p>No substantive impacts No exceedances of standards or thresholds due to mobile sources Growth and development changes would affect traffic patterns and air quality. In areas of transit oriented development, air quality could improve due to more efficient travel patterns.</p> <p>Benefits include:</p> <ul style="list-style-type: none"> ▶ emissions for all pollutants from mobile sources would be reduced from existing levels; and ▶ continued conversion of agricultural land uses would lessen nitrogen deposition effects to Rocky Mountain National Park. 	<p>The following mitigation measures are recommended for construction activities associated with Phase 1:</p> <ul style="list-style-type: none"> ▶ An air quality mitigation plan will be prepared describing all feasible measures to reduce air quality emissions from the project. CDOT staff must review and endorse construction mitigation plans prior to work on a project site. ▶ Acceptable options for reducing emissions could include use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, and after-treatment products. ▶ The contractor will ensure that all construction equipment is properly tuned and maintained. ▶ Idling time will be minimized to 10 minutes—to save fuel and reduce emissions. ▶ An operational water truck will be on site at all times. Water will be applied to control dust as needed to prevent dust impacts off site. ▶ There will be no open burning of removed vegetation. Vegetation will be chipped or delivered to waste energy facilities. ▶ Existing power sources or clean fuel generators will be utilized rather than temporary power generators. ▶ Obstructions of through-traffic lanes will be minimized. A flag person will be provided to guide traffic properly minimizing congestion and to ensure safety at construction sites. <p>The following mitigation measures were identified which could be included (for others to implement) to help reduce ammonia emissions within the study area:</p> <ul style="list-style-type: none"> ▶ Choose a nitrogen fertilizer appropriate for a given cropping system that will have the lowest nitrogen volatilization on the soil type to which it is applied.

2

1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Air Quality (cont'd)	<ul style="list-style-type: none"> ▶ Properly store and manage commercial fertilizer to minimize emissions of ammonia from leaks, spills, or other problems. ▶ The use of feed additive and supplemental hormones in animal production has proven to greatly improve nutrient utilization, resulting in more efficient milk and meat production. Use of these products may decrease nitrogen excretion per day and/or reduce the total number of days on feed, thereby reducing overall nitrogen excretion and subsequent ammonia volatilization. ▶ Ammonia volatilization occurs soon after manure is deposited on barn floors. BMPs should be implemented such as scraping and flushing the floors and alleyways, drying manure and cooling barn temperatures, install filters/scrubbers on air exchange systems, etc. <p>Areas such as lawns, open spaces, parks, and golf courses require large amounts of water as well as significant amounts of fertilizers to help them stay lush green. Therefore, appropriate fertilizers should be applied and BMPs for re-treatment of wastewater run-off should be implemented.</p>

2

1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Noise and Vibration	
<p>An estimated 10 additional Category B sites would be impacted by traffic noise without recommended mitigation measures. No residences, schools, or churches would experience impacts from rail transit noise or vibration.</p>	<p>There are several existing traffic noise barriers in the project area. If any of these barriers must be removed for construction, the old barrier will be replaced with an equivalent or better barrier as part of the Preferred Alternative. From the feasibility and reasonableness evaluations for the barriers, new traffic noise barriers are recommended for the following locations along the Preferred Alternative in Phase 1:</p> <ul style="list-style-type: none"> ▶ Stone Mountain Apartments..... (14-foot barrier) 1,300ft. ▶ Greens of Northglenn (10-foot to 12-foot barrier) 600 ft. ▶ Badding Reservoir extension (12-foot barrier) 900 ft. ▶ Brittany Ridge extension (12-foot barrier) 1,000ft. <p>Construction Noise</p> <p>Construction noise would be subject to relevant local regulations and ordinances, and any construction activities would be expected to comply with them. To address the temporary elevated noise levels that may be experienced during construction, standard mitigation measures would be incorporated into construction contracts, where it is feasible to do so. These would include:</p> <ul style="list-style-type: none"> ▶ Exhaust systems on equipment would be in good working order. Equipment would be maintained on a regular basis, and equipment may be subject to inspection by the project manager to ensure maintenance. ▶ Properly designed engine enclosures and intake silencers would be used where appropriate. ▶ New equipment would be subject to new product noise emission standards. ▶ Stationary equipment would be located as far from sensitive receivers as possible. ▶ Most construction activities in noise-sensitive areas would be conducted during hours that are least disturbing to adjacent and nearby residents.

2

1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Water Resources	
<p>Highway Impacts: Would result in 815 acres of impervious surface area. Would require relocation of as many as 76 wells within the right-of-way. Modifications to the existing drainage system or a new system could improve drainage compared to the No-Action Alternative.</p>	<p>A combination of mitigation measures consisting of permanent structural, nonstructural, and temporary construction best management practices (BMPs) will be implemented in the project area, in compliance with the Clean Water Act and CDOT's MS4 permit requirements. BMPs will include water collection and passive treatment of stormwater, which is currently being directly discharged into existing water systems.</p> <p>Structural BMPs Extended detention/retention ponds have been identified as the primary structural BMP for this project. The Preferred Alternative would provide water quality ponds with a capacity to treat 2,009 acres (101%) of the total impervious area. Locations of water quality ponds have been identified throughout the project area. Placement of the BMPs is provided in the Water Quality and Floodplain Technical Report (FHU, 2008b) and Addendum (FHU, 2010) and the Concept Plans Technical Report (FHU, 2010x).</p> <p>Stormwater management plans (silt fence, inlet protection, containerization of wastes, etc.) will be developed during design, implemented during construction, and updated as needed.</p> <p>Riprap will be placed at bridge abutments, piers, and at critical portions of channels or floodplains.</p> <p>When possible, passive BMPs (e.g., grass swales or natural infiltration) will be used for ephemeral streams</p> <p>Temporary Construction BMPs</p> <ul style="list-style-type: none"> ▶ A Spill Prevention Plan will be prepared. ▶ In-stream activities will be minimized. ▶ CDOT's specifications for managing stormwater at a construction site (currently specifications 107.25, 212, 213, and 216) will be followed. ▶ A Senate Bill 40 (SB40) permit from the CDOW will be obtained. It will include measures to protect existing riparian areas, such as mitigating stormwater runoff or replacing riparian vegetation.

2

1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Water Resources (cont'd)	
	<ul style="list-style-type: none"> ▶ Vegetation or other erosion control techniques (as indicated by CDOT erosion control practices) will be established to prevent sediment loading in compliance with the general stormwater construction permit. ▶ Construction activities will be phased to minimize effects associated with large areas of exposed ground and with soil compaction from heavy machinery use. <p>Groundwater Quality</p> <p>If groundwater is encountered during activities associated with excavations for caisson/retaining walls, the discharge of groundwater is authorized when the following conditions are met:</p> <ul style="list-style-type: none"> ▶ Source is groundwater and/or groundwater combined with stormwater that does not contain pollutants in concentrations exceeding the State groundwater standards in Regulations 5 CCR 1002-41 and 42; ▶ Discharge is in accordance with CDPHE-WQCD Water Quality, Policy-27, Low-Risk Discharges, September 2009; ▶ Source is identified in the Stormwater Management Plan (SWMP); ▶ Dewatering BMPs are included in the SWMP, and ▶ Discharges do not leave the site as surface runoff or to surface waters. <p>If these conditions are not met, then a separate Clean Water Act Section 402 Construction Dewatering Permit or Individual Construction Dewatering Permit will be required to be obtained by CDOT's contractor from the CDPHE – Water Quality Control Division.</p> <p>If dewatering is necessary, groundwater brought to the surface will be managed according to Section 107.25 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT, 2005).</p> <p>If active wells are present prior to construction, status of groundwater well use will have to be determined. Active wells within the right-of-way will be relocated, replaced, or supplemented if a reduction in the water table is anticipated.</p>

2

1 **Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)**

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Wetlands and Waters of the US	
<p>Would result in total direct impacts of 7.75 acres of wetlands and jurisdictional open water.</p> <p>Indirect wetland effects would result from the increase in impervious surfaces caused by additional lanes or added road shoulders. Effects would be expected to include increased roadway runoff, increased surface flows in adjacent streams, erosion, and the creation of channels in wetlands that were previously free of channelization.</p> <p>New flows could contain pollutants associated with roadway runoff. Sediment from winter sanding operations accumulating in wetlands De-icers, petroleum products, and other chemicals would also likely degrade water quality and impacting wetland plants</p> <p>Additional sediment and erosion would be expected during and after construction until exposed fill and cut slopes could be successfully re-vegetated.</p> <p>Other indirect effects include the decrease or elimination of upland tree and/or shrub buffers between the proposed roadway/rail corridor and wetlands adjacent to other aquatic sites</p>	<p>Impacts to wetlands and jurisdictional open water will be avoided and minimized to the greatest extent possible during preliminary and final design.</p> <p>The following mitigation goals are appropriate for unavoidable impacts to wetlands for Phase 1:</p> <ul style="list-style-type: none"> ▶ CDOT plans to mitigate permanent impacts to lower quality wetlands associated with project implementation through the purchase of wetland banking credits from a USACE-approved facility. ▶ Mitigation for impacts to moderate quality wetlands and high quality wetlands, generally associated with perennial waterways, will come in the form of a combination of on-site wetland creation or restoration, in-lieu fee arrangements, and off-site wetland creation or restoration. <p>CDOT is working with the Omaha District of the USACE and EPA to determine how impacts within the project watersheds can be best mitigated.</p> <p>All impacted wetlands and jurisdictional open waters would be mitigated in accordance with the USACE mitigation policies, and the conditions of the USACE Section 404 Permit. All mitigation plans would be developed in coordination with the USACE and other appropriate agencies during the Section 404 permitting process. In addition, all mitigation for the wetlands as a result of the North I-25 project would be done in accordance with CDOT and FHWA (23 CFR 777).</p> <p>During construction, BMPs will be used to avoid indirect construction impacts to wetlands. Materials and equipments will be stored a minimum of 50 feet from wetlands, drainages, and ditches that could carry toxics materials into wetlands. Construction fencing and appropriate sediment control BMPs will be used to mark wetland boundaries and sensitive habitats during construction.</p> <p>Sediment and erosion control will be required to be placed during all phases of construction and will remain in place until all disturbed areas have reached 70% of preconstruction vegetative cover.</p>

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
<p>Floodplains</p> <p>Would impact a total of 7.8 acres of floodplains. Would result in six I-25 crossings of floodplains and replacement or rehabilitation of six drainage structures along I-25.</p>	<p>The following measures will be taken to mitigate floodplain impacts to the extent practicable:</p> <ul style="list-style-type: none"> ▶ Designs will comply with federal, state, and local agency requirements. ▶ Design will consider the maximum allowable backwater as allowed by FEMA. ▶ 100-year FEMA design flows will be used for freeboard determinations, scour design, and to ensure that flow velocities are acceptable. ▶ 500-year design flows will be used for the scour design and to determine the depths of piles or caissons. ▶ Impacts to downstream areas must be assessed during preliminary and final design by using the guidelines described in Section 3.9 Floodplains. ▶ Design flows will be based on the current level of development, and it will not be assumed that any inadvertent detention facilities will lower them. ▶ A bridge deck drainage system that controls seepage at joints should be considered. If possible, bridge deck drains will be piped to a water quality feature before being discharged into a floodplain. ▶ CDOT policy, to obey the Natural Flow Rule of Colorado and to hold others to the same standard (CDOT Drainage Design Manual, 2004, sec. 2.5.2 and 12.1.1), will be followed. ▶ Sediment and erosion will be controlled by implementing appropriate structural and non-structural BMPs during each phase of construction to avoid potential pollutants from entering state waters. ▶ Disturbed land will be seeded and re-vegetated in accordance with current CDOT standards and specifications. <p>SB 40 requirements will be met for applicable areas.</p>

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1 **Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)**

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Vegetation	
<p>Results in 337 acres of vegetation impacts. The potential for noxious weeds to establish and spread onto public lands such as parks and open spaces, and agricultural areas exists.</p>	<p>Specific BMPs will be determined during final design. Mitigation measures are anticipated to include:</p> <ul style="list-style-type: none"> ▶ An acceptable revegetation plan will be developed with the CDOT landscape architect and with county personnel in Adams, Boulder, Broomfield, Denver, Larimer, and Weld counties. The revegetation plan must also be acceptable to municipalities, such as Fort Collins and Longmont, within their jurisdictional areas. ▶ A SB 40 certification for stream crossings or adjacent stream banks will be obtained. In these areas, it is recommended that trees and shrubs be replaced on a 1:1 basis (trees) and square-foot basis (shrubs). ▶ CDOT standard specifications for the amount of time that disturbed areas are allowed to be non-vegetated will be followed. ▶ Existing trees, shrubs, and vegetation will be avoided to the maximum extent possible, especially wetlands and riparian plant communities. The project team will coordinate with the CDOT landscape architect before construction to determine the types of vegetation that will be protected during construction. ▶ Weed-free topsoil will be salvaged for use in seeding. ▶ Erosion control blankets will be used on steep, newly seeded slopes. Slopes should be roughened at all times. ▶ All disturbed areas will be re-vegetated with native grass and forb species. ▶ Seed, mulch, and mulch tackifier will be applied in phases throughout construction.

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
<p>Noxious Weeds</p>	
<p>Results in 111 acres of soil disturbance which can result in the potential disturbance to natural resources due to spread and establishment of noxious weeds.</p>	<p>An integrated weed management plan or project-specific CDOT 217 Specification, will be incorporated into the project design and implemented during construction. Specific BMPs will be required during construction to reduce the potential for introduction and spread of noxious weed species. These will include:</p> <ul style="list-style-type: none"> ▶ Noxious weed mapping will be included in the construction documents along with appropriate weed control methods. ▶ Highway right-of-way areas will be inspected periodically by the associated city or its consultants during construction and during post-construction weed monitoring for invasion of noxious weeds. ▶ Weed management measures will include removal of heavily infested topsoil, herbicide treatment of lightly infested topsoil as well as other herbicide and/or mechanical treatments, limiting disturbance areas, phased seeding with native species throughout the project, and monitoring during and after construction. ▶ Use of herbicides will include selection of appropriate herbicides and timing of herbicide spraying and use of a backpack sprayer in and adjacent to sensitive areas, such as wetlands and riparian areas. ▶ Certified weed-free hay and/or mulch will be used in all revegetated areas. ▶ No fertilizers will be allowed on the project site. ▶ Preventative control measures for project design and construction may include: ▶ Only native species will be used to revegetate sites. ▶ Materials used for revegetating will be inspected and regulated in accordance with provisions of the Weed Free Forage Act, Title 35, Article 27.5, CRS. ▶ When salvaging topsoil from on-site construction locations, the potential for spread of noxious weeds will be considered. Importing topsoil onto the project site will not be allowed. <p>Equipment will remain on designated roadways and stay out of weed-infested areas until the areas are treated. All equipment will be cleaned of all soil and plant parts before its arrival at a project site.</p>

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Wildlife	
<p>Would impact 1.41 acres of sensitive riparian / wetland habitat. Would impact 0.71 acres of aquatic habitat. Would impact 3 wildlife movement corridors and 28 raptor nests</p>	<p>CDOT mitigation measures associated with wildlife impacts will include:</p> <ul style="list-style-type: none"> ▶ An application for SB 40 Certification will be submitted to CDOW. ▶ Requirements of the Migratory Bird Treaty Act (1918) (MBTA) will be followed. CDOT has proposed special provisions creating a new Standards and Specification Section 240 – Protection of Migratory Birds to address the requirements of the MBTA. These provisions will ensure that consistent, appropriate and reasonable measures are taken to prevent injury to and death of migratory birds and the CDOT activities are compatible with current federal and state wildlife laws and regulations. ▶ CDOT will implement three mitigation measures for projects that will have an impact to migratory birds: (1) tree trimming and/or removal activities, (2) bridge or box culvert work that may disturb nesting birds, and (3) clearing and grubbing of vegetation that may disturb ground nesting birds will all be completed before birds begin to nest or after the young have fledged. ▶ A raptor nest survey will be conducted prior to project construction to identify raptor nests and nesting activity in the vicinity of the proposed project. CDOW recommended buffers and seasonal restrictions will be implemented if active raptor nests are found. ▶ If impacts to raptor nests are unavoidable, specific mitigation measures will be developed prior to construction. ▶ To maximize use of movement corridors by wildlife, bridge spans and culverts should have the following features: a minimum clearance of 10 feet and width of 20 feet for deer and a minimum “openness ratio” of 0.75. ▶ Shrubs and vegetative cover will be placed at bridge underpass openings to attract wildlife and provide a “funnel effect”. ▶ For structures that periodically convey water, ledges or shelves will provide passage alternatives during high water. ▶ To avoid human disturbance to wildlife, trails should not be placed near wildlife crossing structures.

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1 **Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)**

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Wildlife (cont'd)	<p>To maximize use of bridges and culverts by wildlife, other recommended design elements include:</p> <ul style="list-style-type: none"> ▶ The placement of lighting should be avoided near the crossing structures. ▶ Roadside vegetation height should be kept to a minimum. <p>Along the commuter rail corridor, CDOT/FHWA will seek permission from the regional transit authority to minimize the use of chain-link fencing in areas that are heavily used by wildlife.</p> <p>The following design measures may be implemented to mitigate potential impacts to aquatic species, including native fish:</p> <ul style="list-style-type: none"> ▶ Riffle and pool complexes should be maintained and/or created. ▶ Natural stream bottoms will be maintained. ▶ Culverts should be partially buried and the bottom should be covered with gravel/sand and have a low gradient. ▶ Culverts to be replaced should be replaced with one of equal or greater size. ▶ Culverts will not have grates, impact dissipators, or any other features that would impede fish movement. ▶ Access points to streams during construction will be limited to minimize degradation of the banks. ▶ No new fish passage barriers will be created. ▶ Existing drop structures that create a barrier to fish movements will be removed or redesigned where possible.

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1 **Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)**

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Threatened, Endangered, Other Federally-Protected, and State Sensitive Species	
<p>Direct impact to 0.25 acre of potential Preble's habitat Direct impact to 194 acres of bald eagle foraging habitat Direct impact to 48 acres of black-tailed prairie dog colonies Indirect impact to Western Burrowing Owl habitat associated with prairie dog colonies. Direct impact to 8 acres of habitat for northern leopard frogs and common gartersnakes Direct impact to 0.15 acre of habitat for state threatened, endangered, or sensitive aquatic species</p>	<p>Mitigation measures for occupied Preble's habitat may be required as part of Section 7 consultation with USFWS. Avoidance and minimization measures will include:</p> <ul style="list-style-type: none"> ▶ Construction within occupied Preble's habitat at the Little Thompson and Big Thompson rivers and any area found to be occupied by Preble's by future surveys will be limited to Preble's inactive season (November through April). ▶ Visible barriers will be used to limit the area of construction. ▶ If culverts in Preble's habitat are replaced or upgraded, the new culverts will incorporate ledges to facilitate small mammal passage. ▶ Where impacts are unavoidable, compensatory mitigation will be provided through replacement with suitable habitat for Preble's habitat. Mitigation measures for Preble's could be combined with wetlands mitigation. Wetland mitigation measures also may replace any impacts to suitable unoccupied Preble's habitat. ▶ Conservation measures would be employed to minimize impacts during construction and include: <ul style="list-style-type: none"> • Stockpiling construction materials in bare areas, rather than on top of existing vegetation in known occupied and high potential habitats. • Informing construction workers the reasons for and importance of limiting impacts to vegetated habitat outside the work area in known occupied habitat. • Supervising work on a daily basis to ensure that conditions established by the USFWS are met. • Providing a report to the USFWS that includes photographic documentation of site conditions prior to and at the completion of construction. • Following requirements stipulated in the Biological Opinion prepared by the USFWS. • Conservation measure in accordance with the Short Grass Prairie Initiative Biological Opinion for sensitive, nonlisted species including black-tailed prairie dog, burrowing owl, native fish, and mussels (including brassy minnow, common shiner, plains minnow, and cylindrical papershell), and northern leopard frog.

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Threatened, Endangered, Other Federally-Protected, and State Sensitive Species (cont'd)	
	<p>Mitigation measures for bald eagles include:</p> <ul style="list-style-type: none"> ▶ A raptor nest survey will be conducted prior to construction to identify bald eagle nests in the project area. If an active bald eagle nest is found within 0.5 mile of the project area, the buffers and seasonal restrictions recommended by CDOW will be established during construction to avoid nest abandonment. ▶ No construction will occur within 0.25 mile of active nocturnal roosts between November 15 and March 15. If perch or roost trees are removed during construction, they will be replaced at a 2:1 ratio with native cottonwood trees. <p>Prairie dog colonies will need to be resurveyed prior to construction. In areas where avoidance of prairie dogs is not possible, CDOT will follow its Impacted Black-tailed Prairie Dog Policy. Any prairie dog relocation or removal activities will be carried out in accordance with CRS 35-7-203, as well as any other applicable laws or regulations, and with close coordination with CDOW.</p> <p>Burrowing owl surveys will be conducted prior to any work in prairie dog colonies between March 15 and October 31. If burrowing owls are present, prairie dog removal will be scheduled to occur outside this time period. If burrowing owls are found within the construction footprint during preconstruction surveys, nests will be left undisturbed and additional avoidance measures will be developed in coordination with CDOW. Direct impacts to burrowing owls will be avoided by covering or destroying prairie dog burrows prior to construction (prior to March 15). Direct impacts to nesting great blue herons will be avoided by prohibiting work within the 500-meter (0.31-mile) buffer from nest sites recommended by CDOW. Impacts within this buffer will be limited during the nesting season, which occurs from mid-March through July.</p> <p>Mitigation measures for wetlands and Preble's, including wetlands replacement and riparian enhancement, will also mitigate impacts to northern leopard frogs and common gartersnakes.</p> <p>Replacement of culverts with larger culverts or free-spanning bridges will also mitigate potential impacts to northern leopard frog and common gartersnake.</p>

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Threatened, Endangered, Other Federally-Protected, and State Sensitive Species (cont'd)	
	<p>The following design measures will mitigate potential impacts to aquatic species, including native fish:</p> <ul style="list-style-type: none"> ▶ Riffle and pool complexes should be maintained and/or created; ▶ Natural stream bottoms will be maintained; ▶ Culverts should be partially buried and the bottom should be covered with gravel/sand and have a low gradient; ▶ Culverts to be replaced will be replaced with one of equal or greater size; ▶ Culverts will not have grates, energy dissipators, or any other features that would impede fish movement. ▶ To avoid erosion-induced siltation and sedimentation, erosion control measures will be applied, such as the immediate reseeding of disturbed areas after construction and, if necessary, the application of mulch and mulch tackifier to stabilize slopes. ▶ Access points to streams during construction will be limited to minimize degradation of the banks. ▶ No new fish passage barriers will be created. ▶ Existing drop structures that create a barrier to fish movements will be removed or redesigned where practicable. <p>CDOT's water quality BMPs will be applied, and will include installation of mechanisms to collect, contain, and/or treat roadway runoff. Mitigation measures, such as habitat replacement/enhancement and replacement of existing culverts with larger or more numerous culverts and/or free-spanning bridges, would also improve fish habitat. These measures are designed to offset impacts to wetlands, Ute ladies'-tresses orchid, and Preble's.</p> <p>Potential Colorado butterfly plant and Ute ladies'-tresses orchid habitat within the project area, along the Cache la Poudre, Big Thompson and Little Thompson rivers, and along St. Vrain Creek will be surveyed during the flowering season just prior to construction.</p>

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Visual Quality	
<p>Most of the proposed improvements would not have a substantial effect to the visual quality of the corridors.</p> <p>Long-term impacts would include relocation of businesses and residences, rebuilt interchanges, increased right-of-way, additions of station amenities, and changes to the surrounding landscape through the use of overpasses, bridges, retaining walls, medians, as well as alterations to the existing roadway grade.</p> <p>Indirect impacts of the proposed improvements could encourage development that is more compact and denser, especially within walking distance of a transit station.</p> <p>The addition of transit stations and a maintenance facility would generate lighting that would be seen by motorists, as well as from adjacent businesses and residences.</p> <p>Short-term impacts would include detours, increased roadway congestion in and around the area, the presence of large equipment, and dust from construction.</p>	<ul style="list-style-type: none"> ▶ Mitigation measures to address visual effects of highway widening will include incorporating landscaping at interchanges and along the highway. ▶ Mitigation measures to address visual effects of structural elements will include providing architectural interest or color into retaining walls and sound walls, and reducing the effect of overpasses by providing architectural detailing of the railings and other features. ▶ Mitigation measures to address the visual effects of carpool lots will include the use of trees in combination with shrubs to filter views to the carpool lots, provide a human scale, and present a positive image. Landscape islands with shade trees would be placed in parking lots to break up the expanse of pavement and parked vehicles. ▶ Mitigation measures to soften and enhance the visual effects of slip ramps will include incorporating landscaping, providing architectural interest or color in retaining wall and limiting lighting to only what is required for safety and security. ▶ Potential mitigation measures to soften and enhance the visual effect of the proposed commuter rail service will include fencing types, landscaping, and architectural features. ▶ Mitigation measures to soften and enhance visual effects of track widening for transit will include incorporating landscaping, considering vinyl-coated chain-link fencing, providing architectural interest or color in retaining wall and bridge design, and limiting lighting to only what is required for safety and security. <p>Mitigation measures to address visual effects of express bus, commuter bus, and commuter rail stations will include providing distinctive treatments at station locations to designate station locations. Local communities, business districts, or other entities should be involved in upgrading or enhancing the currently proposed features. The effects of overpasses will be reduced with architectural detailing of the railing and other features. Station effects will be reduced with the use of trees in combination with shrubs to filter views to the station and parking lots, provide a human scale, and present a positive image to attract ridership. Landscape islands with shade trees will be placed in parking lots to break up the expanse of pavement and parked vehicles.</p>

1 **Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)**

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
<p>Historic Preservation</p> <p>“Adverse effects” to NRHP-eligible or-listed properties: 0 “Adverse effect” determinations</p> <p>“No-adverse effect” to NRHP-eligible or-listed properties: 6 “No-adverse effect” determinations</p> <p>No NRHP-eligible archaeological resources would be affected within the Area of Potential Effect</p>	<p>Mitigation measures to address adverse effects to historic properties will be determined by consultation between FHWA, FTA, CDOT and the Colorado SHPO, and may include:</p> <ul style="list-style-type: none"> ▶ Creation of a detailed narrative and photographic record prepared in accordance with the SHPO’s standards for Level II Documentation; ▶ Preparation of permanent documentation in accordance with the National Park Service standards for the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER); ▶ Development of public interpretation of the historic properties to be lost or substantially changed by the project, by signage, museum exhibits, other interpretive displays, brochures or publications, etc.; ▶ Development of other creative approaches to mitigation to be determined through consultation. ▶ Data recovery (excavation and analysis) will be undertaken for impacted archeological resources. ▶ Construction monitoring will be undertaken as necessary in areas with archaeological resources for impacted archeological resources. ▶ Mitigation measures for indirect effects include: ▶ Construction disturbances will be controlled and minimized. ▶ All disturbed areas will be returned to their original configuration to the extent possible. ▶ Precautionary measures, such as applied palliatives to reduce impact of dust will be implemented. <p>Contractor training to prevent flying debris effects will be implemented.</p>

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1 **Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)**

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Paleontological Resources	
<p>Construction along I-25 between E-470 and US 36, especially where cuts are necessary to expand highways and interchanges, has the highest likelihood of adversely impacting paleontological resources. Ground disturbance associated with the construction of commuter rail lines and facilities</p> <p>Phase 1 of the Preferred Alternative would generally require 1,328 acres of ground disturbance and has the potential for impacts on paleontological resources.</p>	<p>The latest revision of the CDOT Specification 107 Archeological/Paleontological shall be followed. All paleontological monitoring work will be performed by a qualified and State of Colorado-permitted paleontologist. Paleontological monitoring will include inspection of exposed rock units and microscopic examination of matrix to determine if fossils are present. This work would take place during surface disturbing activities, such as excavations for the construction of roads, railways, bridges, underpasses, and buildings.</p> <p>Monitoring will be scheduled to take place continuously or to consist of spot-checks of construction excavations, depending upon the paleontological sensitivity of the project area based on its geology and the types and significance of potential fossils that could be present in subsurface sedimentary deposits. Paleontological monitors will follow earth-moving equipment and examine excavated sediments and excavation sidewalls for evidence of significant paleontological resources. At the request of the monitors, the project engineer will order temporary diversion of grading away from exposed fossils in order to permit the monitors to efficiently and professionally recover the fossil specimens and collect associated data. All efforts to avoid delays to project schedules will be made.</p> <p>If any subsurface bones or other potential fossils are found by construction personnel during construction, work in the immediate area will cease immediately, and the CDOT paleontologist will be contacted to evaluate the significance of the find.</p>
Hazardous Materials	
<p>50 parcels with potential environmental conditions and 15 parcels with recognized environmental conditions are associated with the Preferred Alternative.</p>	<p>A Materials Management Plan (MMP), as required by Section 250.03 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT, 2005a), will be prepared for areas with known soil and groundwater contamination. Construction specifications will be written to include review of the MMP by the CDOT Regional Environmental Manager.</p>

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Hazardous Materials (cont'd)	<p>If dewatering is necessary, groundwater brought to the surface will be managed according to Section 107.25 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT, 2005a) and permitted by the CDPHE Water Quality Control Division.</p> <p>Relocation of overhead electrical utility lines and pole-mounted transformers will be conducted in accordance with any easement agreement between CDOT and/or private landowners.</p> <p>All wells within the proposed construction area will be abandoned and plugged according to CDOT Section 202.02 in Standard Specifications for Road and Bridge Construction (CDOT, 2005a) and in conformance with the Colorado Department of Natural Resources Division of Water Resources State Engineer Water Well Construction Rules, specifically Rule 16.</p> <p>If petroleum-contaminated soil is identified with a concentration less than 1,000 ppm but higher than 500 ppm, CDOT will be responsible for clean-up. A MMP and a Health and Safety plan, as required by Section 250.03 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT, 2005), also is recommended for use when oil and gas facilities are encountered.</p> <p>Prior to demolition of any structures, an asbestos, lead-based paint, and miscellaneous hazardous materials survey will be conducted at each parcel, where applicable. Regulated materials abatement will be conducted in accordance with Section 250, Environmental, Health, and Safety Management, of the CDOT Standard Specifications for Road and Bridge Construction (CDOT, 2005a) and relevant Occupational Health and Safety (OSHA) regulatory details.</p> <p>Prior to demolition, regulated materials must be removed from any structures and appropriately recycled or disposed.</p>

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Hazardous Materials (cont'd)	<p>Coordination with the Colorado Department of Labor and Employment Division of Oil and Public Safety (OPS) will be required prior to parcel acquisition of any sites that are identified as having active leaking tanks. If site characterization and/or remediation have not been completed, the OPS may require CDOT to complete these activities after acquisition. During the right-of-way acquisition process, additional properties may require other actions depending on the results of the Initial Site Assessments (ISAs). By law, all friable asbestos-containing materials (ACM) must be removed from structures, including bridges, prior to demolition, and soils if encountered in excavated landfill or building debris, buried utilities, or other ACM. The contractor performing the asbestos abatement is required to be licensed to perform such work and obtain permits from the CDPHE.</p> <p>Lead-based paint may need to be removed prior to demolition if the lead is leachable at concentrations greater than regulatory levels. Where lead-based painted surfaces will be removed via torching, additional health and safety monitoring requirements are applicable.</p> <p>Prior to construction activities, a Health and Safety Plan, as required by Section 250.03 of the CDOT Standard Specifications for Road and Bridge Construction (CDOT, 2005a), will be developed. Construction specifications shall be written to include review of the Health and Safety Plan by the CDOT Regional Environmental Manager.</p> <p>If abandoned landfills or coal mines are present below and/or within 1,000 feet of construction activities, the Health and Safety Plan will need to include provisions for assessing and monitoring air quality at all utility trenches, drainage structures, and similar underground construction (i.e., caissons) areas prior to and during intrusive activities to ensure worker safety</p>

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Parks and Recreation	
<p>Two parks and recreation properties impacted. Benefits would include improved access and mobility to and from these recreational resources.</p>	<p>All ground disturbing and debris generating construction processes will be contained by erosion and sediment control BMPs designed as part of approved stabilization and stormwater management plans.</p> <p>All disturbed areas will be returned to their original contour, vegetation, and landscape appearance in cooperation with and direction from the resource jurisdictional authorities.</p> <p>Some techniques that may be used to mitigate impacts will include, but not be limited to:</p> <ul style="list-style-type: none"> ▶ coordinating with the local jurisdiction to prepare for construction at the site, including public safety and security measures and providing signed detour and alternate access information; ▶ replacing vegetation will be with native grass and shrubs or irrigated turf as pre-construction conditions dictate; (mitigation ratios and plant selection and placement will be determined through coordination with local jurisdictional agencies); ▶ using BMPs to limit erosion during construction; ▶ compensating for acquisition of the resource (location of any lost access will be negotiated with park representatives during final design); and ▶ rebuilding park features, such as trails, elsewhere on the park site. <p>Fencing will be included in all areas where pedestrian safety is a concern.</p>
Section 6(f)	
<p>Would have no impacts on any of the 6(f) properties</p>	<p>No mitigation is required.</p>
Farmlands	
<p>The Preferred Alternative would result in the direct conversion of 402.8 total acres, if certain farming conditions are present. No farms would be severed or lose access. Most of the farmland impact is associated with the widening of I-25 to accommodate buffer separated tolled express lanes.</p>	<p>If any important agricultural features are affected as design is further defined, mitigation measures, such as replacement of irrigation ditches and pipes, will be considered as appropriate. Loss or damage to crops resulting from construction activities will be compensated.</p>

1 **Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)**

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Energy	
<p>Would use approximately 0.9 percent more energy than the No-Action Alternative, as a result of increase in annual vehicle miles of travel within the project area</p>	<p>Mitigation of energy consumption during operations will focus on a reduction in daily vehicle miles of travel. This reduction can be achieved through successful transit-oriented development, congestion management, and effective improvements to the roadways. These measures all work to increase travel efficiency and save energy.</p>
Public Safety and Security	
<p>An increased security presence would be needed on buses, and at existing and proposed stations and associated existing park-n-Rides.</p> <p>There is a potential for modest increases to police services in response to increases in crime</p> <p>There is a potential for increased theft during the construction phase (a temporary impact)</p>	<p>Mitigation measures for temporary impacts during construction include:</p> <ul style="list-style-type: none"> ▶ The design of bus stations will incorporate life-safety standards, similar to RTD's Comprehensive Safety Certification Program. To ensure consistency of service across the transit corridor, the commuter rail operating authority will be expected to adhere to these same standards. These include measures such as fencing to protect patrons from the track area; well-designed pedestrian underpasses; lighting as a deterrent to crime and to ensure good visibility in stations and parking areas; and, where walls and elevator shafts are constructed, the use of transparent materials to provide better sight lines and reduce concealment areas for criminals. ▶ Prior to operation of commuter rail the operational authority will host training sessions for all affected police, fire, emergency response teams, schools, and employers who either are responsible for police or emergency response or are located in the immediate project corridor. These training sessions will cover the details of commuter train and bus operations, potential security issues, and agency responsibilities. <p>Potential losses at construction sites will be mitigated through fencing and on-site security provided by contractors. All construction contractors will be responsible for safety at their respective sites and will be required to follow all OSHA requirements applicable to construction site safety. The appropriate agencies will provide a site safety officer to monitor site safety.</p>

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Construction	
<p>The Preferred Alternative would have construction impacts greater than Package B because it includes commuter rail, but less than Package A because it has a single track, rather than double track. Construction of all build packages would cause varying temporary impacts to traffic patterns and congestion, noise and vibration, air quality, and visual presence</p> <p>Construction impacts would be short-term and isolated in extent depending upon the types and location of construction</p>	<p>CDOT's Standard Specifications for Road and Bridge Construction (2005) and CDOT's Construction Manual (2002a) outline basic mitigation measures that contractors are required to take on any construction project. Appropriate application of these mitigation strategies will be defined during the final engineering phase of this project.</p> <p>Noise</p> <ul style="list-style-type: none"> ▶ Implement construction best management practices. ▶ Use noise blankets on equipment and quiet-use generators. ▶ Combine noisy operations to occur in the same time period. ▶ Use alternative construction methods, such as sonic or vibratory pile-driving in sensitive areas, when possible. ▶ In residential areas, construction activities will be minimized during the evening, nighttime, weekends, and holidays when receptors are usually in these areas. ▶ Nighttime construction will be desirable (e.g., commercial areas where businesses may be disrupted during daytime hours) or necessary to avoid major traffic disruption. ▶ The major noise source on construction sites is typically diesel motors; therefore, all engines will use commercially available effective mufflers and enclosures, as possible. <p>Modern equipment will be used with improved noise muffling and all equipment items will be evaluated to ensure that they have the manufacturers' recommended noise abatement measure, such as mufflers, engine covers, and engine vibration isolators intact and operational. Generally, newer equipment would create less operational noise than older equipment. All construction equipment should be inspected at periodic intervals to ensure proper maintenance and presence of noise-control devices (e.g., mufflers and shrouding).</p> <ul style="list-style-type: none"> ▶ The use of impact pile driving will be avoided near noise-sensitive areas, where possible. Alternative foundation preparation technologies will be used, such as vibratory pile driving or cast in drilled hole.

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Construction (cont'd)	<ul style="list-style-type: none"> ▶ Temporary barriers will be used and relocated, as required, to protect sensitive receptors from excessive construction noise. Noise barriers should be made of heavy plywood or moveable insulated sound blankets. ▶ Plans will be made to conduct truck loading, unloading, and hauling operations so that noise will be kept to a minimum. ▶ Frequent updates of all construction activities will be provided to the public. <p>A community noise and vibration monitoring plan and a noise and vibration control plan will be prepared before initiating any construction.</p> <p>Access</p> <ul style="list-style-type: none"> ▶ Use enhanced signing. ▶ Use alternate access enhancements. ▶ Use advertising/public relations. ▶ Do not close multiple interchanges concurrently. <p>Highway</p> <ul style="list-style-type: none"> ▶ Limit detours. ▶ Place detours on major arterial streets and ensure no local street detours are implemented. ▶ Schedule construction during periods of least traffic. ▶ Use geometric enhancements including wider lanes and better visibility. ▶ Limit construction vehicles to major arterials. ▶ Enforce speed restrictions; provide adequate space for enforcement; make prime contractor accountable. ▶ Use courtesy patrol. ▶ Use enhanced signing. ▶ Phase construction to limit traffic in neighborhoods. ▶ Comply with AASHTO guidance and Manual on Uniform Traffic Control Devices.

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Construction (cont'd)	<ul style="list-style-type: none"> ▶ Coordinate work activities to ensure they do not coincide with sporting, school, or special events. ▶ Implement advanced traffic diversion. ▶ Use intelligent management systems and variable message signs to advise/redirect traffic. Work with RTD to offer enhanced operations during peak construction. ▶ Develop traffic management plans. ▶ Maintain access to local businesses/residents. ▶ Coordinate with emergency service providers to minimize delay and ensure access to properties. <p>Pedestrian/Bicycle Mobility</p> <ul style="list-style-type: none"> ▶ Provide well-defined detours for pedestrians/ bicyclists. ▶ Enhance safety through the use of adequate signing, fencing, and lighting. ▶ Implement a public relations program. ▶ Comply with American Disability Act requirements. ▶ Construct new bike/pedestrian overpass as a detour before old is demolished. <p>Environmental Impacts</p> <ul style="list-style-type: none"> ▶ Use wetting/chemical inhibitors for dust control. ▶ Provide early investigation of subsurface conditions. ▶ Prepare a well-defined materials handling plan. ▶ Employ educated contractor with trained personnel. ▶ Require prompt and safe disposal of waste products. ▶ Implement water quality best management practices. ▶ Prepare well-defined stormwater management plan. ▶ Conduct monitoring. ▶ Institute resource reuse and allocation. ▶ Ensure regulatory compliance.

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Construction (cont'd)	<ul style="list-style-type: none"> ▶ Cover trucks hauling soil and other materials. ▶ Stabilize and cover stockpile areas. ▶ Minimize offsite tracking of mud, debris, hazardous material, and noxious weeds by washing construction equipment in contained areas. ▶ Avoid impacts to wetlands or other areas of important habitat value in addition to those impacted by the project itself. ▶ Control and prevent concrete washout and construction wastewater. As projects are designed, ensure that proper specifications are adhered to and reviewed to ensure adequacy in the prevention of water pollution by concrete washout. ▶ Store equipment and materials in designated areas only. ▶ Promptly remove any unused detour pavement or signs. ▶ Follow CDOT Standard Specifications for Road and Bridge Construction (2005), including sections regarding water quality control, erosion control, and environmental health and safety. ▶ Prepare or revegetate exposed areas as soon as possible after construction. ▶ Remove soil and other materials from paved streets ▶ Incorporate recommendations as appropriate from the Regional Air Quality Council (RAQC) report, Reducing Diesel Emissions in the Denver Area (RAQC, 2002). ▶ Operate equipment mainly during off-peak hours. ▶ Limit equipment idling time. ▶ Use recycled materials for project activities to the extent allowed by good practice and CDOT construction specifications. ▶ Use construction equipment that use ultra-low sulfur fuels to the extent practicable. <p>Floodplains and Water Resources</p> <ul style="list-style-type: none"> ▶ Best management practices used will be consistent with the MS4 permitting requirements, requirements of Northern Front Range flood control districts, as well as practices mentioned in CDOT's Erosion Control and Stormwater Quality Guide (CDOT, 2002b). ▶ Section 107.25 of CDOT's Standard Specifications for Road and Bridge Construction (2005) deals with contractor's requirements for water quality control

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1 Table 8-9 Phase 1 Impact and Mitigation Summary (cont'd)

Phase 1 Resource Impacts	Phase 1 Mitigation Measures
Section 4(f)	
<p>Section 4(f) resource uses:</p> <ul style="list-style-type: none"> ▶ No Section 4(f) non-<i>de minimis</i> uses ▶ Three park Section 4(f) <i>de minimis</i> uses ▶ Three trail Section 4(f) <i>de minimis</i> uses ▶ Six NRHP listed or eligible sites with <i>de minimis</i> uses 	<p>Mitigation measures to address impacts to Section 4(f)resources will be determined by:</p> <ul style="list-style-type: none"> ▶ Coordinating with the local jurisdiction to prepare for construction at the site including public safety and security measures, and providing detour and alternative access information. ▶ Replacing vegetation with native grass and shrubs or irrigated turf as pre-construction conditions dictate. Mitigation ratios and plant selection and placement will occur through coordination with the local agencies having jurisdiction. ▶ Using BMPs to limit erosion during construction. ▶ Compensating for acquisition of the resource. Location of any lost access will be negotiated with park representative during final design. ▶ Rebuilding park features, such as trails, elsewhere on the park site. ▶ Fencing will be included in all areas where pedestrian safety is a concern.

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